TransWest Express Transmission Project

Draft

Environmental Impact Statement

(Volume II)

BLM

Wyoming State Office

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Western Area Power Administration

Mission Statement

The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

Mission Statement

Western is a Federal agency under the Department of Energy that markets and transmits wholesale electrical power through an integrated 17,000-circuit mile, high-voltage transmission system across 15 western states. Western's mission: Market and deliver clean, renewable, reliable, cost-based Federal hydroelectric power and related services.

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Contents

Volume II

List of Tables

List of Figures

3.5 Vegetation

3.5.1 Regulatory Background

Regulations that directly influence vegetation resources within the analysis area are primarily implemented by the BLM, USFS, Department of Agriculture for Wyoming, Colorado, Utah, and Nevada, and the USACE. The vegetation regulations, including those regulations for noxious weed management, riparian and wetland areas, relevant to the project are presented in **Table 3.5-1**.

Table 3.5-1 Relevant Regulations for Vegetation Resources

Topic	Regulation
Noxious and Invasive Weeds	Federal Plant Protection Act of 2000 (formerly the Noxious Weed Act of 1974) 7 United States Code SS 2801-2814 Colorado Revised Statutes 35-5.5-104.5 to 35-5.5-119; 25-8-205; 25-8-205.5; 35-9-118 Colorado Code of Regulations 8 CCR 1206-2 Wyoming Statutes 11- 5- 102.a.xi Wyoming Weed and Pest Control Act Utah Code 04-17-1 to 04-17-11 Utah Administrative Code Rules 68-9 Nevada Revised Statutes 555.005-555.5570 FSM 2000 Zero Code 2080
Riparian and Wetlands	Clean Water Act (33 USC 1344) Rivers and Harbors Act (33 USC 401 et seq.) Code of Federal Regulations Title 33 Navigation and Navigable Waters Executive Order 11988, “Floodplain Management,” May 24, 1977 Executive Order 11990, “Protection of Wetlands,” May 24, 1977 Colorado Code of Regulations 5-CCR 1002-31 Wyoming Wetland Act W.S. 35-11-308 through 35-11-311 BLM Utah Riparian Policy (IM-UT-2005-091)

3.5.1.1 Noxious and Invasive Weed Species

The terms “noxious weed” and “invasive weed” are often used interchangeably to describe any plant that is unwanted and grows or spreads aggressively. The term “noxious weed” is legally defined under both Federal and state laws. Under the Federal Plant Protection Act of 2000, a noxious weed is defined as “any plant or plant product that can directly or indirectly injure or cause damage to crops, livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the U.S., the public health, or the environment” (Animal and Plant Health Inspection Service 2000; Institute of Public Law 1994). Invasive species are defined as plants able to establish on a site where they were not present in the original plant composition (BLM 2008). The Federal Plant Protection Act of 2000 (formerly the Noxious Weed Act of 1974) and EO 13112 of February 3, 1999, require cooperation with state, local, and other federal agencies in the application and enforcement of all laws and regulations relating to the management and control of noxious weeds.

The BLM has established a goal that NEPA documents consider and analyze the potential for the spread of noxious weed species and provide preventative rehabilitation measures for each management action involving surface disturbance. The USFS regulates noxious weeds as required in the USFS FSM 2000 zero code 2080. BLM and USFS BMPs and Stipulations and Guidelines, as defined in the RMPs and LRMPs, list requirements for noxious weed control and management. In addition to the Federal noxious weed list, each

state maintains a list of regulated and prohibited noxious and invasive weed species. Weed control and management is typically required in each county on public and private lands. Counties also can have their own list of regulated and prohibited invasive weed species. For the land management agencies, while the primary concern is the control of noxious weeds of concern identified by the State statutes and regulations in Wyoming, Colorado, Utah, and Nevada, a secondary concern is the control of invasive species (e.g., halogeton, henbane, and cheatgrass). The following paragraphs outline the management and regulatory requirements by state.

Wyoming

The Wyoming Department of Agriculture defines noxious weeds as "weeds, seeds, or other plant parts that are considered detrimental, destructive, injurious or poisonous, either by virtue of their direct effect or as carriers of diseases or parasites that exist within the state, and are on the designated list (by the Wyoming Statutes" (Title 11, Chapter 5, Section 102.a.xi).

Colorado

The Colorado Department of Agriculture (CDA) manages and regulates noxious and invasive species through the Colorado Noxious Weed Act, which classifies noxious weeds into three lists, A, B, and C (§ 35 5.5-101 through 119, C.R.S. [2003]). Each list has specific control requirements, with the most stringent requirements for those species found on List A. List A species are designated for eradication. List B includes species for which state noxious weed management plans would be developed to stop the continued spread of these species. List C includes species for which state noxious weed management plans would be developed to support the efforts of local governing bodies to facilitate more effective integrated weed management on private and public lands (CDA 2011).

Utah

The Utah Department of Agriculture (UDA) defines a "noxious weed" as any plant especially injurious to public health, crops, livestock, land, or other property per the Utah Noxious Weed Act, which classifies noxious weeds into three non-native classes: Class A (Early Detection Rapid Response [EDRR]), Class B (Control), and Class C (Containment). Class A species pose a serious threat to the state and should be considered a very high priority for EDRR. Class B species pose a threat to the state and should be considered a high priority for control. Class C species are widely spread and pose a threat to agricultural industry with a focus on stopping expansion (Utah Weed Control Association 2011).

Nevada

The State of Nevada defines noxious weeds as "any species of plant which is liable to be detrimental or destructive and difficult to control or eradicate" (NRS 555.010-555.220). The state has enacted laws requiring the control of noxious weed species (NRS 555.005, NAC 555.010) for which the Nevada Department of Agriculture (NDA) maintains jurisdiction, management, and enforcement. Under NRS 555.010-555.220 and per the NDA, state-listed noxious weeds are classified into three categories: A, B, and C. Each list has specific control requirements, with the most stringent requirements for those species found in Category A. Category A includes noxious weed species not found or limited in distribution throughout the state, actively excluded from the state, and actively eradicated wherever found, and whose control is required by the state for all infestations. Category B includes noxious weed species which are established in scattered populations in some counties of the state, actively excluded where possible, and whose control is required by the state in areas where populations are not well established or not previously known to occur. Category C includes noxious weed species currently established and generally widespread in many counties of the state, and whose abatement remains at the discretion of the State Quarantine Officer (NDA 2010).

3.5.1.2 Riparian and Wetland Areas

Waters of the U.S. (WUS) are defined in 33 CFR 328.3 as all non-tidal waters that are currently, or were used in the past, or may be susceptible to use in interstate commerce; all interstate waters including wetlands; all other waters such as interstate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, of which the use, degradation or destruction could affect interstate commerce; and all impoundments of waters otherwise defined as WUS under this definition. In addition, tributaries of the above listed waters, including arroyos and other intermittent drainages, and wetlands adjacent to the above waters also are considered to be WUS.

Criteria used by the USACE to determine whether a drainage constitutes a WUS include presence of a defined bed, banks, or evidence of an ordinary high water mark.

Wetlands adjacent to other WUS, such as streams, also are considered to be WUS. In addition, and as used herein, the term “wetlands” has a regulatory definition as defined in 33 CFR 328. 7(b) as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Note that the frequency and duration of saturation may vary by geographical region, and is largely dependent upon local climatic conditions.

According to the USACE’s 1987 Wetland Delineation Manual, a “three-parameter” approach is required for delineating USACE-defined wetlands (USACE 1987), where areas are identified as wetlands if they exhibit hydrophytic vegetation, hydric soils, and wetland hydrology.

The BLM defines a riparian area as “an area of land that is directly influenced by permanent water. It has visible vegetation or physical characteristics reflective of permanent water influence. Lake shores and stream banks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil” (BLM 2008 [Richfield RMP/EIS]). The USFS defines riparian areas as “Geographically delineable areas of land directly influenced by water, comprised of the aquatic and riparian ecosystems. Riparian ecosystems occupy the transition between the aquatic and adjacent terrestrial ecosystem and are characterized by distinctive vegetation communities that require free or unbound water” (USFS 1986a,b). Wetland and riparian communities typically have persistent water or obligate vegetation (e.g., sedges, rushes, willows) due to the availability of surface or groundwater.

3.5.1.3 Wildland Fire

Wildland fire is managed by the governing agency's policies through the RMPs or Land Use Plans (LUPs) and corresponding Fire Management Plans (FMPs) for each of the agencies office or fire management organization. The State Agencies also have their own process and policies for managing wildland fire that are set in their state statues delegating the authority to specific organizations within the each state on down to the county level. The National Wildfire Coordinating Group (NWCG) is an operational group designed to coordinate programs of participating wildfire management agencies, which include the BLM, USFS, NPS, USFWS, and BIA. Federal fire regulations are based on the *Federal Wildland Fire Management Policy* (1995) and the *Review and Update of the 1995 Federal Wildland Fire Management Policy* (USDOI and USDA 2001, 1995).

The analysis for vegetation contained in this EIS assumes that the BLM will continue to manage vegetation resources, noxious weeds, riparian and wetland areas, and wildland fires in coordination with the USFS, USACE, and applicable state agencies (i.e., WDA, CDA, UDA, and NDA). The USFWS will continue to have jurisdiction over the management of ESA-listed plant species.

3.5.2 Data Sources

Information regarding vegetation resources within the analysis area was obtained from a review of existing published sources; BLM RMPs; USFS LRMPs; and WYNDD, CNHP, UNHP, and NNHP database information. Vegetation communities, including riparian and wetland areas, and acreages were identified using the Southwest Regional Gap Analysis Project (SWReGAP) and Northwest Regional Gap Analysis Project (NWReGAP) land cover data (USGS 2008, 2004). Vegetation community characterizations were compiled based on SWReGAP Land Cover descriptions (USGS 2005), NWReGAP Land Cover Descriptions (NatureServe 2012), BLM RMPs, and USFS LRMPs. Species nomenclature is consistent with the NRCS PLANTS Database (NRCS 2013) unless otherwise specified. Noxious weed regulated species were obtained from state statues and supplemented by information provided on state websites.

3.5.3 Analysis Area

The analysis area for vegetation encompasses the total area within the HUC 10 watershed boundaries (as defined in Section 3.4.3) crossed by the 2-mile transmission line corridors for all alternatives and locations of other project components including terminals and ground electrode sites.

3.5.4 Baseline Description

3.5.4.1 Vegetation

The analysis area crosses a range of vegetation types in several ecoregions. Ecoregions are areas where the ecosystems, and the type, quality, and quantity of environmental resources are generally similar as defined by the analysis of patterns and composition of biotic and abiotic phenomena including geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology (USEPA 2013). The USEPA has mapped ecoregions at various scales for North America, with the coarsest scale labeled as Level I and the most detailed as Level IV. For this analysis, the Level III ecoregions provide sufficient detail at a broad enough scale to discuss the various ecosystems crossed by the analysis area. The following five Level III ecoregions cover the analysis area: the Wyoming Basin, the Colorado Plateau, the Wasatch and Uinta Mountains, the Central Basin and Range, and the Mojave Basin and Range (USEPA 2013). Climate and precipitation throughout the analysis area are covered in Section 3.1, Climate and Air Quality, while topography, physiographic regions, and range of elevations are discussed in Section 3.2, Geological, Paleontological, and Mineral Resources. Soils and land uses within the analysis area are presented in Section 3.3, Soil Resources, and Section 3.14, Land Use, respectively.

The Wyoming Basin is a broad, arid basin drained by the Green and North Platte rivers within the analysis area. Surrounded by mountains, the basin is dominated by grasslands and shrublands (Chapman et al. 2004). The arid uplifted, eroded, and deeply dissected tableland of the Colorado Plateau is crossed by the Green and Colorado rivers within the analysis area. The vegetation is sparse and predominately composed of dwarf shrubs in the low-elevation basins and canyons, whereas in the uplands and higher valleys, shrublands and pinyon-juniper woodlands are common. The Wasatch and Uinta Mountain region includes the Uinta Mountains, Wasatch Range, and Wasatch Plateau. The vegetation communities tend to group along elevation bands, with grasslands and shrublands common in the low elevations, mixed, ponderosa, and pinyon-juniper forests in the low to middle elevations, and fir, spruce, pine, and aspen species in the forested communities in the middle to high elevations. In the highest elevations, the vegetation tends to be small, low stature, alpine shrub and forb species, with stunted spruce, fir and pine trees. The Central Basin and Range ecoregion is composed of elevated, internally drained xeric basins in between scattered mountain ranges (Bryce et al. 2003). The vegetation is a mosaic of sagebrush or saltbush-greasewood shrublands and salt flats. The Mojave Basin and Range found in southern Nevada and southwestern Utah is sparsely vegetated, dominated by desert shrubs such as creosote bush, white bursage, Joshua-tree, yucca species, and blackbrush. Tree species are found in the higher elevations and include juniper, singleleaf pinyon, ponderosa pine, white fir, limber pine, and bristlecone pine.

The SWReGAP land cover type categories have been grouped into 21 associated vegetation communities, which are further grouped into eight land cover types. The land cover and associated vegetation communities, and their spatial extent within the analysis area, are listed in **Table 3.5-2**. Descriptions of the plant communities for each land cover and associated vegetation communities are provided in the following text.

Table 3.5-2 Vegetation Cover and Land Use Types within the Analysis Area[1]

Land Cover Types	Vegetative Communities Associated with Land Cover Types	Extent within Analysis Area (acres)
Agriculture	Cultivated Crop and Pasture	784,433
Barren Areas	Barren/Sparsely Vegetated	321,697
	Cliff and Canyon	816,392
	Dunes	133,157
Developed/Disturbed	Developed/Disturbed	988,126
Forest and Woodlands	Aspen Forest and Woodland	641,483
	Conifer Forest	539,604
	Deciduous Forest	13,933
	Pinyon-Juniper	4,081,539
Grasslands	Grassland	1,537,916
	Montane Grassland	70,313
	Tundra	13,956
Greasewood Flat	Greasewood Flat	875,991
Riparian and Wetlands	Open Water	154,328
	Herbaceous Wetland	188,239
	Riparian	68,489
	Woody Riparian and Wetlands	214,144
Shrubland	Desert Shrub	3,074,124
	Saltbush Shrubland	2,991,796
	Sagebrush Shrubland	6,539,728
	Montane Shrubland	875,292
Total		**24,924,680**

[1] The analysis area includes the HUC 10 watershed boundaries crossed by the 2-mile transmission line corridors and associated facilities.

The agriculture cover type consists of 3 percent of the analysis area and is composed of agriculture lands, cultivated cropland and pasture and hay fields. For additional details of agriculture within the analysis area, see Section 3.14, Land Use.

The barren areas cover type is found in 5 percent of the analysis area, and encompasses three vegetative communities including barren and sparsely vegetated areas, cliff and canyons, and active and stabilized dunes. Barren and sparsely vegetated areas within the analysis area typically have less than 10 percent vegetative cover usually consisting of dwarf shrubs. In the analysis area, these areas are composed of shale badlands in Wyoming, Colorado, and Utah; desert pavements and badlands in Nevada; areas composed of volcanic rock in Utah and Nevada; and scree and bedrock areas in the alpine areas of Utah. Cliff and canyon areas are found throughout the analysis area, but are most common in Utah and Nevada. The cliff and canyon vegetation community is comprised of barren and sparsely vegetated landscapes such as steep cliff faces, narrow canyons, small rock outcrops, and open tablelands of sandstone, shale, and limestone. The vegetation in cliff and canyon areas is characterized by very open tree canopy or scattered trees and shrubs with a sparse herbaceous layer. Common species can include conifers, montane and

desert short-shrub, succulents, and herbaceous species. Dunes are found in Wyoming and Utah on windswept mesas, broad basins and plains where the substrates are stabilized sandsheets or shallow to moderately deep sandy soils that form small hummocks or small coppice dunes. Typical dune vegetation is short shrubs with 10 to 30 percent cover.

The developed/disturbed cover type covers 4 percent of the analysis area and is found throughout the analysis area. Developed areas include urban and rural development, roads, utility corridors and stations, oil and gas development, mines, quarries, and recently burned and chained areas. The urban areas within the analysis area include several towns and subdivisions. For more information on developed areas within the analysis area, see Section 3.14, Land Use, and Section 3.17, Social and Economic Resources.

The forest and woodlands cover type comprises 21 percent of the analysis area and encompasses four vegetation communities including aspen forest and woodland, other deciduous forests, pinyon-juniper woodlands, and other conifer forests. Forest types and dominant tree species in each of these vegetation communities is a factor of elevation, slope, aspect, soil characteristics, and climate. Several of the forest types are commercially important as timber. Aspen forest and woodlands are found in montane and subalpine zones in areas with adequate moisture. The vegetation is dominated by stands of quaking aspen (*Populus tremuloides*), even though other tree species may be present. In the analysis area, aspen woodlands are typically found with mixed conifer forests of fir, pines, and Engelmann spruce. In many areas, the conifers are increasing in dominance in the aspen and mixed conifer woodlands due to pressures from livestock grazing and fire suppression (USGS 2005). Other deciduous forests in the analysis area are found in Wyoming and Utah, and consist of oaks (*Quercus* spp.), maples (*Acer* spp.), and boxelders (*Acer negundo*). In Wyoming, much of the deciduous woodlands have high vegetative tree canopy cover and establishment of invasive vegetation. Conifer forests are found throughout the analysis area, but are most common in Utah's mountainous areas. The dominant coniferous forest type in the analysis area is pinyon-juniper woodlands, which occupy 16 percent of the analysis area. Pinyon-juniper woodlands are located in Colorado Plateau's lower elevations, and the dry mountain ranges of the Great Basin region. Pinyon-juniper communities typically occur on warm, dry areas on mountain slopes, mesas, plateaus, and ridges. Dominant overstory species include singleleaf pinyon (*Pinus monophylla*), two needle pinyon (*Pinus edulis*), and Utah juniper (*Juniperus osteosperma*). Understory vegetation can be sparse shrubs or graminoids with species consisting of greenleaf manzanita (*Arctostaphylos patula*), basin big sagebrush (*Artemisia tridentata* spp. *tridentata*), mountain mahogany (*Cercocarpus* spp.), muttongrass (*Poa fendleriana*), and Idaho fescue (*Festuca idahoensis*). Understory forbs can include penstemons (*Penstemon* spp.) and Scarlet globemallow (*Sphaeralcea coccerea*). Other coniferous forests in the analysis area consist of areas dominated by one species such as ponderosa pine (*Pinus ponderosa*) and lodgepole (*Pinus contorta*) or mixed conifer forests such as spruce-fir, limber pine-bristlecone pine, and limber pine-juniper. These forests are found in foothills, montane, and subalpine environments on dry to mesic sites.

The grasslands cover type occupies 7 percent of the analysis area and encompasses three vegetation communities including grasslands, montane grasslands, and tundra. Grassland vegetation communities occupy a wide range of areas within the analysis area including swales, plains, plateaus, and flat to rolling uplands. Grassland compositions vary across the analysis area with mixed grass prairie occurring in Wyoming, juniper savanna in Colorado, and semi-desert grassland in Colorado, Utah, and Nevada. Throughout the analysis area, invasive noxious and non-native species occur in many of the grasslands. Common species that occur in this vegetation community include western wheatgrass (*Pascopyrum smithii*), green needlegrass (*Nassella viridula)*, fescue (*Festuca* spp.), Indian ricegrass (*Achnatherum hymenoides*), blue grama *(Bouteloua gracilis*), needle-and-thread (*Hesperostipa comata*), muhly (*Muhlenbergia* spp.), and James' galleta (*Pleuraphis jamesii*). Montane grasslands are found within the analysis area in montane and subalpine areas predominantly in Utah. Dominant vegetation ranges from graminoids, specifically bunch grasses, to forbs. Dominant graminoid species include oatgrass (*Danthonia* spp.), fescue (*Festuca* spp.), slimstem muhly (*Muhlenbergia filiculmis*), bluebunch wheatgrass (*Pseudoroegneria spicata*), while forb species include fleabane (*Erigeron* spp.), asters (*Asteraceae* spp.), and penstemons (*Penstemon* spp.). In the analysis area, the tundra vegetation community is found above treeline in mountainous regions in Utah. It typically is found on gentle to moderate slopes, flat ridges, valleys, and basins where the soil is relatively

stable and the water supply is fairly constant. Vegetation is low-growing, perennial graminoids, and forbs, with rhizomatous, sod-forming sedges as the dominant graminoids.

The greasewood flat cover type occupies 4 percent of the analysis area. Greasewood flats are found in all four states crossed by the analysis area. This vegetation community type is defined as a mixed wetland and upland land cover type. Based on the categorization used by NWReGAP and SWReGAP, greasewood flats are defined as a woody wetland. More detail about this vegetation community is provided below under Wetland and Riparian Areas.

The riparian and wetland cover type occupies 3 percent of the analysis area and encompasses four vegetation communities including open water, herbaceous wetlands, riparian, and woody riparian and wetlands. More detail about these vegetation communities are provided below under Wetland and Riparian Areas.

The shrubland cover type is the dominant land cover type within the analysis area, comprising 54 percent of the area. Vegetation communities associated with the shrublands cover type include sagebrush shrubland, montane shrubland, saltbush shrubland, and desert shrublands.

Sagebrush and saltbush shrublands are found predominantly in the northeast of the analysis area; montane shrublands in the mountainous regions of central Utah; while desert shrub communities dominant in the southwest portion of the analysis area. In the sagebrush shrubland communities, sagebrush (*Artemisia* spp.) species dominate. The dominant sagebrush species and cover varies with elevation, aspect, water availability, substrate, and disturbance regime. Disturbance regimes also can alter shrub cover with wildfires decreasing shrub cover, while heavy grazing and fire suppression can increase shrub dominance. Typical sagebrush species in the sagebrush shrubland vegetation community are the Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), mountain big sagebrush (*Artemisia tridentata* ssp*. vaseyana*), threetip sagebrush (*Artemisia tripartita*)*,* black sagebrush (*Artemisia nova*), and little sagebrush (*Artemisia arbuscula*). Other shrubs include shadscale saltbush (*Atriplex confertifolia*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), rubber rabbitbrush (*Ericameria nauseosa*), and fringed sage (*Artemisia frigida)*. Herbaceous species are typically less than 25 percent cover, and can include Idaho fescue (*Festuca idahoensis*), prairie junegrass (*Koeleria macrantha*), bluebunch wheatgrass, Sandberg bluegrass (*Poa secunda),* needle-and-thread (*Hesperostipa comata*), and Great Basin wildrye (*Elymus cinereus* var. *cinereus*).

Montane shrublands are found in the mountains, plateaus, foothills, canyons, and hills in all four states. In Wyoming, the montane shrublands are a minor component of the analysis area, and consist of mountain mahogany shrublands on ridges and steep slopes. In Colorado and Utah, the composition of montane shrublands is determined by aspect, climate, and water availability. Dominant species can include gambel oak (*Quercus gambelii*), serviceberry (*Amelanchier* spp.), antelope bitterbrush (*Purshia tridentata*), and mountain mahogany. In the more arid areas in the southwest portions of the analysis area, montane shrublands tend to occur in the transition areas between the Mojave, Sonoran, and northern Chihuahuan deserts where their composition consists of species that are fire-adapted, such as scrub oak (*Quercus* spp.) and ceanothus (*Ceanothus* spp.).

Salt-desert shrublands are found in Wyoming, Colorado, and Utah on lower elevation slopes, saline basins, alluvial slopes, and plains. The vegetation cover is characterized by an open to moderately dense shrubland dominated by shadscale, four-winged saltbush (*Atriplex canescens*), Wyoming big sagebrush, yellow rabbitbrush, rubber rabbitbrush, and Nevada jointfir (*Ephedra nevadensis*). The understory is comprised of herbaceous species such as galleta (*Hilaria jamesii*), Indian ricegrass, blue grama, western wheatgrass, primrose (*Camissonia* spp., *Oenothera* spp.), and annual buckwheat (*Eriogonum* spp.).

The desert shrub vegetation community is the dominant shrubland vegetation community in the southwest portion of the analysis area. It is found on benchlands, pediments, lower piedmont slopes, bajadas, broad valleys, and plains and low hills. The dominant vegetation is dependent on the surrounding vegetation

communities, region, climate, elevation, and substrate. Desert shrub vegetation communities can be quite variable with the vegetation of the Colorado Plateau region typically dominated by blackbrush (*Coleogyne ramosissima*) and mormon tea (*Ephedra viridis*), and the Mojave and Sonoran deserts dominated by creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). The shrub cover tends to be open, with a sparse herbaceous layer.

3.5.4.2 Noxious and Invasive Weeds

Noxious and invasive weeds have become a growing concern in the western U.S. as their spread has resulted in impacts to endangered native species, available forage for livestock and wildlife, and economic resources. Noxious and invasive species threaten native ecosystems and biological diversity based on their ability to increase in cover relative to surrounding vegetation and exclude native plants from an area. Noxious and invasive species readily establish and spread in recently disturbed areas, which can impede successful reclamation and impact management of livestock, wildlife, and human activities. State regulated and prohibited noxious and invasive weed species in Colorado, Utah, Wyoming, and Nevada are listed in **Appendix G**.

3.5.4.3 Wetlands and Riparian Areas

Riparian and wetland areas comprise a small percentage of the lands in the West, but their importance to the surrounding ecosystems and associated species is disproportionately great. Most wildlife species use riparian areas at some point in their life cycles (e.g., many migratory birds during breeding and migration seasons), and some depend almost entirely on these systems (e.g., amphibians). Wetlands and riparian areas are often rich in vegetation diversity and structure, providing food, water, shade, and cover to wildlife and livestock, in addition to acting as water purifiers, supplying groundwater recharge, and aiding in flood control.

Wetland and riparian mapping is sparse or unavailable in much of the analysis area. To provide consistent coverage across the entire analysis area, riparian and wetland areas were determined using NWReGAP and SWReGAP land cover type categories. As SWReGAP has not been ground-truthed in the entire coverage area, and delineating wetland and riparian areas from aerial imagery can be difficult, not all wetland and riparian areas may be captured within the analysis area. It also may overestimate wetland and riparian areas especially in the southern portions of the analysis area. Land cover types identified in **Table 3.5-2** were further split out into five riparian and wetland types. The riparian and wetland types and their spatial extent within the analysis area are listed in **Table 3.5-3**.

Table 3.5-3 Riparian and Wetland Types within the Analysis Area

Riparian and Wetland Types	Extent within Analysis Area (acres)
Greasewood Flat	875,991
Herbaceous Wetlands	
Depression Wetlands	24,477
Marshes	36,860
Playas	126,902
Woody Riparian and Wetland Areas	
Montane Riverine	132,263
Riverine	82,609

Table 3.5-3 Riparian and Wetland Types within the Analysis Area

Riparian and Wetland Types	Extent within Analysis Area (acres)
Open Water	154,328
Riparian	
Wash	67,761
Total	**1,501,192**

Wetlands are found in areas with a connection to a permanent water source such as the groundwater table, or surface drainages, or where an impermeable soil subhorizon prevents water from draining through the surface profile. Vegetation can consist of herbaceous and woody species that are adapted to saturated soil conditions, and are often salt tolerant.

Greasewood flats are found in all four states crossed by the analysis area. This vegetation community type is defined as a mixed wetland and upland land cover type. Based on the categorization used by NWReGAP and SWReGAP, greasewood flats are defined as a woody wetland. Greasewood flats can cover large, flat areas, on broad expenses along lake shores and playas, on older alluvial terraces, on broad or narrow floodplains, or on stream terraces along drainages. Sites typically have saline soils, a shallow water table and flood intermittently, but remain dry for most growing season. Despite salt accumulations, the water table remains high enough to maintain vegetation. The water table is typically shallow, and the soils are extremely saline. The vegetation cover is open to moderately dense shrublands that are typically halophytes (saline tolerant species) and can consist of both upland and wetland species. Typical species include greasewood species (*Sarcobatus* spp.), winter fat (*Kraschenkovia lanata*), and saltbush species (A*triplex* spp.). Herbaceous species are salt tolerant and include salt grass (*Distichlis spicata*), common spikerush (*Eleocharis palustris*), and alkali sacaton (*Sporobolus airoides*).

Based on the NWReGAP and SWReGAP land cover categories, the herbaceous wetland types in the analysis area are depressional wetlands, marshes, and playas. The depressional wetlands are concave to flat herbaceous wetlands which can include alpine wet meadows, fens, palustrine emergent, and closed and open depressions. Typical wetland species include sedges (*Carex* spp.), rushes (*Juncus* spp.), reedgrass (*Calamagrostis* spp.), spikerush (*Eleocharis* spp.), bulrush (*Scirpus* spp., *Schoenoplectus* spp.), cattails (*Typha* spp.), and canarygrass (*Phalaris* spp.). Playas are barren and sparsely vegetated concave areas that are intermittently flooded. Species around the edges of the playas are typically saline-tolerant such as greasewood (*Sarcobatus vermiculatus*) and saltbush species (*Atriplex* spp.). SWReGAP only identifies playas in the southwestern portion of the analysis area. However, playa type wetlands are common throughout the analysis area.

Woody riparian and wetland areas are found along river, stream, and drainage corridors, and greasewood flats. Within the analysis area, woody riparian and wetland areas are further divided into montane riverine and riverine riparian types. Montane riverine areas are found at higher elevations in Regions I, II, and III. Montane riverine communities are found in areas with natural hydrologic regimes, areas with annual to episodic flooding, flood zones, sand or cobble bars, streambanks along perennial and seasonally intermittent streams, and around seeps, fens, and isolated springs on hillsides. Communities tend to be mosaics of multiple woodland and shrubland communities. Vegetation is usually a mix of riparian shrub and tree species including cottonwood (*Populus* spp.), willow (*Salix* spp.), dogwoods (*Cornus* spp.), birch (*Betula* spp.), alders (*Alnus* spp.), chokecherry (*Prunus virginiana*), and boxelder (*Acer negundo*). In the southern portions of Region III, species composition is similar but also can include Arizona willow (*Juglans major*), mesquite (*Prosopis* spp.), velvet ash (*Fraxinus velutina*), and wingleaf soapberry (*Sapindus saponaria*). Herbaceous species are similar to the ones described for herbaceous wetlands. Exotic trees including

Russian olive (*Elaeagnus angustifolia*) and salt cedar (tamarisk [*Tamarix* spp.]) are common in some stands.

Riverine areas are found along washes, arroyos, streams, rivers, floodplains, and desert valleys, where intermittent flooding occurs overflowing the defined banks of the drainage, or where the groundwater table is high. Vegetation types are variable based on elevation, flooding frequency and duration, stream gradient, floodplain width, climate, substrate, and disturbance regimes (livestock grazing, water diversion structures, or invasive species). Typically, annual or periodic flooding, or an annual rise in the water table is required by the riparian species for growth and reproduction. Vegetation is usually a mix of riparian shrub and tree species similar to those identified for montane riverine wetland communities. Typical herbaceous species are similar to the ones described for herbaceous wetlands. The invasive riparian tree species salt cedar and Russian olive are often found in these areas.

Open water in the analysis area consists of rivers, streams, lakes, reservoirs, and stock ponds. See Section 3.4, Water Resources, for a discussion of the open water features within the analysis area.

3.5.4.4 Wildland Fire

Within each vegetative community type found in the analysis area, there is a characteristic fire regime. A fire regime is a general description of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993; Brown 1995). Historical fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. Generally, fire frequency is inversely related to fire intensity. For example, due to higher precipitation levels and cooler mean temperatures (which foster plant growth), there are higher fuel loads in pinyon-juniper woodlands and upper montane forest vegetation types as compared to lowland shrublands and grasslands. In addition, higher precipitation amounts and cooler temperatures provide greater resistance to fire for longer periods. This leads to infrequent, high-intensity fires in montane and subalpine forests. The reverse is true in grasslands where fine fuel types lead to fires at a high frequency that burn rapidly with low intensity. Other factors that determine fire behavior include site topography, weather and climatic conditions, time of year, type of plant community, health of the ecosystem, fuel moisture levels, depth and duration of heat penetration, fire frequency, and site productivity. The highest potential rates of fire spread occur in areas with flashy fuels such as cured-out annual bromes, and steep brushy mountain slopes. Wildland fire risk tends to be high in disturbed grasslands and forblands dominated by non-native noxious and invasive species, especially those dominated by annual brome species.

There are five natural (historical) fire regimes classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation (National Interagency Fuels, Fire, and Vegetation Technology Transfer 2010). These five regimes include:

I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75 percent of the dominant overstory vegetation replaced);

II – 0-35 year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);

III – 35-200+ year frequency and mixed severity (less than 75 percent of the dominant overstory vegetation replaced);

IV –35-200+ year frequency and high (stand replacement) severity (greater than 75 percent of the dominant overstory vegetation replaced);

V – 200+ year frequency and high (stand replacement) severity.

Fire Regime Condition Class (FRCC) is a discrete metric that describes how similar a landscape's fire regime is to its natural or historical state. FRCC quantifies the amount that current vegetation has departed from the simulated historical vegetation reference conditions (Barrett et al. 2010; Hann and Bunnell 2001; Hardy et al. 2001; Holsinger et al. 2006). The three condition classes describe low departure (FRCC 1), moderate departure (FRCC 2), and high departure (FRCC 3). Landscapes determined to fall within the category of FRCC 1 contain vegetation, fuels, and disturbances characteristic of the natural regime; FRCC 2 landscapes are those that are moderately departed from the natural regime; and FRCC 3 landscapes reflect vegetation, fuels, and disturbances that are uncharacteristic of the natural regime. More detailed descriptions of the fire regime condition classes and associated attributes are provided in **Table 3.5-4**.

Table 3.5-4 Fire Regime Condition Class Description

Condition Class	Fire Regime	Example Management Options	Species Composition and Structure	Non-native Species
Condition Class I	Within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Where appropriate, these areas can be maintained within the natural (historical) fire regime by treatments such as fire use.	Species composition and structure are functioning within their natural (historical) range at both patch and landscape scales.	Non-native species are currently not present or present in limited extent. Through time, or following disturbance, sites are potentially vulnerable to invasion by non-native species.
Condition Class II	Moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Where appropriate, these areas may need moderate levels of restoration treatments, such as fire use and hand or mechanical treatments, to be restored to the natural fire regime.	Species composition and structure have been moderately altered from their historical range at patch and landscape scales.	Populations of nonnative invasive species may have increased, thereby increasing the potential risk for these populations to expand following disturbances, such as wildfires.
Condition Class III	High departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Where appropriate, these areas may need high levels of restoration treatments, such as hand or mechanical treatments, before fire can be used to restore the natural fire regime.	Species composition and structure have been substantially altered from their historical range at patch and landscape scales.	Invasive species maybe common and in some cases the dominant species on the landscape. Any disturbance will likely increase both the dominance and geographic extent of these invasive species.

3.5.4.5 USFS MIS Plant Species

The USFS defines Management Indicator Species (MIS) for each national forest. A Management Indicator Species (MIS) is a plant or animal species selected because its status is believed to: 1) be indicative of the status of a larger group of species; 2) be reflective of the status of a key habitat type; or 3) act as an early warning of an anticipated stressor to ecological integrity. The key characteristics of MIS are that their status and trends provide insight to the integrity of the larger ecological system to which they belong.

Wildlife MIS species are discussed in Section 3.7, Wildlife. There is only one identified MIS plant species within the USFS national forests crossed by the project, which is discussed below.

The one identified MIS plant species is Rydberg milkvetch (*Astragalus perianus*) for the Fishlake National Forest. The perennial species has clustered stems arising from a subterranean caudex. The flowers are sparse and white or lavender tinged. The species flowers and fruits from June to September. It is found in sparsely vegetated areas on shallow soils from 7,200 to 11,500 feet (USFS 2006). It is primarily associated in openings in spruce-fir forests, but other common vegetation community associations include mountain big sagebrush, black sagebrush, alpine krummholz, mixed-conifer, and open aspen-fir-mahogany (USFS 2006). Distribution appears to be determined by substrate and elevation. Typical substrates are igneous intrusive gravels, volcanic gravel, or clayey soils. It was listed as a USFWS threatened species in 1978, and delisted in 1989. The species was listed as a USFS Sensitive Species from 1989 to 1994. The Fishlake National Forest included the species as an MIS in their 1986 forest plan when the population of Rydberg milkvetch on the Fishlake National Forest was estimated to be about 4,000. Currently, the plant is known to exist in at least 20 locations with a combined population in excess of 100,000. The species was included as an MIS species based on its previous listing as a USFWS threatened species, and its representation of a selected habitat type of igneous intrusive and volcanic gravels between 8,000 and 11,000 feet (USFS 2006). Threats to the species include ORV use, grazing, mining, or severe erosion (USFS 2006).

3.5.5 Regional Summary of Vegetation

As described in Section 3.5.4, Baseline Description, a wide variety of land cover and associated vegetation communities are found within the analysis area. Many of these vegetation communities are found over a wide geographic area within the analysis area. Land cover and associated vegetation communities are described in Section 3.5.4, Baseline Description, and summarized by Project region below.

Table 3.5-5 summarizes the percent of each land cover and associated vegetation community within the analysis area by region. Shrublands are the dominant land cover in each region, with sagebrush shrubland and desert shrub the two most common vegetation communities. Vegetation communities found within the analysis area for each Project region are presented in **Figures 3.5-1** through **3.5-4**.

In Region I, the dominant vegetation communities are sagebrush shrubland, and saltbush shrubland, especially through Wyoming, Moffat County, Colorado, and Uintah County, Utah. In the Colorado and Utah portions of Region I at higher elevations, pinyon-juniper communities become more dominant. Overall in Region I, pinyon-juniper accounts for 6 percent of the analysis area. Riparian and wetland areas are predominantly herbaceous wetlands and open water. Open water and associated riparian corridors are found along the Little Snake River and the Yampa River. Agriculture is 4 percent of the analysis area and typically consists of irrigated pasture and haylands. Agriculture lands are found mainly around the valley floors near Baggs, Wyoming. Developed and disturbed lands are 2 percent of the Region I analysis area, and consist predominantly of roads, oil and gas development, and urban areas including Rawlins, Wyoming.

Region II is predominantly sagebrush shrubland, saltbush shrubland, and pinyon-juniper vegetation communities. The topography varies greatly in Region II as the area includes high deserts, mountain ranges, valleys, canyons, gorges, mesas, and buttes. In the east of Region II is the Uintah Basin; while in the south portion of Region II is the Book Cliffs and San Rafael Swell, a dome-shaped anticline of sandstone, shale, and limestone. In the north of Region II are the Uinta Mountains, while the Wasatch Mountains cross the center of the Region. Pinyon-juniper vegetation communities are dominant in the higher elevation areas, especially in the Wasatch Mountains, Book Cliffs, and the Uinta Mountains. Sagebrush shrubland is dominant in the mid-elevation areas, with saltbush shrublands common in the lower elevations and the San Rafael Swell. Riparian and wetland areas are predominantly herbaceous wetlands and open water. Open water and associated riparian corridors are found mainly along the Green River and the White River. Agriculture is 4 percent of the Region II analysis area, and is typically irrigated alfalfa, corn, and hay. Developed and disturbed lands are 4 percent of the analysis area, and consist of oil and gas development, logged areas, roads, power plants, utility corridors, and urban areas.

Table 3.5-5 Vegetation Community Types Within the Analysis Area by Region

Cover and Land Use Types	Vegetative Communities Associated with Each Cover Type	Acres and Percent of Vegetation Type Within the Analysis Area by Region							
		I		II		III		IV	
		Acres	%	Acres	%	Acres	%	Acres	%
Agriculture	Agriculture	230,482	4	484,528	4	69,423	1	-	-
Barren/Sparsely Vegetated	Barren/Sparsely Vegetated	36,819	1	222,948	2	29,338	<1	32,592	3
	Cliff and Canyon	29,704	1	565,493	5	164,119	2	57,076	5
	Dunes	85,276	2	32,567	<1	15,313	<1	-	-
Developed/Disturbed	Developed/Disturbed	107,794	2	459,785	4	180,970	2	239,577	21
Forest and Woodland	Aspen Forest and Woodland	89,921	2	544,114	5	7,448	<1	-	-
	Conifer Forest	35,190	1	477,815	4	26,599	<1	-	-
	Deciduous Forest	39	<1	13,869	<1	26	<1	-	-
	Pinyon-Juniper	303,173	6	2,483,995	22	1,292,483	18	1,888	<1
Grassland	Grassland	210,626	4	519,056	5	801,113	11	7,121	1
	Montane Grassland	3,788	<1	65,241	1	1,284	<1	-	-
	Tundra	-	-	13,956	<1	-	-	-	-
Greasewood Flat	Greasewood Flat	90,502	2	511,410	5	274,079	4	-	-
Riparian and Wetland Areas	Open Water	11,332	<1	61,376	1	12,218	<1	69,401	6
	Herbaceous Wetland	25,146	<1	80,634	1	81,741	1	719	<1
	Riparian	728	<1	-	-	65,185	1	2,576	<1
	Woody Riparian and Wetlands	47,585	1	110,822	1	54,368	1	1,096	<1
Shrubland	Desert Shrub	-	-	125,982	1	2,227,441	30	720,701	63
	Montane Shrubland	117,240	2	570,993	5	187,059	3	-	-
	Sagebrush Shrubland	3,038,971	57	2,307,131	21	1,192,955	16	671	<1
	Saltbush Shrubland	885,851	17	1,468,576	13	635,456	9	1,912	<1
Total		**5,350,440**	**100**	**11,120,291**	**100**	**7,318,618**	**100**	**1,135,330**	**100**

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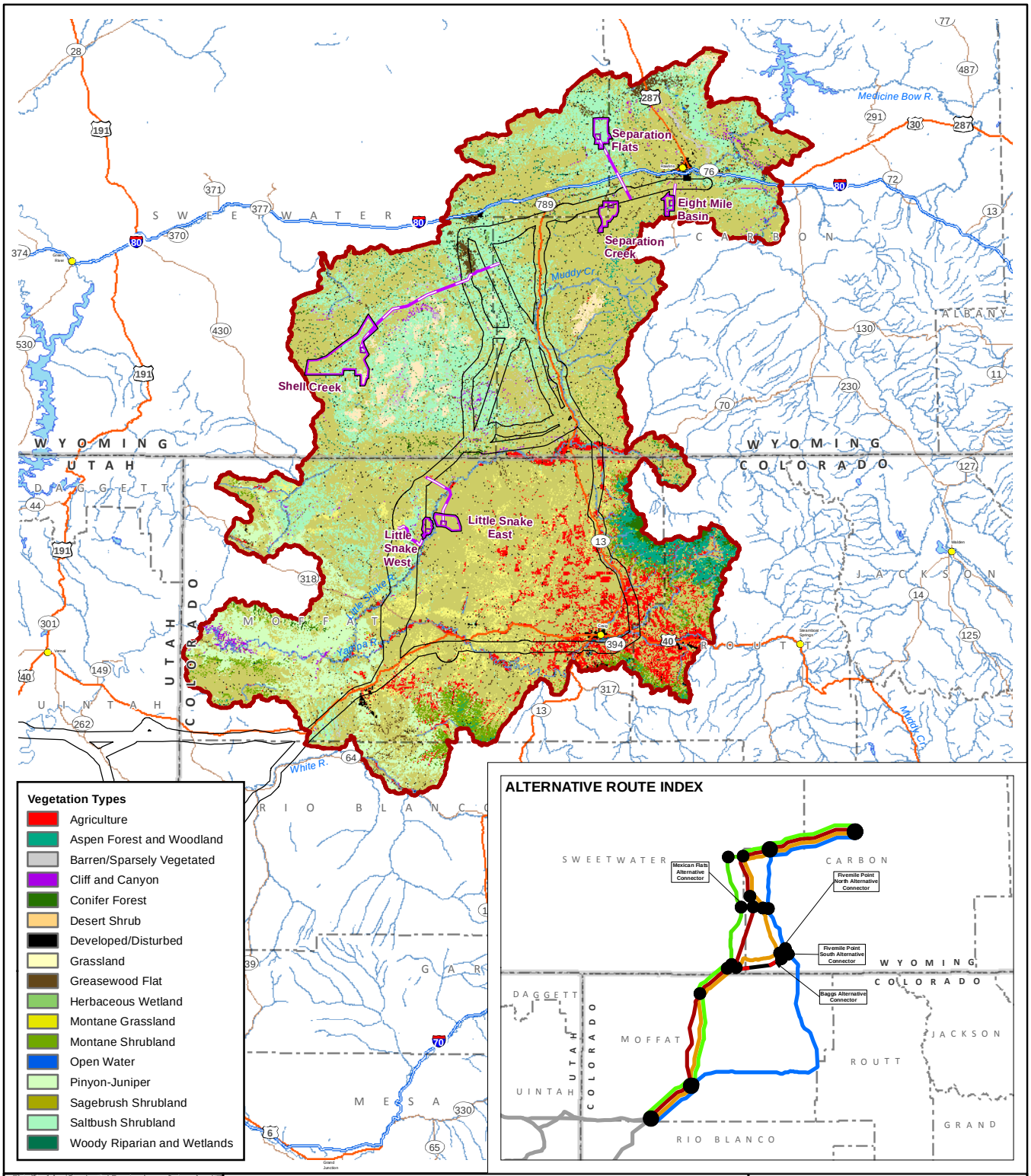

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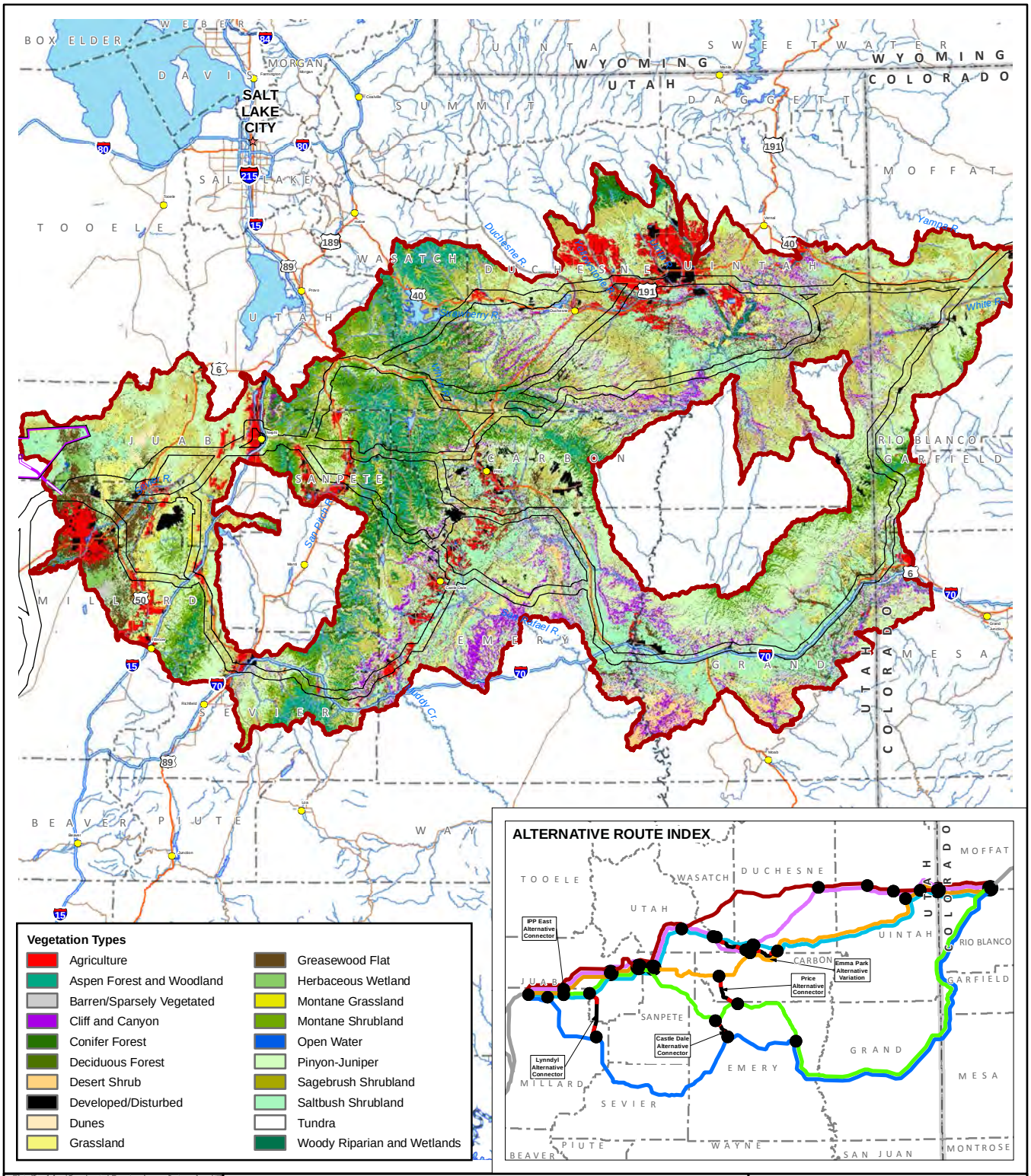
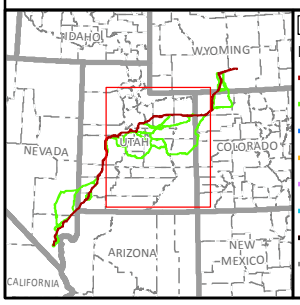


Vegetation Types

- Agriculture
- Aspen Forest and Woodland
- Barren/Sparsely Vegetated
- Cliff and Canyon
- Conifer Forest
- Deciduous Forest
- Desert Shrub
- Developed/Disturbed
- Dunes
- Grassland
- Greasewood Flat
- Herbaceous Wetland
- Montane Grassland
- Montane Shrubland
- Open Water
- Pinyon-Juniper
- Sagebrush Shrubland
- Saltbush Shrubland
- Tundra
- Woody Riparian and Wetlands

ALTERNATIVE ROUTE INDEX



- Project Corridor

DEIS Alternative Routes

- Applicant Proposed II-A
- Alternative II-B
- Alternative II-C
- Alternative II-D
- Alternative II-E
- Agency Preferred II-F
- Alternative Variation or Connector
- Segment not in this Region

- Region II Analysis Area
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.5-2
Region II
Vegetative Communities

0 10 20 40 Miles
0 10 20 40 km
1:2,250,000

N

Western AREA POWER ADMINISTRATION

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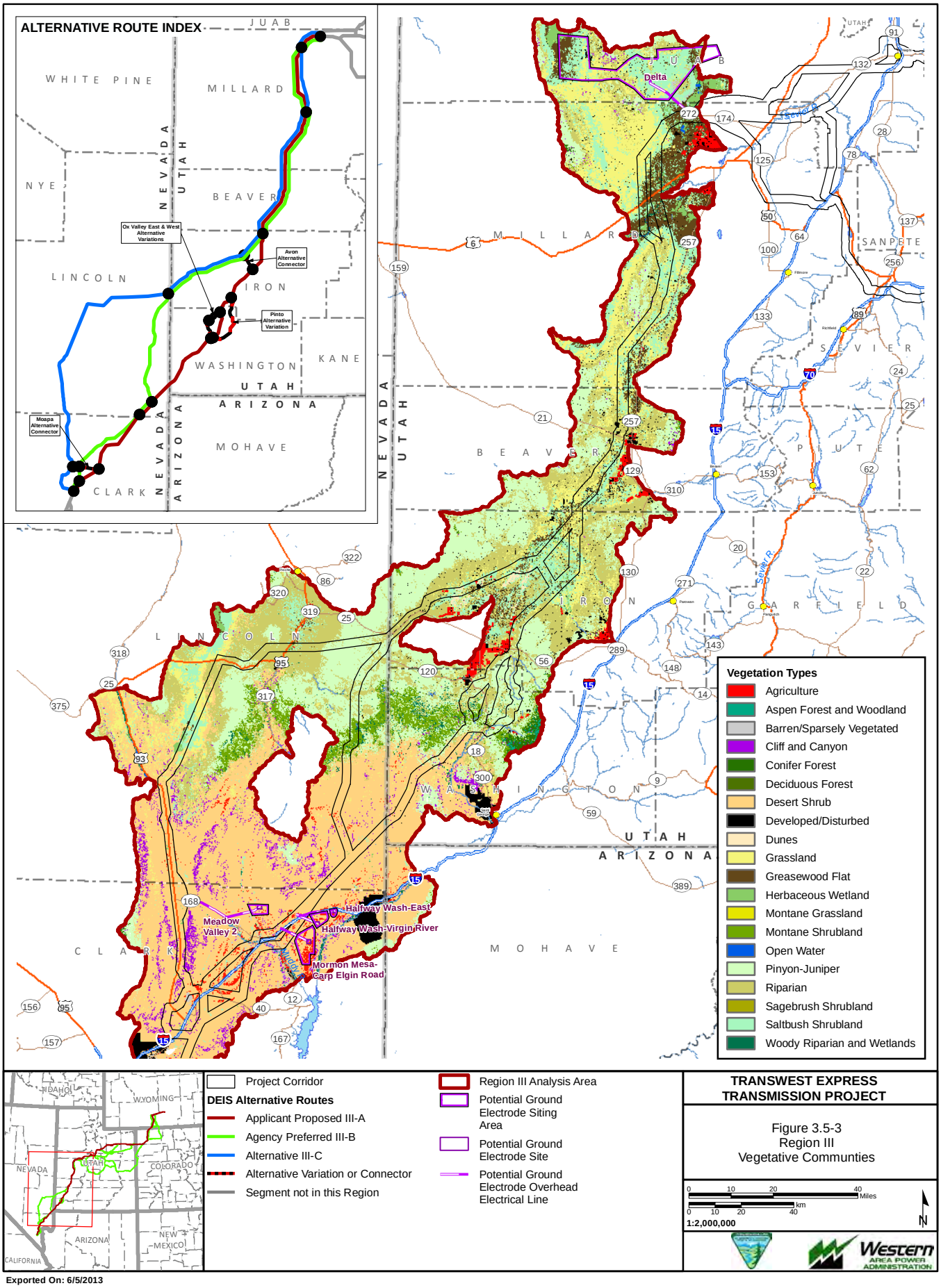

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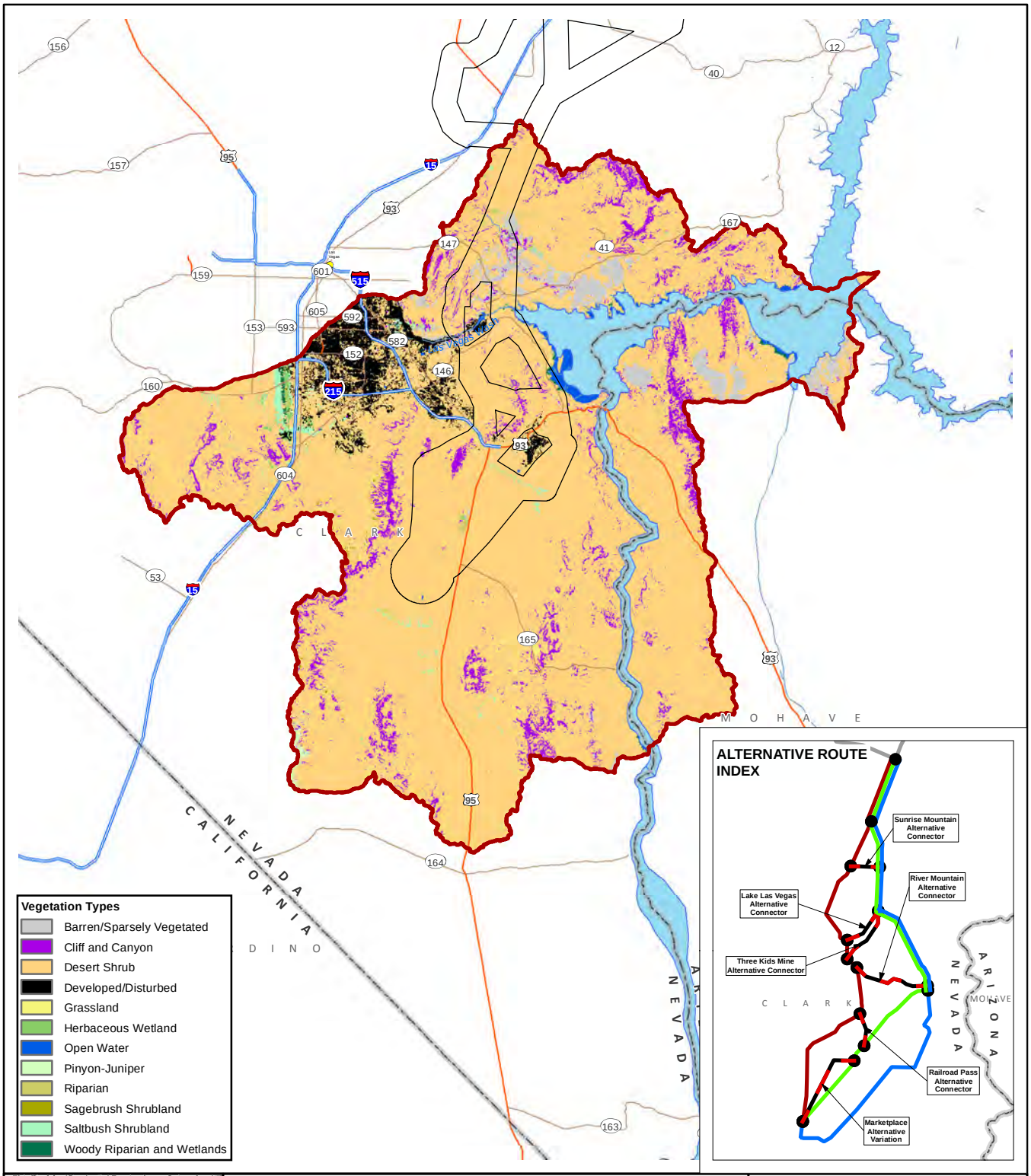

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.5-4
Region IV
Vegetative Communties

0 2.5 5 10 Miles
0 2.5 5 10 km
1:750,000

N

Western AREA POWER ADMINISTRATION

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Desert shrub, pinyon-juniper, sagebrush shrubland, grassland, and saltbush shrubland are the dominant vegetation communities in Region III. Sagebrush shrubland, pinyon-juniper, grassland, and saltbush shrubland are dominant in the portions of Region III analysis area in Utah, while desert shrub is dominant in the Nevada portions of Region III. Wetland areas are a mix of herbaceous wetlands, riparian communities, woody riparian and wetlands, and open water. Agriculture is 1 percent of the Region III analysis area, and is limited by available water. Developed and disturbed lands are 2 percent of the analysis area, and consist of military lands, roads, utility corridors, industrial, and urban areas.

Region IV is dominated by desert shrub vegetation communities. Much of Region IV (21 percent) is disturbed and developed. The other common vegetation communities are cliff and canyon, barren/sparsely vegetation, and open water. Wetland areas are a mix of herbaceous wetlands, riparian communities, woody riparian and wetlands, and open water. There are no agriculture lands in Region IV. Developed and disturbed lands are 21 percent of the analysis area, and consist of urban development in the Las Vegas metropolitan area, military lands, transmission line corridors, solar power plants, and electrical substations.

For more detail on land use in each region, see Section 3.14, Land Use. For more detail on surface water, see Section 3.4, Water.

3.5.5.1 Noxious and Invasive Weed Species

As described in Section 3.5.4, Baseline Description, noxious and invasive weed species are an issue for all land management agencies and private landowners throughout the analysis area. **Appendix G** contains a list of regulated noxious weed species by region for each state within the analysis area. Noxious weed occurrence data is not available with enough consistency and geographic range to be presented by region.

On federal lands in the analysis area, dominant noxious and invasive species include grasses in the *Bromus* genus, halogeton, houndstongue, leafy spurge, Canada thistle, salt cedar, spotted knapweed, rush skeletonweed, Russian knapweed, diffuse knapweed, and hoary cress.

3.5.5.2 Riparian and Wetland Areas

As described in Section 3.5.4, Baseline Description, there are several riparian and wetland types found within the analysis area. While only occurring in a small proportion of the analysis area, the riparian and wetland areas are found over a wide geographic area. Riparian and wetland types are described in Section 3.5.4, Baseline Description, and summarized by region below.

Table 3.5-6 summarizes the percent of each riparian and wetland type within the analysis area. Most of the riparian and wetland areas cover less than 1 percent of the analysis area, except for greasewood flats and open water. Greasewood flats, which can be a mix of wetlands and uplands, cover 2, 5, and 4 percent of Regions I, II and III, respectively, while open water covers 6 percent of Region IV. Riparian and wetland types found within each Project region are included in **Figures 3.5-1** through **3.5-4**.

Table 3.5-6 Percent of Riparian and Wetland Areas in the Analysis Area by Region

	Acres and Percent of Region by Riparian and Wetland Type							
	I		II		III		IV	
Riparian and Wetland Types	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**
Greasewood Flat	90,502	2	511,410	5	274,079	4	--	--
Herbaceous Wetlands								
Depression Wetland	24,477	<1	--	--	--	--	--	--
Marsh	659	<1	30,224	<1	5,522	<1	455	<1
Playa	9	<1	50,409	<1	76,220	1	264	<1

Table 3.5-6 Percent of Riparian and Wetland Areas in the Analysis Area by Region

	Acres and Percent of Region by Riparian and Wetland Type							
	I		II		III		IV	
Riparian and Wetland Types	Acres	%	Acres	%	Acres	%	Acres	%
Woody Riparian and Wetland Areas								
Montane Riverine	8,824	<1	82,402	<1	41,038	<1	--	--
Riverine	39,762	<1	28,420	<1	13,331	<1	1,096	<1
Open Water	11,332	<1	61,376	<1	12,218	<1	69,401	6
Riparian								
Wash	--	--	--	--	65,185	<1	2,576	<1

3.5.5.3 Wildland Fire

The analysis area contains a diverse mix of vegetation communities and land cover types, each having a distinct fire regime. All five fire regimes are found within the analysis area. Spatial extent of the analysis area defined by each fire regime is summarized in **Table 3.5-7**. All three categories of FRCC also are found within the analysis area. Spatial extent of the analysis area defined by each Condition Class is summarized in **Table 3.5-8**. **Figures 3.5-5** through **3.5-8** depict the FRCC in each region.

Table 3.5-7 Fire Regime Acreage for each Region

Fire Regime Class	Frequency (Fire Return Interval)	Severity	Region I	Region II	Region III	Region IV
I	0 to 35+ years, frequent	Predominantly Low	62,534	599,855	102,839	9,805
II	0 to 35+ years, frequent	Replacement	3,052	0	0	0
III	35 to 200+ years, less infrequent	Mixed and Low	690,257	3,237,004	1,528,714	3,273
IV	35 to 200+ years, less infrequent	Replacement	4,141,470	3,526,112	1,301,718	6
V	200+ years	Replacement	233,921	2,378,326	3,782,259	870,198

Table 3.5-8 Acres of Lands Classified as FRCC 1, 2, or 3 within the Analysis Area by Region

Condition	Region I	Region II	Region III	Region IV
Condition Class 1	916,979	2,371,562	663,238	268
Condition Class 2	2,771,222	3,957,532	1,753,603	128,741
Condition Class 3	1,506,743	3,797,577	4,207,606	717,950

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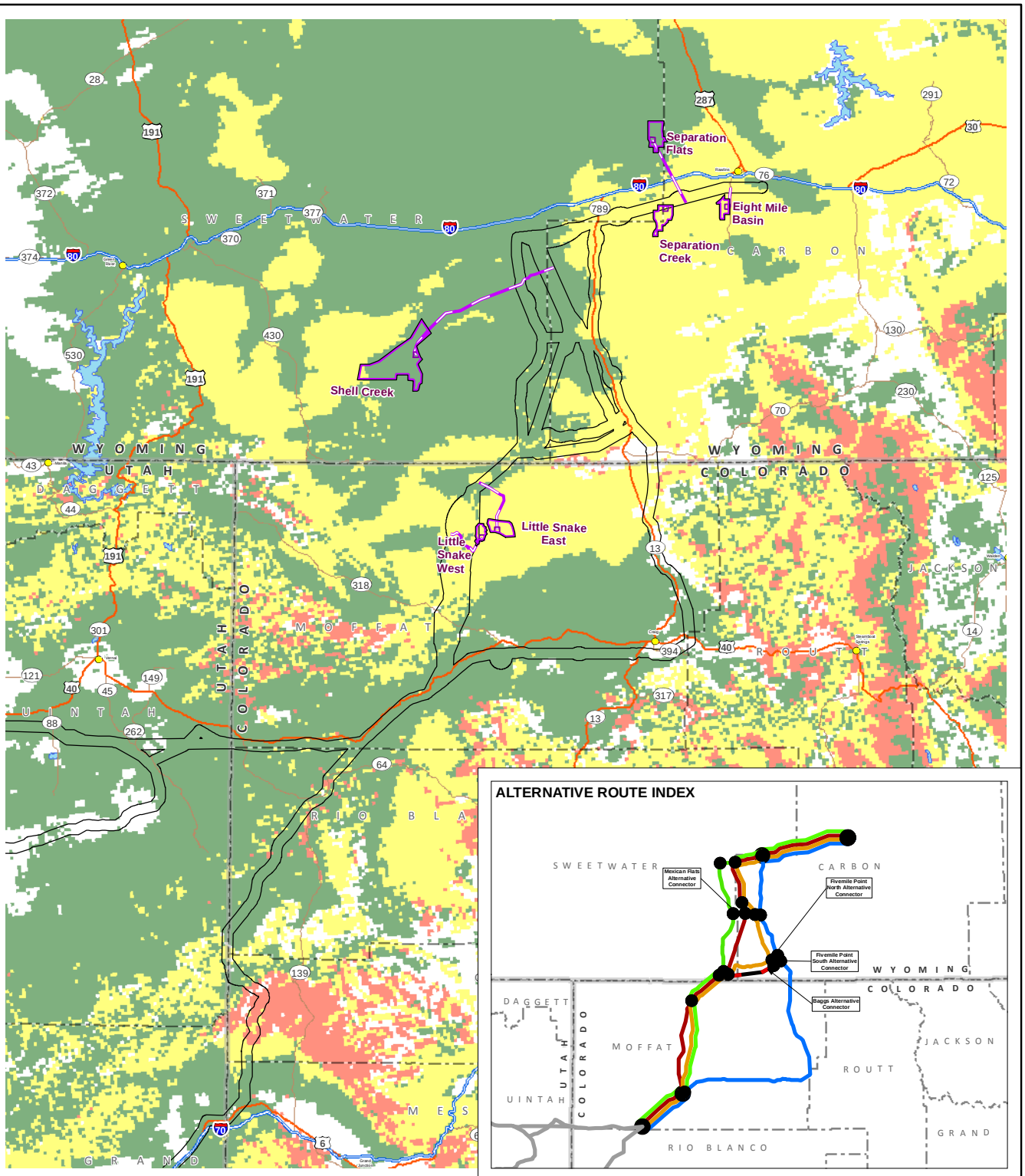

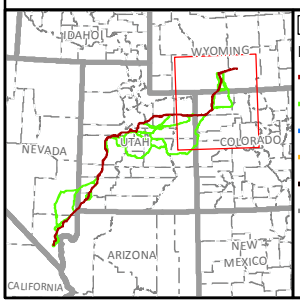

Project Corridor

DEIS Alternative Routes

- Applicant Proposed I-A
- Alternative I-B
- Alternative I-C
- Agency Preferred I-D
- Alternative Variation or Connector
- Segment not in this Region

- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

Fire Regime Condition Class

- Condition Class 1
- Condition Class 2
- Condition Class 3

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.5-5
Region I
Fire Regime Condition Class

0 5 10 20 Miles
0 5 10 20 km
1:1,750,000
N

Western AREA POWER ADMINISTRATION

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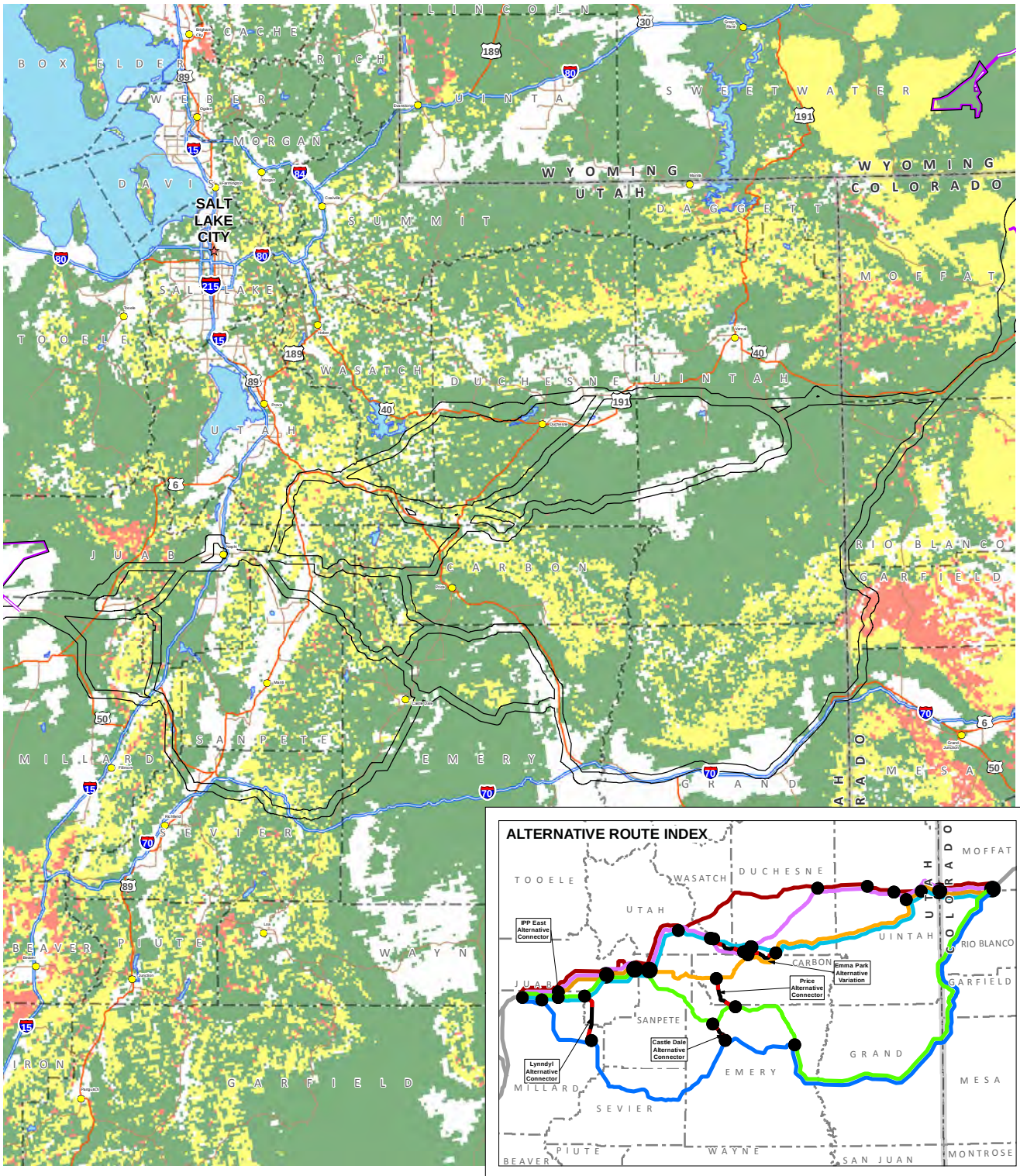

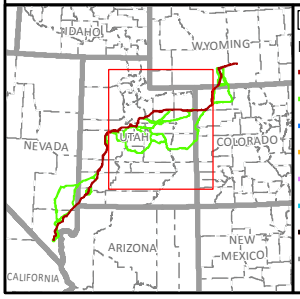

Project Corridor

DEIS Alternative Routes

- Applicant Proposed II-A
- Alternative II-B
- Alternative II-C
- Alternative II-D
- Alternative II-E
- Agency Preferred II-F
- Alternative Variation or Connector
- Segment not in this Region

- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

Fire Regime Condition Class

- Condition Class 1
- Condition Class 2
- Condition Class 3

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.5-6
Region II
Fire Regime Condition Class

0 10 20 40 Miles
0 10 20 40 km
1:2,250,000

N

Western AREA POWER ADMINISTRATION

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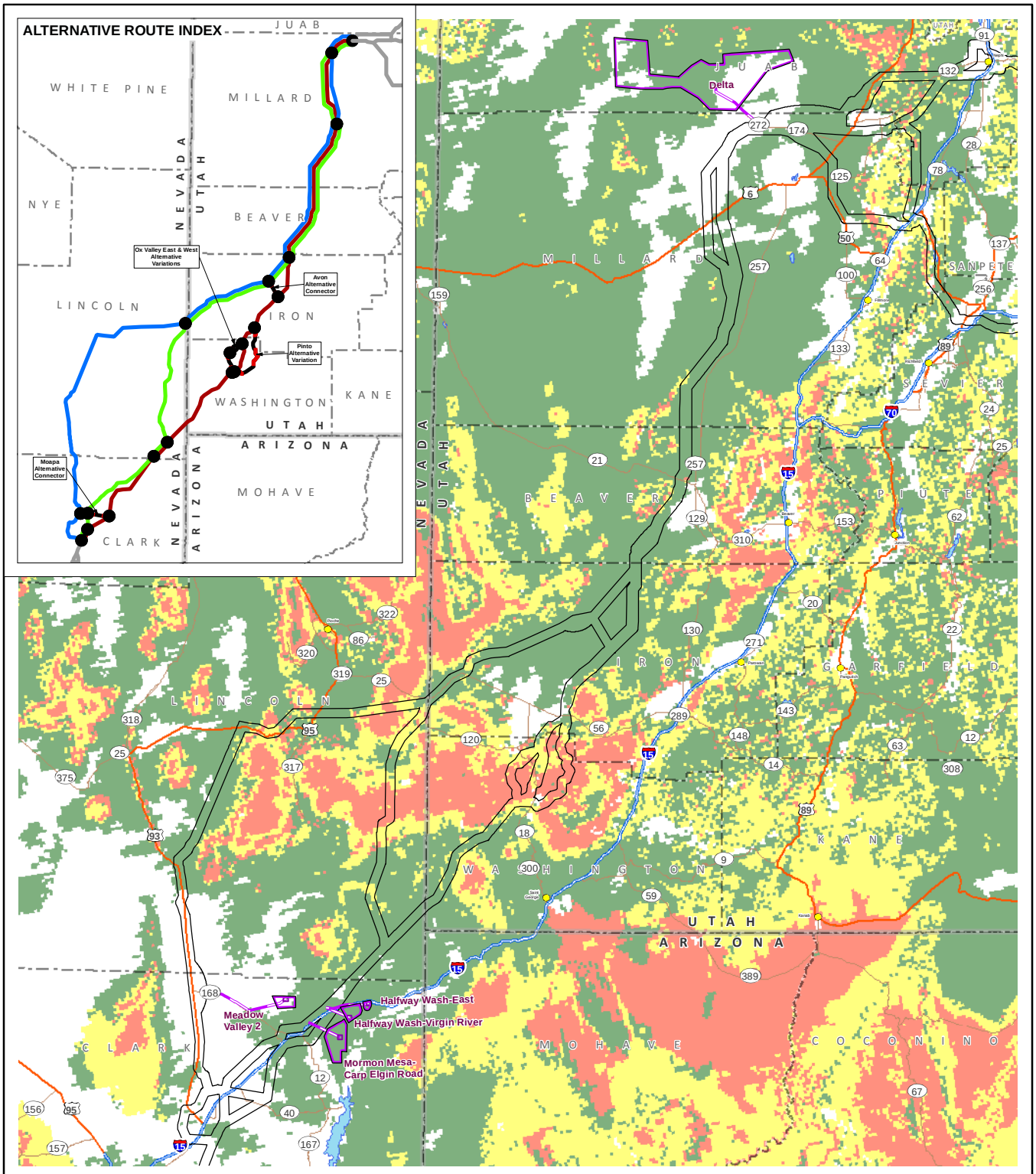

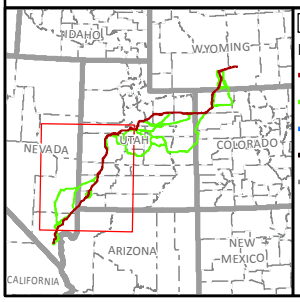

Project Corridor

DEIS Alternative Routes

- Applicant Proposed III-A
- Agency Preferred III-B
- Alternative III-C
- Alternative Variation or Connector
- Segment not in this Region

- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

Fire Regime Condition Class

- Condition Class 1
- Condition Class 2
- Condition Class 3

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.5-7
Region III
Fire Regime Condition Class

0 10 20 40 Miles
0 10 20 40 km
1:2,000,000

N

Western AREA POWER ADMINISTRATION

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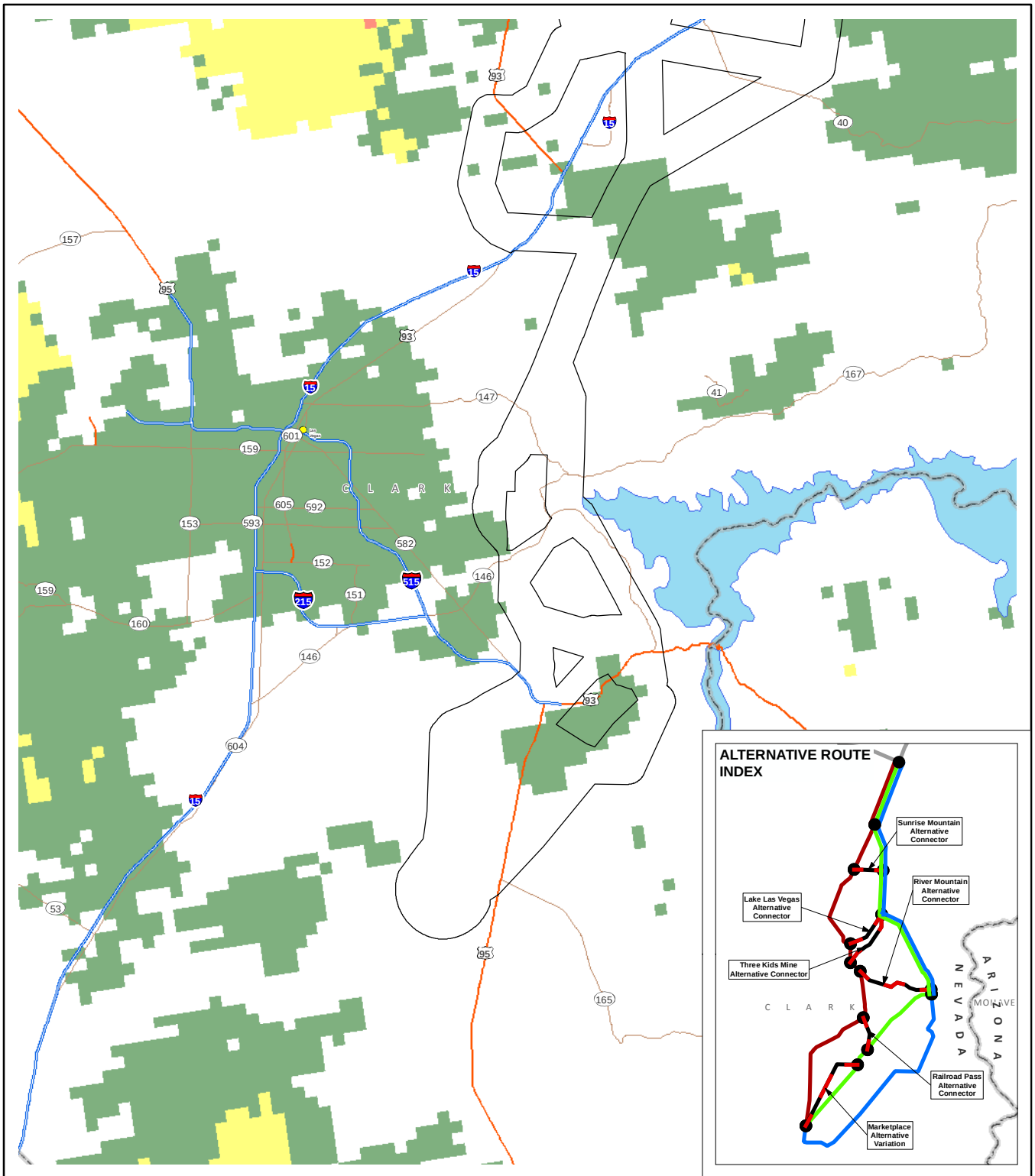

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3.5.5.4 USFS MIS Plant Species

Within the analysis area, the Rydberg milkvetch is found in Region II, in the southern part of the USFS Fishlake National Forest. It has been found in five locations in abundant numbers. Potential habitat is found in the analysis are in the USFS Fishlake National Forest based on substrate, elevation, and vegetation parameters. The population historically has been found to be stable and viable across the USFS Fishlake National Forest (USFS 2006).

3.5.6 Impacts to Vegetation Resources

As described in Section 3.5.3, Analysis Area, the analysis area for vegetation resources encompasses the HUC 10 watershed boundaries crossed by the 2-mile transmission line corridor. For the impacts discussion, the focus is on the impacts resulting from construction and operation activities within the 2-mile transmission line corridor and the 250-foot-wide transmission line ROW. The 2-mile transmission line corridor contains a 1-mile buffer on each side of each alternative route. The 250-foot-wide transmission line ROW is located within the 2 mile transmission line corridor and would contain the surface footprint for all facilities associated with construction and operations except the terminals and electrode beds. Access roads would be located within the ROW where practical. Within the 2-mile transmission line corridor and outside the 250-foot-wide transmission line ROW, access roads would be the only surface disturbance. The larger analysis area (2-mile transmission line corridors) for access roads was required because their locations have not been defined at this time. Surface facilities located outside the 2-mile transmission line corridor include terminals and electrode beds.

The primary issues associated with vegetation resources include direct and/or indirect impacts to native vegetation communities, riparian/wetland habitats, impacts associated with the introduction and/or spread of noxious weeds and invasive species, and changes in fire regime and FRCC.

To evaluate impacts on vegetation resources, potential impacts to vegetation resources were identified based on the locations of these resources in relation to the proposed surface disturbance areas. To determine acres of vegetation disturbed by the project, the known locations of proposed surface disturbances have been overlain on the vegetation layer to determine the amount of acreage disturbed for each vegetation type using GIS as described in the introduction to Chapter 3.0. For impacts from noxious weeds, areas of higher risk of introduction or spread of noxious weed and invasive species have been identified based on vegetation community type, soil constraints, and climate. To determine impacts to wetland resources and fire ecology, the same methodology as described above for vegetation resources has been applied.

Impact issues and the analysis considerations for vegetation resources are listed in **Table 3.5-9**. Impact parameters are used in combination with effects information for the purpose of quantifying impacts. The impact parameters also allow comparisons among alternatives or alternative variations. The following impact parameters were used for this analysis:

- Effects of construction activities on the spread and establishment of noxious and invasive weed species;
- Acres of disturbance based on the extent of construction activities in wetland/riparian areas;
- Acres of fire susceptible vegetation communities crossed, fire frequency and interval.

Table 3.5-9 Relevant Analysis Considerations for Vegetation

Resource Topic	Analysis Considerations and Relevant Assumptions
Erosion and Non-native Species Invasion	Areas of recently disturbed bare ground would be more susceptible to erosion and invasion by non-native species.
Reclamation Timeframes	Erosion from disturbed areas would be minimal once vegetation or other surface stabilization is established. Successful establishment of herbaceous vegetation generally takes a minimum of 3 to 5 years, depending on soil and precipitation. Areas with soil limitations, limited precipitation, and large number of invasive and weedy species can take up to 10 years or longer for herbaceous vegetation to successfully establish. In these areas, additional mitigation measures, such as integrated weed control, are often required for successful establishment of native vegetation. Some plant communities may not return to pre-construction conditions due to alteration of soils, noxious weed invasions, and loss of biological soil crust.
Revegetation	Areas with rehabilitation constraints (e.g., highly erodible or droughty soils, low precipitation amounts, etc.) can have little to no reclamation success, unless additional mitigation measures are implemented.
Landscape Fragmentation	Extensive networks of roads and utility corridors can lead to fragmentation of native landscapes, which can decrease species diversity, lead to decreases in the number and populations of native and special status species, and provide corridors for invasion of non-native species.
Vegetative Type Conversion	Proposed surface disturbance activities can result in the conversion of shrub and tree-dominated vegetation communities to grass/forb-dominated vegetation and the conversion of tree-dominated vegetation communities to shrub-dominated vegetation in the short and long term.
Fire and Fuels	Surface disturbance activities may result in noxious weed invasions, which can lead to alterations in fire regime and FRCC for vegetation communities.
Accidental Fire	Accidental wild fires caused by construction equipment or smoking during construction

3.5.6.1 Impacts from Terminal Construction and Operation

The Northern Terminal would be constructed regardless of alternative route. For the Proposed Action and alternatives corridors, the Southern Terminal would be located in Clark County, Nevada, at either the Southern Terminal or Southern Terminal Alternative location as described below. Under Design Option 2, the Southern Terminal would be located near IPP near Delta, Utah. **Table 3.5-10** identifies estimated acreage of project-related surface disturbance by vegetation cover type within the Northern, Southern, and Southern Alternative Terminal locations.

Northern Terminal

Construction of the Northern terminal would result in surface direct disturbance effects to 504 acres of vegetation. The majority of the disturbance associated with the Northern Terminal would occur in the saltbush and sagebrush shrubland vegetation communities. For the Northern Terminal, the herbaceous wetlands are depressional wetlands.

Surface disturbance activities associated with the Northern Terminal would include pre-development geotechnical sample drilling and site development, which involves vegetation clearing, grading, and facility construction. Construction-associated surface disturbance includes land cleared for storage areas, a

Table 3.5-10 Acreages of Affected Vegetation for the Northern, Southern, and Southern Alternative Terminals

	Northern Terminal				Southern Terminal				Southern Terminal Alternative			
	Construction Disturbance		Operation Disturbance		Construction Disturbance		Operation Disturbance		Construction Disturbance		Operation Disturbance	
Vegetation Type	Acres	% of Analysis Area	Acres	% of Analysis Area	Acres	% of Analysis Area	Acres	% of Analysis Area	Acres	% of Analysis Area	Acres	% of Analysis Area
Total	504	<1	234	<1	412	<1	203	<1	412	<1	203	<1
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	<1	<1	<1	<1	-	-	-	-	-	-	-	-
Cliff and Canyon	3	<1	1	<1	-	-	-	-	-	-	-	-
Conifer Forest	<1	<1	<1	<1	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	-	-	-	-	11	<1	6	<1	54	<1	26	<1
Developed/Disturbed	15	<1	7	<1	401	<1	197	<1	358	<1	177	<1
Dunes	<1	<1	<1	<1	-	-	-	-	-	-	-	-
Grassland	1	<1	1	<1	-	-	-	-	-	-	-	-
Greasewood Flat	4	<1	2	<1	-	-	-	-	-	-	-	-
Herbaceous Wetland	9	<1	4	<1	-	-	-	-	-	-	-	-
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	<1	<1	<1	<1	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	180	<1	83	<1	-	-	-	-	-	-	-	-
Saltbush Shrubland	265	<1	123	<1	-	-	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	27	<1	12	<1	-	-	-	-	-	-	-	-

Discrepancies in totals due to rounding error.

concrete batch plant site, temporary work areas, and pulling, tensioning, and splicing sites. Operation surface disturbance include foot prints of the access roads, the footprints of the station facilities, and the installation of perimeter fence.

Vegetation would be cleared within the entire Northern Terminal plus an additional buffer of 8 to 10 feet outside the fence. After the vegetation is cleared, the area would be graded to a level surface as needed, and drainage design implemented. A soil sterilizer would be applied to prevent regrowth of vegetation, and four to six inch layer of crushed rock laid down resulting in a permanent loss of vegetation for the footprint of the terminal site. For the Northern Terminal, Project-related activities would result in the conversion of 270 acres of mixed vegetation types to grass/forb-dominated vegetation in the short term, and the long-term loss of 234 acres of vegetated land over the lifetime of the project. Herbaceous wetland and greasewood flat areas would be temporarily impacted by construction activities, and permanently impacted by the placement of surface facilities in each of these areas. The conversion and loss of vegetation also would impact the quantity and arrangement of surface fuels, resulting in both temporary and long-term impacts to fire regime condition classifications within the area.

Indirect effects associated with construction of the Northern Terminal would include the potential spread and establishment of noxious and invasive weed species, changes in surface fuels due to establishment and growth of annual species, erosion and sedimentation, and fugitive dust generation. Following surface disturbance activities, noxious weeds and invasive species may readily colonize areas that have minimal vegetation cover. It is anticipated that populations of weedy annual species (e.g., halogeton, cheatgrass) may become established in localized areas for extended periods of time. The establishment of weedy annual species may lead to buildup of fine fuels that ignite readily and are consumed rapidly. Noxious weed invasions into disturbed areas may result in incremental changes to the FRCC for each vegetation community. These changes may result in landscape altercations that shift FRCC 1 classified communities into FRCC 2 or 3. These alterations may result in fire frequencies departing from their natural frequencies.

Following completion of Northern Terminal construction, 270 acres of disturbed land would be immediately reclaimed pursuant to TWE's Final POD. Reclamation would consist of re-grading, mitigating soil compaction, and preparing areas for seeding and revegetating in accordance with land management agency or private landowner requirements. TWE has committed to the development of a Wetlands and Waters of the U.S. Plan as part of the CWA 404 Permit, which would include measures to avoid and minimize impacts to wetlands and WUS to the extent practical. If wetlands are impacted by the project, mitigation measures would be developed through the CWA 404 permitting process. At the end of the useful life of the project, decommissioning would occur, the facilities would be dismantled and removed and the entire terminal site would be reclaimed.

The applicant has committed to the following design features (i.e., environmental protection measures) to mitigate impacts to the Project.

- TWE Design Features - TWE-19 (Erosion Control Plan), TWE-26 (Vegetation Management Plan and Noxious Weed Management Plan), TWE-20 (As part of the CWA 404 Permit, development of a Wetlands and Waters of the U.S. Plan to avoid and minimize impacts to wetlands and WUS to the extent practical), TWE-21 (NPDES Permit), TWE-22 to TWE-25 (Mitigation for runoff and limits to impacts near waterbodies), TWE-29 (Biological Protection Plan), TWE-58 (development of a Pesticide Use Plan), and TWE-64 (Fire Protection Plan).

Additional environmental protection measures that would apply to the project include the WWEC performance standards (i.e., BMPs) which are listed in **Appendix C**. Also listed in **Appendix C** are the NSU and CSU restrictions, which include restrictions for surface disturbance around wetlands, riparian areas, and drainages. A brief overview of the WWEC performance standards applicable to vegetation resources are listed below:

- WWEC performance standards – VEG-1 (restoration must use weed-free native species), VEG-3 (pesticide use), ECO-1/ECO-2/ECO-4/ECO-6 (protection of sensitive and unique habitats), ECO-3/ECO-5 (in consultation with USACE and in accordance with permit requirements, delineate and avoid, minimize or mitigate impacts to wetlands and riparian areas); FIRE-1/FIRE-2 (fire management and fuels buildup strategies); REST-1 (topsoil salvage, seeding with weed-free, native seeds, and restoring pre-development contours), and REST-2 (restoring vegetation to values commensurate with the ecological setting), WAT-9 (erosion controls), WAT-7 (development of SWPPP), WAT-10 (minimization of stream crossings), AIR-1/AIR-2 (fugitive dust control).

Individual BLM FOs have field office-specific BMPs, and USFS forests have forest-specific stipulations and guidelines, that will apply to the project within the boundaries of each FO and forest. Where there is conflict with the WWEC performance standards, and individual BLM or USFS FO BMPs and stipulations and guidelines, the requirements of the individual offices will supersede the WWEC performance standards. Example of agency BMPs specific to vegetation resources include:

- Fugitive dust abatement techniques;
- No surface disturbing activities within a specified distance of riparian areas and wetlands;
- Erosion control methods; and
- Reclamation standards, including seed mix requirements, noxious weed control, and fencing to limit herbivory.

In addition, the following are proposed mitigation measures for vegetation, wetlands and riparian areas, and noxious weeds:

***VG-1**: Native seed mixes to be used for reclamation would be developed in consultation with the land managers for the various regions crossed by the Project. Seed mixes would meet the requirements of the individual agency FO's crossed by the Project. Site-specific seed mixes for soils with low reclamation potential (LRP) would be developed. The LRP seed mixes would be specifically designed for alkaline, saline, or sodic soils and would be used in areas where reclamation would potentially be difficult based on soil conditions. Additional soil amendments may be required in these areas, and would be implemented at the direction of the land manager.*

***WET-1**: Wetland surveys would be conducted at terminal, ROW, ancillary facilities, and along proposed access roads corridors to identify wetland, WUS, and riparian areas located in these areas. Survey information collected would include wetland type, type and cover of hydrophytic and riparian vegetation species present, soil characteristics, site hydrology, global positioning system location of the wetland, and associated information required to determine jurisdictional status. Based on survey results, no surface disturbance including temporary and permanent facilities, the placement of fill material or vegetation clearing for storage, parking, construction activities, or construction work areas as feasible will occur within the avoidance buffer, or surface use restriction defined in the resource management plan for each BLM FO and USFS national forest. If avoidance is not feasible, USACE, BLM, USFS, USFWS crossing and construction techniques for wetlands and riparian areas will be employed. The wetland crossing and construction techniques will be approved by the USACE, BLM, USFS, and USFWS and will be outlined in the Final POD.*

***WET-2**: For any features identified during field surveys as jurisdictional under the USACE and EPA guidance under Section 4 of the Clean Water Act, consultation with the USACE will occur prior to construction. Mitigation for these features will be determined in consultation with the USACE and BLM.*

***NX-1**: The noxious weed management plan to be developed as part of the Construction, Operation and Maintenance (COM) Plan would include the following:*

1. *Pre-construction surveys for noxious weeds in the footprints of the ROW, access roads, and ancillary facilities;*
2. *Pre-construction weed control;*
3. *Education of construction and operation personnel in each project region;*
4. *Washing of vehicles and equipment before entering and leaving the ROW;*
5. *Herbicide spraying; and*
6. *Annual monitoring and reporting.*

Survey information collected during pre-construction surveys would include species name, global positioning system location of weed infestations, percent cover, and approximate size of weed infestations. Control of noxious and invasive species could include chemical, physical, and biological methods and will be developed in consultation with the land agencies and private landowners. The plan will identify species of concern for each BLM FO and USFS forest, and focus monitoring and control methods on these species. The plan would comply with the existing BLM, USFS, USFWS, state, and federal regulations concerning noxious weed management.

***NX-2**: Herbicide spraying would be conducted following all applicable state and federal laws regarding chemical use, adverse weather, chemical storage, and chemical drift. Further guidelines and protocols for herbicide spraying on BLM land is provided in the Final BLM Vegetation Treatment Using Herbicides Programmatic EIS (BLM Vegetation EIS) (BLM 2007). Standard operating procedures for herbicide spraying include buffers for sensitive areas such as riparian and wetland areas and threatened and endangered species habitat, timing restrictions, and safety protocols.*

***NX-3**: On lands managed by the BLM, an approved Pesticide Use Proposal (PUP) would be obtained from each BLM FO prior to herbicide spraying. PUPs would have site-specific information about the herbicides to be used. The PUPs and associated reporting requirements would be submitted on the schedule required for each BLM FO. Herbicide spraying in desert tortoise habitat in Nevada would require consultation with the BLM and USFWS.*

Effectiveness: Implementation of mitigation measure **VG-1**, as well as BMPs and design features would aid in reclamation activities and restoring communities to native ecosystems, especially in areas where reclamation is difficult. Implementation of mitigation measures **WET-1** and **WET-2** would help minimize or avoid direct and indirect impacts to wetlands and riparian areas resulting from construction and operation of the Northern and Southern Terminals. Implementation of **NX-1** would minimize and mitigate impacts associated with the potential introduction or spread of noxious weeds and invasive species, and control the methods used to treat noxious and invasive species. WWEC VEG-3 ensures herbicide use be in compliance with agency policies, and be applied in a manner consistent with label directions and state pesticide regulations. **NX-2** and **NX-3** would ensure compliance BLM standards for herbicide use on BLM lands.

While mitigation measures, BMPs, and design features would increase reclamation success, in areas of temporary disturbance the loss of woody-dominated vegetation related to construction activities would represent a long-term impact, as it would take up to 10 to 25 years following reclamation for mature shrub species to re-establish, and 30 to 50 or more years for re-establishment of mature woodlands. Through the implementation of mitigation measures, direct impacts to wetlands and riparian areas would be avoided, and the spread of noxious weeds would be minimized.

Southern Terminal

Construction of the Southern Terminal would result in surface direct disturbance effects to 412 acres of vegetation. **Table 3.5-10** identifies estimated acreage of project-related surface disturbance by vegetation cover type within the Northern and Southern Terminal locations. The Southern Terminal is located in only

two vegetation community types (Desert Shrub and Developed/Disturbed). The majority of the disturbance in the Southern Terminal would occur in the Developed/Disturbed community type.

Surface disturbance activities and site clearing operation and decommissioning impacts associated with the Southern Terminal would be identical to those associated with the Northern Terminal. Since the predominant cover type within the Southern Terminal area is developed/disturbed, no direct impacts to vegetation resources are anticipated. As with the Northern Terminal, indirect effects associated with construction of the Southern Terminal include the spread and establishment of noxious and invasive weed species, erosion and sedimentation, and fugitive dust generation.

Conclusion: As the majority of the construction and operations disturbance would occur on already developed/disturbed vegetation cover type, direct impacts to vegetation, wetlands, and fire would not be anticipated. Indirect impacts associated with vegetation, wetlands, and noxious weeds would be similar to those discussed for the Northern Terminal. The same design features, BMPs, and mitigation measures listed for the Northern Terminal would be implemented to minimize these impacts.

Southern Terminal Alternative

Construction of the Southern Terminal Alternative location would result in surface direct disturbance effects to 412 acres of vegetation. **Table 3.5-10** identifies estimated acreage of project-related surface disturbance by vegetation cover type within the Northern and Southern Terminal Siting Areas. The Southern Terminal Alternative is located in the same siting area as the Southern Terminal. Within the site for the Southern Terminal Alternative are two vegetation community types (Desert Shrub and Developed/Disturbed). The majority of the disturbance in the Southern Terminal Alternative would occur in the Developed/Disturbed community type.

Surface disturbance activities and site clearing operation and decommissioning impacts associated with the Southern Terminal Alternative would be identical to those described for the Northern Terminal. Since the predominant cover type within the Southern Terminal area is developed/disturbed, no direct impacts to vegetation resources are anticipated. Indirect impacts to vegetation, wetlands, and noxious weeds would be similar to those discussed for the Northern Terminal. The same design features, BMPs, and mitigation measures listed for the Northern Terminal would be implemented to minimize these impacts.

Design Options

Design options would utilize the same alternative routes and construction techniques as the proposed Project. Impacts from construction and operation of this design option would be similar to those discussed under the alternative routes.

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

Differences between this design option and the proposed Project include the locations of the Southern Terminal near IPP, southern converter station and ground electrode system, as well as the addition of a series compensation station midway between IPP and Marketplace. The series compensation station would be located adjacent to the transmission line, and impacts are therefore disclosed within the description of the proposed Project routes. The southern converter station would be located near IPP in Utah instead of Marketplace in Nevada, and the ground electrode system would be within 50 miles of IPP. **Table 3.5-11** provides a summary of impacts associated with Design Option 2.

Construction and operation of a converter station near IPP, ground electrode system, and series compensation station would be similar to impacts described in Section 3.5.6.1, Impacts from Terminal Construction and Operation. The same design features, BMPs, and mitigation measures listed for the Northern Terminal would be implemented to minimize these impacts resulting from Design Option 2. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area.

Table 3.5-11 Summary of Design Option 2 Southern Terminal and Ground Electrode Site Impacts to Vegetation

	Design Option 2 Southern Terminal – Converter/Substation				Delta Ground Electrode Site			
	Construction Disturbance		Operation Disturbance		Construction Disturbance		Operation Disturbance	
Vegetation Communities	Acres	% of Analysis Area	Acres	% of Analysis Area	Acres	% of Analysis Area	Acres	% of Analysis Area
Total	**181**	**<1**	**113**	**<1**	**131**	**<1**	**40**	**<1**
Agriculture	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	-	-	-	-	1	<1	<1	<1
Cliff and Canyon	-	-	-	-	<1	<1	<1	<1
Conifer Forest	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-
Desert Shrub	-	-	-	-	-	-	-	-
Developed/Disturbed	-	-	-	-	2	<1	1	<1
Dunes	-	-	-	-	-	-	-	-
Grassland	18	<1	11	<1	26	<1	8	<1
Greasewood Flat	17	<1	11	<1	18	<1	6	<1
Herbaceous Wetland	7	<1	4	<1	2	<1	1	<1
Montane Grassland	-	-	-	-	<1	<1	<1	<1
Montane Shrubland	-	-	-	-	<1	<1	<1	<1
Open Water	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	<1	<1	<1	<1
Riparian	-	-	-	-	-	-	-	-
Sagebrush Shrubland	-	-	-	-	11	<1	3	<1
Saltbush Shrubland	139	<1	87	<1	69	<1	21	<1
Tundra	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	-	-	-	-	<1	<1	<1	<1

Design Option 3 – Phased Build Out

Design Option 3 would utilize the same alternative routes, facilities, and construction techniques as the proposed Project; however, construction would occur in phases as described in Chapter 2. Differences between this design option and the proposed Project include the construction of an interim substation and connection at IPP and a series compensation station midway between Sinclair, Wyoming and IPP that would operate during Phase I of the design option as described in Chapter 2.0. **Table 3.5-12** provides a summary of impacts associated with the interim substation under Design Option 3.

The total surface disturbance at a given time might be less depending on the timing and reclamation activities associated with the phased build out. Impacts from construction and operation of this design option would be similar as those discussed under the alternative routes below. The series compensation station would be located adjacent to the transmission line, and impacts are therefore disclosed within the description of the proposed Project routes below.

Table 3.5-12 Summary of Design Option 3 Substation Impact Parameters to Vegetation

Vegetation Communities	Design Option 3 Converter/Substation			
	Construction Disturbance		Operation Disturbance	
	Acres	% of Analysis Area	Acres	% of Analysis Area
Total	**171**	**<1**	**75**	**<1**
Agriculture	-	-	-	-
Aspen Forest and Woodland	-	-	-	-
Barren/Sparsely Vegetated	-	-	-	-
Cliff and Canyon	-	-	-	-
Conifer Forest	-	-	-	-
Deciduous Forest	-	-	-	-
Desert Shrub	-	-	-	-
Developed/Disturbed	1	<1	<1	<1
Dunes	-	-	-	-
Grassland	5	<1	2	<1
Greasewood Flat	96	<1	42	<1
Herbaceous Wetland	1	<1	1	<1
Montane Grassland	-	-	-	-
Montane Shrubland	-	-	-	-
Open Water	-	-	-	-
Pinyon-Juniper	-	-	-	-
Riparian	-	-	-	-
Sagebrush Shrubland	<1	<1	<1	<1
Saltbush Shrubland	68	<1	30	<1
Tundra	-	-	-	-
Woody Riparian and Wetlands	-	-	-	-

Construction and operation of a substation and series compensation station would have similar impacts as those described in Section 3.5.6.1, Impacts from Terminal Construction and Operation and Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. The same design features, BMPs, and mitigation measures listed for the Northern Terminal would be implemented to minimize these impacts resulting from Design Option 3. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area.

3.5.6.2 Impacts Common to All Alternative Routes and Associated Components

Construction Impacts

Construction-related surface-disturbing activities would occur in the 250-foot-wide transmission line ROW, the 2-mile transmission line corridor, and the ancillary facilities. In the ROW, surface-disturbing activities would consist of ROW clearing, installation of transmission line structures and wires, and construction of temporary and long-term facilities related to construction and operations. In the corridor, surface-disturbing activities would be related to the construction of temporary and long-term access roads. Acres of surface impacts are listed below under each of the Region's impact discussions.

Construction of the transmission line would occur concurrently with construction of terminals and ground electrode system construction. Prior to construction, sensitive environmental features to be avoided during

construction would be flagged. Direct surface disturbing impacts to vegetation would include the trampling/crushing of vegetation, the removal of vegetation, and soil compaction. Indirect effects to vegetation would include increased erosion, sedimentation, fugitive dust generation, the potential spread and establishment of noxious and invasive weed species, and habitat fragmentation.

Vegetation clearing in the ROW during construction would occur as described in the COM Plan, PDTR and associated framework summary of the draft Vegetation Management Plan (PDTR, **Appendix D**). Based on the draft plan, vegetation clearing during construction would be stratified by vegetation height. Vegetation over 6 feet in height would be cleared or removed as described below. Vegetation over 6 feet in height predominantly would include trees and larger shrub species found in the following vegetation community types: Aspen Forest and Woodland, Conifer Forest, Deciduous Forest, Pinyon-Juniper, and Woody Riparian and Wetlands. Low-growing trees, shrubs, and ground vegetation under 6 feet in height would be left in place. Trees to be cleared would be cut off at ground level, and the stumps left in place for erosion control. Vegetation would be removed using mechanical means appropriate for the area. Marketable timber removed from the ROW would be purchased from the appropriate land management agency or private landowner. Slash would be removed from the ROW or chipped and spread according to approved land agency practices. The depth of wood chips spread over the ROW after vegetation clearing activities could impact vegetation and soil resources in the ROW. Spreading wood chips at a 3-inch depth could increase soil temperature in the winter, moderately increase soil moisture, and substantially decrease soil nitrogen supply and understory vegetation. The increase in soil temperature and soil moisture would have relatively minor ecological effects. However, reductions in the soil N supply may temporarily reduce productivity of the soil and affect revegetation rates (Binkley et al. 2003). With increasing depth of mulch, these impacts will increase in magnitude and duration. As access is needed to the ROW during construction activities, the remaining vegetation not removed during clearing would be driven over resulting in trampling and/or crushing of the vegetation. This would leave the root stock and topsoil in place in the majority of the ROW. Leaving the root stock and topsoil in place would allow the vegetation in the ROW to resprout from the existing seed bank and root stock. The removal of woody vegetation over 6 feet in height could result in changes in vegetation community structure, through increases in the amount of light and open areas in the ROW. Depending on the species present, and the length of time for the woody species to re-establish in the ROW, woody communities could temporarily or permanently shift to communities dominated by herbaceous and/or low growing shrubs. In addition, increased light and open areas in the ROW could lead to increased noxious and invasive weed species establishment and spread.

For any routes that cross IRAs, special construction and maintenance methods are proposed (see **Appendix D**, Section D.3.8.3). A 100-foot-wide construction ROW would be used to install the transmission line through these areas. Within the construction zone, vegetation clearing, and grading would be the same as in the non-IRA portion of the ROW. Construction in IRAs would occur over a shorter time frame (6 to 9 months) and helicopter construction methods may be used to the extent practical.

Biological soil crusts damaged during construction activities could affect the health and successful restoration of native vegetative communities. See Section 3.3, Soils, for further discussion of impacts related to compaction and topsoil. Wetlands would be avoided to the extent practical.

Indirect impacts from ROW clearing could include increased runoff, erosion, and sedimentation; potential spread and establishment of noxious and invasive species, herbicide drift, changes in the quantity and arrangement of surface fuels, and changes in surface runoff from additional surface disturbance. The amount of vegetation impacted by indirect impacts as a result of project implementation would vary depending on the type of indirect disturbance. Typically, indirect impacts occur 100 to 300 feet away from the construction impact, but could affect vegetation communities further away such as through increased sedimentation into drainages affecting communities downstream (USFWS 2013).

Construction activities may increase erosion and sedimentation, and modify the floodplain surface as well as channel beds and banks. These effects may create indirect impacts on nearby riparian vegetation or directly affect habitat for wildlife and endangered fish, adversely impact water quality, and may adversely affect

wildlife and plant species further downstream. Following surface disturbance activities, noxious weeds and invasive species may readily colonize areas that have minimal vegetation cover. It is anticipated that populations of weedy annual species (e.g., halogeton, cheatgrass) may become established in localized areas for extended periods of time. The establishment of weedy annual species may lead to buildup of fine fuels that ignite readily and are consumed rapidly. Noxious weed invasions into disturbed areas may result in incremental changes to the FRCC for each vegetation community. These changes may result in landscape alterations that shift FRCC 1 classified communities into FRCC 2 or 3. These alterations may result in fire frequencies departing from their natural regime.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1**, **VG-2**, and **VG-3** would mitigate impacts to the natural fire regime of these communities.

Accidental wildfires ignited as a result of construction activities could affect vegetation communities in a variety of ways. Impacts may include, but are not limited to, the following: partial to complete removal of aboveground plant cover and belowground components (e.g., roots, rhizomes, and seed bank); soil moisture loss and possible subsequent hydrophobic soil; loss of cacti, yucca, and special status plant species and/or their associated habitats; propensity to increase the spread or introduction of noxious and non-native invasive weed species; and loss of suitable habitat for wildlife and grazing animals.

The land cover type with the highest overall risk of accidental fires spreading upon ignition is sagebrush shrubland. The risk of fire spread in the sagebrush cover type would largely depend on the shrub interspaces and the cover of the herbaceous understory in any given area. Wide interspaces among shrubs and low herbaceous cover would limit fire spread whereas dense sagebrush shrub stands, and/or extensive herbaceous plant cover could increase the risk of fire spread. Post-wildfire revegetation to a pre-disturbance baseline structure and composition may vary depending on physical, environmental, and physiological factors such as the severity, intensity, and duration of the wildfire; extent of disturbance; topography; slope; soil moisture; precipitation; and sensitivity of the impacted species. Vegetation cover type recovery time frames would be generally consistent with those described above for post-construction reclamation.

Temporary work areas would be located within the 2-mile transmission line corridor, and would include staging areas, material storage yards, fly yards, pulling, tensioning, and splicing sites, work areas at each structure site, batch plant sites, and guard structures. The portion of surface disturbance associated with each of a these areas varies. Staging areas, fly yards, batch plant sites would be, to the extent possible, co-located in areas that are previously disturbed or areas of minimal vegetation to minimize surface disturbance. The vegetation in these areas would be cleared as necessary. Staging areas and fly yards might be bladed and graveled. Equipment staging and refueling sites would be co-located with other temporary work areas. Wire pulling, tensioning, and splicing sites, as well as and structure work areas, would be completely cleared of vegetation during construction. The applicant would locate wire pulling, tensioning, and splicing sites such that clearing and blading activities would be minimized to the extent practical. The work area to be cleared around the each structure would depend on the type of structure (e.g., guyed lattice structures, tubular steel pole, and self supporting lattice structures) installed.

Within the ROW and corridor, temporary and long-term access roads would be required to provide surface access to all structures and work areas. To minimize disturbance, existing access roads would be utilized wherever practical. Existing roads would be improved as necessary. Non-graded overland access would be used where terrain and soil conditions are suitable. Vegetation along existing access roads would be affected (e.g., reduction in growth rate) as a result of dust deposition. No access roads are proposed in IRAs.

Where access to structures or work areas is prohibited by lack of existing roads, or where topographic conditions prohibit safe overland access to the site, new access roads would be constructed. To limit surface disturbance from construction of new access roads, the new roads would be located within the

ROW where practical, and sited to minimize potential environmental impacts. An access road plan would be developed during engineering and design, which would define site-specific access. Access roads would be constructed in accordance with AASHTO standards and guidelines, and BLM, USFS, and county road requirements on public lands. Water crossings to be implemented for access roads are described in the PDTR (**Appendix D**).

Direct surface disturbance impacts from access road construction would include vegetation trampling/crushing, vegetation removal, grading, and compaction. Indirect impacts from access road construction would include increased erosion, sedimentation, fugitive dust generation, the potential spread and establishment of noxious and invasive weed species, and habitat fragmentation. In the corridor, outside of the ROW, construction impacts would be limited to the construction of access roads. The linear construction surface disturbance-related activities can result in increased introduction and/or spread of noxious weeds and invasive species within adjacent areas. In areas where there are already extensive infestations of noxious weeds, noxious weed control during construction, operation, and maintenance activities could be difficult due to the large local seed source.

Linear surface disturbances such as those associated with transmission lines and roads can and have provided corridors (Gelbard and Belnap 2003; Watkins et al. 2003) and serve as a source of propagules (D'Antonio et al. 2001) for further spread of noxious and invasive species into adjacent undisturbed areas. Localized surface disturbances can facilitate the invasion of noxious and invasive species by removing native vegetative cover, creating areas of bare ground (Burke and Grime 1996; Watkins et al. 2003), and increasing light and nutrient availability (Stohlgren et al. 2003, 1999). Noxious and invasive weed species compete with native plants, can degrade and modify native communities, and reduce resources for native species (e.g., moisture, soil nutrients, and light).

Landscape fragmentation would result from the development of the access road network, facilities, and transmission line towers. Landscape fragmentation is defined as the transformation or break-up of large patches of continuous, connected areas into a number of patches of smaller total area, that are isolated from each other. Landscape fragmentation, through the construction of access roads, utility corridors, and facilities, breaks up native habitats into smaller units separated by areas of disturbance, or different habitat types. Landscape fragmentation can result in loss of habitats, increased edge effects, effects on sensitive species populations, and increased competition from noxious and invasive weed species. Surface disturbance and associated landscape fragmentation increases the potential for noxious weed and invasive species to spread and establish proportionate to the amount of disturbance.

Fire regimes in vegetation communities modified by construction activities would be altered. Cover type conversions, the removal or rearrangement of canopy and surface fuels, the temporary creation of localized areas devoid of vegetation or firebreaks, and colonization of disturbed areas by annual invasive species would result in altered fire regime condition classes at facility locations and within vegetation communities within the ROW. The majority of the facilities sites would be located in the ROW, while the terminal and ground electrode facilities would be located outside this 2-mile-wide transmission line corridor.

Impacts to vegetation from reclamation would be similar to those described under Section 3.5.6.1, Impacts from Terminal Construction and Operation. In IRAs, areas disturbed in the construction zone would be re-contoured, the topsoil replaced, and revegetated per USFS requirements and the Vegetation Management Plan. Areas disturbed and reclaimed in the IRAs would be monitored for 3 to 5 years, in accordance with USFS requirements. For all areas disturbed and reclaimed, a general mitigation monitoring plan would be developed as part of the COM Plan that would address how each mitigation measure would be monitored for compliance, as described in the PDTR (**Appendix D**). Reclamation of the vegetation communities back to their native diversity and composition would vary across the ROW and corridor due to various factors such as soil mixing, timing and duration of disturbance, topography, slope, soil moisture, and precipitation. Reclamation standards for the project would vary by the requirements defined by each land management agency crossed by the project. In general, reclamation success is defined as re-establishing a self-sustaining, diverse vegetation community composed of species native to the region in sufficient species

density and diversity to closely approximate natural, undisturbed vegetation potential. In herbaceous communities, reclamation is often determined by the establishment of adequate ground cover to prevent erosion and provide forage for wildlife species and grazing operations.

It is estimated that overall, herb-dominated plant communities would require a minimum of 2 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and grazing operations. Woody-dominated plant communities would require at least 10 to 25 years for shrubs to recolonize the area while re-establishment of mature woodlands would require at least 30 to 50 or more years. Depending on the composition and topography of existing woodlands, recovery could take up to 80 to 100 years to achieve mature trees of similar stature to pre-construction conditions. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, successful reestablishment of native vegetation may require additional measures, and take a longer timeframe. The success of woodland re-establishment could be impacted by co-located disturbances and adverse environmental conditions including wildfire, drought, climate change, insects, and disease (Folke et al. 2004; Loehman et al. 2011). Wildfire in combination with adverse environmental conditions could result in woodlands converting to shrubland communities over time.

In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long-term, and may not be successful (10 to 100 years depending on the community structure). Some plant communities may not return to pre-construction conditions due to alteration of soil communities, noxious weed invasion, and loss of biological soil crusts. The implementation of additional reclamation techniques such as minimization of surface disturbance, soil amendments, and noxious weed control may be required in these areas to achieve successful reclamation. Areas with soil reclamation constraints are identified in Section 3.3, Soils.

The implementation of BMPs and design features would be the same as described under Section 3.5.6.1, Impacts from Terminal Construction and Operation. Additional Project design features to be implemented include:

- TWE Design Features TWE-9/TWE-10 (restrict travel to pre-designated areas, access or public roads), TWE-11/TWE-27 (where re-contouring not required, vegetation will be left in place wherever possible), TWE-12 (no widening or upgrading of existing access roads in areas sensitive to disturbance), TWE-13 (restoration of temporary work areas), TWE-14 (borrow pits), and TWE-28 (clearing will be minimized to extent possible).

Additional WWEC BMPs that would apply to the project include:

- WWEC BMPs – VEG-2 (integrated vegetation management plan development), SOIL-1 (topsoil salvage), SOIL-2 (slopes), WAT-10 (minimize stream crossings), and WAT-11 (erosions controls at drainage crossings).

Each BLM FO and USFS Forest has specific surface disturbance avoidance buffers for riparian and wetland areas. Examples of NSU and CSU restrictions that apply to wetland and riparian resources include:

- Rock Springs FO – 500 feet from surface water, perennial streams, riparian areas, and wetlands. Surface disturbing activities will be avoided within 100 feet from the inner forge of ephemeral channels.
- Little Snake FO – NSO stipulations for up to 0.25 mile from perennial water sources, if necessary, depending on type and use of the water source, soil type, and slope steepness.

- Las Vegas FO – Protect artificial and natural waters that provide benefit to wildlife by providing a minimum buffer of 0.25 mile for permitted activities (such as for off-road vehicle events).
- Uinta National Forest – 300-foot buffer associated with major drainages where volumes of base water flows are at least 10 cubic feet per second (cfs).

Examples of agency BMPs specific to vegetation resources would be the same as described in Section 3.5.6.1, Impacts from Terminal Construction and Operation. The following mitigation measures are proposed to minimize impacts to vegetation, to wetlands and riparian areas, and from noxious weeds:

***VG-2**: Woody areas such as pinyon-juniper, which are on average taller than the 6 feet minimum clearance, but with wide spacing between the trees allowing vehicle and equipment access to the transmission line ROW, would not be cleared during construction activities. This measure would consider conductor clearance requirements.*

***VG-3**: A vegetation reclamation and monitoring plan will be developed as part of the Construction, Operation, and Maintenance (COM) Plan. The reclamation monitoring plan would define reclamation success for each vegetation type and management agency, list reclamation seed mixes, and detail reclamation monitoring for both interim and final reclamation. Interim and final reclamation success would be monitored quarterly for the first year, and then annually for at least three years, or until reclamation success as defined by each land management agency crossed by the project is achieved. Reporting of construction, reclamation progress, and monitoring results would be submitted to each land management agency per each office's reporting requirements.*

***VG-4**: During vegetation clearing, if chipping and spreading woody material in the ROW, wood chips will not exceed 3 inches in depth. Distribute chips in discontinuous patches that do not result in a continuous chip mat (<40% of surface covered by 3 inches of chips).*

***VG-5**: Masticated material spread in the ROW will not exceed a depth of 3 to 6 inches. Distribute material in discontinuous patches that do not result in a continuous chip mat (less than 40 percent of surface covered 3 to 6 inches thick.*

***NX-4**: The cut-stumps of mature salt cedar stands that are cut as part of vegetation clearing will be immediately painted with herbicides. The specific control methods, and herbicide to be used will be determined in consultation with the Nevada BLM State and FOs. Additional control measures could the planting of native or desired plant species following treatment to provide erosion control, and the use of biocontrols.*

***WET-3**: Access roads will be routed around riparian areas, wetlands, intermittent or perennial drainages, and ephemeral channels to the extent practical. If jurisdictional wetlands or WUS cannot be avoided, USACE approved construction techniques for construction in wetlands and WUS will be applied. BLM and USFS construction techniques for non-jurisdictional wetlands, riparian areas, intermittent drainages, and ephemeral channels would be applied on BLM and USFS lands, as appropriate. These include the use of timber mats, erosion controls, and the placement of equipment outside of the wetland, riparian areas, intermittent drainages, and ephemeral channels boundaries.*

Effectiveness: By minimizing the number of trees cut or removed, mitigation measure **VG-2** would diminish the impacts of construction-related activities to woodlands in the Project ROW. **VG-3** would define the reclamation requirements, seed mixes to be used for reclamation, and reclamation success monitoring to be conducted by the applicant. **VG-4** and **VG-5** would mitigate impacts to soil and vegetation resources from the spreading of chipped and masticated material in the ROW as part of vegetation clearing activities. **NX-4** would improve the control and management of salt cedar stands that are to be cleared as part of the construction and maintenance activities. Implementation of mitigation measure **WET-1** through **WET-3**, in conjunction with design feature TWE-20 (as part of the CWA 404 Permit, development of a Wetlands and

Waters of the U.S. Plan to avoid and minimize impacts to wetlands and WUS to the extent practical), would mitigate impacts to wetlands and riparian areas through identification and mapping of wetlands, riparian areas, and drainages, and the avoidance of surface disturbance in these areas. For access roads, where avoidance of wetland, riparian areas, and drainages is not feasible, mitigation will be applied as directed in **WET-3** to minimize impacts.

Project-related activities would result in the conversion of tree-dominated vegetation communities to shrub- and grass/forb-dominated vegetation in the short and long-term. Long-term impacts would include the loss of vegetation from long-term facilities (structure footprints and roads) during the life of the project; other disturbed areas would be reclaimed immediately following completion of construction.

Through the implementation of mitigation measures **VG-1** and **VG-2**, direct impacts to woody vegetation would be minimized. The loss of woody-dominated vegetation related to construction activities would represent a long-term impact. Implementation of **WET-2** and **WET-3** would minimize or avoid direct and indirect impacts to wetlands and riparian areas due to construction. Implementation of **NX-1** would minimize and mitigate impacts associated with the potential introduction or spread of noxious weeds and invasive species, through the development of the Noxious Weed Management Plan and identification of noxious weed species of concern in the ROW and ancillary facilities during annual monitoring. The Noxious Weed Management Plan would identify control and prevention methodologies and techniques to be implemented during the construction, reclamation, operation, and decommissioning phases of the proposed Project.

If wetlands and riparian areas cannot be avoided, potential construction impacts may include, but are not limited to, clearing of all vegetation, topsoil handling during construction and restoration, and potential temporary disturbance of the surface and subsurface hydrology. If drainages cannot be avoided, construction impacts may include erosion and sedimentation of stream channels, and the introduction of contaminants into flows and/or existing channel sediments. Cuts-and-fills at streams associated with access road crossings or other project features may affect the extent and cross-sectional geometry of drainages. The extent of impacts would depend on presence of water at the time of construction, channel crossing methods, erosion controls during construction, and the subsequent success of reclamation and stabilization. To minimize impacts at stream crossings, TWE would apply design features TWE-20 to TWE-25. Potential post-construction impacts may include alteration of vegetation composition resulting from the establishment of noxious weeds and invasive plant species.

Operation and Maintenance Impacts

Operation and maintenance impacts include the permanent loss of vegetation due to facility, structure, and access road footprints, maintenance activities in the ROW, and increased use of access roads. Acres of operation-related surface impacts are listed under each of the Region's specific impact discussions below.

Vegetation maintenance for the ROW would be defined by the Vegetation Management Plan. The development of a Vegetation Management Plan is a requirement of NERC reliability standard FAC-003-02. NERC reliability standard FAC-003-2 is focused on preventing vegetation-related outages from occurring on transmission lines. The Vegetation Management Plan would define levels of maintenance and would be developed during Project engineering and design as part of the COM plan. Based on the current draft plan (PDTR Volume I **Appendix D**), maintenance activities would be stratified into three categories for management (Levels I, II, and III). Level I would be applied to the majority of the ROW, while Levels II and III, due to their increased cost and maintenance, would only be applied to areas identified as sensitive based on biological, cultural, visual, or other characteristics. The definitions and specific details of the individual management levels are explained in the PDTR Volume I and **Appendix D**.

Level I is the standard ROW vegetation management category that would be applied across the majority of the ROW. Vegetation would be maintained to achieve stable, low-growth plant communities that would be free of noxious or invasive plants and comprised of herbaceous plants and low-growing shrubs. The desirable condition for this standard is vegetation heights averaging 3 feet in height, ranging between 2 and

6 feet. Vegetation debris and density would be assessed to determine wildfire risks, and additional mitigation. Level II and III measures are treated as the same vegetation maintenance plan for impact analysis. These activities would be applied in sensitive and constrained areas as defined by the permitting agencies. Level II and Level III maintenance activities would be applied to the crossings of riparian vegetation to mitigate impacts from maintenance activities in riparian areas. Any direct maintenance activities that occur in the wetlands or riparian areas could impact wetlands and other WUS and may require USACE consultation.

The desired condition is defined by the Wire Border Zone concept, and defines two zones (wire zone, and border zone) for vegetation management in the ROW. The wire zone is defined as the section of the utility ROW that is directly under the wires and extends outward a distance sufficient to accommodate anticipated wire movement (90 feet in width centered on the centerline of the transmission line). Within the wire zone, vegetation maintenance would be the same as for Level I. The border zone extends 80 feet from the wire zone boundary to the ROW boundary. The desired condition within the border zone is stable low-growth vegetation consisting of small trees and large shrubs, and herbaceous vegetation. The maximum height in the border zone varies from 25 feet to 35 feet. In canyons, or low-lying valleys, and depending on growth and density characteristics of individual trees, taller vegetation might be allowed.

In IRAs, maintenance activities would be conducted using aircraft, non-motorized methods, or by approved all terrain vehicles. For emergency repairs, or to maintain NESC electrical line clearance, motorized vehicles potentially would be used. Active vegetation management would occur in a limited ROW width for the life of the project.

Noxious weed and invasive species impacts could result from maintenance activities and increased use of access roads. Maintenance activities can aid in the mechanical transport of propagules from outside the ROW. Removal of taller vegetation can create open patches of vegetation and bare ground and facilitate the invasion of noxious and invasive species and increase light and nutrient availability (Burke and Grime 1996; Stohlgren et al. 2003, 1999; Watkins et al. 2003). Mitigation measures and their effectiveness are the same as described for construction activities.

Vegetation management levels would be applied as temporary use areas cleared during construction are successfully reclaimed once construction activities are completed. Mitigation measure **VG-2** is recommended to be implemented during operation activities to mitigate impacts to pinyon-juniper communities and other wooded areas with trees that are widely spaced.

Removal of fuels along the power lines through vegetation management would reduce the hazard of wildland fire caused by power line malfunction. The removal of hazardous trees and fuels in a linear fashion along the power line ROW would create a zone of disturbed fuels in the event of power line discharge or arcing. With little or no vegetation and forest fuels to sustain a fire, an arc from the power line would not likely be able to ignite a fire event. Indirectly, removal of hazard trees and fuel loads along the power lines may prevent power line damage from wildfire by moving the sources of heat and flame away from power lines and power line structures, thus preventing power failure.

In areas where removal is not feasible or possible, fuel treatments such as mastication, chipping, or lopping and scattering would be used to reduce overhead hazards; however, these methods would do little to slow or prevent fire movement to the power line structures. These fuel treatments are designed to place as much of the fuel as possible in direct contact with the ground to facilitate decay through increased moisture retention, potentially lessening the intensity of a fire situation over time while providing increased access for firefighters.

The response and revegetation potential of each vegetation type varies depending on actual fire conditions, the seasonal timing, pre- and post- fire vegetation, elevation and post-fire weather patterns. Vegetation in cool fire areas (for example areas where native perennial bunchgrass cover and site productivity are high) can frequently revegetate naturally without seeding. Hot fires in areas with dense sagebrush or

pinyon-juniper stands can result in scorched, water-resistant soils that become unproductive until the condition changes, which could take several years. Extremely severe fires have been known to sterilize soils and lead to the permanent loss of productivity.

Decommission Impacts

Decommissioning activities would include the removal of facilities, and the reclamation of the ROW, access roads, and ancillary facilities. Impacts would be similar to those as discussed for construction activities, except that removal of vegetation would not be required as part of decommissioning. The same BMPs and design features and mitigation measures would be applied to reduce impacts during decommissioning activities. See **Appendix D** for more details on decommissioning activities.

3.5.6.3 Region I

Impact areas in the regional table are split between ROW clearing/trampling and facilities. Clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height, and driving over the vegetation with construction equipment. Facilities would include access roads; temporary work areas such as staging areas, material storage yards, fly yards, drilling, fencing, and splicing sites; batch plant sites; and guard structures within the 2-mile transmission line corridor. **Table 3.5-13** provides a comparison of impacts associated with the alternative routes in Region I.

Alternative I-A (Applicant Proposed)

Key Parameters Summary

In Alternative I-A the majority of the disturbance would occur in the sagebrush and saltbush shrubland vegetation community types. Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. The route follows I-40 for a considerable portion of the line's length in Colorado. This area historically has been disturbed. Clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 1 acre of conifer forest, 43 acres of pinyon-juniper, and 28 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by facility construction would be trampled or driven-over during construction activities. Implementation of **VG-1** would mitigate impacts to saltbush communities, and other areas that may be difficult to reclaim to pre-disturbance native vegetation conditions. Implementation of mitigation measure **VG-2** would mitigate impacts to pinyon-juniper communities along the ROW, and decrease the amount of area to be cleared. Implementation of **VEG-3** would assist in ensuring post-reclamation success through monitoring and reporting of reclamation results. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 21 acres of greasewood flat, 23 acres of herbaceous wetlands, and 16 acres of woody riparian and wetlands. Of this, 6 acres of greasewood flat, 5 acres of herbaceous wetlands, and 4 acres of woody riparian and wetland areas would be impacted by operation impacts. Specific herbaceous wetland and riparian types along Alternative I-A include wet meadows, fens, and wetlands associated with topographical depressions. Specific riparian woodlands and wetlands found along Alternative I-A would include riparian woodlands and shrublands in both montane and lower elevation areas. Implementation of **WET-1** through **WET-3** would mitigate impacts to wetland and woody riparian and wetland areas, as described in Section 3.5.6.1 and Section 3.5.6.2.

Table 3.5-13 Summary of Region I Alternative Route Impacts for Vegetation

	Construction Disturbance								Operation Disturbance							
	Alternative I-A		Alternative I-B		Alternative I-C		Alternative-I-D		Alternative I-A		Alternative I-B		Alternative I-C		Alternative I-D	
Vegetation Communities	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I
Total	**3,242**	**<1**	**3,304**	**<1**	**3,848**	**<1**	**3,500**	**<1**								
ROW Clearing/Trampling[1]																
Agriculture	20	<1	28	<1	356	<1	28	<1	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	19	<1	15	<1	6	<1	11	<1	-	-	-	-	-	-	-	-
Cliff and Canyon	16	<1	29	<1	7	<1	14	<1	-	-	-	-	-	-	-	-
Conifer Forest	1	<1	1	<1	1	<1	1	<1	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Developed/Disturbed	81	<1	80	<1	95	<1	95	<1	-	-	-	-	-	-	-	-
Dunes	26	<1	<1	<1	<1	<1	1	<1	-	-	-	-	-	-	-	-
Grassland	146	<1	128	<1	275	<1	128	<1	-	-	-	-	-	-	-	-
Greasewood Flat	29	<1	123	<1	38	<1	63	<1	-	-	-	-	-	-	-	-
Herbaceous Wetland	37	<1	23	<1	4	<1	46	<1	-	-	-	-	-	-	-	-
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	1	<1	-	-	-	-	-	-	-	-	-	-
Open Water	3	<1	3	<1	3	<1	3	<1	-	-	-	-	-	-	-	-
Pinyon-Juniper	43	<1	45	<1	46	<1	45	<1	-	-	-	-	-	-	-	-
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	1,921	<1	1,826	<1	2,616	<1	2,198	<1	-	-	-	-	-	-	-	-
Saltbush Shrubland	872	<1	974	<1	377	<1	84	<1	-	-	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	28	<1	29	<1	23	<1	24	<1	-	-	-	-	-	-	-	-
Facilities[2]																
Total	**2,057**	**<1**	**2,083**	**<1**	**2,511**	**<1**	**2,306**	**<1**	**526**	**<1**	**495**	**<1**	**618**	**<1**	**531**	**<1**
Agriculture	14	<1	19	<1	254	<1	19	<1	4	<1	5	<1	68	<1	5	<1
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	11	<1	10	<1	4	<1	7	<1	3	<1	2	<1	1	<1	2	<1
Cliff and Canyon	11	<1	19	<1	4	<1	9	<1	3	<1	5	<1	1	<1	2	<1

Table 3.5-13 Summary of Region I Alternative Route Impacts for Vegetation

	Construction Disturbance								Operation Disturbance							
	Alternative I-A		Alternative I-B		Alternative I-C		Alternative-I-D		Alternative I-A		Alternative I-B		Alternative I-C		Alternative I-D	
Vegetation Communities	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I
Conifer Forest	1	<1	1	<1	1	<1	2	<1	<1	<1	<1	<1	<1	<1	1	<1
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Developed/Disturbed	52	<1	50	<1	70	<1	61	<1	13	<1	12	<1	18	<1	15	<1
Dunes	16	<1	1	<1	<1	<1	1	<1	4	<1	<1	<1	<1	<1	<1	<1
Grassland	105	<1	92	<1	187	<1	92	<1	30	<1	25	<1	50	<1	25	<1
Greasewood Flat	21	<1	78	<1	31	<1	41	<1	6	<1	17	<1	8	<1	9	<1
Herbaceous Wetland	23	<1	15	<1	7	<1	29	<1	5	<1	3	<1	2	<1	6	<1
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	2	<1	-	-	-	-	-	-	1	<1	-	-
Open Water	3	<1	2	<1	3	<1	2	<1	1	<1	1	<1	1	<1	1	<1
Pinyon-Juniper	29	<1	30	<1	31	<1	30	<1	8	<1	8	<1	9	<1	8	<1
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	1,203	<1	1,125	<1	1,663	<1	1,434	<1	309	<1	272	<1	404	<1	328	<1
Saltbush Shrubland	552	<1	624	<1	235	<1	565	<1	135	<1	140	<1	52	<1	127	<1
Tundra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	16	<1	17	<1	19	<1	15	<1	4	<1	4	<1	5	<1	3	<1

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

[2] Facilities would include access roads, temporary work areas such as staging areas, material storage yards, fly yards, pulling, tensioning, and splicing sites, work areas at each structure site, batch plant sites, and guard structures within the 2-mile wide corridor. Staging areas, fly yards, batch plant sites would be cleared as necessary. Staging areas and fly yards might be bladed and graveled. Equipment staging and refueling sites would be co-located with other temporary work areas. Wire pulling, tensioning, and splicing sites, structure work areas would be completely cleared of vegetation during construction.

Discrepancies in totals due to rounding error.

Alternative I-B

Key Parameters Summary

In Alternative I-B, the majority of the disturbance would occur in the sagebrush and saltbush shrubland vegetation communities. Clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 1 acre of conifer forest, 45 acres of pinyon-juniper, and 29 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by facility construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 78 acres of greasewood flat, 15 acres of herbaceous wetlands, and 17 acres of woody riparian and wetland areas. Of this, 17 acres of greasewood flat, 3 acres of herbaceous wetlands, and 4 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetland and riparian types in Alternative I-B include wetlands associated with topographical depressions. Specific riparian woodlands and wetlands found along Alternative I-B would include riparian woodlands and shrublands in lower elevation areas.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative I-C

Key Parameters Summary

In Alternative I-C, the majority of the disturbance would occur in the sagebrush vegetation community. Clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 1 acre of conifer forest, 46 acres of pinyon-juniper, and 23 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by facility construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 31 acres of greasewood flat, 7 acres of herbaceous wetlands, and 19 acres of woody riparian and wetland areas. Of this, 8 acres of greasewood flat, 2 acres of herbaceous wetlands, and 5 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along Alternative I-C include wetlands associated with topographical depressions. Specific riparian woodlands and wetlands types found along Alternative I-C include riparian woodlands and shrublands in montane and lower elevation areas.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative I-D (Agency Preferred)

Key Parameters Summary

The majority of the disturbance for this alternative would occur in the sagebrush vegetation community. Clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 1 acre of conifer forest, 45 acres of pinyon-juniper, and 24 acres of woody riparian and wetland vegetation communities. Alternative I-D has less impact to agriculture lands and grasslands compared to Alternative I-C. Vegetation in the remaining portions of the ROW not impacted by facility construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 41 acres of greasewood flat, 29 acres of herbaceous wetlands, and 15 acres of woody riparian and wetland areas. Of this, 9 acres of greasewood flat, 6 acres of herbaceous wetlands, and 3 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along Alternative I-D include wetlands associated with topographical depressions. Specific riparian woodlands and wetlands types found along Alternative I-D include riparian woodlands and shrublands in montane and lower elevation areas.

Along Alternative I-D are the Tuttle Easement micro-siting options 1, 2, and 3. For the Tuttle Easement micro-sites, the vegetation communities located along options 1, 2, and 3 are similar to the vegetation communities located along Alternative I-D. All three micro-siting options would affect more pinyon-juniper from ROW clearing and trampling compared to Alternative I-D. Impacts to vegetation would be similar between the three micro-siting options and the comparable section of Alternative I-D.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative Connectors in Region I

The Alternative Connectors in Region I would include minimal increases in surface disturbance acreages for the various vegetation community types crossed, if constructed. Wetlands and riparian areas in the Fivemile Point North and South Alternative Connectors include herbaceous riparian washes, streams, rivers, and floodplains. Wetlands and riparian areas in the Mexican Flats Alternative Connectors include greasewood flats. Wetlands and riparian areas in the Baggs Alternative Connectors include greasewood flats, and riparian woodlands and shrublands in lower elevation areas. **Table 3.5-14** summarizes impacts and advantages associated with the alternative connectors in Region I. Impacts to each vegetative community would comprise less than 1 percent of the total acreage of each vegetative community in the analysis area.

Alternative Ground Electrode Systems in Region I

The northern ground electrode system would be necessary within 100 miles of the northern terminal as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided. The impacts associated with constructing and operating this system are discussed in Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. **Table 3.5-15** summarizes impacts associated with the northern ground electrode system. **Table 3.5-16** summarizes impacts associated with the northern ground electrode transmission line. Some locations might serve multiple alternative routes, while others could only be associated with a certain alternative route. Impacts to each vegetative community would comprise less than 1 percent of the total acreage of each vegetative community in the analysis area.

Table 3.5-14 Summary of Region I Alternative Connector Impacts for Vegetation

Vegetation Communities	Fivemile Point North Alternative Connector						Fivemile Point South Alternative Connector						Mexican Flats Alternative Connector						Baggs Alternative Connector					
	ROW-vegetation Clearing[1]		Construction Disturbance		Operation Disturbance		ROW-vegetation Clearing[1]		Construction Disturbance		Operation Disturbance		ROW-vegetation Clearing[1]		Construction Disturbance		Operation Disturbance		ROW-vegetation Clearing[1]		Construction Disturbance		Operation Disturbance	
	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I
Total	**20**	**<1**	**82**	**<1**	**8**	**<1**	**42**	**<1**	**31**	**<1**	**6**	**<1**	**206**	**<1**	**129**	**<1**	**26**	**<1**	**464**	**<1**	**294**	**<1**	**70**	**<1**
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	-	-	<1	<1	-	-	-	-	-	-	-	-	--	--	--	--	--	--	4	<1	3	<1	1	<1
Cliff and Canyon	-	-	-	-	-	-	-	-	-	-	-	-	1	<1	<1	<1	--	--	8	<1	7	<1	2	<1
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	<1	2	<1	1	<1
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Developed/ Disturbed	4	<1	14	<1	1	<1	<1	<1	<1	<1	--	--	8	<1	5	<1	1	<1	14	<1	8	<1	2	<1
Dunes	-	-	-	-	-	-	-	-	-	-	-	-	26	<1	15	<1	3	<1	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	--	--
Greasewood Flat	1	<1	6	<1	1	<1	2	<1	1	<1	<1	<1	5	<1	4	<1	1	<1	6	<1	4	<1	1	<1
Herbaceous Wetland	-	-	-	-	-	-	-	-	-	-	-	-	2	<1	1	<1	<1	<1	3	<1	2	<1	1	<1
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	14	<1	59	<1	6	<1	40	<1	30	<1	6	<1	21	<1	16	<1	3	<1	382	<1	237	<1	57	<1
Saltbush Shrubland	1	<1	2	<1	<1	<1	-	-	-	-	-	-	143	<1	87	<1	18	<1	45	<1	31	<1	7	<1
Tundra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	<1	<1	1	<1	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	1	<1	1	<1	<1	<1

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

Discrepancies in totals due to rounding error.

Table 3.5-15 Summary of Region I Alternative Ground Electrode Siting Area Impact Parameters for Vegetation

	Eight Mile Basin (All Alternatives)				Separation Flat (All Alternatives)				Little Snake West (Alternative I-A)				Little Snake West (Alternatives I-B and I-D)				Little Snake East (Alternatives I-A, I-B, I-D)				Separation Creek (All Alternatives)				Shell Creek (Alternatives I-A and I-D)				Shell Creek (Alternative I-B)			
	Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)	
Vegetation Communities	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I	Acres	% of Region I
Total	**86**	**<1**	**18**	**<1**	**128**	**<1**	**39**	**<1**	**121**	**<1**	**37**	**<1**	**93**	**<1**	**21**	**<1**	**108**	**<1**	**29**	**<1**	**138**	**<1**	**48**	**<1**	**223**	**<1**	**89**	**<1**	**189**	**<1**	**71**	**<1**
Agriculture	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Aspen Forest and Woodland	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barren/Sparsely Vegetated	1	<1	<1	<1	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cliff and Canyon	<1	<1	<1	<1	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Conifer Forest	<1	<1	<1	<1	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Deciduous Forest	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Desert Shrub	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Developed/Disturbed	3	<1	1	<1	2	<1	1	<1	1	<1	<1	<1	1	<1	<1	<1	1	<1	<1	<1	3	<1	1	<1	3	<1	1	<1	3	<1	1	<1
Dunes	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14	<1	6	<1	12	<1	5	<1
Grassland	2	<1	<1	<1	--	--	--	--	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Greasewood Flat	1	<1	<1	<1	3	<1	1	<1	1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	2	<1	1	<1	1	<1	<1	<1	1	<1	<1	<1
Herbaceous Wetland	2	<1	<1	<1	7	<1	2	<1	--	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	2	<1	1	<1	2	<1	1	<1
Montane Grassland	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Montane Shrubland	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1	<1	<1	<1	--	--	--	--	--	--	--	--
Open Water	2	<1	<1	<1	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pinyon-Juniper	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Riparian	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sagebrush Shrubland	61	<1	12	<1	9	<1	3	<1	104	<1	31	<1	79	<1	18	<1	106	<1	29	<1	129	<1	45	<1	124	<1	49	<1	105	<1	39	<1
Saltbush Shrubland	13	<1	3	<1	107	<1	32	<1	15	<1	5	<1	11	<1	3	<1	<1	<1	<1	<1	3	<1	1	<1	75	<1	30	<1	63	<1	24	<1
Tundra	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Woody Riparian and Wetlands	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	--	--	--	--	1	<1	<1	<1	4	<1	2	<1	4	<1	1	<1

Discrepancies in totals due to rounding error.

Table 3.5-16 Summary of Region I Alternative Ground Electrode Overhead Electric Line Impact Parameters for Vegetation (Miles)

Vegetation Communities	Separation Flat (All Alternatives)	Little Snake West (Alternative I-A)	Little Snake West (Alternatives I-B and I-D)	Little Snake East (Alternatives I-A, I-B, I-D)	Eight Mile Basin (All Alternatives)	Shell Creek (Alternatives I-A and I-D)	Shell Creek (Alternative I-B)	Separation Creek (All Alternatives)
Total	**13**	**18**	**14**	**12**	**4**	**32**	**25**	**1**
Agriculture								
Aspen Forest and Woodland								
Barren/Sparsely Vegetated		<1	<1			<1	<1	
Cliff and Canyon	<1					<1	<1	
Conifer Forest								
Deciduous Forest								
Desert Shrub								
Developed/Disturbed	1	<1	<1	<1	1	1	<1	<1
Dunes	<1					1	1	
Grassland	<1	1	1		<1			
Greasewood Flat	<1	<1	<1	<1	<1	<1	<1	
Herbaceous Wetland	<1					<1	<1	
Montane Grassland								
Montane Shrubland								
Open Water				<1				
Pinyon-Juniper								
Riparian								
Sagebrush Shrubland	5	9	7	11	3	14	12	<1
Saltbush Shrubland	7	8	5	<1	<1	15	11	<1
Tundra								
Woody Riparian and Wetlands	<1					1	1	

Discrepancies in totals due to rounding error. Blanks indicate no impact.

Region I Conclusion

In Region I, the alternative resulting in the most acres of vegetation impacted is Alternative I-C. Alternative I-A would impact the least vegetation acreage. Impacts from vegetation clearing are fairly similar between Alternative I-A and the Alternative I-D as both alternatives cross similar vegetation communities with similar acreages. Vegetation clearing would impact less than 1 percent of each vegetation community for each alternative in the Region I analysis area. Noxious weeds impacts would be similar between these two alternatives due to the similarities in vegetation communities crossed, and similar climate conditions between these two alternatives. Revegetation constraints would be similar between Alternatives I-A and I-C, as would the potential for vegetation type conversion from either shrublands to grasslands, or woodlands to shrublands/grasslands.

Impacts to wetland and riparian areas would be similar between Alternative I-A and Alternative I-D, with slightly more impacts to herbaceous wetlands under Alternative I-D. Impacts to wetlands would be the least under Alternative I-C. Less than 1 percent of wetlands would be impacted for each alternative in Region I of the analysis area.

3.5.6.4 Region II

Table 3.5-17 provides a comparison of impacts associated with the alternative routes in Region II.

Alternative II-A

Key Parameters Summary

In Alternative II-A, the majority of disturbance would occur in the sagebrush shrubland vegetation community. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 165 acres of aspen forest and woodland, 68 acres of conifer forest, 29 acres of deciduous forest, 732 acres of pinyon-juniper, and 53 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 152 acres of greasewood flat, 12 acres of herbaceous wetlands, and 38 acres of woody riparian and wetlands. Of this, 36 acres of greasewood flat, 3 acres of herbaceous wetlands, and 12 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetland and riparian types along Alternative II-A include playas and wet meadows. Specific riparian woodlands and wetlands found along Alternative II-A would include riparian woodlands and shrublands in both montane and lower elevation areas.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Table 3.5-17 Summary of Region II Alternative Route Impacts for Vegetation

Vegetation Communities	Construction Disturbance												Operation Disturbance											
	Alternative II-A		Alternative II-B		Alternative II-C		Alternative II-D		Alternative II-E		Alternative II-F		Alternative II-A		Alternative II-B		Alternative II-C		Alternative II-D		Alternative II-E		Alternative II-F	
	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II
ROW Clearing/Trampling[1]																								
Total	**5,392**	**<1**	**7,103**	**<1**	**7,487**	**<1**	**5,267**	**<1**	**5,499**	**<1**	**5,393**	**<1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Agriculture	457	<1	168	<1	237	<1	80	<1	288	<1	104	<1	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	165	<1	149	<1	49	<1	270	<1	65	<1	162	<1	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	37	<1	314	<1	339	<1	47	<1	41	<1	48	<1	-	-	-	-	-	-	-	-	-	-	-	-
Cliff and Canyon	96	<1	89	<1	161	<1	140	<1	100	<1	133	<1	-	-	-	-	-	-	-	-	-	-	-	-
Conifer Forest	68	<1	150	<1	34	<1	124	<1	82	<1	191	<1	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	29	<1	-	-	-	-	-	-	4	<1	4	<1	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	-	-	22	<1	37	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Developed/Disturbed	296	<1	365	<1	245	<1	252	<1	341	<1	281	<1	-	-	-	-	-	-	-	-	-	-	-	-
Dunes	2	<1	4	<1	7	<1	2	<1	2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	377	<1	365	<1	473	<1	427	<1	388	<1	418	<1	-	-	-	-	-	-	-	-	-	-	-	-
Greasewood Flat	249	<1	817	<1	878	<1	326	<1	283	<1	299	<1	-	-	-	-	-	-	-	-	-	-	-	-
Herbaceous Wetland	17	<1	13	<1	9	<1	18	<1	49	<1	9	<1	-	-	-	-	-	-	-	-	-	-	-	-
Montane Grassland	15	<1	22	<1	1	<1	39	<1	46	<1	51	<1	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	400	<1	269	<1	222	<1	342	<1	448	<1	459	<1	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	5	<1	4	<1	14	<1	2	<1	6	<1	3	<1	-	-	-	-	-	-	-	-	-	-	-	-
Pinyon-Juniper	732	<1	956	<1	1,026	<1	727	<1	894	<1	865	<1	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	1,936	<1	1,297	<1	1,449	<1	1,741	<1	1,916	<1	1,741	<1	-	-	-	-	-	-	-	-	-	-	-	-
Saltbush Shrubland	461	<1	2,055	<1	2,277	<1	716	<1	514	<1	610	<1	-	-	-	-	-	-	-	-	-	-	-	-
Tundra	-	-	14	<1	-	-	1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	53	<1	36	<1	30	<1	15	<1	34	<1	15	<1	-	-	-	-	-	-	-	-	-	-	-	-
Facilities[2]																								
Total	**3,744**	**<1**	**5,002**	**<1**	**5,064**	**<1**	**4,055**	**<1**	**3,935**	**<1**	**4,276**	**<1**	**1,178**	**<1**	**1,436**	**<1**	**1,308**	**<1**	**1,223**	**<1**	**1,195**	**<1**	**1,392**	**<1**
Agriculture	330	<1	138	<1	177	<1	71	<1	210	<1	82	<1	93	<1	51	<1	49	<1	29	<1	61	<1	32	<1
Aspen Forest and Woodland	105	<1	144	<1	39	<1	240	<1	68	<1	185	<1	35	<1	59	<1	12	<1	85	<1	28	<1	71	<1
Barren/Sparsely Vegetated	24	<1	195	<1	212	<1	42	<1	27	<1	43	<1	6	<1	47	<1	52	<1	13	<1	7	<1	13	<1
Cliff and Canyon	71	<1	74	<1	127	<1	122	<1	83	<1	117	<1	24	<1	21	<1	34	<1	37	<1	25	<1	36	<1
Conifer Forest	52	<1	137	<1	29	<1	119	<1	76	<1	227	<1	20	<1	54	<1	9	<1	43	<1	26	<1	91	<1
Deciduous Forest	17	<1	-	-	-	-	-	-	3	<1	3	<1	5	<1	-	-	-	-	-	-	1	<1	1	<1
Desert Shrub	-	-	14	<1	25	<1	-	-	-	-	-	-	-	-	3	<1	5	<1	-	-	-	-	-	-
Developed/Disturbed	215	<1	294	<1	189	<1	190	<1	235	<1	213	<1	66	<1	84	<1	53	<1	55	<1	69	<1	64	<1
Dunes	1	<1	2	<1	5	<1	1	<1	1	<1	-	-	<1	<1	1	<1	1	<1	<1	<1	<1	<1	-	-
Grassland	252	<1	238	<1	305	<1	292	<1	251	<1	286	<1	63	<1	62	<1	72	<1	75	<1	63	<1	77	<1
Greasewood Flat	152	<1	506	<1	538	<1	215	<1	176	<1	212	<1	36	<1	119	<1	129	<1	53	<1	41	<1	54	<1
Herbaceous Wetland	12	<1	8	<1	7	<1	15	<1	35	<1	6	<1	3	<1	2	<1	2	<1	4	<1	8	<1	1	<1
Montane Grassland	10	<1	22	<1	1	<1	33	<1	32	<1	43	<1	3	<1	9	<1	<1	<1	10	<1	8	<1	13	<1
Montane Shrubland	310	<1	216	<1	171	<1	312	<1	371	<1	392	<1	118	<1	77	<1	50	<1	118	<1	152	<1	159	<1
Open Water	6	<1	5	<1	11	<1	3	<1	6	<1	4	<1	2	<1	2	<1	3	<1	1	<1	1	<1	1	<1
Pinyon-Juniper	558	<1	744	<1	768	<1	606	<1	677	<1	672	<1	199	<1	242	<1	210	<1	199	<1	232	<1	241	<1

Table 3.5-17 Summary of Region II Alternative Route Impacts for Vegetation

Vegetation Communities	Construction Disturbance												Operation Disturbance											
	Alternative II-A		Alternative II-B		Alternative II-C		Alternative II-D		Alternative II-E		Alternative II-F		Alternative II-A		Alternative II-B		Alternative II-C		Alternative II-D		Alternative II-E		Alternative II-F	
	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	1,278	<1	874	<1	918	<1	1,255	<1	1,316	<1	1,313	<1	400	<1	257	<1	232	<1	355	<1	377	<1	407	<1
Saltbush Shrubland	312	<1	1,350	<1	1,517	<1	528	<1	340	<1	463	<1	92	<1	335	<1	388	<1	140	<1	88	<1	124	<1
Tundra	-	-	9	<1	-	-	<1	<1	-	-	-	-	-	-	3	<1	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	38	<1	27	<1	26	<1	12	<1	28	<1	16	<1	12	<1	7	<1	8	<1	4	<1	9	<1	7	<1

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

[2] Facilities would include access roads, temporary work areas such as staging areas, material storage yards, fly yards, pulling, tensioning, and splicing sites, work areas at each structure site, batch plant sites, and guard structures within the 2-mile wide corridor. Staging areas, fly yards, batch plant sites would be cleared as necessary. Staging areas and fly yards might be bladed and graveled. Equipment staging and refueling sites would be co-located with other temporary work areas. Wire pulling, tensioning, and splicing sites, structure work areas would be completely cleared of vegetation during construction.

Discrepancies in totals due to rounding error.

Along Alternative II-A are two sets of micro-siting options, Strawberry IRA option 1, 2, and 3 and Cedar Knoll IRA options 1 and 2. For the Strawberry IRA micro-siting options, the vegetation communities located along options 1, 2, and 3 are similar to the vegetation communities located along Alternative II-A. Impacts to vegetation would be the same for each Strawberry IRA micro-siting option and for Alternative II-A. The Cedar Knoll IRA options 1 and 2 have similar vegetation communities to Alternative II-A. Impacts to vegetation would be the same for each Cedar Knoll option and Alternative II-A.

Alternative II-B

Key Parameters Summary

In Alternative II-B, the majority of the disturbance would occur in the saltbush and sagebrush shrubland vegetation community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 149 acres of aspen forest and woodland, 150 acres of conifer forest, 956 acres of pinyon-juniper, and 36 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations of FRCC for each vegetation community implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 506 acres of greasewood flat, 8 acres of herbaceous wetlands and 27 acres of woody riparian and wetlands. Of this, 119 acres of greasewood flat, 2 acres of herbaceous wetlands and 7 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along Alternative II-B include playas, emergent marshes, and wet meadows. Specific riparian woodlands and wetlands found along Alternative II-B would include riparian woodlands and shrublands in both montane and lower elevation areas.

The USFS MIS plant species, Rydberg milkvetch is listed for the USFS Fishlake National Forest, which is crossed by Alternative II-B. Based on the elevation requirements for the species, there is no habitat for the species along this alternative within the USFS Fishlake National Forest.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative II-C

Key Parameters Summary

In Alternative II-C, the majority of the disturbance would occur in the saltbush and sagebrush shrubland vegetation community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 237 acres of aspen forest and woodland, 34 acres of conifer forest, 1,026 acres of pinyon-juniper, and 30 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction of facilities would disturb 538 acres of greasewood flat, 7 acres of herbaceous wetlands, and 26 acres of woody riparian and wetlands. Of this, 129 acres of greasewood flat, 2 acres of herbaceous wetlands, and 8 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along Alternative II-C include playas, emergent marshes, and wet meadows. Specific riparian woodlands and wetlands found along Alternative II-C would include riparian woodlands and shrublands in both montane and lower elevation areas.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

The USFS MIS plant species, Rydberg milkvetch is listed for the USFS Fishlake National Forest, which is crossed by Alternative II-C. While there are no known occurrences along Alternative II-C in Sevier County, Utah, where the route crosses the USFS Fishlake National Forest, potential habitat would be possible based on substrate, elevation, and vegetation parameters. Direct impacts would include the loss of potential habitat, while indirect impacts could include the spread and establishment of noxious and invasive weed species and increased access in the vicinity of the known populations.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative II-D

Key Parameters Summary

In Alternative II-D, the majority of the disturbance would occur in the sagebrush shrubland vegetation community type. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 270 acres of aspen forest and woodland, 124 acres of conifer forest, 727 acres of pinyon-juniper, and 15 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 215 acres of greasewood flat, 15 acres of herbaceous wetlands and 12 acres of woody riparian and wetlands. Of this, 53 acres of greasewood flat, 4 acres of herbaceous wetlands, and 4 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along in Alternative II-D include playas, emergent marshes, and wet meadows. Specific riparian woodlands and wetlands found along Alternative II-D would include riparian woodlands and shrublands in both montane and lower elevation areas.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative II-E

Key Parameters Summary

In Alternative II-E, the majority of the disturbance would occur in the sagebrush shrubland and pinyon-juniper vegetation community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 65 acres of aspen forest and woodland, 82 acres of conifer forest, 4 acres of deciduous forest, 894 acres of pinyon-juniper, and 34 acres of woody riparian and wetland vegetation communities. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 176 acres of greasewood flat, 35 acres of herbaceous wetlands, and 28 acres of woody riparian and wetlands. Of this, 41 acres of greasewood flat, 8 acres of herbaceous wetlands, and 9 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along Alternative II-E include playas, emergent marshes, and wet meadows. Specific riparian woodlands and wetlands found along Alternative II-E include riparian woodlands and shrublands in both montane and lower elevation areas.

Along Alternative II-E are the micro-siting options, Cedar Knoll IRA options 1 and 2. Cedar Knoll IRA options 1 and 2 have similar vegetation communities. Impacts to vegetation would be the same for each Cedar Knoll option and the comparable section of Alternative II-E.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative II-F (Agency Preferred)

Key Parameters Summary

The majority of the disturbance for this alternative would occur in the sagebrush shrubland and pinyon-juniper vegetation community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 162 acres of aspen forest and woodland, 191 acres of conifer forest, 4 acres of deciduous forest, 865 acres of pinyon-juniper, and 15 acres of woody riparian and wetland vegetation communities. Alternative II-A impacts more acres of agriculture but less acres of forests than Alternative II-F. The vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 212 acres of greasewood flat, 6 acres of herbaceous wetlands and 16 acres of woody riparian and wetlands. Of this, 54 acres of greasewood flat, 1 acre of herbaceous wetlands and 7 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along Alternative II-F include playas, emergent marshes, and wet meadows. Specific riparian woodlands and wetlands found along Alternative II-F include riparian woodlands and shrublands in both montane and lower elevation areas.

Along Alternative II-F are the micro-siting options, Cedar Knoll IRA options 1 and 2. Cedar Knoll IRA options 1 and 2 have similar vegetation communities. Impacts to vegetation would be the same for each Cedar Knoll option and the comparable section of Alternative II-F.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative Variation in Region II

Emma Park Alternative Variation

The Emma Park Alternative Variation would impact similar vegetation community types compared to those of Alternative II-F. The Emma Park Alternative Variation would increase the total area affected by ROW trampling and clearing from 577 to 669 acres. The area of forests impacted would increase slightly in the Emma Park Alternative Variation (310 versus 296 acres), with greater impacts to aspen forest and woodland (211 versus 133 acres) and pinyon-juniper (73 versus 2 acres), but with smaller impacts to conifer forest (26 versus 161 acres). The Emma Park Alternative Variation also would have larger impacts to agriculture, cliff and canyon, montane shrubland, sagebrush shrubland, and herbaceous wetlands compared to Alternative II-F. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative Connectors in Region II

Each of the Region II alternative connectors would result in small disturbance acreage increases in the various vegetation community types crossed. Wetlands and riparian areas in the Lynndyl and IPP East Alternative Connectors include herbaceous wetlands. Vegetation clearing would occur in aspen forest and woodlands, conifer forests, pinyon-juniper, and woody riparian and wetlands if some of these alternative connectors were used. **Table 3.5-18** summarizes impacts and advantages associated with the alternative connectors in Region II. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area.

Region II Conclusion

In Region II, Alternative II-F would affect almost the same total acreage as Alternative II-A. Both routes would cross the Uintah Basin and the Wasatch Mountains. Alternative II-F would cross more acreage at higher elevation terrain than Alternative II-A. Alternative II-A would cross more agriculture lands, deciduous forests, and woody riparian and wetlands. Vegetation clearing would impact more forested areas in Alternative II-F, whereas there would be a greater impact to wetlands on Alternative II-A. Impacts to vegetation communities under Alternative II-F would comprise less than 1 percent of the analysis area in Region II.

For all routes, reclamation in the Uintah Basin would be difficult due to soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, specifically halogeton. Additionally, reclamation in the San Rafael Swell area, specifically along Alternatives II-B and II-C, would be difficult due to soil reclamation constraints, and low regional annual precipitation rates. Construction and operation impacts would be similar between Alternative II-F and Alternative II-A due to the similarities in vegetation communities crossed, and similar climate conditions between the two alternatives.

3.5.6.5 Region III

Table 3.5-19 provides a comparison of impacts associated with the alternative routes in Region III.

Alternative III-A (Applicant Proposed)

Key Parameters Summary

In Alternative III-A, the majority of the disturbance would occur in the desert shrub, grassland, sagebrush shrubland, and saltbush shrubland vegetation community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 276 acres of pinyon-juniper and 12 acres of woody riparian and wetlands. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Table 3.5-18 Summary of Region II Alternative Connector Impacts for Vegetation (acres)

Vegetation Communities	Lynndyl Alternative Connector						IPP East Alternative Connector						Price Alternative Connector						Castle Dale Alternative Connector						Highway 191 Alternative Connector					
	ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance	
	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II
Total	**511**	**<1**	**305**	**<1**	**72**	**<1**	**50**	**<1**	**36**	**<1**	**7**	**<1**	**369**	**<1**	**280**	**<1**	**81**	**<1**	**225**	**<1**	**176**	**<1**	**50**	**<1**	**61**	**<1**	**119**	**<1**	**38**	**<1**
Agriculture	-	-	4	<1	1	<1	-	-	-	-	-	-	-	-	-	-	-	-	17	<1	17	<1	6	<1	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	<1	9	<1	4	<1
Barren/ Sparsely Vegetated	-	-	-	-	-	-	-	-	-	-	-	-	2	<1	2	<1	1	<1	2	<1	2	<1	1	<1	-	-	-	-	-	-
Cliff and Canyon	-	-	-	-	-	-	-	-	-	-	-	-	7	<1	8	<1	3	<1	10	<1	8	<1	2	<1	5	<1	10	<1	3	<1
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	<1	<1	<1	-	-	-	-	-	-	12	<1	22	<1	7	<1
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Developed/ Disturbed	12	<1	8	<1	2	<1	-	-	<1	<1	-	-	22	<1	18	<1	6	<1	32	<1	21	<1	5	<1	2	<1	4	<1	1	<1
Dunes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	138	<1	79	<1	18	<1	10	<1	7	<1	1	<1	4	<1	3	<1	1	<1	9	<1	6	<1	1	<1	-	-	-	-	-	-
Greasewood Flat	2	<1	1	<1	<1	<1	13	<1	10	<1	2	<1	12	<1	7	<1	2	<1	8	<1	7	<1	2	<1	-	-	-	-	-	-
Herbaceous Wetland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Grassland	15	<1	13	<1	3	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	<1	<1	<1
Montane Shrubland	-	-	<1	<1	-	-	-	-	-	-	-	-	6	<1	5	<1	2	<1	-	-	-	-	-	-	10	<1	17	<1	4	<1
Open Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	-	-	-	-	-	-
Pinyon-Juniper	47	<1	34	<1	9	<1	-	-	-	-	-	-	139	<1	106	<1	31	<1	11	<1	9	<1	3	<1	3	<1	6	<1	2	<1
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	295	<1	164	<1	38	<1	-	-	-	-	-	-	133	<1	99	<1	28	<1	16	<1	14	<1	4	<1	26	<1	51	<1	16	<1

Table 3.5-18 Summary of Region II Alternative Connector Impacts for Vegetation (acres)

Vegetation Communities	Lynndyl Alternative Connector						IPP East Alternative Connector						Price Alternative Connector						Castle Dale Alternative Connector						Highway 191 Alternative Connector					
	ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance	
	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II	Acres	% of Region II
Saltbush Shrubland	2	<1	2	<1	1	<1	26	<1	18	<1	3	<1	44	<1	30	<1	8	<1	117	<1	89	<1	25	<1	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	-	-	-	-	-	-	-	-	-	-	-	-	2	<1	1	<1	<1	<1	3	<1	3	<1	1	<1	-	-	-	-	-	-

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

Discrepancies in totals due to rounding error.

Table 3.5-19 Summary of Region III Alternative Route Impacts for Vegetation

Vegetation Communities	Construction Disturbance						Operation Disturbance					
	Alternative III-A		Alternative III-B		Alternative III-C		Alternative III-A		Alternative III-B		Alternative III-C	
	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III
ROW Clearing/Trampling[1]												
Total	**5,852**	**<1**	**6,056**	**<1**	**6,539**	**<1**	**-**	**-**	**-**	**-**	**-**	**-**
Agriculture	-	-	14	<1	4	<1	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	14	<1	15	<1	1	<1	-	-	-	-	-	-
Cliff and Canyon	33	<1	14	<1	9	<1	-	-	-	-	-	-
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	2,013	<1	1,688	<1	1,648	<1	-	-	-	-	-	-
Developed/Disturbed	105	<1	87	<1	83	<1	-	-	-	-	-	-
Dunes	-	-	45	<1	45	<1	-	-	-	-	-	-
Grassland	1,018	<1	1,057	<1	1,108	<1	-	-	-	-	-	-
Greasewood Flat	345	<1	378	<1	463	<1	-	-	-	-	-	-
Herbaceous Wetland	79	<1	92	<1	115	<1	-	-	-	-	-	-
Montane Grassland	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-
Montane Shrubland	10	<1	134	<1	-	-	-	-	-	-	-	-
Open Water	2	<1	2	<1	1	<1	-	-	-	-	-	-
Pinyon-Juniper	276	<1	331	<1	337	<1	-	-	-	-	-	-
Riparian	58	<1	79	<1	18	<1	-	-	-	-		-
Sagebrush Shrubland	974	<1	1,083	<1	1,479	<1	-	-	-	-	-	-
Saltbush Shrubland	912	<1	984	<1	1,215	<1	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	12	<1	53	<1	12	<1	-	-	-	-	-	-
Facilities[2]												
Total	**3,641**	**<1**	**3,543**	**<1**	**3,926**	**<1**	**996**	**<1**	**875**	**<1**	**953**	**<1**
Agriculture	2	<1	9	<1	4	<1	1	<1	2	<1	1	<1
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	9	<1	10	<1	2	<1	3	<1	2	1	<1	<1

Table 3.5-19 Summary of Region III Alternative Route Impacts for Vegetation

Vegetation Communities	Construction Disturbance						Operation Disturbance					
	Alternative III-A		Alternative III-B		Alternative III-C		Alternative III-A		Alternative III-B		Alternative III-C	
	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III
Cliff and Canyon	23	<1	11	<1	15	<1	7	<1	4	<1	5	<1
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	1,267	<1	1,009	<1	1,026	<1	389	<1	263	<1	251	<1
Developed/Disturbed	64	<1	56	<1	54	<1	16	<1	13	<1	13	<1
Dunes	-	-	27	<1	27	<1	-	-	6	<1	6	<1
Grassland	592	<1	613	<1	639	<1	139	<1	142	<1	154	<1
Greasewood Flat	210	<1	229	<1	287	<1	48	<1	51	<1	70	<1
Herbaceous Wetland	46	<1	55	<1	75	<1	10	<1	12	<1	19	<1
Montane Grassland	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Montane Shrubland	15	<1	86	<1	-	-	8	<1	24	<1	-	-
Open Water	2	<1	2	<1	1	<1	<1	<1	<1	<1	<1	<1
Pinyon-Juniper	227	<1	215	<1	207	<1	77	<1	61	<1	53	<1
Riparian	41	<1	50	<1	11	<1	13	<1	11	<1	3	<1
Sagebrush Shrubland	594	<1	617	<1	863	<1	156	<1	144	<1	208	<1
Saltbush Shrubland	539	<1	576	<1	709	<1	126	<1	132	<1	169	<1
Tundra	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	9	<1	28	<1	7	<1	3	<1	6	<1	2	<1

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

[2] Facilities would include access roads, temporary work areas such as staging areas, material storage yards, fly yards, pulling, tensioning, and splicing sites, work areas at each structure site, batch plant sites, and guard structures within the 2-mile wide corridor. Staging areas, fly yards, batch plant sites would be cleared as necessary. Staging areas and fly yards might be bladed and graveled. Equipment staging and refueling sites would be co-located with other temporary work areas. Wire pulling, tensioning, and splicing sites, structure work areas would be completely cleared of vegetation during construction.

Discrepancies in totals due to rounding error.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 210 acres of greasewood flats, 46 acres of herbaceous wetlands, 41 acres of riparian, and 9 acres of woody riparian and wetlands. Of this, 48 acres of greasewood flats, 10 acres of herbaceous wetlands, 13 acres of riparian, and 3 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along in Alternative III-A include wetlands associated with topographical depressions. Specific riparian woodlands and wetlands found along Alternative III-A would include riparian woodlands and shrublands in both montane and lower elevation areas.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative III-B (Agency Preferred)

Key Parameters Summary

The majority of the disturbance would occur in the desert shrub, grassland, sagebrush shrubland, and saltbush shrubland vegetation community types. Alternative III-B would cross in the vicinity of the Little Sahara Sand Dunes Recreation Area. Due to the sandy substrate, shifting topography, and winds in the area, reclamation would be difficult and most likely would not be successful. See Section 3.3, Soils, for more detail. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 331 acres of pinyon-juniper and 53 acres of woody riparian and wetlands. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 229 acres of greasewood flat, 55 acres of herbaceous wetlands, 50 acres of riparian, and 28 acres of woody riparian and wetlands. Of this, 51 acres of greasewood flat, 12 acres of herbaceous wetlands, 11 acres of riparian, and 6 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along in Alternative III-B include wetlands associated with topographical depressions. Specific riparian woodlands and wetlands found along Alternative III-B would include riparian woodlands and shrublands in lower elevation areas.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative III-C

Key Parameters Summary

In Alternative III-C, the majority of the disturbance would occur in the desert shrub, grassland, sagebrush shrubland, and saltbush shrubland vegetation community types. Alternative III-C would cross in the vicinity of the Little Sahara Sand Dunes Recreation Area. Due to the sandy substrate, shifting topography, and winds in the area, reclamation would be difficult and most likely would not be successful. See Section 3.3,

Soils, for more detail. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 337 acres of pinyon-juniper and 12 acres of woody riparian and wetlands. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 287 acres of greasewood flat, 75 acres of herbaceous wetlands, 11 acres of riparian, and 7 acres of woody riparian and wetlands. Of this, 70 acres of greasewood flat, 19 acres of herbaceous wetlands, 3 acres of riparian, and 2 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetland and riparian types along Alternative III-C include wetlands associated with topographical depressions. Specific riparian woodlands and wetlands found along Alternative III-C would include riparian woodlands and shrublands in both montane and lower elevation areas.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative Variations in Region III

Table 3.5-20 provides a comparison of impacts associated with the alternative variations in Region III.

The Ox Valley East Alternative Variation would impact similar vegetation community types compared to those of Alternative III-A; however, there would be additional impacts in the aspen forest and woodland, cliff and canyon, and pinyon-juniper vegetation community types. Wetlands and riparian areas in the Ox Valley East Variation include riparian woodlands and shrublands in both montane and lower elevation areas. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

The Ox Valley West Alternative Variation would impact similar vegetation community types compared to those of Alternative III-A; however, there would be additional impacts in the aspen forest and woodland, cliff and canyon, pinyon-juniper, and woody riparian community types, and decreased impacts in the developed/disturbed, montane shrubland, and sagebrush shrubland community types under this variation. Wetlands and riparian areas in the Ox Valley West Variation include riparian woodlands and shrublands in both montane and lower elevation areas. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

The Pinto Alternative Variation would impact similar vegetation community types compared to those of Alternative III-A, however there would be additional impacts in the agriculture, desert shrub, pinyon-juniper, saltbush shrub community types, and decreased impacts in the grassland, and sagebrush shrubland community types under this variation. Wetlands and riparian areas in the Ox Valley East Variation include riparian woodlands and shrublands in both montane and lower elevation areas. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative Connectors in Region III

The Moapa Alternative Connector and Avon Alternative Connector would include minor disturbance acreage increases across the various vegetation community types crossed if constructed. Vegetation clearing would occur in the woody riparian and wetlands community type for the Moapa Alternative Connector. There would be no vegetation clearing for the Avon Connector as there are no vegetation communities identified as likely

Table 3.5-20 Summary of Region III Alternative Variation Impacts for Vegetation (acres)

Vegetation Communities	Ox Valley East Alternative Variation						*Alternative III-A Comparable*						Ox Valley West Alternative Variation						*Alternative III-A Comparable*						Pinto Alternative Variation						*Alternative III-A Comparable*					
	ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance	
	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III
Total	**315**	**<1**	**276**	**<1**	**100**	**<1**	***285***	***<1***	***252***	***<1***	***95***	***<1***	**333**	**<1**	**268**	**<1**	**100**	**<1**	***285***	***<1***	***252***	***<1***	***95***	***<1***	**572**	**<1**	**449**	**<1**	**111**	**<1**	***469***	***<1***	***381***	***<1***	***125***	***<1***
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	<1	<1	<1	-	-	-	-	-	-
Aspen Forest and Woodland	3	<1	2	<1	1	<1	-	-	-	-	-	-	3	<1	2	<1	1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barren/ Sparsely Vegetated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cliff and Canyon	4	<1	2	<1	<1	<1	-	-	*<1*	*<1*	*<1*	*<1*	4	<1	2	<1	<1	<1	-	-	*<1*	*<1*	*<1*	*<1*	-	-	<1	<1	<1	<1	-	-	*<1*	*<1*	*<1*	*<1*
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	<1	<1	<1	<1	-	-	*1*	*<1*	*1*	*<1*	*1*	*<1*	<1	<1	<1	<1	-	-	*1*	*<1*	*1*	*<1*	*1*	*<1*	17	<1	11	<1	2	<1	-	-	*<1*	*<1*	*<1*	*<1*
Developed/ Disturbed	4	<1	3	<1	1	<1	*5*	*<1*	*4*	*<1*	*1*	*<1*	3	<1	2	<1	1	<1	*5*	*<1*	*4*	*<1*	*1*	*<1*	16	<1	11	<1	2	<1	*14*	*<1*	*9*	*<1*	*2*	*<1*
Dunes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	<1	<1	2	<1	1	<1	*1*	*<1*	*2*	*<1*	*1*	*<1*	<1	<1	2	<1	1	<1	*1*	*<1*	*2*	*<1*	*1*	*<1*	3	<1	5	<1	2	<1	*1*	*<1*	*2*	*<1*	*1*	*<1*
Greasewood Flat	-	-	-	-	-	-	-	-	*<1*	*<1*	-	-	-	-	-	-	-	-	-	-	*<1*	*<1*	-	-	1	<1	1	<1	<1	<1	-	-	*<1*	*<1*	-	-
Herbaceous Wetland	-	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	-	-	-	-	-	-	-	-	*<1*	*<1*	*<1*	*<1*	-	-	<1	<1	<1	<1	-	-	*<1*	*<1*	*<1*	*<1*
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	39	<1	36	<1	16	<1	*8*	*<1*	*14*	*<1*	*7*	*<1*	37	<1	35	<1	15	<1	*8*	*<1*	*14*	*<1*	*7*	*<1*	13	<1	11	<1	3	<1	*8*	*<1*	*14*	*<1*	*7*	*<1*
Open Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	-	-	*<1*	*<1*	-	-
Pinyon-Juniper	155	<1	134	<1	46	<1	*126*	*<1*	*113*	*<1*	*43*	*<1*	169	<1	129	<1	45	<1	*126*	*<1*	*113*	*<1*	*43*	*<1*	304	<1	250	<1	64	<1	*176*	*<1*	*156*	*<1*	*54*	*<1*
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 3.5-20 Summary of Region III Alternative Variation Impacts for Vegetation (acres)

Vegetation Communities	Ox Valley East Alternative Variation						*Alternative III-A Comparable*						Ox Valley West Alternative Variation						*Alternative III-A Comparable*						Pinto Alternative Variation						*Alternative III-A Comparable*					
	ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance	
	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III
Sagebrush Shrubland	107	<1	93	<1	32	<1	*139*	*<1*	*115*	*<1*	*41*	*<1*	112	<1	91	<1	34	<1	*139*	*<1*	*115*	*<1*	*41*	*<1*	215	<1	156	<1	36	<1	*267*	*<1*	*196*	*<1*	*59*	*<1*
Saltbush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	-	-	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	3	<1	5	<1	3	<1	*3*	*<1*	*3*	*<1*	*1*	*<1*	4	<1	5	<1	3	<1	*3*	*<1*	*3*	*<1*	*1*	*<1*	2	<1	3	<1	1	<1	*3*	*<1*	*3*	*<1*	*1*	*<1*

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

Discrepancies in totals due to rounding error.

having vegetation over 6 feet in height along the 250-foot-wide transmission line ROW. Wetlands and riparian areas in the Moapa Alternative Connector include riparian woodland and shrublands. The Avon connector includes riparian communities, such as warm desert washes. **Table 3.5-21** summarizes impacts and advantages associated with the alternative connectors in Region III. Impacts to each vegetative community would comprise less than 1 percent of the total of each vegetative community in the analysis area.

Alternative Ground Electrode Systems in Region III

The southern ground electrode system would be necessary within 100 miles of the southern terminal as discussed in Chapter 2. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the proponent. The impacts associated with constructing and operating this system are discussed in Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. **Table 3.5-22** summarizes impacts associated with the southern ground electrode system. **Table 3.5-23** summarizes impacts associated with the southern ground electrode transmission line. Some locations might serve multiple alternative routes, while others could only be associated with a certain alternative route.

Region III Conclusion

In Region III, the alternative with the most acres impacted is Alternative III-C. Alternative III-A would impact the least vegetation acreage. Impacts from vegetation clearing are fairly similar between Alternative III-A and Alternative III-B as both alternatives cross similar vegetation communities with similar acreage of disturbance. Impacts to vegetation communities under Alternative III-B would be less than 1 percent of the analysis area in Region III. Alternative III-B and Alternative III-C would cross in the vicinity of the Little Sahara Sand Dunes Recreation Area, which would be difficult to reclaim. For more information, see Section 3.3, Soils.

Noxious weeds impacts would be similar between the two alternatives due to the similarities in vegetation communities crossed and similar climate conditions between the two alternatives. Revegetation constraints would be similar between the two alternatives, as would the potential for vegetation type conversion from either shrublands to grasslands, or woodlands to shrublands/grasslands. The agency preferred alternative crosses more acres of herbaceous wetlands, specifically in Lincoln County, Nevada, while the Applicant Proposed route crosses slightly more acres of woody riparian and wetlands habitat.

3.5.6.6 Region IV

Table 3.5-24 provides a comparison of impacts associated with the alternative routes in Region IV.

Alternative IV-A (Applicant Proposed and Agency Preferred)

Key Parameters Summary

The majority of the disturbance for this alternative would occur in the desert shrub and developed/disturbed vegetation community types, with minor impacts occurring in the barren/sparsely vegetated, cliff and canyon, riparian, saltbush shrubland, and woody riparian and wetland community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in less than 1 acre of the woody riparian and wetland community type. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Table 3.5-21 Summary of Region III Alternative Connector Impacts for Vegetation

Vegetation Communities	Moapa Alternative Connector						Avon Alternative Connector					
	ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance	
	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III
Total	**264**	**<1**	**168**	**<1**	**34**	**<1**	**164**	**<1**	**104**	**<1**	**21**	**<1**
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	-	-	-	-	-	-	-	-	-	-	-	-
Cliff and Canyon	-	-	-	-	-	-	-	-	-	-	-	-
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	178	<1	116	<1	24	<1	-	-	-	-	-	-
Developed/Disturbed	2	<1	1	<1	<1	<1	2	<1	2	<1	<1	<1
Dunes	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	8	<1	5	<1	1	<1
Greasewood Flat	-	-	-	-	-	-	1	<1	1	<1	<1	<1
Herbaceous Wetland	-	-	-	-	-	-	-	-	<1	<1	-	-
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	-	-	-	-	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	84	<1	51	<1	10	<1	-	-	-	-	-	-
Sagebrush Shrubland	-	-	-	-	-	-	21	<1	14	<1	3	<1
Saltbush Shrubland	-	-	-	-	-	-	132	<1	81	<1	16	<1
Tundra	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	1	<1	<1	<1	-	-	-	-	-	-	-	-

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

Discrepancies in totals due to rounding error.

Table 3.5-22 Summary of Region III Alternative Ground Electrode Siting Area Impact Parameters to Vegetation

Vegetation Communities	Halfway Wash – Virgin River (Alternative III-A)				Halfway Wash – Virgin River (Alternative III-B)				Halfway Wash East (Alternative III-A)				Halfway Wash East (Alternative III-B)				Meadow Valley 2 (Alternative III-C)				Mormon Mesa-Carp Elgin Rd (Alternative III-A)				Mormon Mesa-Carp Elgin Rd (Alternative III-B)			
	Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)	
	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III
Total	**84**	**<1**	**16**	**<1**	**93**	**<1**	**20**	**<1**	**104**	**<1**	**26**	**<1**	**102**	**<1**	**25**	**<1**	**174**	**<1**	**66**	**<1**	**91**	**<1**	**19**	**<1**	**103**	**<1**	**26**	**<1**
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barren/ Sparsely Vegetated	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	1	<1	<1	<1	-	-	-	-	-	-	-	-
Cliff and Canyon	1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	5	<1	2	<1	-	-	-	-	-	-	-	-
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	65	<1	12	<1	71	<1	15	<1	76	<1	19	<1	75	<1	18	<1	144	<1	54	<1	57	<1	12	<1	64	<1	16	<1
Developed/ Disturbed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dunes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Greasewood Flat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Herbaceous Wetland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	18	<1	3	<1	20	<1	4	<1	27	<1	7	<1	27	<1	7	<1	16	<1	6	<1	35	<1	7	<1	49	<1	10	<1

Table 3.5-22 Summary of Region III Alternative Ground Electrode Siting Area Impact Parameters to Vegetation

Vegetation Communities	Halfway Wash – Virgin River (Alternative III-A)				Halfway Wash – Virgin River (Alternative III-B)				Halfway Wash East (Alternative III-A)				Halfway Wash East (Alternative III-B)				Meadow Valley 2 (Alternative III-C)				Mormon Mesa-Carp Elgin Rd (Alternative III-A)				Mormon Mesa-Carp Elgin Rd (Alternative III-B)			
	Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)		Construction Dist (acres)		Operation Dist (acres)	
	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III	Acres	% of Region III
Sagebrush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Saltbush Shrubland	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	8	<1	3	<1	-	-	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	-	-	-	-	-	-	-	-	1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

Discrepancies in totals due to rounding error.

Table 3.5-23 Summary of Region III Alternative Ground Electrode Transmission Line Impact Parameters to Vegetation (Miles)

Vegetation Communities	Halfway Wash – Virgin River (Alternative III-A)	Halfway Wash – Virgin River (Alternative III-B)	Halfway Wash East (Alternative III-A)	Halfway Wash East (Alternative III-B)	Meadow Valley 2 (Alternative III-C)	Mormon Mesa – Carp Elgin Rd (Alternative III-A)	Mormon Mesa-Carp Elgin Rd (Alternative III-B)
Total	**4**	**6**	**8**	**9**	**22**	**5**	**16**
Agriculture	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	-	-	-	-	<1	-	-
Cliff and Canyon	<1	<1	-	-	-	-	-
Conifer Forest	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-
Desert Shrub	3	5	7	8	21	4	10
Developed/Disturbed	-	<1	-	<1	-	-	<1
Dunes	-	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	-
Greasewood Flat	-	-	-	-	-	-	-
Herbaceous Wetland	-	-	-	-	<1	-	-
Montane Grassland	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-
Open Water	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-
Riparian	<1	1	1	1	<1	1	5
Sagebrush Shrubland	-	-	-	-	-	-	-
Saltbush Shrubland	-	-	-	-	1	-	-
Tundra	-	-	-	-	-	-	-
Woody Riparian and Wetlands	-	-	-	-	<1	-	-

Discrepancies in totals due to rounding error.

Construction of facilities would disturb 5 acres of riparian, and less than 1 acre of woody riparian and wetlands, while operation impacts would occur in 1 acre of riparian.

Specific riparian woodlands and wetlands found along Alternative IV-A would include desert washes and riparian woodlands and shrublands.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Table 3.5-24 Summary of Region IV Alternative Route Impacts for Vegetation

	Construction Disturbance						Operation Disturbance					
	Alternative IV-A		Alternative IV-B		Alternative IV-C		Alternative IV-A		Alternative IV-B		Alternative IV-C	
	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV
ROW Clearing/Trampling[1]												
Total	**738**	**<1**	**818**	**<1**	**893**	**<1**	**-**	**-**	**-**	**-**	**-**	**-**
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	35	<1	38	<1	38	<1	-	-	-	-	-	-
Cliff and Canyon	9	<1	12	<1	12	<1	-	-	-	-	-	-
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	454	<1	459	<1	465	<1	-	-	-	-	-	-
Developed/Disturbed	225	<1	295	<1	355	<1	-	-	-	-	-	-
Dunes	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Greasewood Flat	-	-	-	-	-	-	-	-	-	-	-	-
Herbaceous Wetland	-	-	1	<1	1	<1	-	-	-	-	-	-
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	-	-	-	-	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	8	<1	1	<1	1	<1	-	-	-	-	-	-
Sagebrush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Saltbush Shrubland	6	<1	5	<1	14	<1	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	<1	<1	7	<1	7	<1	-	-	-	-	-	-
Facilities[2]												
Total	**566**	**<1**	**573**	**<1**	**663**	**<1**	**148**	**<1**	**180**	**<1**	**182**	**<1**
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	25	<1	32	<1	32	<1	5	<1	8	<1	8	<1

Table 3.5-24 Summary of Region IV Alternative Route Impacts for Vegetation

	Construction Disturbance						Operation Disturbance					
	Alternative IV-A		Alternative IV-B		Alternative IV-C		Alternative IV-A		Alternative IV-B		Alternative IV-C	
	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV
Cliff and Canyon	13	<1	11	<1	11	<1	4	<1	3	<1	3	<1
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	341	<1	322	<1	328	<1	87	<1	106	<1	106	<1
Developed/Disturbed	179	<1	194	<1	272	<1	51	<1	55	<1	56	<1
Dunes	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Greasewood Flat	-	-	-	-	-	-	-	-	-	-	-	-
Herbaceous Wetland	-	-	1	<1	1	<1	<1	<1	<1	<1	<1	<1
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	-	-	5	<1	5	<1	-	-	4	<1	4	<1
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	5	<1	1	<1	1	<1	1	<1	<1	<1	<1	<1
Sagebrush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Saltbush Shrubland	3	<1	2	<1	8	<1	1	<1	1	<1	2	<1
Tundra	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	<1	<1	5	<1	5	<1	-	-	2	<1	2	<1

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

[2] Facilities would include access roads, temporary work areas such as staging areas, material storage yards, fly yards, pulling, tensioning, and splicing sites, work areas at each structure site, batch plant sites, and guard structures within the 2-mile-wide corridor. Staging areas, fly yards, batch plant sites would be cleared as necessary. Staging areas and fly yards might be bladed and graveled. Equipment staging and refueling sites would be co-located with other temporary work areas. Wire pulling, tensioning, and splicing sites, structure work areas would be completely cleared of vegetation during construction.

Discrepancies in totals due to rounding error.

Alternative IV-B

Key Parameters Summary

In Alternative IV-B, the majority of the disturbance would occur in the desert shrub and developed/disturbed community types, with minor impacts occurring in the barren/sparsely vegetated, cliff and canyon, herbaceous wetland, riparian, saltbush shrubland, and woody riparian and wetland community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 7 acres of woody riparian and wetlands. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 1 acre of herbaceous wetlands, 1 acre of riparian, and 5 acres of woody riparian and wetlands. Of this, less than 1 acre of herbaceous wetlands, less than 1 acre of riparian, and 2 acres of woody riparian and wetlands would be impacted by operations. Specific herbaceous wetlands and riparian types along Alternative IV-B include emergent marshes, while specific riparian woodlands and wetlands include desert washes and riparian woodlands and shrublands.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative IV-C

Key Parameters Summary

In Alternative IV-C, the majority of the disturbance would occur in desert shrub and developed/disturbed vegetation community types, with minor impacts occurring in the barren/sparsely vegetated, cliff and canyon, herbaceous wetland, riparian, saltbush shrubland, and woody riparian and wetland vegetation community types. Vegetation clearing of woody vegetation over 6 feet in height along the construction ROW would occur in 7 acres of the woody riparian and wetland vegetation community. Vegetation in the remaining portions of the ROW not impacted by construction would be trampled or driven-over during construction activities.

Construction activities could alter vegetation communities classified as FRCC 1. These alterations may result in fire frequencies departing from their natural frequencies. To minimize the potential alterations of FRCC for each vegetation community, implementation of **VG-1** and **VG-2** would mitigate impacts to the natural fire regime of these communities.

Construction of facilities would disturb 1 acre of herbaceous wetlands, 1 acre of riparian, and 5 acres of woody riparian and wetlands. Of this, less than one acre each of herbaceous wetlands and riparian and 2 acres of woody riparian and wetlands would be impacted by operation impacts. Specific herbaceous wetlands and riparian types along Alternative IV-C include emergent marshes, while specific riparian woodlands and wetlands include desert washes, and riparian woodlands and shrublands.

Construction and operation impacts would be the same as described for Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area. Implementation and effects of mitigation measures would be the same as described for Alternative I-A.

Alternative Variations in Region IV

The Marketplace Alternative Variation would impact the same vegetation communities as compared to Alternative IV-B. Implementation and effects of mitigation measures would be the same as described for Alternative I-A. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area.

Table 3.5-25 provides a comparison of impacts associated with the alternative variations in Region IV.

Table 3.5-25 Summary of Region IV Alternative Variation Impacts for Vegetation

	Marketplace Alternative Variation (Alternative IV-B)						***Alternative IV-B Comparable***					
	ROW Clearing[1]		**Construction Disturbance**		**Operation Disturbance**		**ROW Clearing[1]**		**Construction Disturbance**		**Operation Disturbance**	
Vegetation Communities	**Acres**	**% of Region IV**	**Acres**	**% of Region IV**	**Acres**	**% of Region IV**	**Acres**	**% of Region IV**	**Acres**	**% of Region IV**	**Acres**	**% of Region IV**
Total	**155**	**<1**	**108**	**<1**	**21**	**<1**	***154***	***<1***	***82***	***<1***	***19***	***<1***
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	-	-	-	-	-	-	-	-	-	-	-	-
Cliff and Canyon	-	-	1	<1	<1	<1	-	-	-	-	-	-
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	66	<1	50	<1	10	<1	*1*	*<1*	*<1*	*<1*	*<1*	*<1*
Developed/Disturbed	88	<1	58	<1	11	<1	*153*	*<1*	*82*	*<1*	*18*	*<1*
Dunes	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Greasewood Flat	-	-	-	-	-	-	-	-	-	-	-	-
Herbaceous Wetland	-	-	-	-	-	-	-	-	-	-	-	-
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	-	-	-	-	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	-	-	-	-	-	-	-	-	-	-	-	-
Sagebrush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Saltbush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	-	-	-	-	-	-	-	-	-	-	-	-

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

Discrepancies in totals due to rounding error.

Alternative Connectors in Region IV

All the Alternative Connectors in Region IV would include minor surface disturbance increases across the various vegetation community types, with the greatest disturbances associated with barren/sparsely vegetated and desert shrub community types. There would be no vegetation clearing of woody vegetation over 6 feet in height along the construction ROW for the Region IV alternative connectors. The River Mountains Alternative Connector includes a small area of riparian vegetation communities. **Table 3.5-26** summarizes impacts and advantages associated with the alternative connectors in Region IV. Impacts to each vegetative community would occur in less than 1 percent of the total of each vegetative community in the analysis area.

Region IV Conclusion

In Region IV, the alternative resulting in the most acres of vegetation impacted is Alternative IV-C, while Alternative IV-A would impact the least vegetation acreage. Impacts to vegetation communities on the various alternatives would comprise less than 1 percent of the analysis area in Region IV.

Noxious weeds impacts would be similar between these two alternatives due to the similarities in vegetation communities crossed, and similar climate conditions between the two alternatives. Revegetation constraints would be similar between the two alternatives, as would the potential for vegetation type conversion from either shrublands to grasslands, or woodlands to shrublands/grasslands. The Agency Preferred Alternative crosses herbaceous wetlands and woody riparian and wetlands habitat, while according to the SWReGAP data, the Applicant Proposed route does not cross herbaceous wetlands, or woody riparian and wetlands.

3.5.6.7 Residual Impacts

Residual impacts would include the loss of vegetation related to the permanent placement of facilities, and access roads for the life of the project, the invasion and spread of noxious weeds and invasive species into previously undisturbed areas, and fragmentation of native habitats.

Vegetation recovery to similar cover and species composition after implementation of a reclamation program is expected to occur at varying rates. Overall community recovery is anticipated to take 2 to 3 years to reestablish an early seral vegetation community. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, successful reestablishment of early seral native vegetation may take a longer timeframe. It is estimated that overall, herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species and grazing operations. Woody-dominated plant communities would require at least 10 to 25 years for shrubs to recolonize the area while re-establishment of mature woodlands would require at least 30 to 50 or more years. In areas with soil reclamation constraints, low regional annual precipitation rates, and the invasion and spread of noxious and invasive weed species, community recovery is anticipated to be long-term, and may not be successful (10 to 100 years depending on the community structure).

Depending on the composition and topography of existing woodlands, recovery could take up to 80 to 100 years to achieve mature trees of similar stature to pre-construction conditions. The success of woodland re-establishment could be impacted by co-located disturbances and adverse environmental conditions including wildfire, drought, climate change, insects, and disease (Folke et al. 2004; Loehman et al. 2011). Wildfire in combination with adverse environmental conditions could result in woodlands converting to shrubland communities over time.

Implementation of the Project design features, the agency and WWEC BMPs, and the proposed additional mitigation measures would minimize residual impacts to vegetation, wetlands, and riparian areas from noxious weeds and invasive species, erosion, and fire. Residual impacts due to the loss of sagebrush habitat are discussed in Section 3.8, Special Status Wildlife Species. Noxious weed and invasive species may persist over the long term regardless of the implementation of control programs. Some plant

communities may not return to pre-construction conditions due to alteration of soil communities, noxious weed invasion, and loss of biological soil crusts. Fragmentation and the conversion of vegetation communities may occur over the long term, depending on the success of reclamation and associated disturbance from maintenance activities over the life of the Project.

Residual impacts, especially noxious weed invasion, may impact the reclamation success as defined by each BLM FO and USFS forest. Residual impacts, depending on their type, and quantity, may exceed the significance threshold of impacts for individual BLM FOs or USFS forests, depending on the requirements of the management documents.

3.5.6.8 Impacts to Vegetation from the No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. The analysis area would exist under current authorizations and land uses (e.g., livestock grazing, agriculture, energy development, mining, etc.). Therefore, impacts to vegetation resources associated with the development of the proposed Project would not occur.

3.5.6.9 Irreversible and Irretrievable Commitment of Resources

For all alternatives, Project-related impacts that may affect productivity include the disturbance of shrub-dominated and woody vegetation cover types that would require 10 to 100 years to recover, and the potential that populations of weedy annual species (e.g., halogeton, cheatgrass) may become established in localized areas for extended periods of time. The decrease in vegetation cover types either through direct impacts (i.e., removal of vegetation) or indirect impacts (i.e., the spread of noxious and invasive species) could impact ecological function, livestock and wildlife grazing, and recreation activities in and around the areas to be disturbed.

For areas with low reclamation potential (i.e., the slow revegetation rates and low revegetation success), the proposed project could result in impacts to vegetation communities that would extend beyond construction, operation, and decommissioning activities, affecting long-term habitat value and human uses of these areas.

3.5.6.10 Relationship Between Local Short-term Uses and Long-term Productivity

For areas successfully reclaimed (as defined by each land management agency after construction), no irretrievable commitments are anticipated. For plant communities, including woody dominated vegetation communities, and areas of low-reclamation potential, the alteration of these communities may persist during the life of the project, resulting in an irretrievable loss of these resources. These impacts would be reversible by the successful reclamation of these communities to pre-construction conditions.

Irreversible commitments would result from construction and operation impacts that result in the permanent conversion of plant communities. This may occur in areas where reclamation is not successful, or fragmentation and noxious weed and invasive species permanently alter native habitats. If successful reclamation is not achieved, disturbed areas would no longer support native vegetation.

Table 3.5-26 Summary of Region IV Alternative Connector Impacts for Vegetation

Vegetation Communities	Sunrise Mountain Alternative Connector						Lake Las Vegas Alternative Connector						Three Kids Mine Alternative Connector						River Mountains Alternative Connector						Railroad Pass Alternative Connector					
	ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance		ROW Clearing[1]		Construction Disturbance		Operation Disturbance	
	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV	Acres	% of Region IV
Total	**50**	**<1**	**37**	**<1**	**8**	**<1**	**86**	**<1**	**54**	**<1**	**19**	**<1**	**106**	**<1**	**93**	**<1**	**33**	**<1**	**132**	**<1**	**142**	**<1**	**57**	**<1**	**48**	**<1**	**58**	**<1**	**14**	**<1**
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aspen Forest and Woodland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barren/Sparsely Vegetated	28	<1	20	<1	4	<1	3	<1	1	<1	<1	<1	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-
Cliff and Canyon	2	<1	1	<1	<1	<1	-	-	-	-	-	-	1	<1	1	<1	<1	<1	4	<1	6	<1	3	<1	-	-	<1	<1	<1	<1
Conifer Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deciduous Forest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desert Shrub	19	<1	16	<1	4	<1	68	<1	42	<1	15	<1	86	<1	77	<1	28	<1	127	<1	131	<1	50	<1	2	<1	7	<1	3	<1
Developed/Disturbed	-	-	-	-	-	-	15	<1	10	<1	4	<1	19	<1	15	<1	5	<1	-	-	5	<1	3	<1	46	<1	50	<1	11	<1
Dunes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Greasewood Flat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Herbaceous Wetland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Grassland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montane Shrubland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Open Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pinyon-Juniper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Riparian	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-
Sagebrush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Saltbush Shrubland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tundra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Woody Riparian and Wetlands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[1] Within the ROW, vegetation would be cleared or trampled. Vegetation clearing is defined as cutting off at ground level vegetation over 6 feet in height and leaving the stumps in place for erosion control. Trampling is defined as leaving vegetation under 6 feet in height in the ROW, and driving over the vegetation with construction equipment.

Discrepancies in totals due to rounding error.

3.6 Special Status Plant Species

3.6.1 Regulatory Background

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the ESA and species designated as sensitive by the BLM and USFS. In addition, there are state protected plant lists for Nevada (Nevada Administrative Code 501.100-503.104) that include many of the BLM and USFS sensitive species as well as ESA-listed species.

In accordance with the ESA, as amended, the lead agencies (BLM and Western) in coordination with the USFWS must ensure that any action that they authorize, fund, or carry out would not adversely affect a federally listed threatened or endangered species, and cannot destroy or adversely modify designated critical habitats for federally listed plant species. In addition, as stated in the BLM's Special Status Species Management Policy 6840 (6840 Policy) (Rel. 6-125), it also is BLM policy "to conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA provisions are no longer needed for these species, and to initiate proactive conservation measures that reduce or eliminate threats to BLM sensitive species to minimize the likelihood of and need for listing of these species under the ESA."

Regulations that directly influence special status species management decisions within the analysis area are primarily implemented by the BLM and USFS. Special status species regulations relevant to the Project include:

- ESA of 1973;
- BLM Special Status Species Management Policy 6840 (6840 Policy) (Rel. 6-125);
- USFS Manual (FSM) 2670;
- Nevada Administrative Code (CE); and
- Nevada Revised Statutes (NRS).

The analysis for special status species assumes the BLM and USFS will continue to manage special status species' habitats in coordination with the USFWS.

3.6.2 Data Sources

Information regarding special status plant species and their habitat within the analysis area was obtained from a review of existing published sources, BLM RMPs, USFS LRMPs, BLM, USFS, USFWS, and NPS file information, as well as WYNDD, CNHP, UNHP, and NNHP database information. In addition, information obtained through correspondence with agency botanists and ecologists was incorporated into this section as appropriate.

3.6.3 Analysis Area

The analysis area for special status plant species encompasses the total area within the HUC 10 watershed boundaries (as defined in Section 3.4.3) crossed by the 2-mile transmission line corridors for all alternatives and the locations of other Project components including terminals and ground electrodes. Special status plant species and their habitats that may be present within the 2-mile transmission line corridor (based on available literature and data reviewed for the Project) are carried forward for analysis.

3.6.4 Baseline Description

In total, 304 special status plant species were evaluated for potential occurrence within the 2-mile transmission line corridor. These species, their associated habitats, and potential for occurrence within

and around the 2-mile transmission line corridor are summarized in **Appendix G**, **Table G-1**. Occurrence potential was evaluated for each species based on its habitat requirements and known distribution. Based on these evaluations, 162 special status plant species have been eliminated from further consideration in the EIS. The rationale for eliminating these species from detail analysis is provided in **Appendix G**, **Table G-1**. In total, 140 special status plant species were carried forward for detailed analysis. Some species are included in multiple protection status categories. A summary of the listing status, habitat, and general distribution for the federally listed plant species that were carried forward in detailed analysis is provided below. Special status plant species occurrences are summarized by Project region in Section 3.6.5, Regional Summary of Special Status Plant Species.

3.6.4.1 Federally Listed, Candidate, and Proposed Plant Species

Shivwitz Milkvetch (*Astragalus ampullaroides*) – Federally Endangered

The Shivwitz milkvetch, a perennial forb, was listed as endangered pursuant to the ESA on September 28, 2001, due to its rarity and declining population trends as well as the threats of urban development, off-road vehicle use, grazing, displacement by invasive plants, and mineral development (USFWS ECOS 2012). The species is found within desert shrub and saltbush communities, specifically warm desert shrub, creosote bush (*Larrea tridentata*), and juniper (*Juniperus* spp.) communities on purple-hued patches of soft clay typically associated with the Petrified Forest member of the Chinle Formation. Occupied sites are small, with populations found between 3,018 and 4,363 feet amsl in sparsely vegetated habitat with an average 12 percent vegetative cover. The species is typically found in dense patches, flowering between May and June. The species is constrained by the isolation of appropriate soil substrate and limited mechanisms for seed dispersal, with fluctuating population numbers that may be dependent on rainfall (UNPS 2003-2006; USFWS 2006).

The Shivwitz milkvetch is an endemic species of the Mojave Desert and is known to occur in the vicinity of St. George in Washington County, southwestern Utah. Within the analysis area, Shivwitz milkvetch is only known from two locations in Washington County, Utah. The remaining known occurrences for this species are east of the analysis area. The species has been documented approximately 4 miles southeast of the 2-mile transmission line corridor for Alternative III-A in Washington County, Utah. On December 27, 2006, the USFWS designated 2,181 acres of critical habitat for the species in Washington County, Utah; the closest critical habitat parcel is located adjacent to Alternative III-A (USFWS ECOS 2012).

Deseret Milkvetch (*Astragalus desereticus*) – Federally Threatened

The Deseret milkvetch, a perennial herb, was listed as threatened under the ESA on October 20, 1999 (USFWS ECOS 2012). The species is found in barren/sparsely vegetated, montane shrub, desert shrub, and pinyon–juniper communities, specifically open to sparse juniper-sagebrush (*Artemisia* sp.) communities on open, steep, naturally disturbed south and west (rarely north) facing slopes. Populations are found between 5,400 and 5,700 feet amsl, flowering between May and June.

The Deseret milkvetch is a narrow endemic occurring only on the sandy-gravelly hillsides of the Moroni Formation near the community of Birdseye in Utah County, Utah (UDWR 2012). A 5-year review of the species was completed in 2011 (USFWS). The review determined that many of the previously identified threats were not as significant as had been anticipated or had failed to develop. Based on the 5-year review UFWS determined that the species should be proposed for delisting due to the absence of threats to the species and its habitat and because the species' known range and population size is greater than previously thought (USFWS 2011).

The species has been documented within the 2-mile transmission line corridor for Alternatives II-A, II-E, and II-F in Utah County, Utah. The species is not found outside the analysis area. Critical habitat has not been designated for this species.

Jones Cycladenia (*Cycladenia humilis* var. *jonesii*) – Federally Threatened

The Jones cycladenia, a perennial herb, was listed as threatened under the ESA on May 5, 1986 (USFWS ECOS 2012). The species is found in desert shrub, and pinyon–juniper communities, specifically, buckwheat (*Eriogonum* sp.)/Mormon tea (*Ephedra* sp.), cool desert shrub, and juniper communities comprised of gypiferous saline soils. Populations are found between 4,400 and 6,000 feet amsl, flowering between mid May and June (UNPS 2003-2006).

The Jones cycladenia is an endemic of the Chinle, Cutler, and Summerville formations within Emery, Garfield, Grand, and Kane counties, Utah (UNPS 2003-2006). Jones cycladenia is found in the southern portions of the analysis area in Emery and Grand counties, Utah. The majority of the known occurrences for the species are found outside of the analysis area. The species is known to occur in central Utah, documented approximately 8.5 miles southwest of the 2-mile transmission line corridor for Alternatives II-B and II-C in Emery County, Utah. Critical habitat has not been designated for this species (USFWS ECOS 2012).

Las Vegas Buckwheat (*Eriogonum corymbosum* var. *nilesii*) – Federal Candidate

The Las Vegas buckwheat, a perennial subshrub, was designated a candidate for federal listing under the ESA on December 6, 2007 (USFWS ECOS 2012). Threats to the species include the loss of individuals and/or habitat, inadequacy of existing regulatory mechanisms, and noxious and invasive weed species. The species is found in barren/sparsely vegetated areas, specifically, on and near gypsum soils, often forming low mounds or outcrops in washes and drainages, or in areas of generally low relief. The species is often associated with California bearpoppy (*Arctomecon californica*) and other gypsum-tolerant species, surrounded by burrobush (*Ambrosia dumosa*), desert princesplume (*Stanleya pinnata*), fourwing saltbush (*Atriplex canescens*), Torrey's jointfir (*Ephedra torreyana*), creosote bush (*Larrea tridentata*), catclaw acacia (*Acacia greggii*), Mojave seablite (*Suaeda torreyana*), and Fremont's dalea (*Psorothamnus fremontii*). Populations are found between 1,900 to 3,839 feet amsl and flower between August and November (NNHP 2001; Styles 2010).

The Las Vegas buckwheat, a species of the Mojave Desert, is known from the Las Vegas and Muddy Mountains region of Clark County, Nevada; Lincoln County, Nevada, near Toquop Wash; and Washington County, Utah (NNHP 2001; Styles 2010). Within the analysis area, the species is found in Clark County and southern Lincoln County. The bulk of the known occurrences are found west of the analysis area. The species has been documented within the 2-mile transmission line corridor for Alternatives III-A, III-B, and III-C in Lincoln and Clark counties, Nevada, and adjacent to multiple 2-mile transmission line corridors in Clark County, Nevada. Since this species is listed as a federal candidate, critical habitat has not been designated for this species (USFWS ECOS 2012).

Barneby Ridgecress (*Lepidium barnebyanum*) – Federally Endangered

The Barneby ridgecress, a perennial herb, was listed as threatened under the ESA on September 28, 1990 (USFWS ECOS 2012). Threats to the species include oil and gas activities, ORVs, and trampling from livestock grazing. The species is found within pinyon-juniper communities on poorly developed soils derived from the marly shale outcrops in a zone of interbedding geologic stratas from the Uinta and Green River formations. Populations are found between 6,200 and 6,500 feet amsl and flowering occurs in early May (USFWS 1993).

Within the analysis area, the Barneby ridgecress is known from only three ridges near Indian Canyon on the Uintah and Ouray Reservations of the Ute Indian Tribe within the Uinta Basin, Duchesne County, northeastern Utah (USFWS 1993). The species is not found outside the analysis area. This species has been documented adjacent to the 2-mile transmission line corridor for Alternatives II-A and II-E in Duchesne County, Utah. Critical habitat has not been designated for this species.

San Rafael Cactus (*Pediocactus despainii*) – Federally Endangered

The San Rafael cactus was listed as endangered pursuant to the ESA on September 16, 1987 (52 FR 34914) due to its rarity and declining population trends as a result of over-collection, trampling, and destruction of habitat for access to oil and gas reserves. Threats to San Rafael cactus include small population size, habitat loss, ORV use, trampling by humans and livestock, mineral and energy development, and illegal collection. The species grows in pinyon-juniper communities on fine textured, mildly alkaline soils rich in calcium derived from limestone substrates of the Carmel Formation and the Sinbad member of the Moenkopi formation. The species is most commonly found on benches, hill tops, and gentle slopes with a southern exposure. It grows in open woodlands of scattered Utah juniper (*Juniper osteosperma*) and pinyon pine (*Pinus edulis*) with an understory of shrubs and grasses (USFWS 1995). The habitat of the San Rafael cactus is underlain by bentonite clay, uranium ore deposits, gypsum, petroleum, and other minerals. Populations are found at approximately 6,000 feet amsl, flowering between late April and early May.

The San Rafael cactus is restricted entirely to the San Rafael Swell in Emery and Wayne counties of central Utah. Approximately half of the known occurrences are found within the analysis area in Emery County, Utah; the rest of the known occurrences are found south of the analysis area predominantly in Emery County, Utah. The species has been documented within and adjacent to the 2-mile transmission line corridor for Alternative II-C in Emery County, Utah. Critical habitat has not been designated for this species.

Siler Pincushion Cactus (*Pediocactus sileri*) – Federally Threatened

The Siler pincushion cactus was listed as threatened pursuant to the ESA on December 27, 1993 (58 FR 68476) due to habitat destruction from mining activities, off-road vehicle use, over-collection from both private and commercial interests, and trampling by grazing livestock (58 FR 68476; NatureServe 2012; Phillips et al. 1979; USFWS 1986a). The effects of these identified threats are intensified by the species' restricted habitat and its small, scattered, disjunct populations (44 FR 61786; NatureServe 2012; USFWS 1986a). The species grows in desert shrub, montane shrub, pinyon-juniper, and conifer forests in gypsiferous and calcareous clay soils derived from members of the Moenkopi Formation, and sometimes on members of the Chinle and Kaibab Formations. It is commonly associated with shadscale (*Atriplex confertifolia*), fourwing saltbush, big sagebrush (*Artemisia tridentata*), flat sagebrush (*Artemisia bigelovii*), rabbitbrush (*Chrysothamnus* spp.), and Mormon tea (*Ephedra* spp.). At higher elevations, common associates are Colorado pinyon (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), and cliffrose (*Purshia mexicana*), while lower elevation habitat is dominated by creosotebush (*Larrea tridentata*) and cheesebush (*Hymenoclea salsola*) (USFWS 1986a). This species typically grows in soils which are high in soluble salts, usually white or gray in color, or occasionally red if derived from some red members of the Moenkopi Formation (58 FR 68476; Phillips et al. 1979). Populations are found between 3,000 to 5,200 feet amsl, flowering between March and April/May.

The Siler pincushion cactus is found in the extreme southern parts of Washington and Kane counties in southwestern Utah. All known occurrences for Siler pincushion cactus are found outside the analysis area. The species has been documented approximately 23 miles southeast of the 2-mile transmission line corridor for Alternative III-A in Washington County, Utah. Critical habitat has not been designated for this species.

Winkler Cactus (*Pediocactus winkleri*) – Federally Threatened

The Winkler cactus was listed as threatened pursuant to the ESA on August 20, 1998 (63 FR 44587) due to habitat destruction from ORV use, over-collection from both private and commercial interests, and, to a lesser extent, from mineral exploration, disease, and trampling by grazing livestock (USFWS 2007). The species is found in barren/sparsely vegetated, and saltbush shrub communities. The species inhabits benches, hilltops, and gentle southern exposed slopes on barren, open sites at lower elevations, growing in fine-textured, mildly alkaline soils with high clay content derived from the Dakota

Formation and Brushy Basin member of the Morrison Formation (BLM 2008; Tilley et al. 2011a; USFWS 1995). The species is associated with the saltbrush vegetation community of the Canyonlands section of the Colorado Plateau Floristic Division, characterized by drought-tolerant shrubs and grasses with ephemeral forbs including saltbush, rabbitbrush (*Chrysothamnus pulchellus*), vetches (*Astragalus* spp.), catseye (*Cryptantha* spp.), and Nuttall's horsebrush (*Tetradymia nuttallii*) (USFWS 1995). Populations are found between 4,800 to 5,200 feet amsl, flowering between late March and mid-May.

The Winkler cactus is endemic to central Utah in Emery and Wayne counties. Winkler cactus is found in only two locations within the analysis area in Emery County, Utah. The majority of the species' known locations are found south of the analysis area. The species has been documented approximately 1.5 miles east and 6 miles northwest of the 2-mile transmission line corridor for Alternative II-C in Emery County, Utah. Critical habitat has not been designated for this species.

Graham's Penstemon (*Penstemon grahamii*) – Federally Proposed

The Graham's penstemon has been proposed for listing as a threatened species under the ESA pursuant to candidate notice of review documents dated September 12, 2006 (71 FR 53756 53835). Threats to the species include degradation of the species' habitat by mineral and energy development, ORV use, overgrazing, overutilization for horticultural use, small population sizes, and limited distribution. The species inhabits desert shrub, saltbush shrub, and pinyon-juniper communities, specifically, sparsely vegetated shadscale, buckwheat, horsebrush, ryegrass, and pinyon-juniper communities on shale ledges and talus of the Green River Formation. Populations are found between 4,600 to 7,600 feet amsl, flowering between late May and mid-June (NatureServe 2012; UNPS 2003-2006).

The Graham's penstemon is restricted to the Uinta Basin in Uintah, Carbon, and Duchesne counties, Utah, and adjacent Rio Blanco County, Colorado. Within the analysis area, Graham's penstemon is restricted to the Uinta Basin, with the majority of known occurrences in the analysis area located in southern Uintah County. The species has been documented within Alternatives II-A, II-B, II-C, II-D, and II-E within Uintah and Duchesne counties, Utah; and adjacent to the 2-mile transmission line corridor for Alternatives II-B and II-C in Rio Blanco County, Colorado. Proposed critical habitat has been designated for this species, which affords protection under the ESA (USFWS ECOS 2012).

White River Beardtongue (*Penstemon scariosus* var. *albifluvis*) – Federal Candidate

The White River beardtongue was designated as a candidate for federal listing under the ESA on November 28, 1983 (48 FR 53640). Due to its association with oil shale barrens, the species is vulnerable to habitat destruction as a consequence of energy exploration, production and other activities within its limited habitat (48 FR 53640). Habitat loss and fragmentation has the potential to result in reduced seed and pollen dispersal leading to a reduced beardtongue population (48 FR 53640). The White River beardtongue is found in barren/sparsely vegetated, pinyon-juniper, and desert shrub communities. It is specifically endemic to the oil shale barrens found in semi-barren openings in pinyon-juniper-desert shrub or desert shrub communities on substrates composed of fine-textured soils and shale fragments weathered from the Green River Formation of the Uinta Basin of northeastern Utah and adjacent Colorado (BLM 2008). The species is frequently found on white or red soil at an elevation of 5,000 to 6,680 feet amsl, flowering between late May and June. Associated vegetation includes shadscale, rabbitbrush, ricegrass (*Achnatherum hymenoides*), Salina ryegrass (*Elymus salinus*), sagebrush, and Barneby's thistle (*Cirsium barnebyi*) (Tilley et al. 2011b; USFWS 2012b).

According to available data, the White River beardtongue is located in eastern Uintah County, Utah, and western Rio Blanco County, Colorado, near the White River in the vicinity of Evacuation Creek and Weaver Ridge. Within the analysis area, White River beardtongue is found along the border between Colorado and Utah within its range. The species has been documented approximately 6 miles west of the 2-mile transmission line corridor for Alternatives II-B and II-C in Rio Blanco County, Colorado; and approximately 8 miles southeast of the 2-mile transmission line corridor for Alternative II-D in Uintah

County, Utah. Since this species is only a candidate for federal listing, critical habitat has not been designated (USFWS ECOS 2012).

Clay Phacelia (*Phacelia argillacea*) – Federally Endangered

The clay phacelia, a winter annual, was listed as endangered pursuant to the ESA on June 28, 1978 (43 FR 44810), due to climactic changes, edaphic factors, and its drastically small population size. Additional threats include rarity and declining population trends as a result of over-collection, trampling, livestock and wildlife grazing, noxious and invasive weed species, railroad maintenance, and destruction of habitat for access to oil and gas reserves. The species is found in pinyon-juniper, montane shrub, and barren/sparsely vegetated areas. It is specifically found on steep slopes (up to 70 percent) in sparsely populated juniper-pinyon and mountain brush communities (Welsh 1987) associated with skunkbush sumac (*Rush trilobata*) and serviceberry (*Amelranchier alnifolia*) located on shaley clay colluviums of the Green River Formation (Atwood 1975; USFWS 1982). The species occurs at elevations between 6,000 and 7,000 feet amsl, flowering between late May and early June.

Within the analysis area, clay phacelia has a limited range, with its only known occurrences being in Spanish Fork Canyon in the vicinity of Tucker and down-canyon near Mill Fork in Utah County, central Utah (UDWR 2010-2012). The species has been documented within, and immediately adjacent to, the 2-mile transmission line corridor for Alternative II-E in Utah County, Utah. Critical habitat has not been designated for this species.

Clay Reed-mustard (*Schoenocrambe argillacea*) – Federally Threatened

The clay reed-mustard, a perennial herb, was listed as threatened pursuant to the ESA on January 14, 1992, due to habitat disturbance from oil and gas, and oil shale developments (57 FR 1398 1403). Additional threats to the species includes its small population size, habitat destruction from mineral and energy exploration and development, recreational activities, and/or building stone excavation. The species occurs in mixed desert shrub communities of shadscale, Indian ricegrass, and pygmy sagebrush (*Artemisia pygmaea*) located on generally north-facing slopes composed of clay soils rich with gypsum overlain with sandstone talus on shale substrates at the contact zone between the lower Uinta and upper Green River formations (UDWR 2010-2012; UNPS 2003-2006). The species occurs at elevations between 4,800 and 5,600 feet amsl, flowering between April and May.

Within the analysis area, the clay reed-mustard has limited range. The species is endemic to the Bookcliffs in Uintah County, Utah; known populations are present from the west side of the Green River to the east side of Willow Creek (UDWR 2010-2012; UNPS 2003-2012). The species is known to occur in northeastern Utah, documented within, and immediately adjacent to, the 2-mile transmission line corridor for Alternatives II-D and II-F in Utah County, Utah. Critical habitat has not been designated for this species.

Shrubby Reed-mustard (*Schoenocrambe suffrutescens*) – Federally Endangered

The shrubby reed-mustard, a perennial herb, was listed as endangered pursuant to the ESA on October 6, 1987 (52 FR 37416 37420) due to various habitat disturbances including building stone removal, localized historic overgrazing, and oil and gas development (USFWS ECOS 2012). The species occurs in shadscale, pygmy sagebrush, mountain mahogany (*Cercocarpus montanus*), juniper, and other mixed desert shrub communities on calcareous shale substrates of the Evacuation Creek member of the Green River Shale Formation (BLM 2008; UNPS 2003-2006). The species occurs at elevations between 5,400 and 6,000 feet amsl, flowering between late May and June/July.

The shrubby reed-mustard is endemic to the Hill Creek and Willow Creek drainages, and to the Badland Cliffs within Duchesne and Uintah counties, Utah (BLM 2008; UNPS 2003-2006), within the analysis area. No known occurrences occur outside of the analysis area. The species has been documented approximately 1 mile south of the 2-mile transmission line corridor for Alternative II-D in Duchesne

County, Utah, and approximately 5 miles south of the 2-mile transmission line corridor for Alternatives II-D and II-F in Uintah County, Utah. Critical habitat has not been designated for this species (USFWS ECOS 2012).

Colorado Hookless Cactus (*Sclerocactus glaucus*) – Federally Threatened

The Colorado hookless cactus was listed as threatened pursuant to the ESA on October 11, 1979, based primarily on threats of over-collection and habitat destruction (44 FR 58868). Additional threats to Colorado hookless cactus include loss of habitat, mineral and energy development, utility construction, water development Projects, illegal collection, recreational ORV use, and grazing. The species grows in salt desert shrub communities, big sagebrush, and pinyon-juniper woodlands on alluvial benches, soils that are coarse, gravelly river alluvium usually consisting of Mancos shale with volcanic cobbles and pebbles of the surface (USFWS 2012a). The soil is weathered from the Uinta and Green River formations. The species is more abundant on south-facing slopes with up to a 30 percent grade, with associated species such as shadscale, galleta (*Hilaria jamesii*), black sagebrush (*Artemisia nova*), and Indian ricegrass (USFWS 2010a, 1990). Populations are found between 4,500 to 6,000 feet amsl, flowering between April and May.

The Colorado hookless cactus is known in Mesa, Delta, Garfield, and Montrose counties, Colorado. The species occurs in two locations of the upper Colorado and Gunnison River valleys of western Colorado; one on the alluvial river terraces of the Gunnison River near Delta to southern Mesa County and the other on the alluvial river terraces of the Colorado River and in the Plateau and Roan Creek drainages near Debeque, Colorado (USFWS 2010a, 1990). The species has been documented within, and adjacent to, the 2-mile transmission line corridor for Alternatives II-B and II-C in Mesa and Garfield counties, Colorado. Within the analysis area, there are no additional Colorado hookless cacti known occurrences. The majority of known occurrences of Colorado hookless cactus are located outside of the analysis area. Critical habitat has not been designated for this species.

Uinta Basin Hookless Cactus (*Sclerocactus wetlandicus*) – Federally Threatened

The Uinta Basin hookless cactus (a member of the *Sclerocactus glaucus* complex due to taxonomic differentiation) was listed as threatened pursuant to the ESA on October 11, 1979 based primarily on threats of mineral and energy development, water development, and collection (44 FR 58868). The species grows in salt desert shrub communities and pinyon-juniper woodlands on river benches, valley slopes, and rolling hills on Quaternary and Tertiary alluvial soils that are fine textured, dry, and overlain with cobble and pebble (BLM 2008). The soil is weathered from the Duchesne River, Uinta, and Green River formations. The species is more abundant on south facing slopes with up to a 30 percent grade, with associated species such as shadscale, galleta, black sagebrush, and Indian ricegrass (USFWS 1990). Populations are found between 4,500 to 6,600 feet amsl, flowering between April to late May.

Uinta Basin hookless cactus is found extensively on the Duchesne River, Green River, and Mancos formations in Carbon, Duchesne, and Uintah counties, Utah. The Uinta Basin hookless cactus (as part of the *S. glaucus* complex) is known to occur in Uintah, Duchesne, and Carbon counties, Utah. The species occurs on the alluvial river terraces near the confluence of the Green, White, and Duchesne rivers, south along the Green River to the vicinity of Sand Wash and the mouth of the Pariette Draw, the Badland Cliffs, and the clay badlands of the Pariette Draw drainage south of Myton, Utah. Within Uintah and Duchesne Counties, core conservation areas for the species have been identified by USFWS. These core conservation areas contain the dense known concentrations of cacti (BLM 2012a). There are two levels of core conservation areas (1, 2) based on pollinator travel distance, and habitat connectivity between populations and individuals. A trans-located population of cactus also falls within the boundaries of one of the core conservation areas. A potentially genetically isolated population of cactus is found near Bonanza, Utah. In the analysis area, the species is located in west and central Uintah County, Utah. The species has been documented within, and adjacent to, Alternatives II-D and II-F in Uintah and Duchesne counties, Utah, and immediately adjacent to the 2-mile transmission line

corridor for Alternative II-A in Duchesne County, Utah. Critical habitat has not been designated for this species.

Wright Fishhook Cactus (*Sclerocactus wrightiae*) – Federally Endangered

The Wright fishhook cactus was listed as endangered pursuant to the ESA on October 11, 1979 (44 FR 58866) due to species collection by professional and amateur cactus growers, resource extraction within occupied and suitable habitat, cactus borer beetle predation, cattle trampling, and ORV crushing. The species grows in salt desert shrub and pinyon-juniper communities, typically in semi-barren sites within desert scrub or open woodland (USFWS 1985). Associated species include pinyon pine (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), valley saltbush (*Atriplex cuneata*), shadscale, saltbush, and galleta (USFWS 1985). The species is found in areas with well-developed gypsiferous layers and in areas with no gypsum, and has been documented on Mancos shale, Emery, Entrada, and Dakota sandstone, Morrison, Summerville, Curtis, and Moenkopi formations, Carmel limestone, and alluvium (70 FR 44544) with soil substrate ranging from clays to sandy silts to fine sands. Populations are found between 4,260 and 5,900 feet amsl, flowering between April and May (NatureServe 2012).

The Wright fishhook cactus is endemic to Emery, Sevier, and Wayne counties in central Utah. Distribution generally follows a low elevation trough around the southern end of the San Rafael Swell uplift. Wright fishhook cactus is found in only two locations within the analysis area in Emery County, Utah. The species has been documented approximately 3.5 miles southeast of the 2-mile transmission line corridor for Alternative II-C in Emery County, and approximately 4 miles south of the 2-mile transmission line corridor for Alternative II-C in Sevier County, Utah. Critical habitat has not been designated for this species.

Ute Ladies'-tresses Orchid (*Spiranthes diluvialis*) – Federally Threatened

The Ute ladies'-tresses orchid was listed as threatened pursuant to the ESA on January 17, 1992 (57 FR 2048), due to adverse impacts such as grazing, and loss or fragmentation of habitat as a result of noxious weed species invasion, and shifts in the species-dependant hydrologic regime. Additional threats to Ute ladies'-tresses orchid include habitat loss and modification, over-collection, noxious and invasive species, herbicide drift, recreation activities, mowing, livestock grazing, hydrologic modifications, herbivory, loss of pollinators, drought, and loss of mycorrhizal symbionts. The species is aquatic or wetland-dependent, and typically occupies moist to very wet, somewhat alkaline or calcareous native meadows near streams, springs, seeps, lake shores, or abandoned stream meanders that still retain ample groundwater (Fertig 2000; USFWS 2010b). The orchid appears to require moisture in the rooting zone, typically provided by a high groundwater table, through the growing season and into late summer or early autumn. Plants usually occur as small scattered groups and occupy relatively small areas within the riparian system. Elevations range from 4,200 to 7,000 feet amsl over the entire range of the species, but in each state the species is found at more specific elevation ranges. The species typically flowers from July to August, but can vary from late June to late September depending on the state/region (Fertig 2000; USFWS 2010b).

The Ute ladies'-tresses orchid is known to occur in central and northeastern Utah, northwestern Colorado, and eastern Nevada (USFWS 2010b). Habitat for the Ute ladies'-tresses orchid is also found in southwestern Wyoming (USFWS 2010b). Within the analysis area, the species occurs in wet areas and riparian areas in the northern portion of the analysis area in Duchesne and Uintah counties, Utah. The species is also found outside of the analysis area. The species has been documented within Alternatives II-A and II-E in Utah, Uintah, Duchesne, and Wasatch counties, Utah; and also adjacent to the 2-mile transmission line corridor for Alternatives II-A, II-D, and II-E in Daggett, Duchesne, Wasatch, Uintah, and Utah counties, Utah. Critical habitat has not been designated for this species.

Last Chance Townsendia (*Townsendia aprica*) – Federally Threatened

The Last Chance townsendia was listed as threatened pursuant to the ESA on August 21, 1985 (50 FR 33734) due to mineral and energy development, road building, and livestock trampling. The species generally occurs in galleta and salt desert shrub, and pinyon-juniper communities of the Mancos shale formation (NatureServe 2012). Commonly associated species include galleta, blue grama (*Bouteloua gracilis*), black sagebrush (*Artemisia nova*), shadscale, and yellow rabbitbrush (*Chrysothamnus viscidiflorus*). Surface geology of suitable habitat is highly mixed, containing a wide variety of soils of unusual soil chemistries. The species is mostly found in shale lens soils with very fine silt texture with very high alkalinities, occurring in small, isolated pockets. In effect, such pockets form islands of suitable habitat within otherwise unsuitable geologic substrates. Populations are found between 6,100 to 8,000 feet amsl. The species typically flowers between April and May.

The Last Chance townsendia is endemic to Emery, Sevier, and Wayne counties in central Utah. The majority of the species' populations occur in an 8 km by 48 km band from interstate 70 at the western edge of the San Rafael Swell in southwestern Emery County, west to Fremont Junction in extreme southeastern Sevier County, south to the vicinity of Hartnet Draw in north-central Wayne County. Within the analysis area, Last Chance townsendia is found in eastern Sevier County, and southwestern Emery County. The majority of the populations are found outside the analysis area. Additional small, isolated populations occur to the east and south of the main population group; one near the southern margin and one in the center of the San Rafael Swell and one in the central portion of Capitol Reef National Park. The species has been documented adjacent to the 2-mile transmission line corridor for Alternative II-C in Emery and Sevier counties, Utah. Critical habitat has not been designated for this species.

BLM Sensitive, Forest Sensitive, and Nevada State Listed Species

In addition to federally listed and candidate species, a total of 132 BLM sensitive, USFS sensitive, NPS sensitive, or Nevada state-protected species potentially occur within the 2-mile transmission corridor. This total also includes Nevada cacti and yucca species protected under NRS 527.060.120, which prohibits the destruction, cutting, mutilating, or removal of cactus (*Cactaceae* ssp.) and yucca (Yucca ssp.) without the written permission of the landowner and/or Nevada State Forester Firewarden (NRS 527). Descriptions of occurrence and habitat used by these plant species are provided in **Appendix G**, **Table G-1**. The occurrence of these plants, by region, is presented below.

3.6.5 Regional Summary of Special Status Plant Species

A summary of the number of special status plant species by Project regions is provided in **Table 3.6-1**.

Table 3.6-1 Special Status Plant Species Summary by Project Region

Total within the Analysis Area (All Regions)	Region I	Region II	Region III	Region IV
140	24	84	50	20

Note: Numerous special status plant species are listed within multiple agencies and several species are analyzed in multiple regions.

3.6.5.1 Region I

Region I extends from the Terminal Siting Area east of Rawlins, Wyoming, southwestward through northwestern Colorado and northeastern Utah. Dominant vegetation community types consist mainly of shrublands, specifically sagebrush shrublands and saltbush shrublands. A description of these communities is presented in Section 3.5, Vegetation. Special status plant species that may occur within the 2-mile transmission line corridor in Region I are presented in **Table 3.6-2**.

Table 3.6-2 Special Status Plant Species Potentially Occurring in Region I

Common Name	Scientific Name	Status[1]
Meadow pussytoes	*Antennaria arcuata*	BLM-WY
Cushion milkvetch	*Astragalus aretoides*	BLM-CO
Debris milkvetch	*Astragalus detritalis*	BLM-CO
Meadow milkvetch	*Astragalus diversifolius*	BLM-WY
Duchesne milkvetch	*Astragalus duchesnensis*	BLM-CO
Starvling milkvetch	*Astragalus jejunus* var. *jejunus (Astragalus jejunus)*	BLM-CO
Nelson's milkvetch	*Astragalus nelsonianus*	BLM-CO
Trelease's milkvetch	*Astragalus racemosus* var. *treleasei*	BLM-WY
Ownbey's thistle	*Cirsium ownbeyi*	BLM-WY
Cedar Rim thistle	*Cirsium pulcherrimum* var. *aridum (Cirsium aridum)*	BLM-WY
Tufted cryptantha	*Cryptantha caespitosa*	BLM-CO
Rollins cryptantha	*Cryptantha rollinii*	BLM-CO
Uinta Basin springparsley	*Cymopterus duchesnesis*	BLM-CO
Wyoming tansymustard	*Descurainia torulosa*	BLM-WY
Single-stemmed wild buckwheat	*Eriogonum acaule*	BLM-CO
Ephedra buckwheat	*Eriogonum ephredoides*	BLM-CO
Woodside buckwheat	*Eriogonum tumulosum*	BLM-CO
Nuttall sandwort	*Minuartia nuttallii*	BLM-CO
Matted fiddleleaf	*Nama densum* var. *parviflorum*	BLM-CO
Gibbens penstemon (Gibbens beardtongue)	*Penstemon gibbensii*	BLM-WY, BLM-CO, BLM-UT
Beaver Rim phlox	*Phlox pungens*	BLM-WY
Tufted twinpod	*Physaria condensata*	BLM-WY
Ute ladies'-tresses orchid	*Spiranthes diluvialis*	FT (CO, UT, WY), BLM-NV, NV State CE
Strigose easter daisy	*Townsendia strigosa*	BLM-CO

[1]Status: FE = Federally Endangered; FT = Federally Threatened; FC = Federal Candidate; BLM = BLM Sensitive; USFS = Forest Sensitive.

3.6.5.2 Region II

Region II extends from northeastern Utah and northwestern Colorado to the IPP in western Utah. Vegetation communities within Region II are diverse, with the dominant vegetation community types consisting of sagebrush shrubland, saltbush shrubland, and pinyon-juniper. Other common vegetation communities include woody riparian and wetlands, grassland, montane shrublands, and agriculture. A description of these communities is presented in Section 3.5, Vegetation. Special status plant species that may occur within the 2-mile transmission line corridor in Region II are presented in **Table 3.6-3**.

Table 3.6-3 Special Status Plant Species Potentially Occurring in Region II

Common Name	Scientific Name	Status[1]
Mussentuchit gilia	*Aliciella tenuis (Gilia tenuis)*	BLM-UT

Table 3.6-3 Special Status Plant Species Potentially Occurring in Region II

Common Name	Scientific Name	Status[1]
Jones' blue star	*Amsonia jonesii*	BLM-CO
Link Trail columbine	*Aquilegia flavescens* var. *rubicunda*	USFS-Manti-La Sal NF
Utah columbine	*Aquilegia scopulorum* var. *goodrichii*	BLM-UT
Unknown	*Arabis goodrichii*	BLM-UT
Cushion milkvetch	*Astragalus aretoides*	BLM-CO
Bicknell milkvetch	*Astragalus consobrinus*	USFS-Fishlake NF
Debeque milkvetch	*Astragalus debequaeus*	BLM-CO
Deseret milkvetch	*Astragalus desereticus*	FT (UT)
Horseshoe milkvetch	*Astragalus desperatus* var. *neeseae (Astragalus equisolensis*)	BLM-UT
Debris milkvetch	*Astragalus detritalis*	BLM-CO
Duchesne milkvetch	*Astragalus duchesnensis*	BLM-CO
Hamilton milkvetch	*Astragalus hamiltonii*	FC(UT), BLM-UT
Starvling milkvetch	*Astragalus jejunus* var. *jejunus (Astragalus jejunus)*	BLM-CO
Loa milkvetch	*Astragalus loanus*	BLM-UT
Ferron milkvetch	*Astragalus musiniensis*	BLM-CO
Naturita milkvetch	*Astragalus naturitensis*	BLM-CO
San Rafael milkvetch	*Astragalus rafaelensis*	BLM-CO
Cisco milkvetch	*Astragalus sabulosus* var. *sabulosus*	BLM-UT
Giant fourwing saltbush	*Atriplex canescens* var. *gigantea*	BLM-UT
Dainty moonwort	*Botrychium crenulatum*	USFS-Ashley NF, USFS-Uinta-Wasatch-Cache NF, BLM-NV
Slender moonwort	*Botrychium lineare*	USFS-Ashley NF, USFS-Uinta-Wasatch-Cache NF
Barneby's catseye	*Cryptantha barnebyi*	BLM-UT
Tufted cryptantha	*Cryptantha caespitosa*	BLM-CO
Creutzfeldt-flower	*Cryptantha creutzfeldtii*	USFS-Manti-La Sal NF, BLM-UT
Graham's catseye	*Cryptantha grahamii*	BLM-UT
Rollins cryptantha	*Cryptantha rollinii*	BLM-CO
Jones cycladenia	*Cycladenia humilis* var. *jonesii (Cycladenia jonesii)*	FT (UT)
Uinta Basin springparsley	*Cymopterus duchesnesis*	BLM-CO
Nevada willowherb	*Epilobium nevadense*	USFS-Fishlake NF, BLM-UT, BLM-NV
Carrington daisy	*Erigeron carringtonae*	USFS-Manti-La Sal NF
Maguire daisy	*Erigeron maguirei*	USFS-Fishlake NF, BLM-UT
Untermann daisy	*Erigeron untermanii*	USFS-Ashley NF, BLM-UT
Single-stemmed wild buckwheat	*Eriogonum acaule*	BLM-CO
Elsinore buckwheat	*Eriogonum batemanii* var. *ostlundii*	USFS-Fishlake NF

Table 3.6-3 Special Status Plant Species Potentially Occurring in Region II

Common Name	Scientific Name	Status[1]
Unknown	*Eriogonum brevicaule* var. *mitophyllum*	BLM-UT
Grand buckwheat	*Eriogonum contortum*	BLM-CO
Ephedra buckwheat	*Eriogonum ephredoides*	BLM-CO
Ibex buckwheat	*Eriogonum nummulare* var. *ammophilum*	BLM-UT
Woodside buckwheat	*Eriogonum tumulosum*	BLM-CO
Utah spurge	*Euphorbia nephradenia*	BLM-UT
Tufted green gentian	*Frasera paniculata*	BLM-CO
Narrowstem gilia	*Gilia stenothysra*	BLM-CO
Canyon sweetvetch	*Hedysarum occidentale* var. *canone*	USFS-Manti-La Sal NF
Wasatch jamesia	*Jamesia americana* var. *macrocalyx*	USFS-Uinta-Wasatch-Cache NF
Barneby ridgecress	*Lepidium barnebyanum*	FE (UT)
Dolores rushpink	*Lygodesmia grandiflora* var. *doloresensis*	BLM-UT
Entrada rushpink	*Lygodesmia grandiflora* var. *entrada*	BLM-UT
Pioche blazingstar	*Mentzelia argillicola*	BLM-NV, BLM-UT
Goodrich blazingstar (Goodrich stickleaf)	*Mentzelia goodrichii*	USFS-Ashley NF, BLM-UT
Horse Canyon stickleaf	*Mentzelia multicaulis* var. *librina*	BLM-UT
Shultz stickleaf	*Mentzelia shultziorum*	BLM-UT
Nuttall sandwort	*Minuartia nuttallii*	BLM-CO
Matted fiddleleaf	*Nama densum* var. *parviflorum*	BLM-CO
Trotter oreoxis	*Oreoxis trotteri*	BLM-UT
Ligulate feverfew	*Parthenium ligulatum*	BLM-CO
San Rafael cactus (Despain pincushion cactus)	*Pediocactus despainii*	FE (UT)
Winkler cactus	*Pediocactus winkleri*	FT (UT)
Neese narrowleaf penstemon	*Penstemon angustifolius* var. *dulcis*	BLM-UT
Goodrich penstemon	*Penstemon goodrichii*	BLM-UT
Graham's penstemon	*Penstemon grahamii*	FP, BLM-CO, BLM-UT
White River beardtongue (White River penstemon)	*Penstemon scariosus (Penstemon scariosus* var. *albifluvis)*	FC (CO, UT), BLM-CO, BLM-UT
Ward beardtongue	*Penstemon wardii*	BLM-UT, USFS-Fishlake NF
Clay phacelia	*Phacelia argillacea*	FE (UT)
Argyle Canyon phacelia	*Phacelia argylensis*	BLM-UT
Utah phacelia	*Phacelia utahensis*	BLM-UT
Jones indigo-bush	*Psorothamnus polydenius* var. *jonesii (Psorothamnus nummularious)*	BLM-UT

Table 3.6-3 Special Status Plant Species Potentially Occurring in Region II

Common Name	Scientific Name	Status[1]
Arizona willow	*Salix arizonica*	USFS-Dixie NF, USFS-Fishlake NF, USFS-Manti-La Sal NF
Clay reed-mustard	*Schoenocrambe argillacea*	FT (UT)
Shrubby reed-mustard	*Schoenocrambe suffrutescens*	FE (UT)
Colorado hookless cactus	*Sclerocactus glaucus*	FT (CO)
Uinta Basin hookless cactus	*Sclerocactus wetlandicus*	FT (UT)
Wright fishhook cactus	*Sclerocactus wrightiae*	FE (UT)
Maguire campion	*Silene petersonii*	USFS-Dixie NF, USFS-Fishlake NF, USFS-Manti-La Sal NF
Psoralea globemallow	*Sphaeralcea psoraloides*	BLM-UT
Ute ladies'-tresses orchid	*Spiranthes diluvialis*	FT (CO, UT, WY), BLM-NV, NV State CE
Thompson talinum	*Talinum thompsonii*	BLM-UT
Cathedral Bluff meadow-rue	*Thalictrum heliophilum*	BLM-CO
Duchesne greenthread (Caespitose greenthread)	*Thelesperma caespitosum (Thelesperma caespitosa)*	USFS-Ashley NF, BLM-UT, BLM-WY
Last Chance townsendia	*Townsendia aprica*	FT (UT)
Sigurd townsendia (Sevier townsendia)	*Townsendia jonesii* var. *lutea*	BLM-UT, USFS-Fishlake NF
Strigose easter daisy	*Townsendia strigosa*	BLM-CO
Strigose townsendia	*Townsendia strigosa* var. *prolixa*	BLM-UT
Sterile yucca	*Yucca sterilis (Yucca harrimaniae* var. *sterilis*)	BLM-UT

[1]Status: FE = Federally Endangered; FT = Federally Threatened; FC = Federal Candidate; BLM = BLM Sensitive; USFS = Forest Sensitive.

3.6.5.3 Region III

Region III extends from the IPP in western Utah to north Las Vegas, Nevada. In Region III, desert shrub communities start shifting into the dominant vegetation community. Other common vegetation communities include pinyon-juniper, sagebrush shrubland, saltbush shrubland, grassland, and woody riparian and wetlands. A description of these communities is presented in Section 3.5, Vegetation. Special status plant species that may occur within the 2-mile transmission line corridor in Region III are presented in **Table 3.6-4**.

Table 3.6-4 Special Status Plant Species Potentially Occurring in Region III

Common Name	Scientific Name	Status[1]
Sticky ringstem	*Anulocaulis leiosolenus* var. *leiosolenus*	NPS-Lake Mead NRA, BLM-NV
Unknown	*Arabis goodrichii*	BLM-UT
Las Vegas bearpoppy	*Arctomecon californica*	NPS-Lake Mead NRA, NV State CE, BLM-NV
White bearpoppy	*Arctomecon merriamii*	BLM-NV
Eastwood milkweed	*Asclepias eastwoodiana*	BLM-NV

Table 3.6-4 Special Status Plant Species Potentially Occurring in Region III

Common Name	Scientific Name	Status[1]
Sheep Mountain milkvetch	*Astragalus amphioxys* var. *musimonum*	BLM-NV
Shivwitz milkvetch	*Astragalus ampullarioides*	FE (UT)
Torrey milkvetch	*Astragalus calycosus* var. *monophyllidius*	BLM-NV
Veyo milkvetch	*Astragalus ensiformis* var. *gracilior*	BLM-NV
Needle Mountains milkvetch	*Astragalus eurylobus*	BLM-NV
Black woollypod	*Astragalus funereus*	BLM-NV
Threecorner milkvetch	*Astragalus geyeri* var. *triquetrus*	NPS-Lake Mead NRA, NV State CE, BLM-NV
Gilman milkvetch	*Astragalus gilmanii*	BLM-NV
Straw milkvetch	*Astragalus lentiginosus* var. *stramineus*	BLM-NV
Halfring milkvetch	*Astragalus mohavensis* var. *hemygyrus*	BLM-NV
Mokiak milkvetch	*Astragalus mokiacensis*	NPS-Lake Mead NRA, BLM-NV
Pink egg milkvetch (Long-calyx eggvetch)	*Astragalus oophorus* var. *lonchocalyx*	BLM-UT, BLM-NV
Giant fourwing saltbush	*Atriplex canescens* var. *gigantea*	BLM-UT
Alkali mariposa lily	*Calochortus striatus*	BLM-NV
Baird camissonia	*Camissonia bairdii*	BLM-UT
Gould camissonia	*Camissonia gouldii*	BLM-UT
White River catseye	*Cryptantha welshii*	BLM-NV
Sanicle biscuitroot	*Cymopterus ripleyi* var. *saniculoides*	BLM-NV
Gold Butte moss	*Didymodon nevadensis*	BLM-NV
Silverleaf sunray	*Enceliopsis argophylla*	NPS-Lake Mead NRA, BLM-NV
Antelope Canyon goldenbush	*Ericameria cervina*	BLM-NV
Las Vegas buckwheat	*Eriogonum corymbosum var. nilesii*	FC (NV), BLM-NV, NV State CE#
Ibex buckwheat	*Eriogonum nummulare* var. *ammophilum*	BLM-UT
Wirestem buckwheat	*Eriogonum pharnaceoides* var. *cervinum*	BLM-UT
Sticky buckwheat	*Eriogonum viscidulum*	NPS-Lake Mead NRA, NV State CE, BLM-NV
Bullfrog Hills sweetpea	*Lathyrus hitchcockianus*	BLM-NV
Polished blazingstar	*Mentzelia polita*	BLM-NV
Sand cholla	*Opuntia pulcella (Grusonia pulchella)*	NV State CY
Siler pincushion cactus	*Pediocactus sileri*	FT (UT)
Beaver Dam breadroot	*Pediomelum castoreum*	NPS-Lake Mead NRA, BLM-NV
White-margined beardtongue	*Penstemon albomarginatus*	BLM-NV
Neese narrowleaf penstemon	*Penstemon angustifolius* var. *dulcis*	BLM-UT
Yellow twotone beardtongue	*Penstemon bicolor* ssp. *bicolor*	BLM-NV
Rosy twotone beardtongue	*Penstemon bicolor* ssp. *roseus*	NPS-Lake Mead NRA, BLM-NV
Tunnel Springs beardtongue	*Penstemon concinnus*	BLM-NV
Franklin penstemon	*Penstemon franklinii*	BLM-UT

Table 3.6-4 Special Status Plant Species Potentially Occurring in Region III

Common Name	Scientific Name	Status[1]
Pinyon penstemon	*Penstemon pinorum*	USFS-Dixie NF, BLM-UT
Parry petalonyx	*Petalonyx parryii*	BLM-UT
Parish phacelia	*Phacelia parishii*	BLM-NV
Pygmy poreleaf	*Porophyllum pygmaeum*	BLM-NV
Blaine pincushion	*Sclerocactus blainei*	BLM-NV
Schlesser pincushion	*Sclerocactus schlesseri*	BLM-NV
St. George blue-eyed grass	*Sisyrinchium radicatum*	BLM-NV
Jones' globemallow	*Sphaeralcea caespitosa* var. *caespitosa*	BLM-UT
Ute ladies'-tresses orchid	*Spiranthes diluvialis*	FT (CO, UT, WY), BLM-NV, NV State CE

[1]Status: FE = Federally Endangered; FT = Federally Threatened; FC = Federal Candidate; BLM = BLM Sensitive; NPS = NPS Sensitive; USFS = Forest Sensitive; NV State CE = NV State Critically Endangered; NV State CE = NV State Recommended for Listing a Critically Endangered; NV State CY = NV State Protected as a Cacti, Yucca, or Christmas Tree.

3.6.5.4 Region IV

Region IV extends from north Las Vegas, Nevada to Marketplace. There is less diversity of vegetation communities in Region IV, with the dominant vegetation community type being desert shrub. The remaining eight vegetation communities in Region IV all occupy less than 1 percent of the analysis area. A description of these communities is presented in Section 3.5, Vegetation. Special status plant species that may occur within the 2-mile transmission line corridor in Region IV are presented in **Table 3.6-5**.

Table 3.6-5 Special Status Plant Species Potentially Occurring in Region IV

Common Name	Scientific Name	Status[1]
Sticky ringstem	*Anulocaulis leiosolenus* var. *leiosolenus*	NPS-Lake Mead NRA, BLM-NV
Las Vegas bearpoppy	*Arctomecon californica*	NPS-Lake Mead NRA, NV State CE, BLM-NV
White bearpoppy	*Arctomecon merriamii*	BLM-NV
Black woollypod	*Astragalus funereus*	BLM-NV
Threecorner milkvetch	*Astragalus geyeri* var. *triquetrus*	NPS-Lake Mead NRA, NV State CE, BLM-NV
Straw milkvetch	*Astragalus lentiginosus* var. *stramineus*	BLM-NV
Mokiak milkvetch	*Astragalus mokiacensis*	NPS-Lake Mead NRA, BLM-NV
Alkali mariposa lily	*Calochortus striatus*	BLM-NV
Las Vegas catseye	*Cryptantha insolita*	NV State CE
Gold Butte moss	*Didymodon nevadensis*	BLM-NV
Silverleaf sunray	*Enceliopsis argophylla*	NPS-Lake Mead NRA, BLM-NV
Las Vegas buckwheat	*Eriogonum corymbosum* var. *nilesii*	FC (NV), BLM-NV, NV State CE
Sticky buckwheat	*Eriogonum viscidulum*	NPS-Lake Mead NRA, NV State CE, BLM-NV
Catchfly gentian	*Eustoma exaltatum*	BLM-NV
Beaver Dam breadroot	*Pediomelum castoreum*	NPS-Lake Mead NRA, BLM-NV
White-margined beardtongue	*Penstemon albomarginatus*	BLM-NV
Yellow twotone beardtongue	*Penstemon bicolor* ssp. *bicolor*	BLM-NV
Rosy twotone beardtongue	*Penstemon bicolor* ssp. *roseus*	NPS-Lake Mead NRA, BLM-NV

Table 3.6-5 Special Status Plant Species Potentially Occurring in Region IV

Common Name	Scientific Name	Status[1]
Parish phacelia	*Phacelia parishii*	BLM-NV
St. George blue-eyed grass	*Sisyrinchium radicatum*	BLM-NV

[1]Status: FE = Federally Endangered; FT = Federally Threatened; FC = Federal Candidate; BLM = BLM Sensitive; NPS = NPS Sensitive; USFS = Forest Sensitive; NV State CE = NV State Critically Endangered; NV State CE# = NV State Recommended for Listing a Critically Endangered; NV State CY = NV State Protected as a Cacti, Yucca, or Christmas Tree.

3.6.6 Impacts to Special Status Plant Species

As described above, the analysis area for special status plant species encompasses the HUC 10 watershed boundaries crossed by the 2-mile transmission line corridor. For impacts, the discussions focus on the impacts resulting from construction and operation activities within the 2-mile transmission line corridor. Operation activities include maintenance activities for the transmission line. The 2-mile transmission line corridor consists of a one-mile buffer on each side of the reference center line. Within the 2-mile transmission line is located the 250-foot-wide transmission line ROW. The 250-foot-wide transmission line ROW would contain the surface footprint for all temporary and permanent facilities associated with construction and operation activities. Permanent and temporary access roads would be located within the 250-foot-wide transmission line ROW where practical. Within the 2-mile transmission line corridor and outside of the 250-foot-wide transmission line ROW, access roads would be the only surface disturbance. The access roads locations have not been defined at this time. Additional surface facilities outside the 2-mile transmission line corridor include terminals and electrode beds.

Occurrence potential within the 2-mile transmission line corridor was evaluated for each plant species based on habitat requirements (including associated geological formations, soil substrates, vegetation communities, and elevation range) and known distribution. Special status plant species that were identified as potentially occurring within the analysis area were carried forward for impact analysis. The special status plant species carried forward in this analysis include the following: 18 federally listed species, 115 BLM sensitive species, 20 Forest sensitive species, 8 NPS-Lake Mead NRA sensitive species, and 7 species with state protection, as listed in the previous sections and **Appendix G**, **Table G-1**. Impact issues and the analysis considerations for special status plant species within the 2-mile transmission line corridor are listed in **Table 3.6-6**. Due to the programmatic nature of the EIS, impacts to the special status plant species are discussed within the context of the 2-mile transmission line corridor with the assumption that impacts could occur anywhere within the 2-mile transmission line corridor. For the facilities located outside the 2-mile transmission line corridor, which include ground electrodes, and terminals, impacts to special status species are discussed within the context of the facilities' proposed footprints.

Table 3.6-6 Relevant Analysis Considerations for Special Status Plant Species

Resource Topic	Analysis Considerations and Relevant Assumptions
Potential loss of individuals and/or suitable or occupied habitats as a result of construction and operation activities	The analysis will include a programmatic assessment of direct disturbance effects from temporary (i.e., construction-related) and permanent facility footprints.
Number of species whose range is limited to within or directly adjacent to the impact analysis area.	The analysis will evaluate impacts in the context of the range of the species and the 2-mile wide transmission line corridor, and facility footprints.

Table 3.6-6 Relevant Analysis Considerations for Special Status Plant Species

Resource Topic	Analysis Considerations and Relevant Assumptions
Increased trampling or removal of aboveground vegetation	The analysis will evaluate partial and complete vegetation removal as a result of construction and operation activities (e.g., clearing, stringing, vehicles driving cross-country, etc.).
Increased habitat fragmentation from access road construction and operation	The analysis will evaluate indirect effects of habitat fragmentation as a result of an increased road network, edge effects, and presence of transmission line ROW.
Accumulation of fugitive dust from increased access roads and vehicle traffic	The analysis will evaluate indirect effects from increased fugitive dust emissions associated with roads and vehicles on a potential decrease in species and habitat productivity.
Potential for introduction and spread of noxious and invasive species from construction and operation activity	The analysis will evaluate indirect effects of potential introduction and spread of noxious weeds from construction equipment or vehicles, spreading from infested area into the undisturbed areas.
Potential for greater access to populations from collectors	The analysis will evaluate indirect effects associated with potential loss of species and suitable/potential habitat as a result of greater public access to populations for plant collectors, and increased non-Project-related motor vehicle use via an expanded road network and ROW system.
Potential loss of pollinators	The analysis will evaluate indirect effects associated with potential loss of pollinators due to fugitive dust emissions and habitat fragmentation.

Impact parameters were used in combination with effects information for the purpose of quantifying impacts. The impact parameters also allow comparisons among the alternative routes and variations. The following impact parameters used for this analysis are:

- Acreage of potential habitat (based on species-specific modeling results) within the 2-mile transmission line corridors for federally listed and Forest sensitive plant species potentially impacted by the Project.
- Acreage of critical habitat within the 2-mile transmission line corridors for federally listed species potentially impacted by the Project.
- The presence of known individuals or populations within the 2-mile transmission line corridors for all special status plant species carried forward for detailed analysis that could be potentially impacted by the Project.
- The presence of potential habitat (based on preliminary desktop analysis) within the corridors for BLM sensitive, NPS-Lake Mead NRA sensitive, and state-listed plant species potentially impacted by the Project.
- Presence of species whose range is limited to within or directly adjacent to the 2-mile transmission line corridor.

Potential direct and indirect effects on special status plant species and their associated habitats as a result of construction, operation, and decommissioning activities are discussed below. After impacts are identified, relevant agency BMPs and design features are discussed in terms of reducing impacts. If significant impacts remain after application of BMPs and design features, additional mitigation is recommended to reduce impacts to non-significant levels.

The impacts analysis for special status plant species assumes that the USFWS will continue to have jurisdiction over the management of federally endangered, threatened, proposed, and candidate species populations. The BLM will continue to manage BLM sensitive species is accordance with BLM Manual 6840. The USFS will continue to manage Forest sensitive species in accordance with USFS Manual 2670. The National Park Service will continue to manage NPS sensitive species in accordance with the

Lake Mead General Management Plan (NPS 1986) and the Lake Mead NRA RMP (NPS 2002). In addition, the BLM, USFS, and NPS will continue to manage special status species habitats in coordination with USFWS.

3.6.6.1 Impacts from Terminal Construction and Operation

The northern and southern terminals would be constructed regardless of alternative route selection.

Northern Terminal

Direct and indirect impacts to special status plant species from construction and operation of the northern terminal can be grouped into two main categories: 1) loss of individuals and/or populations; and 2) loss of potentially suitable habitat. The habitat analysis is presented within a programmatic framework, given that site-specific disturbance locations and exact locations of suitable habitat (i.e., ground-verified potential habitat locations) are unknown. Species-specific impacts, as a result of construction and operation of the northern terminal, are presented in **Table 3.6-7**. Based on species occurrence information, no special status plant species populations are known within the northern terminal area.

Table 3.6-7 Impacts to Special Status Plant Species from Construction of the Northern and Southern Terminals

Common Name	Scientific Name	Status[1]	Northern Terminal[2]		Southern Terminal[3]	
			Known Populations Impacted? (Y/N)	Potential Habitat Impacted? (Y/N)	Known Populations Impacted? (Y/N)	Potential Habitat Impacted? (Y/N)
Meadow pussytoes	*Antennaria arcuata*	BLM-WY	N	Y	N	N
Meadow milkvetch	*Astragalus diversifolius*	BLM-WY	N	Y	N	N
Trelease's milkvetch	*Astragalus racemosus* var. *treleasei*	BLM-WY	N	Y	N	N
Ownbey's thistle	*Cirsium ownbeyi*	BLM-WY	N	Y	N	N
Gibbens penstemon (Gibbens beardtongue)	*Penstemon gibbensii*	BLM-WY, BLM-CO, BLM-UT	N	Y	N	N
Beaver Rim phlox	*Phlox pungens*	BLM-WY	N	Y	N	N
Tufted twinpod	*Physaria condensata*	BLM-WY	N	Y	N	N
Limber pine	*Pinus flexilis*	BLM-WY	N	Y	N	N
Persistent sepal yellowcress	*Rorippa calycina*	BLM-WY	N	Y	N	N
Ute ladies'-tresses	*Spiranthes diluvialis*	FT (CO, UT, WY), BLM-NV, NV State CE	N	Y	N	N
Laramie false sagebrush	*Sphaeromeria simplex*	BLM-WY	N	Y	N	N

[1] Status: BLM = BLM Sensitive; NPS = NPS Sensitive; NV-State CE = Nevada State Critically Endangered.

[2] Analysis encompasses the Northern Terminal Siting Area, within which the proposed Northern Terminal Site would be located.

[3] Analysis encompasses the Southern Terminal Siting Area, within which the proposed Southern Terminal Site and Southern Terminal Alternative Site would be located.

Based on species-specific habitat associations, potentially suitable habitats could be directly impacted as a result of construction implementation. Direct disturbance effects could include the loss of potential habitat as a result of ground clearing during construction, and the loss of potential habitat associated with the operational footprint of the terminal site.

Indirect effects associated with construction of the northern terminals could include the following: 1) establishment of noxious and invasive weed species during construction and operation; 2) loss of pollinators as a result of host species loss or fragmentation; and 3) accumulation of fugitive dust on vegetation species within suitable habitat, due to construction and operation vehicle and equipment use and resulting in reduced photosynthesis and habitat degradation. If pollinator populations occur within or adjacent to the terminal areas, a localized effect to host species may potentially occur. Given the lack of pollinator data associated with species dominating the various potential habitats within the terminal areas, the intensity of this impact is unknown.

Following completion of construction, 270 acres of disturbance would be reclaimed pursuant to TWE's PDTR (**Appendix D**). See Section 3.5, Vegetation, for a discussion of reclamation. At the end of the useful life of the Project, decommissioning would occur, the facilities would be dismantled and removed, and the entire terminal site would be reclaimed.

The applicant has committed to the following design features (i.e., environmental protection measures) to mitigate impacts to special status species as a result of the Project:

- TWE-12 – Minimizing surface disturbance in areas where soils and vegetation are sensitive to disturbance.
- TWE-13 – Restoration of temporary work areas;
- TWE-19 – Implementation of an Erosion Control Plan;
- TWE-26 – Implementation of a Vegetation Management Plan and Noxious Weed Management Plan; and
- TWE-29 – Implementation of a Biological Protection Plan.

Additional environmental protection measures that would apply to the Project include the WWEC performance standards (i.e., WWEC BMPs) which are listed in **Appendix C**. Also listed in **Appendix C** are the NSU and CSU restrictions which include restrictions for surface disturbance around wetlands, riparian areas, and drainages, and special status species populations. A brief overview of the WWEC performance standards applicable to special status plant species are listed below:

- AIR-1 – Cover stockpiled soil for fugitive dust;
- AIR-2 – Water surfaces prior to clearing or grading to prevent fugitive dust emissions;
- ECO-1/ECO-2/ECO-4 – Protection of sensitive and unique habitats;
- VEG-1 – Restoration using weed-free native species;
- VEG-2 – Development of an integrated vegetation management plan; and
- VEG-3 – Pesticide use stipulations.

Individual BLM FOs have FO-specific BMPs, and USFS forests have forest-specific stipulations and guidelines, that would apply to the Project within the boundaries of each FO and forest. Where there is conflict with the WWEC performance standards and individual BLM or USFS FO BMPs and stipulations and guidelines, the requirements of the individual offices will supersede the WWEC performance standards. Example of agency BMPs specific to special status plant species include:

- Conduct pre-Project habitat assessments and site inventories within suitable habitat to determine occupancy;
- Design Project infrastructure to minimize impacts within suitable habitat;
- Stay on designated roads, and other cleared/approved areas; and

- Use erosion control measures to avoid erosion on sedimentation into occupied habitat and avoidance areas.

In addition, the following mitigation measures for special status plant species are proposed:

SS-1*: (Species-specific Surveys for Federally-listed Species) – Site- and species-specific surveys for federally listed plant species would be conducted prior to the BA to identify the precise location of known individuals and populations and ground-truth modeled habitats. Surveys would be conducted in areas identified as potential habitat through models developed for the EIS, or from agency provided models for specific species. Surveys would be conducted as described in the TWE Project Special Status Species Survey Plan and subsequent Survey Plan Memos. Species not requiring surveys prior to the BA would be identified by the USFWS and BLM. For these species, pre-construction surveys still would be required. If individuals or populations are identified during surveys in potential habitat areas, species-specific avoidance through structure and ROW design modifications would be developed and implemented. For species that cannot be avoided, species specific mitigation would need to be developed in consultation with the USFWS and BLM. Species-specific mitigation may include compensatory mitigation and transplanting of individuals.*

SS-2*: (Species-specific Surveys for USFS Sensitive) – Site- and species-specific surveys for USFS sensitive plant species would be conducted prior to the BE to identify the precise location of known individuals and populations and ground-truth modeled habitats. Surveys would be conducted in areas identified as potential habitat through models developed for the EIS, or from agency provided models for specific species. Surveys for USFS sensitive species would be conducted only in the national forests crossed by the proposed Project. Surveys would be conducted as described in the TWE Project Special Status Species Survey Plan and subsequent Survey Plan Memos. Species not requiring surveys prior to the BE would be identified by the USFS and BLM. For these species, pre-construction surveys still would be required. If individuals or populations are identified, species-specific avoidance through structure and ROW design modifications would be developed and implemented. If individuals or populations are identified during surveys in potential habitat areas, species-specific avoidance through structure and ROW design modifications would be developed and implemented. For species that cannot be avoided, species specific mitigation would need to be developed in consultation with the USFS and BLM. Species specific mitigation may include compensatory mitigation and transplanting of individuals.*

SS-3*: (Species-specific Surveys for BLM Sensitive, NPS Sensitive, and Nevada State Protected Species) – Site- and species-specific surveys for BLM sensitive, NPS sensitive, and Nevada state-protected plant species would be conducted prior to construction to identify the precise location of known individuals and populations and ground-truth modeled habitats. Surveys would be conducted as described in the TWE Project Special Status Species Survey Plan and subsequent Survey Plan Memos. If individuals or populations are identified, species-specific avoidance through structure and ROW design modifications would be developed and implemented.*

SS-4*: (Avoidance of Ute Ladies'-tresses Orchid Species and Habitat) – Known individuals and populations and areas identified as potential habitat through consultation with the USFWS would be spanned by the transmission line. Surface disturbance associated with facilities, access roads, and other Project-related construction activities would not occur within the areas identified as potential habitat or within a 50-foot buffer around known occurrences. Presence of species in modeled habitat would be assumed for USFWS mitigation purposes. If potential habitat cannot be avoided, 2 years of surveys in potential habitat would be required, and USFWS formal consultation may be necessary.*

SS-5*: Construction will occur down slope of special status plants and populations where feasible; if surface disturbance must be sited upslope, a 300-foot minimum buffer between surface disturbances and plants and populations will be incorporated. Erosion controls would be implemented at the direction of the BLM, USFS, or USFWS, as appropriate, to prevent sedimentation and erosion from upslope surface disturbance.*

***SS-6**: A minimum 300-foot buffer distance would be incorporated between federally listed individuals and populations and surface disturbance. Avoidance areas will be visible during construction through fencing, signing, rebar, etc. Construction and operation traffic will stay on designed routes, and other cleared or approved areas.*

Effectiveness: With implementation of mitigation measures **SS-1** through **SS-3**, in addition to TWE's design features, and the WWEC BMPs, no direct impacts to special status plant species and their associated suitable habitats within the Northern Terminal are anticipated. If species or habitat avoidance remains unfeasible, impact minimization and mitigation measures would be developed in consultation with the BLM, Western, USFWS, and USFS prior to construction. With implementation of mitigation measure **SS-4**, which would avoid surface disturbance in Ute ladies'-tresses orchid modeled habitat, in addition to WWEC BMPs, and TWE design features, no impacts to Ute ladies'-tresses orchid individuals or their associated habitats would be anticipated. With implementation of mitigation measure **SS-5**, erosion and sedimentation impacts to special status species would be minimized through Project design, avoidance buffers, and erosion controls. Implementation of mitigation measure **SS-6** would minimize impacts to federally listed individuals and populations through the use of avoidance buffers.

Southern Terminal

There are two sites proposed for the Southern Terminal site (Southern Terminal, and Southern Terminal Alternative). Both sites are located primarily on developed/disturbed land cover types. Within each of the Southern Terminal proposed sites, there are no known occurrences or potential habitat for special status plant species. Therefore, no impacts are anticipated to special status plant species at either of the proposed Southern Terminal sites.

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

Because the implementation of Design Option 2 would use the same alternative routes and construction techniques as the Project, impacts from construction and operation of this design option would be the similar to those discussed under the alternative routes. Differences between this design option and the Project include the locations of the southern converter station and ground electrode system, as well as the addition of a series compensation station midway between IPP and Marketplace. The southern converter station would be located near IPP in Utah instead of at Marketplace in Nevada, and the ground electrode system would be within 50 miles of IPP.

Construction and operation of a converter station near IPP, ground electrode system, and series compensation station would similar to impacts described in Section 3.5.6.1, Impacts to Vegetation Resources from Terminal Construction and Operation. Impacts to special status plant species would be as described for Alternatives II-A, II-D, II-E, and the Southern Terminal locations.

Design Option 3 – Phased Build Out

Because the implementation of Design Option 3 would utilize the same alternative routes, facilities, and construction techniques as the Project, impacts from construction and operation of this design option would be similar to those discussed under the alternative routes. The total surface disturbance at one time might be less depending on the timing and reclamation activities associated with the phased build out.

3.6.6.2 Impacts Common to All Alternative Routes and Associated Components

Construction Impacts

Construction impacts would occur within the 250-foot-wide transmission line ROW, the 2-mile transmission line corridor, and the ancillary facility footprints. Within the 250-foot-wide transmission line ROW, surface disturbances would consist of ROW clearing in preparation of transmission line structure installation; and vegetation removal and blading to facilitate the construction of temporary and

permanent aboveground and belowground ancillary facilities. Within the 2-mile transmission line corridor, surface-disturbing activities would be limited to development and maintenance of temporary and permanent access roads.

Surface disturbances resulting from construction activities within the 250-foot-wide transmission line ROW, the 2-mile transmission line corridor, and at the ancillary facilities sites would impact special status plant species through the following: 1) loss of individuals and/or populations and 2) loss of potentially suitable habitat. Given that site-specific disturbance locations and exact locations of suitable habitat (i.e., ground-verified potential habitat locations) are unknown, the species and habitat analysis is presented herein using a programmatic approach. Further, it is assumed that any known occurrences or potential habitat located within the 250-foot-wide transmission line ROW, the 2-mile transmission line corridor, or the ancillary facilities footprint potentially would be impacted by the Project.

Direct disturbance effects on species could include the loss of individuals or local populations resulting from partial removal of vegetative material due to trampling or crushing from construction vehicles and equipment, or loss of individuals as a result of ROW clearing and construction of transmission line components. Trampling of vegetation could result in permanent loss of individuals and/or populations depending on the extent of vegetation removed and the resulting damage to the individual species. The Project would cross modeled potential habitat, field verified suitable habitat, and occupied habitat of many special status plant species, which are analyzed in detail below. As a result of construction activities, direct disturbance effects to sensitive species habitat could include the loss of suitable habitat as a result of trampling or crushing from construction equipment and ROW clearing; or loss of suitable habitat as a result of transmission line structure or ancillary facility placement, in the event that spanning or avoidance of habitat is unachievable.

The types of indirect impacts to special status plant species as a result of construction activities would include potentially increased erosion, sedimentation, fugitive dust, the spread and establishment of noxious and invasive weed species, habitat fragmentation, the potential loss of pollinators, and increased opportunities for illegal collection of individual special status plant species.

Construction activities may increase erosion and sedimentation, and modify the floodplain surface as well as channel beds and banks. The effects of erosion and sedimentation may create indirect impacts on nearby riparian vegetation or directly affect the habitats of special status plant species. Changes to surface overflow and increased sedimentation can also affect upland special status plant species. Erosion and sedimentation effects could affect special status species outside the 2-mile transmission line corridor that are downstream of construction activities. See Section 3.4, Water Resources, for more detail on the effects of sedimentation on drainages in and around the Project area. Fugitive dust accumulation may adversely impact photosynthesis, respiration, transpiration, water use efficiency, leaf conductance, growth rate, gas exchange, and growth vigor (USFWS 2008). Fugitive dust tends to be a greater issue in desert vegetation communities, barren sparsely vegetated areas, and sandy soils. Linear surface disturbances such as those associated with transmission lines and roads can and have provided corridors (Gelbard and Belnap 2003; Watkins et al. 2003) and serve as a source of propagules (D'Antonio et al. 2001) for further infestation of noxious weeds and invasive species into adjacent undisturbed areas. Localized surface disturbances can and have facilitated the invasion of noxious and invasive species by removing native vegetative cover, creating areas of bare ground (Burke and Grime 1996; Watkins et al. 2003), and increasing light and nutrient availability (Stohlgren et al. 2003, 1999). Noxious and invasive weed species compete with native plants, can degrade and modify native communities, and reduce resources for native species (e.g., moisture, soil nutrients, and light).

Habitat fragmentation could occur as a result of the increased number of access roads, the 250-foot-wide transmission line ROW, and long-term surface disturbance from transmission structures and permanent facilities. The anthropogenic fragmentation of special status plant species habitats can result in more isolated, smaller populations, decreased species density, adverse impacts to pollination, decreased reproductive success, increased edge effects, and increased competition from noxious and

invasive weed species. In addition, the increase in the number of access roads within and near occupied habitats would allow greater access to special status plant species populations. This potentially could increase illegal collection of the individual species. If pollinator populations occur within or adjacent to the ROW and temporary and permanent access roads, a localized effect to pollinator and host species may occur. Given the lack of pollinator data associated with species dominating the various potential habitats within the 2-mile transmission line corridors, the intensity and extent of this potential impact is unknown.

Typically, indirect impacts to plants occur 100 to 300 feet away from the construction impact (USFWS 2012), but could affect special status species communities further away such as through increased sedimentation into drainages affecting communities downstream. Indirect effects could occur to all species and habitats located within the construction ROW regardless of the avoidance of surface disturbance and construction activities within identified habitats and populations. BMPs and design features presented above and in Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components (Vegetation) would be implemented to minimize and mitigate indirect impacts.

Following completion of construction, temporary use areas would be reclaimed pursuant to TWE's PDTR (**Appendix D**). See Section 3.5, Vegetation, for a more thorough discussion of reclamation. At the end of the useful life of the Project, decommissioning would occur, the facilities would be dismantled and removed, and the Project areas would be reclaimed. Areas characterized by arid conditions, soils reclamation constraints, and high local populations of noxious weeds would be difficult to reclaim to native vegetation. In these areas, impacts to special status species could be greater due to the difficulties in reclamation. Specifically, impacts to special status species in the San Rafael Swell would be greater and potentially longer lasting due to the arid, desert environment, and the prevalence of low reclamation potential soils in this area.

The implementation of BMPs and design features would the same as described under Section 3.5.6.1, Impacts from Terminal Construction and Operation. Additional Project design features to be implemented include:

- TWE-6 – Implementation of an Access Road Plan;
- TWE-14 – Construction of borrow pits; and
- TWE-47 – Implementation of a Dust Control and Air Quality Plan.

Additional WWEC BMPs that would apply to the Project include:

- WWEC BMPs – VEG-2 (integrated vegetation management plan development), SOIL-1 (topsoil salvage), SOIL-2 (slopes); WAT-10 (minimize stream crossings); WAT-11 (erosion controls at drainage crossings); and REST-1 (topsoil salvage, seeding with weed-free, native seeds, and restoring pre-development contours).

An Access Road Plan would be developed and would incorporate relevant agency standards regarding road design, construction, maintenance, and decommissioning. In addition, the Access Road Plan would incorporate BMPs stipulated by the agencies in their respective decision documents and permits.

In addition, the following mitigation measure for special status plant species are proposed:

SS-7*: The Dust Control and Air Quality Plan will include dust abatement measures to minimize impacts to special status plant species including: slower speed limits on unpaved roads, using gravel for roads in occupied habitat and avoidance areas, and the application of water for dust abatement.*

Effectiveness: Implementation of mitigation measure **SS-7** would mitigate impacts to special status species resulting from fugitive dust.

Operation Impacts

The discussion of operation impacts includes maintenance activities for the transmission line. Direct and indirect impacts to special status plant species from operation of the alternative routes would result in the potential for: 1) loss of individuals and/or populations and 2) loss or degradation of potentially suitable habitat related to the use of access roads and the ROW for repair and maintenance activities and vegetation management. Impacts associated with operation activities would involve several of the same types of effects discussed for construction activities. Direct impacts would result from vegetation management activities occurring in special status plant species habitat, or if access for vegetation management requires vehicles traveling through special status plant species habitat. Vegetation management activities and their associated impacts are detailed in Section 3.5.6.2, Impacts Common to All Alternative Routes and Associated Components. Indirect impacts would be similar to those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation. Additional indirect impacts associated with operations would result from the vegetation management in the ROW. This would include effects from herbicide drift near special status plant species populations and habitats, and activities such as mowing and trimming of woody vegetation. For more information on vegetation management activities, see Section 3.5.6.2, Operation Impacts. The BMPs and design features presented above and in the referenced sections would be implemented to minimize and mitigate indirect impacts.

Decommissioning Impacts

Direct and indirect impacts to special status plant species associated with decommissioning and reclamation of the alternative routes are anticipated to be similar to those presented for construction impacts.

3.6.6.3 Region I Impacts

To determine the location and spatial extent of potentially suitable habitat for federally listed species within the 2-mile transmission line corridors, a habitat assessment was conducted using ArcGIS and best available GIS datasets based on species-specific habitat characteristics. Selected datasets and species parameters are detailed within the Special Status Species Survey Plan. Species occurrence, range, and habitats in Region I are provided in **Appendix G**, **Table G-1**. **Table 3.6-8** provides acreages and numbers of special status plant species potentially impacted by the alternative routes in Region I based on known occurrences and potential habitat within the 2-mile transmission line corridors. In Region I, 23 BLM sensitive species and 1 federally listed species could be impacted by the Project.

Table 3.6-8 Summary of Region I Alternative Route Impacts for Special Status Plant Species

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Federally Listed Species				
Number of species with known occurrences impacted	0	0	0	0
Number of species with potential habitat impacted	1	1	1	1
Acreage of critical habitat impacted	--	--	--	--
Acreage of Ute ladies'-tresses Orchid potential habitat impacted	862	1,390	3,082	1,876
BLM Sensitive Species				
Number of species with known occurrences impacted	3	3	3	3
Number of species with potential habitat impacted	22	22	20	22

Alternative I-A (Applicant Proposed)

Ute Ladies'-tresses Orchid (Federally Threatened)

Within the 2-mile transmission line corridor for Alternative I-A, approximately 862 acres of potential habitat for the Ute ladies'-tresses orchid has been identified in the 2-mile transmission line corridor based on species-specific modeling as presented in **Table 3.6-8** and illustrated in **Figure 3.6-1**. Based on species occurrence data and agency consultation, no individuals or populations have been identified within the Alternative I-A corridor. No critical habitat has been designated for this species. Implementation of BMPs, design features, and mitigation measures and effects would be similar as presented for the Northern Terminal Ute ladies'-tresses orchid analysis. Specifically, mitigation measure **SS-2** would be implemented to avoid Ute ladies'-tresses potential habitat. Therefore, no impacts to Ute ladies'-tresses orchid and its associated habitat are anticipated.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative I-A 2-mile-wide corridor: debris milkvetch, Gibbens penstemon, and tufted cryptantha. Based on a desktop review, potential habitat has been identified for 22 BLM sensitive species within the Alternative I-A corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**.

Impacts would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. The BLM sensitive species with known locations and habitats within the corridors are located in a variety of habitats including barren, sparsely vegetated areas; shrub and woodland communities on the Green River formation, rocky outcrops, and sandy soils; and wetland and riparian areas. Two species (the cushion milkvetch and strigose Easter daisy) did not have available habitat information; therefore, a conservative analysis was applied for these species, which were carried forward within the impact analysis. Impacts to species in habitats with low reclamation potential such as rocky outcrops, sandy soils, and barren, sparsely vegetated areas would greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and woodland communities may take longer due to the longer time-frame to restore woody communities.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate potential impacts to BLM sensitive species habitats. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species or habitat avoidance to BLM sensitive species is deemed infeasible based on physical, other biological, or engineering constraints, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. In such case, impact minimization and additional mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated. As there is currently no designated critical habitat in the corridor, no impacts to critical habitat are anticipated.

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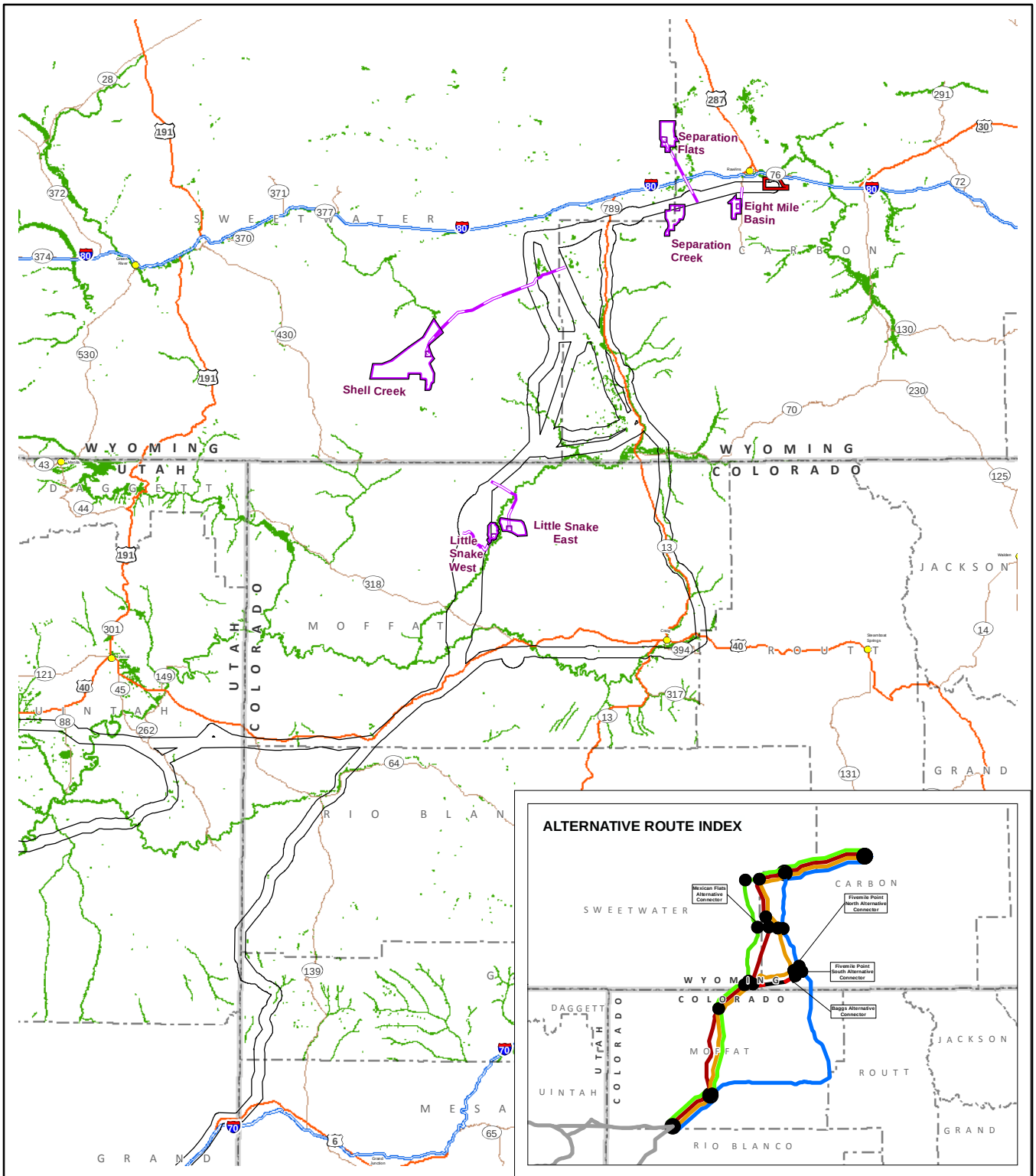

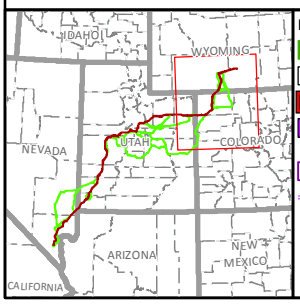

Potential Habitat

- Ute Ladies'-tresses Orchid
- Project Corridor
- Terminal Siting Area
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

DEIS Alternative Routes

- Applicant Proposed I-A
- Alternative I-B
- Alternative I-C
- Agency Preferred I-D
- Alternative Variation or Connector
- Segment not in this Region

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.6-1
Region I
Potential Habitat for
Ute Ladies'-tresses Orchid

0 5 10 20 Miles
0 5 10 20 km
1:1,750,000

N

Western AREA POWER ADMINISTRATION

Exported On: 6/5/2013

Alternative I-B

Ute Ladies'-tresses Orchid (Federally Threatened)

Within the 2-mile-wide corridor for Alternative I-B, approximately 1,390 acres of potential habitat for the Ute ladies'-tresses orchid has been identified based on species-specific modeling as presented in **Table 3.6-8** and illustrated in **Figure 3.6-1**. Based on species occurrence data and agency consultation, no individuals or populations have been identified within the Alternative I-B 2-mile-wide corridor. No critical habitat has been designated for this species.

Implementation of BMPs, design features, and mitigation measures and effects would be similar as presented for Alternative I-A Ute ladies'-tresses orchid conclusion; therefore, no impacts to Ute ladies'-tresses orchid species and their associated habitat are anticipated. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the corridors associated with Alternative I-B: debris milkvetch, Gibbens penstemon, and tufted cryptantha. Based on a desktop review, potential habitat has been identified for 22 BLM sensitive species within the corridors associated with Alternative I-B. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Impacts to special status plants under Alternative I-B would be the same as those described above for Alternative I-A BLM Sensitive Species.

Alternative I-C

Ute Ladies'-tresses Orchid (Federally Threatened)

Within Alternative I-C, approximately 3,082 acres of potential habitat for the Ute ladies'-tresses orchid has been identified based on species-specific modeling as presented in **Table 3.6-8** and illustrated in **Figure 3.6-1**. Based on species occurrence data and agency consultation, no individuals or populations have been identified within the corridors associated with Alternative I-C. No critical habitat has been designated for this species.

Implementation of BMPs, design features, and mitigation measures and effects would be similar as presented for Alternative I-A Ute ladies'-tresses orchid conclusion; therefore, no impacts to the Ute ladies'-tresses orchid or its habitat are anticipated.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the corridors associated with Alternative I-C: debris milkvetch, Gibbens penstemon, and tufted cryptantha. Based on a desktop review, potential habitat has been identified for 20 BLM sensitive species within the corridors associated with Alternative I-C. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Impacts would be the same as described above for Alternative I-A BLM Sensitive Species.

Alternative I-D (Agency Preferred)

Ute Ladies'-tresses Orchid (Federally Threatened)

Within Alternative I-D, approximately 1,876 acres of potential habitat for the Ute ladies'-tresses orchid has been identified based on species-specific modeling as presented in **Table 3.6-8** and illustrated in **Figure 3.6-1**. Based on species occurrence data and agency consultation, no individuals or populations have been identified within the corridors associated with Alternative I-D. No critical habitat has been designated for this species.

Implementation of BMPs, design features, and mitigation measures and effects would be similar as presented for Alternative I-A; therefore, no impacts to Ute ladies'-tresses orchid species and their associated habitat are anticipated.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the 2-mile-wide corridors associated with Alternative I-D: debris milkvetch, Gibbens penstemon, and tufted cryptantha. Based on a desktop review, potential habitat has been identified for 22 BLM sensitive species within the Alternative I-D 2-mile-wide corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**. Impacts would be the same as those described above for Alternative I-A BLM Sensitive Species.

Along Alternative I-D, three micro-siting options exist in the area of the Tuttle Easement. The only federal species identified as having potential habitat in the micro-siting area is the Ute ladies'-tresses orchid. The micro-siting options do not differ from each other or the comparable portion of Alternative I-D in their effects on the Ute ladies'-tresses orchid's potential habitat.

Alternative Connectors in Region I

Table 3.6-9 summarizes the impacts and advantages/disadvantages associated with the four alternative connectors in Region I based on known occurrences and potential habitat identified within the 2-mile transmission line corridors.

Table 3.6-9 Summary of Region I Alternative Connector Impacts for Special Status Plant Species

Alternative Connector	Analysis	Impact Conclusion
Fivemile Point North Alternative Connector	One BLM sensitive species (Gibbens penstemon) is known to occur within the 2-mile transmission line corridor and could be impacted by Project-related activities. Potential habitat for one federally listed species (Ute ladies'-tresses orchid) [approximately 9 acres] is located within the 2-mile transmission corridor, and could be impacted by Project–related activities. Potential habitat for six BLM sensitive species (meadow pussytoes, Trelease's milkvetch, Ownbey's thistle, Gibbens penstemon, Beaver Rim phlox, and tufted twinpod) is located within the 2-mile transmission line corridor and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals of one BLM sensitive species; and habitat disturbance to one federally listed species and six BLM sensitive species.
Fivemile Point South Alternative Connector	One BLM sensitive species (Gibbens penstemon) is known to occur within the 2-mile transmission line corridor and could be impacted by Project-related activities. Potential habitat for one federally listed species (Ute ladies'-tresses orchid [approximately 18 acres]) is located within the 2-mile transmission corridor, and could be impacted by Project–related activities. Potential habitat for six BLM sensitive species (meadow pussytoes, Trelease's milkvetch, Ownbey's thistle, Gibbens penstemon, Beaver Rim phlox, and tufted twinpod) is located within the 2-mile transmission line corridor and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals of one BLM sensitive species; and habitat disturbance to one federally listed species and six BLM sensitive species.
Mexican Flats Alternative Connector	Potential habitat for one federally listed species (Ute ladies'-tresses orchid [approximately 196 acres]) is located within the 2-mile transmission corridor, and could be impacted by Project–related activities. Potential habitat for six BLM sensitive species (meadow pussytoes, Trelease's milkvetch, Ownbey's thistle, Cedar Rim thistle, Beaver Rim phlox, and tufted twinpod) is located within the 2-mile transmission line corridor and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential habitat disturbance to one federally listed species and six BLM sensitive species.

Table 3.6-9 Summary of Region I Alternative Connector Impacts for Special Status Plant Species

Alternative Connector	Analysis	Impact Conclusion
Baggs Alternative Connector	One BLM sensitive species, (Gibbens penstemon is known to occur within the 2-mile transmission line corridor and could be impacted by Project-related activities. This population of Gibbens penstemon is the largest known population of the species in Wyoming (BLM 2012b). Potential habitat for one federally listed species (Ute ladies'-tresses orchid [approximately 650 acres]) is located within the 2-mile transmission corridor, and could be impacted by Project–related activities. Potential habitat for eight BLM sensitive species (Meadow pussytoes, meadow milkvetch, Trelease's milkvetch, Ownbey's thistle, Cedar Rim thistle, Gibbens penstemon, Beaver Rim phlox, and tufted twinpod) is located within the 2-mile transmission line corridor and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals of one BLM sensitive species' and habitat disturbance to one federally listed species and eight BLM sensitive species.

Alternative Ground Electrode Systems in Region I

The northern alternative ground electrode system would be required within 100 miles of the northern terminal, which is based on the conceptual locations and connections to the alternative routes. **Table 3.6-10** provides a comparison of impact parameters associated with the alternative ground electrode systems in Region I based on known occurrences and potential habitat identified within the ground electrode system siting areas. Based on species occurrence information and habitat associations, 17 special status plant species may be impacted by construction and operation of the ground electrode systems in Region I including 16 BLM sensitive species and one federally listed species (Ute ladies'-tresses orchid).

Table 3.6-10 Summary of Region I Alternative Ground Electrode System Impacts for Special Status Plant Species

Alternative Ground Electrode System Locations	Analysis
Separation Flat – All Alternative Routes	• No impacts to federally listed species would occur based on lack of documented occurrences. Potential habitat for one federally listed species (Ute ladies'-tresses orchid [approximately 48 acres]) is located within the ground electrode system siting area and could be impacted by Project-related activities. • Potential habitat for six BLM sensitive species (meadow pussytoes, meadow milkvetch, Trelease's milkvetch, Ownbey's thistle, Beaver Rim phlox, and tufted twinpod) is located within this ground electrode system siting area and could be impacted by Project-related activities.
Shell Creek (Alternatives I-A, I-B, and I-D)	• No impacts to federally listed species would occur based on lack of documented occurrences. Potential habitat for one federally listed species (Ute ladies'-tresses orchid [approximately 1 acre]) is located within the ground electrode system siting area and could be impacted by Project–related activities. • Potential habitat for nine BLM sensitive species (meadow pussytoes, meadow milkvetch, Trelease's milkvetch, Ownbey's thistle, Cedar Rim thistle, stemless beardtongue, Gibbens penstemon, Beaver Rim phlox, and tufted twinpod) is located within this ground electrode system siting area, and could be impacted by Project-related activities.

Table 3.6-10 Summary of Region I Alternative Ground Electrode System Impacts for Special Status Plant Species

Alternative Ground Electrode System Locations	Analysis
Little Snake East (Alternatives I-A, I-B, and I-D)	• No impacts to federally listed species and their associated habitats would occur based on lack of documented occurrences and suitable habitat. • Potential habitat for seven BLM sensitive species (cushion milkvetch, Duchesne milkvetch, starvling milkvetch, tufted cryptantha, single stemmed wild buckwheat, Nuttall sandwort, and matted fiddleleaf) is located within the 2-mile transmission line corridor and could be impacted by Project-related activities.
Little Snake West (Alternatives I-A, I-B, and I-D)	• No impacts to federally listed species would occur based on lack of documented occurrences. Potential habitat for one federally listed species (Ute ladies'-tresses orchid [approximately 7 acres]) is located within the ground electrode system siting area and could be impacted by Project–related activities. • Potential habitat for seven BLM sensitive species (cushion milkvetch, Duchesne milkvetch, starvling milkvetch, tufted cryptantha, single-stemmed wild buckwheat, Nuttall sandwort, and matted fiddleleaf) is located within this ground electrode system siting area, and could be impacted by Project-related activities.
Eight Mile Basin (All Alternative Routes)	• No impacts to federally listed species and their associated habitats would occur based on lack of documented occurrences and suitable habitat. • Potential habitat for six BLM sensitive species (meadow pussytoes, meadow milkvetch, Trelease's milkvetch, Ownbey's thistle, Beaver Rim phlox, and tufted twinpod) is located within this ground electrode system siting area and could be impacted by Project-related activities.
Separation Creek (All Alternative Routes)	• No impacts to federally listed species would occur based on lack of documented occurrences. Potential habitat for one federally listed species (Ute ladies'-tresses orchid [approximately 0.2 acre]) is located within this ground electrode system siting area and could be impacted by Project-related activities. • Potential habitat for six BLM sensitive species (meadow pussytoes, meadow milkvetch, Trelease's milkvetch, Ownbey's thistle, Beaver Rim phlox, and tufted twinpod) is located within this ground electrode system siting area and could be impacted by Project-related activities.

Region I Conclusion

Within Region I, only potential habitat for one federally listed species is found in the 2-mile-wide corridor for Alternatives I-B and I-D. Based on the implementation of proposed mitigation measure **SS-2**, which would avoid surface disturbance in all potential modeled habitat, no impacts to Ute ladies'-tresses orchid and its associated habitat are anticipated. Impacts to BLM species would be similar between the various alternatives. There would be no impacts to USFS species within any of the Alternatives.

3.6.6.4 Region II

Table 3.6-11 provides a comparison of impact parameters for special status plant species associated with the alternative routes in Region II based on known occurrences and potential habitat identified within the 2-mile transmission line corridor. Based on species occurrence information and habitat associations, the special status plant species that may be impacted by the Project in Region II include 62 BLM sensitive species, 18 USFS sensitive species, and 14 federally listed species. To determine the locations and spatial extents of potentially suitable habitats for federally listed species and USFS sensitive species within the 2-mile transmission line corridor alternatives, a detailed habitat assessment was conducted using ArcGIS and best available GIS datasets based on species-specific habitat parameters. Selected datasets and species parameters are detailed within the Special Status Species Survey Plan. Species occurrence and associated habitats in Region II are summarized in **Appendix G**, **Table G-1**.

Table 3.6-11 Summary of Region II Alternative Route Impacts for Special Status Plant Species

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Federally Listed Species						
Number of species with known occurrences impacted	2	1	2	3	4	5
Number of species with potential habitat impacted	6	8	9	6	5	8
Acreage of critical habitat impacted	N/A	N/A	N/A	N/A	N/A	N/A
Acreage of Barneby Ridgecress potential habitat impacted	4,112	0	0	0	0	0
Acreage of Clay Phacelia potential habitat impacted	226	0	0	0	2,645	2,645
Acreage of Clay Reed-mustard potential habitat impacted	0	0	0	3,607	0	3,607
Acreage of Colorado Hookless Cactus potential habitat impacted	0	5,338	5,338	0	0	0
Acreage of Deseret Milkvetch potential habitat impacted	785	0	0	0	785	785
Acreage of Graham's Penstemon potential habitat impacted	694	1,713	1,713	9,077	15,080	18,622
Acreage of Jones Cycladenia potential habitat impacted	0	17	1,004	0	0	0
Acreage of Last Chance Townsendia potential habitat impacted	0	383	8,068	0	0	0
Acreage of San Rafael Cactus potential habitat impacted	0	0	868	0	0	0
Acreage of Shrubby Reed-mustard potential habitat impacted	0	0	0	108	0	108
Acreage of Uinta Basin Hookless Cactus potential habitat impacted	0	0	0	54,839	0	54,839
Acreage of Ute ladies'-tresses Orchid potential habitat impacted	3,357	892	692	1,167	3,900	2,228
Acreage of Winkler Cactus potential habitat impacted	0	5,320	3,665	0	0	0
Acreage of White River Beardtongue potential habitat impacted	34	3,058	3,058	403	343	403
Acreage of Wright Fishhook Cactus potential habitat impacted	0	44,995	50,421	0	0	0
BLM Sensitive Species						
Number of species with known occurrences impacted	6	12	17	9	11	10
Number of species with potential habitat impacted	29	36	43	32	32	34

Table 3.6-11 Summary of Region II Alternative Route Impacts for Special Status Plant Species

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
USFS Sensitive Species[1]						
Number of species with known occurrences impacted	0	1	2	2	2	2
Number of species with potential habitat impacted	3	7	7	7	6	9
Acreage of Arizona Willow potential habitat impacted	0	0	5,478	0	0	0
Acreage of Bicknell Milkvetch potential habitat impacted	0	0	3,182	0	0	0
Acreage of Canyon Sweetvetch potential habitat impacted	0	1,433	0	4	0	0
Acreage of Carrington Daisy potential habitat impacted	0	172	0	0	0	0
Acreage of Dainty Moonwort potential habitat impacted	91	0	0	3	3	7
Acreage of Duchesne Greenthread potential habitat impacted	0	0	0	3,513	9,593	3,528
Acreage of Elsinore Buckwheat potential habitat impacted	0	0	3,299	0	0	0
Acreage of Goodrich Blazingstar potential habitat impacted	0	0	0	731	7,219	1,158
Acreage of Link Trail Columbine potential habitat impacted	0	321	0	0	0	0
Acreage of Maguire Campion potential habitat impacted	0	4,312	3,709	6,509	0	0
Acreage of Nevada Willowherb potential habitat impacted	0	561	2,158	0	0	561
Acreage of Sigurd Townsendia potential habitat impacted	0	975	4,520	0	0	975
Acreage of Slender Moonwort potential habitat impacted	1,812	0	0	0	152	608
Acreage of Untermann's Daisy potential habitat impacted	0	0	0	3,556	11,284	3,766
Acreage of Ward Beardtongue potential habitat impacted	0	1,322	20,825	0	0	1,322
Acreage of Wasatch Jamesia potential habitat impacted	6,582	0	0	4	343	343

[1] Although carried forward in detailed analysis due to their status as BLM sensitive species, potential habitat for the Creutzfeldt-flower (USFS-Manti-La Sal NF) and the Maguire daisy (USFS-Fishlake NF) on USFS-administered lands was not identified.

Alternative II-A (Applicant Proposed)

Deseret Milkvetch (Federally Threatened)

As presented in **Table 3.6-11** and illustrated in **Figure 3.6-2**, approximately 785 acres of potential habitat for the Deseret milkvetch would be impacted under Alternative II-A in the 2-mile-wide corridor. In addition, the only population of the Deseret milkvetch is located within the 2-mile transmission line corridor. Currently, the USFWS is reviewing a proposal to delist the species due to lack of the threats (USFWS 2011a). Implementation of Alternative II-A potentially would represent a new threat to the species that may result in the USFWS making the determination to not delist the species (USFWS 2012b).

To mitigate Project-related impacts to the Deseret milkvetch, the following proposed mitigation measure would be implemented:

SS-8*: (Avoidance of Deseret Milkvetch Species and Habitat) - Known individuals and populations and areas identified as ground-truthed suitable habitat would be spanned by the transmission line. Surface disturbance associated with facilities, access roads, and other Project-related construction activities would not occur within a 984-foot (300-meter) buffer around the areas identified as having known occurrences or suitable habitat. Presence of species would be assumed for development of USFWS conservation measures as appropriate.*

Effectiveness: WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to avoid, minimize, and mitigate any potential impacts to the Deseret milkvetch. In this area, the 2-mile transmission line corridor has been widened to allow for the 250-foot-wide transmission line ROW to be routed around the Deseret milkvetch. With the implementation of proposed mitigation measure **SS-8** in addition to the BMPs, design features, and TWE's applicant-committed measures, no impacts to the desert milkvetch and its associated habitat would be anticipated.

Indirect impacts would be mitigated through implementation of mitigation measures **SS-5**, **SS-6**, and **SS-7**. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

Ute Ladies'-tresses Orchid (Federally Threatened)

As presented in **Table 3.6-11** and illustrated in **Figure 3.6-1**, within the Alternative II-A 2-mile-wide corridor there are approximately 3,357 acres of potential habitat for the Ute ladies'-tresses orchid and the orchid has been documented within this corridor. No critical habitat has been designated for this species.

BMPs, design features, mitigation measures and their effects would be similar to those presented for Alternative I-A Ute ladies'-tresses orchid conclusion; therefore, no impacts to Ute ladies'-tresses orchid and its associated habitat is anticipated.

Federal Species Identified as having Potential Habitat

Within the 2-mile-wide corridor for Alternative II-A, there is potential habitat identified for Barneby ridgecress, clay phacelia, Graham's penstemon, and White River beardtongue (**Table 3.6-11**, **Figures 3.6-3**, **3.6-4**, and **3.6-5**). Based on species occurrence data and agency consultation, no individuals or populations of these species have been documented within Alternative II-A corridor. Additionally, no critical habitat has been designated for these species.

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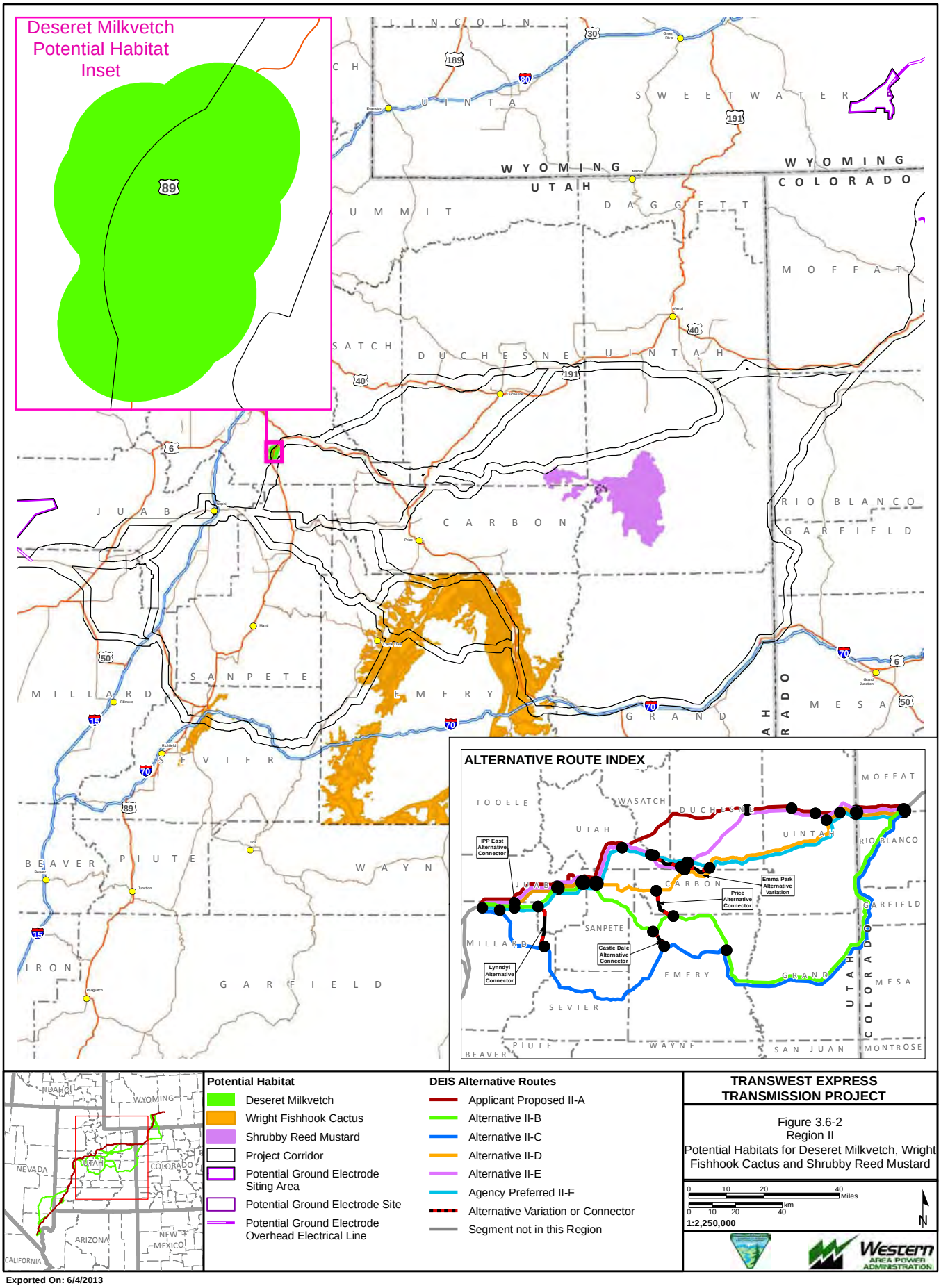

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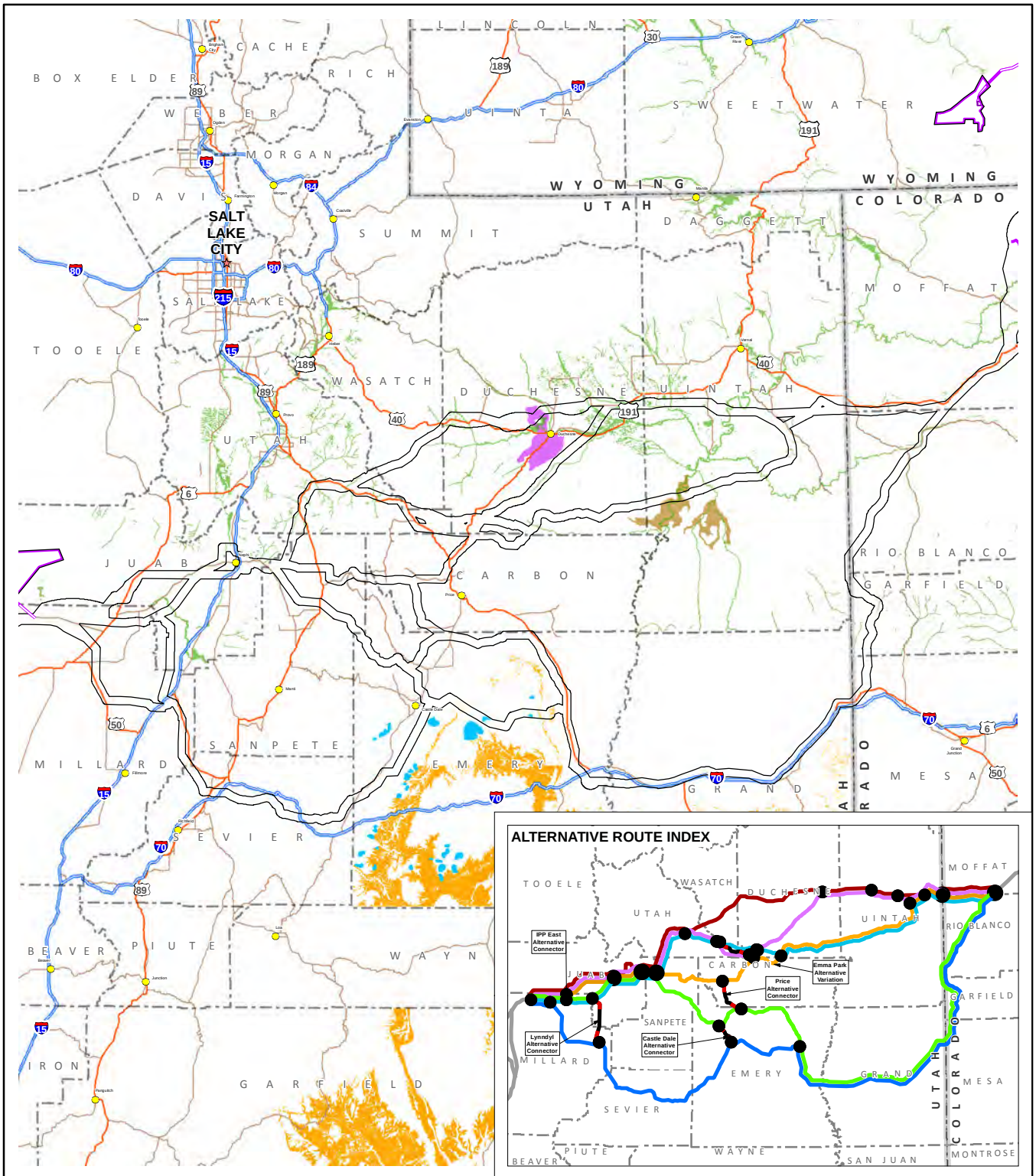

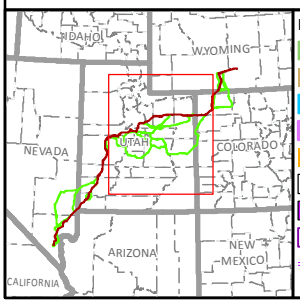

Potential Habitat

- Ute Ladies'-tresses Orchid
- Clay Reed Mustard
- San Rafael Cactus
- Barneby Ridgecress
- Jones Cycladenia
- Project Corridor
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

DEIS Alternative Routes

- Applicant Proposed II-A
- Alternative II-B
- Alternative II-C
- Alternative II-D
- Alternative II-E
- Agency Preferred II-F
- Alternative Variation or Connector
- Segment not in this Region

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.6-3
Region II
Potential Habitats for Ute Ladies'-tresses Orchid, Clay Reed Mustard, San Rafael Cactus, Barneby Ridgecress, and Jones Cycladenia

0 10 20 40 Miles
0 10 20 40 km
1:2,250,000
N

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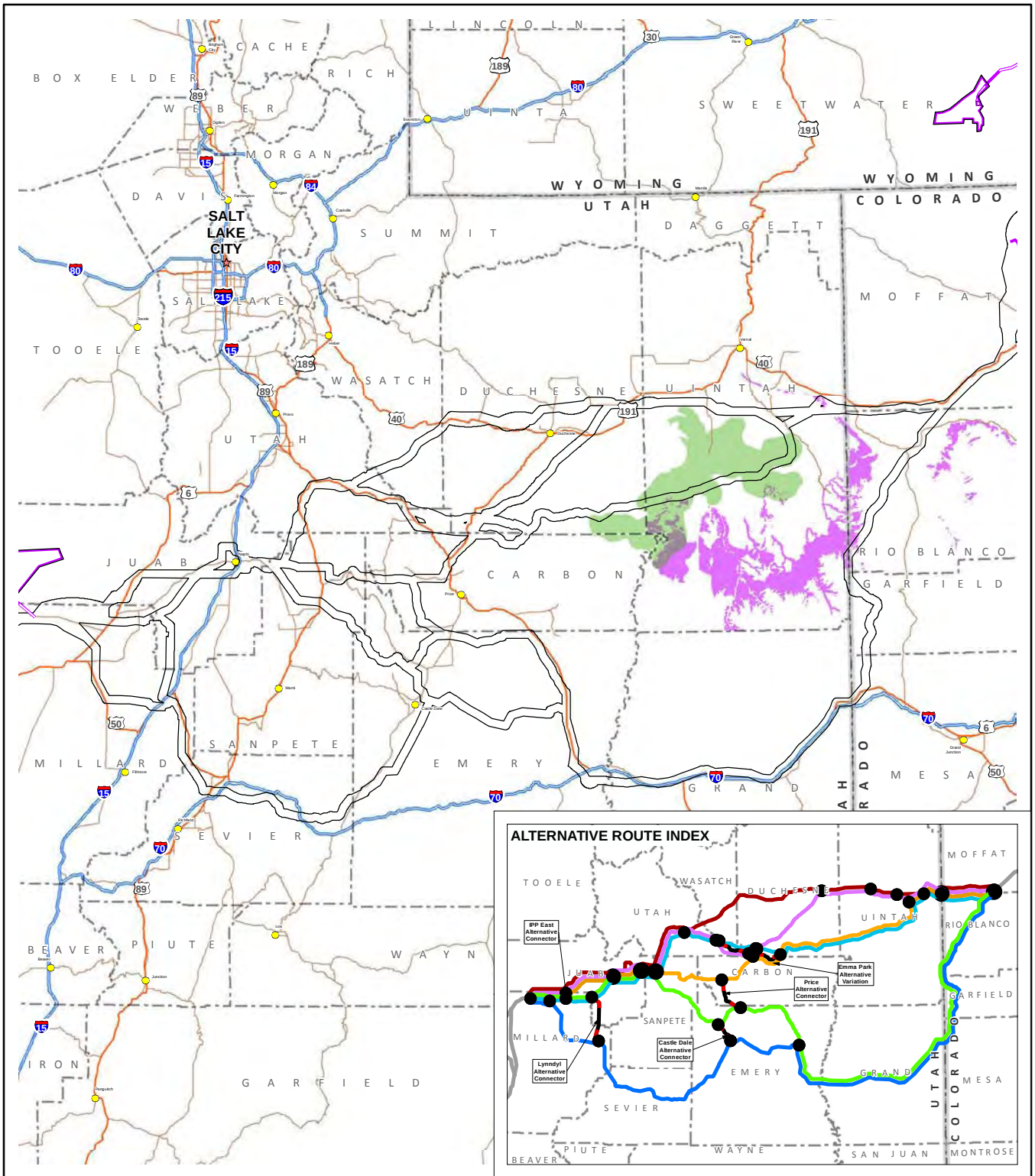

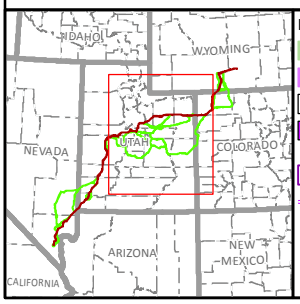

Potential Habitat

- Uinta Basin Hookless Cactus
- White River Beardtongue
- Project Corridor
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

DEIS Alternative Routes

- Applicant Proposed II-A
- Alternative II-B
- Alternative II-C
- Alternative II-D
- Alternative II-E
- Agency Preferred II-F
- Alternative Variation or Connector
- Segment not in this Region

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.6-4
Region II
Potential Habitats for Uinta Basin Hookless Cactus and White River Beardtongue

0 10 20 40 Miles
0 10 20 40 km
1:2,250,000
N

Western AREA POWER ADMINISTRATION

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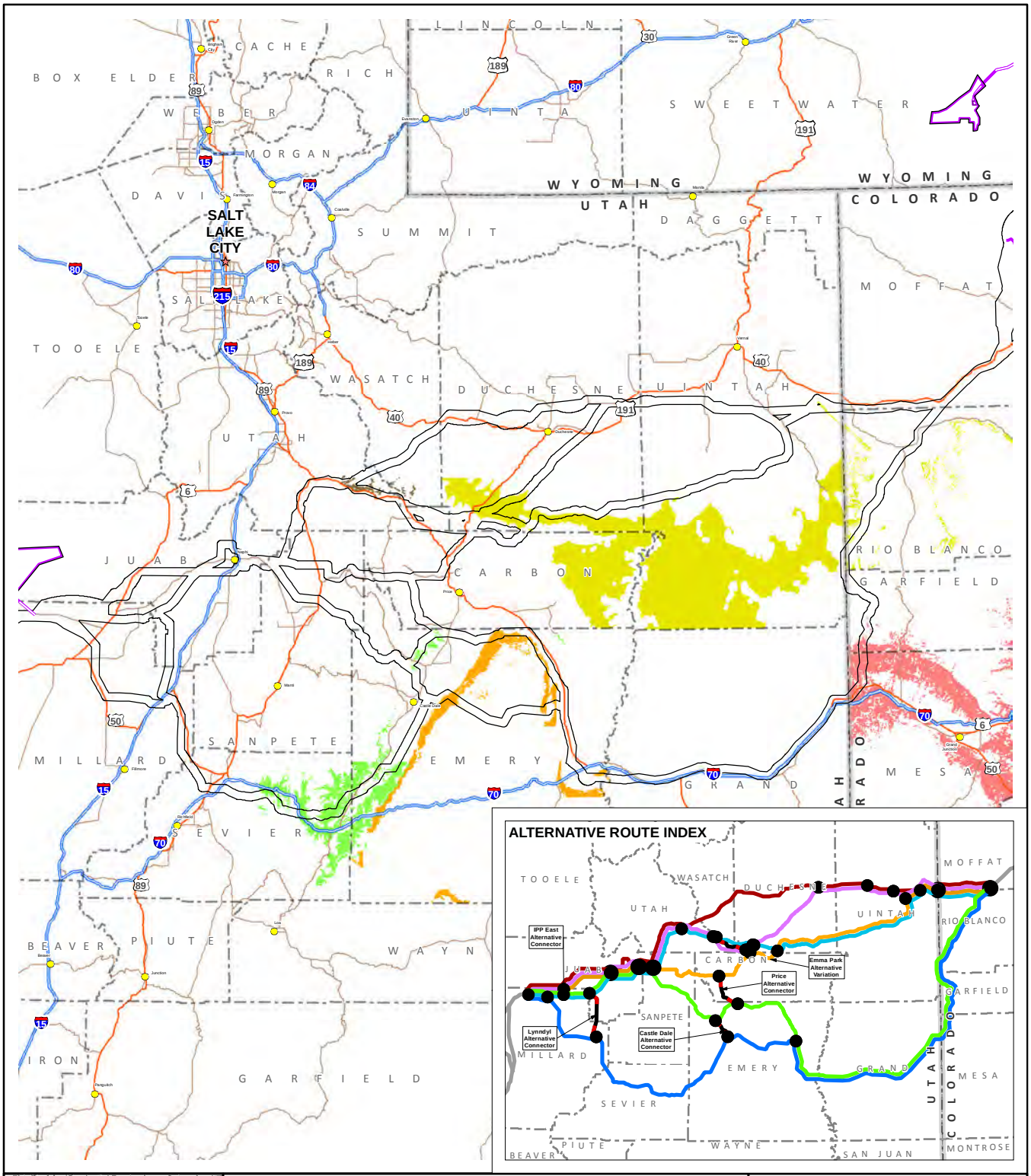

Potential Habitat

- Graham's Penstemon
- Clay Phacelia
- Colorado Hookless Cactus
- Winkler Cactus
- Last Chance Townsendia
- Project Corridor
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

DEIS Alternative Routes

- Applicant Proposed II-A
- Alternative II-B
- Alternative II-C
- Alternative II-D
- Alternative II-E
- Agency Preferred II-F
- Alternative Variation or Connector
- Segment not in this Region

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.6-5
Region II
Potential Habitats for Graham's Penstemon, Clay Phacelia, Colorado Hookless Cactus, Winkler Cactus, and Last Chance Townsendia

0 10 20 40 Miles
0 10 20 40 km
1:2,250,000
N

Western AREA POWER ADMINISTRATION

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Approximately 4,112 acres of potential habitat was identified for the Barneby ridgecress and approximately 226 acres of potential habitat was identified for clay phacelia within the 2-mile transmission line corridor. Less than 1,000 acres of potential habitat for the Graham's penstemon and White River beardtongue was modeled within the 2-mile transmission line corridor.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2 Impacts Common to All Alternative Routes and Associated Components, would be implemented to avoid, minimize, and mitigate any potential impacts to special status species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation measures **SS-3** and **SS-4**.

Based on the small area of potential habitat that was identified for the species and the distribution of the habitat in the 2-mile-wide corridor, allowing the habitat to be only spanned by the transmission line, no impacts to this species under Alternative II-A is anticipated. If species or habitat avoidance is deemed infeasible based on physical, other biological, or engineering constraints, impacts would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. At such time, impact minimization and additional mitigation measures would be developed in consultation with the BLM and Western prior to construction.

The limited range of clay phacelia is located predominantly within the 2-mile transmission line corridor. Also located in the 2-mile transmission line corridor, are relocation areas for the species. Known occurrences of the species are found along the 2-mile transmission line corridor on steep slopes on fine textured soil and fragmented shale derived from the Green River Formation. As the species grows on barren, precipitous hillsides, and fine textured soil, it is extremely susceptible to erosion and sedimentation. Reclamation of the habitat for this species is difficult due to the steep slopes of its habitat. The known occurrences are located near the main highway in the corridor. The habitat for the species is found throughout the corridor in the area. Based on the current reference line, the known locations for the species would be avoided; however, the species could be impacted by erosion from construction activities based on its proximity between the main highway and the potential locations for the proposed transmission line.

To mitigate Project-related impacts to clay phacelia, the following mitigation measures are proposed:

SS-9*: (Avoidance of Clay Phacelia and minimization of indirect impacts) – Known individuals and populations would be spanned by the transmission line. Surface disturbance associated with facilities, access roads, and other Project-related construction activities would not occur within a 984-foot (300-meter) buffer around areas identified as having known occurrences. Additional site-specific erosion control measures would be developed with the USFWS and implemented during construction to minimize erosion in areas near known clay phacelia populations. Site-specific construction techniques developed in consultation with the USFWS, BLM, and USFS would be used to minimize the amount of surface disturbance (such as installing structures with helicopter).*

SS-10*: (Avoidance of High Quality Habitats) – In instances where complete habitat avoidance is not possible (due to, for example, topographical, biological, or engineering constraints), all "high quality" habitats as determined during site- and species-specific surveys would be avoided by all direct disturbances during construction and operational activities. High quality habitat are defined as areas that are within the geographic range of the species, have been field verified as having the majority of required habitat characteristics; and/or the species has been observed in the area or near vicinity.*

Effectiveness: Upon completion of Mitigation Measure **SS-1**, the spatial extent of suitable habitats, in addition to a quantification of habitat quality based on species-specific habitat parameters, would be

identified for each federally listed species. Implementation of **SS-6** and **SS-9** would prevent direct impacts to clay phacelia individuals and minimize indirect impacts from erosion resulting from surface-disturbing activities. Total avoidance of clay phacelia habitat is unlikely in this corridor; however, with implementation of mitigation measure **SS-9** and **SS-10**, in conjunction with mitigation measure **SS-1** and **SS-3**, WWEC BMPs and TWE's design features, impacts to high quality habitats would be avoided. The areas not avoided would result in loss of suitable habitat for the species. Loss of suitable habitat or direct and indirect impacts to clay phacelia individuals likely would result in a decision of jeopardy for the species. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following BLM-listed sensitive species have been identified within the Alternative II-A 2-mile- transmission line corridor: Neese narrowleaf penstemon, debris milkvetch, giant fourwing saltbush, Graham's penstemon, horseshoe milkvetch, and narrowstem gilia. Based on a desktop review, potential habitat has been identified for 29 BLM sensitive species within the Alternative II-A corridor. Associated species' ranges and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

Under this alternative, impacts to BLM-listed sensitive species would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. The BLM sensitive species with known locations and habitat within the Alternative II-A corridor include species that are found across a wide range of habitats as well as those that are only found on very specific soil and vegetation combinations. The habitats include dunes, barren, sparsely vegetated areas, shrub and juniper communities, rocky ridge tops, and desert shrublands. Two species (the cushion milkvetch and strigose Easter daisy) do not have available habitat information; therefore, a conservative analysis was applied for these species, which were carried forward through the impact analysis. Impacts to species in low reclamation-potential habitats such as rocky ridgetops, sandy soils, and barren, sparsely vegetated areas would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and woodland communities may take longer due to the timeframe needed to restore woody communities.

The WWEC BMPs, and TWE's design features presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance of BLM sensitive species is not feasible, impacts would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on implementation of the WWEC BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated under Alternative II-A.

USFS Sensitive Species

Based on species occurrence data and agency consultation, there are no USFS-listed sensitive species that have been identified within the Alternative II-A 2-mile-transmission line corridor. Based on a desktop review, potential habitat has been identified for the following three USFS sensitive species within the Alternative II-A corridor: dainty moonwort, slender moonwort, and Wasatch jamesia. The dainty moonwort and slender moonwort are listed in the Ashley and Uinta-Wasatch-Cache national forests; the Wasatch jamesia is listed in the Uinta-Wasatch-Cache National Forest. Associated species range and

habitat descriptions for these species are provided in **Appendix G, Table G-1**. Potential habitats for the aforementioned species are shown in **Figures 3.6-6**, **3.6-7**, and **3.6-8**.

Potential habitat for the dainty moonwort totals approximately 91 acres within and adjacent to the two forests within the analysis area. The dainty moonwort is found in wet, marshy, and spring areas around 8,000 feet amsl. Potential habitat for the slender moonwort totals approximately 1,812 acres within the Uinta National Forest. Within the analysis area, the slender moonwort is found above 9,000 feet amsl in riparian and wet areas. Potential habitat for the Wasatch jamesia totals approximately 6,582 acres within the Uinta National Forest. For all three species, all known occurrences are located outside of the 2-mile transmission line corridors.

Since no individuals or populations of USFS-listed sensitive species were identified within the 2-mile transmission line corridor, direct impacts to these species are not anticipated. If USFS sensitive species are identified during site-specific surveys, impacts would be avoided as per mitigation measure **SS-2**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components and impact minimization and mitigation measures would be developed in consultation with the USFS, and Western prior to construction.

To minimize and mitigate impacts to all potential habitats within the 2-mile transmission line corridors, WWEC BMPs, design features, and proposed mitigation, as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation measures **SS-5** and **SS-6**. Based on the limited amount of potential habitat identified for the dainty and slender moonworts, it is anticipated that potential habitat avoidance would be feasible. Given the spatial extent of potential habitat identified for the Wasatch jamesia, complete habitat avoidance may not be possible. To minimize impacts to Wasatch jamesia habitat, mitigation measure **SS-10** would be applied; however, the areas not avoided would result in loss of potential habitat for the species. In these areas, direct and indirect impacts to the species would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

The Strawberry IRA and Cedar Creek Knoll IRA micro-siting options all have similar impacts to special status plant species as the comparable section of Alternative II-A.

Alternative II-B

Colorado Hookless Cactus (Federally Threatened)

Within the Alternative II-B 2-mile transmission line corridor, approximately 5,338 acres of potential habitat has been identified for the Colorado hookless cactus (**Table 3.6-11**, **Figure 3.6-5**). Based on species occurrence data and agency consultation, Colorado hookless cactus individuals or populations have been identified within the Alternative II-B corridor. No critical habitat has been designated for this species.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to special status species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4, and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative

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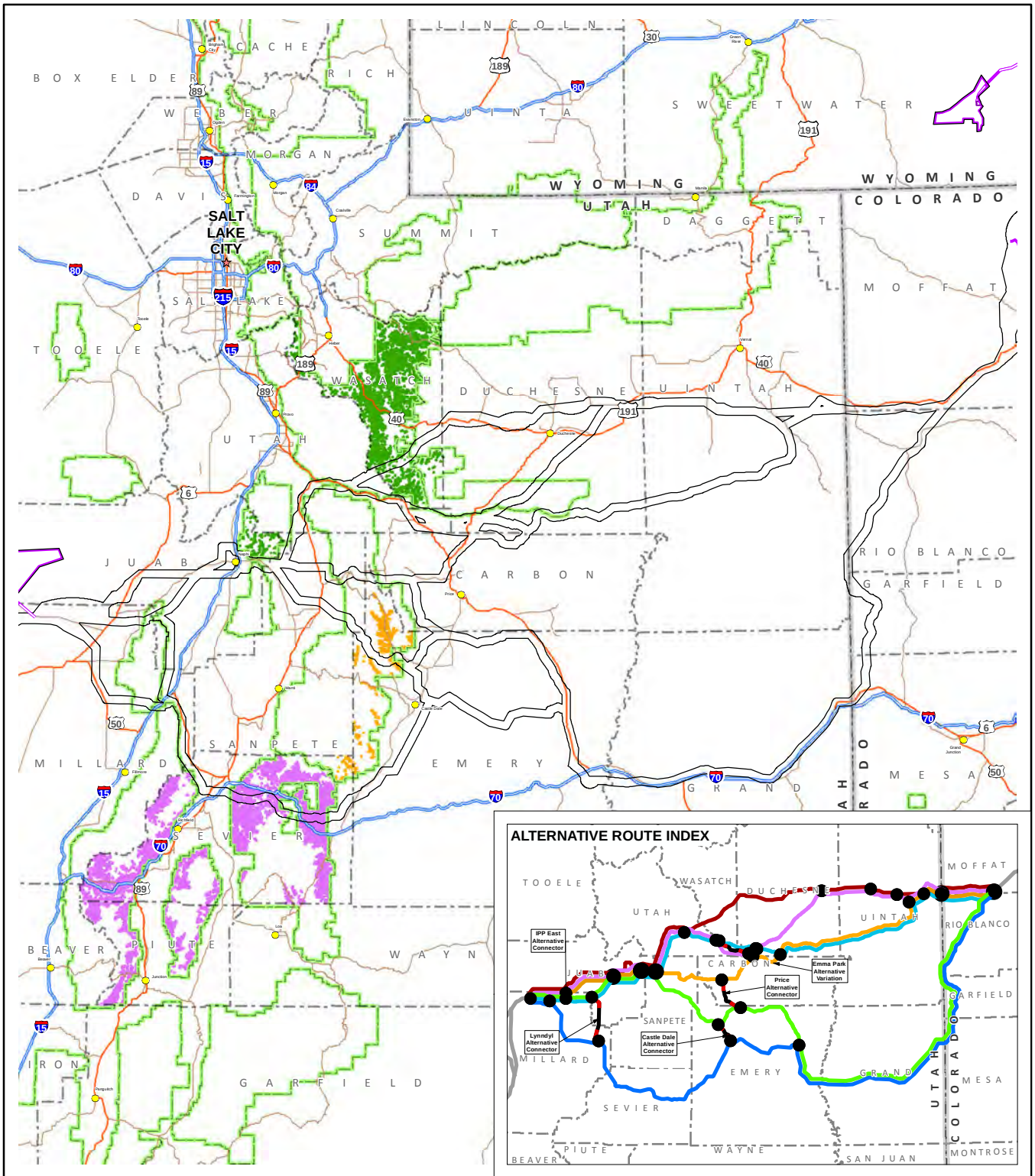

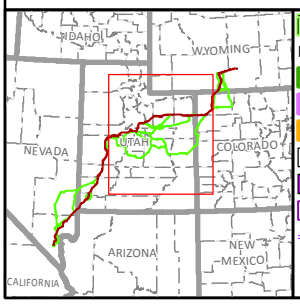

National Forest

Potential Habitat

- Dainty Moonwort
- Elsinore Buckwheat
- Link Trail Columbine
- Project Corridor
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

DEIS Alternative Routes

- Applicant Proposed II-A
- Alternative II-B
- Alternative II-C
- Alternative II-D
- Alternative II-E
- Agency Preferred II-F
- Alternative Variation or Connector
- Segment not in this Region

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.6-6
Region II
Potential Habitats for Dainty Moonwort, Elsinore Buckwheat, and Link Trail Columbine

0 10 20 40 Miles
0 10 20 40 km
1:2,250,000

N

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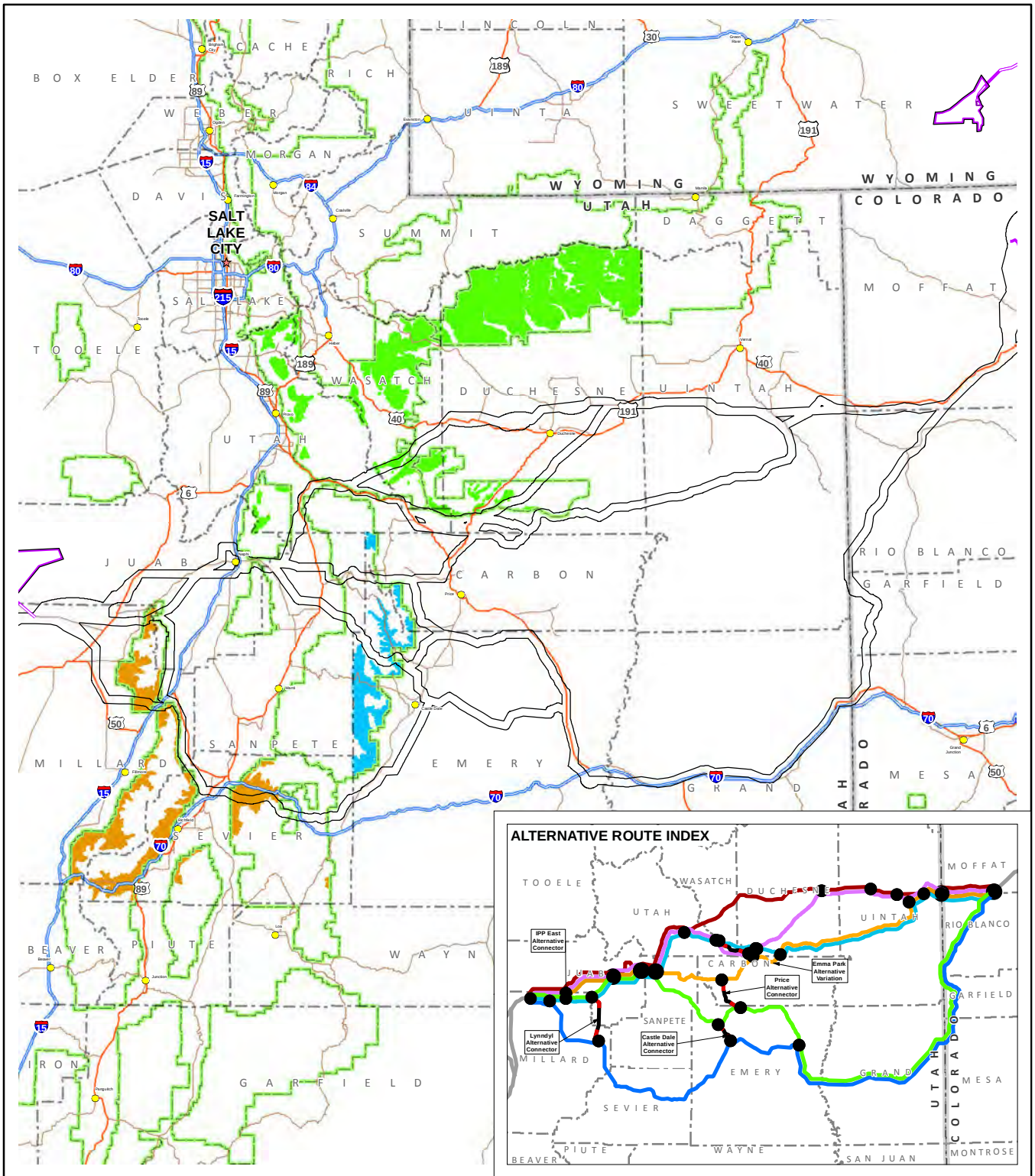

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.6-7
Region II
Potential Habitats for Slender Moonwort, Ward Beardtongue, and Canyon Sweetvetch

0 10 20 40 Miles
0 10 20 40 km
1:2,250,000
N

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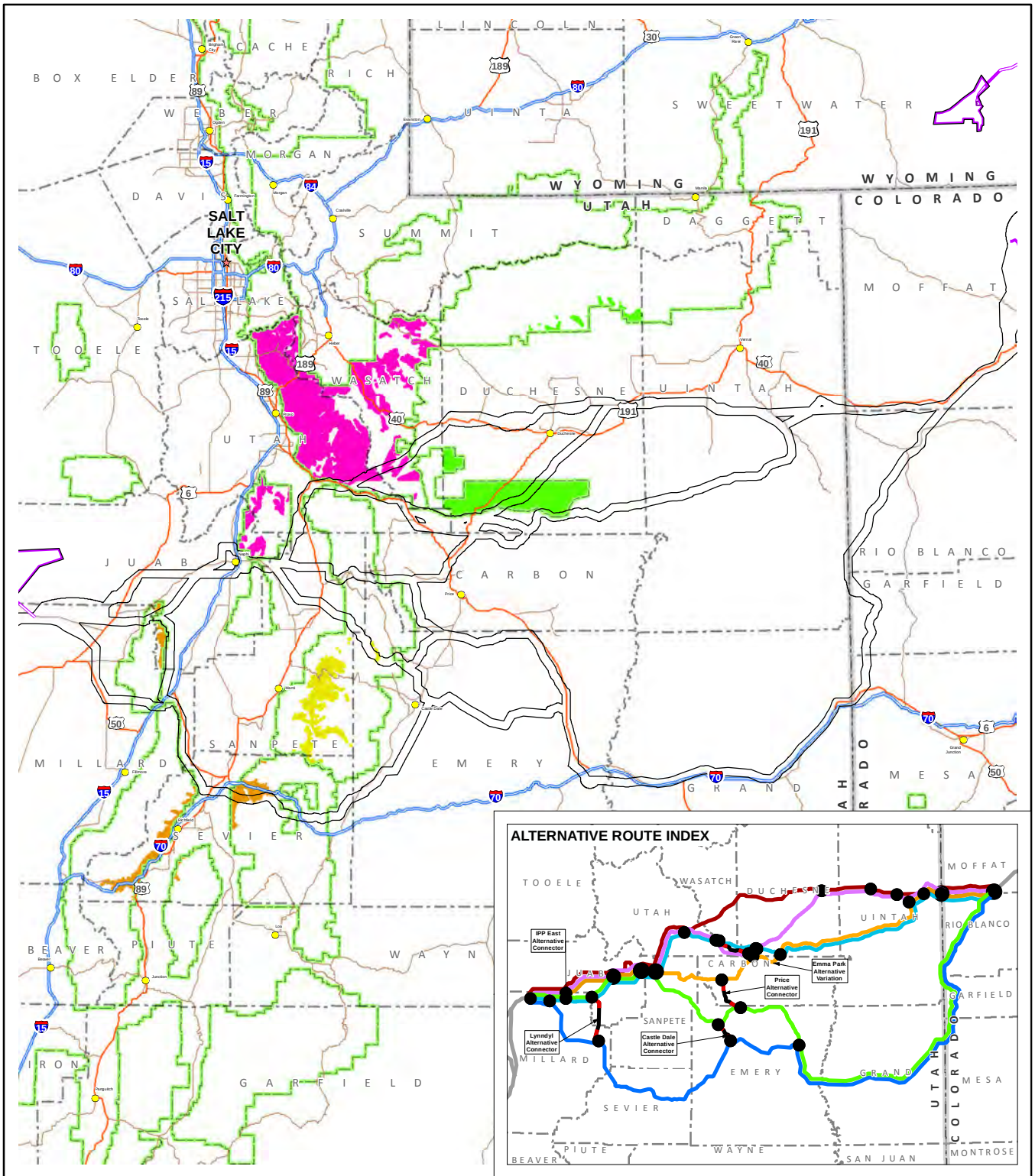

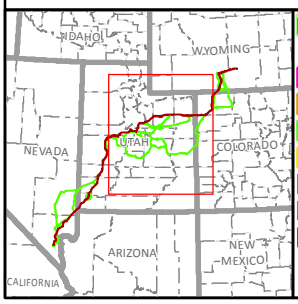

National Forest

Potential Habitat

- Wasatch Jamesia
- Sigurd Townsendia
- Duchesne Greenthread
- Carrington daisy
- Project Corridor
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

DEIS Alternative Routes

- Applicant Proposed II-A
- Alternative II-B
- Alternative II-C
- Alternative II-D
- Alternative II-E
- Agency Preferred II-F
- Alternative Variation or Connector
- Segment not in this Region

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.6-8
Region II
Potential Habitats for Wasatch Jamesia, Sigurd Townsendia, Duchesne Greenthread, and Carrington Daisy

0 10 20 40 Miles
0 10 20 40 km
1:2,250,000
N

Western AREA POWER ADMINISTRATION

Exported On: 3/13/2013

Routes and Associated Components. Based on the substantial amount of potential habitat identified within the 2-mile transmission line corridor, and the occurrence of known locations in Alternative II-B, total avoidance of potential habitat for Colorado hookless cactus may not be feasible. To minimize impacts to Colorado hookless cactus habitat, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of potential habitat for the species. In these areas, direct and indirect impacts to the species would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

Federal Species Identified as having Potential Habitat

Within Alternative II-B, potential habitat was identified for the Graham's penstemon, Jones cycladenia, Last Chance townsendia, Ute ladies'-tresses orchid, Winkler cactus, White River beardtongue, and Wright fishhook cactus, as presented in **Table 3.6-11** and illustrated in **Figures 3.6-2**, **3.6-3**, **3.6-4**, and **3.6-5**. Based on species occurrence data and agency consultation, no individuals or populations of these species have been identified within the Alternative II-B 2-mile transmission line corridor. No critical habitat has been designated for these species. Alternative II-B crosses the San Rafael Swell, which would be difficult to reclaim due to soil reclamation constraints, and low regional annual precipitation rates.

Potential habitat for the Graham's penstemon, Jones cycladenia, Last Chance townsendia, and Ute ladies'-tresses orchid each total less than 2,000 acres, and for some, less than 100 acres. Potential habitats for the Winkler cactus and White River beardtongue total approximately 5,320 and 3,058 acres, respectively, but are found in limited locations within the 2-mile transmission line corridor. Potential habitat for the Wright fishhook cactus extends over 40,000 acres within the 2-mile transmission line corridor.

Since no individuals or populations were identified within the 2-mile transmission line corridor, direct impacts to the aforementioned species are not anticipated. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. If species are identified during site-specific surveys, impacts would be avoided as per mitigation measure **SS-1**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Species-specific impact minimization and mitigation measures would be developed in consultation with the appropriate management agencies prior to construction.

To minimize and mitigate impacts to all potential habitats within the 2-mile transmission line corridors, WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented.

With implementation of mitigation measure **SS-4**, no impacts to Ute ladies'-tresses orchid habitat is anticipated. Based on the limited acreage of potential habitat identified within the 2-mile transmission line corridor for the Graham's penstemon, Jones cycladenia, and Last Chance townsendia, no impacts are anticipated for these species within Alternative II-B. As potential habitats for Winkler cactus and White River beardtongue are only found in isolated locations within the 2-mile transmission line corridor, no impacts are anticipated for these species within Alternative II-B. Given the contiguous spatial extent of potential habitat identified for the Wright fishhook cactus, complete avoidance may not be feasible. To minimize impacts to suitable habitat for the Wright fishhook cactus, mitigation measure **SS-10** would be applied. Reclamation in the habitats associated with the Wright fishhook cactus may be difficult and long-term due to the desert environment where the Wright fishhook is found. See Section 3.5,

Vegetation, for more detail on reclamation. Lack of reclamation success would result in greater loss of suitable habitat for this species.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative II-B 2-mile-wide corridor: Neese narrowleaf penstemon, Cisco milkvetch, debris milkvetch, Duchesne milkvetch, Ferron milkvetch, giant fourwing saltbush, grand buckwheat, Jones' blue star, Jones indigo-bush, narrowstem gilia, Rollins' cryptantha, and Uinta Basin springparsley. Based on a desktop review, potential habitat has been identified for 36 BLM sensitive species within the Alternative II-B 2-mile transmission line corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Alternative II-B crosses the San Rafael Swell, which would be difficult to reclaim due to soil reclamation constraints, and low regional annual precipitation rates.

The BLM sensitive species with known locations and habitat within the corridors are predominantly found in desert shrublands, rocky, barren areas, sand dunes, and shrub and pinyon-juniper communities. Impacts to species in low reclamation habitats such as rocky barren areas, sand dunes, and desert shrublands would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and woodland communities may take longer due to the timeframe needed to restore woody communities.

The WWEC BMPs, design features, and proposed mitigation presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate potential impacts to BLM sensitive species habitat.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. In such cases, additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided through implementation of the BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

USFS Sensitive Species

Based on species occurrence data and agency consultation, one species, the Carrington daisy, has been identified within the Alternative II-B 2-mile transmission line corridor. Within Alternative II-B, potential habitat has been identified for the following USFS sensitive species: canyon sweetvetch, Carrington daisy, Link Trail columbine, Maguire campion, Nevada willowherb, Sigurd townsendia, and Ward beardtongue. The canyon sweetvetch, Carrington daisy, Link Trail columbine, and Maguire campion are protected in the USFS-Manti-La Sal National Forest. The Maguire campion also is listed in the Dixie and Fishlake national forests. The Nevada willowherb, Sigurd townsendia, and Ward beardtongue are listed in the Fishlake National Forest. Species ranges and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**. Potential habitats for these species are illustrated in **Figures 3.6-6**, **3.6-7**, **3.6-8**, **3.6-9**, and **3.6-10**.

The majority of the known occurrences for Carrington Daisy are located south of the analysis area within the Manti-La Sal National Forest. The known occurrence within the 2-mile transmission line corridors is also within the Manti-La Sal National Forest. Link Trail columbine, Nevada willowherb, and Sigurd townsendia, have less than 1,000 acres of potential habitat identified within the corridors. Link Trail

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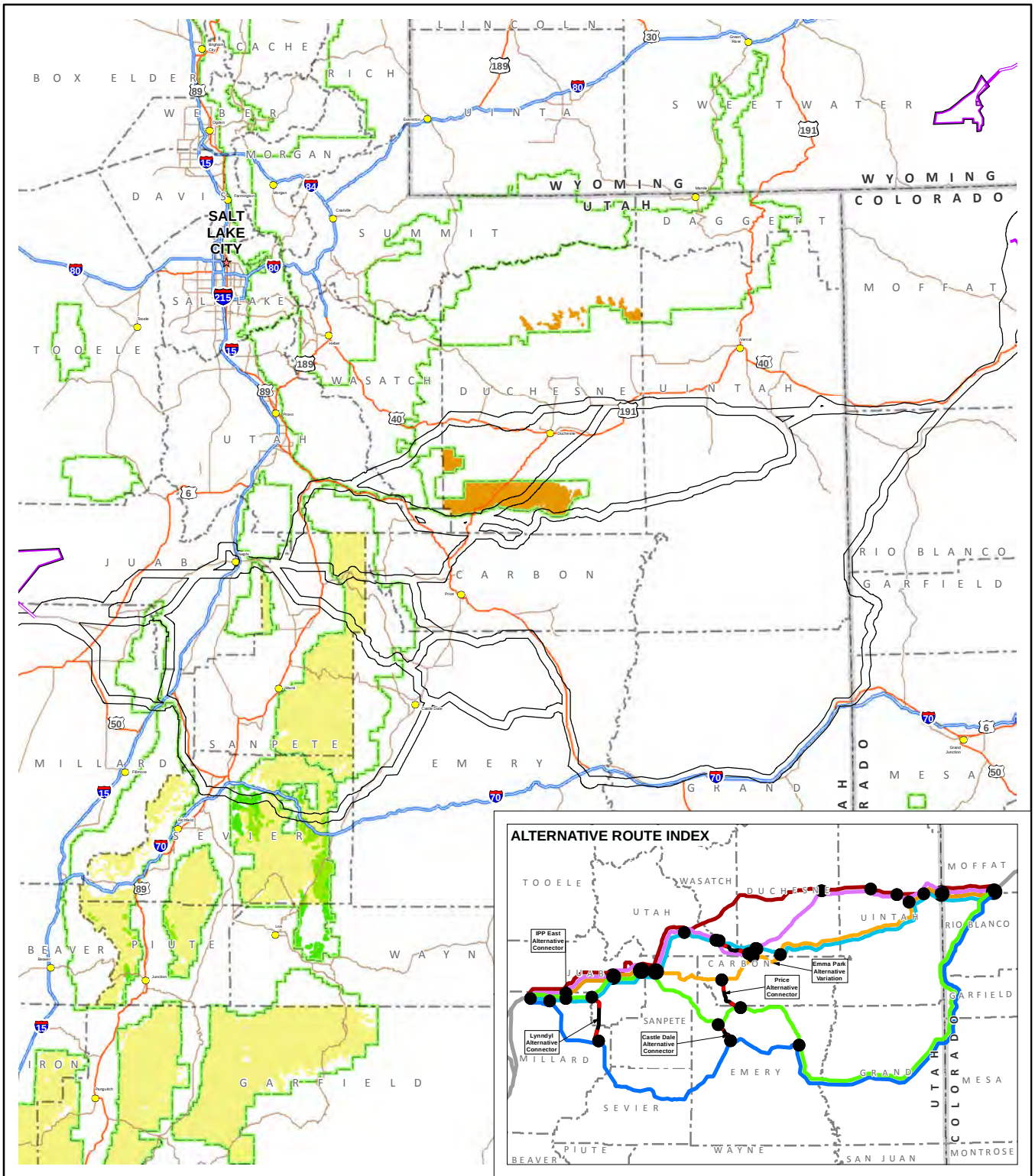

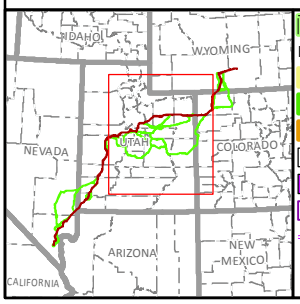

National Forest

Potential Habitat

- Maguire Campion
- Bicknell Milkvetch
- Goodrich Blazingstar
- Project Corridor
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

DEIS Alternative Routes

- Applicant Proposed II-A
- Alternative II-B
- Alternative II-C
- Alternative II-D
- Alternative II-E
- Agency Preferred II-F
- Alternative Variation or Connector
- Segment not in this Region

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.6-9
Region II
Potential Habitats for Maguire Campion, Bicknell Milkvetch, and Goodrich Blazingstar

0 10 20 40 Miles
0 10 20 40 km
1:2,250,000
N

Western AREA POWER ADMINISTRATION

Exported On: 3/13/2013

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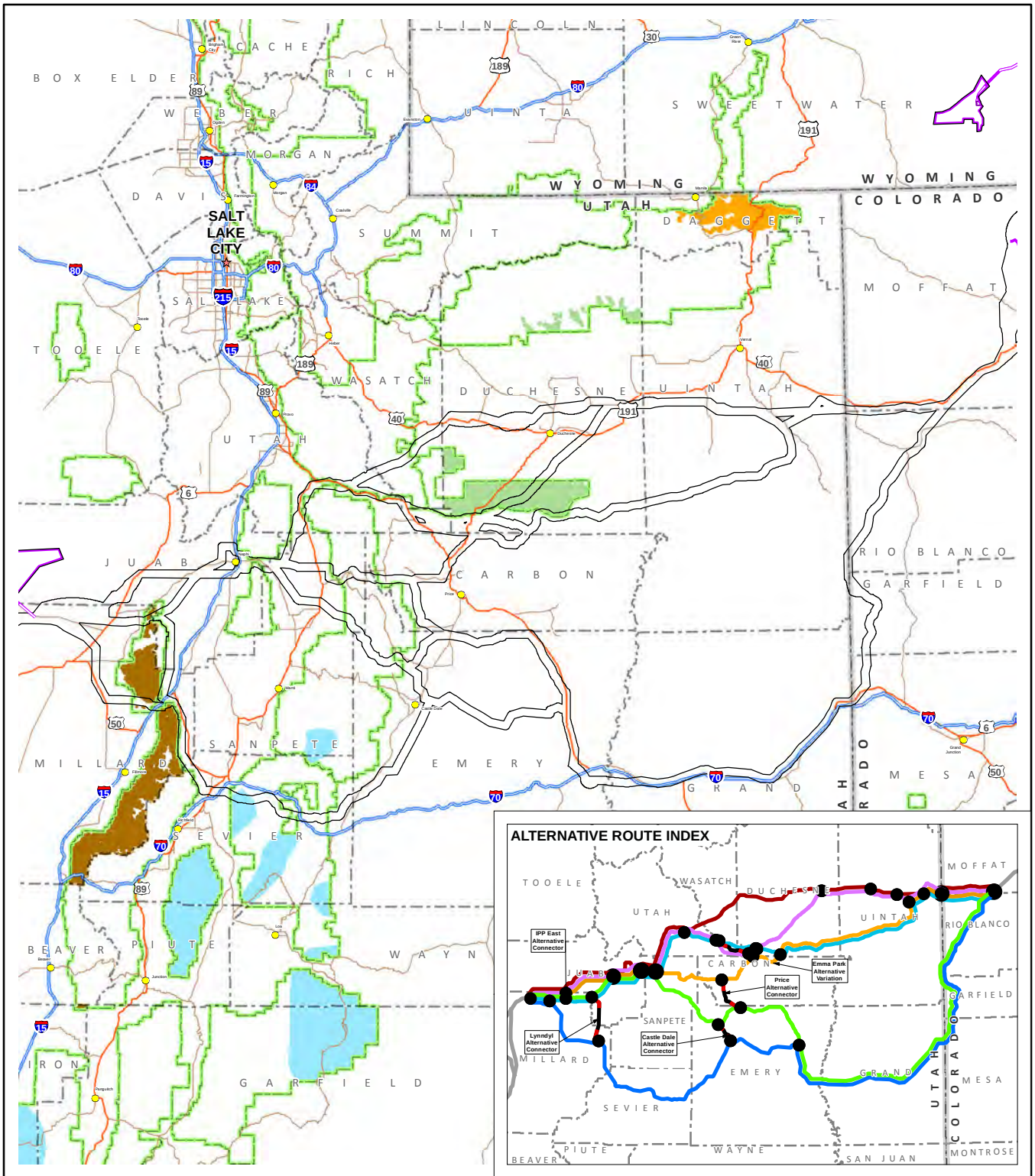

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.6-10
Region II
Potential Habitats for Arizona Willow, Nevada Willowherb, Untermann Daisy, and Stemless Beardtongue

1:2,250,000

Exported On: 3/13/2013

columbine is found in the analysis area in Manti-La Sal and Fishlake National Forests. Nevada willowherb is located completely in the analysis area in Fishlake National Forest. Ward beardtongue has approximately 1,300 acres of fairly contiguous potential habitat. Sigurd townsendia and Ward beardtongue are found within and outside the analysis area in Fishlake National Forest. The canyon sweetvetch has approximately 1,400 acres of potential habitat located in small units within the 2-mile transmission line corridor. The majority of canyon sweetvetch occurrences are found outside of the analysis area. Within the 2-mile corridor of Alternative II-B, the Maguire campion has approximately 4,300 acres of fairly contiguous potential habitat. Although not within the 2-mile transmission line corridor, most of the known Maguire campion occurrences are found within the analysis area in the Manti-La Sal National Forest.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM, USFS, and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to USFS sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4, and proposed mitigation **SS-5** and **SS-6**. For the species with limited and dispersed potential habitat (canyon sweetvetch, Carrington Daisy, Link Trail columbine, Nevada willowherb, and Sigurd townsendia), impacts to suitable habitats are not anticipated. For the species with linear stretches of contiguous habitat paralleling the corridors (Maguire campion and Ward beardtongue), total avoidance of habitat may not be feasible. To minimize impacts to Maguire campion and Ward beardtongue suitable habitats, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts in these areas would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

Alternative II-C

Colorado Hookless Cactus (Federally Threatened)

As Alternative II-C coincides with Alternative II-B through Colorado hookless cactus habitat, the acreage and occurrence data for Colorado hookless cactus under Alternative II-C is the same as that described for Alternative II-B.

As Alternative II-C coincides with Alternative II-B in this area, impacts to Colorado hookless cactus would be the same under Alternative II-C as described above for Alternative II-B.

San Rafael Cactus (Federally Endangered)

Within Alternative II-C, there is approximately 868 acres of potential habitat for the San Rafael cactus (**Table 3.6-11**, **Figure 3.6-3**). Based on species occurrence data and agency consultation, San Rafael cactus individuals or populations have been identified within the Alternative II-C corridor. No critical habitat has been designated for this species.

WWEC BMPs, TWE's design features and proposed mitigation presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. Based on the limited acreage of potential habitat and limited number of known locations in the Alternative II-C corridor, no impacts are anticipated for this species and associated habitat.

Federally Listed Species Identified as having Potential Habitat

Within the Alternative II-C 2-mile transmission line corridor, there is potential habitat identified for Graham's penstemon, Jones cycladenia, Last Chance townsendia, Ute ladies'-tresses orchid, White River beardtongue (White River penstemon), Winkler cactus, and Wright fishhook cactus, as presented in **Table 3.6-11** and illustrated in **Figures 3.6-2**, **3.6-3**, **3.6-4**, and **3.6-5**. Based on species occurrence data and agency consultation, no individuals or populations of these species have been identified within the Alternative II-C corridor. No critical habitat has been designated for these species. Habitat descriptions are similar to those described for Alternative II-B.

Based on the similar vegetation communities, list of federally listed species, and similar acres of potential habitat, impacts to federally listed species under Alternative II-C would be similar to those described above for Alternative II-B, except for Last Chance townsendia. Within Alternative II-C, 8,068 acres of fairly contiguous potential habitat for Last Chance townsendia falls within the 2-mile transmission line corridor.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4, and proposed mitigation **SS-5** and **SS-6**. For the linear stretches of contiguous Last Chance townsendia habitat in the corridor, total avoidance of habitat may not be feasible. To minimize impacts to Last Chance townsendia suitable habitats, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts in these areas would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within Alternative II-C 2-mile-wide corridor: Neese narrowleaf penstemon, Cisco milkvetch, debris milkvetch, Duchesne milkvetch, Ferron milkvetch, Grand buckwheat, Jones' blue star, Jones indigo-bush, loa milkvetch, Maguire daisy, narrowstem gilia, Pioche blazingstar, Rollins cryptantha, Sigurd townsendia, Uinta Basin springparsely, Utah phacelia, and Ward beardtongue. Based on a desktop review, potential habitat has been identified for 43 BLM sensitive species within the Alternative II-C corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

Impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. The BLM sensitive species with known locations and habitat within the corridors range from species that are found across a wide variety of habitats to those that are only found

on very specific soil and vegetation combinations. The habitats in this alternative are composed predominantly of various sandy, rocky, gravelly, and volcanic substrates that are located on outcrops, barren areas, desert, or in shrub and woodland communities such as pinyon-juniper and sagebrush communities, and desert shrublands. A few species are located in riparian and wet areas. Impacts to species in habitats with low reclamation potential such as sandy soils, cliffs, deserts, and barren, sparsely vegetated areas would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and woodland communities may take longer due to the longer time-frame to restore woody communities.

The BMPs and design features presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitats. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species or habitat avoidance of BLM sensitive species is not feasible, impacts would be consistent with those discussed in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

USFS Sensitive Species

Based on species occurrence data and agency consultation, two species, Sigurd townsendia and Ward beardtongue have been identified within the Alternative II-C 2-mile transmission line corridor. Based on a desktop review, potential habitat has been identified for the following USFS sensitive species within this corridor: Arizona willow, Bicknell milkvetch, Elsinore buckwheat, Maguire campion, Nevada willowherb, Sigurd townsendia, and Ward beardtongue. All the species are listed in the Fishlake National Forest; Arizona willow and Maguire campion are also listed in Dixie and Manti-La Sal national forests. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Potential habitats for the aforementioned species are illustrated in **Figures 3.6-6**, **3.6-7**, **3.6-8**, **3.6-9**, and **3.6-10**.

Potential habitat for Sigurd townsendia totals 4,520 acres of scattered habitat within Fishlake National Forest. Two of the areas identified as potential habitat are fairly long contiguous sections. The species is found in several locations within the analysis area and the 2-mile transmission line corridor associated with this alternative. Sigurd townsendia is found within and outside the analysis area in Fishlake National Forest. Potential habitat for the Ward beardtongue totals approximately 20,825 acres of fairly contiguous habitat within the Fishlake National Forest. Known occurrences for Ward beardtongue are found within and outside the analysis area in Fishlake National Forest.

Potential habitat for Arizona willow covers a large portion of the corridor where it crosses the Fishlake National Forest. Arizona willow is located within the analysis area in Manti-La Sal National Forest. Potential habitat for Bicknell milkvetch is located in the 2-mile transmission line corridor in the Fishlake National Forest. The potential habitat is scattered within the corridor. The majority of known occurrences of Bicknell milkvetch are located predominantly outside the analysis area. Potential habitat for Elsinore buckwheat is located in Fishlake National Forest and is found in scattered locations within the corridor, with some sections that are fairly contiguous. Documented Elsinore buckwheat occurrences are located predominantly outside the analysis area. Potential habitat for Maguire campion totals approximately, 3,700 acres and is scattered within the 2-mile transmission line corridors in Alternative II-C. The majority of the Maguire campion occurrences are found within the analysis area within Manti-La Sal National Forest. Potential habitat for Nevada willowherb totals approximately 2,100 acres of potential habitat

identified within the Alternative II-C 2-mile transmission line corridor. The species is located completely in the analysis area in Fishlake National Forest.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM, USFS, and Western prior to construction. For the species that are avoided based on the implementation of the BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

The WWEC BMPs, and TWE's design features as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to USFS sensitive species habitats. Species-specific surveys within suitable habitats, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Impacts are not anticipated for the species with limited and dispersed potential habitat (Bicknell milkvetch, Maguire campion, and Nevada willowherb). For the species with linear stretches of contiguous habitat paralleling the corridors (Arizona willow, Elsinore buckwheat, Sigurd townsendia, and Ward beardtongue), total avoidance of habitat may not be feasible. To minimize impacts to suitable habitats for Arizona willow, Elsinore buckwheat, Sigurd townsendia, and Ward beardtongue, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

Alternative II-D

Clay Reed-Mustard (Federally Threatened)

Within Alternative II-D 2-mile corridor, there is approximately 3,607 acres of potential habitat for the clay reed-mustard (**Table 3.6-11**, **Figure 3.6-3**). Based on species occurrence data and agency consultation, clay reed-mustard individuals or populations have been identified within the Alternative II-D corridors. No critical habitat has been designated for this species.

BMPs and design features presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. TWE's applicant-committed protection measures ECO-1 and ECO-4 indicate suitable habitat avoidance as the primary consideration during Project design and implementation. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the limited number of known clay reed-mustard locations in the 2-mile transmission line corridor for Alternative II-D, no direct impacts to this species are anticipated. Total avoidance of potential habitat for this species may not be feasible based on the length of contiguous potential habitat with the corridor. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied.

Graham's Penstemon

Within Alternative II-D, there is approximately 9,077 acres of potential habitat for the Graham's penstemon (**Table 3.6-11**, **Figure 3.6-5**). Based on species occurrence data and agency consultation, Graham's penstemon individuals or populations have been identified within the corridors within Alternative II-D 2-mile transmission line corridor. No critical habitat has been designated for this species.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Based on the limited number of known locations in the 2-mile transmission line corridors for Alternative II-D, no direct impacts to the Graham's penstemon are anticipated. Total avoidance of potential habitat for this species may not be feasible based on the length of contiguous potential habitat with the 2-mile transmission line corridors. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

Uinta Basin Hookless Cactus

Within Alternative II-D, there is approximately 54,839 acres of potential habitat for the Uinta Basin hookless cactus as presented in **Table 3.6-11** and illustrated in **Figure 3.6-4**. Based on species occurrence data and agency consultation, Uinta Basin hookless cactus individuals or populations have been identified within the corridors within Alternative II-D 2-mile transmission line corridor. Alternative II-D crosses Uinta Basin hookless cactus Level 1 and Level 2 core conservation areas. Disturbance in a Level 1 core conservation area may require formal consultation with the USFWS. No critical habitat has been designated for this species. Any surface disturbance within 300 feet of Uinta Basin hookless cactus would require formal consultation with the USFWS.

Based on the extent of the potential habitat, and known locations within the 2-mile corridor, total avoidance of this species and its habitat is unlikely. If avoidance is not feasible, impacts to the Uinta Basin hookless cactus would be the same as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Specific impacts of concern to the Uinta Basin hookless cactus include potential increases in illegal collection of the Uinta Basin hookless cactus, habitat fragmentation, the introduction and spread of invasive species, the loss of pollinators, fugitive dust impacts, and increased sedimentation. Reclamation in the habitats associated Uinta Basin hookless cactus may be difficult due to poor soils, invasive and noxious weeds, and low precipitation. See Section 3.5, Vegetation, for more detail on reclamation.

To mitigate Project-related impacts to Uinta Basin hookless cactus, the following mitigation measure is proposed:

SS-11: *(Uinta Basin Hookless Cactus Core Conservation Area Mitigation Measures) – Construction within Uinta Basin Hookless Cactus Level 1 and Level 2 Core Conservation areas will follow the Draft Energy Development Management Guidelines for Sclerocactus wetlandicus and Sclerocactus brevispinus Core Conservation Areas as appropriate. These include limited to no surface disturbance in core conservation areas and having an on-site botanist during construction activities. If these measures are not implemented, mitigation measures will need to be developed in consultation with the BLM and USFWS.*

Effectiveness: Implementation of mitigation measure **SS-10**, in addition to WWEC BMPs, TWE's design features and proposed mitigation presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would minimize direct and indirect impacts to the Uinta Basin hookless cactus within the Core Conservation Areas. Based on the large number of known locations and large amount of potential habitat in the 2-mile transmission line corridor for Alternative II-D, total avoidance of known locations and

potential habitat for this species is unlikely. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied. To minimize impacts to Core Conservation Areas, mitigation measure **SS-11**, would be applied. If the Level 1 Core Conservation Areas cannot be avoided, it could result in a loss of individuals and suitable habitat and formal consultation with the USFWS would be required. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

Federal Species Identified as having Potential Habitat

Within Alternative II-D, potential habitat was modeled for the shrubby reed-mustard, Ute ladies'-tresses orchid, and White River beardtongue (**Table 3.6-11** and **Figures 3.6-2**, **3.6-3**, and **3.6-4**). Based on species occurrence data and agency consultation, no individuals or populations of these species have been identified within the Alternative II-D corridor. No critical habitat has been designated for these species.

Modeled potentially suitable habitat for shrubby reed-mustard within the Alternative II-D corridor totals around 108 acres. Potential habitat for White River beardtongue totals less than 500 acres and modeled habitat for Ute ladies'-tresses orchid totals around 1,170 acres.

Since no individuals or populations were identified within the 2-mile transmission line corridor, direct impacts to the aforementioned species are not anticipated. If species are identified during species-specific surveys, species avoidance would be conducted based on mitigation measure **SS-1**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, and impact minimization and mitigation measures would be developed in consultation with the USFS, and Western prior to construction.

To minimize and mitigate impacts to all potential habitats within the 2-mile transmission line corridor, the WWEC BMPs, and TWE's design features as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, would be implemented. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**.

Based on the limited acreage of potential habitat that has been modeled in the 2-mile transmission corridor for shrubby reed-mustard, no impacts are anticipated for shrubby reed-mustard under Alternative II-D.

Given the small amount of potential habitat for White River beardtongue, no impacts are anticipated for this species within Alternative II-D. Reclamation in the habitats associated with clay reed-mustard, Uinta Basin Hookless Cactus, and shrubby reed-mustard may be difficult due to soils with low reclamation potential, invasive and noxious weeds, and low precipitation. See Section 3.5, Vegetation, for more detail on reclamation. With implementation of mitigation measure **SS-4**, no impacts to Ute ladies'-tresses orchid habitat is anticipated.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative II-D 2-mile-wide corridor: Barneby's catseye, Neese narrowleaf penstemon, debris milkvetch, Duchesne greenthread, giant fourwing saltbush, Goodrich blazingstar, Graham's penstemon, horseshoe milkvetch, and narrowstem gilia. Based on a desktop review, potential habitat has been identified for 32 BLM sensitive species within the Alternative II-D corridor. Associated ranges and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the BLM sensitive species that are avoided based on the implementation of the BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

The BLM sensitive species with known locations and habitat within the corridors range from species that are found across a wide variety of habitats to those that are only found on very specific soil and vegetation combinations. The habitats include dunes, clay substrates, ridge tops, barren, sparsely, vegetated areas; shrub and juniper communities, coniferous communities, chaparral, mountain, and mixed and desert shrublands. Two species do not have available habitat information: the cushion milkvetch and strigose Easter daisy. A conservative analysis was applied for these species and they were carried forward for detailed analysis. Impacts to species in habitats with low reclamation potential such as rocky ridgetops, sandy soils, and barren, sparsely vegetated areas would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and woodland communities may take longer due to the longer time-frame needed to restore woody communities. The WWEC BMPs, and TWE's design features as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitat.

USFS Sensitive Species

Based on species occurrence data and agency consultation, Duchesne greenthread and Goodrich blazingstar have been identified within the Alternative II-D corridor. Within this corridor, potential habitat has been identified for the following USFS sensitive species: canyon sweetvetch, dainty moonwort, Duchesne greenthread, Goodrich blazingstar, Maguire campion, Untermann daisy, and Wasatch jamesia. Canyon sweetvetch and Maguire campion are listed as sensitive in the Manti-La Sal National Forest. Maguire campion also is listed in the Dixie and Fishlake national forests. Dainty moonwort, Duchesne greenthread, Goodrich blazingstar, and Untermann daisy are listed as sensitive in the Ashley National Forest. Dainty moonwort is also listed in the Uinta-Wasatch-Cache National Forest along with the Wasatch jamesia. Associated species ranges and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Potential habitats for the aforementioned species are illustrated in **Figures 3.6-6**, **3.6-7**, **3.6-8**, **3.6-9**, and **3.6-10**.

The majority of the known occurrences for Duchesne greenthread and Goodrich blazingstar are located almost entirely in the analysis area within the Ashley National Forest. The known occurrences for both species within the Alternative II-D corridor also are within the Ashley National Forest and potential habitats for both are quite extensive.

Canyon sweetvetch, dainty moonwort, and Wasatch jamesia each have less than 5 acres of potential habitat identified within this corridor. All known occurrences of these three species are located outside of the 2-mile transmission line corridor and, for the most part, outside of the analysis area. Maguire campion has approximately 6,500 acres of fairly contiguous potential habitat within the 2-mile transmission line corridor of Alternative II-D. The majority of the Maguire campion occurrences found within the analysis area are within the Manti-La Sal National Forest. Untermann daisy is located within Ashley National Forest in the analysis area, and the potential habitat for this species covers a large portion of the Alternative II-D route where it crosses Ashley National Forest.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. If species avoidance is not feasible,

impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM, USFS, and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, and TWE's design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

The WWEC BMPs, and TWE's design features as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to USFS sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**.

For the species with limited and dispersed potential habitat (canyon sweetvetch, dainty moonwort, and Wasatch jamesia), impacts are not anticipated. For the species with linear stretches of contiguous habitat paralleling the corridors (Duchesne greenthread, Goodrich blazingstar, Maguire campion, and Untermann daisy), complete avoidance of habitat is not likely. To minimize impacts to suitable habitats for these species, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

Alternative II-E

Clay Phacelia

Within Alternative II-E, there are approximately 2,645 acres of potential habitat for the clay phacelia (**Table 3.6-11** and **Figure 3.6-5**). Based on species occurrence data and agency consultation, clay phacelia individuals or populations have been identified within the Alternative II-E corridor. No critical habitat has been designated for this species. Impacts to the species would be the similar as described for Alternative II-A.

As Alternative II-E coincides with Alternative II-A in this area, potential Project-related impacts to clay phacelia would be the same as those described above for Alternative II-A.

Deseret Milkvetch

As Alternative II-E coincides with Alternative II-A through this species' range, the acreage and occurrence data for Deseret milkvetch are the same as those described for Alternative II-A. Potential Project-related impacts to Deseret milkvetch would be the same as those described above for Alternative II-A.

Graham's Penstemon

Within Alternative II-E, there are approximately 15,080 acres of potential habitat for the Graham's penstemon (**Table 3.6-11** and **Figure 3.6-5**). Based on species occurrence data and agency consultation, Graham's penstemon individuals or populations have been identified within the Alternative II-E corridor. No critical habitat has been designated for this species.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to special status species habitat. Species-specific surveys within suitable habitat, and subsequent species

avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Based on the limited number of known locations in the Alternative II-E corridor, no direct impacts to Graham's penstemon are anticipated. Total avoidance of potential habitat for this species may not be feasible based on the length of contiguous potential habitat within the 2-mile-wide corridors. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

Ute Ladies'-tresses Orchid

Within Alternative II-E, there are approximately 3,900 acres of potential habitat for the Ute ladies'-tresses orchid as presented in **Table 3.6-8** and illustrated in **Figure 3.6-1**. Based on species occurrence data and agency consultation, Ute ladies'-tresses orchid individuals or populations have been identified within the Alternative II-E corridor. No critical habitat has been designated for this species.

BMPs, design features, and mitigation measures and effects would be similar to those presented for the Alternative I-A Ute ladies'-tresses orchid conclusion; therefore, no impacts to the Ute ladies'-tresses orchid and its associated habitat are anticipated.

Federal Species Identified as having Potential Habitat

Within Alternative II-E, there is potential habitat identified for White River beardtongue, as presented in **Table 3.6-11** and illustrated in **Figure 3.6-4**. Based on species occurrence data and agency consultation, no individuals or populations of these species have been identified within the Alternative II-E corridor. No critical habitat has been designated for these species.

Approximately 343 acres of potential habitat for White River beardtongue has been identified within the 2-mile transmission line corridor.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to special status species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Based on the small amount of potential habitat for White River beardtongue, impacts associated with Alternative II-E are not anticipated for this species.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative II-E 2-mile transmission line corridor: Argyle Canyon phacelia, Barneby's catseye, Neese narrowleaf penstemon, debris milkvetch, giant fourwing saltbush, Goodrich blazingstar, Graham's penstemon, horseshoe milkvetch, narrowstem gilia, Untermann daisy, and Utah columbine. Based on a desktop review, potential habitat has been identified for 32 BLM sensitive species within the Alternative II-A corridor. Associated species range and habitat are provided in **Appendix G, Table G-1**.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4, and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and

Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that can be avoided based on the implementation of the WWEC BMPs, TWE's design features and proposed mitigation, direct and indirect impacts are not anticipated.

The BLM sensitive species with known locations and habitat within the Alternative II-E corridor range from species that are found across a wide variety of habitats to those that are only found on very specific soil and vegetation combinations. The habitats include sandy and clay substrates, ridge tops, badlands, steep slopes, barren, and sparsely vegetated areas; shrub and juniper communities, coniferous communities, chaparral, mountain, and mixed and desert shrublands. Two species do not have available habitat information: the cushion milkvetch and strigose Easter daisy. A conservative analysis was applied for these species and they were carried forward for detailed analysis. Impacts to species in habitats with low reclamation potential such as rocky ridgetops, sandy soils, and barren or sparsely vegetated areas would greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and woodland communities may take longer due to the longer time-frame needed to restore woody communities.

The BMPs and design features presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species or habitat avoidance is not infeasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. In such cases, impact minimization and additional mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on the implementation of the BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

USFS Sensitive Species

Based on species occurrence data and agency consultation, Goodrich blazingstar and Untermann daisy have been identified within the Alternative II-E 2-mile transmission line corridor. Within this corridor, potential habitat has been identified for the following USFS sensitive species: dainty moonwort, Duchesne greenthread, Goodrich blazingstar, slender moonwort, Untermann daisy, and Wasatch jamesia. The dainty moonwort, Duchesne greenthread, Goodrich blazingstar, and Untermann daisy are listed in the Ashley National Forest. Dainty moonwort is also listed in the Uinta-Wasatch-Cache National Forest along with the Wasatch jamesia. Associated species range and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**. Potential habitat for the aforementioned species are illustrated in **Figures 3.6-6**, **3.6-7**, **3.6-8**, **3.6-9**, and **3.6-10**.

The majority of the known occurrences for Goodrich blazingstar (Goodrich stickleaf) and Untermann daisy are located almost entirely in the analysis area within the Ashley National Forest. The known occurrences for both species within the 2-mile transmission line corridor are also within the Ashley National Forest and potential habitats for both are quite extensive. Dainty moonwort has only three acres of potential habitat identified within the corridors. Within the analysis area, dainty moonwort is found in wet, marshy, and spring areas around 8,000 feet. The majority of the known occurrences for Duchesne greenthread are located almost entirely in the analysis area within the Ashley National Forest. For Duchesne greenthread, there is approximately 9,500 acres of potential habitat that is extensive in the Alternative II-E 2-mile corridors within the Ashley National Forest. Slender moonwort has 152 acres of potential habitat within the Ashley National Forest. Within the analysis area, slender moonwort is

found above 9,000 feet in riparian and wet areas. Wasatch jamesia has 343 acres of potential habitat identified in the Uinta National Forest. The species occurrences for Wasatch jamesia are located outside of the analysis area.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM, USFS, and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, and TWE's design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

The WWEC BMPs, and TWE's design features presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to USFS sensitive species habitats. Species-specific surveys within suitable habitats, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. For the species with limited and dispersed potential habitat (dainty moonwort, slender moonwort, and Wasatch jamesia), impacts are not anticipated. For the species with linear stretches of contiguous habitat paralleling the corridors (Duchesne greenthread, Goodrich blazingstar, and Untermann daisy), total avoidance of habitat is not likely. To minimize impacts to Duchesne greenthread, Goodrich blazingstar, Maguire campion, and Untermann daisy suitable habitats, mitigation measure **SS-10** would be applied. For the areas that cannot be avoided, there would be a loss of suitable habitat for the species. For these species, impacts would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

Alternative II-F (Agency Preferred)

Clay Phacelia

Within Alternative II-F 2-mile corridor, there are approximately 2,645 acres of potential habitat for the clay phacelia (**Table 3.6-11** and **Figure 3.6-5**). Based on species occurrence data and agency consultation, clay phacelia individuals or populations have been identified within the Alternative II-F corridor. No critical habitat has been designated for this species. Impacts to the species would be similar as those described for Alternative II-A.

As Alternative II-F coincides with Alternative II-E in this area, potential Project-related impacts to clay phacelia would be the same as those described above for Alternative II-E.

Desert Milkvetch

As Alternative II-F coincides with Alternative II-A through this species' range, the acreage and occurrence data for Deseret milkvetch are the same as those described for Alternative II-A. Potential Project-related impacts to Deseret milkvetch would be the same as those described above for Alternative II-A.

Graham's Penstemon

Within Alternative II-F, there are approximately 18,622 acres of potential habitat for the Graham's penstemon (**Table 3.6-11** and **Figure 3.6-5**). Based on species occurrence data and agency

consultation, Graham's penstemon individuals or populations have been identified within the Alternative II-F corridor. No critical habitat has been designated for this species.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to special status species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (Appendix C), and proposed mitigation **SS-5** and **SS-6**. Based on the limited number of known locations in the Alternative II-F corridor, no direct impacts to Graham's penstemon are anticipated. Total avoidance of potential habitat for this species may not be feasible based on the length of contiguous potential habitat within the 2-mile wide corridors. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Avoidance of the known occurrences and suitable habitat would be difficult if another transmission line was routed in the same corridor as the TWE proposed Project.

Clay Reed-mustard

As Alternative II-F coincides with Alternative II-D through this species' range, the acreage and occurrence data for the clay reed-mustard are the same as those described for Alternative II-D. Potential Project-related impacts to the clay reed-mustard would be the same as those described above for Alternative II-D.

Uinta Basin Hookless Cactus

As Alternative II-F coincides with Alternative II-D through this species' range, the acreage and occurrence data for the Uinta Basin hookless cactus are the same as those described for Alternative II-D. Potential Project-related impacts to the Uinta Basin hookless cactus would be the same as those described above for Alternative II-D.

Federal Species Identified as having Potential Habitat

Within Alternative II-F 2-mile corridor, there is potential habitat identified for shrubby reed-mustard, Ute ladies'-tresses orchid, and White River beardtongue, as presented in **Table 3.6-11** and illustrated in **Figures 3.6-2**, **3.6-3**, and **3.6-4**. Based on species occurrence data and agency consultation, no individuals or populations of these species have been identified within the Alternative II-F corridor. No critical habitat has been designated for these species.

Approximately 108 acres of potential habitat for shrubby reed-mustard; 2,228 acres of potential habitat for Ute ladies'-tresses orchid; and 400 acres of potential habitat for the White River beardtongue were identified within the 2-mile transmission line corridor.

WWEC BMPs, TWE's design features and proposed mitigation presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to special status species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**.

BMP's design features, mitigation measures, and their effects would be similar to those presented for Alternative I-A conclusion; therefore, no impacts to Ute ladies'-tresses orchid and its habitat are anticipated. Reclamation in the habitats associated with shrubby reed-mustard may be difficult due to low reclamation soils, invasive and noxious weeds, and low precipitation. See Section 3.5, Vegetation,

for more detail on reclamation. Based on the small amount of potential habitat for White River beardtongue and shrubby reed-mustard, impacts associated with Alternative II-F are not anticipated for these species.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative II-F corridor: debris milkvetch, narrowstem gilia, Argyle Canyon phacelia, Barneby's catseye, Neese narrowleaf penstemon, giant fourwing saltbush, Goodrich blazingstar, Graham's penstemon, horseshoe milkvetch, and Duchesne greenthread. Based on a desktop review, potential habitat has been identified for 34 BLM sensitive species within the Alternative II-F corridor. Associated species range and habitat are provided in **Appendix G, Table G-1**.

The BLM sensitive species with known locations and habitat within the Alternative II-F corridor range from species that are found across a wide variety of habitats to those that are only found on very specific soil and vegetation combinations. The habitats include sandy and clay substrates, ridge tops, badlands, steep slopes, barren, and sparsely vegetated areas; shrub and juniper communities, coniferous communities, chaparral, mountain, and mixed and desert shrublands. Impacts to species in habitats with low reclamation potential such as rocky ridgetops, sandy soils, and barren or sparsely vegetated areas, would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and woodland communities may take longer due to the longer time-frame needed to restore woody communities.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to special status species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that can be avoided based on the implementation of the WWEC BMPs, TWE's design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

USFS Sensitive Species

Based on species occurrence data and agency consultation, the Goodrich blazingstar and Duchesne greenthread have been identified within the Alternative II-F 2-mile transmission line corridor. Within this corridor, potential habitat has been identified for the following nine USFS sensitive species: Nevada willowherb, dainty moonwort, slender moonwort, Duchesne greenthread, Goodrich blazingstar, Untermann daisy, Wasatch jamesia, Ward beardtongue, and Sigurd townsendia. The dainty moonwort, Duchesne greenthread, Goodrich blazingstar, and Untermann daisy are listed as sensitive in the Ashley National Forest. Dainty moonwort also is listed as sensitive in the Uinta-Wasatch-Cache National Forest along with the Wasatch jamesia. Associated species range and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**. Potential habitat for the aforementioned species are illustrated in **Figures 3.6-6**, **3.6-7**, **3.6-8**, **3.6-9**, and **3.6-10**.

The majority of the known occurrences for Goodrich blazingstar (Goodrich stickleaf) and Untermann daisy are located almost entirely in the analysis area within the Ashley National Forest. The known occurrences for both species within the 2-mile transmission line corridor also are within the Ashley National Forest and potential habitats for both species are quite extensive. Dainty moonwort has only 7 acres of potential habitat identified within the corridors. Within the analysis area, dainty moonwort is

found in wet, marshy, and spring areas around 8,000 feet amsl. The majority of the known occurrences for Duchesne greenthread are located almost entirely in the analysis area within the Ashley National Forest. For Duchesne greenthread, there is approximately 3,500 acres of potential habitat in the Alternative II-F 2-mile corridor within the Ashley and Uinta national forests. Slender moonwort has 608 acres of potential habitat within the Ashley National Forest. Within the analysis area, slender moonwort is found above 9,000 feet in riparian and wet areas. Wasatch jamesia has 343 acres of potential habitat identified in the Uinta National Forest. The species occurrences for Wasatch jamesia are located outside of the analysis area. Ward beardtongue has approximately 1,300 acres of fairly contiguous potential habitat in the 2-mile corridor.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to USFS sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation measures **SS-5** and **SS-6**. For the species with limited and dispersed potential habitat (dainty moonwort, slender moonwort, Nevada willowherb, Sigurd townsendia, and Wasatch jamesia), impacts are not anticipated. For the species with linear stretches of contiguous habitat paralleling the corridors (Duchesne greenthread, Untermann daisy, and Ward beardtongue), total avoidance of habitat is not likely. To minimize impacts to Duchesne greenthread, Untermann daisy, and Ward beardtongue suitable habitats, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

Along Alternative II-A, three micro-siting options exist in the area of the Strawberry IRA. There are three Federal Species identified as having potential habitat in the micro-siting area, including Barneby ridecress, clay phacelia, and Ute ladies'-tresses orchid. The micro-siting options do not differ from each other or the comparable portion of Alternative II-A in their effects on the three Federal Species' potential habitat. There are also three USFS Sensitive Species identified as having potential habitat in the micro-siting area, including dainty moonwort, slender moonwort, and Wasatch jamesia. The micro-siting options do not differ from each other or the comparable portion of Alternative II-A in their effects on the three USFS Sensitive Species' potential habitat.

Alternative Variation in Region II

Emma Park Alternative Variation

The Emma Park Alternative Variation would reduce impacts on special status species potential habitat compared to Alternative II-F. The Emma Park Alternative Variation would avoid the portions of Alternative II-F that run along the Ashley and Uinta National Forests, therefore completely avoiding potential habitat for five USFS Sensitive Species, including Duchesne greenthread, Goodrich blazingstar, dainty moonwort, slender moonwort, and Untermann daisy, while reducing the acreage impacted for Wasatch jamesia from 77 acres to 18 acres. The Emma Park Alternative Variation would also completely avoid potential habitat for the Federally Listed Graham's penstemon, which intersects 9,545 acres of Alternative II-F.

Alternative Connectors in Region II

Table 3.6-12 summarizes the impacts and advantages/disadvantages associated with the four alternative connectors in Region II based on known occurrences and potential habitat identification within the 2-mile transmission line corridors.

Table 3.6-12 Summary of Region II Alternative Connector Impacts for Special Status Plant Species

Alternative Connector	Analysis	Advantage
Highway 191 Alternative Connector	No known populations or potential habitat for special status plant species.	The advantage of using this alternative connector would include avoidance of special status plant species.
Price Alternative Connector	Potential habitat for two federally listed species (i.e., Wright fishhook cactus [approx. 13 acres] and Last Chance townsendia [approximately 12 acres]) is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential habitat disturbance to two federally listed species.
Castle Dale Alternative Connector	Potential habitat for two federally listed species (i.e., Wright fishhook cactus [approx. 1,450 acres] and Last Chance townsendia [approximately 32 acres]) and seven BLM sensitive species (Creutzfeldt flower, entrada rushpink, Horse Canyon stickleaf, trotter oreoxis, Jones indigo-bush, psoralea globemallow, and Thompson talinum) is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential habitat disturbance to two federally listed species and seven BLM sensitive species.
Lynndyl Alternative Connector	Potential habitat for one federally listed species (i.e., Ute ladies'-tresses orchid [approximately 1 acre]; three USFS sensitive species (i.e., Nevada willowherb [approximately 194 acres], Ward beardtongue [approximately 885 acres], Sigurd townsendia [approximately 344 acres]), and seven BLM sensitive species (*Arabis goodrichii,* Nevada willowherb, giant saltbush, ibex buckwheat, Neese narrowleaf penstemon, Ward beardtongue, and Sigurd townsendia) is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential habitat disturbance to one federally listed species, three USFS sensitive species, and seven BLM sensitive species.
IPP East Alternative Connector	Known populations of the giant fourwing saltbush (BLM sensitive species) are located within the 2-mile transmission line corridor, and could be impacted by Project-related activities. Potential habitat for four BLM sensitive species (*Arabis goodrichii,* giant saltbush, ibex buckwheat, Neese narrowleaf penstemon) is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals of one BLM sensitive species and potential habitat disturbance to four BLM sensitive species.

Region II Conclusion

The only known population of Deseret milkvetch is located along the 2-mile corridors for Alternatives II-A, II-E, and II-F. Implementation of **SS-8** would avoid impacts to Deseret milkvetch within the ROW. Indirect impacts to the species could potentially result from fugitive dust and noxious weed impacts. Within the Alternatives II-A, II-E, and II-F 2-mile corridors are located the majority of the known occurrences of clay phacelia. Based on the current reference line, the known locations for the species would be avoided; however, species could be impacted by erosion from construction activities based on its proximity between the main highway and the potential locations for the proposed transmission line. Direct impacts to clay phacelia could occur, especially if another second transmission line is located within the corridor. Predominately, indirect impacts to the species could predominantly result from erosion and sedimentation. Implementation of **SS-5** and **SS-10** would mitigate impacts to the species

through avoidance of known populations of high quality habitat and the implementation of stringent erosion controls.

Within Region II, Alternative II-F has the highest number of known occurrences of federally listed species, while the number of federally listed species with potential habitat is greatest in Alternative II-D and Alternative II-F impact the greatest acreage of potential habitat for federally listed species. Alternative II-C impacts the greatest number of BLM species. Alternative II-A impacts the least number of USFS species and potential habitat.

For species in along Alternatives II-B and II-C, within the San Rafael Swell, reclamation would be difficult and impacts potentially long-term based on the desert environment and poor soils characteristics of the San Rafael Swell.

3.6.6.5 Region III

Table 3.6-13 provides a comparison of impact parameters associated with the alternative routes in Region III based on known occurrences and potential habitat identified within the 2-mile transmission line corridors for special status plant species. Based on species occurrence information and habitat associations, 51 special status plant species may be impacted by the Project in Region III including 46 BLM sensitive species, 2 Forest sensitive species, 5 Nevada state listed species, and 4 federally listed species. To determine the location and spatial extent of potentially suitable habitat for federally listed species within the 2-mile transmission line corridors, a habitat assessment was conducted using ArcGIS and best available GIS datasets based on the habitat characteristics associated with individual species. Selected datasets and species parameters are detailed within the Special Status Species Survey Plan under development. Species occurrence and associated habitats in Region III are provided in **Appendix G**, **Table G-1**.

Table 3.6-13 Summary of Region III Alternative Route Impacts for Special Status Plant Species

Parameter	Alternative III-A	Alternative III-B	Alternative III-C
Federally Listed Species			
Number of species with known occurrences impacted	1	1	1
Number of species with potential habitat impacted	3	2	2
Acreage of critical habitat impacted	--	--	--
Acreage of Las Vegas Buckwheat potential habitat impacted	11,591	4,442	7,088
Acreage of Shivwitz Milkvetch potential habitat impacted	195	0	0
Acreage of Siler Pincushion Cactus potential habitat impacted	2,904	0	0
Acreage of Ute ladies'-tresses orchid potential habitat impacted	0	18	977
BLM Sensitive Species			
Number of species with known occurrences impacted	9	9	7
Number of species with potential habitat impacted	31	38	38
USFS Sensitive Species			
Number of species with known occurrences impacted	1	0	0
Number of species with potential habitat impacted	2	0	0
Acreage of Pinyon Penstemon potential habitat impacted	15,573	0	0
Nevada State Listed Species			
Number of species with known occurrences impacted	3	3	1
Number of species with potential habitat impacted	4	6	6

Alternative III-A (Applicant Proposed)

Las Vegas Buckwheat (Federal Candidate)

Within Alternative III-A, there is approximately 11,591 acres of potential habitat for the Las Vegas buckwheat as presented in **Table 3.6-13** and illustrated in **Figure 3.6-11**. Based on species occurrence data and agency consultation, Las Vegas buckwheat individuals or populations have been identified within the Alternative III-A corridor. Critical habitat is not designated for candidate species; therefore, a critical habitat assessment was not completed.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4, and proposed mitigation **SS-5** and **SS-6**. Based on the limited occurrence of known locations in Alternative III-A, direct impacts to this species are not anticipated, but the extensive area of potential habitat makes total avoidance of Las Vegas buckwheat habitat unlikely. With implementation of mitigation measures **SS-5** and **SS-10**, in conjunction with mitigation measures **SS-1** and **SS-3**, WWEC BMP's, and TWE's design features, impacts to high quality habitats would be avoided. The areas not avoided would result in loss of suitable habitat for the species. For these areas, impacts would be as described in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

Federal Species Identified as having Potential Habitat

Within Alternative III-A 2-mile corridor, there is potential habitat identified for Shivwitz milkvetch and Siler pincushion cactus as presented in **Table 3.6-13** and illustrated in **Figures 3.6-11** and **3.6-12**. Based on species occurrence data and agency consultation, no individuals or populations of these species have been identified within the Alternative III-A corridor. No critical habitat has been designated for Siler pincushion cactus. Although critical habitat has been designated for the Shivwitz milkvetch, the corridor is located approximately five miles northwest of the closest critical habitat location.

Since no individuals or populations were identified within the 2-mile transmission line corridor, direct impacts to the aforementioned species are not anticipated. If these species are identified during site-specific surveys, impacts would be avoided based on mitigation measure **SS-1**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, and impact minimization and mitigation measures would be developed in consultation with the USFWS, BLM, and Western prior to construction.

To minimize and mitigate impacts to all potential sensitive plant species habitats within the 2-mile transmission line corridors, WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Based on the limited range of both species, and the amount of acreage potential habitat identified for them, no impacts are anticipated for these species under Alternative III-A.

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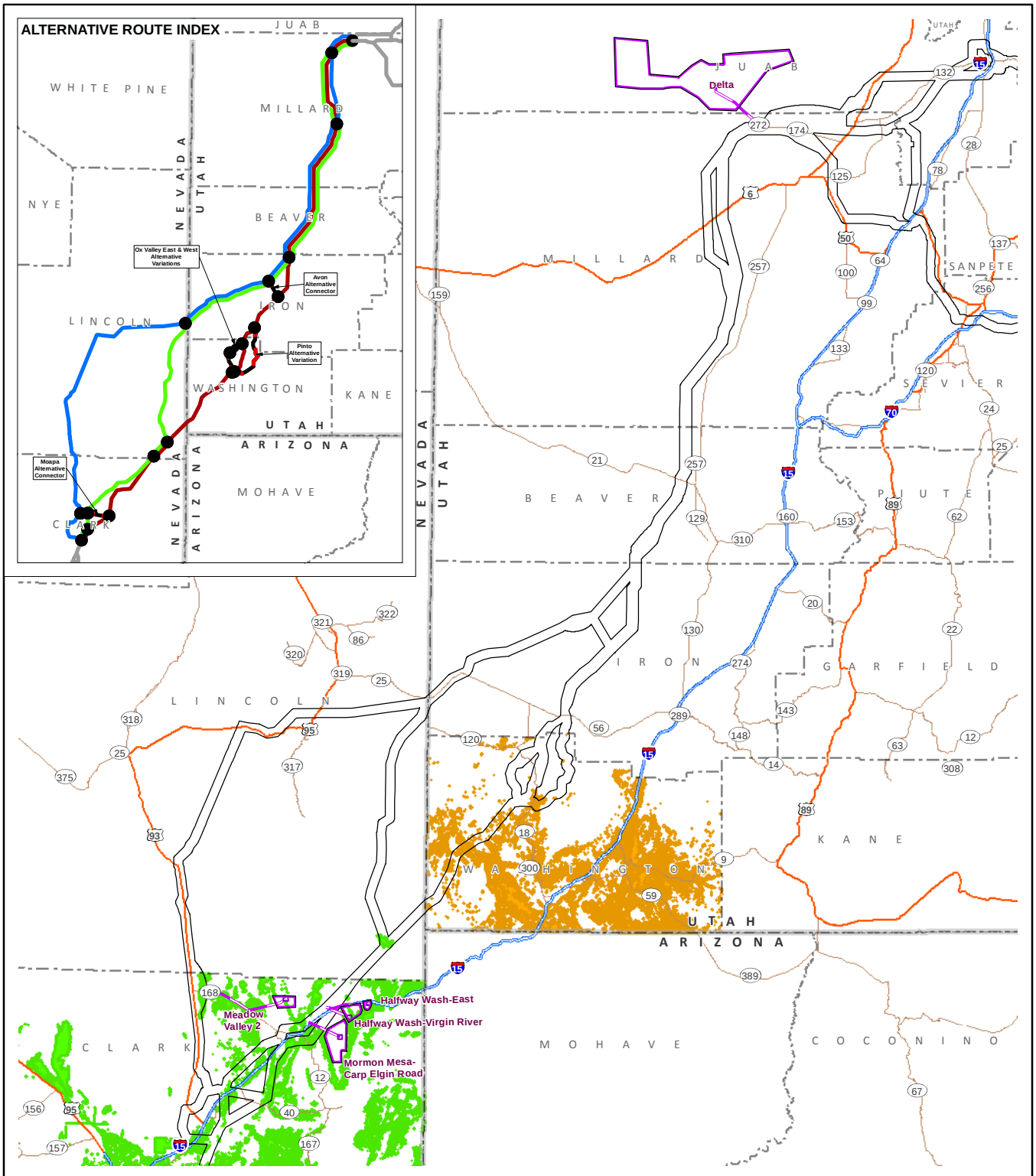

Potential Habitat
- Las Vegas Buckwheat
- Siler Pincushion Cactus
- Project Corridor
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

DEIS Alternative Routes
- Applicant Proposed III-A
- Agency Preferred III-B
- Alternative III-C
- Alternative Variation or Connector
- Segment not in this Region

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.6-11
Region III
Potential Habitats for
Las Vegas Buckwheat and
Siler Pincushion Cactus

0 10 20 40 Miles
0 10 20 40 km
1:2,000,000

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Western AREA POWER ADMINISTRATION

Exported On: 6/5/2013

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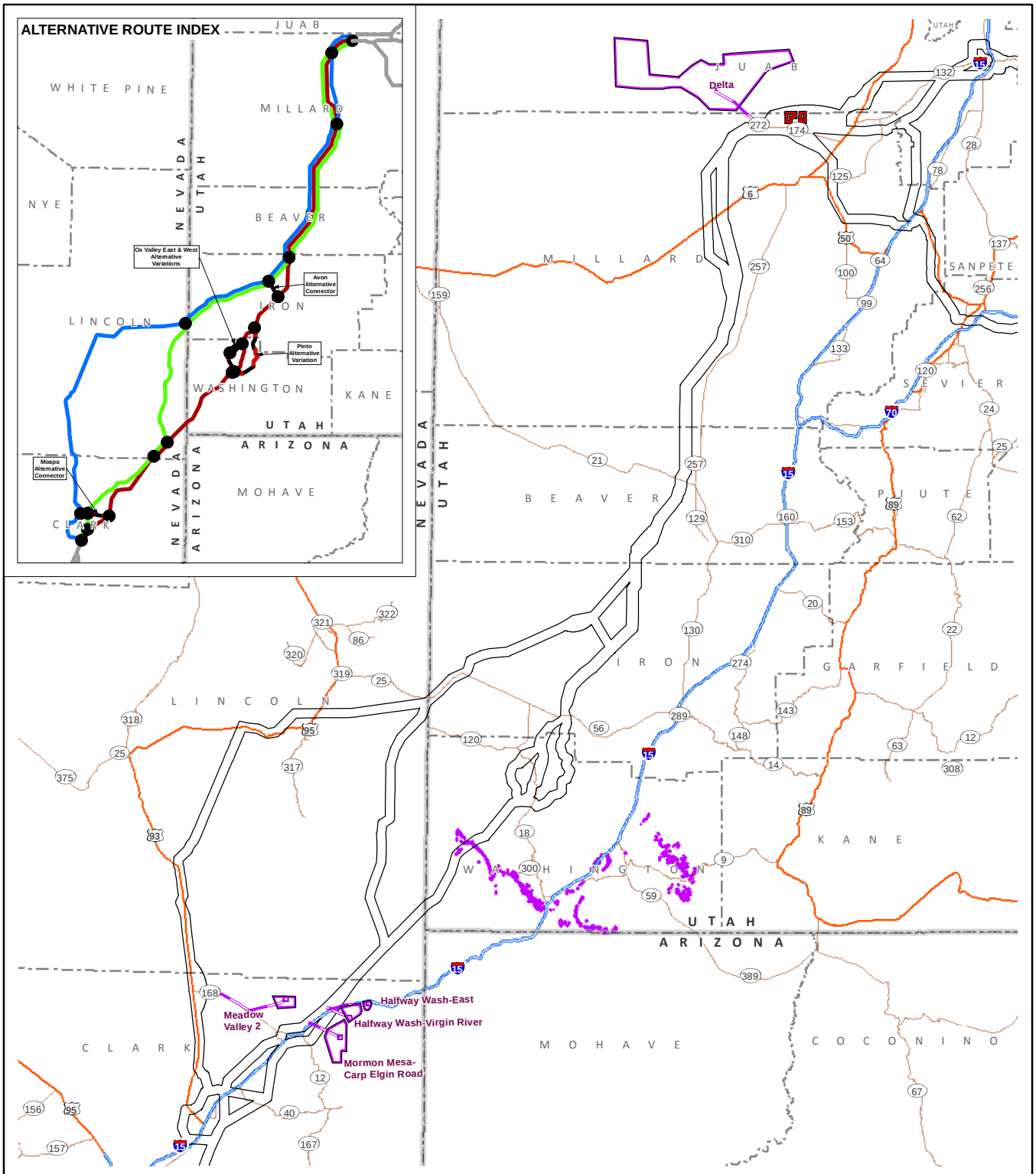

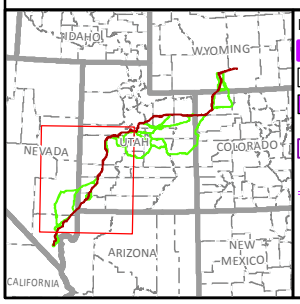

Potential Habitat

- Shivwitz Milkvetch
- Project Corridor
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

DEIS Alternative Routes

- Applicant Proposed III-A
- Agency Preferred III-B
- Alternative III-C
- Alternative Variation or Connector
- Segment not in this Region

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.6-12
Region III
Potential Habitat for
Shivwitz Milkvetch

0 10 20 40 Miles
0 10 20 40 km
1:2,000,000

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Western AREA POWER ADMINISTRATION

Exported On: 6/5/2013

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the corridors associated with Alternative III-A: Beaver Dam breadroot, Jones' globemallow, Las Vegas buckwheat, rosy twotone beardtongue, silverleaf sunray, sticky buckwheat, sticky ringstem, pinyon penstemon, and threecorner milkvetch. Based on a desktop review, potential habitat has been identified for 31 BLM sensitive species within the Alternative III-A corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

The BLM sensitive species with known locations and habitat within the corridors vary from species that are found across a wide range of habitats to those that are only found on very specific soil and vegetation combinations. The habitats include wetland and riparian areas, shrub and pinyon-juniper communities, sandy soils, barren, rocky, sparsely vegetated areas, shrub-steppe communities, mountain and mixed desert shrub communities, grasslands, bluffs, cliffs, canyons, dry washes, and volcanic substrates. Impacts to species in habitats with low reclamation potential such as sandy soils, and barren or sparsely vegetated areas, would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and pinyon-juniper communities may take longer due to the longer time-frame to restore woody communities.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitat.

Site- and species-specific surveys within suitable habitat, and subsequent avoidance of documented occurrences, would be conducted through the implementation of mitigation measure **SS-2**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on the implementation of the BMPs, applicant-committed design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

USFS Sensitive Species

Based on species occurrence data and agency consultation, one species, the pinyon penstemon, has been identified within the Alternative III-A corridor. Within Alternative III-A, potential habitat has been identified for pinyon penstemon. Pinyon penstemon is listed in the Dixie National Forest. Associated species range and habitat descriptions for this species is provided in **Appendix G**, **Table G-1**. Potential habitats are illustrated in **Figure 3.6-13**.

Within the analysis area, pinyon penstemon is found entirely in Dixie National Forest. The potential habitat of 15,573 acres is found extensively in large contiguous sections through the corridor for this alternative.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM, USFS, and Western prior to construction. For the species that are avoided based on the implementation of the BMPs, design features, applicant-committed protection measures, and proposed mitigation measures, direct and indirect impacts are not anticipated.

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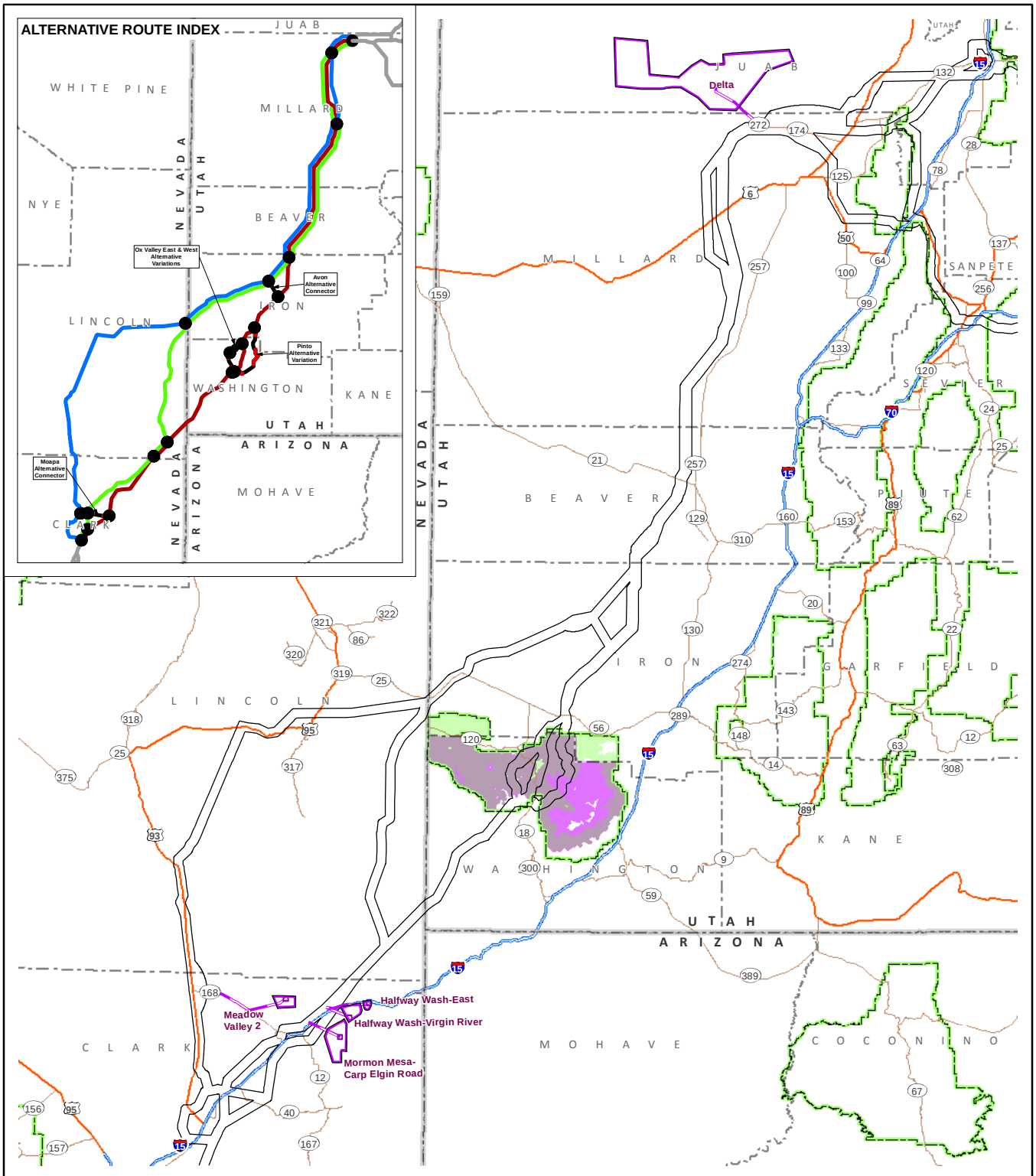

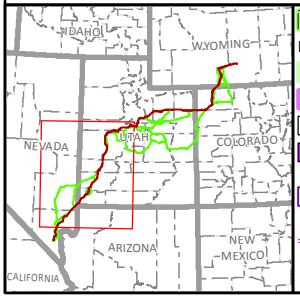

National Forest

Potential Habitat

- Pinyon Penstemon
- Guard Milkvetch
- Project Corridor
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

DEIS Alternative Routes

- Applicant Proposed III-A
- Agency Preferred III-B
- Alternative III-C
- Alternative Variation or Connector
- Segment not in this Region

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.6-13
Region III
Potential Habitats for Pinyon Penstemon and Guardian Milkvetch

0 10 20 40 Miles
0 10 20 40 km
1:2,000,000

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Western AREA POWER ADMINISTRATION

Exported On: 6/5/2013

The WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to USFS sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-3**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. For both species, total avoidance of habitat may not be feasible based on the extensive coverage of the potential habitat within the corridor associated with this Alternative. To minimize impacts to suitable habitats, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species.

Nevada State Listed Species

Based on species occurrence data and agency consultation, the following three Nevada state listed species have been identified within the Alternative III-A corridor: threecorner milkvetch, Las Vegas buckwheat, and sticky buckwheat. Based on a desktop review, potential habitat within the Alternative III-A 2-mile corridor has been identified for the following four Nevada state listed species: Las Vegas bearpoppy, threecorner milkvetch, Las Vegas buckwheat, and sticky buckwheat. Associated species ranges and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

Potential Project-related impacts to State of Nevada-listed sensitive species would be the same as described above for Alternative III-A Las Vegas Buckwheat and Alternative III-A BLM Sensitive Species.

Alternative III-B (Agency Preferred)

Las Vegas Buckwheat (Federal Candidate)

Within Alternative III-B 2-mile corridor, there are approximately 4,442 acres of potential habitat for the Las Vegas buckwheat as presented in **Table 3.6-13** and illustrated in **Figure 3.6-11**. Based on species occurrence data and agency consultation, Las Vegas buckwheat individuals or populations have been identified within the Alternative III-B corridor. Critical habitat is not designated for candidate species; therefore, a critical habitat assessment was not completed.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Based on the location of the potential habitat identified in the corridor for this alternative, and the occurrence of known locations in Alternative II-B, total avoidance of potential habitat for this species may not be feasible. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

Federal Species Identified as having Potential Habitat

Within Alternative III-B 2-mile corridor, there is potential habitat identified for Ute ladies'-tresses orchid as presented in **Table 3.6-13**. Based on species occurrence data and agency consultation, no individuals or populations of this species have been identified within the Alternative III-B corridor. No critical habitat has been designated for Ute ladies'-tresses orchid.

Since no individuals or populations were identified within the 2-mile transmission line corridor, direct impacts to the Ute ladies'-tresses are not anticipated. If this species is identified during site-specific

surveys, impacts would be avoided based on mitigation measure **SS-1**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, and impact minimization and mitigation measures would be developed in consultation with the USFS, and Western prior to construction.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative III-B corridor: Beaver Dam breadroot, Las Vegas buckwheat, pink egg milkvetch, yellow twotone beardtongue, sticky buckwheat, sticky ringstem, threecorner milkvetch, straw milkvetch, and Veyo milkvetch. Based on a desktop review, potential habitat has been identified for 38 BLM sensitive species within the Alternative III-B corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

The BLM sensitive species with known locations and habitat within the Alternative III-B corridor vary from species that are found across a wide range of habitats to those that are only found on very specific soil and vegetation combinations. The habitats include wetland and riparian areas, shrub and conifer communities, sandy soils, barren, rocky, sparsely vegetated areas, badlands, mountain and mixed desert shrub communities, grasslands, bluffs, cliffs, canyons, dry washes, and volcanic substrates. Impacts to species in habitats with low reclamation potential such as sandy soils, and barren or sparsely vegetated areas would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and pinyon-juniper communities may take longer due to the longer time-frame to restore woody communities.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitats.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, design features, and proposed mitigation, direct and indirect impacts are not anticipated.

Nevada State Listed Species

Based on species occurrence data and agency consultation, the following three Nevada state listed species have been identified within the Alternative III-B corridor: Las Vegas buckwheat, pink egg milkvetch, and Veyo milkvetch. Based on a desktop review, potential habitat has been identified in the Alternative III-B 2-mile corridor for the following Nevada state-listed species: Las Vegas bearpoppy, Las Vegas buckwheat, sand cholla, pink egg milkvetch, Ute ladies'-tresses orchid, and Veyo milkvetch, within the Alternative III-B corridor. Sand cholla is protected in the State of Nevada as a Cacti, Yucca, or Christmas Tree species. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Impacts to state-sensitive species under Alternative III-B would be the same as those described above for Alternative III-A for Las Vegas Buckwheat and Alternative III-A for BLM Sensitive Species.

Alternative III-C

Las Vegas Buckwheat (Federal Candidate)

Within Alternative III-C, there are approximately 7,088 acres of potential habitat for the Las Vegas buckwheat as presented in **Table 3.6-13** and illustrated in **Figure 3.6-11**. Based on species occurrence data and agency consultation, Las Vegas buckwheat individuals or populations have been identified within the Alternative III-C corridor. Critical habitat is not designated for candidate species; therefore, a critical habitat assessment was not completed.

To minimize and mitigate impacts to potential habitat WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components would be implemented. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Based on the location of the potential habitat identified in the corridor for this alternative, and the occurrence of known locations in Alternative II-B, total avoidance of potential habitat for this species may not be feasible. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

Ute Ladies'-Tresses Orchid (Federally Threatened)

Within Alternative III-C, approximately 977 acres of potential habitat for the Ute ladies'-tresses orchid has been identified based on species-specific modeling as presented in **Table 3.6-13**. Based on species occurrence data and agency consultation, no individuals or populations of this species have been identified within the Alternative III-C corridor. No critical habitat has been designated for Ute ladies'-tresses orchid. Implementation of BMPs, design features, and mitigation measures and associated effects would be similar as presented for Alternative I-A; therefore, no impacts to Ute ladies'-tresses orchid and its associated habitat are anticipated.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following seven species have been identified within the Alternative III-C 2-mile corridor: Las Vegas buckwheat, Needle Mountains milkvetch, pink egg milkvetch, rosy twotone beardtongue, silverleaf sunray, white bearpoppy, and White River catseye. Based on a desktop review, potential habitat has been identified for 38 BLM sensitive species within the Alternative III-C corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

The BLM sensitive species with known locations and habitat within the Alternative III-C 2-mile corridor vary from species that are found across a wide range of habitats to those that are only found on very specific soil and vegetation combinations. The habitats include wetland and riparian areas, shrub and conifer communities, sandy soils, barren, rocky, sparsely vegetated areas, badlands, mountain and mixed desert shrub communities, grasslands, bluffs, cliffs, canyons, dry washes, and volcanic substrates. Impacts to species in habitats with low reclamation potential such as sandy soils, and barren or sparsely vegetated areas would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions. Reclamation in shrub and pinyon-juniper communities may take longer due to the longer time-frame to restore woody communities.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitats.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

Nevada State Listed Species

Based on species occurrence data and agency consultation, the only Nevada state listed species that has been identified within the Alternative III-C 2-mile corridor is the Las Vegas buckwheat. Based on a desktop review, potential habitat has been identified in the Alternative III-C 2-mile corridor for the following six Nevada state listed species: Las Vegas bearpoppy, Las Vegas buckwheat, sand cholla, sticky buckwheat, Ute ladies'-tresses orchid, and threecorner milkvetch. Sand cholla is protected in the State of Nevada as a Cacti, Yucca, or Christmas Tree species. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**.

Potential Project-related impacts would be the same as those described above under Alternative III-A for Las Vegas Buckwheat and under Alternative III-A for BLM Sensitive Species.

Alternative Variations in Region III

Table 3.6-14 provides a comparison of impact parameters associated with the alternative variations in Region III based on known occurrences and potential habitat identification within the 2-mile transmission line corridors. Based on species occurrence information and habitat associations, five special status plant species may be impacted by the Project in Region III including three BLM sensitive species, one Forest sensitive species, and one federally listed species. **Figures 3.6-11** and **3.6-13** illustrate the potential habitats for the one federally listed and one Forest sensitive species associated with the Region III alternative variations.

Table 3.6-14 Summary of Region III Alternative Variation Impacts for Special Status Plant Species

Parameter	Ox Valley East Alternative Variation (Alternative III-A)	Comparable Portions of Alternative III-A	Ox Valley West Alternative Variation (Alternative III-A)	Comparable Portions of Alternative III-A	Pinto Alternative Variation (Alternative III-A)	Comparable Portions of Alternative III-A
Federally Listed Species						
Number of species with known occurrences impacted[1]	0	0	0	0	0	0
Number of species with potential habitat impacted [1]	0	1	0	1	1	1
Acreage of critical habitat impacted	N/A	N/A	N/A	N/A	N/A	N/A
Acreage of Siler Pincushion Cactus potential habitat impacted[1]	0	60	0	60	407	60

Table 3.6-14 Summary of Region III Alternative Variation Impacts for Special Status Plant Species

Parameter	Ox Valley East Alternative Variation (Alternative III-A)	Comparable Portions of Alternative III-A	Ox Valley West Alternative Variation (Alternative III-A)	Comparable Portions of Alternative III-A	Pinto Alternative Variation (Alternative III-A)	Comparable Portions of Alternative III-A
BLM Sensitive Species						
Number of species with known occurrences impacted[1]	0	0	0	0	0	1
Number of species with potential habitat impacted[1]	2	2	2	2	3	3
USFS Sensitive Species						
Number of species with known occurrences impacted[1]	0	0	0	0	0	1
Number of species with potential habitat impacted	1	1	1	1	1	1
Acreage of Pinyon Penstemon potential habitat impacted	9,140	12,115	5,404	12,115	16,650	15,373
Nevada State Listed Species						
Number of species with known occurrences impacted	0	0	0	0	0	0
Number of species with potential habitat impacted	0	0	0	0	0	0

Alternative Connectors in Region III

Table 3.6-15 summarizes the impacts and advantages/disadvantages associated with the two alternative connectors in Region III based on known occurrences and potential habitat identification within the 2-mile transmission line corridors.

Alternative Ground Electrode Systems in Region III

The southern electrode system would be required within 100 miles of the southern terminal, which is based on the conceptual locations and connections to the alternative routes. **Table 3.6-16** provides a comparison of impact parameters associated with the alternative ground electrodes in Region III based on known occurrences and potential habitat identification within the ground electrode system siting areas. Based on species occurrence information and habitat associations, 15 BLM sensitive species and three Nevada state listed species may be impacted by the Project in Region III.

Table 3.6-15 Summary of Region III Alternative Connector Impacts for Special Status Plant Species

Alternative Connector	Analysis	Advantage
Avon Alternative Connector	No special status plant species or their associated habitats are present within the 2-mile transmission line corridor.	No impacts to special status plant species or their associated habitats are anticipated.

Table 3.6-15 Summary of Region III Alternative Connector Impacts for Special Status Plant Species

Alternative Connector	Analysis	Advantage
Moapa Alternative Connector	• Known populations of the threecorner milkvetch (BLM sensitive and NV-State listed), silverleaf sunray (BLM sensitive), sticky buckwheat (BLM sensitive and Nevada state listed), and Schlesser pincushion (BLM sensitive) are located within the 2-mile transmission line corridor, and could be impacted by Project- related activities. • Potential habitat for one federally listed species (Las Vegas buckwheat [approximately 1,472 acres]); fourteen BLM sensitive species (Las Vegas buckwheat, Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, alkali mariposa lily, Gold Butte moss, sticky buckwheat, rosy twotone beardtongue, parish phacelia, and Schlesser pincushion); and four Nevada state listed species (Las Vegas buckwheat, Las Vegas bearpoppy, threecorner milkvetch, and sticky buckwheat) are located within the 2-mile transmission line corridor, and could be impacted by Project-related activities. **Figure 3.6-11** illustrates the potential habitat for the Las Vegas buckwheat.	The disadvantage of using this alternative connector would include potential loss of individuals of four BLM sensitive species and two Nevada state listed species and potential habitat disturbance to one federally listed species, fourteen BLM sensitive species, and four Nevada state listed species.

Table 3.6-16 Summary of Region III Alternative Ground Electrode Impacts for Special Status Plant Species

Alternative Ground Electrode System Locations	Analysis
Mormon Mesa-Carp Elgin Rd (Alternatives III-A and III-B)	• No impacts to federally listed species and their associated habitats would occur based on lack of documented occurrences and suitable habitat. • Known populations of the Beaver Dam breadroot (BLM sensitive species) and the threecorner milkvetch (BLM sensitive species and State listed species) are located within the ground electrode system siting areas, and could be impacted by Project-related activities. • Potential habitat for 15 BLM sensitive species (sticky ringstem, Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, Mokiak milkvetch, alkali mariposa lily, Gold Butte moss, sticky buckwheat, yellow twotone beardtongue, rosy twotone beardtongue, and parish phacelia) and three Nevada state listed species (Las Vegas bearpoppy, threecorner milkvetch, and sticky buckwheat) is located within the ground electrode system siting areas, and could be impacted by Project-related activities.

Table 3.6-16 Summary of Region III Alternative Ground Electrode Impacts for Special Status Plant Species

Alternative Ground Electrode System Locations	Analysis
Halfway Wash-Virgin River (Alternatives III-A and III-B)	• No impacts to federally listed species and their associated habitats would occur based on lack of documented occurrences and suitable habitat. • No impacts to BLM sensitive and Nevada state listed species would occur based on lack of documented occurrences. • Potential habitat for 15 BLM sensitive species (sticky ringstem, Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, Mokiak milkvetch, alkali mariposa lily, Gold Butte moss, sticky buckwheat, yellow twotone beardtongue, rosy twotone beardtongue, and parish phacelia) and 3 Nevada state listed species (Las Vegas bearpoppy, threecorner milkvetch, and sticky buckwheat) is located within the ground electrode system siting areas, and could be impacted by Project-related activities.
Halfway Wash East (Alternatives III-A and III-B)	• No impacts to federally listed species and their associated habitats would occur based on lack of documented occurrences and suitable habitat. • No impacts to BLM sensitive and Nevada state listed species would occur based on lack of documented occurrences. • Potential habitat for 15 BLM sensitive species (sticky ringstem, Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, Mokiak milkvetch, alkali mariposa lily, Gold Butte moss, sticky buckwheat, yellow twotone beardtongue, rosy twotone beardtongue, and parish phacelia) and 3 Nevada state listed species (Las Vegas bearpoppy, threecorner milkvetch, and sticky buckwheat) is located within the ground electrode system siting areas, and could be impacted by Project-related activities.
Meadow Valley 2 (Alternative III-C)	• No impacts to federally listed species and their associated habitats would occur based on lack of documented occurrences and suitable habitat. • No impacts to BLM sensitive and Nevada state listed species would occur based on lack of documented occurrences. • Potential habitat for 15 BLM sensitive species (sticky ringstem, Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, Mokiak milkvetch, alkali mariposa lily, Gold Butte moss, sticky buckwheat, yellow twotone beardtongue, rosy twotone beardtongue, and parish phacelia) and 3 Nevada state listed species (Las Vegas bearpoppy, threecorner milkvetch, and sticky buckwheat) is located within the ground electrode system siting areas, and could be impacted by Project-related activities.
Delta (Design Option 2) (All Alternatives)	• No impacts to federally listed species and their associated habitats would occur based on lack of documented occurrences and suitable habitat. • Known populations of the ibex buckwheat (BLM sensitive species) are located within the ground electrode system siting area, and could be impacted by Project-related activities. • Potential habitat for four BLM sensitive species (Arabis goodrichii, giant fourwing saltbush, ibex buckwheat, and Neese narrowleaf penstemon is located within the ground electrode system siting area, and could be impacted by Project-related activities.

Region III Conclusion

Within Region III, Alternative III-A would impact the greatest amount of potential habitat for federally listed species and all alternatives would impact known federally listed species populations equally. Alternatives III-B and III-C would impact the greatest number of BLM species; Alternative III-A would impact the greatest number of USFS species and potential habitat. Alternatives III-B and III-C do not have any impacts to USFS species. Alternative III-B impacts the greatest number of Nevada state-listed species populations.

3.6.6.6 Region IV

Table 3.6-17 provides a comparison of impact parameters associated with the alternative routes in Region IV based on known occurrences and potential habitat identified within the 2-mile transmission line corridors for special status plant species. Based on species occurrence information and habitat associations, 20 special status plant species may be impacted by the Project in Region IV including 18 BLM sensitive species, five Nevada state listed species, 8 NPS-Lake Mead NRA sensitive species, and one federally listed species. To determine the location and spatial extent of potentially suitable habitat for federally listed species within the 2-mile transmission line corridors, a habitat assessment was conducted using ArcGIS and best available GIS datasets based on the habitat characteristics associated with individual species. Selected datasets and species parameters are detailed within the Special Status Species Survey Plan under development. Species occurrence and associated habitats in Region IV are provided in **Appendix G**, **Table G-1**.

Table 3.6-17 Summary of Region IV Alternative Route Impacts for Special Status Plant Species

Parameter	Alternative IV-A	Alternative IV-B	Alternative IV-C
Federally Listed Species			
Number of species with known occurrences impacted	0	0	0
Number of species with potential habitat impacted	1	1	1
Acreage of critical habitat impacted	--	--	--
Acreage of Las Vegas Buckwheat potential habitat impacted	7,308	2,636	6,569
BLM Sensitive Species			
Number of species with known occurrences impacted	4	3	2
Number of species with potential habitat impacted	19	18	16
NPS Lake Mead NRA Sensitive Species			
Number of species with known occurrences impacted	0	2	2
Number of species with potential habitat impacted	0	2	2
Nevada State Listed Species			
Number of species with known occurrences impacted	1	1	1
Number of species with potential habitat impacted	5	5	5

Alternative IV-A (Applicant Proposed and Agency Preferred)

Las Vegas Buckwheat (Federal Candidate)

Within Alternative IV-A, there is approximately 7,308 acres of potential habitat for the Las Vegas buckwheat as presented in **Table 3.6-17** and illustrated in **Figure 3.6-14**. Based on species occurrence data and agency consultation, no Las Vegas buckwheat individuals or populations have been identified within the Alternative IV-A corridor. Critical habitat is not designated for candidate species; therefore, a critical habitat assessment was not completed.

WWEC BMPs, TWE design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Because Alternative IV-A parallels sensitive species habitat, total avoidance of this species may not be feasible. To minimize impacts to suitable habitat, mitigation measure **SS-10** would be applied. The areas not avoided would result in loss of suitable habitat for the species. Impacts would be as described in Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative IV-A corridor: Las Vegas bearpoppy, silverleaf sunray, sticky ringstem, and rosy twotone beardtongue. Based on a desktop review, potential habitat has been identified for 19 BLM sensitive species within the corridors associated with Alternative IV-A. Associated species ranges and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**.

The BLM sensitive species with known locations and habitat within the Alternative IV-A 2-mile corridor range from species that are found across a wide variety of habitats to those that are only found on very specific soil and vegetation combinations. The habitats include wetland and riparian areas, sandy soils, barren, rocky, sparsely vegetated areas, badlands, bluffs, cliffs, canyons, dry washes, and volcanic substrates. Impacts to species in habitats with low reclamation potential such as sandy soils, and barren, sparsely vegetated areas would be greater due to the difficulties in reclaiming these areas to pre-disturbance conditions.

WWEC BMPs, design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to BLM sensitive species habitat.

Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-2**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. If species avoidance is not feasible, impacts would be consistent with those discussed in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components. Additional impact minimization and mitigation measures would be developed in consultation with the BLM and Western prior to construction. For the species that are avoided based on the implementation of the WWEC BMPs, design features, and proposed mitigation measures, direct and indirect impacts are not anticipated.

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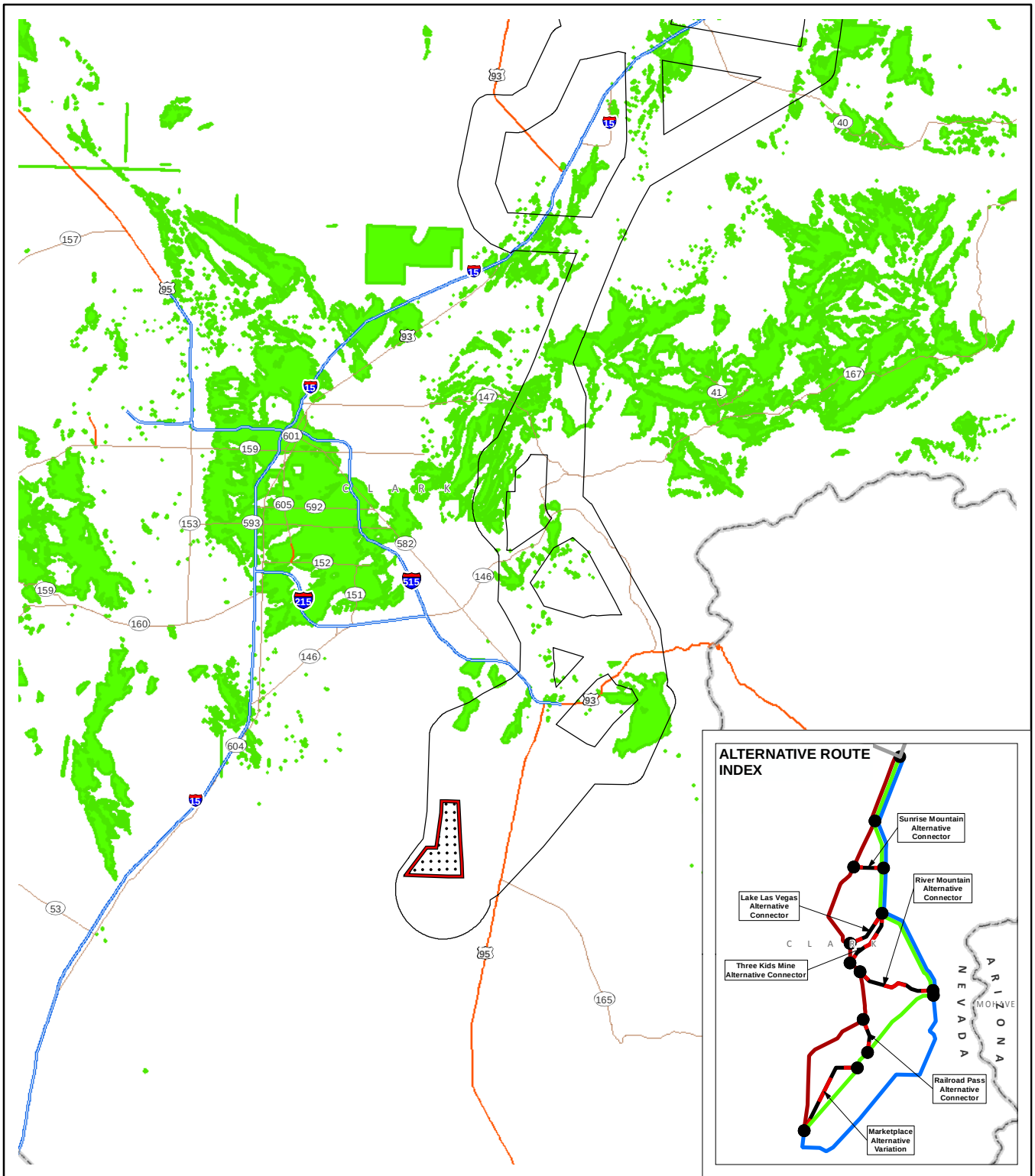

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Nevada State Listed Species

Based on species occurrence data and agency consultation, one Nevada State-listed sensitive species, the Las Vegas bearpoppy, has been identified within the Alternative IV-A corridor. Potential habitat has been identified in the Alternative IV-A 2-mile corridor for the following five Nevada state-listed species: Las Vegas bearpoppy, Las Vegas buckwheat, Las Vegas catseye, sticky buckwheat, and threecorner milkvetch. Associated species range and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**.

Impacts to state-listed sensitive species would be the same as described under Alternative IV-A for Las Vegas Buckwheat and under Alternative IV-A for BLM Sensitive Species.

Alternative IV-B

Las Vegas Buckwheat (Federal Candidate)

Within Alternative IV-B, there are approximately 2,636 acres of potential habitat for the Las Vegas buckwheat as presented in **Table 3.6-17** and illustrated in **Figure 3.6-14**. Based on species occurrence data and agency consultation, no Las Vegas buckwheat individuals or populations have been identified within the Alternative IV-B corridor. Critical habitat is not designated for candidate species; therefore, a critical habitat assessment was not completed.

The WWEC BMPs, TWE design features, and proposed mitigation as presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, and Section 3.6.6.2, Impacts Common to All Alternative Routes and Associated Components, would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. Species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the results of the surveys, design specifications could be implemented in accordance with WWEC BMPs ECO-1 and ECO-4 (**Appendix C**), and proposed mitigation **SS-5** and **SS-6**. Based on the location of the one area of potential habitat within the Alternative IV-A 2-mile corridor, impacts are not anticipated for Las Vegas buckwheat under this alternative. The areas not avoided would result in loss of suitable habitat for the species.

BLM Sensitive Species

Based on species occurrence data and agency consultation, the following species have been identified within the Alternative IV-B corridor: Las Vegas bearpoppy, rosy twotone beardtongue, and silverleaf sunray. Based on a desktop review, potential habitat has been identified for 18 BLM sensitive species within the Alternative IV-B corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Based on the similarity in vegetative communities and species impacted, potential Project-related impacts to the Las Vegas bearpoppy and silverleaf sunray would be the same as described above for Alternative IV-A.

Nevada State Listed Species

Based on species occurrence data and agency consultation, one species, the Las Vegas bearpoppy, has been identified within the Alternative IV-B corridor. Potential habitat has been identified for the following five Nevada state-listed species: Las Vegas bearpoppy, Las Vegas buckwheat, Las Vegas catseye, sticky buckwheat, and threecorner milkvetch within the Alternative IV-B corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**. Impacts to state-listed sensitive species under Alternative IV-B would be the same as described above for Alternative IV-A Las Vegas Buckwheat and Alternative IV-A BLM Sensitive Species.

National Park Service Sensitive Species

Based on species occurrence data and agency consultation, two species, the Las Vegas bearpoppy, and silverleaf sunray, have been identified within the Alternative IV-B corridor. Based on a desktop

review, potential habitat has been identified for two National Park Service sensitive species within the Alternative IV-B corridor. Associated species ranges and habitat descriptions for these species are provided in **Appendix G**, **Table G-1**. Impacts to NPS-listed sensitive species under Alternative IV-B would be the same as described above for Alternative IV-A BLM Sensitive Species.

Alternative IV-C

Las Vegas Buckwheat (Federal Candidate)

Within the Alternative IV-C 2-mile corridor, there are approximately 6,569 acres of potential habitat for the Las Vegas buckwheat as presented in **Table 3.6-17** and illustrated in **Figure 3.6-14**. Based on species occurrence data and agency consultation, Las Vegas buckwheat individuals or populations have been identified within the Alternative IV-C corridor. Critical habitat is not designated for candidate species; therefore, a critical habitat assessment was not completed.

The BMPs and design features presented in Section 3.6.6.1, Impacts from Terminal Construction and Operation, would be implemented to minimize and mitigate any potential impacts to sensitive species habitat. TWE's applicant-committed protection measures ECO-1 and ECO-4 (**Appendix C**) would avoid suitable, sensitive-species habitats during Project design and implementation. Site and species-specific surveys within suitable habitat, and subsequent species avoidance, would be conducted through the implementation of mitigation measure **SS-1**. Based on the location of the potential habitat with the corridor for this alternative, impacts to Las Vegas buckwheat are not anticipated under this alternative.

BLM Sensitive Species

Based on species occurrence data and agency consultation, two species, the Las Vegas bearpoppy and the silverleaf sunray, have been identified within Alternative IV-C corridor. Based on a desktop review, potential habitat has been identified for 16 BLM sensitive species within the Alternative IV-C corridor. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Based on the similarity in vegetative communities and species impacted, impacts to BLM-listed sensitive species would be the same as described above for Alternative IV-A.

Nevada State Listed Species

Based on species occurrence data and agency consultation, one species, the Las Vegas bearpoppy, has been identified within the Alternative IV-C 2-mile corridor. Potential habitat has been identified in this alternative for the following five Nevada state-listed species: Las Vegas bearpoppy, Las Vegas buckwheat, Las Vegas catseye, sticky buckwheat, and threecorner milkvetch. Associated species range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Impacts to Nevada state-listed sensitive species under Alternative IV-C would be the same as described above for Alternative IV-A Las Vegas Buckwheat and Alternative IV-A BLM Sensitive Species.

National Park Service Sensitive Species

Based on species occurrence data and agency consultation, two species, the Las Vegas bearpoppy and silverleaf sunray, have been identified within the Alternative IV-C corridor. Based on a desktop review, potential habitat has been identified for these two National Park Service sensitive species within the Alternative IV-C corridor. Associated range and habitat descriptions for these species are provided in **Appendix G, Table G-1**. Impacts to National Park Service sensitive species would be the same as described above for Alternative IV-A BLM Sensitive Species.

Alternative Variations in Region IV

Table 3.6-18 provides a comparison of impact parameters associated with the alternative variations in Region IV based on known occurrences and potential habitat for special status plant species identified within the 2-mile transmission line corridors. Based on species occurrence information and habitat

associations, 14 special status plant species may be impacted by the Project in Region IV including one federally listed species (Las Vegas buckwheat), 13 BLM sensitive species, and five state listed species.

Table 3.6-18 Summary of Region IV Alternative Variation Impacts for Special Status Species

Parameter	Marketplace Alternative Variation (Alternative IV-B)	Comparable Portions of Alternative IV-B
Federally Listed Species		
Number of species with known occurrences impacted	0	0
Number of species with potential habitat impacted	0	0
Acreage of critical habitat impacted	N/A	N/A
Acreage of Las Vegas buckwheat potential habitat impacted	87	0
BLM Sensitive Species		
Number of species with known occurrences impacted	0	0
Number of species with potential habitat impacted	13	13
NPS Lake Mead NRA Sensitive Species		
Number of species with known occurrences impacted	0	0
Number of species with potential habitat impacted	0	0
Nevada State Listed Species		
Number of species with known occurrences impacted	0	0
Number of species with potential habitat impacted	5	5

Alternative Connectors in Region IV

Table 3.6-19 summarizes the impacts and advantages/disadvantages associated with the five alternative connectors in Region IV based on known occurrences and potential habitat identification within the 2-mile transmission line corridors.

Table 3.6-19 Summary of Region IV Alternative Connector Impacts for Special Status Species

Alternative Connector	Analysis	Impact Conclusion
Sunrise Mountain Alternative Connector	Potential habitat for one federally listed species (Las Vegas buckwheat [approximately 240 acres]); six NPS-Lake Mead NRA sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, threecorner milkvetch, sticky buckwheat, and rosy twotone beardtongue); 15 BLM sensitive species (Las Vegas buckwheat, Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, alkali mariposa lily, Gold Butte moss, sticky buckwheat, catchfly gentian, rosy twotone beardtongue, parish phacelia, and St. George blue-eyed grass); and five Nevada state listed species (Las Vegas buckwheat, Las Vegas bearpoppy, threecorner milkvetch, Las Vegas catseye, and sticky buckwheat) is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities. **Figure 3.6-14** illustrates the potential habitat for the Las Vegas buckwheat. Known populations of the silverleaf sunray (NPS-Lake Mead NRA and BLM sensitive species) are located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals of one NPS-Lake Mead NRA sensitive species and one BLM sensitive species and potential habitat disturbance to one federally listed species, six NPS-Lake Mead NRA sensitive species, 15 BLM sensitive species, and five Nevada state listed species.

Table 3.6-19 Summary of Region IV Alternative Connector Impacts for Special Status Species

Alternative Connector	Analysis	Impact Conclusion
Lake Las Vegas Alternative Connector	Potential habitat for one federally listed species (Las Vegas buckwheat [approximately 337 acres]); five NPS-Lake Mead NRA sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, threecorner milkvetch, and rosy twotone beardtongue); 14 BLM sensitive species (Las Vegas buckwheat, Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, alkali mariposa lily, Gold Butte moss, catchfly gentian, sticky buckwheat, rosy twotone beardtongue, and parish phacelia); and four Nevada state listed species is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities. **Figure 3.6-14** illustrates the potential habitat for the Las Vegas buckwheat. Known populations of the silverleaf sunray (NPS-Lake Mead NRA and BLM sensitive species) and Las Vegas bearpoppy (NPS-Lake Mead NRA and BLM sensitive species, and Nevada State listed species) are located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals of two NPS-Lake Mead NRA sensitive species, two BLM sensitive species, and one Nevada state listed species and potential habitat disturbance to one federally listed species, five NPS-Lake Mead sensitive species, 14 BLM sensitive species, and four Nevada state listed species.
Three Kids Mine Alternative Connector	Potential habitat for one federally listed species (i.e., Las Vegas buckwheat [approximately 399 acres]); six NPS-Lake Mead NRA sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, threecorner milkvetch, sticky buckwheat, and rosy twotone beardtongue), 14 BLM sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, straw milkvetch, white bearpoppy, black woollypod, threecorner milkvetch, Las Vegas buckwheat, alkali mariposa lily, Gold Butte moss, sticky buckwheat, catchfly gentian, rosy twotone beardtongue, and parish phacelia); and five Nevada state listed species (Las Vegas bearpoppy, threecorner milkvetch, Las Vegas catseye, Las Vegas buckwheat, and sticky buckwheat) is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities. **Figure 3.6-14** illustrates the potential habitat for the Las Vegas buckwheat. Known populations of the silverleaf sunray (NPS-Lake Mead NRA and BLM sensitive species), and Las Vegas bearpoppy (NPS-Lake Mead NRA sensitive, BLM sensitive species, and Nevada State listed species) are located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals from two NPS-Lake Mead NRA sensitive species, two BLM sensitive species, and one Nevada state listed species and potential habitat disturbance to one federally listed species, six NPS-Lake Mead sensitive species, 14 BLM sensitive species, and five Nevada state listed species.
River Mountain Alternative Connector	Potential habitat for one federally listed species (i.e., Las Vegas buckwheat [approximately 30 acres]); six NPS-Lake Mead NRA sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, threecorner milkvetch, sticky buckwheat, and rosy twotone beardtongue); 14 BLM sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, white bearpoppy, black woollypod, threecorner milkvetch, alkali mariposa lily, Gold Butte moss, Las Vegas buckwheat, sticky buckwheat, catchfly gentian, white-margined beardtongue, rosy twotone beardtongue, and parish phacelia); and five Nevada state listed species (Las Vegas bearpoppy, threecorner milkvetch, Las Vegas catseye, Las Vegas buckwheat, sticky buckwheat) is located within the 2-mile transmission line corridor, and could be impacted by Project-related activities. **Figure 3.6-14** illustrates the potential habitat for the Las Vegas buckwheat. Known populations of the rosy twotone beardtongue (BLM sensitive species) are located within the 2-mile transmission line corridor, and could be impacted by Project-related activities.	The disadvantage of using this alternative connector would include potential loss of individuals from one BLM sensitive species and potential habitat disturbance to one federally listed species, six NPS-Lake Mead sensitive species, 14 BLM sensitive species, and five Nevada state listed species.

Table 3.6-19 Summary of Region IV Alternative Connector Impacts for Special Status Species

Alternative Connector	Analysis	Impact Conclusion
Railroad Pass Alternative Pass	Potential habitat for one federally listed species (i.e., Las Vegas buckwheat [approximately 130 acres]); seven NPS-Lake Mead NRA sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, threecorner milkvetch, Mokiak milkvetch, sticky buckwheat, and rosy twotone beardtongue); 13 BLM sensitive species (Beaver Dam breadroot, silverleaf sunray, Las Vegas bearpoppy, white bearpoppy, black woollypod, threecorner milkvetch, Mokiak milkvetch, alkali mariposa lily, Gold Butte moss, Las Vegas buckwheat, sticky buckwheat, rosy twotone beardtongue, and parish phacelia); and five Nevada state listed species (Las Vegas buckwheat, Las Vegas bearpoppy, threecorner milkvetch, Las Vegas catseye, sticky buckwheat) is located within the 2-mile corridor, and could be impacted by Project-related activities. **Figure 3.6-14** illustrates the potential habitat for the Las Vegas buckwheat.	The disadvantage of using this alternative connector would include potential habitat disturbance to one federally listed species, seven NPS-Lake Mead sensitive species, 13 BLM sensitive species, and five Nevada state listed species.

Region IV Conclusion

Within Region IV, impacts to federally listed, and BLM, Nevada state listed species are fairly consistent between alternatives. Impacts to Lake Mead NRA sensitive species are found only in Alternatives IV-B and IV-C.

3.6.6.7 Impacts to Special Status Plant Species from the No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. The analysis area would exist under current authorizations and land uses (e.g., livestock grazing, agriculture, energy development, mining, etc.). Therefore, impacts to special status plant species associated with the development of the Project would not occur.

3.6.6.8 Residual Impacts

If species or habitat avoidance is not feasible due to physical, biological, or engineering constraints, the loss of those species and/or habitats would be a residual impact. Residual impacts would also result from indirect impacts such as fragmentation of suitable habitats, and establishment of noxious weeds and invasive species into previously undisturbed areas as a result of permanent placement of facilities and access roads. Depending on the length of time for construction, and the reclamation success, pollinators that are also rare or specific to a certain special status plant species could be impacted by the Project.

Vegetation recovery to similar cover and species composition after implementation of a reclamation program is expected to occur at varying rates. Reclamation and recovery timeframes for each vegetation cover type are presented in Section 3.5.6.8, Residual Impacts. Some native habitats may not return to pre-construction conditions due to alteration of soil communities, noxious weed invasion, and loss of biological soil crusts. Fragmentation of native habitats and the conversion of vegetation communities may occur over the long term, depending on the success of reclamation and associated disturbance from maintenance activities over the life of the Project. Noxious weed and invasive species may persist over the long term regardless of the implementation of control programs.

3.6.6.9 Irreversible and Irretrievable Commitment of Resources

All potential operation impacts to special status habitats within the 2-mile transmission line corridor would be irretrievable until transmission line decommissioning, after which time all land uses could be reclaimed. However, reclamation activities may have limited success in areas with poor soils, some vegetation communities would take years to reestablish, and some areas may never return to their

former vegetation cover and composition. As such, these impacts may represent an irreversible commitment of special status plant resources. Additionally, any fragmentation of native habitats and subservient establishment of noxious weeds and invasive species, resulting in the conversion of native plant communities that could not be reclaimed to pre-construction conditions after transmission line decommissioning these impacts would be considered irreversible.

3.6.6.10 Relationship Between Local Short-term Uses and Long-term Productivity

Long-term impacts to special status plant species include the disturbance of suitable habitat that may require extended time (10 to 100 years) for recovery, the potential for weedy annual species such as halogeton and cheatgrass to become established in localized areas increasing competition on special status plant species, the loss of species-specific pollinators, and the conversion of native habitats.

3.7 Wildlife

3.7.1 Regulatory Background

Regulations that directly influence wildlife management decisions within the wildlife analysis area are primarily implemented by the BLM, USFS, USFWS, and state wildlife agencies. These consist of the Wyoming Game and Fish Department (WGFD), Colorado Parks and Wildlife (CPW) (formerly Colorado Division of Wildlife [CDOW]), Utah Division of Wildlife Resources (UDWR), and Nevada Department of Wildlife (NDOW). The wildlife regulations relevant to the proposed project are presented in **Table 3.7-1**.

Table 3.7-1 Relevant Regulations for Wildlife Species

Wildlife Species	Regulation
Big Game	• Wyoming Statutes 23-3-102; • Colorado Revised Statutes 33-1-101; • Utah Code 23-14-1, 23-16, and Rules R657-5; and • Nevada Administrative Code 503-020.
Small Game	• Wyoming Statutes 23-3-103; • Colorado Revised Statutes 33-1-101; • Utah Code 23-14-1, 23-48, and Rules R657-6, R657-9, R657-10, R657-11, R657-33, and R657-54; and • Nevada Administrative Code 503-020, 503-025, 503-045.
Nongame (including raptors, migratory birds, and reptiles)	• Migratory Bird Treaty Act (16 USC 703 et seq.); • Bald and Golden Eagle Protection Act (16 USC 668 et seq.); • Executive Order (EO) 13186 (66 FR 3853); • BLM MOU WO-230-2010-04 • BLM IM WY-2013-005 • FS Agreement # 08-MU-1113-2400-264 • USFS Land and Resource Management Plans (LRMPs) • Wyoming Statutes 23-1-101, 23-1-103, 23-1-302 and 23-3-108); • Colorado Revised Statutes 33-1-101, 33-2-104; • Utah Code 23-14-1, and Rules R657-3, R65713, R657-19, and R657-53; and • Nevada Administrative Code 503-030, 503-050, 503-075, 503-080.

3.7.2 Data Sources

Information regarding wildlife species and their habitats within the wildlife analysis area was obtained from a review of existing published sources, BLM resource management plans, USFS land and resource management plans (forest management plans), BLM, USFS, WGFD, CPW, UDWR, NDOW, and USFWS file information, as well as WYNDD, CNHP, UNHP, and NNHP database information. GIS shapefiles of big game habitat (e.g., crucial winter range, parturition habitat, migration corridors, etc.) were obtained from the WGFD, CPW, UDWR, and NDOW and reviewed for this project. This information is updated regularly and presents the most accurate habitat data for the wildlife analysis area. In addition, information received through correspondence with agency wildlife biologists has been incorporated, as appropriate. Species-specific surveys for the agency-preferred alternative will be completed after that alternative has been finalized and results of those surveys will be incorporated into the final EIS.

3.7.3 Analysis Areas

The analysis areas for wildlife species were chosen because they represent the combination of geographic areas containing contiguous habitat that would be impacted by the proposed project, as well as the management regimes to which this habitat is subject. Accordingly, these analysis areas provide a clear disclosure of the context of project impacts in light of the management considerations for these areas. The analysis areas are based in part on HUC10 watershed boundaries. HUC 10 watershed refers to the 10-digit hydrologic unit codes specifying the 5th-level watershed boundaries that were originally delineated by the USGS and subsequently refined by the NRCS. These watershed areas average from approximately 40,000 – 250,000 acres in size and provide a clear bio-geographical delineation of vegetation communities and wildlife habitats. Section 3.4, Water Resources presents tables and figures of HUC 10 watersheds in the wildlife analysis area.

Three analysis areas for wildlife species are defined as follows:

- The wildlife analysis area for small game species, nongame species, raptors, migratory birds, Audubon Important Bird Areas (IBAs), and USFWS Bird Habitat Conservation Areas (BHCAs) includes suitable habitat within the HUC 10 watersheds crossed by Project alternatives.

- The big game analysis area includes the most important and limiting seasonal habitat (e.g., crucial winter range, parturition range) within all state big game management units located within HUC 10 watersheds crossed by the Project. This analysis area provides the context for project and cumulative impacts on habitat specifically managed by state agencies for big game populations.

- The MIS Analysis Area for USFS MIS includes suitable habitat within the entire national forest(s) for which they are identified. The exceptions are mule deer and Rocky Mountain elk, which are MIS but are analyzed under the big game analysis area described above. This MIS Analysis Area was chosen because it allows disclosure of the context of impacts within the unique requirements of the USFS for monitoring and managing MIS within the jurisdiction of NFS lands. Seven MIS are also accorded special status as BLM, state-listed, or federal candidate species and are analyzed in Chapter 3.8, Special Status Wildlife Species.

Table 3.7-2 presents the acreages of the major vegetation communities providing wildlife habitat within the wildlife analysis area.

Table 3.7-2 Vegetation Communities Within the Wildlife Analysis Area

Vegetation Community	Acres Within the Wildlife Analysis Area[1]	Percent of the Wildlife Analysis Area
1. Agricultural Land	784,433	3.1
2. Aspen Forest and Woodland	641,483	2.6
3. Barren/Sparsely Vegetated	321,697	1.3
4. Cliff and Canyon	816,392	3.3
5. Conifer Forest	539,604	2.2
6. Deciduous Forest	13,933	0.1
7. Desert Shrubland	3,074,124	12.3
8. Developed/Disturbed Land[2]	988,126	4.0
9. Dunes	133,157	0.5
10. Grassland	1,537,916	6.2

Table 3.7-2 Vegetation Communities Within the Wildlife Analysis Area

Vegetation Community	Acres Within the Wildlife Analysis Area[1]	Percent of the Wildlife Analysis Area
11. Greasewood Flat	875,991	3.5
12. Herbaceous Wetland	188,239	0.8
13. Montane Grassland	70,313	0.3
14. Montane Shrubland	875,292	3.5
15. Open Water	154,328	0.6
16. Pinyon-juniper	4,081,539	16.4
17. Riparian	68,489	0.3
18. Sagebrush Shrubland	6,539,728	26.2
19. Saltbush shrubland	2,991,796	12.0
20. Tundra	13,956	0.1
21. Woody Riparian and Wetlands	214,144	0.9
Total	**24,924,680**	**100**

[1] The wildlife analysis area includes suitable habitat within the HUC 10 watersheds crossed by the Project.

[2] The developed/disturbed vegetation community is not considered to be typical wildlife habitat and is not included in analyses.

Sources: USGS 2010, 2005, 2004 (SWReGAP and NWReGAP).

Table 3.7-3 presents the acreages of the major vegetation communities providing wildlife habitat within the MIS Analysis Area.

3.7.4 Baseline Description

As discussed in Section 3.5, Vegetation, 20 vegetation communities and developed/disturbed land are located within the wildlife analysis area. Developed/disturbed land is not considered to be typical wildlife habitat and is not included in analyses. Vegetation community/habitat types are presented in **Table 3.7-2**. Sagebrush shrubland, saltbush shrubland, desert shrub, and pinyon-juniper are the most common vegetation communities and account for 67 percent of the wildlife analysis area. A variety of wildlife species are associated with habitats found within the wildlife analysis area, with greater species diversity occurring in areas exhibiting greater vegetation structure, soil moisture, and open water, such as wetlands and riparian areas. Species that inhabit wetland and riparian habitats are limited to the perennial and intermittent drainages, reservoirs, lakes, ponds, and marshes that occur within the wildlife analysis area or in the immediate vicinity of these areas. The following sections (i.e., big game species, small game species, nongame species, migratory birds, including raptors, and USFS MIS) include baseline descriptions of both resident and migratory wildlife species that have either been documented within the wildlife analysis area or that may occur within the wildlife analysis area based on habitat associations. Detailed species descriptions by Project region are presented in Section 3.7.5, Regional Summary. Amphibians and fish are addressed in Sections 3.9, Aquatic Biological Resources, and 3.10, Special Status Aquatic Species.

3.7.4.1 Big Game Species

Big game species that occur within the big game analysis area include pronghorn, mule deer, white-tailed deer, elk, moose, Rocky Mountain bighorn sheep, desert bighorn sheep, black bear, and mountain lion

Table 3.7-3 Vegetation Communities/Habitat Types Within National Forests Crossed by the Project

Vegetation Community/ Habitat Type	Ashley National Forest Region II		Dixie National Forest Region III		Fishlake National Forest Region II		Manti-La Sal National Forest Region II		Uinta-Wasatch-Cache National Forest Region II	
	Acres	Percent of Forest	Acres	Percent of Forest	Acres	Percent of Forest	Acres	Percent of Forest	Acres	Percent of Forest
1. Agriculture Land	2,691	0.2	629	<0.1	623	<0.1	1,466	0.1	290	<0.1
2. Aspen Forest and Woodland	102,261	7.7	196,825	10.5	196,958	13.5	234,483	17.5	231,663	25.9
3. Barren/Sparsely Vegetated	136,429	10.2	26,266	1.4	11,977	0.8	16,519	1.2	11,182	1.2
4. Cliff and Canyon	39,266	2.9	93,023	4.9	38,891	2.7	43,352	3.2	25,335	2.8
5. Conifer Forest	543,194	40.7	537,641	28.5	224,021	15.4	289,618	21.7	114,549	12.8
6. Deciduous Forest	1,125	0.1	0	0.0	1	<0.1	0	0.0	28,171	3.1
7. Desert Shrub	0	0.0	5,265	0.3	121	<0.1	1	<0.1	0	0.0
8. Developed/Disturbed[1]	42,056	3.1	26,479	1.4	28,664	2.0	4,505	0.3	497	0.1
9. Dunes	23	<0.1	2	<0.1	0	0.0	0	0.0	0	0.0
10. Grassland	1,591	0.1	2,010	0.1	7,453	0.5	104	<0.1	3,211	0.4
11. Greasewood Flat	1,891	0.1	19	<0.1	306	<0.1	80	<0.1	0	0.0
12. Herbaceous Wetland	28,424	2.1	4,438	0.2	4,530	0.3	2,789	0.2	15,225	1.7
13. Montane Grassland	25,557	1.9	12,854	0.7	9,129	0.6	26,225	2.0	26,455	3.0
14. Montane Shrubland	36,831	2.8	106,207	5.6	211,109	14.5	230,868	17.3	168,362	18.8
15. Open Water	21,383	1.6	2,445	0.1	4,334	0.3	2,282	0.2	16,673	1.9
16. Pinyon-Juniper	104,031	7.8	521,470	27.7	426,154	29.3	265,022	19.8	50,613	5.7
17. Riparian	119	<0.1	0	0.0	0	0.0	0	0.0	0	0.0
18. Sagebrush Shrubland	200,159	15.0	315,223	16.7	270,972	18.6	192,203	14.4	187,523	20.9
19. Saltbush Shrubland	15,422	1.2	497	<0.1	2,738	0.2	2,814	0.2	71	<0.1
20. Tundra	17,639	1.3	16,504	0.9	7,664	0.5	18,793	1.4	57	<0.1
21. Woody Riparian and Wetlands	15,120	1.1	15,660	0.8	8,234	0.6	6,028	0.5	15,377	1.7
Totals	**1,335,210**	**100**	**1,883,453**	**100**	**1,453,879**	**100**	**1,337,152**	**100**	**895,255**	**100**

[1] The developed/disturbed vegetation community is not considered to be typical wildlife habitat and is not included in analyses.

(BLM 2008; Fitzgerald et al. 2011; NDOW 2011; UDWR 2009a,b). Population numbers for these big game species typically fluctuate from year to year and depend on habitat conditions such as forage quality, water availability, and cover as well as weather patterns. The big game analysis area contains numerous big game seasonal habitats including migration corridors, production/parturition areas, and crucial winter range. Big game migration corridors and crucial winter range (defined as severe winter habitat in Colorado) have been identified by the WGFD, CPW, UDWR, and NDOW and are typically considered the most important and limiting habitats for big game species, especially during harsh winters with extremely cold temperatures and above average snow depths. Additional habitats such as parturition range (e.g., calving and fawning areas) may also be limiting in portions of the big game analysis area. Details on big game species and seasonal habitats found within the big game analysis area are presented below.

Pronghorn

Pronghorn inhabit grassland, desert shrubland, and sagebrush shrubland in flat to rolling topography and browse on grass, forbs, and shrubs, especially sagebrush, throughout the year. Pronghorn are prominent in portions of the big game analysis area with adequate forage and surface water (BLM 2008; Fitzgerald et al. 2011). During the winter, pronghorn generally utilize areas of relatively high sagebrush densities and overall low snow accumulations, on south- and west-facing slopes.

Mule Deer

Mule deer occur throughout the big game analysis area, but are concentrated in areas of rolling terrain and forested habitats (BLM 2008; Fitzgerald et al. 2011). A variety of vegetation communities provide suitable habitat for mule deer. These vegetation communities include aspen forests and woodlands, conifer forests, shrublands, and pinyon-juniper woodlands. Although their diet varies somewhat by season, mule deer are primarily browsers, feeding on a wide variety of woody vegetation including shoots, leaves, and twigs of shrubs and trees. Like pronghorn, winter habitat for mule deer occurs in areas of relatively high sagebrush densities and overall low snow accumulation, on south- and west-facing slopes.

White-tailed Deer

White-tailed deer occur in portions of the big game analysis area and are typically found near woody riparian and wetland areas in south-central Wyoming and northwestern Colorado (Fitzgerald et al. 2011). White-tailed deer feed on a variety of plant species but tend to rely heavily on agricultural fields, depending on the type of forage present (e.g., alfalfa, wheat, etc.). Winter habitat is typically low elevation riparian corridors and agricultural fields (BLM 2008). White-tailed deer are expanding their population westward in Wyoming and have increased in numbers considerably in the past 5 to 10 years in the North Platte River drainage. In northwestern Colorado, white-tailed deer are expanding their populations in agricultural areas along the Yampa River.

Elk

Elk occur in portions of the big game analysis area and are typically found in forested habitats, although in southern Wyoming and northwestern Colorado elk are found in large herds during the winter months in open sagebrush shrublands and grasslands (BLM 2008; CDOW 2011). Winter habitat for elk typically consists of low elevation rolling hills, meadows, and agricultural fields. However, unlike pronghorn and mule deer, elk are not as susceptible to harsh winter conditions due to their nutritional requirements and large body size and will often remain at higher elevations until snow depths reach approximately 16 inches (Fitzgerald et al. 2011).

Moose

Moose occur within the big game analysis area in portions of Wyoming and Utah (Fitzgerald et al. 2011; UDWR 2009b). This species is found in forested areas, primarily along riparian areas with abundant willow habitat. In Wyoming, this species has increased in numbers in the Baggs area along the Little Snake River as moose populations from the Park Range expand into southwestern Wyoming. Moose feed on a wide

variety of plants including trees, shrubs, grasses, forbs, algae, and other aquatic plants (Fitzgerald et al. 2011; UDWR 2009b). Generally, moose are not as susceptible to severe winter conditions as other big game animals due to their large body size that allows them to forage in deep snow. Consequently, many moose populations in Utah are found in the same habitats year-round (UDWR 2009b).

Rocky Mountain Bighorn Sheep

Rocky Mountain bighorn sheep occur in portions of the big game analysis area in Utah (UDWR 2008) and Colorado (CPW 2012), and are listed as USFS sensitive in the Uinta National Forest. This species is found in a variety of habitats from alpine to lower elevation foothills. Rocky Mountain bighorn sheep typically occupy steep, inaccessible habitat that provides them vantage points for predator detection and escape cover (CDOW 2009; Fitzgerald et al. 2011; UDWR 2008). This species feeds primarily on grasses, shrubs, and some forbs depending on the elevation of occupied habitat. Winter range for Rocky Mountain bighorn sheep typically consists of low elevation south-facing slopes that are blown free of snow cover. Rocky Mountain bighorn sheep are gregarious and exhibit high site-fidelity. In many areas of their range, this species spends the winter months in the same localized winter habitat each year (CDOW 2009; Fitzgerald et al. 2011; UDWR 2008).

Desert Bighorn Sheep

Desert bighorn sheep may occur within the big game analysis area in Utah and Nevada (NDOW 2001; UDWR 2008), and are listed as USFS sensitive in the Dixie, Fishlake, and Manti-LaSal National Forests. This species is found in desert shrubland and barren/sparsely vegetated habitats and is most common in steep, rocky terrain with abundant grass and browse (NDOW 2001; UDWR 2008). Water sources are often limited in desert bighorn sheep habitat; therefore, this species may occupy habitats near streams, springs, and man-made water sources (i.e., guzzlers) during the summer months (NDOW 2001). The diet of the desert bighorn sheep is similar to that of the Rocky Mountain bighorn sheep and consists primarily of grasses, shrubs, and forbs (NDOW 2001; UDWR 2008). Due to the geographic range of the desert bighorn sheep, use of seasonal habitats is primarily determined by water and forage availability rather than weather patterns and snow depth (UDWR 2008).

Black Bear

Black bear are classified as a big game species in Wyoming, Colorado, and Nevada. In Utah, black bear are managed under the furbearer program which provides certain protections. The species is fairly common within the big game analysis area, especially in forested, woody riparian, wetland areas along perennial water bodies (Fitzgerald et al. 2011). Black bears generally occur at low densities in habitats found within the big game analysis area and their distribution is dependent on existing and ongoing disturbance and on available food sources.

Mountain Lion

Mountain lions are classified as a big game species in Wyoming, Colorado, and Nevada. In Utah, mountain lions are managed under the furbearer program which provides certain protections. The species is fairly common within the big game analysis area, especially in forested, woody riparian and wetland areas along perennial water bodies (Fitzgerald et al. 2011). Mountain lions generally occur at low densities in habitats found within the big game analysis area and their distribution is dependent on available food sources, primarily mule deer.

3.7.4.2 Small Game Species

Small game species that occur within the wildlife analysis area include upland game birds, small mammals, furbearers, and waterfowl.

Upland Game Birds

Upland game bird species that occur within the wildlife analysis area include greater sage-grouse, Columbian sharp-tailed grouse, dusky grouse, ruffed grouse, chukar, ring-necked pheasant, wild turkey, Gambel's quail, California quail, band-tailed pigeon, and mourning dove. The greater sage-grouse is a federal candidate species, as well as a BLM, USFS, and Utah state sensitive species and is discussed in Section 3.8, Special Status Wildlife Species. The Columbian sharp-tailed grouse also is a BLM and Utah state sensitive species and is discussed in Section 3.8, Special Status Wildlife Species. Dusky grouse are found in forested areas of Wyoming, Colorado, and Utah in areas that contain aspen, chokecherry, serviceberry, Douglas-fir, lodgepole pine, and spruce/fir vegetation types (Kingery 1998; Stokes and Stokes 1996). Ruffed grouse are found in forested habitats in central Utah in areas that have a mixture of deciduous and coniferous trees (UDWR 2011). Chukars are found in central and western Utah, and Nevada in dry, rocky terrain with abundant cheatgrass (UDWR 2003). Depending on weather conditions, this species is often found near water sources (e.g., guzzlers, springs, seeps) in drainages that have sufficient escape cover. Ring-necked pheasants are found in the agricultural areas of central Utah and are relatively common in areas that provide sufficient cover (e.g., weedy fields, fence rows, grain fields, wetlands, ditches). Wild turkeys are found in Colorado, Utah, and Nevada and are typically associated with ponderosa pine and oakbrush habitats but also may be found in riparian and agricultural areas with suitable trees for roosting (Kingery 1998; UDWR 2011). The wild turkey is also identified as a MIS for the Dixie National Forest. Gambel's quail are found in Colorado, Utah, and Nevada, while California quail are found in Utah and Nevada (Stokes and Stokes 1996; UDWR 2011). These two species of quail occupy similar brushy habitats near riparian areas (Stokes and Stokes 1996). Band-tailed pigeons occur in Colorado and Utah in forests and mountain shrub habitats, primarily ponderosa pine and oakbrush (Kingery 1998). Mourning doves occur in habitats ranging from deciduous forests to shrubland and grassland communities, often nesting in trees or shrubs near riparian areas or water sources (Stokes and Stokes 1996). Most upland game bird species feed on a wide variety of plant and insect species depending on the time of year (i.e., insects during the spring and summer and leaves and seeds during the fall and winter). Many of the species described above exhibit annual population fluctuations depending on habitat conditions and weather patterns.

Small Game Mammals

Small game mammals that are likely to occur within the wildlife analysis area include mountain cottontail, desert cottontail, snowshoe hare, black-tailed jackrabbit, white-tailed jackrabbit, and pine squirrel (Fitzgerald et al. 2011). These species occupy a wide variety of habitats from high elevation coniferous forests to low elevation deserts and sagebrush shrubland. Most of these species are fairly abundant within suitable habitat and their populations typically follow a cyclical pattern that exhibits highs and lows at approximately 10-year intervals (Fitzgerald et al. 2011).

Furbearers

Furbearers likely to occur within the wildlife analysis area include beaver, muskrat, raccoon, striped skunk, long-tailed weasel, short-tailed weasel, badger, bobcat, coyote, mink, and red fox (BLM 2008; CDOW 2010; UDWR 2010). These species have wide distributions within the wildlife analysis area and are found within a variety of habitat types (e.g., sagebrush shrubland, desert shrub, pinyon-juniper, montane shrubland, grassland, etc.). The distribution of furbearers within the wildlife analysis area is typically determined by available food sources (e.g., small rodents, fish, insects, waste grain, human trash). The Canada lynx is listed as threatened, BLM sensitive and Utah state sensitive, and Colorado state endangered and is discussed in detail in Section 3.8, Special Status Wildlife Species.

Waterfowl

The wildlife analysis area is located within the Central and Pacific Flyways. Common waterfowl species that may occur within the wildlife analysis area include Canada goose, mallard, green-winged teal, northern pintail, gadwall, American widgeon, and common goldeneye. Other common summer residents include blue-winged teal, cinnamon teal, northern shoveler, redhead, ring-necked duck, and sandhill crane

(Cerovski et al. 2004; Floyd et al. 2007; Kingery 1998; Stokes and Stokes 1996). These species distributions are limited to the rivers, streams, lakes, reservoirs, ponds, and wetlands found within the wildlife analysis area. Population numbers for these species vary annually, based on available habitat and weather patterns. While waterfowl species are considered game birds, they also are protected under the MBTA.

3.7.4.3 Nongame Species

A diversity of nongame species (e.g., small mammals, raptors, passerines, and reptiles) occupies a variety of habitat types within the wildlife analysis area. Nongame species serve as predators, prey, and scavengers in ecosystems. Common nongame wildlife species include birds and small mammals such as bats, voles, chipmunks, gophers, woodrats, ground squirrels, and mice. These species provide a substantial prey base for predators within the wildlife analysis area including larger mammals (coyote, badger, bobcat), raptors (eagles, hawks, falcons, owls), and reptiles (snakes). Nongame small mammals that are further classified as sensitive are discussed in Section 3.8, Special Status Wildlife Species. A number of bat species also occurs within the wildlife analysis area (Bradley et al. 2006; Cerovski et al. 2004; Fitzgerald et al. 2011; Oliver 2000; WGFD 2010) and, with the exception of little brown myotis, these species are state protected, BLM sensitive, or USFS sensitive and are discussed in Section 3.8, Special Status Wildlife Species.

Raptors and Other Migratory Birds

Nongame birds encompass a variety of passerine and raptor species, including migratory bird species that are protected under the Migratory Bird Treaty Act (16 U.S.C. 703-711) and Executive Order (EO) 13186 (66 FR 3853). In addition, bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Pursuant to EO 13186, both the BLM and USFS have signed MOUs with the USFWS that outline a collaborative approach to promote the conservation of migratory bird populations. The purpose of the MOUs is to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts on migratory birds in coordination with state, tribal, and local governments. These MOUs identify specific activities where cooperation between the BLM, USFS, and USFWS would contribute to the conservation of migratory birds and their habitat. Specific activities outlined in the MOUs include but are not limited to:

- Follow the USFWS Bald Eagle Management Guidelines as appropriate;
- Follow migratory bird conservation measures as they are developed by the USFWS;
- Work collaboratively to identify and address issues affecting migratory bird Species of Concern;
- Evaluate the effects of proposed project actions on migratory birds during the NEPA process.

In order to comply with all applicable regulatory requirements outlined by the EO 13186 and the associated MOUs, TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this EIS, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Raptor species that could potentially occur as residents or migrants within the wildlife analysis area include eagles (bald and golden eagles), buteos (e.g., red-tailed hawk, Swainson's hawk, ferruginous hawk), falcons (e.g., prairie falcon, peregrine falcon, American kestrel), accipiters (e.g., northern goshawk, Cooper's hawk, sharp-shinned hawk), owls (e.g., great-horned owl, burrowing owl, long-eared owl, short-eared owl, flammulated owl), northern harrier, and osprey (Floyd et al. 2007; Herron et al. 1985;

Kingery 1998; Stokes and Stokes 1996; WGFD 2008). Special status raptor species are discussed in Section 3.8, Special Status Wildlife Species.

A variety of migratory birds occur within the wildlife analysis area throughout the year; however, they are most abundant during migration, as well as during the breeding season. Migratory bird breeding season for the wildlife analysis area generally is January 1 to August 15, depending on latitude and elevation, as well as seasonal weather conditions (Floyd et al. 2007; Kingery 1998; Nicholoff 2003). Representative bird species that occur throughout the wildlife analysis area include great blue heron, horned lark, barn swallow, black-billed magpie, common raven, western meadowlark, green-tailed towhee, American goldfinch, and red-winged blackbird (Floyd et al. 2007; Kingery 1998; Stokes and Stokes 1996; WGFD 2008). Migratory bird species that are further classified as federally-listed, candidate, state-listed, BLM sensitive, or USFS sensitive are discussed in Section 3.8, Special Status Wildlife Species.

USFWS Birds of Conservation Concern

A list of Birds of Conservation Concern (BCC) was developed as a result of a 1988 amendment to the Fish and Wildlife Conservation Act. This Act mandated that the USFWS "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973." The goal of the BCC list is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation actions, and that these species would be consulted on in accordance with EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (USFWS 2008).

The wildlife analysis area is located within Bird Conservation Regions (BCR) 9 (Great Basin), 10 (Northern Rockies), 16 (Southern Rockies/Colorado Plateau), and 33 (Sonoran and Mohave Deserts). These BCR regions contain a wide variety of habitats from high elevation coniferous forests and alpine tundra to low elevation desert and sagebrush shrublands. Due to this habitat diversity, a large number of migratory birds are found year-round or during migration within these regions. The wildlife analysis area falls within a major migration corridor for bird species, which travel to and from western Canada through the U.S. to Mexico and Central and South America (USFWS 2008).

Within each BCR, BHCAs are specifically identified. BHCAs are grouped into three categories of priority, A, B and C, as defined below. Three criteria were used to rank these habitat areas: 1) statewide importance to birds; 2) degree of threat; and 3) opportunities (funding, partnerships, and feasibility for habitat protection, restoration, and enhancement). The three habitat categories were defined as:

- Priority A: High threat, high opportunity, and/or high value to birds statewide
- Priority B: One criterion may be high; generally the habitat is of moderate concern
- Priority C: Relatively low threat, low opportunity, and/or low value as habitat statewide

BHCAs have no official status, but are important as areas where state partners believe the best opportunity exists for effective conservation activities (IMJV 2005). Potential temporary and long-term impacts to BHCAs can result in lost opportunities for conservation efforts. In order to address this loss of conservation opportunity, BHCAs will be identified in the TWE Avian Protection Plan and prioritized as areas for potential compensatory mitigation. A total of 7 BHCAs are crossed by the 250-foot-wide transmission line ROW for all alternatives. A total of 26 BHCAs are crossed by the 2-mile transmission line corridor for all alternatives. A total of 47 BHCAs are partially or completely within the wildlife analysis area. BHCAs that are crossed by the 250 foot-wide transmission line ROW and examples of BCC species that may be found within them are presented in Section 3.7.5, Regional Summary, and on **Figure 3.7-1**.

Partners in Flight Priority Bird Species

The national Partners in Flight (PIF) program began in 1989 as a coordinated effort to document and reverse apparent population declines for neotropical migratory birds that breed north of Mexico and then

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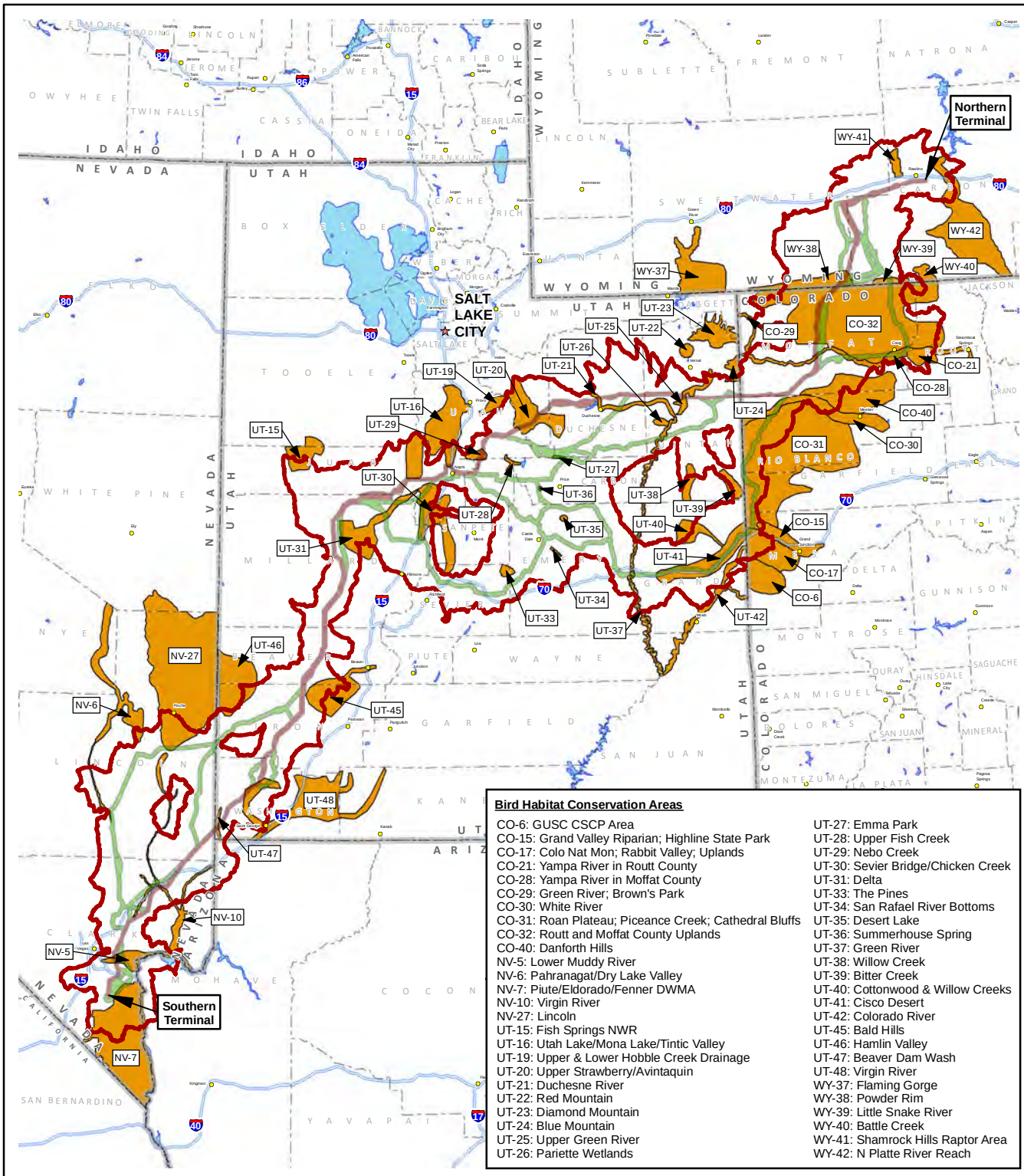
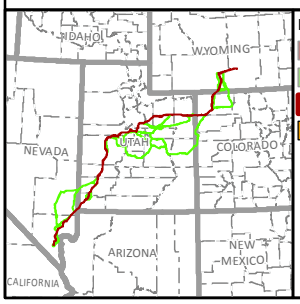


Bird Habitat Conservation Areas

CO-6: GUSC CSCP Area
CO-15: Grand Valley Riparian; Highline State Park
CO-17: Colo Nat Mon; Rabbit Valley; Uplands
CO-21: Yampa River in Routt County
CO-28: Yampa River in Moffat County
CO-29: Green River; Brown's Park
CO-30: White River
CO-31: Roan Plateau; Piceance Creek; Cathedral Bluffs
CO-32: Routt and Moffat County Uplands
CO-40: Danforth Hills
NV-5: Lower Muddy River
NV-6: Pahranagat/Dry Lake Valley
NV-7: Piute/Eldorado/Fenner DWMA
NV-10: Virgin River
NV-27: Lincoln
UT-15: Fish Springs NWR
UT-16: Utah Lake/Mona Lake/Tintic Valley
UT-19: Upper & Lower Hobble Creek Drainage
UT-20: Upper Strawberry/Avintaquin
UT-21: Duchesne River
UT-22: Red Mountain
UT-23: Diamond Mountain
UT-24: Blue Mountain
UT-25: Upper Green River
UT-26: Pariette Wetlands
UT-27: Emma Park
UT-28: Upper Fish Creek
UT-29: Nebo Creek
UT-30: Sevier Bridge/Chicken Creek
UT-31: Delta
UT-33: The Pines
UT-34: San Rafael River Bottoms
UT-35: Desert Lake
UT-36: Summerhouse Spring
UT-37: Green River
UT-38: Willow Creek
UT-39: Bitter Creek
UT-40: Cottonwood & Willow Creeks
UT-41: Cisco Desert
UT-42: Colorado River
UT-45: Bald Hills
UT-46: Hamlin Valley
UT-47: Beaver Dam Wash
UT-48: Virgin River
WY-37: Flaming Gorge
WY-38: Powder Rim
WY-39: Little Snake River
WY-40: Battle Creek
WY-41: Shamrock Hills Raptor Area
WY-42: N Platte River Reach



Project Corridors

- Applicant Proposed
- Alternative
- Project Analysis Area
- Bird Habitat Conservation Area (BHCA)

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.7-1
Bird Habitat Conservation Areas (BHCA)

0 20 40 80 Miles
0 20 40 80 km
1:4,750,000
N

Western AREA POWER ADMINISTRATION

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migrate to Mexico, Central and South America, and the Caribbean in the winter months (Colorado Partners in Flight 2000; Neel 1999; Nicholoff 2003; Utah Steering Committee Intermountain West Joint Venture 2005). Examples of PIF Priority Bird Species that may be found within the wildlife analysis area in each Project region are presented in Section 3.7.5, Regional Summary.

Audubon Important Bird Areas

The Important Bird Areas (IBAs) program was initiated by BirdLife International in Europe in the 1980s. Since then, over 8,000 sites in 178 countries have been identified as Important Bird Areas. As the U.S. Partner of BirdLife International, the National Audubon Society administers the IBA Program in the U.S. Audubon launched its IBA initiative in 1995. State-based IBA programs provide the flexibility to tailor the program to individual state needs (National Audubon Society 2011).

IBAs are sites that provide essential habitat for one or more species of birds. They include sites for breeding, wintering, and/or migrating birds. IBAs may be a few acres or thousands of acres, but usually are discrete sites that stand out from the surrounding landscape. IBAs may include public or private lands, or both, and they may be protected by local, state, or national regulations (National Audubon Society 2011).

To qualify as an Important Bird Area, sites must satisfy at least one of the following criteria. The site must support:

- Species of conservation concern (e.g. threatened and endangered species);
- Restricted-range species (species vulnerable because they are not widely distributed);
- Species that are vulnerable because their populations are concentrated in one general habitat type or biome; or
- Species, or groups of similar species (such as waterfowl or shorebirds), that are vulnerable because they occur at high densities due to their behavior and habitat requirements.

A summary of IBAs that are within the wildlife analysis area in each Project region are presented in Section 3.7.5, Regional Summary. **Figure 3.7-2** displays IBAs within the wildlife analysis area.

Reptiles

Potential habitat for reptiles within the wildlife analysis area includes nearly all of the vegetative communities present, with the exception of high elevation coniferous forests and tundra. Species that could potentially occur within the wildlife analysis area include the desert horned lizard; Great Basin collared lizard, northern sagebrush lizard, bull snake, and prairie rattlesnake (Baxter and Stone 1980; Hammerson 1999; NDOW 2012). Sensitive reptile species are discussed in Section 3.8, Special Status Wildlife Species.

USFS Management Indicator Species

A Management Indicator Species (MIS) is a plant or animal species selected because its status is believed to: 1) be indicative of the status of a larger group of species; 2) be reflective of the status of a key habitat type; or 3) act as an early warning of an anticipated stressor to ecological integrity. The key characteristics of MIS are that their status and trend provide insights to the integrity of the larger ecological system to which they belong. Wildlife species that have been selected as MIS for the national forests crossed by the project are presented in **Table 3.7-4**. Seven MIS also are categorized as special status species and are presented in Section 3.8, Special Status Wildlife Species. Mule deer and Rocky Mountain elk are analyzed as big game species.

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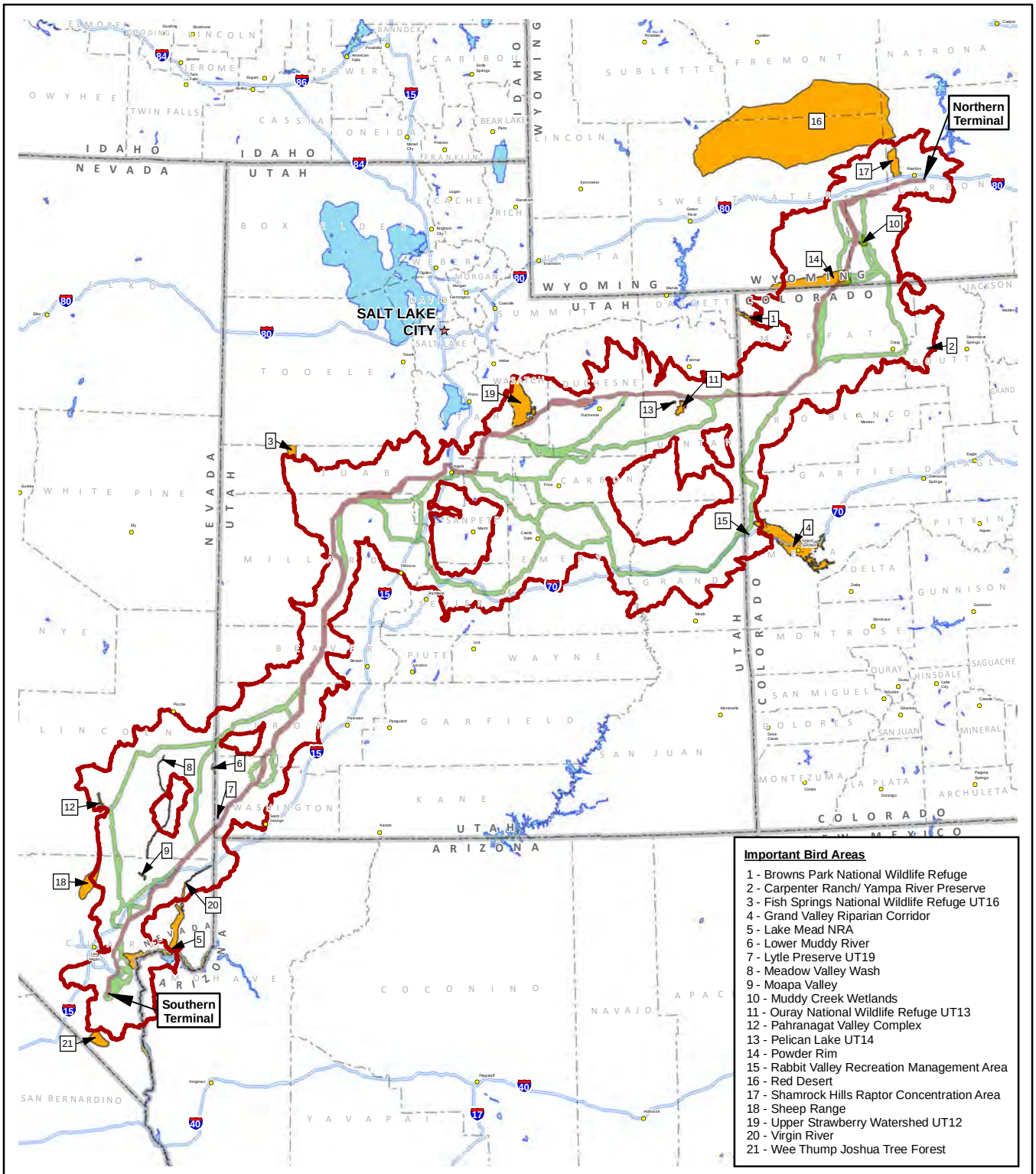

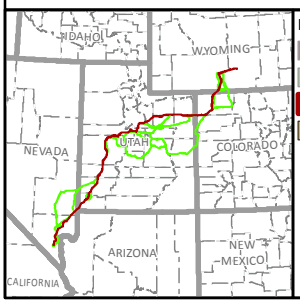

Project Corridors

- Applicant Proposed
- Alternative
- Project Analysis Area
- Important Bird Area (IBA)

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.7-2
Important Bird Areas

0 20 40 80 Miles
0 20 40 80 km
1:4,750,000

N

Western AREA POWER ADMINISTRATION

Exported On: 4/4/2013

Table 3.7-4 USFS Management Indicator Species for National Forests Crossed by the 2-mile Transmission Line Corridor

Species/Habitat Association[1]	Scientific Name	Ashley National Forest Region II	Dixie National Forest Region III	Fishlake National Forest Region II	Manti-LaSal National Forest Region II	Uinta-Wasatch-Cache National Forest Region II
Mammals						
American beaver Habitat category: 15, 21	*Castor Canadensis*					MIS
Mule deer Refer to Section 3.7.4.1	*Odocoileus hemionus*	MIS	MIS	MIS	MIS, Big Game	
Elk Refer to Section 3.7.4.1	*Cervus Canadensis*	MIS	MIS	MIS	MIS, Big Game	
Birds						
Northern goshawk Habitat category: 2, 5, 6	*Accipiter gentilis*	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I
Golden eagle Habitat category: 1, 4, 7, 10, 13, 14, 16, 18, 19, 20	*Aquila chrysaetos*	MIS, BLM			MIS, BLM	
Greater sage-grouse Habitat category: 18	*Centrocercus urophasianus*	MIS, FC, BLM, USFS, UT-SS Tier I				
White-tailed ptarmigan Habitat category: 20	*Lagopus leucura*	MIS				
Wild turkey Habitat category: 1, 2, 5, 6, 7, 10, 11, 13, 16, 19, 21	*Meleagris gallopavo*		MIS			
Red-naped sapsucker Habitat category: 2, 5, 6, 21	*Sphyrapicus nuchalis*	MIS, BLM				
Hairy woodpecker Habitat category: 1, 2, 6, 16, 21	*Picoides villosus*			MIS		
American three-toed woodpecker Habitat category: 5	*Picoides dorsalis*					MIS, BLM, USFS, UT-SS Tier II
Northern flicker Habitat category: 1, 2, 5, 6, 12, 16, 21	*Colaptes auratus*		MIS			
Warbling vireo Habitat category: 2, 16, 21	*Vireo gilvus*	MIS				
Western bluebird Habitat category: 1, 2, 5, 6, 10, 13, 16, 19, 21	*Sialia Mexicana*			MIS		
Mountain bluebird Habitat category: 1, 2, 5, 6, 10, 13, 16, 19, 21	*Sialia currucoides*			MIS		
Sage thrasher Habitat category: 18	*Oreoscoptes montanus*			MIS, BLM		
Yellow warbler Habitat category: 2, 6, 16, 19, 21	*Dendroica petechia*			MIS		
MacGillivray's warbler Habitat category: 2, 6, 16, 19, 21	*Oporornis tolmiei*			MIS		
Brewer's sparrow Habitat category: 18	*Spizella breweri*			MIS		

Table 3.7-4 USFS Management Indicator Species for National Forests Crossed by the 2-mile Transmission Line Corridor

Species/Habitat Association[1]	Scientific Name	Ashley National Forest Region II	Dixie National Forest Region III	Fishlake National Forest Region II	Manti-LaSal National Forest Region II	Uinta-Wasatch-Cache National Forest Region II
Vesper sparrow Habitat category: 1, 10, 13, 18	*Pooecetes gramineus*			MIS, BLM		
Song sparrow Habitat category: 1, 2, 5, 6, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21	*Melospiza melodia*	MIS		MIS		
Lincoln's sparrow Habitat category: 2, 12, 16, 19, 21	*Melospiza lincolnii*			MIS		

[1] Habitat association refers to vegetation communities (by number) as presented in **Table 3.7-2**.

Note: Status is defined as: BLM = BLM Sensitive, USFS = USFS Sensitive, UT-SS = Utah Sensitive Species (Tier I and Tier II species are defined in Utah's Comprehensive Wildlife Strategy, NV-P = Nevada State Protected.

3.7.5 Regional Summary

As described in Section 3.7.4, Baseline Description, a wide variety of wildlife habitats and species is found within the three analysis areas. Many of these species are found over a wide geographic area in various habitat types and elevations found within the analysis areas. As described in Section 3.5, Vegetation, 20 habitat types associated with vegetation communities are found within the analysis areas and each Project region has several dominant habitat types (**Table 3.5-2**). Developed/disturbed land is not considered to be typical wildlife habitat and is not included in impact analyses. Given the habitat types present in each Project region, wildlife species and habitats specific to each region are summarized below.

The highest number of wildlife species occurs in Region II, due to elevation variation and associated habitat diversity. The potential occurrence of special status wildlife species by Project region is discussed in detail in Section 3.8.5, Regional Summary of Special Status Wildlife Species.

3.7.5.1 Big Game Species

As described in Section 3.7.4, Baseline Description, seven big game species are known to occur within the big game analysis area. A summary of big game species and habitat occurrence by Project region, including the terminal locations is provided below. The highest number of big game species occurs in Regions I and II, due to elevation fluctuations and associated habitat diversity. **Table 3.7-5** presents big game habitat present at the terminal siting areas.

Table 3.7-5 Big Game Habitat within the Terminal Siting Areas

Terminal	State	Species	Habitat Type	Acres with the Terminal Siting Area
Northern Terminal	Wyoming	Mule Deer	Crucial Winter/Yearlong Range	3,334
Southern Terminal Located near IPP (Design Option 2)	Utah	Pronghorn	Yearlong Crucial Range	639
Southern Terminal Located near IPP (Design Option 3)	Utah	Pronghorn	Yearlong Crucial Range	639
Proposed Alternative Southern Terminal	Nevada	None	N/A	N/A
Alternate Southern Terminal	Nevada	None	N/A	N/A

Northern Terminal

Table 3.7-6 presents big game habitat present at the Northern Terminal siting area.

Table 3.7-6 Big Game Habitat within the Northern Terminal Siting Area

State	Species	Habitat Type	Acres within the Northern Terminal Siting Area
Wyoming	Mule Deer	Crucial Winter/Yearlong Range	3,334

Proposed Alternative Southern Terminal

The Proposed Alternative Southern Terminal and associated facilities are sited almost entirely within developed/disturbed areas. Developed/disturbed land is not considered to be typical wildlife habitat and is not included in impact analyses. Less than 1 percent of the Southern Terminal siting area is within the desert shrub community. No big game species are known to occupy the Southern Terminal siting area.

Alternate Southern Terminal

The Alternate Southern Terminal and associated facilities are sited almost entirely within developed/disturbed areas. Developed/disturbed land is not considered to be typical wildlife habitat and is not included in impact analyses. Less than 1 percent of the Alternate Southern Terminal siting area is within the desert shrub community. No big game species are known to occupy the Alternate Southern Terminal siting area.

Southern Terminal located near IPP (Design Option 2)

The Southern Terminal located near IPP (Design Option 2) siting area is located within pronghorn yearlong crucial range.

Southern Substation located near IPP (Design Option 3)

The Southern Substation located near IPP (Design Option 3) is entirely within the boundaries of the Southern Terminal (Design Option 2). The Southern Substation would be located within pronghorn yearlong crucial range.

Region I

Species that occur within the Region I big game analysis area include pronghorn, mule deer, white-tailed deer, elk, moose, Rocky Mountain bighorn sheep, black bear, and mountain lion. Pronghorn, mule deer, and elk crucial winter range occurs within the big game analysis area throughout most of southern Wyoming, northwestern Colorado, and northeastern Utah. In addition, Rocky Mountain bighorn sheep crucial winter range occurs within the big game analysis area in northeastern Utah. Seasonal habitats within the Region I big game analysis area are presented in **Table 3.7-7** and on **Figure 3.7-3**.

Table 3.7-7 Habitat within the Big Game Analysis Area in Region I

State	Species	Habitat Type	Acres within Big Game Analysis Area
Wyoming	Pronghorn	Crucial Winter/Yearlong Range	485,710
	Mule Deer	Crucial Winter; Crucial Winter/ Yearlong Range	362,828
	Elk	Crucial Winter/Yearlong Range	206,076
Colorado	Pronghorn	Severe Winter Range	198,590
	Mule Deer	Severe Winter Range	677,309
	Elk	Severe Winter Range	1,016,686
	Elk	Parturition Range	370,140

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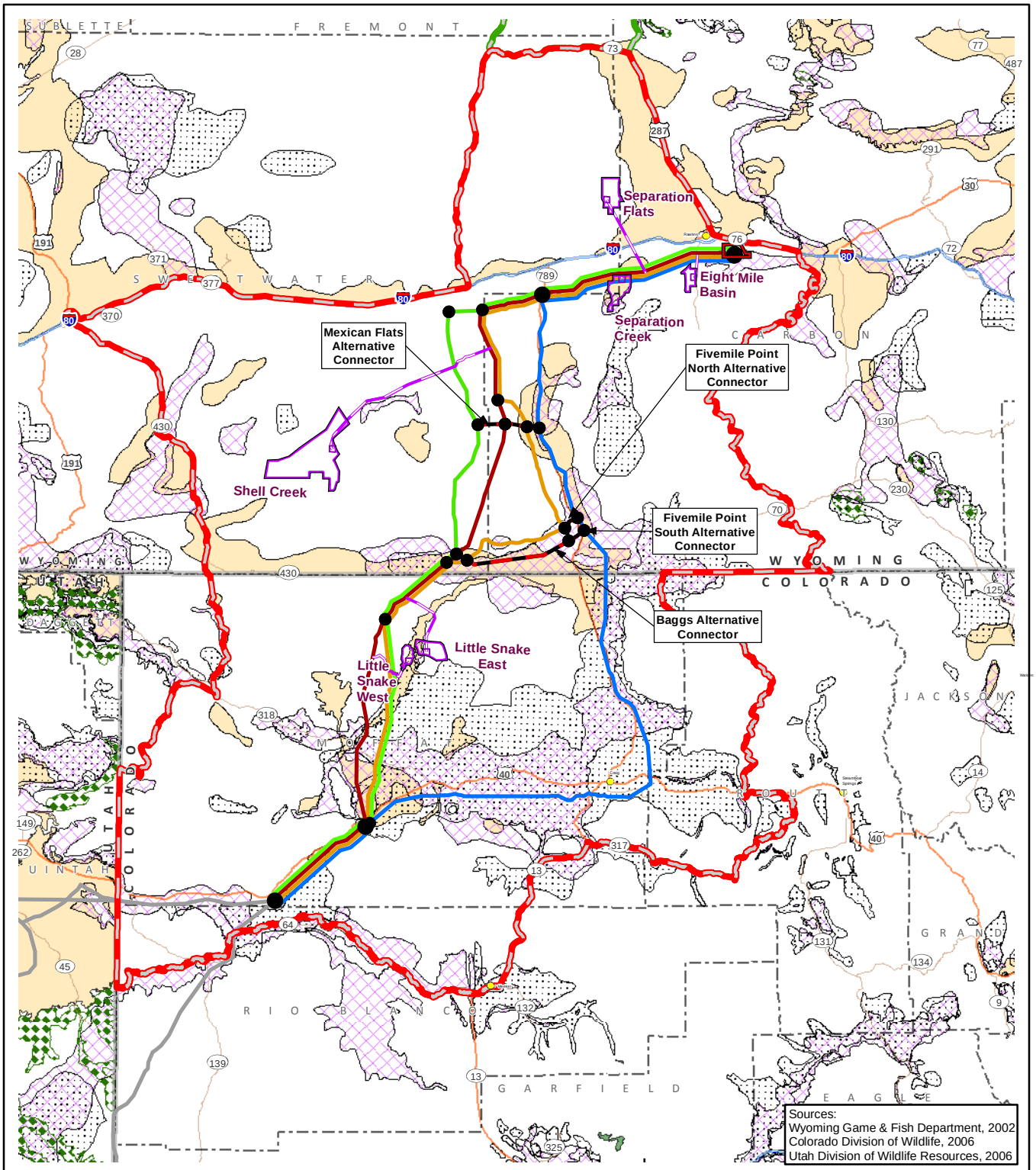

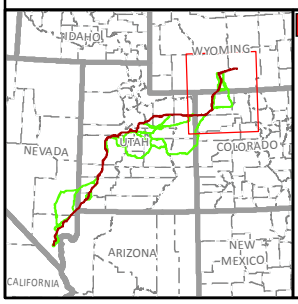

Terminal Siting Area
Node

DEIS Alternative Routes
- Applicant Proposed I-A
- Alternative I-B
- Alternative I-C
- Agency Preferred I-D
- Alternative Variation or Connector
- Segment not in this Region

Big Game Analysis Area
- Region I
- Region I Pronghorn Extension

Big Game Crucial Winter Range
- Elk
- Mule Deer
- Rocky Mountain Bighorn Sheep
- Pronghorn

- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.7-3
Region I
Important Big Game Habitat

0 5 10 20 Miles
0 5 10 20 km
1:1,500,000

N

Western AREA POWER ADMINISTRATION

Exported On: 6/5/2013

Region II

Species that occur within the Region II big game analysis area include pronghorn, mule deer, elk, moose, Rocky Mountain bighorn sheep, desert bighorn sheep, black bear, and mountain lion. Pronghorn, mule deer, and elk crucial winter ranges occur within the big game analysis area in portions of western Colorado and eastern and central Utah. Moose crucial winter range occurs within the big game analysis area in central Utah in Sanpete County. Rocky Mountain bighorn sheep crucial winter range occurs within the big game analysis area primarily along the I-70 corridor in Grand County and in southern Wasatch and Duchesne counties, Utah. Desert bighorn sheep crucial winter range occurs within the big game analysis area in Emery County, Utah. Big game seasonal habitats within the Region II big game analysis area are presented in **Table 3.7-8** and on **Figure 3.7-4**.

Table 3.7-8 Habitats within the Big Game Analysis Area in Region II

State	Species	Habitat Type	Acres within Big Game Analysis Area
Colorado	Pronghorn	Severe Winter Range	15,494
	Mule Deer	Severe Winter Range	179,527
	Elk	Severe Winter Range	106,056
	Elk	Parturition Range	22,548
Utah	Pronghorn	Crucial Yearlong; Substantial Yearlong Range	6,081,343
	Pronghorn	Parturition Range	1,428,978
	Mule Deer	Crucial Winter Range	3,486,734
	Mule Deer	Parturition Range	3,511,145
	Elk	Crucial Winter Range	3,329,852
	Elk	Parturition Range	1,624,494
	Moose	Occupied	1,319,143
	Moose	Parturition Range	393,186
	Rocky Mountain Bighorn Sheep	Crucial Yearlong Range	1,781,886
	Desert Bighorn Sheep	Occupied	1,103,697

Region III

Species that occur within the Region III big game analysis area include pronghorn, mule deer, desert bighorn sheep, black bear, and mountain lion. Pronghorn and mule deer crucial winter range occurs within the big game analysis area throughout Region III in southwestern Utah and eastern Nevada. Desert bighorn sheep occupied habitat occurs within the big game analysis area in southern Nevada in Clark County. Big game seasonal habitats within the Region III big game analysis area are presented in **Table 3.7-9** and on **Figure 3.7-5**.

Table 3.7-9 Habitats within the Big Game Analysis Area in Region III

State	Species	Habitat Type	Acres within Big Game Analysis Area
Utah	Pronghorn	Crucial Yearlong Habitat	5,428,001
	Mule Deer	Crucial Winter Habitat	812,705
	Desert Bighorn Sheep	Occupied	67,786
Nevada	Pronghorn	Occupied	1,512,355
	Mule Deer	Occupied	250,417
	Desert Bighorn Sheep	Occupied[1]	564,735

[1] NDOW classifies desert bighorn sheep habitat as occupied, unoccupied, and potential habitat.

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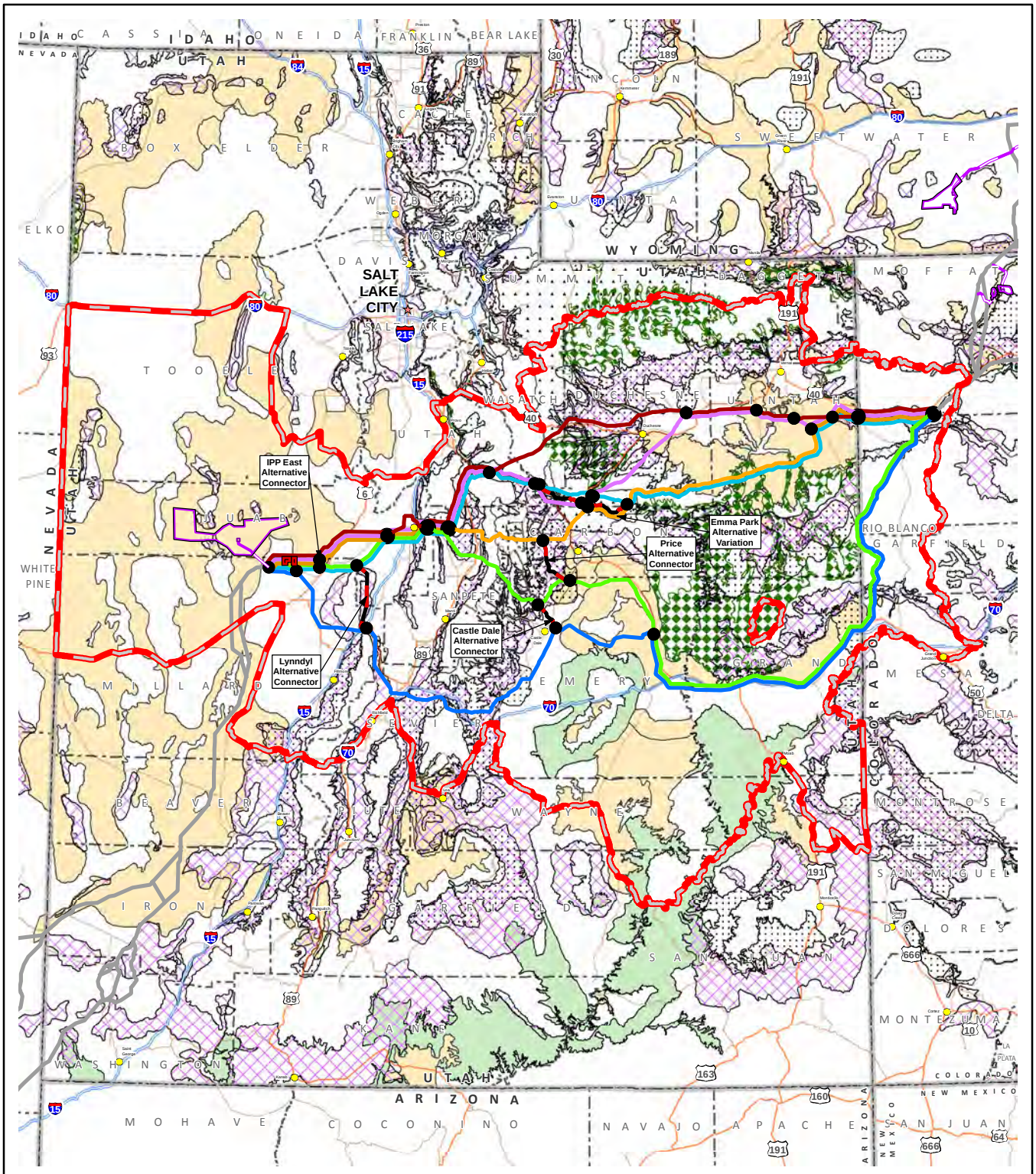

DEIS Alternative Routes
- Applicant Proposed II-A
- Alternative II-B
- Alternative II-C
- Alternative II-D
- Alternative II-E
- Agency Preferred II-F
- Alternative Variation or Connector
- Segment not in this Region

- Terminal Siting Area
- Node
- Region II Big Game Analysis Area

Big Game Crucial Winter Range
- Pronghorn
- Elk
- Mule Deer
- Rocky Mountain Bighorn Sheep
- Desert Bighorn Sheep
- Moose

- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.7-4
Region II
Important Big Game Habitat

0 10 20 40 Miles
0 10 20 40 km
1:3,100,000

N

Western Area Power Administration

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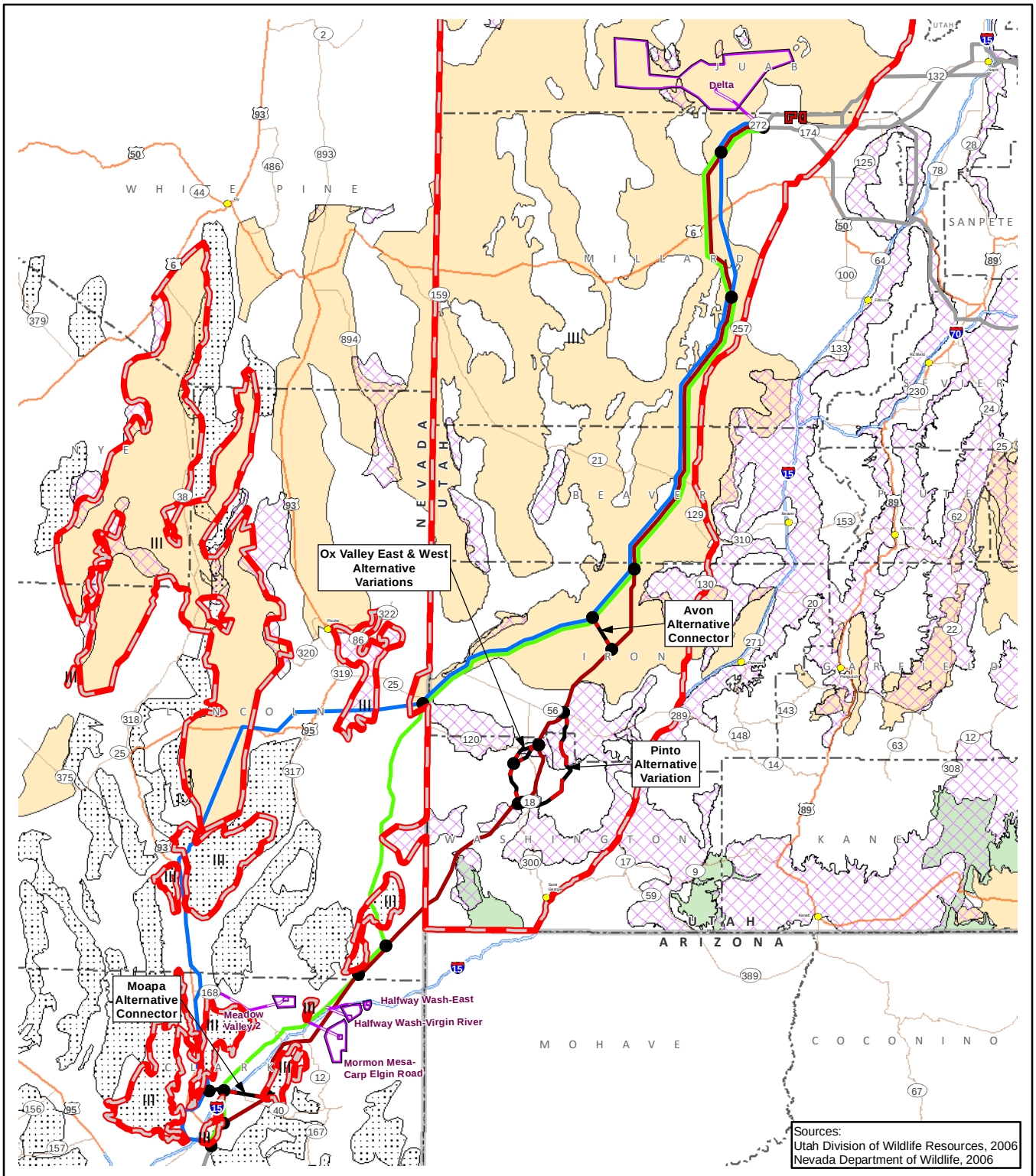

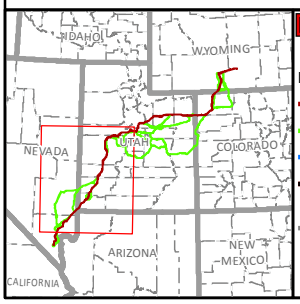

Terminal Siting Area
Node

DEIS Alternative Routes
- Applicant Proposed III-A
- Agency Preferred III-B
- Alternative III-C
- Alternative Variation or Connector
- Segment not in this Region

Region III Big Game Analysis Area

Big Game Crucial Winter Range
- Mule Deer
- Pronghorn
- Desert Bighorn Sheep

Occupied Habitat (Nevada)
- Desert Bighorn Sheep

- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.7-5
Region III
Important Big Game Habitat

0 10 20 40 Miles
0 10 20 40 km
1:2,000,000

N

Western AREA POWER ADMINISTRATION

Exported On: 6/5/2013

Region IV

Species that occur within the Region IV big game analysis area include desert bighorn sheep and mountain lion. Desert bighorn sheep occupied habitat occurs within the big game analysis area in the mountain ranges surrounding Las Vegas, Nevada. Desert bighorn sheep habitat within the Region IV big game analysis area is presented in **Table 3.7-10** and on **Figure 3.7-6**.

Table 3.7-10 Habitat within the Big Game Analysis Area in Region IV

State	Species	Habitat Type	Acres within Big Game Analysis Area
Nevada	Desert Bighorn Sheep	Occupied[1]	257,657

[1] NDOW classifies desert bighorn sheep habitat as occupied, unoccupied, and potential habitat.

3.7.5.2 Small Game Species

As described in Section 3.7.4, Baseline Description, numerous small game species are known to occur within the wildlife analysis area. A summary of small game species occurrence for the terminal siting areas and by Project region is provided below. The highest number of small game species occurs within the wildlife analysis area in Regions I and II due to topography and associated habitat diversity.

Northern Terminal

Representative small game species that may occur within the Northern Terminal siting area include upland game birds such as mourning dove; small game mammals such as desert cottontail, black-tailed jackrabbit, and white-tailed jackrabbit; furbearers such as badger, bobcat, and coyote; and waterfowl such as mallard, Canada goose, blue-winged teal, and pintail.

Proposed Alternative Southern Terminal

Representative small game species that may occur within the proposed alternative Southern Terminal siting area include upland game birds such as Gambel's quail, chukar, and mourning dove; small game mammals such as desert cottontail; furbearers such as raccoon and coyote; and waterfowl such as mallard, Canada goose, green-winged teal, gadwall, and pintail.

Alternate Southern Terminal

Representative small game species that may occur within the Alternate Southern Terminal siting area would be the same as for the proposed alternative Southern Terminal siting area.

Southern Terminal located near IPP (Design Option 2)

Representative small game species that may occur within the Southern Terminal located near IPP (Design Option 2) siting area include upland game birds such as dusky grouse, ruffed grouse, chukar, ring-necked pheasant, wild turkey, Gambel's quail, California quail, band-tailed pigeon, and mourning dove; small game mammals such as desert cottontail and white-tailed jackrabbit, furbearers such as bobcat, red fox, and coyote and waterfowl such as mallard, Canada goose, cinnamon teal, northern shoveler, and pintail.

Southern Substation located near IPP (Design Option 3)

The Southern Substation located near IPP (Design Option 3) is entirely within the boundaries of the Southern Terminal (Design Option 2) and representative small game species would be the same.

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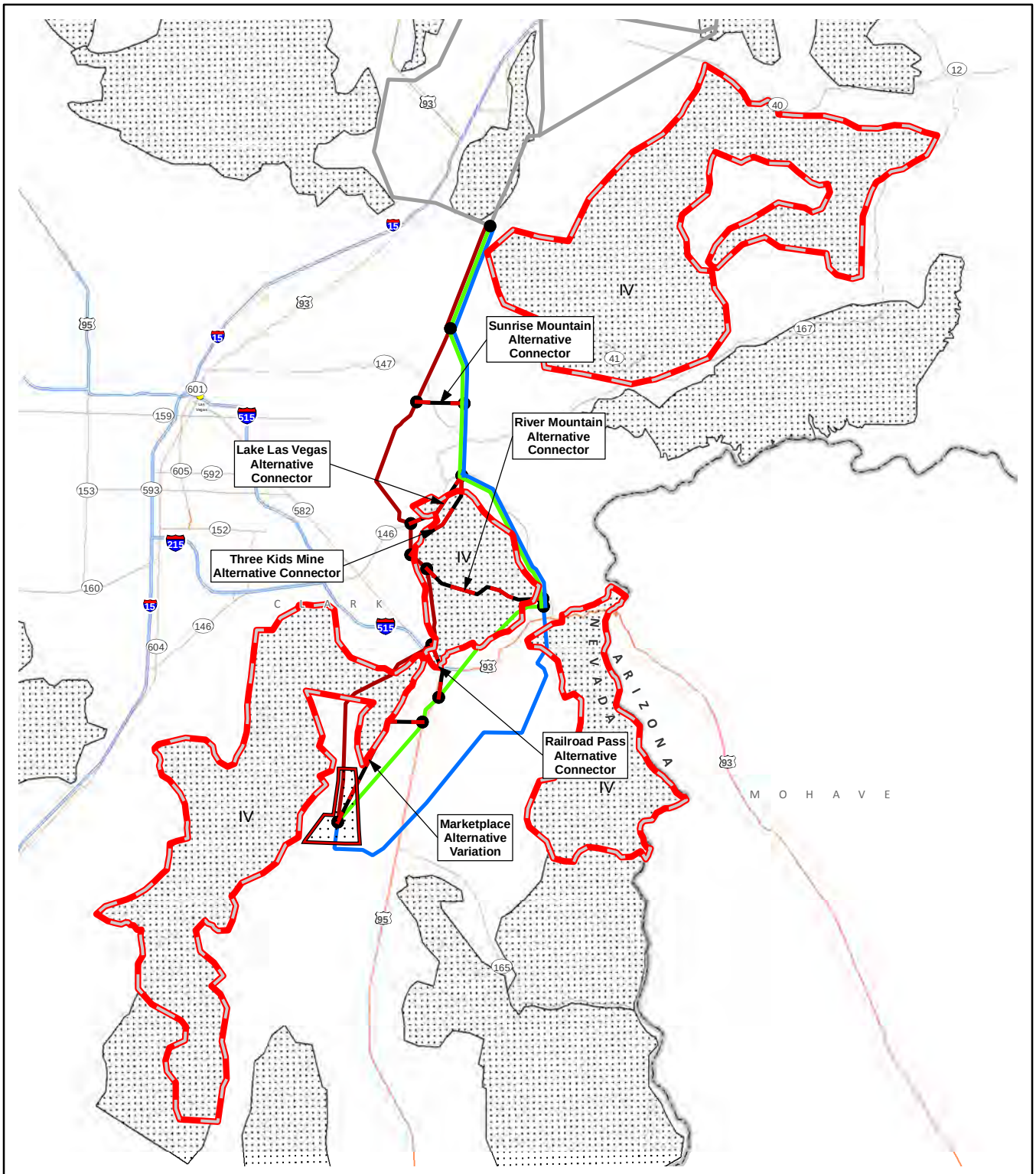
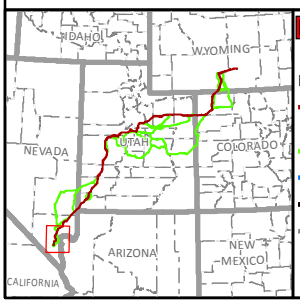




Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed/ Agency Preferred IV-A
Alternative IV-B
Alternative IV-C
Alternative Variation or Connector
Segment not in this Region

Region IV Big Game Analysis Area
Occupied Habitat (Nevada)
Desert Bighorn Sheep

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.7-6
Region IV
Important Big Game Habitat

0 2.5 5 10 Miles
0 2.5 5 10 km
1:500,000

N

Western AREA POWER ADMINISTRATION

Exported On: 5/2/2013

Region I

Representative small game species that may occur within the Region I wildlife analysis area include upland game birds such as dusky grouse, ruffed grouse, and mourning dove; small game mammals such as desert cottontail, black-tailed jackrabbit, and white-tailed jackrabbit; furbearers such as beaver, badger, bobcat, and coyote; and waterfowl such as mallard, Canada goose, blue-winged teal, and pintail. Region I is located within the Central Flyway in portions of Wyoming near Rawlins and the Pacific Flyway in southern Wyoming and northwestern Colorado. Due to the arid climate and limited water sources in Region I, waterfowl species are typically found in close relation to wetlands and riparian areas, such as Muddy Creek in Wyoming; the Little Snake and Yampa rivers in Colorado; and the Green River and its tributaries in northeastern Utah.

Region II

Representative small game species that may occur within the Region II wildlife analysis area include upland game birds such as dusky grouse, ruffed grouse, chukar, ring-necked pheasant, wild turkey, California quail, band-tailed pigeon, and mourning dove; small game mammals such as desert cottontail, snowshoe hare, furbearers such as beaver, muskrat, bobcat, red fox, and coyote; and waterfowl such as mallard, Canada goose, green-winged teal, gadwall, and pintail. Region II is located within the Pacific Flyway. The Ouray National Wildlife Refuge (NWR) is located in the wildlife analysis area near the Green River in Uintah County, Utah. The Ouray NWR area provides important habitat during migration for waterfowl that migrate along the Green River riparian corridor in eastern Utah (USFWS 2011). The White River and Douglas Creek also provide habitat for small game species and waterfowl.

Region III

Representative small game species that may occur within the Region III wildlife analysis area include upland game birds such as dusky grouse, chukar, wild turkey, California quail, Gambel's quail, band-tailed pigeon, and mourning dove; small game mammals such as desert cottontail and white-tailed jackrabbit; furbearers such as badger, bobcat, red fox, and coyote; and waterfowl such as mallard, Canada goose, cinnamon teal, northern shoveler, and pintail. Region III is located within the Pacific Flyway. Due to the arid climate and limited water sources in Region III, small game species are typically found in close relation to wetlands and riparian areas such as streams and lakes in the Dixie National Forest in Washington County, Utah and along the Muddy River in Clark County, Nevada.

Region IV

Representative small game species that may occur within the Region IV wildlife analysis area include upland game birds such as Gambel's quail, chukar, and mourning dove; small game mammals such as desert cottontail; furbearers such as raccoon and coyote; and waterfowl such as mallard, Canada goose, pintail, and northern shoveler. Region IV is located with the Pacific Flyway. Due to a lack of water sources and riparian and wetland habitats within the Region IV wildlife analysis area, most waterfowl use is limited to migrating individuals that utilize the Lake Mead National Recreation Area in eastern Clark County, Nevada.

3.7.5.3 Nongame Species

As described in Section 3.7.4, Baseline Description, numerous nongame species are known to occur within the wildlife analysis area. A summary of nongame species occurrence for the terminal siting areas and by Project region is provided below. The highest number of nongame species occurs within the wildlife analysis area in Regions I and II due to topography and associated habitat diversity.

Northern Terminal

Small Mammals

Representative nongame small mammal species that may be found within the Northern Terminal siting area include little brown myotis, Merriam's shrew, golden-mantled ground squirrel, least chipmunk, northern pocket gopher, Ord's kangaroo rat, white-tailed prairie dog, Wyoming ground squirrel, Wyoming pocket gopher, and olive-backed pocket mouse (Fitzgerald et al. 2011).

Raptors

Based on agency raptor nest data, three species of raptors have been documented nesting within 1 mile of the Northern Terminal siting area. These include burrowing owl, golden eagle, and prairie falcon. As special status raptor species, these are addressed in Section 3.8.4.3, Region I.

Other Migratory Birds

A wide variety of migratory bird species may be found within the Northern Terminal siting area. Representative species include horned lark, western flycatcher, lark sparrow, and American goldfinch.

Reptiles

Representative reptile species that may be found within the Northern Terminal siting area include sagebrush lizard, short-horned lizard, Great Basin gopher snake, bull snake, wandering garter snake, and prairie rattlesnake (Baxter and Stone 1980; Hammerson 1999).

Proposed Alternative Southern Terminal

Small Mammals

Representative nongame small mammal species that may be found within the Proposed Alternative Southern Terminal siting area include little brown myotis, desert shrew, white-tailed antelope squirrel, Botta's pocket gopher, brush mouse, and canyon mouse (Hall 1995).

Raptors

No raptor nests are known to occur within 1 mile of the Proposed Alternative Southern Terminal siting area.

Other Migratory Birds

Representative migratory bird species that may be found at the Proposed Alternative Southern Terminal siting area include rock wren, black-tailed gnatcatcher, black-throated sparrow, and verdin.

Reptiles

Representative reptile species that may be found within the Proposed Alternative Southern Terminal siting area include western fence lizard, common side-blotched lizard, and western rattlesnake (SDNHM 2011).

Alternate Southern Terminal

Representative nongame species that may occur within the Alternate Southern Terminal siting area would be the same as for the Proposed Alternative Southern Terminal siting area.

Southern Terminal located near IPP (Design Option 2)

Small Mammals

Representative nongame small mammal species that may be found within the Southern Terminal located near IPP (Design Option 2) include little brown myotis, white-tailed antelope squirrel, northern pocket gopher, Ord's kangaroo rat, and plains pocket mouse (Fitzgerald et al. 2011).

Raptors

No raptor nests are known to occur within 1 mile of the Southern Terminal located near IPP (Design Option 2) siting area.

Other Migratory Birds

Representative migratory bird species that may be found at the Southern Terminal located near IPP (Design Option 3) siting area include western kingbird, dark-eyed junco, white-crowned sparrow, black-billed magpie, and cliff swallow.

Reptiles

Representative reptile species that may be found within the Region II wildlife analysis area include sagebrush lizard, short-horned lizard, rubber boa, bull snake, wandering garter snake, and western rattlesnake (Hammerson 1999; UDWR 2005).

Southern Substation located near IPP (Design Option 3)

The Southern Substation located near IPP (Design Option 3) is entirely within the boundaries of the Southern Terminal (Design Option 2) and representative nongame species would be the same.

USFS Management Indicator Species

Terminal siting areas are not within National Forests; therefore, no MIS are addressed for those locations.

Audubon IBAs and USFWS BHCAs

Terminal siting areas are not within Audubon IBAs or USFWS BHCAs.

Region I

Small Mammals

The primary habitat type in Region I consists of sagebrush shrubland. Representative nongame small mammal species that may be found within the Region I wildlife analysis area include little brown myotis, Merriam's shrew, golden-mantled ground squirrel, least chipmunk, northern pocket gopher, Ord's kangaroo rat, white-tailed prairie dog, Wyoming ground squirrel, Wyoming pocket gopher, and olive-backed pocket mouse (Fitzgerald et al. 2011).

Raptors

The Region I wildlife analysis area encompasses a wide variety of habitats (e.g., sagebrush shrubland, saltbush shrubland, grassland, etc.) for breeding and foraging raptor species (Johnsgard 1990; Kingery 1998). Based on agency raptor nest data, six species of raptors that are not classified as special status have been documented nesting within the Region I wildlife analysis area. These include northern harrier, Cooper's hawk, red-tailed hawk, American kestrel, great horned owl, and common raven (**Table 3.7-11**). Common ravens are not considered raptors, but ravens may utilize historic raptor nests and, conversely, raptors may add to, and utilize historic raven nests. Special status raptor species that occur in Region I are addressed in Section 3.8.4.3, Region I.

Table 3.7-11 Non-Special Status Raptor Species Known to Nest in Region I

Species	Habitat Association[1]
Northern harrier	1, 10, 11, 12, 13, 17, 21
Cooper's hawk	1, 2, 5, 6, 17, 21
Red-tailed hawk	1, 3, 4, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21

Table 3.7-11 Non-Special Status Raptor Species Known to Nest in Region I

Species	Habitat Association[1]
American kestrel	1, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21
Great horned Owl	1, 2, 5, 6, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21
Common raven	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21

[1] Habitat Association refers to vegetation communities (by number) as presented in **Table 3.7-2**.

Other Migratory Birds

In addition to the common migratory bird species presented in Section 3.7.4, Baseline Description, a wide variety of migratory bird species may occur in the various habitat types found in Region I. Details regarding BCC regions, BHCAs and associated species, PIF species, and Audubon IBAs are discussed below.

USFWS Birds of Conservation Concern and Partners in Flight Priority Bird Species

The Region I wildlife analysis area is located within USFWS Bird Conservation Regions 10 (Northern Rockies) and 16 (Southern Rockies/Colorado Plateau). **Table 3.7-12** presents the five BHCAs that are crossed by the 2-mile transmission line corridor in Region I and several representative bird species for each (Colorado PIF 2000, Nicholoff 2003; USFWS 2008; Wyoming Steering Committee IWJV 2005). Within Region I there are 16 BHCAs located within the wildlife analysis area, comprising a total of 5,507,769 acres.

Table 3.7-12 Bird Habitat Conservation Areas and Representative Priority Bird Species within the Region I Wildlife Analysis Area

State	BCR	BHCA Number and Name	Habitat Types	Representative Priority Birds[1,2]
WY	10	38 – Powder Rim	• Sagebrush shrubland • Utah juniper	• Ash-throated flycatcher[3] • Plumbeous vireo[3]
WY	10	39 – Little Snake River	• Herbaceous wetland • Open water	• Cinnamon teal • Northern harrier[3] • Marsh wren[2]
CO	10/16	21 – Yampa River in Routt County	• Herbaceous wetland • Open water • Woody riparian and wetlands	• Bufflehead • Marsh wren[3] • Willow flycatcher • Veery[3] • Wilson's warbler
CO	10	28 - Yampa River in Moffat County	• Herbaceous wetland • Open water • Woody riparian and wetlands	• Northern harrier[3] • Cinnamon teal • Marsh wren[3]
CO	10	32 - Routt and Moffat County Uplands	• Sagebrush shrubland • Montane shrubland	• Greater sage-grouse[3] • Columbian sharp-tailed grouse[3] • Sage sparrow[3] • Brewer's sparrow[3]

1This is not an all-inclusive list of BCC and PIF species.

[2]Many of these species also are special status species and are presented in further detail in Section 3.8, Special Status Wildlife Species.

[3]Partners in Flight Priority Bird Species (may differ between states depending on abundance and threats to the species).

Audubon Important Bird Areas

A total of eight Audubon Important Bird Areas are within the Region I wildlife analysis area.

Red Desert IBA – The Red Desert IBA is located 22.6 miles from the from the 2-mile transmission line corridor. The site consists of a 1,910,651 acre complex of IBA sites in Sweetwater County, Wyoming. The Red Desert IBA is also a Conservation Action Site for Audubon Wyoming's Sagebrush Initiative. The IBA encompasses a variety of habitats, including sagebrush/grasslands; shrub-steppe; springs and seeps; stands of limber pine and aspen with a deciduous shrub understory; seasonal wetlands; and seasonal ponds in spring. The site provides important habitat for sagebrush obligate species, such as greater sage-grouse, sage thrasher, sage sparrow, and Brewer's sparrow. Numerous other bird species inhabit the micro-habitats in the Red Desert IBA (National Audubon Society 2011).

Muddy Creek Wetlands IBA – The Muddy Creek Wetlands IBA is intersected by the 2-mile transmission line corridor in Carbon County, Wyoming. The IBA consists of a 7,205 acre site that encompasses 6 miles of riparian vegetation along Muddy Creek. Habitat at the site includes a willow-dominated riparian corridor with associated flood plain, meadows, and adjacent upland areas. Hundreds of species of waterbirds, shorebirds, and waterfowl from both the Pacific and Central flyways utilize the area for breeding and migration. The diversity of habitats provides an oasis for a large variety of bird species, such as white-faced ibis, snowy egrets, herons, grebes, warblers, and willow flycatchers. The wetlands support up to 50,000 ducks during migration and a host of breeding shorebirds, including American avocets and black-necked stilts (National Audubon Society 2011).

Brown's Park National Wildlife Refuge IBA – Brown's Park National Wildlife Refuge is located 2 miles from the 2-mile transmission line corridor in Moffat County, Colorado. The IBA consists of a 13,211-acre site along the Green River. The vegetation is characterized by riparian, wetland, grassland, semi-desert shrubland, and pinyon-juniper. The IBA provides important habitat for 222 bird species, especially breeding and migrating waterbirds, shorebirds, gulls, terns, and songbirds (National Audubon Society 2011).

Powder Rim IBA – The Powder Rim IBA is located 14 miles from the 2-mile transmission line corridor in Sweetwater County, Wyoming. The IBA consists of a 131,826 acre mosaic of juniper and big sagebrush. Because juniper habitat is limited in Wyoming, the bird community at Powder Rim IBA is unique and has significant conservation value. The juniper woodlands have been shown to support greater bird species diversity than the surrounding shrubland habitat. Powder Rim IBA is especially noted for juniper obligate species (National Audubon Society 2011).

Carpenter Ranch/Yampa River Preserve IBA - The Carpenter Ranch/Yampa River Preserve IBA is located 9.9 miles from the 2-mile transmission line corridor in Routt County, Colorado. The IBA consists of 1730 acres of riparian forest dominated by narrowleaf cottonwood, box elder, and red-osier dogwood. This type of riparian forest community is considered rare because it only occurs in a few locations in Colorado, Utah, and Wyoming. The Yampa River Preserve is located just upstream from the Carpenter Ranch and encompasses 824 acres of the same rare riparian forest community as the Carpenter Ranch (National Audubon Society 2011).

Pelican Lake IBA – Pelican Lake IBA is located 2 miles from the 2-mile transmission line corridor in Uintah County, Utah, and falls within both the Region I and Region II wildlife analysis areas. The IBA consists of a 1,056 acre complex of wetland areas, including a natural lake, which provides important winter habitat for large numbers of waterfowl, especially mallards. Bald eagles winter at this site. American white pelicans forage at Pelican Lake during much of the year (National Audubon Society 2011).

Ouray National Wildlife Refuge IBA – The Ouray National Wildlife Refuge IBA lies in the Uintah Basin located in Uintah County, Utah, and falls within both the Region I and Region II wildlife analysis areas. The

IBA is located 4.6 miles from the 2-mile transmission line corridor. The site consists of 20,890 acres and is considered to contain the most significant single stand of riparian cottonwood on the entire Green River and perhaps the entire Colorado River Drainage. Of the five priority habitats identified by the Utah Avian Conservation Strategy, the Ouray National Wildlife Refuge IBA contains three. The lowland riparian habitat supports broad-tailed hummingbird, yellow-billed cuckoo, and black-throated gray warbler. The wetland habitat supports nesting populations of American avocet, black-necked stilt, and American white pelican. The shrub/steppe habitat supports ferruginous hawks, greater sage-grouse, Brewer's sparrow, and sage sparrow (National Audubon Society 2011).

Shamrock Hills Raptor Concentration Area IBA – The Shamrock Hills Raptor Concentration Area IBA is located 2.7 miles from the 2-mile transmission line corridor in Carbon County, Wyoming. The IBA consists of 36,787 acres encompassing a variety of habitat types. Sagebrush and grasslands are the dominant vegetation communities. The area is known as one of the largest breeding grounds for ferruginous hawks in the western U.S. Other migratory birds known to utilize this IBA include golden eagle, burrowing owl, northern harrier, prairie falcon, American kestrel, great horned owl, and red-tailed hawk. Mountain plover are present in low numbers. Passerine species include lark bunting, sage sparrow, sage thrasher, Say's phoebe, and mountain bluebird (National Audubon Society 2011).

Reptiles

The primary habitat type in Region I consists of sagebrush shrubland. Representative reptile species that may be found within the Region I wildlife analysis area include sagebrush lizard, short-horned lizard, Great Basin gopher snake, bull snake, wandering garter snake, and prairie rattlesnake (Baxter and Stone 1980; Hammerson 1999).

USFS Management Indicator Species

No National Forests are crossed by the Project in Region I; therefore, no MIS are addressed in this section.

Region II

Small Mammals

The primary habitat types in Region II consist of sagebrush shrubland, saltbush shrubland, and pinyon-juniper. Representative nongame small mammal species that may be found within the wildlife analysis area in Region II include little brown myotis, masked shrew, white-tailed antelope squirrel, Uintah chipmunk, northern pocket gopher, Ord's kangaroo rat, and plains pocket mouse (Fitzgerald et al. 2011).

Raptors

The Region II wildlife analysis area encompasses a wide variety of habitats (e.g., agriculture, sagebrush shrubland, saltbush shrubland, pinyon-juniper, etc.) for breeding and foraging raptor species. Based on agency raptor nest data, six species of raptors that are not classified as special status have been documented nesting within the Region II wildlife analysis area. These include osprey, Cooper's hawk, red-tailed hawk, American kestrel, great horned owl, and common raven (**Table 3.7-13**). Common ravens are not considered raptors, but ravens may utilize historic raptor nests and, conversely, raptors may add to, and utilize historic raven nests. Special status raptor species that occur in Region II are addressed in Section 3.8.4.4, Region II.

Table 3.7-13 Non-special Status Raptor Species Known to Nest in Region II

Species	Habitat Association[1]
Cooper's hawk	1, 2, 5, 6, 16, 17, 21
Red-tailed hawk	1, 3, 4, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21

Table 3.7-13 Non-special Status Raptor Species Known to Nest in Region II

Species	Habitat Association[1]
Osprey	15, 17, 21
American kestrel	1, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21
Great horned owl	1, 2, 5, 6, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21
Common raven	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21

[1] Habitat Association refers to vegetation communities (by number) as presented in **Table 3.7-2**.

Other Migratory Birds

USFWS Birds of Conservation Concern and Partners in Flight Priority Bird Species

The Region II wildlife analysis area falls within USFWS Bird Conservation Regions 16 (Southern Rockies/Colorado Plateau and 9 (Great Basin). **Table 3.7-14** presents the 14 BHCAs found in the Region II wildlife analysis area and several representative bird species that have been observed utilizing these BHCAs (Colorado PIF 2000; Parrish et al. 2002; USFWS 2008; Utah Steering Committee IWJV 2005). There are 28 BHCAs located within the Region II wildlife analysis area, comprising a total of 4,823,358 acres.

Table 3.7-14 Bird Habitat Conservation Areas and Representative Priority Bird Species within the Region II Wildlife Analysis Area

State	BCR	BHCA Number and Name	Habitat Types	Representative Priority Birds[1,2]
CO	16	17 – Colorado National Monument, Rabbit Valley, Uplands	• Sagebrush shrubland • Montane shrubland • Woody riparian and wetlands	• Lewis's woodpecker[3] • Brewer's sparrow[3] • Common poorwill[3] • Virginia's warbler[3]
CO	16	30 - White River	• Open water • Woody riparian and wetlands	• Barrow's goldeneye[3] • Veery[3] • Northern harrier[3] • Lewis's woodpecker[3]
CO	16	31 - Roan Plateau, Piceance Creek, Cathedral Bluffs	• Saltbush shrubland • Woody riparian and wetlands	• Gray vireo[3] • Long-eared owl • Black-throated gray warbler[3] • Piñon jay
UT	9	16 – Utah Lake, Mona Lake, Tintic Valley	• Open water • Herbaceous wetland • Woody riparian and wetlands • Sagebrush shrubland • Saltbush shrubland	• Greater sage-grouse[3] • Brewer's sparrow[3] • Cinnamon teal • Long-billed curlew[3] • American avocet[3] • Black-necked stilt[3] • American white pelican[3]
UT	16	36 – Summerhouse Spring	• Wetland and associated uplands	• Greater sage-grouse[3] • Common snipe
UT	16	27 - Emma Park	• Wet meadow	• Greater sage-grouse[3] • Common snipe • Long-billed curlew[3] • Shorebirds

Table 3.7-14 Bird Habitat Conservation Areas and Representative Priority Bird Species within the Region II Wildlife Analysis Area

State	BCR	BHCA Number and Name	Habitat Types	Representative Priority Birds[1,2]
UT	16	20 – Strawberry Reservoir Watershed	• Open water • Woody riparian and wetlands • Montane shrubland	• Greater sage-grouse[3] • Brewer's sparrow3 • Sage sparrow[3] • Cinnamon teal
UT	16	21 - Duchesne River	• Open water • Herbaceous wetland • Woody riparian and wetlands • Saltbush shrubland	• Yellow-billed cuckoo (western)[3] • Bobolink[3] • American white pelican[3]
UT	16	25 - Upper Green River – Including: • Ouray National Wildlife Refuge • Pelican Lake • Stewart Lake Waterfowl Management Area • Pariette Wetlands	• Herbaceous wetland • Open water • Woody riparian and wetlands	• Yellow-billed cuckoo[3] • American white pelican[3] • Lewis's woodpecker[3] • Mountain plover[3]
UT	16	29 – Lower Nebo Creek Drainage	• Woody riparian and wetlands • Herbaceous wetland	• Lewis's woodpecker[3] • Cooper's hawk
UT	9	30 – Sevier Bridge, Chicken Creek Reservoirs	• Open water • Herbaceous wetland	• Cinnamon teal • Peregrine falcon • Long-billed curlew[3] • American avocet[3] • Black-necked stilt[3]
UT	9	31 - Delta	• Open water • Herbaceous wetland	• Cinnamon teal • Long-billed curlew[3] • American avocet[3] • Black-necked stilt[3]
UT	16	37 – Green River	• Woody riparian and wetlands • Herbaceous wetland • Open water	• Bald eagle • Virginia warbler[3] • Lucy's warbler[3] • Yellow-breasted chat • Blue grosbeak • Yellow-billed cuckoo (western)[3] • Mexican spotted owl[3]
UT	16	41 – Cisco Desert	• Desert shrub	• Bald eagle • Golden eagle • Ferruginous hawk[3] • Burrowing owl[3] • Long-billed curlew[2]

[1] Not an all inclusive list of BCC and PIF species.

[2] Many of these species also are special status species and are presented in further detail in Section 3.8, Special Status Wildlife Species.

[3] Partners in Flight Priority Bird Species (may differ between states depending on abundance and threats to the species).

Audubon Important Bird Areas

A total of five Audubon Important Bird Areas are within the Region II wildlife analysis area.

Ouray National Wildlife Refuge IBA – The Ouray National Wildlife Refuge IBA lies in the Uintah Basin located in Uintah County, Utah, and falls within the Region I and Region II wildlife analysis areas. The IBA is located 4.6 miles from the 2-mile transmission line corridor. The site consists of 20,890 acres and is considered to contain the most significant single stand of riparian cottonwood on the entire Green River and perhaps the entire Colorado River Drainage. Of the five priority habitats identified by the Utah Avian Conservation Strategy, the Ouray National Wildlife Refuge IBA contains three. The lowland riparian habitat supports broad-tailed hummingbird, yellow-billed cuckoo, and black-throated gray warbler. The wetland habitat supports nesting populations of American avocet, black-necked stilt, and American white pelican. The shrubsteppe habitat supports ferruginous hawks, greater sage-grouse, Brewer's sparrow, and sage sparrow (National Audubon Society 2011).

Pelican Lake IBA – Pelican Lake IBA is located 2 miles from the 2-mile transmission line corridor in Uintah County, Utah, and falls within the Region I and Region II wildlife analysis areas. The IBA consists of a 1,056 acre complex of wetland areas, including a natural lake, which provides important winter habitat for large numbers of waterfowl, especially mallards. Bald eagles winter at this site. American white pelicans forage at Pelican Lake during much of the year (National Audubon Society 2011).

Rabbit Valley Recreation Management Area and IBA – Rabbit Valley Recreation Management Area IBA is located 3 miles from the 2-mile transmission line corridor in Mesa County, Colorado. The IBA consists of a 366 acre Recreation Management Area. The vegetation is characterized by pinyon-juniper -juniper and sagebrush in high desert terrain. A small portion of the site consists of lowland riparian habitat. Rabbit Valley Recreation Management Area IBA is especially noted as providing habitat for gray vireos and Scott's orioles (National Audubon Society 2011).

Upper Strawberry Watershed IBA – The Upper Strawberry Watershed IBA is located 11 miles from the 2-mile transmission line corridor in Wasatch County, Utah. The IBA consists of a 126,073 acre site with a wide variety of forested and non-forested habitats. The Upper Strawberry Reservoir Watershed IBA provides habitat for a wide variety of species. Over 120 bird species have been recorded at the site, including an estimated 500 greater sage-grouse, over 200 American white pelicans, and at least 10 pairs of nesting American three-toed woodpeckers. A nesting pair of bald eagles is also known to occur in the Strawberry Valley. Numerous neotropical migrants are known to nest or regularly occur in the Upper Strawberry Watershed IBA. These include Brewer's sparrow and broad-tailed hummingbird. Strawberry Reservoir provides significant habitat for Caspian terns (as high as 60). An estimated 1,200 western grebes and 100 Clark's grebes have been counted on Strawberry Reservoir. These numbers approximate 1 percent of the total North American population for these species (National Audubon Society 2011).

Grand Valley Riparian Corridor and Highline State Park IBA – The Grand Valley Riparian Corridor and Highline State Park IBA is located 7 miles from the 2-mile transmission line corridor in Mesa County, Colorado. This IBA consists of a 175,634 acre assemblage of areas along the Colorado River floodplain in the Grand Valley. The site contains much of Colorado's best remaining Rio Grande cottonwood habitat. The IBA provides nesting, wintering, and stopover habitat for approximately 75 percent of the state's bird species. Nearly 300 bird species have been recorded at this IBA, including nearly 70 breeding species and over 70 wintering species (National Audubon Society 2011).

USFS Management Indicator Species

Four National Forests would be crossed by the Project in Region II. Management Indicator Species for each of these forests are presented in **Table 3.7-4**.

Reptiles

The primary habitat types in Region II consist of sagebrush shrubland, saltbush shrubland, and pinyon-juniper woodland. Representative reptile species that may be found within the Region II wildlife analysis area include sagebrush lizard, short-horned lizard, rubber boa, bull snake, wandering garter snake, and western rattlesnake (Hammerson 1999; UDWR 2005).

Region III

Small Mammals

The Region III wildlife analysis area encompasses a wide variety of habitats for small mammals (e.g., sagebrush shrubland, grassland, desert shrubland); however, the primary habitat type is desert shrubland. Representative nongame small mammal species that may be found within the Region III wildlife analysis area include little brown myotis, Merriam's shrew, white-tailed antelope squirrel, cliff chipmunk, Botta's pocket gopher, Ord's kangaroo rat, and Great Basin pocket mouse (Hall 1995).

Raptors

The Region III wildlife analysis area encompasses a wide variety of habitats for breeding and foraging raptor species (e.g., sagebrush shrubland, grassland, desert shrubland); however, the primary habitat type is desert shrubland. Agency raptor nest data is limited within Region III but suspected nesting raptors that are not classified as special status include red-tailed hawk, osprey, and common raven (**Table 3.7-15**). Common ravens are not raptors, but ravens may utilize historic raptor nests and, conversely, raptors may add to, and utilize historic raven nests. Special status raptor species that occur in Region III are addressed in Section 3.5.4.5, Region III.

Table 3.7-15 Non-Special Status Raptor Species Known to Nest in Region III

Species	Habitat Association[1]
Red-tailed hawk	1, 3, 4, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21
Osprey	15, 17, 21
Common raven	1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21

[1] Habitat Association refers to vegetation communities (by number) as presented in **Table 3.7-2**.

Other Migratory Birds

Birds of Conservation Concern and Partners in Flight Priority Bird Species

The Region III wildlife analysis area falls within USFWS Bird Conservation Regions 9 (Great Basin), 16 (Southern Rockies/Colorado Plateau), and 33 (Sonoran and Mojave Deserts). **Table 3.7-16** presents the seven BHCAs in Region III that are crossed by the 2-mile transmission line corridor, and several representative bird species for each (Neel 1999; Parrish et al. 2002; USFWS 2008; Utah Steering Committee IWJV 2005). There are nine BHCAs located within the Region III wildlife analysis area, comprising a total of 3,422,193 acres.

Table 3.7-16 Bird Habitat Conservation Areas and Representative Priority Bird Species within the Region III Wildlife Analysis Area

State	BCR	BHCA Number and Name	Habitat Types	Representative Priority Birds[1,2]
UT	9	31 - Delta	• Open water • Herbaceous wetland	• Cinnamon teal • Long-billed curlew[3] • American avocet[3] • Black-necked stilt[3]
UT	9	45 – Bald Hills	• Shrub-steppe	• Greater sage-grouse[3] • Ferruginous hawk[3] • Sage sparrow[3] • Brewer's sparrow[3]

Table 3.7-16 Bird Habitat Conservation Areas and Representative Priority Bird Species within the Region III Wildlife Analysis Area

State	BCR	BHCA Number and Name	Habitat Types	Representative Priority Birds[1,2]
UT	9, 16	48 – Virgin River	• Open water • Woody riparian and wetlands	• Abert's towhee[3] • Lucy's warbler[3] • Bell's vireo[3] • Gray vireo[3] • Yellow-billed cuckoo (western)[3]
UT	33	47 – Beaver Dam and Wash	• Open water • Woody riparian and wetlands	• Black-tailed gnatcatcher[3] • Yellow-billed cuckoo (western)[3] • Lucy's warbler[3] • Bell's vireo[3]
NV	9	5- Lower Muddy River Complex/ Meadow Valley Wash	• Multi-aged tree stands with riparian shrub understory • Floodplain wetlands	• Yuma clapper rail • Southwestern willow flycatcher
NV	9	6- Pahranaghat/ Dry Lake Valley	• Cottonwood-willow riparian • Upland habitat	• Southwestern willow flycatcher • Yellow-billed cuckoo • Greater sandhill crane • Bald eagle • Golden eagle
NV	9	27- Lincoln Sage Grouse PMU	• Sagebrush	• Greater sage-grouse

[1] Not an all inclusive list of BCC and PIF species.

[2] Many of these species also are special status species and are presented in further detail in Section 3.8, Special Status Wildlife Species.

[3] Partners in Flight Priority Bird Species (may differ between states depending on abundance and threats to the species).

Audubon Important Bird Areas

Nine Audubon Important Bird Areas are within the Region III wildlife analysis area.

Lytle Preserve IBA – The Lytle Preserve IBA located 1 mile from the 2-mile transmission line corridor in Washington County, Utah. The IBA consists of 525 acres of cottonwood riparian habitat within the Utah portion of the Mojave Desert. Over 200 bird species have been recorded on the preserve. Of particular note are Gambel's quail, Lucy's warbler, and Bell's vireo. The preserve also is a corridor for migrants, including flycatchers, warblers, and flammulated owls. Nesting species include Cooper's hawk, Costa's hummingbird, black-tailed gnatcatcher, white-winged dove, summer tanager, blue grosbeak, common black hawk, brown-crested flycatcher, vermillion flycatcher, and phainopepla (National Audubon Society 2011).

Moapa Valley IBA – The Moapa Valley IBA is located 6 miles from the 2-mile transmission line corridor in Clark County, Nevada. The IBA consists of 2,404 acres of riparian habitat along the upper Virgin River. The site is located within a region of dry Mojave Desert scrub and mesquite, and provides significant riparian stopover habitat for migratory birds, including western yellow-billed cuckoo, sandhill crane, loggerhead shrike, Lucy's warbler, Crissal thrasher, and vermillion flycatcher (National Audubon Society 2011).

Virgin River IBA - The Virgin River IBA is located 8 miles from the 2-mile transmission line corridor in Clark County, Nevada. The IBA consists of 15,454 acres encompassing considerable meanders of the Virgin River. The site is characterized by a variety of native riparian vegetation, including marshes and patches of

native willow. Depending on the water level of Lake Mead, a delta forms where the river flows into the lake. The Virgin River is the only intact river in the Mojave Desert of Nevada that still has meanders and is not influenced by dams. All of Nevada's endangered birds and many of the birds identified in the Lowland Riparian section of the Nevada Bird Conservation Plan occur at the Virgin River (National Audubon Society 2011).

Fish Springs National Wildlife Refuge IBA – The Fish Springs National Wildlife Refuge IBA is located 33 miles from the 2-mile transmission line corridor in Juab County, Utah. The IBA consists of 18,123 acres encompassing salt grass uplands, desert shrub, mudflats, and spring-fed saline marsh impoundments. The refuge provides 10,000 acres of critical wetlands habitat in a very arid desert region. Fish Springs National Wildlife Refuge IBA is the only significant wetland in over 50 miles. The refuge serves as a vital stopover point for migrating birds, with 275 bird species documented at the refuge. Unusual or rare birds utilizing the IBA include: blue grosbeak, varied thrush, summer tanager, phainopepla, Lucy's warbler, magnolia warbler, blackpoll warbler, black-and-white warbler, and American redstart (National Audubon Society 2011).

Lower Muddy River IBA – The Lower Muddy River IBA is located 4 miles from the 2-mile transmission line corridor in Clark County, Nevada. The IBA consists of 2,646 acres, including the river and its flood plain from the Overton Wildlife Management Area to Lake Mead. The cottonwood riparian vegetation along this Colorado River tributary provides important habitat for a variety of bird species, including Yuma clapper rail, Virginia rail, southwestern willow flycatcher, western yellow-billed cuckoo, summer tanager, brown-crested flycatcher, black-tailed gnatcatcher, Crissal thrasher, verdin, and a variety of raptors and waterbirds (NDOW 2012).

Meadow Valley Wash IBA – The Meadow Valley Wash IBA is located 3 miles from the 2-mile transmission line corridor in Lincoln County, Nevada. The IBA consists of 15,056 acres of intermittent wetlands and seeps. The combination of a large area, north-south alignment, and wetland/water sites make this wash system a significant wildlife habitat and migration corridor for riparian and desert bird species. The IBA provides habitat for year-round residents, seasonal breeding birds, and migrants (National Audubon Society 2011).

Pahranagat Valley Complex IBA – The Pahranagat Valley Complex IBA is intersected by the 2-mile transmission line corridor in Lincoln County, Nevada. The IBA consists of 5,914 acres from the Pahranagat Valley National Wildlife Refuge and the Key-Pittman Wildlife Management Area. More than 230 different bird species utilize the Pahranagat National Wildlife Refuge. Bird abundance and diversity is highest during migration when large numbers of songbirds, waterfowl, shorebirds, and raptors converge. Willow thickets on the west side of Nesbitt Lake provide nesting sites for southwestern willow flycatchers and western yellow-billed cuckoos. Sandhill cranes utilize the IBA during migration (National Audubon Society 2011)

Sheep Range IBA – The Sheep Range IBA is located 6 miles from the 2-mile transmission line corridor in Clark County, Nevada. The IBA consists of 59,917 acres in the arid mountains of southern Nevada. This area encompasses three different life zones and provides habitat diversity for many bird species. Small seeps and springs provide much needed water for birds. The site is noteworthy for flammulated owl, gray flycatcher, black-throated gray warbler, and Grace's warbler (National Audubon Society 2011).

Lake Mead National Recreation Area IBA – The Lake Mead National Recreation Area IBA is intersected by the 2-mile transmission line corridor in Clark County, Nevada and falls within the Regions III and IV wildlife analysis areas. The 152,860 acre IBA is part of the Lake Mead National Recreation Area. The area of the NRA recognized as an IBA is limited to Lake Mead and Lake Mohave above Davis Dam on the Colorado River, the adjacent vegetated shoreline, and the immediately adjacent cliff faces. A variety of habitat types can be found at the Lake Mead National Recreation Area IBA. The majority of vegetation is Mojave desert scrub, characterized by creosote and bursage. Desert washes support more lush vegetation, including mesquite bosques and acacia thickets. Cliff habitat is present at Lake Mead and in

the Black Canyon below Hoover Dam. Forty springs and over 950 miles of shoreline in the National Recreation Area provide riparian habitat that supports diverse plant and wildlife species. Nearly 370 species of birds have been recorded in the National Recreation Area. This area encompasses migration stopover habitat for waterbirds. The adjacent cliff habitat provides important nesting sites for raptors, particularly peregrine falcons. Other species of note include bald eagle, southwestern willow flycatcher, Lucy's warbler, Bell's vireo, and yellow-breasted chat (National Audubon Society 2011).

USFS Management Indicator Species

The Dixie National Forest would be crossed by the Project in Region III. Management Indicator Species for this forest are presented in **Table 3.7-4**.

Reptiles

The primary habitat type in Region III consists of desert shrubland. Representative reptile species that may be found within the Region III wildlife analysis area include coachwhip, common kingsnake, and glossy snake (UDWR 2005). Desert tortoises also occur in Region III and are addressed in Section 3.8, Special Status Species.

Region IV

Small Mammals

The primary habitat type in Region IV consists of desert shrubland. Representative nongame small mammal species that may be found within the Region IV wildlife analysis area include little brown myotis, desert shrew, white-tailed antelope squirrel, Botta's pocket gopher, brush mouse, and canyon mouse (Hall 1995).

Raptors

The Region IV wildlife analysis area encompasses mostly desert shrubland, which is habitat for breeding and foraging raptor species. Agency raptor nest data is limited within Region IV but suspected nesting raptors that are not classified as special status include red-tailed hawk and great horned owl (**Table 3.7-17**). Special status raptor species that occur in Region IV are addressed in Section 3.8.4.6, Region IV.

Table 3.7-17 Non-Special Status Raptor Species Suspected to Nest in Region IV

Species	Habitat Association[1]
Red-tailed hawk	1, 3, 4, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21
Great horned Owl	1, 2, 5, 6, 7, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21

[1] Habitat Association refers to vegetation communities (by number) as presented in **Table 3.7-2**.

Other Migratory Birds

Birds of Conservation Concern and Partners in Flight Priority Bird Species

The Region IV wildlife analysis area falls within USFWS Bird Conservation Region 33 (Sonoran and Mojave Deserts). **Table 3.7-18** presents the two BHCAs that are crossed by the 2-mile transmission line corridor in Region IV and several representative bird species for each (Neel 1999; Nevada Steering Committee IWJV 2005; USFWS 2008). There are two BHCAs located within the Region IV wildlife analysis area comprising a total of 1,036,647 acres.

Table 3.7-18 Birds of Conservation Concern and Partners in Flight Priority Bird Species for Region IV

State	BCR	BHCA Number and Name	Habitat Types	Representative Priority Birds[1,2]
NV	33	5 – Lower Muddy River Complex/Meadow Valley Wash	• Open water • Herbaceous wetland	• Cinnamon teal • Southwestern willow flycatcher[3] • Lucy's warbler[3] • Black-crowned night heron
NV	33	7 – Piute/Eldorado/Fenner DWMA	• Desert shrub	• LeConte's thrasher[3] • Burrowing owl[3] • Ash-throated flycatcher[3] • Phainopepla[3] • Loggerhead shrike[3]

[1] Not an all inclusive list of BCC and PIF species.

[2] Many of these species also are special status species and are presented in further detail in Section 3.8, Special Status Wildlife Species.

[3] Partners in Flight Priority Bird Species (may differ between states depending on abundance and threats to the species).

Audubon Important Bird Areas

Two Audubon Important Bird Areas are within the Region IV wildlife analysis area.

Lake Mead National Recreation Area IBA – The Lake Mead National Recreation Area IBA is intersected by the 2-mile transmission line corridor in Clark County, Nevada and falls within the Regions III and IV wildlife analysis areas. The 152,860 acre IBA is part of the Lake Mead National Recreation Area. The area of the NRA recognized as an IBA is limited to Lake Mead and Lake Mohave above Davis Dam on the Colorado River, the adjacent vegetated shoreline, and the immediately adjacent cliff faces. A variety of habitat types can be found at the Lake Mead National Recreation Area IBA. The majority of vegetation is Mojave desert scrub, characterized by creosote and bursage. Desert washes support more lush vegetation, including mesquite bosques and acacia thickets. Cliff habitat is present at Lake Mead and in the Black Canyon below Hoover Dam. Forty springs and over 950 miles of shoreline in the National Recreation Area provide riparian habitat that supports diverse plant and wildlife. Nearly 370 species of birds have been recorded in the National Recreation Area. This area encompasses migration stopover habitat for waterbirds. The adjacent cliff habitat provides important nesting sites for raptors, particularly peregrine falcons. Other species of note include bald eagle, southwestern willow flycatcher, Lucy's warbler, Bell's vireo, and yellow-breasted chat (National Audubon Society 2011).

Wee Thump Joshua Tree Forest IBA – The Wee Thump Joshua Tree Forest IBA is located 15 miles from the 2-mile transmission line corridor in Clark County, Nevada. The IBA consists of 30,808 acres containing dense stands of the Joshua Tree forest. Nest cavities are one habitat component that is almost exclusively absent from desert sites, and it is this resource that makes Wee Thump Joshua Tree Forest IBA unique. The ancient Joshua trees, many estimated to be over 250 years old, do contain cavities, which provide important nesting sites and winter refuges for cavity-dependent bird species. These species include gilded flicker, northern flicker, ash-throated flycatcher, and hairy woodpecker (National Audubon Society 2011).

USFS Management Indicator Species

No national forests are crossed by the Project in Region IV; therefore, no MIS are addressed in the impact analysis.

Reptiles

The primary habitat type in Region IV consists of desert shrubland. Representative reptile species that may be found within the Region IV wildlife analysis area include western fence lizard, common side-blotched lizard, and western rattlesnake (SDNHM 2011).

3.7.6 Impacts to Wildlife

Potential direct impacts to wildlife habitats from the transmission line would occur within a 250-foot-wide transmission line right-of-way (ROW) for each alternative. Direct impacts to wildlife habitats from potential access roads would occur within a 2-mile transmission line corridor for each alternative. Although the precise locations for the transmission line and associated access roads are not known, it is known that they will be constructed within the respective 2-mile transmission line corridors.

Several small reroutes and micro-siting adjustments to the proposed alternative routes in Regions I, II, and III have been included in this impact analysis and are described in detail in Section 2.5.1. These adjustments are located along Alternatives I-D, II-A, II-B, II-C, II-E, II-F, III-A, IV-A, and IV-C. Alternatives I-B and I-D have been widened slightly to accommodate possible micro-siting adjustments to avoid greater sage-grouse habitat. The slight changes in impact acreages for micro-siting, widening, reroutes, or merged alternative segments have been analyzed and are reported only if they are expected to cause more than incremental differences. These project adjustments have been incorporated to address concerns regarding USFS IRAs, BLM designated utility corridors, and greater sage-grouse potential habitat.

Impact analyses include wildlife habitat either directly disturbed or indirectly affected by construction within the 2-mile transmission line corridors. This could include direct removal or alteration of habitat within the 2-mile transmission line corridors, or loss of habitat value, both inside or outside of the 2-mile transmission line corridors due to human presence or noise. Wildlife habitats are based on the vegetation communities identified in **Tables 3.7-2** and **3.7-3** that support various species of wildlife seasonally or throughout the year.

Wildlife-related issues addressed by this impact assessment were determined through the public scoping process and in consultation with BLM, BOR, CPW, NDOW, UDWR, USFS, USFWS, Western, and WGFD. Wildlife-related issues ranged from direct loss and fragmentation of big game crucial winter habitat and migratory bird habitat to the direct loss of birds, primarily raptor species, as a result of electrocution, collision with transmission lines and guy wires. The primary impact issues and analysis considerations for wildlife are listed in **Table 3.7-19**.

Table 3.7-19 Relevant Analysis Considerations for Wildlife

Resource Topic	Analysis Considerations and Relevant Assumptions
Habitat loss and fragmentation	• Acres of habitat for wildlife species located within the 250-foot-wide transmission line ROW and 2-mile transmission line corridor for access roads are quantified; • Species-specific avoidance measures are discussed; • The degree to which the loss or fragmentation of habitat would affect individuals and whether these effects could impact populations of affected species are qualitatively discussed; • Changes in vegetation communities that influence wildlife habitat are referenced; • The timeline for vegetation communities to recover to baseline levels is estimated; • Habitat disturbance is related to overall habitat availability in the respective analysis areas; • Impacts resulting from habitat loss and fragmentation are evaluated using the best available literature; and • The lost opportunity for bird conservation represented by fragmentation and other Project impacts in BHCAs is quantified as the acreages of construction, operation, and indirect impacts to BHCAs crossed by the alternative routes and associated facilities.

Table 3.7-19 Relevant Analysis Considerations for Wildlife

Resource Topic	Analysis Considerations and Relevant Assumptions
Loss of or injury to a species, displacement of individuals, and loss of breeding success from exposure to increased noise and human activity	• Impacts of bird and bat collisions from transmission lines on overall populations are evaluated in qualitative terms; • A qualitative discussion of how construction and operation activities may displace or impact breeding activity for wildlife species is included; and • The wildlife/vehicle collision potential is described in both quantitative and qualitative terms.
Potential impacts of increased perches/ predation from Project infrastructure	• Impacts of increased predation by raptors and corvids (e.g., ravens, crows) on wildlife species is evaluated in qualitative terms.

Through the implementation of the following Project design features and BMPs (as outlined in **Appendix C**), the direct impacts to wildlife resources due to construction would be minimized:

- WWEC BMPs – ECO-1/ECO-2/ECO-4/ECO-6/ECO-7/ECO-8 (protection of sensitive wildlife and habitats); FIRE-1/FIRE-2 (fire management and fuels strategies); NOISE-2 (noise reduction strategy); REST-1 (topsoil salvage, seeding with weed-free, native seeds, and restoring pre-development contours) and REST-2 (restoring vegetation to values commensurate with the ecological setting);
- Agency BMPs – All applicable State and Federal agency No Surface Occupancy restrictions (NSO), Conditional Surface Occupancy (CSO) restrictions, and Timing Limitations (TL) as outlined in **Appendix C**;
- TWE Design Features – TWE-1/TWE-2 (compliance with agency stipulations, laws and regulations); TWE-4 (environmental training); TWE-13/TWE-14/TWE-16 (vegetation management, restoration, and erosion control); TWE-26/TWE-27/TWE-28 (vegetation and noxious weed management); TWE-29/TWE-30/TWE-31/TWE-32/TWE-33/TWE-34 (ecological and special status species protection).

In addition the following mitigation measure for wildlife should be implemented:

WLF-1*: For the protection of breeding migratory birds,* ***WLF-1*** *requires TWE to avoid migratory bird habitat removal on currently undisturbed lands, to the extent possible, between approximately February 1 and July 31 (depends on state) or, alternately, to conduct breeding migratory bird surveys and implement appropriate mitigation in coordination with the BLM, Bureau of Reclamation, CPW, NDOW, UDWR, USFS, USFWS, Western, and WGFD. In addition, in order to avoid impacts to raptors during the breeding season (January 1 to August 31 for most eagles, hawks, falcons, and owls and April 15 to September 15 for burrowing owls), TWE would be required to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around active nests, as needed.*

The impact analyses for wildlife assume that the BLM and USFS will continue to manage wildlife habitats in coordination with CPW, NDOW, UDWR, and WGFD. Further assumptions include project design features committed to by TWE and BMPs that would be implemented as applicable under each alternative (**Appendix C**).

3.7.6.1 Impacts to Wildlife from Terminal Construction and Operation

Northern Terminal Habitat Disturbance and Fragmentation

The existing conditions at the proposed Northern Terminal Siting area relative to wildlife habitat can be characterized as highly disturbed and fragmented. Located immediately between the urbanized areas of Sinclair and Rawlins, Wyoming, the siting area exhibits multiple types of anthropogenic disturbance. The

major source of disturbance is the interstate Highway 80 and State Highway 76 corridor located approximately 2.2 miles to the north. This highly active corridor provides constant disturbance from vehicle traffic and fragments the landscape for several miles in both directions. In addition, the Northern Terminal sitting area is fragmented by several existing pipelines, ROWs, County Road 71 to the west, and a Union Pacific Railroad rail line to the north. Other notable sources of disturbance near the Northern Terminal siting area include the Sinclair petroleum refinery located approximately 3 mile to the northeast and the Wyoming State Penitentiary located approximately 3.4 miles to the west.

Potential impacts to wildlife species at the Northern Terminal can be grouped into two main categories: construction and operation. Construction-related impacts are primarily habitat loss, fragmentation, and wildlife mortalities as a result of vehicle collisions and crushing of nests/burrows. Construction impacts account for all disturbance during construction of the Project (e.g., clearing of vegetation for footing construction, upgrading access roads, etc.). Operation impacts are defined as impacts that remain after reclamation is complete and will last at least as long as the Project is in operation and maintenance activities are conducted. Construction-related impacts are typically short-term, whereas operation impacts are typically long-term. Examples of potential operation impacts include habitat disturbance in areas where facilities will be sited, periodic vegetation management activities, wildlife mortalities that occur as a result of collisions with Project facilities, and habitat degradation resulting from increased noise and human activity at the terminal site. During operation of the Project, a portion of habitat disturbed during construction would not be reclaimed until after the end of the Project's design life (decommissioning).

Habitat impacts can be further categorized as direct and indirect. Direct habitat impact results when habitat is destroyed or converted to a form that is unsuitable for the impacted species, typically an operation impact. The primary potential indirect impact is wildlife avoidance (displacement) of otherwise suitable habitat in and around the Northern Terminal site during construction and operation. The primary operation-related impact associated with the terminal is likely to be wildlife mortality as a consequence of electrocution or collision with electrical components. Other potential impacts include habitat avoidance of otherwise suitable habitat due to the presence of the terminal facility and transmission line, avoidance of otherwise suitable habitat due to increased predation from perching raptors, and the increased noise and human presence that are the result of regular maintenance activities.

Construction Impacts

Construction of the Northern Terminal would result in the disturbance of 489 acres of potential wildlife habitat during construction. Approximately 262 acres of temporary use areas would be reclaimed following construction and 227 acres of habitat would remain disturbed during long-term operation of the facility. These areas of impact represent <0.01 percent of shrubland habitat within the Region I wildlife analysis area. The remaining area of disturbance would be reclaimed at the end of the project life (estimated at 50 years).

Impacts to wildlife from surface disturbance would include the loss and fragmentation of wildlife habitat. Habitat loss or alteration would result in direct losses of smaller, less mobile wildlife species, such as small mammals and reptiles, and the displacement of more mobile species into adjacent habitats.

Big Game Species

Potential direct impacts to big game species (i.e., mule deer and pronghorn) would include the incremental reduction of potential forage and the incremental increase of noxious and invasive weeds and habitat fragmentation from vegetation removal. These impacts would be more pronounced within mule deer and pronghorn crucial winter range. Construction of the Northern Terminal would disturb 376 acres of mule deer crucial/yearlong winter range. This area of impact represents 0.12 percent of the total existing crucial winter range for mule deer within the Region I big game analysis area. These habitats consist primarily of saltbush shrubland and sagebrush shrubland. Impacts to crucial winter range would include the loss of potential cover and forage consisting primarily of woody/shrubby vegetation such as sagebrush, bitterbrush, and winterfat. Loss of available forage (e.g., woody shrubs, such as sagebrush) would result in

a long-term (greater than 25 years) impact to wintering big game species. The application of the BLM Rawlins Field Office RMP's (BLM 2008) seasonal restriction to prevent construction activities on public lands within crucial winter range between November 15 and April 30 would reduce displacement of mule deer during the winter months. However, this protection measure does not limit surface disturbance, and impacts to habitat (i.e., crucial winter range) would still occur. No pronghorn crucial winter range would be disturbed by construction of the Northern Terminal. Impacts to elk and mountain lions at the Northern Terminal are not expected since these species are known to occur at low densities in the vicinity of the Northern Terminal.

Small Game Species

Construction of the Northern Terminal would result in direct impacts to small game species (e.g., greater sage-grouse, mourning dove, desert cottontail, white-tailed jackrabbit, and furbearers) and would include construction- and operation-related disturbance of approximately 489 and 227 acres, respectively. These areas of impact represent <0.01 percent and <0.01 percent of small game habitat, respectively, within the Region I wildlife analysis area. The greater sage-grouse is classified as a federal candidate species, as well as a BLM, USFS, and state sensitive species. Therefore, this species is discussed further in Section 3.8, Special Status Wildlife Species. Impacts from construction of the Northern Terminal also would include animal displacement from disturbed areas and increased habitat fragmentation until reclamation has been completed and vegetation is re-established. In most instances, suitable habitat adjacent to disturbed areas would be available for use by these species. However, displacement would increase competition and could result in local reductions in wildlife populations, if adjacent habitats are at carrying capacity. Potential impacts also could include nest and burrow abandonment or loss of eggs or young. These temporary losses would reduce productivity for that breeding season, given the duration of construction activities in the terminal area. Construction of the Northern Terminal also would result in the indirect disturbance of 36 acres and operation disturbance of 17 acres of waterfowl habitat. These areas represent<0.01 percent and <0.01 percent, respectively of the available waterfowl habitat within the wildlife analysis area.

Several factors would minimize potential impacts to big game and small game species as a result of the construction of the Northern Terminal. The Northern Terminal is located in an area that already has a high level of human presence and noise (e.g., Interstate 80, town of Sinclair). Also, implementation of TWE's design features (TWE-32 and TWE-33) and the Rawlins RMP's crucial winter range timing stipulation would reduce direct impacts to big game and small game species during sensitive periods (e.g., nesting, wintering). Therefore, direct impacts from construction of the proposed project at the Northern Terminal would be limited primarily to habitat loss and fragmentation.

Nongame Species

The types of impacts to nongame species (e.g., small mammals, passerines, raptors, and reptiles) would be similar to those previously discussed for small game species. Construction of the Northern Terminal also would result in the construction disturbance of 489 acres and operation disturbance of 227 acres of potential nongame habitat. These areas of impact represent <0.01 percent and <0.01 percent of potential nongame habitat within the Region I wildlife analysis area.

Raptors and Other Migratory Birds

Raptor Nest Data Assumptions

Raptor species are known to use nests for multiple years. The species using a particular nest may vary annually. For example, owls do not construct their own nests; they use previously constructed nests or burrows. Non-raptor species also use raptor nests and vice versa. Common ravens are not considered raptors, but raptor nest data often include common raven nests for this reason.

When a raptor nest is identified outside of nesting season, or when no birds are present, it is often not possible to determine the species that uses the nest. Such nest occurrence data is still valuable and is included in analyses as unknown. Also, as previously described, the species using a nest can change over time. Nests for which the species is unknown are reported both in Section 3.7, Wildlife and Section 3.8, Special Status Wildlife Species.

Raptor nest data are compiled from seven BLM Field Offices, four National Forest datasets, NDOW, and two private consultants. Every effort was made to compile the most accurate dataset for the project; however, there is potential for duplication. The EIS analysis reports nests within 1 mile of the project reference lines and terminal sites. It is possible for a particular raptor nest to occur within 1 mile of multiple alternative routes, micro-siting options, alternative connectors, alternative variations, electrode sites, and terminal sites. Thus, the nest would be reported as potentially impacted multiple times, once for each of the facilities in its proximity.

Finally, while the most recent raptor nest data has been incorporated into analyses, nests and nest structures (i.e. trees) can be destroyed and new nests are constructed each year. A comprehensive raptor nest survey would be conducted along the agency preferred route prior to construction. This would provide the data needed to inform micro-siting adjustments and timing of construction activities to avoid or minimize impacts to nesting raptors.

Raptor species that are not classified as special status species may either seasonally occupy or remain as yearlong residents in the habitats found at the Northern Terminal. These include northern harrier, Cooper's hawk, red-tailed hawk, American kestrel, great horned owl, and common raven. Common ravens are not considered raptors but ravens may utilize historic raptor nests and, conversely, raptors may add to, and utilize, historic raven nests. Potential direct impacts to raptors and other migratory birds at the Northern Terminal would include the construction and operation disturbance of approximately 489 acres and 227 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent <0.01 percent and <0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region I wildlife analysis area. Impacts to raptor species can result from the loss or alteration in habitat, reduction in prey base, and increased human disturbance, especially during the breeding season. If construction of the Northern Terminal was to occur during the raptor breeding season in Wyoming (January 1 to July 31 for most eagles, hawks, falcons, and owls and April 15 to September 15 for burrowing owls) [BLM 2008]), direct impacts to breeding raptors could include the possible direct loss of nests or indirect effects (e.g., nest abandonment) from increased noise and human presence in proximity to an active nest site.

While no IBAs or BHCAs occur in the vicinity of the Northern Terminal, the habitat types present at this location support migratory bird use for roosting, foraging, and nesting. Direct impacts to migratory birds would include the construction and operation disturbance of 489 acres and 227 acres, respectively, of potentially suitable migratory bird habitat. These areas represent <0.01 percent and <0.01 percent of potentially suitable migratory habitat within the Region I wildlife analysis area. Impacts to migratory bird species would result from loss or alteration of habitat, reduction in forage base, and increased noise and human activity. If construction of the Northern Terminal was to occur during the migratory bird breeding season in Wyoming (January 1 to July 31 for most eagles, hawks, falcons, and owls and April 15 to September 15 for burrowing owls [BLM 2008]), direct impacts to breeding birds could include the direct loss of nests or indirect effects (e.g., nest abandonment) from increased noise and human presence in proximity to an active nest site. Design measure ***WLF-1*** addresses impacts to raptors and migratory birds.

WLF-1*: For the protection of breeding migratory birds,* ***WLF-1*** *requires TWE to avoid migratory bird habitat removal on currently undisturbed lands, to the extent possible, between approximately February 1 and July 31 (depends on state) or, alternately, to conduct breeding migratory bird surveys and implement appropriate mitigation in coordination with the BLM, Bureau of Reclamation, CPW, NDOW, UDWR, USFS, USFWS, Western, and WGFD. In addition, in order to avoid impacts to raptors during the breeding season (January 1 to August 31 for most eagles, hawks, falcons, and owls and April 15 to September 15 for*

burrowing owls), TWE would be required to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around active nests, as needed.

Effectiveness: In order to minimize impacts to raptors during the breeding season, TWE has committed to implement seasonal timing restrictions in appropriate areas (TWE-32). More specifically, **WLF-1** would require TWE to conduct a preconstruction breeding raptor survey and to implement appropriate mitigation measures, such as buffer zones around active nests, as needed. More specifically, **WLF-1** would require TWE to avoid habitat removal on currently undisturbed lands, to the extent possible, between February 1 to July 31 in Wyoming or, alternatively, to conduct breeding bird surveys and implement appropriate mitigation in coordination with the BLM, USFWS, Western, and WGFD.

Several factors would minimize potential impacts to nongame species, raptors, and other migratory birds as a result of the construction of the Northern Terminal. The Northern Terminal is located in an area that already has a high level of human presence and noise (e.g., I-80, town of Sinclair). Also, implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season. Remaining impacts to nesting raptor and migratory bird species within the Region I wildlife analysis area would be limited primarily to habitat loss and fragmentation.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Southern Terminal and Alternate Southern Terminal

Southern Terminal Habitat Disturbance and Fragmentation

The existing conditions at the proposed Southern Terminal Siting area relative to wildlife habitat can be characterized as moderately disturbed and fragmented. The majority of human disturbance near the siting area results from Interstate Highway 95 located approximately 3.5 miles to the east. This highway is a major source of fragmentation in the local area. The Solar One energy plant located approximately 1.5 miles to the southwest of the siting area contributes to existing disturbance and fragmentation within the siting area. Several existing large transmission lines are located adjacent to the Southern Terminal siting area resulting in further fragmentation of the local landscape.

Construction of the Southern Terminal and the Alternate Southern Terminal would mostly occur in developed/disturbed areas that are not considered to be typical wildlife habitat. Eleven percent of the siting area is desert shrubland. Consequently, species associated with this habitat type in the region (e.g., mourning dove, greater roadrunner, greater short-horned lizard, bushy-tailed woodrat) potentially could be impacted. The Alternate Southern Terminal would potentially impact more desert shrubland habitat than the Southern Terminal, but no substantive impacts resulting from construction of the Southern Terminal or the Alternate Southern Terminal are anticipated.

Southern Terminal located near IPP (Design Option 2)

Construction of the Southern Terminal located near IPP (Design Option 2) would mostly occur in grassland, greasewood flat, and saltbush shrubland vegetation communities. Approximately 77 percent of the siting area is saltbush shrubland. Consequently, species associated with this habitat type in the region (e.g., western meadowlark, badger, white-tailed jackrabbit, gophersnake) potentially could be impacted.

Southern Substation located near IPP (Design Option 3)

The Southern Substation located near IPP (Design Option 3) is entirely within the boundaries of the Southern Terminal (Design Option 2). Construction impacts to wildlife species would be anticipated to be similar to those resulting from construction of the preferred alternative.

Operation Impacts

Acres of operation disturbance are presented in the big game species, small game species, and nongame species discussions above. Impacts from operations to these taxa groups are similar to those presented in construction; however, they are less intensive and longer in duration. The additional operation-related impact discussion below describes specific potential for bird mortality during operation of the project.

Northern Terminal

The primary operation-related impact to wildlife, particularly birds, is mortality as a result of electrocution or collision. As described in Section 2.4.3.1, six 500-kV AC line positions, three 500/230-kV transformer banks, eight 230-kV line positions, two 500-kV AC filter line positions, two DC line positions with transformers, converter building(s), and AC and DC filter yards would be constructed at the Northern Terminal. Depending on the design of the facility and the kV capacity, transmission lines and transformers pose an electrocution hazard for bird species, especially raptors, which attempt to perch on the structures. Transmission line configurations greater than 69-kV typically do not present a high risk of avian electrocution, based on conductor placement and orientation (APLIC 2006). The transmission lines also would incrementally increase the collision potential for migrating and foraging bird species. However, collision potential typically is dependent on variables such as the location in relation to high-use habitat areas (e.g., nesting, foraging, and roosting); line orientation to flight patterns and movement corridors; species composition; visibility; and line design (APLIC 2006).

To minimize potential operation-related impacts to raptors and other migratory birds, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). Therefore impacts to wildlife species, particularly raptors, from operation of the Northern Terminal would be limited to habitat loss, fragmentation, collision, and disturbance during normal maintenance activities.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Southern Terminal and Alternate Southern Terminal

Operation of the Southern Terminal or the Alternate Southern Terminal would occur in developed/disturbed areas that are not considered to be typical wildlife habitat. Eleven percent of the siting area is desert shrubland. Consequently, species associated with this habitat type in the region (e.g., mourning dove, greater roadrunner, greater short-horned lizard, bushy-tailed woodrat) potentially could be impacted. The Alternate Southern Terminal would potentially impact more desert shrubland habitat than the Southern Terminal, but no substantive impacts resulting from operation of the Southern Terminal or the Alternate Southern Terminal.

Southern Terminal located near IPP (Design Option 2)

Operation of the Southern Terminal located near IPP (Design Option 2) would mostly occur in grassland, greasewood flat, and saltbush shrubland vegetation communities. Approximately 77 percent of the siting

area is saltbush shrubland. Consequently, species associated with this habitat type in the region (e.g., western meadowlark, badger, white-tailed jackrabbit, gophersnake) potentially could be impacted.

Southern Substation located near IPP (Design Option 3)

The Southern Substation located near IPP (Design Option 3) is entirely within the boundaries of the Southern Terminal (Design Option 2). Operation impacts to wildlife species would be anticipated to similar to those resulting from construction of the preferred alternative.

Decommissioning Impacts

Impacts to wildlife during decommissioning of the Northern, Southern, Alternate Southern Terminals, Southern Terminal located near IPP (Design Option 2), or the Southern Substation located near IPP (Design Option 3) would be similar to, but substantially less intensive than construction impacts.

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

Because the implementation of Design Option 2 would utilize the same alternative routes and construction techniques as the proposed Project, impacts to wildlife from construction and operation of Design Option 2 would be similar to those discussed under the alternative routes. Differences between Design Option 2 and the proposed Project include the locations of the Southern Terminal and ground electrode system, as well as the addition of a series compensation station midway between IPP and Marketplace. The Southern Terminal would be located near IPP in Utah instead of near Marketplace in Nevada, and the ground electrode system would be within 50 miles of IPP. Impacts to vegetation from construction and operation of a converter station near IPP, ground electrode system, and series compensation station can be related to wildlife, and are discussed in Section 3.5.6.7.

Table 3.7-20 provides a summary of impacts associated with Design Option 2. Impacts from Design Option 2 facilities would be similar to impacts described in Section 3.7.6.1, Impacts from Terminal Construction and Operation, and Section 3.7.6.2, Impacts Common to all Alternative Routes and Associated Components. The same design features, BMPs, and mitigation measure listed for the Northern Terminal would be implemented to minimize impacts resulting from Design Option 2. Impacts to each wildlife habitat type would be less than 1 percent of the total of each habitat type in the wildlife analysis area.

Table 3.7-20 Summary of Design Option 2 Alternative Ground Electrode Siting Area Impact Parameters for Wildlife

Design Option 2 Converter/Substation
• Approximately 36 acres of construction and 22 acres of operation impacts to pronghorn crucial yearlong range would occur. • Approximately 181 acres of construction and 113 acres of operation impacts to small game and nongame potential habitat would occur. • Approximately 7 acres of construction and 4 acres of operation impacts to waterfowl potential habitat would occur.

[1] Length refers to length of transmission lines and lines serves as a proxy metric for avian collision potential.

Design Option 3 – Phased Build Out

Because the implementation of Design Option 3 would utilize the same alternative routes, facilities, and construction techniques as the proposed Project, albeit in a phased approach, impacts to wildlife from construction and operation of Design Option 3 would be the same as those discussed under the alternative routes.

Table 3.7-21 provides a summary of impacts associated with Design Option 3.

Table 3.7-21 Summary of Design Option 3 Substation Impact Parameters for Wildlife

Design Option 3 Substation
• Approximately 34 acres of construction and 15 acres of operation impacts to pronghorn crucial yearlong range would occur. • Approximately 170 acres of construction and 75 acres of operation impacts to small game and nongame potential habitat would occur. • Approximately 1 acre of construction and 1 acre of operation impacts to waterfowl potential habitat would occur.

3.7.6.2 Impacts to Wildlife Common to All Alternative Routes and Associated Components

Potential impacts to wildlife species from the alternative routes can be grouped into two main categories, construction and operation. Construction-related impacts are primarily habitat loss, fragmentation, and wildlife mortalities as a result of vehicle collisions and crushing of nests/burrows. Construction impacts account for all disturbance during construction of the Project (e.g., clearing of vegetation for footing construction, upgrading access roads, etc.). Operation impacts are defined as impacts that remain after reclamation is complete and will last at least as long as the Project is in operation and maintenance activities are conducted. Construction-related impacts are typically short-term, whereas operation impacts are typically long-term. Examples of potential operation impacts include habitat disturbance in areas where facilities will be sited, periodic vegetation management activities, wildlife mortalities that occur as a result of maintenance activities, increased predation of local prey populations by perching raptors, and habitat degradation resulting from increased noise and human activity in and along the 2-mile transmission line corridor. During operation of the Project, a portion of habitat disturbed during construction would not be reclaimed until after the end of the Project's design life (decommissioning).

Habitat impacts can be further categorized as direct and indirect. Direct habitat impact results when habitat is destroyed or converted to a form that is unsuitable for the impacted species. The primary potential indirect impact is wildlife avoidance (displacement) of otherwise suitable habitat in and around the Project disturbance areas during construction and operation.

The primary operation-related impact associated with transmission lines and associated facilities are wildlife mortalities as a consequence of electrocution or collision with transmission line components. Other potential impacts include habitat avoidance of otherwise suitable habitat due to the presence of a transmission line, and the increased noise and human presence that are the result of routine maintenance activities.

Construction Impacts

Construction of the proposed Project would result in the alteration, degradation, and loss of wildlife habitat, of which a percentage would be immediately reclaimed following construction of the facilities. The remaining disturbance area would be reclaimed at the end of the life of the project (estimated at 50 years). Recovery times of the various vegetation communities that provide habitat for the species within the wildlife analysis area are discussed in Section 3.5, Vegetation.

Habitat loss or alteration from surface disturbance would result in direct losses of smaller, less mobile species of wildlife, such as small mammals and reptiles, and the displacement of more mobile species into adjacent habitats. Surface disturbance also would result in an increase in habitat fragmentation along the proposed Project until reclamation has been completed and vegetation is re-established.

The road network, which would be constructed or upgraded to fulfill the construction requirements of the proposed Project, may impact wildlife species to varying degrees depending on the geographical location, type of habitat disturbed, and wildlife species potentially impacted. There are seven general impacts to wildlife habitat associated with roads including: 1) increased mortality from road construction; 2) increased mortality from collisions with vehicles; 3) modification of wildlife behavior; 4) alteration of the physical

environment; 5) alteration of the chemical environment; 6) spread of invasive and exotic species; and 7) increased alteration and use of habitats by humans (Trombulak and Fissell 2000). Not all species and ecosystems are equally impacted by roads, but overall the presence of roads is highly correlated with changes in species composition, population sizes, and hydrologic and geomorphic processes that shape aquatic and riparian habitats (Trombulak and Fissell 2000).

Game Species

Potential direct impacts to big game species (e.g., pronghorn, mule deer, elk, moose, Rocky Mountain bighorn sheep, and desert bighorn sheep) would include the incremental loss of potential forage and the increase of habitat fragmentation from vegetation removal associated with surface disturbance. The primary potential indirect impact would be wildlife avoidance (displacement) of otherwise suitable habitat in the vicinity of Project disturbance areas due to noise and human activity. Impacts due to disturbance may also include both short-term and permanent changes to big game migration corridors during periods of construction and operation activity. Impacts would be more pronounced within big game crucial winter range and desert bighorn sheep occupied habitat. Impacts to crucial winter range would include the loss of potential cover and forage consisting primarily of woody/shrubby vegetation such as sagebrush, bitterbrush, and winterfat. Loss of available forage (e.g., woody shrubs, such as sagebrush) would result in a long-term (greater than 25 years) impact to wintering big game species.

Construction of the proposed Project would result in direct impacts to small game species (i.e., upland game birds, small game mammals, furbearers, and waterfowl) and would include the loss of potentially suitable habitat. Small game species such as the Columbian sharp-tailed grouse, greater sage-grouse, and pygmy rabbit have designated protections (e.g., BLM sensitive, USFS sensitive, state-protected, etc.) and are discussed further in Section 3.8, Special Status Wildlife Species. Impacts from the construction of the alternative routes also would include animal displacement from the disturbance areas and increased habitat fragmentation, until reclamation has been completed and vegetation is re-established. Potential impacts also could include nest and burrow abandonment or loss of eggs or young. These losses could reduce productivity for that breeding season, depending on timing and duration of construction activities in a specific area. Indirect impacts associated with human activity and noise have been shown to negatively impact small game populations, especially upland game birds. These species may experience increased mortality rates due to increased access as a result of new and improved roads (Holbrook and Vaughan 1985). Vehicular traffic may injure or kill individuals, and local populations may experience higher levels of hunting and poaching pressure, due to improved human access (Holbrook and Vaughan 1985). In most instances, suitable habitat adjacent to disturbance areas would be available for use by small game species.

Implementation of TWE-32 and TWE-33 (summarized above and found in **Appendix C**), as well as BLM, USFS, and state wildlife agency restrictions to prevent disturbance to wintering big game species in identified crucial winter range from November 15 to April 30, would minimize direct impacts to wintering big game species. Similarly, through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts from construction of the proposed Project would be limited primarily to habitat loss and fragmentation.

Nongame Species

The types of impacts to nongame species (e.g., small mammals, reptiles) would be similar to those discussed for small game species. Nongame species such as the Wyoming pocket gopher, midget faded rattlesnake, and desert iguana have designated protections (e.g., BLM sensitive, USFS sensitive, state-protected, etc.) and are discussed further in Section 3.8 Special Status Wildlife Species.

Implementation of TWE's design feature (TWE-32) would limit direct impacts to nongame species during sensitive periods (e.g., nesting and breeding). Therefore, impacts from construction of the proposed Project would be limited primarily to habitat loss and fragmentation.

Raptors and Other Migratory Birds

A number of raptor species that are not classified as special status (e.g., Cooper's hawk, northern harrier, American kestrel, red-tailed hawk, and great-horned owl) may either seasonally occupy or remain as yearlong residents in the habitats found within the wildlife analysis area. Potential direct impacts to raptors would include the loss of potentially suitable breeding, roosting, and foraging habitat. Impacts to raptor species can result from the loss or alteration in habitat, reduction in prey base, and increased human disturbance, particularly during the breeding season. The loss of native habitat to human development has resulted in declines of hawks and eagles throughout the West (Boeker and Ray 1971; Schmutz 1984). In some cases, habitat changes have not reduced numbers of raptors, but have resulted in shifts in species composition (Harlow and Bloom 1987). Impacts to small mammal populations due to habitat loss and fragmentation can result in a reduced prey base for raptors, causing lower raptor densities. Thompson et al. (1982) and Woffinden and Murphy (1989) found that golden eagles and ferruginous hawks had lowered nesting success where native vegetation had been lost and the habitat was unable to support jackrabbit (prey) populations. Furthermore, raptors have a high potential of being disturbed from nests and roosts, which contributes to displacement and reduced nesting success (Holmes et al. 1993; Postovit and Postovit 1987; Stalmaster and Newman 1978).

The availability of raptor nest data, which is typically associated with project surveys, is not an accurate portrayal of the actual distribution and abundance of nesting raptors. The availability of aptor nest data tends to be biased based on whether previous surveys have been conducted in association with other projects. Alternatives that are proposed in areas where other linear projects have not occurred cannot be directly compared to alternatives that may be paralleling exiting linear features where surveys were previously completed. In addition, inactive raptor nests are difficult to attribute to a specific species. Data is often reported as "species unknown". Nonetheless, the number of known raptor nests (active and inactive) along a project alternative is valuable information to be presented in analyses. Prior to construction, a comprehensive raptor nest survey will be conducted for the agency preferred alternative. If construction of the proposed Project was to occur during the raptor breeding season (approximately January 1 to August 15, depending on the species and location), impacts to breeding raptors could include the possible loss of nests or nest abandonment due to increased noise and human activity in proximity to an active nest site. Special status raptor species are addressed in Section 3.8, Special Status Wildlife Species.

As presented above, a total of 21 IBAs and 49 BHCAs occur within the wildlife analysis area. As discussed in Section 3.7.4.3, Wildlife, these areas support a higher diversity of migratory bird species than surrounding areas and encompass critical breeding, foraging, or migration habitat for both common and sensitive migratory bird species. Migratory bird species that may be impacted by construction activities include nesting passerines or songbirds that utilize the various habitats found within the wildlife analysis area. Potential direct impacts to migratory birds would include the construction and operation disturbance of potentially suitable breeding, roosting, and foraging habitat. Impacts to migratory bird species can result from the loss or alteration of habitat, reduction in forage base, and increased human disturbance, especially during the breeding season. If construction of the proposed Project was to occur during the migratory bird breeding season (approximately March 1 to July 31, depending on the state), impacts to breeding birds could include the loss of nests or nest abandonment caused by increased noise and human activity in proximity to an active nest site.

***WLF-1**: For the protection of breeding migratory birds, **WLF-1** requires TWE to avoid migratory bird habitat removal on currently undisturbed lands, to the extent possible, between approximately February 1 and July 31 (depends on state) or, alternately, to conduct breeding migratory bird surveys and implement appropriate mitigation in coordination with the BLM, Bureau of Reclamation, CPW, NDOW, UDWR, USFS, USFWS, Western, and WGFD. In addition, in order to avoid impacts to raptors during the breeding season (January 1 to August 31 for most eagles, hawks, falcons, and owls and April 15 to September 15 for burrowing owls), TWE would be required to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around active nests, as needed.*

Effectiveness: In order to minimize impacts to raptors during the breeding season (February 1 to August 15), TWE has committed to implement seasonal timing restrictions in appropriate areas (TWE-32). More specifically, **WLF-1** would require TWE to conduct a preconstruction breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. To minimize impacts to migratory birds during the breeding season, TWE also has committed to implement seasonal timing restrictions in applicable areas (TWE-32). More specifically, **WLF-1** would require TWE to avoid habitat removal on currently undisturbed lands, to the extent possible, between March 1 and July 31 (depending on the state) or, alternately, to conduct breeding bird surveys and implement appropriate mitigation in coordination with the BLM, CPW, NDOW, UDWR, USFS, USFWS, Western, and WGFD.

Implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season. Remaining impacts to nesting raptor and migratory bird species within the wildlife analysis area would be primarily limited to habitat loss and fragmentation.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Analysis of Wildlife Impacts as a Result of Human Activity and Noise

Indirect impacts from the construction of the proposed Project would result from increased human activity and noise in the vicinity of the terminal locations and the approved 2-mile transmission line corridor. The most common wildlife responses to noise and human activity are avoidance or accommodation. Avoidance would result in displacement of animals from an area larger than the actual disturbance area. Following avoidance of human activity and noise-producing areas during construction, certain wildlife species may acclimate to the activity and begin to return to areas that were formerly avoided. For example, during construction, it is likely that big game species (i.e., pronghorn, mule deer) would be displaced from a larger area than the actual disturbance sites due to the avoidance response. Displacement of big game species as a result of direct habitat loss and indirect reduction in habitat quality has been widely documented (Irwin and Peek 1983; Lyon 1983, 1979; Rost and Bailey 1979). Studies have shown that big game species tend to move away from areas of human activity and roads; thereby reducing habitat utilization near disturbance areas (Cole et al. 1997; Sawyer et al. 2006). However, big game species have demonstrated the ability to acclimate to a variety of activities as long as human harassment levels do not increase substantially (Forman et al. 2003). Therefore, it is possible that the extent of displacement would approximate the actual disturbance area after the first few years of operation (Forman et al. 2003). Mule deer and pronghorn appear to be more tolerant of human activity than desert bighorn sheep. For mule deer, displacement distances from new roads ranged from 330 feet to 0.6 mile, depending on the presence of vegetative cover (Rost and Bailey 1979, as cited in Forman et al. 2003). However, disturbance associated with construction activities would occur over a relatively short period, and it is assumed that big game species would return to the area following completion of Project construction. In addition to an avoidance response, increased human activity intensifies the potential for wildlife/human interactions ranging from harassment of big game species to legal harvest or poaching.

Noise levels associated with construction may impact migratory bird species that occupy habitats in the 2-mile transmission line corridor. Studies also have shown that reductions in bird population densities in both open grasslands and woodlands also may be attributed to a reduction in habitat quality produced by elevated noise levels (Reijnen et al. 1997, 1995). Although visual stimuli in open landscapes may contribute to reduced bird densities at relatively short distances, the impacts of noise appear to be the most critical factor since breeding birds of open grasslands (threshold noise range of 43 to 60 decibels on the A-weighted scale [dBA]) and woodlands (threshold noise range of 36 to 58 dBA) respond very similarly

to disturbance by traffic volume (Reijnen et al. 1997). Reijnen et al. (1996) determined a threshold of effect for bird species to be 47 dBA, while a New Mexico study in a pinyon-juniper community found that impacts of gas well compressor noise on bird populations were strongest in areas where noise levels were greater than 50 dBA. However, moderate noise levels (40 to 50 dBA) also showed some effect on bird densities in this study (LaGory et al. 2001).

For the purposes of this programmatic analysis, the total extent of indirect habitat loss as a result of the wildlife avoidance response is estimated to be the same as the construction noise attenuation distance so that it could be applied across all wildlife species. The analysis conservatively assumes habitat to be flat terrain with no atmospheric conditions or other potential dampening effects, so that construction noise would dissipate to ambient noise levels at a distance of approximately 6,400 feet (1.2 miles). Because many areas along the proposed 2-mile transmission line corridor and its alternatives are characterized by topographic variation and woody vegetation (e.g. shrubland, woodland, forest), this approach likely overestimates potential noise impacts. Using this distance from the 250 foot-wide transmission line ROW and considering the potential for access road development within the 2-mile transmission line corridor, this analysis reports all acreages of habitat within the 2-mile transmission line corridor as being potentially indirectly impacted by noise and human activity. While actual locations of access roads are not yet known and construction would not impact all acres within the 2-mile transmission line corridor, this methodology accounts for areas with more potential for being indirectly impacted by noise and human activity and counterbalances those acreages at the edge of the 2-mile transmission line corridor where the access roads would tie into existing roads. These impacts would occur during Project construction. Subsequent impact summary tables for each of the Project regions present these acreages of indirect impacts.

Several factors would minimize the potential impacts related to human activity and noise during construction of the proposed Project. TWE would implement a mandatory employee biological education program for all personnel working within the 250-foot-wide transmission line ROW and the 2-mile transmission line corridor for potential access roads (TWE-33). This would consist of all contractor and subcontractor personnel and others involved in construction activities being notified of known occurrence of protected species or habitat in the construction area. Sensitive areas will be considered avoidance areas. Prior to any construction activity, avoidance areas will be marked on the ground and maintained through the duration of the contract. TWE's design feature to implement seasonal timing restrictions in certain areas (TWE-32) would help avoid impacts to wildlife during sensitive periods (e.g., nesting and breeding periods). Implementation of **WLF-1** would further define how TWE would avoid impacts to breeding bird species by requiring implementation of seasonal timing restrictions and protection buffers during the raptor and migratory bird breeding seasons. Implementation of the BLM, USFS, and state wildlife agency big game crucial winter timing stipulation would prohibit Project development within big game crucial winter range from approximately November 15 to April 30 (depending on species, state, and management agency), which would reduce impacts to wintering big game species. Remaining noise and human activity impacts to wildlife species within the Region I wildlife analysis area would be limited to habitat avoidance outside of key breeding periods within important habitat types and protection buffers.

Operation Impacts

Game Species

Operation-related impacts to big game and small game species would result primarily from vegetation management and other maintenance activities, including reconnaissance flights for transmission line inspection. Depending on species sensitivity, some species may experience disruption or additional stress due to overhead flights. Vegetation maintenance would have impacts similar to those described above for construction activities. Noise and human activity impacts also are discussed above. Small game species would have potential increased risk of predation by raptor and corvid species, which may perch on transmission lines and towers.

Nongame Species

Potential impacts to nongame species are similar to those discussed above for game species. Additional operation-related impacts to raptors and other migratory birds and bats are discussed below. Operation-related impacts to bat species would be similar to those described below for avian species.

Raptors and Other Migratory Birds

The primary operation-related impacts to birds are mortalities as a result of electrocution and collision with transmission line components. Maintenance activities (vegetation management, ground or air inspections, and repair work) would have indirect impacts, but would be less intense, shorter in duration, and smaller in acreage extent than those described above in the Construction Impacts section and discussed below under indirect construction impacts by region. As described in Section 2.1, the proposed Project would consist of the operation of a 600-kV DC transmission line and two AC/DC converter stations. Transmission lines and transformers pose an electrocution hazard for bird species, especially raptors, which attempt to perch on the structures. However, configurations greater than 69 kV typically do not present a high electrocution potential, based on conductor placement and orientation (APLIC 2006). Avian predators, particularly raptors, are attracted to overhead utility lines because they provide perches for various activities, including hunting (APLIC 2006). Power poles increase a raptor's range of vision, allow for greater speed during attacks on prey, and serve as territorial markers (APLIC 2006; Manville 2002; Steenhof et al. 1993). Transmission line structures can impact small game, nongame, migratory bird, reptile, and amphibian populations by enhancing raptor and corvid populations. Raptors and corvids nest and perch on transmission structures, which create vertical structure in generally treeless shrub-steppe habitats (Knight and Kawashima 1993; Steenhof et al. 1993). Raptors and corvids may then occur at higher densities than normal due to increased nesting locations and perches. For example, within one year of construction of a 372.5-mile transmission line in southern Idaho and Oregon, raptors and common ravens began nesting on the supporting poles. Within ten years of construction, 133 pairs of raptors and ravens were nesting along this stretch (Steenhof et al. 1993). Along a transmission line in Nevada, the mean number of the most common raptor species observed over a six–year period one year prior to and five years after construction of the line remained relatively stable. However, the mean number of common ravens seen per survey point dramatically increased during the first four years after construction before declining drastically the fifth year after construction (Blomberg and Sedinger 2008).

The transmission lines also would incrementally increase the collision potential for migrating and foraging bird species. Collision potential typically is dependent on variables such as the location in relation to high-use habitat areas (e.g., nesting, foraging, and roosting); line orientation to flight patterns and movement corridors; species composition; visibility; and line design (APLIC 2006). However, avian mortality from collisions with power lines is well documented (Brown and Drewien 1995). Although rarely impacting healthy populations with good reproductive potential, collision mortality can be biologically significant to small local populations (Beer and Ogilvie 1972) and endangered species (Faanes 1987; APLIC 1994). Avian loss is often greatest where power lines cross migratory paths, bisect feeding and nesting-roosting sites, or occur adjacent to major avian use areas (Savereno et al. 1996). Higher risk also exists when land topography funnels birds through power-line corridors (Bevanger 1990; Faanes 1987). While some species of birds (e.g., upland game birds and certain grassland migratory birds) are predominantly ground dwelling species, the risk for collision during flight is heavily dependent upon transmission line locations, such as locations between loafing and feeding areas or migration routes. Highest collision probabilities appear to occur where birds typically fly between foraging and loafing habitats bisected with overhead lines (Science Applications International Corporation [SAIC] 2001).

Factors that influence the risk of collision to individual birds as they encounter power lines are varied and include flight characteristics, previous experience with power lines (typically a function of age), weather, and power line structural characteristics (APLIC 2006, 1994; Thompson 1978). The static wire, also referred to as the shield or groundwire, has posed the greatest collision danger to birds (APLIC 1994; Faanes 1987). Research has indicated that most collisions occur with static wires when birds increased

their altitude in apparent attempts to avoid conductor wires. Birds maneuvering to avoid the conductor wires actually increased collision risk, and in the absence of static wires most collisions could have been avoided. If power lines must be placed above ground, the risk of colliding would probably be reduced if all wires were in a single horizontal plane (Bevanger 1994).

Research on communication and meteorological towers suggests that the use of guy wires increases avian collision risk and mortality (Gehring et al. 2009; Manville 2009, 2005; Erickson et al. 2005). Although these types of towers tend to be considerably taller and have more complex guy wire configurations than the transmission line tower designs being considered for this project, the use of guyed transmission towers would be likely to increase avian collision risk relative to unguyed towers. This risk can be expected to be higher for species with high wing loading and rapid flight such as wild turkeys, grouse, and waterfowl. Where guy wires must be used, they should be adequately marked with bird diverters to reduce avian collision risk (Manville 2005; APLIC 1994).

Research conducted by Savereno et al. (1996) indicates that the height of the transmission lines relative to a bird's flight heights could be a potential risk factor. Empirical data and theoretical considerations indicate that species with high wing loading and low aspect run a high risk of colliding with power lines. These birds are characterized by rapid flight, and the combination of heavy body and small wings restricts swift reactions to unexpected obstacles (Bevanger 1998). Raptors have a much greater wing to body ratio, and are more likely to fly at levels well above the transmission line heights, and maintain flight levels for an extended period of time. Other bird species, such as upland game birds, may have a greater potential for collision risk because of the smaller wing to body ratio, resulting in lower flight heights and a greater occurrence of takeoffs and landings crossing the transmission line levels.

Operation-related impacts to raptors and other migratory birds may be more pronounced in areas near Audubon IBAs. As discussed in Section 3.7.4.3, Nongame Species, these areas have unique habitat (e.g., wetlands, playas) or geographical features (e.g., canyons, gorges) that provide important habitat for raptors and other migratory birds throughout the year or during migration.

To minimize potential operation-related impacts to wildlife as a result of the proposed Project, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). Even with implementation of the proposed design features, there would be some remaining potential for avian collisions with the transmission line and towers. However, the potential for electrocution impacts to bird species within the wildlife analysis area would be negligible. Wildlife prey species also would be impacted due to the potential for increased avian predator populations nesting on power line structures. **SSWS-5** (anti-perching within key greater sage-grouse habitat) presented in Section 3.8 also would benefit other wildlife prey species.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Decommissioning Impacts

The types of impacts to wildlife during decommissioning of the Project would be similar to, but substantially less intensive than construction impacts.

3.7.6.3 Region I

Alternative I-A (Applicant Proposed)

Alternative I-A Habitat Disturbance and Fragmentation

Alternative I-A would cross approximately 155 miles of wildlife habitat in Wyoming and Colorado. Approximately 62 miles (40 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-22**. Existing conditions within the Alternative I-A 2-mile corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Alternative I-A follows the I-80 corridor for approximately 40 miles from Rawlins, Wyoming, to just south of Wamsutter, Wyoming, at which point it turns south towards the Wyoming-Colorado border. This section of Alternative I-A is highly fragmented and disturbed by the highway, several county roads, and high densities of existing oil and gas operations. The remaining segments of Alternative I-A are moderately fragmented by county roads, low density oil and gas and livestock operations, and private residences. A total of 458 miles of existing roads are located within the 2-mile corridor as shown **Table 3.7-22**. This represents the lowest existing road density within the 2-mile corridor amongst Region I alternatives.

Table 3.7-22 Summary of Existing Conditions by Alternative within Region I

Alternative	Total Length (miles)	Length of Greenfield Construction	Length of Co-Located Construction	Miles of Existing Roads within 2-Mile Corridor	Miles of Roads within 2-Mile Corridor/Mile of Alternative
I-A	155	93	62	458	2.95
I-B	159	91	68	461	2.89
I-C	186	88	98	662	3.56
I-D (Agency Preferred)	171	109	63	550	3.20

Table 3.7-23 provides a tabulation of impacts associated with the alternative routes in Region I. Key impact parameters that relate to the impact discussion in Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below.

Key Parameters Summary

Game Species

Alternative I-A would result in the direct disturbance to pronghorn, mule deer, and elk crucial winter ranges (**Table 3.7-23**). Implementation of the BLM, CPW, and WGFD restriction to prevent disturbance to wintering big game species in identified crucial winter range from November 15 to April 30, would prevent direct impacts to wintering big game species. Alternative I-A would result in the construction and operation disturbance of 5,159 acres and 512 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.10 and <0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region I wildlife analysis area. Alternative I-A also would result in the construction disturbance of 110 acres and operation disturbance of 9 acres of waterfowl habitat. These areas represent 0.13 percent and 0.01 percent of the available waterfowl habitat within the Region I wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative I-A would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Table 3.7-23 Summary of Region I Alternative Route Impact Parameters for Wildlife

Parameter	Alternative I-A			Alternative I-B			Alternative I-C			Alternative I-D		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Big Game Species												
Colorado pronghorn severe winter range (acres)	157	43	12,299	163	38	18,366	248	62	20,068	163	38	18,366
Percentage of existing habitat within the Region I big game analysis area	0.08	0.02	6.19	0.08	0.02	9.25	0.12	0.03	10.11	0.08	0.02	9.25
Wyoming pronghorn crucial winter/yearlong range (acres)	135	37	13,007	125	34	12,175	519	110	45,484	277	64	22,636
Percentage of existing habitat within the Region I big game analysis area	0.03	<0.01	2.68	0.03	<0.01	2.51	0.11	0.02	9.36	0.06	0.01	4.66
Colorado mule deer severe winter range (acres)	207	57	18,366	167	40	22,550	725	187	69,373	167	40	22,550
Percentage of existing habitat within the Region I big game analysis area	0.03	<0.01	2.71	0.02	<0.01	3.33	0.11	0.03	10.24	0.02	<0.01	3.33
Wyoming mule deer crucial winter range (acres)	0	0	0	0	0	0	10	2	4,209	0	0	0
Percentage of existing habitat within the Region I big game analysis area	0	0	0	0	0	0	0.02	<0.01	7.43	0	0	0
Wyoming mule deer crucial winter/yearlong range (acres)	112	29	9,880	113	29	9,999	427	91	34,221	283	59	20,727
Percentage of existing habitat within the Region I big game analysis area	0.04	<0.01	3.23	0.04	<0.01	3.27	0.14	0.03	11.18	0.09	0.02	6.77
Colorado elk severe winter range (acres)	285	77	23,281	377	95	41,047	1,335	345	122,036	377	95	41,047
Percentage of existing habitat within the Region I big game analysis area	0.03	<0.01	2.29	0.04	<0.01	4.04	0.13	0.03	12.00	0.04	<0.01	4.04
Colorado elk parturition range	218	61	20,766	82	23	21,302	<1	<1	32	82	23	21,302
Percentage of existing habitat within Region I big game analysis area	<1	<1	5.61	<1	<1	5.76	<1	<1	<1	<1	<1	5.76

Table 3.7-23 Summary of Region I Alternative Route Impact Parameters for Wildlife

Parameter	Alternative I-A			Alternative I-B			Alternative I-C			Alternative I-D		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Wyoming elk crucial winter/yearlong range (acres)	24	6	1,782	24	6	1,782	7	2	898	24	6	1,779
Percentage of existing habitat within the Region I big game analysis area	0.01	<0.01	0.86	0.01	<0.01	0.86	<0.01	<0.01	0.44	0.01	<0.01	0.86
Small Game and Nongame Species												
Upland game bird, small game mammal, furbearer, small nongame mammal, migratory bird, and reptile habitat (acres)[1]	5,159	512	207,395	5,252	482	229,262	6,188	599	236,625	5,644	516	247,824
Percentage of existing habitat within the Region I wildlife analysis area	0.10	<0.01	3.96	0.10	<0.01	4.38	0.12	0.01	4.52	0.11	<0.01	4.74
Waterfowl habitat (acres)[2]	110	9	3,427	90	8	3,365	59	7	4,601	120	10	4,343
Percentage of existing habitat within the Region I wildlife analysis area	0.13	0.01	4.03	0.11	<0.01	3.96	0.07	<0.01	5.41	0.14	0.01	5.11
Relative Collision Potential for Migratory Birds												
Length of transmission line (miles)[4]	155			159			186			171		
Raptor Nests (Non-special Status)												
Number within 1 mile of the reference line[3]	60			96			149			202		
Bird Habitat Conservation Areas												
BHCAs crossed by 250 foot-wide transmission line ROW (acres)	1,356			1,304			2,231			1,322		
Percentage of existing BHCA habitat within the Region I wildlife analysis area	0.06			0.06			0.11			0.06		

Table 3.7-23 Summary of Region I Alternative Route Impact Parameters for Wildlife

Parameter	Alternative I-A			Alternative I-B			Alternative I-C			Alternative I-D		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Audubon Important Bird Areas												
Powder Rim IBA crossed by the 2-mile transmission line corridor (acres)	9,708			9,456			2,023			11,988		
Muddy Creek Wetlands IBA crossed by the 2-mile transmission line corridor (acres)	0			0			2,023			3,131		
Percentage of IBA within the Region I wildlife analysis area	5.84			5.69			1.22			7.21		

[1] Vegetation communities used to calculate acreages of habitat disturbance include agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, desert shrubland, dunes, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland other coniferous forest, other deciduous forest, open water, pinyon-juniper, sagebrush shrubland, saltbush shrubland, tundra, riparian, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[2] Vegetation communities used to calculate acreages of waterfowl habitat disturbance include open water, herbaceous wetland, riparian, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[3] Special status raptor species are addressed in Section 3.8, Special Status Wildlife Species. A total of 175 raptor nests of unknown species are documented in Region I. These nests potentially could be utilized by special status raptor species, thus also are tabulated in Section 3.8.5.3, Region I.

[4] Length refers to length of 600-kV transmission lines, and serves as a proxy metric for avian collision potential.

Nongame Species

Impacts under Alternative I-A would occur as the result of the construction disturbance of 5,159 acres and operation disturbance of 512 acres of small mammal and reptile habitat. These areas represent 0.10 percent and <0.01 percent of the available small mammal and reptile habitat within the Region I wildlife analysis area. Implementation of TWE's design feature (TWE-32) would limit direct impacts to nongame species during sensitive periods (e.g., nesting and breeding). Therefore, impacts would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

Potential direct impacts to raptors and other migratory birds under Alternative I-A would include the construction and operation loss of approximately 5,159 acres and 512 acres, respectively, of potentially suitable breeding, roosting, and foraging habitat. These areas represent 0.10 percent and <0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region I wildlife analysis area. The length of Alternative I-A is found in **Tables 3.7-22** and **3.7-23**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 60 raptor nests that are not classified as special status occur within 1 mile of the reference line under Alternative I-A (**Tables 3.7-23** and **3.7-24**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative I-A. **Table 3.7-24** presents known raptor nests within 1 mile of the reference line corridor in Region I.

Table 3.7-24 Non-special Status Raptor Nests Documented Within 1 Mile of the Reference Line in Region I

Species	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D	Tuttle Easement Micro-siting Option 1	Tuttle Easement Micro-siting Option 2	Tuttle Easement Micro-siting Option 3	Tuttle Easement Micro-siting Comparable Portion of Alternative I-D	Mexican Flats alternative Connector	Baggs Alternative Connector	Fivemile Point North Alternative Connector	Fivemile Point South Alternative Connector
Northern harrier	2	2	3	2	0	0	0	0	0	0	1	0
Cooper's hawk	1	1	3	2	0	0	0	0	0	1	1	0
Red-tailed hawk	5	20	25	14	0	0	0	0	0	6	6	0
American kestrel	3	8	9	3	0	0	0	0	0	1	1	0
Great horned owl	1	4	5	3	0	0	0	0	0	1	4	0

Table 3.7-24 Non-special Status Raptor Nests Documented Within 1 Mile of the Reference Line in Region I

Species	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D	Tuttle Easement Micro-siting Option 1	Tuttle Easement Micro-siting Option 2	Tuttle Easement Micro-siting Option 3	Tuttle Easement Micro-siting Comparable Portion of Alternative I-D	Mexican Flats alternative Connector	Baggs Alternative Connector	Fivemile Point North Alternative Connector	Fivemile Point South Alternative Connector
Common raven	1	1	1	1	0	0	0	0	0	0	0	0
Unknown raptor species	47	60	103	177	24	24	24	24	3	31	6	1
Totals	60	96	149	202	24	24	24	24	3	40	19	1

[1] Special status raptor species are presented in Section 3.8, Special Status Wildlife.

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010, 2012; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012, Manti-LaSal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012, AECOM 2012..

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative I-B

Alternative I-B Habitat Disturbance and Fragmentation

Alternative I-B would cross approximately 159 miles of wildlife habitat in Wyoming and Colorado. Approximately 68 miles (43 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-22**. Existing conditions within the Alternative I-B 2-mile corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Alternative I-B follows the I-80 corridor for approximately 40 miles from Rawlins, Wyoming, to just south of Wamsutter, Wyoming, at which point it turns south towards the Wyoming-Colorado border. This section of Alternative I-B is highly fragmented and disturbed by the highway, several county roads, and high densities of existing oil and gas operations. The remaining segments of Alternative I-B are moderately fragmented by county roads, low density oil and gas and livestock operations, and private residences. A total of 461 miles of existing roads are located within the 2-mile corridor as shown **Table 3.7-22**. This represents the third highest existing road density within the 2-mile corridor amongst Region I alternatives.

Game Species

The types of impacts to big game species under Alternative I-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-23** presents a comparison of impacts to habitat in Region I. Alternative I-B would result in the construction and operation disturbance to 5,252 acres and 482 acres, respectively, of potentially suitable upland game bird, small game mammal,

and furbearer habitat. These areas represent 0.10 percent and <0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region I wildlife analysis area. Alternative I-B also would result in the construction disturbance of 90 acres and operation disturbance of 8 acres of waterfowl habitat. These areas represent 0.11 percent and <0.01 percent of the available waterfowl habitat within the Region I wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative I-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative I-B generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-23** presents a comparison of impacts to habitat in Region I. Alternative I-B would result in the construction and operation disturbance of 5,252 acres and 482 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.10 percent and <0.01 percent of the available small mammal and reptile habitat within the Region I wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative I-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative I-B generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-23** presents a comparison of impacts to habitat in Region I. Alternative I-B would result in the construction and operation disturbance of 5,252 acres and 482 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.10 percent and <0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region I wildlife analysis area. The length of Alternative I-B is found in **Tables 3.7-22** and **3.7-23**. Potential impacts to raptors and migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 96 raptor nests that are not classified as special status occur within 1 mile of the reference line under Alternative I-B (**Table 3.7-24**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative I-B would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative I-B.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative I-C

Alternative I-C Habitat Disturbance and Fragmentation

Alternative I-C would cross approximately 186 miles of wildlife habitat in Wyoming and Colorado. Approximately 98 miles (53 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-22**. Existing conditions within the Alternative I-C 2-mile corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Alternative I-C follows the I-80 corridor for approximately 32 miles from Rawlins, Wyoming, to just south of Creston junction, Wyoming, at which point it turns south following the State Highway 798 corridor towards the Wyoming-Colorado border. This section of Alternative I-C is highly fragmented and disturbed by the highway, several county roads, and high densities of existing oil and gas operations. The remaining segments of Alternative I-C are moderately fragmented by county roads, low density oil and gas and livestock operations, and private residences. A total of 662 miles of existing roads are located within the 2-mile corridor as shown **Table 3.7-22**. This represents the highest existing road density within the 2-mile corridor amongst Region I alternatives.

Game Species

The types of impacts to big game species under Alternative I-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-23** presents a comparison of impacts to habitat in Region I. Alternative I-C would result in the construction and operation disturbance of 6,188 acres and 599 acres, respectively, of potentially suitable upland game bird, small game mammal, and furbearer habitat. These areas represent 0.12 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region I wildlife analysis area. Alternative I-C also would result in the construction disturbance of 59 acres and operation disturbance of 7 acres of waterfowl habitat. These areas represent 0.07 percent and <0.01 percent of the available waterfowl habitat within the Region I wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative I-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative I-C generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-23** presents a comparison of impacts to habitat in Region I. Alternative I-C would result in the construction and operation disturbance of 6,188 acres and 599 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.12 percent and 0.01 percent of the available small mammal and reptile habitat within the Region I wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative I-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative I-C would generally be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative I-C would result in the construction and operation disturbance of 6,188 acres and 599 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.12 percent and 0.01 percent of potentially suitable raptor and migratory bird breeding, roosting, and foraging habitat within the Region I wildlife analysis area. The length of Alternative I-C is found in **Table 3.7-23**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or

exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 149 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative I-C (**Table 3.7-24**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative I-C would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative I-C.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative I-D (Agency Preferred)

Alternative I-D Habitat Disturbance and Fragmentation

Alternative I-D would cross approximately 171 miles of wildlife habitat in Wyoming and Colorado. Approximately 63 miles (36 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-22**. Existing conditions within the Alternative I-D 2-mile corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Alternative I-D follows the I-80 corridor for approximately 40 miles from Rawlins, Wyoming, to just south of Wamsutter, Wyoming, at which point it turns south towards the Wyoming-Colorado border. This section of Alternative I-D is highly fragmented and disturbed by the highway, several county roads, and high densities of existing oil and gas operations. The remaining segments of Alternative I-D are moderately fragmented by county roads, low density oil and gas and livestock operations, and private residences. A total of 550 miles of existing roads are located within the 2-mile corridor as shown **Table 3.7-22**. This represents the second highest existing road density within the 2-mile corridor amongst Region I alternatives.

Game Species

The types of impacts to big game species under Alternative I-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-23** presents a comparison of impacts to habitat in Region I. Alternative I-D would result in the construction and operation disturbance of 5,644 acres and 516 acres, respectively, of potentially suitable upland game bird, small game mammal, and furbearer habitat. These areas represent 0.11 percent and <0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region I wildlife analysis area. Alternative I-D also would result in the construction disturbance of 120 acres and operation disturbance of 10 acres of waterfowl habitat. These areas represent 0.14 percent and 0.01 percent of the available waterfowl habitat within the Region I wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative I-D would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative I-D generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-23** presents a comparison of impacts to habitat in Region I. Alternative I-D would result in the construction and operation disturbance of 5,644 acres and 516 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.11 percent and <0.01 percent of the available small mammal and reptile habitat within the Region I wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative I-D would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative I-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative I-D would result in the construction and operation disturbance of 5,644 acres and 516 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.11 percent and <0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region I wildlife analysis area. The length of Alternative I-D is found in **Table 3.7-23**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 202 raptor nests that are not classified as special status occur within 1 mile of the reference line under Alternative I-D (**Table 3.7-24**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative I-D.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Tuttle Easement Micro-siting Options

TWE has developed three potential options to avoid or minimize the crossing of the Tuttle Easement and the NPS Deerlodge Road along Alternative I-D. These are referred to as Tuttle Easement micro-siting options 1, 2, and 3. CPW holds a conservation easement over portions of the Tuttle Ranch, located east of the town of Elk Springs in Moffat County, Colorado. The Tuttle Ranch supports an important white-tailed prairie dog colony, which is suitable habitat for the black-footed ferret. It is intended that future black-footed ferret reintroductions will occur within this conservation easement.

The differences in the potential impacts to local wildlife populations resulting from these micro-siting options when compared to Alternative I-D are anticipated to be minor in terms of the number of acres of habitat directly impacted. The substantive difference between the micro-siting options and Alternative I-D involves the level of habitat fragmentation resulting from construction. Although micro-siting option 1 would cross the conservation easement and areas of active white-tailed prairie dog colonies similar to Alternative I-D, Option 1 would be located immediately adjacent to an existing 345-kV transmission line therefore reducing the amount of habitat fragmentation resulting from construction in comparison to Alternative I-D. Micro-siting options 2 and 3 would differ from Alternative I-D by not crossing the conservation easement and active white-tailed prairie dog colonies but would result in increased habitat fragmentation as construction would be located in an area with no existing overhead transmission lines.

Region I Conclusion

Based on a comparison of impact parameters for Region I alternatives, potential construction and operation impacts to wildlife would be greatest for Alternative I-C as shown in **Table 3.7-23**. Potential effects for Alternatives I-A, I-B, and I-D would be relatively low compared to those of Alternative I-C. Alternative I-C would result in the greatest direct and indirect impacts to big game habitat, small game habitat, and migratory bird habitat in comparison to the other Region I alternatives. Alternative I-C also would result in the greatest impacts to existing raptor nests and BHCAs in comparison to the other Region I alternatives (**Table 3.7-23**). Alternative I-C also could result in the highest potential construction disturbance to riparian areas near perennial streams as discussed in Section 3.9, Aquatic Biological Resources, and displayed in **Table 3.9-8**. Even though the greatest level of impacts are associated with Alternative I-C, project effects on wildlife species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.7.6.2 and 3.7.6.3 and **Appendix C**).

Alternative Connectors in Region I

Both the Mexican Flats Alternative Connector and the Baggs Alternative Connector would include minimal increases of total habitat disturbance relative to the total impacts associated with Region I alternatives if they were to be utilized. Both Alternative Connectors would cross pronghorn and mule deer crucial winter range. **Table 3.7-25** summarizes impacts associated with the alternative connectors in Region I.

Table 3.7-25 Summary of Region I Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Impact Parameters
Mexican Flats Alternative Connector	Big Game Species • Approximately 48 acres of construction, 9 acres of operation, and 3,123 acres of indirect impacts to pronghorn crucial winter/yearlong range would occur. • Approximately 4 acres of construction, 1 acre of operation, and 82 acres of indirect impacts to mule deer crucial winter/yearlong range would occur. • Approximately 10 acres of construction, 2 acres of operation, and 617 acres of indirect impacts to mule deer crucial winter range would occur. Small Game and Nongame Species • Approximately 10 miles in length.[1] • An additional 322 acres of construction, 25 acres of operation and 9,018 acres of indirect impacts to small game and nongame potential habitat would occur. Approximately 4 acres of construction, 0 acres of operation, and 302 acres of indirect impacts to waterfowl potential habitat would occur. • Three non-special status raptor nests are within 1 mile of the reference line. These nests, for which the species is not known, potentially could be utilized by special status raptor species.

Table 3.7-25 Summary of Region I Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Impact Parameters
	• Muddy Creek Wetlands IBA is crossed by the 2-mile transmission line corridor for a total of 1,513 acres.
Baggs Alternative Connector	Big Game Species • Approximately 225 acres of construction, 52 acres of operation, and 18,595 acres of indirect impacts to pronghorn crucial winter/yearlong range would occur. • Approximately 290 acres of construction, 69 acres of operation, and 24,457 acres of indirect impacts to mule deer crucial winter/yearlong range would occur.
	Small Game and Nongame Species • Approximately 22 miles in length.[1] • Approximately 737 acres of construction, 68 acres of operation, and 24,777 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 7 acres of construction and 1 acre of operation and 505 acres of indirect impacts to waterfowl potential habitat would occur. • Forty non-special status raptor nests are within 1 mile of the reference line. Thirty-one of these nests, for which the species is not known, potentially could be utilized by special status raptor species. IBAs • Powder Rim IBA is crossed by the 2-mile transmission line corridor for a total of 4,950 acres. BHCAs • Powder Rim BHCA is crossed by the 2-mile transmission line corridor for a total of 169 acres.
Fivemile Point North Alternative Connector	Big Game Species • Approximately 9 acres of construction, 1 acre of operation, and 121 acres of indirect impacts to pronghorn crucial winter/yearlong range would occur. • Approximately 82 acres of construction, 8 acres of operation, and 2,637 acres of indirect impacts to mule deer crucial winter/yearlong range would occur. Small Game and Nongame Species • Approximately 3 miles in length.[1] • Approximately 85 acres of construction, 7 acres of operation, and 2,546 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 1 acre of construction, 0.1 acres of operation, and 20 acres of indirect impacts to waterfowl potential habitat would occur. • Nineteen non-special status raptor nests are within 1 mile of the reference line. Six of these nests for which the species is not known potentially could be utilized by special status raptor species.
Fivemile Point South Alternative Connector	Big Game Species • Approximately 31 acres of construction, 6 acres of operation, and 1,497 acres of indirect impacts to mule deer crucial winter/yearlong range would occur. Small Game and Nongame Species • Approximately 2 miles in length.[1] • Approximately 73 acres of construction, 6 acres of operation, and 1,485 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 0 acres of construction, 0 acres of operation, and 23 acres of indirect impacts to waterfowl potential habitat would occur. • One non-special status raptor nest is within 1 mile of the reference line. This nest, for which the species is not known, potentially could be utilized by special status raptor species.

[1] Note: Length refers to length of 600 kV transmission lines, and serves as a proxy metric for avian collision potential.

Alternative Ground Electrode Systems in Region I

The northern ground electrode system would be necessary within 100 miles of the Northern Terminal, as discussed in Section 2.5.1, Alternative Transmission Line Routes and Ancillary Facilities by Region. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the proponent. The types of impacts associated with constructing and operating this system will be similar to those discussed under Alternative I-A but will be significantly reduced in scope and intensity. The ground electrode systems are detailed in Section 2.4.3, Facilities Common to All Action Alternatives. Direct impacts to wildlife habitat will include those resulting from construction of the ground electrode site and access roads. Indirect impacts to wildlife will include disturbance from operation activities and habitat fragmentation resulting from access road construction and the operation of the low voltage overhead line. The ground electrode overhead line will be similar to a modified 345-kV/69-kV distribution transmission line as discussed in Section 2.4.3, and will meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines : The State of the Art in 2006* (APLIC 2006). **Table 3.7-26** summarizes impacts associated with the seven combinations of alternative route and location possibilities for the northern ground electrode system. **Table 3.7-27** presents known raptor nests within 1 mile of the ground electrode system locations.

Table 3.7-26 Summary of Region I Alternative Ground Electrode System Location Impact Parameters for Wildlife[1]

Alternative Ground Electrode System Locations	Analysis
Separation Flat – All Alternative Routes	• Approximately 13 miles in length.[2] • Approximately 351 acres of indirect impacts to pronghorn crucial winter/yearlong range would occur. • Approximately 63 acres of construction, 19 acres of operation, and 13,232 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 4 acres of construction, 1 acre of operation, and 579 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 1,307 acres of indirect impacts to the Shamrock Hills Raptor Area BHCA would occur. • Approximately 1,308 acres of indirect impacts to the Shamrock Hills Raptor Concentration Area IBA would occur.
Shell Creek (Alternatives I-A and I-D)	• Approximately 33 miles in length.[2] • Approximately 12 acres of indirect impacts to mule deer crucial winter/yearlong range would occur. • Approximately 220 acres of construction, 88 acres of operation, and 13,294 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 6 acres of construction, 2 acres of operation, and 290 acres of indirect impacts to waterfowl potential habitat would occur.
Little Snake East (Alternatives I-A, I-B, and I-D)	• Approximately 9 miles in length.[2] • Approximately 19 acres of construction, 5 acres of operation, and 2,942 acres of indirect impacts to pronghorn severe winter range would occur. • Approximately16 acres of construction, 4 acres of operation, and 1,079 acres of indirect impacts to mule deer severe winter range would occur. • Approximately 2 acres of construction, 1 acre of operation, and 1,529 acres of indirect impacts to elk severe winter range would occur. • Approximately 107 acres of construction, 29 acres of operation, and 13,327 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 156 acres of indirect impacts to waterfowl potential habitat would occur. • The Routt and Moffat County Uplands BHCA is crossed by this ground electrode and associated facilities for a total of 9,102 acres. • Approximately 13,597 acres of indirect impacts to the Routt and Moffat County Uplands BHCA would occur.

Table 3.7-26 Summary of Region I Alternative Ground Electrode System Location Impact Parameters for Wildlife[1]

Alternative Ground Electrode System Locations	Analysis
Little Snake West (Alternative I-A)	• Approximately 10 miles in length.[2] • Approximately 7 acres of construction, 2 acres of operation, and 2,105 acres of indirect impacts to elk severe winter range would occur. • Approximately 79 acres of construction, 24 acres of operation, and 5,626 acres of indirect impacts to pronghorn severe winter range would occur. • Approximately 1,455 acres of indirect impacts to mule deer severe winter range would occur. • Approximately 121 acres of construction, 37 acres of operation, and 13,202 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 308 acres of indirect impacts to waterfowl potential habitat would occur. • The Routt and Moffat County Uplands BHCA is crossed by this ground electrode and associated facilities for a total of 4,797 acres. • Approximately 13,599 acres of indirect impacts to the Routt and Moffat County Uplands BHCA would occur.
Shell Creek (Alternative I-B)	• Approximately 26 miles in length.[2] • Approximately 12 acres of indirect impacts to mule deer crucial winter/yearlong range would occur. • Approximately 213 acres of construction, 76 acres of operation, and 13,294 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 6 acres of construction, 2 acres of operation, and 290 acres of indirect impacts to waterfowl habitat would occur.
Little Snake West (Alternative I-B and I-D)	• Approximately 5 miles in length.[2] • Approximately 6 acres of construction, 1 acre of operation, and 2,105 acres of indirect impacts to elk severe winter range would occur. • Approximately 60 acres of construction, 13 acres of operation, and 5,626 acres of indirect impacts to pronghorn severe winter range would occur. • Approximately 1,455 acres of indirect impacts to mule deer severe winter range would occur. • Approximately 92 acres of construction, 21 acres of operation, and 13,202 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 308 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 13,599 acres of indirect impacts to the Routt and Moffat County Uplands BHCA would occur.
Eight Mile Basin	• Approximately 4 miles in length.[2] • Approximately 66 acres of indirect impacts to mule deer crucial winter/yearlong range would occur. • Approximately 12,538 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 170 acres of indirect impacts to waterfowl potential habitat would occur.
Separation Creek	• Approximately 14 miles in length.[2] • Approximately 102 acres of construction, 36 acres of operation, and 4,343 acres of indirect impacts to pronghorn crucial winter/yearlong range would occur. • Approximately 34 acres of construction, 12 acres of operation, and 1,880 acres of indirect impacts to mule deer crucial winter/yearlong range would occur. • Approximately 13,290 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 154 acres of indirect impacts to waterfowl potential habitat would occur.

[1] Ground electrode systems are described in detail in Section 2.5.1, Alternative Transmission Line Routes and Ancillary Facilities by Region.

[2] Length refers to length of 34.5 kV transmission lines, and serves as a proxy metric for avian collision potential.

Table 3.7-27 Non-special Status Raptor Nests Within 1 Mile of the Ground Electrode System Locations[1]

Alternative Ground Electrode System Locations	Raptor Nests[2,3,4]
Separation Flat (All Alternatives)	2 American kestrel, 1 red-tailed hawk, 3 unknown raptor species nests
Shell Creek (Alternatives I-A, I-B, I-D)	1 American kestrel, 1 unknown raptor species nest
Little Snake East (Alternatives I-A, I-B, I-D)	1 red-tailed hawk, 5 unknown raptor species nests
Little Snake West (Alternatives I-A, I-B, I-D)	27 unknown raptor species nests
Eight Mile Basin (All Alternatives)	2 red-tailed hawk nests
Separation Creek (All Alternatives)	7 American kestrel, 1 great-horned owl, 3 northern harrier, 9 red-tailed hawk, 3 unknown raptor species nests

[1] Ground electrode systems are described in detail in Section 2.5.1, Alternative Transmission Line Routes and Ancillary Facilities by Region.

[2] Special status raptor species are presented in Section 3.8, Special Status Wildlife.

[3] Raptor nests are a total of those within 1 mile of the reference line, site, and siting area. Some duplication exists due to the unknown exact locations of electrode sites and associated features.

[4] Nests of raptor species, which are classified as special status, are tabulated in Section 3.8, Special Status Wildlife Species. Nests of unknown raptor species are tabulated in both Sections 3.7 and 3.8 because they may have been utilized by either special status raptors or non-special status raptors.

3.7.6.4 Region II

As presented in **Table 3.7-28**, the Project alternatives cross five national forests. This table presents miles of NFS land crossed by alternative and associated Project components in order to provide a general understanding of potential for impacts. Additional information on potential impacts to wildlife in the national forests is provided in the Region II and Region III discussions.

Table 3.7-28 Miles of National Forest Crossed by Region, Alternative, Alternative Connector, or Alternative Variation

	Region II									Region III				
												Alternative Variation		
National Forest	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F	Emma Park Alternative Variation	Comparable Portion of Emma Park Alternative	Highway 191 Alternative Connector	Lynndyl Alternative Connector	Alternative III-A	Ox Valley East	Ox Valley West	Pinto
Uintah-Wasatch-Cache	18	0	0	0	8	10	0	2	0	0	0	0	0	0
Manti-La Sal	3	19	0	9	0	3	0	0	0	0	0	0	0	0
Ashley	0	0	0	0*	10	<1	0	<1	0	0	0	0	0	0
Fishlake	0	4	29	0	0	4	0	0	0	<1	0	0	0	0
Dixie	0	0	0	0	0	0	0	0	0	0	16	27	20	34
Total miles of forest crossed by route in region	21	23	29	9	18	17	0	2	0	<1	16	27	20	34

* While Alternative II-D alignment does not cross the Ashley National Forest, because the route so closely follows the boundary, there are potential associated impacts that are discussed in the Region II section.

Table 3.7-29 provides a tabulation of impacts to wildlife associated with the alternative routes in Region II. **Table 3.7-30** provides a tabulation of impacts to USFS MIS, which are not classified as special status, associated with the alternative routes in Region II. MIS that are classified as special status species are discussed in Section 3.8, Special Status Wildlife Species. Key impact parameters that relate to the impact discussion in Section 3.7.6.2, Impacts Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below.

Alternative II-A (Applicant Proposed)

Alternative II-A Habitat Disturbance and Fragmentation

Alternative II-A would cross approximately 257 miles of wildlife habitat in Colorado and Utah. Approximately 225 miles (86 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-31**. Existing conditions within the Alternative II-A 2-mile corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Major sources of disturbance along Alternative II-A in western Colorado and eastern Utah include several livestock operation roads, a major surface coal mining operation located within the 2-mile corridor, and the town of Dinosaur, Colorado. Wildlife habitat along the Alternative II-A in Moffat County, Colorado, also is fragmented by the existence of U.S highway 40 which parallels the 2-mile corridor to the Utah-Colorado border. Sources of disturbance in Uintah County, Utah, include oil and gas operations, livestock operations, and center pivot agriculture operations near the communities of Roosevelt and Duchesne. In Duchesne County, Utah, sources of disturbance include oil and gas operations, livestock operations, and center pivot agriculture operations, and the communities of Fort Duchesne, Roosevelt, and Fruitland. Wildlife habitat in Wasatch County, Utah, becomes less fragmented as the landscape become more forested and mountainous. In Utah County, Utah, the major source of fragmentation within the 2-mile corridor is State Highway 89 and State Highway 6 which parallel Alternative II-A for approximately 17 miles. Major sources of disturbance and fragmentation in Juab County, Utah, are center pivot operations, the town of Nephi, Utah, and the Intermountain Power Plant located north of Delta, Utah. A total of 1,256 miles of existing roads are located within the Alternative II-A 2-mile corridor as shown **Table 3.7-30**. This represents the highest existing road density within the 2-mile corridor amongst Region II alternatives.

Key Parameters Summary

Game Species

Alternative II-A would result in the direct disturbance to pronghorn, mule deer, elk, moose, and Rocky Mountain bighorn sheep crucial winter habitat (**Table 3.7-29**). Implementation of the BLM, CPW, UDWR, and USFS restriction to prevent disturbance to wintering big game species in identified crucial winter range from November 15 to April 30, would prevent direct impacts to wintering big game species. Alternative II-A would result in the construction and operation disturbance of 8,613 acres and 1,110 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.08 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region II wildlife analysis area. Alternative II-A also would result in the construction disturbance of 131 acres and operation disturbance of 17 acres of waterfowl habitat. These areas represent 0.05 percent and <0.01 percent of the available waterfowl habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-A would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Table 3.7-29 Summary of Region II Alternative Route Impact Parameters for Wildlife

Parameter	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Big Game Species																		
Colorado pronghorn severe winter range (acres)	0	0	0	57	15	4,836	57	15	4,836	0	0	0	0	0	0	0	0	0
Percentage of existing habitat within the Region II big game analysis area	0	0	0	0.37	0.09	31.21	0.37	0.09	31.21	0	0	0	0	0	0	0	0	0
Utah pronghorn crucial yearlong range (acres)	731	219	67,961	1,217	288	102,765	1,029	249	84,160	1,275	354	111,220	768	192	73,610	1,047	284	83,693
Percentage of existing habitat within the Region II big game analysis area	0.01	<0.01	1.32	0.02	<0.01	2.00	0.02	<0.01	1.64	0.02	<0.01	2.13	0.01	<0.01	1.43	0.02	<0.01	1.62
Utah pronghorn substantial yearlong range (acres)	80	18	9,739	406	97	39,549	491	114	43,163	19	8	2,566	226	60	20,802	18	7	2,566
Percentage of existing habitat within the Region II big game analysis area	<0.01	<0.01	1.04	0.04	0.01	4.23	0.05	0.01	4.62	<0.01	<0.01	0.27	0.02	<0.01	2.22	<0.01	<0.01	0.27
Colorado mule deer severe winter range (acres)	248	63	25,313	188	48	16,000	188	48	16,000	248	63	25,390	248	63	25,390	248	63	25,390
Percentage of existing habitat within the Region II big game analysis area	0.14	0.03	14.10	0.10	0.03	8.91	0.10	0.03	8.91	0.14	0.03	14.14	0.14	0.03	14.14	0.14	0.03	14.14
Utah mule deer crucial winter range (acres)	793	299	78,508	648	227	47,244	755	206	64,596	575	202	38,237	824	318	47,908	555	219	37,270
Percentage of existing habitat within the Region II big game analysis area	0.02	<0.01	2.25	0.02	<0.01	1.35	0.02	<0.01	1.85	0.02	<0.01	1.10	0.02	<0.01	1.37	0.02	<0.01	1.07
Colorado elk severe winter range (acres)	93	22	6,425	122	32	11,295	122	32	11,295	93	22	6,425	93	22	6,425	93	22	6,425
Percentage of existing habitat within the Region II big game analysis area	0.09	0.02	6.06	0.12	0.03	10.65	0.12	0.03	10.65	0.09	0.02	6.06	0.09	0.02	6.06	0.09	0.02	6.06
Utah elk crucial winter range (acres)	1,009	386	89,504	805	251	49,473	857	241	17,548	715	257	49,536	1,472	569	72,194	844	551	53,785
Percentage of existing habitat within the Region II big game analysis area	0.03	0.01	2.69	0.02	<0.01	1.49	0.03	<0.01	0.53	0.02	<0.01	1.49	0.04	0.02	2.17	0.03	0.02	2.68
Utah moose occupied habitat (acres)	220	72	22,806	311	125	21,576	0	0	0	790	256	56,727	432	143	29,431	710	255	52,566
Percentage of existing habitat within the Region II big game analysis area	0.02	<0.01	1.73	0.02	<0.01	1.64	0	0	0	0.06	0.02	4.30	0.03	0.01	2.23	0.05	0.02	3.98
Utah Rocky Mountain bighorn sheep crucial yearlong range (acres)	14	6	2,528	2	1	761	2	1	761	151	45	11,796	3	2	694	147	41	11,817
Percentage of existing habitat within the Region II big game analysis area	<0.01	<0.01	0.14	<0.01	<0.01	0.04	<0.01	<0.01	0.04	<0.01	<0.01	0.66	<0.01	<0.01	0.04	<0.01	<0.01	0.66
Utah desert bighorn sheep occupied habitat (acres)	0	0	0	23	5	1,111	26	6	2,219	0	0	0	0	0	0	0	0	0
Percentage of existing habitat within the Region II big game analysis area	0	0	0	<0.01	<0.01	0.10	<0.01	<0.01	0.20	0	0	0	0	0	0	0	0	0
Moose parturition range	0	0	0	35	16	3,073	97	28	8,612	16	5	763	67	19	4,119	47	17	2,087
Percentage of existing habitat within the Region II big game analysis area	0	0	0	<0.01	<0.01	0.78	<0.01	<0.01	2.19	<0.01	<0.01	0.19	<0.01	<0.01	1.05	<0.01	<0.01	0.53
Mule deer parturition range	306	94	30,362	297	119	21,620	191	55	34,017	599	206	43,129	474	138	33,638	727	258	18,542
Percentage of existing habitat within the Region II big game analysis area	<0.01	<0.01	0.86	<0.01	<0.01	0.62	<0.01	<0.01	12.40	<0.01	<0.01	15.72	<0.01	<0.01	12.26	<0.01	<0.01	0.53
Pronghorn parturition range	492	162	37,132	1,166	277	97,005	1,029	249	84,157	1,014	275	78,747	529	135	42,765	1,014	275	78,747
Percentage of existing habitat within the Region II big game analysis area	<0.01	<0.01	2.60	<0.0	<0.01	6.79	<0.01	<0.01	5.89	<0.01	<0.01	5.51	<0.01	<0.01	2.99	<0.01	<0.01	5.51
Rocky Mountain elk parturition range	44	15	4,707	<1	<1	4,740	<1	<1	5,607	88	25	7,738	0	0	0	88	25	7,738
Percentage of existing habitat within the Region II big game analysis area	<0.01	<0.01	0.29	<0.01	<0.01	0.29	<0.01	<0.01	0.35	<0.01	<0.01	0.48	0	0	0	<0.01	<0.01	0.48
Small Game and Nongame Species																		
Upland game bird, small game mammal, furbearer, small nongame mammal, migratory bird, and reptile habitat (acres)[1]	8,613	1,110	329,494	11,436	1,350	415,597	12,093	1,252	446,512	8,876	1,166	319,535	8,846	1,125	318,382	9,169	1,327	311,279
Percentage of existing habitat within Region II wildlife analysis area	0.08	0.01	3.11	0.11	0.01	3.92	0.11	0.01	4.21	0.08	0.01	3.01	0.08	0.01	3.00	0.09	0.01	2.94
Waterfowl habitat (acres)[2]	131	17	7,415	94	11	5,183	96	12	6,050	64	9	3,843	157	18	6,985	54	10	3,044
Percentage of existing habitat within Region II wildlife analysis area	0.05	<0.01	2.93	0.04	<0.01	2.05	0.04	<0.01	2.39	0.03	<0.01	1.52	0.06	<0.01	2.76	0.02	<0.01	1.20
Relative Collision Potential for Migratory Birds																		
Length of transmission line (miles)[4]	257			345			364			262			266			267		
Raptor Nests (Non-special Status)																		
Number within 1 mile of the reference line[3]	99			107			99			139			101			117		
Bird Habitat Conservation Areas																		
BHCAs crossed by the 250-foot-wide transmission line ROW (acres)	761			4,569			4,256			59			534			0		

Table 3.7-29 Summary of Region II Alternative Route Impact Parameters for Wildlife

Parameter	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Percentage of existing BHCA habitat within the Region II wildlife analysis area	0.04			0.23			0.22			<0.01			0.03			0		
Audubon Important Bird Areas																		
Upper Strawberry Watershed IBA crossed by the 2-mile transmission line corridor (acres)	1,399			0			0			0			0			0		
Percentage of IBA within the Region II wildlife analysis area (acres)	0.90			0			0			0			0			0		

[1] Habitat categories used to calculate acreages of habitat disturbance include agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, desert shrub, dunes, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, other conifer forest, other deciduous forest, pinyon-juniper, riparian, saltbush shrubland, sagebrush shrubland, tundra, and woody riparian and wetlands. Further discussion of these habitat types is included in Section 3.5.6, Impacts to Vegetation.

[2] Habitat categories used to calculate acreages of waterfowl habitat disturbance include open water, herbaceous wetland, riparian, and woody riparian and wetlands. Further discussion of these habitat types is included in Section 3.5.6, Impacts to Vegetation.

[3] Special status raptor species are addressed in Section 3.8, Special Status Wildlife Species. A total of 180 raptor nests of unknown species are documented in Region II. These nests potentially could be utilized by special status raptor species, thus also are tabulated in Section 3.8.5.4, Region II.

[4] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Table 3.7-30 Summary of Region II Alternative Route Impact Parameters for USFS Management Indicator Species

Parameter	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F		
Species[1]	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect
Ashley National Forest Management Indicator Species Not Otherwise Analyzed as Special Status Species																		
White-tailed ptarmigan Habitat category: 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Warbling vireo Habitat categories: 2, 16, 21	0	0	0	0	0	0	0	0	0	5	2	769	93	16	6,531	13	4	966
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	0	0	0	0	0	0	<0.01	<0.01	0.35	0.04	<0.01	2.95	0.01	<0.01	0.44
Song sparrow Habitat categories: 1, 2, 5, 6, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21	0	0	0	0	0	0	0	0	0	23	9	3,785	302	37	13,126	65	20	4,989
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	0	0	0	0	0	0	<0.01	<0.01	0.40	0.03	<0.01	1.38	0.01	<0.01	0.52
Lincoln's sparrow Habitat categories: 2, 12, 16, 19, 21	0	0	0	0	0	0	0	0	0	5	2	795	98	16	6,626	13	4	992
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	0	0	0	0	0	0	<0.01	<0.01	0.30	0.04	0.01	2.50	0.01	<0.01	0.37
Fishlake National Forest Management Indicator Species Not Otherwise Analyzed as Special Status Species																		
Song sparrow Habitat categories: 1, 2, 5, 6, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21	<1	<1	<1	132	16	4,032	989	115	39,973	0	0	0	0	0	0	132	16	4,032
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	<0.01	<0.01	0.30	0.07	<0.01	2.86	0	0	0	0	0	0	<0.01	<0.01	0.32
Hairy woodpecker Habitat categories: 1, 2, 6, 16, 21	<1	<1	<1	94	10	2,255	526	62	20,949	0	0	0	0	0	0	94	10	2,255
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	0.01	<0.01	0.36	0.08	<0.01	3.31	0	0	0	0	0	0	0.01	<0.01	0.36
Western bluebird Habitat categories: 1, 2, 5, 6, 10, 13, 16, 19, 21	<1	<1	<1	111	13	3,254	593	69	22,989	0	0	0	0	0	0	111	13	3,254
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	0.01	<0.01	0.37	0.07	<0.01	2.63	0	0	0	0	0	0	0.01	<0.01	0.37
Mountain bluebird Habitat categories: 1, 2, 5, 6, 10, 13, 16, 19, 21	<1	<1	<1	111	13	3,254	593	69	22,989	0	0	0	0	0	0	111	13	3,254
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	0.01	<0.01	0.37	0.07	<0.01	2.63	0	0	0	0	0	0	0.01	<0.01	0.37
Yellow warbler Habitat categories: 2, 16, 19, 21	<1	<1	<1	94	10	2,261	529	62	20,956	0	0	0	0	0	0	94	10	2,261
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	0.01	<0.01	0.36	0.08	<0.01	3.30	0	0	0	0	0	0	0.01	<0.01	0.36
MacGillivray's warbler Habitat categories: 2, 6, 16, 19, 21	<1	<1	<1	94	10	2,261	529	62	20,956	0	0	0	0	0	0	94	10	2,261
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	0.01	<0.01	0.35	0.08	<0.01	3.30	0	0	0	0	0	0	0.01	<0.01	0.35
Brewer's sparrow Habitat category: 18	<1	<1	<1	19	3	769	218	23	7,022	0	0	0	0	0	0	19	3	769
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	<0.01	<0.01	0.28	0.08	<0.01	2.59	0	0	0	0	0	0	<0.01	<0.01	0.28
Lincoln's sparrow Habitat Categories: 2, 12, 16, 19, 21	<1	<1	<1	94	10	2,261	529	62	20,956	0	0	0	0	0	0	94	10	2,261
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	0.01	<0.01	0.35	0.08	<0.01	3.28	0	0	0	0	0	0	0.01	<0.01	0.35

Table 3.7-30 Summary of Region II Alternative Route Impact Parameters for USFS Management Indicator Species

Parameter	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F		
Species[1]	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect	Construction	Operation	Indirect
Manti-LaSal National Forest Management Indicator Species Not Otherwise Analyzed as Special Status Species																		
Abert's squirrel Habitat category: 5	3	2	470	185	37	6,269	0	0	0	66	13	2,590	3	2	537	3	2	537
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	0.16	0.06	0.01	2.16	0	0	0	0.02	<0.01	0.89	<0.01	<0.01	0.19	<0.01	<0.01	0.19
Uintah-Wasatch-Cache National Forest Management Indicator Species Not Otherwise Analyzed as Special Status Species																		
American beaver Habitat categories: 15, 21	1	<1	3	<1	<1	31	0	0	0	<1	<1	24	1	<1	3	1	<1	3
Percentage of existing habitat within the Region II MIS Analysis Area	0.01	<0.01	0.04	<0.01	<0.01	0.37	0	0	0	<0.01	<0.01	0.29	<0.01	<0.01	0.04	<0.01	<0.01	0.04

[1] MIS that are classified as special status species are presented in Section 3.8, Special Status Wildlife Species.

Note: Please refer to Section 3.8.5.4 for indirect impacts by vegetation community/habitat category.

Table 3.7-31 Summary of Existing Conditions by Alternative within Region II

Alternative	Length (miles)	Length of Greenfield Construction	Length of Co-located Construction	Miles of Roads within 2-Mile Corridor	Miles of Roads within 2-Mile Corridor/Mile of Alternative
II-A	257	32	225	1,256	4.89
II-B	345	156	189	1,364	3.95
II-C	364	157	208	1,645	4.52
II-D	262	151	110	946	3.61
II-E	266	45	222	1,289	4.85
II-F	267	121	146	1,084	4.06

Nongame Species

The types of impacts to nongame species under Alternative II-A generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Alternative II-A would result in the construction and operation disturbance of 8,613 acres and 1,110 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.08 percent and 0.01 percent of the available small mammal and reptile habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-A would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative II-A generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-A would result in the construction and operation disturbance of 8,613 acres and 1,110 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.08 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region II wildlife analysis area. The length of Alternative II-A is found in **Tables 3.7-29** and **3.7-31**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 99 raptor nests that are not classified as special status have been identified within 1 mile of the reference line along Alternative II-A (**Table 3.7-32**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative II-A would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative II-A.

Table 3.7-32 Non-special Status Raptor Nests Within 1 Mile of the Reference Line in Region II

Species	Alternative II-A (Applicant Proposed)	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F (Agency Preferred)	Castle Dale Alternative Connector	Price Alternative Connector	Lynndyl Alternative Connector	IPP East Alternative connector	Highway 191 Alternative Connector	Cedar Knoll Micro-siting Option 1	Cedar Knoll Micro-siting Option 2	Comparable Portion of Alternative II-F	Emma Park Alternative Variation	Comparable Portion of Alternative II-F	Strawberry IRA Micro-siting Option 1	Strawberry IRA Micro-siting Option 2	Strawberry IRA Micro-siting Option 3	Strawberry IRA Comparable Portion of Alternative II-A	Cedar Knoll IRA Micro-siting Option 1	Cedar Knoll IRA Micro-siting Option 2	Cedar Knoll Comparable Portion of alternative II-A
Osprey	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	0	0	0
Cooper's hawk	0	3	2	9	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red-tailed hawk	15	9	1	28	20	15	0	6	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0
American kestrel	0	0	1	4	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great horned owl	1	0	2	7	2	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common raven	1	0	2	3	0	3	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0
Unknown raptor species	80	95	91	87	77	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bald eagle winter roosts	6	0	0	2	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	99	107	99	139	101	117	0	6	0	0	0	1	1	1	0	0	3	3	3	3	0	0	0

Note: Each alternative route is comprised of unique segments. Segments may be included in more than one alternative route. The total nests for each alternative route will not add to the total number of nests for the region. Bald eagle winter roosts are not included in the total.

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010, 2012; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012; Manti-LaSal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012; AECOM 2012.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Strawberry IRA Micro-siting Options

TWE has developed three potential options to avoid or minimize the crossing of national forest IRAs along Alternative II-A. These are referred to as Strawberry IRA micro-siting options 1, 2, and 3. These three micro-siting options would result in similar direct impacts to wildlife habitat in comparison to Alternative II-A. Micro-siting options 2 and 3 would reduce the amount of habitat fragmentation in comparison to Alternative II-A as they would be collocated adjacent to an existing 345-kV transmission line for approximately 4 miles. Any other differences in impacts to wildlife habitat are anticipated to be negligible in comparison to Alternative II-A.

Alternative II-B

Alternative II-B Habitat Disturbance and Fragmentation

Alternative II-B would cross approximately 345 miles of wildlife habitat in Colorado and Utah. Approximately 189 miles (55 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-31**. Existing conditions within the Alternative II-B 2-mile corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Major sources of disturbance along Alternative II-B in western Colorado include roads from several livestock operations and oil infrastructure located within the 2-mile corridor, and the town of Rangely, Colorado. Wildlife habitat along Alternative II-B in Rio Blanco County, Colorado, also is fragmented by the existence of State Highway 64, which parallels the 2-mile transmission line corridor for several miles east of Rangely, and State Highway 138, which crosses the corridor south of Rangely. Energy development and infrastructure fragments wildlife habitat in the Alternative II-B corridor along the rest of the route through Rio Blanco County. Existing disturbance along Alternative II-B is limited mostly to county and USFS maintenance roads in Garfield and Mesa counties, Colorado, until it reaches I-70 and follows the I-70 corridor into Utah. This section of Alternative II-B follows I-70 across all of Grand County, Utah, and is highly fragmented by the interstate, the crossing of multiple state highways and county roads, as well as the communities of Harley Dome, Thompson, and Crescent Junction. Major disturbance also is caused by the Union Pacific Railroad that weaves in and out of the 2-mile transmission line corridor for approximately 40 miles to the border of Emery County. Alternative II-B parallels U.S. Highway 6/191 north from I-70 to the border of Carbon County where the 2-mile transmission line corridor heads west. Disturbance along this stretch of Alternative II-B include I-70, U.S. Highway 6/191, the Union Pacific Railroad, Green River Municipal Airport and the community of Woodside, Utah. Pivot agriculture, oil and gas infrastructure, and State Highway 31 causes most disturbance along this portion of the route until Alternative II-B reaches the Manti-La Sal National Forest where disturbance and fragmentation is limited to USFS and county roads to the border of Sanpete County. Wildlife disturbance in Sanpete County include the towns of Mount Pleasant, and Fountain Green, Utah, and State Highways 146 and 132. The outskirts of Nephi, Utah, heavy agriculture, I-15, and State Highway 132 cause fragmentation in Juab County. The final stretch of Alternate II-B in Millard County is disturbed by State Highways 132, 125, and 174. U.S. Highway 6 and the Union Pacific Railroad also fragment the 2-mile transmission line corridor. Pivot agriculture and the Intermountain Power Plant also exist along the route where it terminates west of the town of Delta, Utah. The remaining segments of Alternative II-B are moderately fragmented by county roads, low density oil and gas and livestock operations, and private residences. A total of 1,364 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-31**. This represents the fifth highest existing road density within the 2-mile transmission line corridor amongst Region II alternatives.

Game Species

The types of impacts to big game species under Alternative II-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Rocky Mountain bighorn sheep crucial winter range would not be impacted but pronghorn and desert bighorn sheep crucial winter range would be impacted under Alternative II-B. Alternative II-B would result in the construction and operation disturbance of 11,436 acres and 1,350 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.11 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region II wildlife analysis area. Alternative II-B also would result in the construction disturbance of 94 acres and operation disturbance of 11 acres of waterfowl habitat. These areas represent 0.04 percent and <0.01 percent of the available waterfowl habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative II-B generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Alternative II-B would result in the construction and operation disturbance of 11,436 acres and 1,350 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.11 percent and 0.01 percent of the available small mammal and reptile habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative II-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-B would result in the construction and operation disturbance of 11,436 acres and 1,350 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.11 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region II wildlife analysis area. The length of Alternative II-B is found in **Table 3.7-29**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 107 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative II-B (**Table 3.7-32**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative II-B would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative II-B.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative II-C

Alternative II-C Habitat Disturbance and Fragmentation

Alternative II-C would cross approximately 364 miles of wildlife habitat in Colorado and Utah. Approximately 208 miles (57 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-31**. Existing conditions within the Alternative II-C 2-mile transmission line corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Alternative II-C follows the same route as Alternative II-B (see above) until the corridor heads west near Woodside, Utah, in Emery County. Most of the existing disturbance and fragmentation in the remainder of Emery County exists around the town of Emery. Disturbance includes the town of Emery, State Highway 10, and multiple agricultural operations along the route. There also is an open pit mine within the 2-mile transmission line corridor south of Castle Dale, Utah. Disturbance and fragmentation are minimized in the mountainous regions of Sevier County consisting mainly of county and USFS roads. However, I-70 is crossed twice and part of the town of Aurora, Utah, occurs within the 2-mile transmission line corridor. Wildlife habitat along Alternative II-C is highly fragmented throughout most of Millard County beginning with the 2-mile transmission line corridor following U.S. Highway 50 to Scipio. At this point, the route tracks west and crosses the I-15 corridor, and skirts the southern boundary of the Fishlake National Forest to where it follows U.S. Highway 50 to the Delta metropolitan area. The remaining portions of the Alternative II-C corridor are moderately fragmented by county roads, low density oil and gas and livestock operations, agriculture, and private residences. A total of 1,645 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-31**. This represents the third highest existing road density within the 2-mile transmission line corridor amongst Region II alternatives.

Game Species

The types of impacts to big game species under Alternative II-C generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Pronghorn crucial winter range would be impacted under Alternative II-C. Alternative II-C would result in the construction and operation disturbance of 12,093 acres and 1,252 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.11 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region II wildlife analysis area. Alternative II-C also would result in the construction disturbance of 96 acres and operation disturbance of 12 acres of waterfowl habitat. These areas represent 0.04 percent and <0.01 percent of the available waterfowl habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative II-C generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Alternative II-C would result in the construction and operation disturbance of 12,093 acres and 1,252 acres, respectively of potentially suitable small mammal

and reptile habitat. These areas represent 0.11 percent and 0.01 percent of the available small mammal and reptile habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative II-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-C would result in the construction and operation disturbance of 12,093 acres and 1,252 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.11 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region II wildlife analysis area. The length of Alternative II-C is found in **Table 3.7-29**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 99 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative II-C (**Table 3.7-32**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative II-C would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative II-C.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative II-D

Alternative II-D Habitat Disturbance and Fragmentation

Alternative II-D would cross approximately 262 miles of wildlife habitat in Colorado and Utah. Approximately 110 miles (42 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-31**. Existing conditions within the Alternative II-D 2-mile transmission line corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Major sources of disturbance along Alternative II-D in western Colorado and eastern Utah include several livestock operation roads, oil and gas infrastructure located within the 2-mile transmission line corridor, and the town of Dinosaur, Colorado. Wildlife habitat along the Alternative II-D in Moffat County, Colorado, also is fragmented by the existence of U.S. Highway 40, which parallels the 2-mile transmission line corridor to the Utah-Colorado border. Sources of disturbance in Uintah County, Utah, include heavy oil and gas operations, livestock operations, and center pivot agriculture operations near the town of Jensen. In Duchesne County, Utah, sources of disturbance include oil and gas operations, livestock operations, and center pivot agriculture operations. Disturbance and fragmentation increases in western Carbon County

with an increased presence of oil and gas infrastructure, and the crossing of several major roadways (U.S. Highways 191 and 6) in this section of Alternative II-D. Major sources of disturbance and fragmentation in Juab County, Utah, are center pivot operations, the town of Nephi, Utah, and the Intermountain Power Plant located north of Delta, Utah. A total of 946 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-31**. This represents the lowest existing road density within the 2-mile transmission line corridor among Region II alternatives.

Game Species

The types of impacts to big game species under Alternative II-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Pronghorn crucial winter range would be impacted under Alternative II-D. Alternative II-D would result in the construction and operation disturbance of 8,876 acres and 1,166 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.08 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region II wildlife analysis area. Alternative II-D also would result in the construction disturbance of 64 acres and operation disturbance of 9 acres of waterfowl habitat. These areas represent 0.03 percent and <0.01 percent of the available waterfowl habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-D would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative II-D generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Alternative II-D would result in the construction and operation disturbance of 8,876 acres and 1,166 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.08 percent and 0.01 percent of the available small mammal and reptile habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-D would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative II-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-D would result in the construction and operation disturbance of 8,876 acres and 1,166 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.08 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region II wildlife analysis area. The length of Alternative II-D is found in **Table 3.7-29**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 139 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative II-D (**Table 3.7-32**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design

features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative II-D would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative II-D.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative II-E

Alternative II-E Existing Habitat Disturbance and Fragmentation

Alternative II-E would cross approximately 266 miles of wildlife habitat in Colorado and Utah. Approximately 222 miles (83 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-31**. Existing conditions within the Alternative II-E 2-mile corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Major sources of disturbance along Alternative II-E in western Colorado and eastern Utah include several livestock operations, a major surface coal mining operation located within the 2-mile transmission line corridor, and the town of Dinosaur, Colorado. Wildlife habitat along the Alternative II-E in Moffat County, Colorado, also is fragmented by the existence of U.S. Highway 40, which parallels the 2-mile corridor to the Utah-Colorado border. Sources of disturbance in Uintah County, Utah, include oil and gas operations, livestock operations, and center pivot agriculture operations near the town of Jensen. In Duchesne County, Utah, sources of disturbance include the crossing of U.S. Highway 40, oil and gas operations, livestock operations, and center pivot agriculture operations, and the communities of Bridgeland, Ioca, and Roosevelt. In Utah County, Utah, the major source of fragmentation within the 2-mile transmission line corridor is State Highway 89 and U.S. Highway 6, which parallel Alternative II-E for approximately 17 miles. Major sources of disturbance and fragmentation in Juab County, Utah, are center pivot operations, the town of Nephi, and the Intermountain Power Plant located north of Delta, Utah. A total of 1,289 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-31**. This represents the second highest existing road density within the 2-mile transmission line corridor among Region II alternatives.

Game Species

The types of impacts to big game species under Alternative II-E generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Pronghorn crucial winter range would be impacted under Alternative II-E. Alternative II-E would result in the construction and operation disturbance of 8,846 acres and 1,125 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.08 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region II wildlife analysis area. Alternative II-E also would result in the construction disturbance of 157 acres and operation disturbance of 18 acres of waterfowl habitat. These areas represent 0.06 percent and <0.01 percent of the available waterfowl habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-D would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative II-E generally would be same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Alternative II-E would result in the construction and operation disturbance of 8,846 acres and 1,125 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.08 percent and 0.01 percent of the available small mammal and reptile habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-E would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative II-E generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-E would result in the construction and operation disturbance of 8,846 acres and 1,125 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.08 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region II wildlife analysis area. The length of Alternative II-E is found in **Table 3.7-29**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 101 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative II-E (**Table 3.7-32**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative II-E would be limited to habitat loss, fragmentation, mortality from collisions, negligible potential for electrocution, and disturbance during routine maintenance activities.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative II-F (Agency Preferred)

Alternative II-F Habitat Disturbance and Fragmentation

Alternative II-F would cross approximately 267 miles of wildlife habitat in Colorado and Utah. Approximately 146 miles (55 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-31**. Existing conditions within the Alternative II-F 2-mile transmission line corridor relative to wildlife can be characterized as moderately disturbed and fragmented. Major sources of disturbance along Alternative II-F in western Colorado and eastern Utah include several livestock operations, oil and gas infrastructure located within the 2-mile transmission line corridor, and the town of Dinosaur, Colorado. Wildlife habitat along the Alternative II-F in Moffat County, Colorado, also is

fragmented by the existence of U.S. Highway 40, which parallels the 2-mile transmission line corridor to the Utah-Colorado border. Sources of disturbance in Uintah County, Utah, include heavy oil and gas operations, livestock operations, and center pivot agriculture operations near the town of Roosevelt. In Duchesne County, Utah, sources of disturbance also include oil and gas operations, livestock operations, and center pivot agriculture operations. In Utah County, Utah, the major source of fragmentation within the 2-mile transmission line corridor is State Highway 89 and U.S. Highway 6, which parallel Alternative II-F for approximately 17 miles. Major sources of disturbance and fragmentation in Juab County, Utah, are center pivot operations, the town of Nephi, Utah, and the Intermountain Power Plant located north of Delta, Utah. The remaining segments of Alternative II-F are moderately fragmented by county roads, low density oil and gas and livestock operations, and private residences. A total of 1,084 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-31**. This represents the fourth highest existing road density within the 2-mile transmission line corridor among Region II alternatives.

Game Species

The types of impacts to big game species under Alternative II-F generally would be the same as described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Sensitive big game habitats that would be impacted under Alternative II-F include mule deer crucial winter range, elk severe winter range, pronghorn year-long and seasonal crucial range, and Rocky mountain bighorn sheep year-long crucial range. Alternative II-F would result in the construction and operation disturbance of 9,169 acres and 1,327 acres, respectively, of upland game bird, small game mammal, and furbearer potential habitat. These areas represent 0.09 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer potential habitat within the Region II wildlife analysis area. Alternative II-F also would result in the construction disturbance of 54 acres and operation disturbance of 10 acres of waterfowl habitat. These areas represent 0.02 percent and <0.01 percent of the available waterfowl habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative II-F would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative II-F generally would be the same as those described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-29** presents a comparison of impacts to habitat in Region II. Alternative II-F would result in the construction and operation disturbance of 9,169 acres and 1,327 acres, respectively, of potential small mammal and reptile habitat. These areas represent 0.09 percent and 0.01 percent of the potential small mammal and reptile habitat within the Region II wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative II-F generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-F would result in the construction and operation disturbance of 9,169 acres and 1,327 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.09 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region II wildlife analysis area. The length of Alternative II-F is found in **Table 3.7-29**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or

exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 117 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative II-F (**Table 3.7-32**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and migratory birds along Alternative II-F would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative II-F.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Cedar Knoll IRA Micro-siting Options

TWE has developed two potential options to avoid or minimize the crossing of national forest IRAs along Alternatives II-E and II-F. These are referred to as Cedar Knoll micro-siting options 1, and 2. Both of these micro-siting options would result in similar acreages of direct impacts to wildlife habitat in comparison to Alternatives II-E and II-F. However, both of these micro-siting options would be collocated adjacent to an existing 345-kV transmission line while Alternatives II-E and II-F would not be collocated with existing transmission in this area. This aspect of the micro-siting options would result in reduced habitat fragmentation in comparison to Alternatives II-E and II-F. All other differences in impacts to wildlife habitat are anticipated to be negligible in comparison to Alternatives II-E and II-F.

USFS Management Indicator Species

Four national forests would be crossed by the Project in Region II. A total of 12 wildlife species are identified as MIS that are not otherwise classified as special status species. Impacts to these species are presented in **Table 3.7-30**.

Alternative Variation in Region II

Emma Park Alternative Variation

Multiple routes have been developed in the Emma Park area north of Price, Utah to avoid occupied greater sage-grouse habitat. One route is aligned east-west and is analyzed as the Emma Park Alternative Variation. This variation and the comparable portion of Alternative II-F do not cross the Fishlake or Manti-LaSal national forests. **Table 3.7-33** summarizes Region II Alternative Variation impact parameters for wildlife species.

Table 3.7-33 Summary of Region II Alternative Variation Impact Parameters for Wildlife

Impact Parameters	Emma Park Alternative Variation			Comparable Portion of Alternative II-F		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Big Game Species						
Utah mule deer crucial winter range (acres)	3	<1	83	20	6	798
Percentage of existing habitat within the Region II big game analysis area	<0.01	<0.01	<0.01	<0.01	<0.01	0.02
Utah moose occupied habitat (acres)	609	210	34,828	582	213	25,435
Percentage of existing habitat within the Region II big game analysis area	0.05	0.02	2.64	0.04	0.02	1.93
Utah elk crucial winter range (acres)	308	110	16,913	58	16	1,373
Percentage of existing habitat within the Region II big game analysis area	<0.01	<0.01	0.51	<0.01	<0.01	0.04
Utah Rocky Mountain bighorn sheep crucial yearlong range (acres)	0	0	0	<1	<1	20
Percentage of existing habitat within the Region II big game analysis area	0	0	0	<0.01	<0.01	<0.01
Small Game and Nongame Species						
Small game and nongame potential habitat (acres)[1]	1,250	215	35,632	1,182	234	27,323
Percentage of potential habitat within the Region II wildlife analysis area	0.01	<0.01	0.34	0.01	<0.01	0.26
Waterfowl						
Waterfowl potential habitat (acres)[2]	7	1	141	<1	<1	9
Percentage of potential habitat within the Region II wildlife analysis area	<0.01	<0.01	0.06	<0.01	<0.01	<0.01
Relative Collision Potential for Migratory Birds						
Length of transmission line (miles)[3]	35			32		
Raptor Nests (Non-special Status)						
Number of raptor nests within 1 mile of the reference line[4]	0			0		
Bird Habitat Conservation Areas						
BHCAs crossed by the 250 foot-wide transmission line ROW (acres)	20	5	257	0	0	0
Percentage of existing BHCA habitat within the Region II wildlife analysis area	<0.01	<0.01	<0.01	0	0	0
Audubon Important Bird Areas						
IBA (acres) within 2-mile transmission line corridor	0	0	0	0	0	0
Ashley National Forest Management Indicator Species Not Otherwise Analyzed as Special Status Species						
White-tailed ptarmigan potential habitat (acres) Habitat category[5]: 20	0	0	0	0	0	0
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	0	0	0
Warbling Vireo potential habitat (acres) Habitat categories: 2, 16, 21	0	0	0	9	2	197

Table 3.7-33 Summary of Region II Alternative Variation Impact Parameters for Wildlife

Impact Parameters	Emma Park Alternative Variation			Comparable Portion of Alternative II-F		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	<0.01	<0.01	0.09
Song sparrow potential habitat (acres) Habitat categories: 1, 2, 5, 6, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21	<1	<1	<1	45	12	1,204
Percentage of existing habitat within the Region II MIS Analysis Area	<0.01	<0.01	<0.01	<0.01	<0.01	0.11
Lincoln's sparrow potential habitat (acres) Habitat categories: 2, 12, 16, 19, 21	0	0	0	9	2	197
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	<0.01	<0.01	0.07
Uintah-Wasatch-Cache National Forest management Indicator Species Not Otherwise Analyzed as Special Status Species						
American beaver potential habitat (acres) Habitat categories: 15, 21	0	0	0	<1	<1	3
Percentage of existing habitat within the Region II MIS Analysis Area	0	0	0	<0.01	<0.01	<0.01

[1] Vegetation communities/habitat categories used to calculate acreages of potential habitat disturbance include agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, dunes, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon-juniper, riparian, sagebrush shrubland, saltbush shrubland, tundra, and woody riparian and wetlands. Further discussion of these vegetation communities in included in Section 3.5.6, Impacts to Vegetation.

[2] Vegetation communities/habitat categories used to calculate acreages of disturbance to potential waterfowl habitat include herbaceous wetland, open water, riparian, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[3] Length refers to length of 600-kV transmission line and serves as a metric for avian collision potential.

[4] Special status raptor species are addressed in Section 3.8, Special Status Wildlife Species.

[5] Habitat categories refers to vegetation communities (by number) as presented in **Table 3.7-2.**

Alternative Connectors in Region II

If utilized, the Castle Dale, Price, Lynndyl, Highway 191, and IPP East alternative connectors would include minimal increases of total habitat disturbance relative to the total impacts associated with Region II alternatives.

TWE has developed alternative reference lines in the Emma Park area north of Price, Utah. The Highway 191 Alternative Connector was identified to reduce, avoid, or minimize potential impacts to greater sage-grouse.

The Lynndyl Alternative Connector would impact mule deer crucial winter range.

Table 3.7-34 summarizes impacts associated with the alternative connectors in Region II.

Table 3.7-34 Summary of Region II Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Analysis
Lynndyl Alternative Connector (Alternatives II-B and II-C)	• Approximately 24 miles in length.[1] • Approximately 266 acres of construction, 63 acres of operation, and 24,932 acres of indirect impacts to mule deer crucial winter range would occur. • Approximately 793 acres of construction, 69 acres of operation, and 28,059 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 0 acres of construction, 0 acres of operation, and 7 acres of indirect impacts to waterfowl potential habitat would occur. • Fishlake National Forest would be crossed. Potential impacts to MIS species would range from 15 acres of construction and 2 acres of operation to song sparrow to 2 acres of construction and <1 acre of operation to Brewer's sparrow. • There are 688 acres of the Sevier Bridge/Chicken Creek BHCA within the 250 foot-wide transmission line ROW. • No raptor nests are within 1 mile of the reference line.
IPP East Alternative Connector (Alternatives II-A and II-B)	• Approximately 3 miles in length.[1] • Approximately 35 acres of construction impacts and 7 acres of operation impacts to pronghorn crucial yearlong range would occur. • Approximately 86 acres of construction, 7 acres of operation, and 2,317 acres of indirect impacts to small game and nongame potential habitat would occur. • No raptor nests are within 1 mile of the reference line.
Castle Dale Alternative Connector	• Approximately 11 miles in length.[1] • Approximately 38 acres of construction, 10 acres of operation, and 2,282 acres of indirect impacts to mule deer crucial winter range would occur. • Approximately 1 acre of indirect impacts to moose occupied habitat would occur. • Approximately 348 acres of construction, 45 acres of operation, and 12,019 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 6 acres of construction, 1 acre of operation, and 294 acres of indirect impacts to waterfowl potential habitat would occur. • No raptor nests are within 1 mile of the reference line.
Highway 191 Alternative Connector	• Approximately 5 miles in length.[1] • Approximately 119 acres of construction, 38 acres of operation, and 3,134 acres of indirect impacts to Utah moose occupied habitat would occur. • Approximately 22 acres of construction, 5 acres of operation, and 379 acres of indirect impacts to Utah elk crucial winter range would occur. • Approximately 175 acres of construction, 36 acres of operation, and 3,035 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 0 acres of construction, 0 acres of operation, and 1 acre of indirect impacts to waterfowl potential habitat would occur. • No raptor nests are within 1 mile of the reference line.

Table 3.7-34 Summary of Region II Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Analysis
Price Alternative Connector	• Approximately 18 miles in length.[1] • Approximately 56 acres of construction, 15 acres of operation, and 3,419 acres of indirect impacts to pronghorn crucial yearlong range would occur. • Approximately 0.1 acres of construction, 0.02 acres of operation, and 3 acres of indirect impacts to pronghorn substantial yearlong range would occur. • Approximately 246 acres of construction, 72 acres of operation, and 19,529 acres of indirect impacts to mule deer crucial winter range would occur. • Approximately 280 acres of construction, 81 acres of operation, and 21,262 acres of indirect impacts to elk crucial winter range would occur. • Approximately 6 acres of construction, 3 acres of operation, and 1,334 acres of indirect impacts to moose occupied habitat would occur. • Approximately 609 acres of construction, 75 acres of operation, and 19,623 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 3 acres of construction, 0.4 acres of operation, and 87 acres of indirect impacts to waterfowl potential habitat would occur. • Six raptor nests are within 1 mile of the reference line. • Forty-two acres of the Summerhouse Spring BHCA are within the 250 foot-wide transmission line ROW.

[1] Length refers to length of 600-kV transmission lines, and serves as a proxy metric for avian collision potential.

[2] Indirect impacts for these species can be calculated utilizing the vegetation communities presented in Section 3.5, Vegetation, and on **Table 3.7-14**.

Region II Conclusion

Based on a comparison of impact parameters for Region II alternatives, potential construction and operation impacts to wildlife would be varied across all alternatives as shown in **Table 3.7-29**. Alternative II-F would result in the greatest direct and indirect impacts to big game habitat in comparison to the other Region II alternatives. Alternative II-C would result in the greatest direct and indirect impacts to small game habitat in comparison to the other Region II alternatives (**Table 3.7-29**). Alternative II-B would result in the greatest direct and indirect impacts to migratory bird habitat in comparison to the other Region II alternatives (**Table 3.7-29**). Alternative II-D would result in the greatest direct and indirect impacts to existing raptor nests in comparison to the other Region II alternatives (**Table 3.7-29**). Alternative II-E could also result in the highest potential construction disturbance to riparian areas near perennial streams as discussed in Section 3.9, Aquatic Biological Resources, and displayed in **Table 3.9-12**. Although potential impacts to these separate groups of species are varied, Alternative II-C would result in the greatest potential impacts to wildlife in terms of the total acreage of construction and operation impacts combined. Potential impacts to wildlife species present within the five national forests also would be greatest for Alternative II-C as shown in **Tables 3.7-28** and **3.7-30**. Even though the greatest level of impacts are associated with Alternative II-C, project effects on wildlife species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.7.6.2 and 3.7.6.4 and **Appendix C**).

3.7.6.5 Region III

Table 3.7-35 provides a tabulation of impacts associated with the alternative routes in Region III. Key impact parameters that relate to the impact discussion in Section 3.7.6.2, Impacts Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below.

Table 3.7-35 Summary of Existing Conditions by Alternative within Region III

Alternative	Length (miles)	Length of Greenfield Construction	Length of Co-located Construction	Miles of Roads within 2-Mile Corridor	Miles of Roads within 2-Mile Corridor/Mile of Alternative
III-A	276	73	203	982	3.55
III-B	285	140	145	1,045	3.68
III-C	308	96	213	1,110	3.60

Alternative III-A (Applicant Proposed)

Alternative III-A Habitat Disturbance and Fragmentation

Alternative III-A would cross approximately 276 miles of wildlife habitat in Utah. Approximately 203 miles (74 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-35**. Existing conditions within the Alternative III-A 2-mile transmission line corridor relative to wildlife can be characterized as moderately disturbed and fragmented. The section of Alternative III-A crossing Millard County is fragmented and disturbed by existing BLM maintenance roads, several county roads, existing oil and gas operations, and U.S. Highway 6. Wildlife habitat along the III-A route in Beaver County is fragmented by BLM and county roads, as well as oil and gas infrastructure. The Alternate III-A corridor also crosses State Highway 21, an abandoned iron mine site located northeast of Milford, Utah, and a Union Pacific Rail line before entering into Iron County. Major causes of disturbance in Iron County include agricultural pivots, and oil and gas infrastructure. The Alternative III-A route also crosses State Highway 56 and a section of the Union Pacific Railroad before continuing into Washington County, Utah. The Alternative III-A route is collocated with existing transmission lines throughout Washington County and into Nevada and disturbance and fragmentation is mostly limited to USFS roads as the route enters the mountains. Some agriculture, the Veyo Compressor Station (located west of Veyo, Utah) and the crossing of State Highway 18 also adds to habitat disturbance and fragmentation along this section of the route. The remaining segments of Alternative III-A through Nevada are moderately disturbed by county roads, low density oil and gas and livestock operations, and private residences. However, fragmentation does increase along this stretch as the route approaches Las Vegas, Nevada, and crosses I-15 several times, as well as some smaller state highways. A total of 982 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-35**. This represents the lowest existing road density within the 2-mile transmission line corridor among Region III alternatives.

Key Parameters Summary

Game Species

Alternative III-A would result in direct disturbance to mule deer crucial winter range in Utah and desert bighorn sheep occupied habitat in Nevada (**Table 3.7-36**). Implementation of the BLM, UDWR, and USFS restriction to prevent disturbance to wintering big game species in identified crucial winter range from November 15 to April 30, would prevent direct impacts to wintering big game species. Alternative III-A would result in the construction and operation disturbance of 9,320 acres and 979 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.13 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region III wildlife analysis area. Alternative III-A also would result in the construction disturbance of 249 acres and operation disturbance of 26 acres of waterfowl habitat. These areas represent 0.12 percent and 0.01 percent of the available waterfowl habitat within the Region III wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative III-A would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Table 3.7-36 Summary of Region III Alternative Route Impact Parameters for Wildlife

Parameter	Alternative III-A			Alternative III-B			Alternative III-C		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Big Game Species									
Nevada pronghorn occupied habitat (acres)	0	0	0	31	7	1,860	373	95	36,278
Percentage of existing habitat within the Region III big game analysis area	0	0	0	<0.01	<0.01	0.12	0.02	<0.01	2.40
Utah pronghorn crucial yearlong range (acres)	1,627	378	201,853	1,897	433	217,375	1,868	439	223,170
Percentage of existing habitat within the Region III big game analysis area	0.03	<0.01	3.72	0.03	<0.01	4.00	0.03	<0.01	4.11
Nevada mule deer occupied habitat (acres)	0	0	0	2	1	675	84	21	8,591
Percentage of existing habitat within the Region III big game analysis area	0	0	0	<0.01	<0.01	0.27	0.03	<0.01	3.43
Utah mule deer crucial winter range (acres)	185	51	13,692	0	0	0	0	0	0
Percentage of existing habitat within the Region III big game analysis area	0.02	<0.01	1.68	0	0	0	0	0	0
Nevada desert bighorn sheep occupied habitat (acres)	102	31	7,605	140	40	12,203	106	30	19,332
Percentage of existing habitat within the Region III big game analysis area	0.02	<0.01	1.35	0.02	<0.01	2.16	0.02	<0.01	3.42
Utah desert bighorn sheep occupied habitat (acres)	4	2	958	0	0	0	0	0	0
Percent of existing habitat within the Region III big game analysis area	<0.01	<0.01	1.41	0	0	0	0	0	0
Small Game and Nongame Species									
Upland game bird, small game mammal, furbearer, small nongame mammal, migratory bird, and reptile habitat (acres)[1]	9,320	979	374,780	9,502	862	375,681	10,327	940	435,065
Percentage of existing habitat within the Region III wildlife analysis area	0.13	0.01	5.26	0.13	0.01	5.27	0.14	0.01	6.11
Waterfowl habitat (acres)[2]	249	26	11,389	360	30	14,704	239	23	12,932
Percentage of existing habitat within the Region III wildlife analysis area	0.12	0.01	5.33	0.17	0.01	6.89	0.11	0.01	6.06
Relative Collision Potential for Migratory Birds									
Length of transmission line (miles)[4]	276			285			308		
Raptor Nests (Non-special Status)									
Number within 1 mile of the reference line[3]	254			129			137		
Bird Habitat Conservation Areas									
BHCAs crossed by the 250-foot-wide transmission line ROW (acres)	473			131			199		
Percentage of existing BHCAs within the Region III wildlife analysis area	0.07			0.02			0.03		

Table 3.7-36 Summary of Region III Alternative Route Impact Parameters for Wildlife

Parameter	Alternative III-A			Alternative III-B			Alternative III-C		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Audubon Important Bird Areas									
Pahranagat Valley Complex IBA (acres within 2-mile transmission line corridor)	0			0			188		
Percentage of existing IBA habitat within the Region III wildlife analysis area	0			0			0.31		

[1] Habitat categories used to calculate acreages of habitat disturbance include agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, dunes, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon-juniper, riparian, sagebrush shrubland, saltbush shrubland, tundra, and woody riparian and wetlands. Further discussion of these habitat types is included in Section 3.5.6, Impacts to Vegetation.

[2] Habitat categories used to calculate acreages of waterfowl habitat disturbance include herbaceous wetland, open water, riparian, and woody riparian and wetlands. Further discussion of these habitat types is included in Section 3.5.6, Impacts to Vegetation.

[3] Special status raptor species are addressed in Section 3.8, Special Status Wildlife Species. A total of 74 raptor nests of unknown species are documented in Region III. These nests potentially could be utilized by special status raptor species, thus also are tabulated in Section 3.8.5.5, Region III.

[4] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Nongame Species

The types of impacts to nongame species under Alternative III-A generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-36** presents a comparison of impacts to habitat in Region III. Alternative III-A would result in the construction and operation disturbance of 9,320 acres and 979 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.13 percent and 0.01 percent of the available small mammal and reptile habitat within the Region III wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative III-A would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative III-A generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative III-A would result in the construction and operation disturbance of 9,320 acres and 979 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.13 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region III wildlife analysis area. The length of Alternative III-A is found in **Table 3.7-36**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 254 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative III-A (**Table 3.7-37**). In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative III-A would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative III-A.

Table 3.7-37 Non-special Status Raptor Nests Within 1 Mile of the Reference Line in Region III

Species	Alternative III-A	Alternative III-B	Alternative III-C	Ox Valley East Alternative Variation	Ox Valley West Alternative Variation	Ox Valley Alternative Variation Comparative Portion	Pinto Alternative Variation	Pinto Alternative Variation Comparative Portion	Avon Alternative Connector	Moapa Alternative Connector
Red-tailed hawk	15	7	6	0	0	4	2	7	0	0
Common raven	91	43	49	0	0	2	2	7	4	0
Osprey	1	0	0	0	0	0	0	0	0	0
Unknown raptor species	147	79	82	1	1	11	3	50	1	0
Totals	254	129	137	1	1	17	7	64	5	0

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010, 2012; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012; Manti-LaSal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012; AECOM 2012.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative III-B (Agency Preferred)

Alternative III-B Habitat Disturbance and Fragmentation

Alternative III-B would cross approximately 285 miles of wildlife habitat in Utah. Approximately 145 miles (51 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-36**. Existing conditions within the Alternative III-B 2-mile transmission line corridor relative to wildlife can be characterized as moderately disturbed and fragmented. The section of Alternative III-B crossing Millard County is fragmented and disturbed by existing BLM maintenance roads, several county roads, existing oil and gas operations, and U.S. Highway 6. Wildlife habitat along the Alternative III-B route in Beaver County is moderately fragmented by BLM and county roads, as well as oil and gas infrastructure. Alternate III-B also crosses State Highway 21, an abandoned iron mine site located northeast of Milford, Utah, and a Union Pacific rail line before entering into Iron County. Major causes of disturbance in Iron County include the towns of Sun Valley, Beryl, and Modena, Utah, and the associated agricultural pivots, ranches and county roads. The Alternative III-B route also crosses State Highway 56 and a section of the Union Pacific Railroad that follows the 2-mile transmission line corridor from Sun Valley, Utah, to the boundary of Lincoln County, Nevada. A Union Pacific rail line continues to fragment the Alternate III-B corridor for approximately 16 miles into Nevada where the rail line heads west at Barclay, Nevada. The remaining segments of Alternative III-B through Nevada are moderately fragmented by county roads, low density oil and gas and livestock operations, and private residences. However, disturbance does increase along this stretch as Alternative III-B enters Clark County and intersects State Highway 168 at Moapa Town, Nevada. As the route approaches Las Vegas, Nevada, the 2-mile transmission line corridor crosses I-15 several times, as well as smaller state highways and metropolitan roadways. A total of 1,045 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-35**. This represents the highest existing road density within the 2-mile transmission line corridor among Region III alternatives.

Game Species

The types of impacts to big game species under Alternative III-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-36** presents a comparison of impacts to habitat in Region III. Pronghorn crucial winter range in Nevada also would be impacted under Alternative III-B. Alternative III-B would result in the construction and operation disturbance of 9,502 acres and 862 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.13 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region III wildlife analysis area. Alternative III-B also would result in the construction disturbance of 360 acres and operation disturbance of 30 acres of waterfowl habitat. These areas represent 0.17 percent and 0.01 percent of the available waterfowl habitat within the Region III wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative III-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative III-B generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-36** presents a comparison of impacts to habitat in Region III. Alternative III-B would result in the construction and operation disturbance of 9,502 acres and 862 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.13 percent and 0.01 percent of the available small mammal and reptile habitat within the Region III wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative III-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative III-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-B would result in the construction and operation disturbance of 9,502 acres and 862 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.13 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region III wildlife analysis area. The length of Alternative III-B is found in **Table 3.7-36**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 129 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative III-B. These are presented in **Table 3.7-37**. In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, there would be negligible potential for electrocution and remaining Project construction and operation impacts to raptors and other migratory birds under Alternative III-B would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative III-C

Alternative III-C Habitat Disturbance and Fragmentation

Alternative III-C would cross approximately 308 miles of wildlife habitat in Utah. Approximately 213 miles (69 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-35**. Existing conditions within the Alternative III-C 2-mile transmission line corridor relative to wildlife can be characterized as moderately disturbed and fragmented. The section of Alternative III-C crossing Millard County is fragmented and disturbed by existing BLM maintenance roads, several county roads, existing oil and gas operations, and U.S. Highway 6. Wildlife habitat along the Alternative III-C route in Beaver County is moderately fragmented by BLM and county roads, as well as oil and gas infrastructure. Alternative III-C also crosses State Highway 21, an abandoned iron mine site located

northeast of Milford, Utah, and a Union Pacific rail line before entering into Iron County. Major causes of disturbance in Iron County include the towns of Sun Valley, Beryl, and Modena, Utah, and the associated agricultural pivots, ranches and county roads. The Alternative III-C route also crosses State Highway 56 and a section of the Union Pacific Railroad that follows the 2-mile transmission line corridor from Sun Valley, Utah, to the boundary of Lincoln County, Nevada. Alternative III-C is parallel to U.S. Highway 93 for a majority of this section of the corridor. The remaining segments of Alternative III-C through Lincoln County are sporadically fragmented by county roads, low density oil and gas and livestock operations, and private residences. The route continues to follow U.S. Highway 93 until infrastructure from Las Vegas, Nevada (I-15, Harry Allen Generating Station, Silverhawk Generating Station and Power Plant) causes nearly continuous disturbance and fragmentation to the terminus of Alternative III-C just north of the city. A total of 1,110 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-35**. This represents the second highest existing road density within the 2-mile transmission line corridor among Region III alternatives.

Game Species

The types of impacts to big game species under Alternative III-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-36** presents a comparison of impacts to habitat in Region III. Additional mule deer and pronghorn crucial winter ranges would be impacted under Alternative III-C. Alternative III-C would result in the construction and operation disturbance of 10,327 acres and 940 acres, respectively, of upland game bird, small game mammal, and furbearer habitat. These areas represent 0.14 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer habitat within the Region III wildlife analysis area. Alternative III-C also would result in the construction disturbance of 239 acres and operation disturbance of 23 acres of waterfowl habitat. These areas represent 0.11 percent and 0.01 percent of the available waterfowl habitat within the Region III wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative III-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative III-C generally would be the same as those described for Alternative I-A, but would differ in the amount of habitat disturbed. **Table 3.7-36** presents a comparison of impacts to habitat in Region III. Alternative III-C would result in the construction and operation disturbance of 10,327 acres and 940 acres, respectively, of potentially suitable small mammal and reptile habitat. These areas represent 0.14 percent and 0.01 percent of the available small mammal and reptile habitat within the Region III wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative III-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative III-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative III-C would result in the construction and operation disturbance of 10,327 acres and 940 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.14 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region III wildlife analysis area. The length of Alternative III-B is found in **Table 3.7-36**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). In addition, 137 raptor nests that are not classified as special status occur within 1 mile of the reference line along Alternative III-C (**Table 3.7-37**).

In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative III-C would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative III-C.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

USFS Management Indicator Species

The Dixie National Forest is crossed by the Project in Region III. Two wildlife species, the wild turkey and the northern flicker, are identified as MIS that are not otherwise classified as special status species. Only Alternative III-A would cross the forest, impacting 336 acres of potential wild turkey habitat and 298 acres of potential northern flicker habitat during construction. Operation would impact 59 acres of potential wild turkey habitat and 54 acres of potential northern flicker habitat. Impacts to Dixie National Forest MIS not otherwise classified as special status species are listed in **Table 3.7-38**. Impacts to MIS also classified as special status are discussed in Section 3.8, Special Status Wildlife Species.

Table 3.7-38 Summary of Region III Alternative Route Impact Parameters for USFS MIS

Parameter	Alternative III-A			Alternative III-B			Alternative III-C		
Species	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Dixie National Forest MIS not Otherwise Analyzed as Special Status Species[1]									
Wild turkey potential habitat (acres) Habitat categories: 1, 2, 5, 6, 7, 10, 11, 13, 16, 19, 21	336	59	15,286	0	0	0	0	0	0
Percentage of potential habitat within the Region III MIS Analysis Area	0.03	<0.01	0.81	0	0	0	0	0	0
Northern flicker potential habitat (acres) Habitat categories: 1, 2, 5, 6, 12, 16, 21	298	54	14,193	0	0	0	0	0	0
Percentage of potential habitat within the Region III MIS Analysis Area	0.02	<0.01	0.75	0	0	0	0	0	0

[1] There are no habitat impacts to northern goshawk anticipated from Alternative III-A.

Note: Please refer to Section 3.8.5.5 for indirect impacts by vegetation community/habitat type.

Region III Conclusion

Based on a comparison of impact parameters for Region III alternatives, potential construction and operation impacts to wildlife would be varied across all alternatives as shown in **Table 3.7-36**. Alternative III-C would result in the greatest direct and indirect impacts to big game, small game, and non-game habitat in comparison to the other Region III alternatives. Alternative III-A would result in the greatest impacts to existing raptor nests and BHCAs in comparison to the other Region III alternatives (**Table 3.7-36**). Alternatives III-A and III-B also could result in the highest potential construction disturbance to riparian areas near perennial streams as discussed in Section 3.9, Aquatic Biological Resources, and displayed in **Table 3.9-15**. Potential impacts to wildlife species present within the Dixie National Forest would be greatest for Alternative III-A as shown in **Table 3.7-38**. Although potential impacts to these separate groups of species are varied, Alternative III-C would result in the greatest potential impacts to wildlife in terms of the total acreage of construction and operation impacts combined. Even though the greatest level of impacts are associated with Alternative III-C, project effects on wildlife species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.7.6.2 and 3.7.6.5 and **Appendix C**).

Alternative Variations in Region III

Table 3.7-39 summarizes impacts associated with the alternative variations in Region III. Impacts to big game species under the three alternative variations in Region III would generally be the same as the comparable portions of Alternatives III-A, but would differ in the amount of habitat disturbed (**Table 3.7-39**). Similar to the comparable portions of Alternatives III-A, after considering design features and mitigation measures, impacts to game and nongame species from Project construction and operation would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

The Ox Valley East and Ox Valley West alternative variations are approximately 16 and 17 miles in length, respectively, and potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution.

After considering design features and mitigation measures, impacts to raptors and other migratory birds from Project construction and operation would be limited primarily to habitat loss and fragmentation. The Pinto Alternative Variation is approximately 29 miles in length, of which approximately 21 miles are located within the Dixie National Forest. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution. Impacts to Dixie National Forest MIS not otherwise classified as special status species are listed in **Table 3.7-38**. Impacts to MIS also classified as special status are discussed in Section 3.8, Special Status Wildlife Species. After considering design features and mitigation measures, impacts to raptors and other migratory birds from construction and operation of the Pinto Alternative Variation would be limited primarily to habitat loss, fragmentation, disturbance from routine maintenance activities, and disturbance during routine maintenance activities.

Alternative Connectors in Region III

The Moapa and the Avon alternative connectors would include minimal increases of total habitat disturbance relative to the total impacts associated with Region III alternatives, if they were to be utilized. **Table 3.7-40** summarizes impacts associated with the alternative connectors in Region III.

Table 3.7-39 Summary of Region III Alternative Variation Impact Parameters for Wildlife

Impact Parameters	Ox Valley East Alternative Variation			Comparable Portion of Alternative III-A			Ox Valley West Alternative Variation			Comparable Portion of Alternative III-A			Pinto Alternative Variation			Comparable Portion of Alternative III-A		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Big Game Species																		
Utah mule deer crucial winter range	0	0	0	27	6	804	0	0	0	27	6	804	57	14	3,936	73	17	3,734
Percentage of existing habitat within the Region III big game analysis area	0	0	0	<0.01	<0.01	0.10	0	0	0	<0.01	<0.01	0.10	<0.01	<0.01	0.48	<0.01	<0.01	0.46
Small Game and Nongame Species																		
Small game and nongame potential habitat (acres)[1]	584	99	17,210	528	94	19,692	595	99	12,774	528	94	19,692	993	109	35,239	827	122	29,013
Percentage of potential habitat within the Region III wildlife analysis area	<0.01	<0.01	0.24	<0.01	<0.01	0.28	<0.01	<0.01	0.18	<0.01	<0.01	0.28	0.01	<0.01	0.49	0.01	<0.01	0.41
Waterfowl																		
Waterfowl potential habitat[2]	9	3	551	6	1	285	9	3	537	6	1	285	6	1	585	6	1	322
Percentage of potential habitat within the Region III wildlife analysis area	<0.01	<0.01	0.26	<0.01	<0.01	0.13	<0.01	<0.01	0.25	<0.01	<0.01	0.13	<0.01	<0.01	0.27	<0.01	<0.01	0.15
Relative Collision Potential for Migratory Birds																		
Length of transmission line (miles)[3]	16			15			17			15			29			24		
Raptor Nests (Non-special Status)																		
Number of raptor nests within 1 mile of the reference line[4]	1			17			1			17			7			64		
Bird Habitat Conservation Areas																		
BHCAs crossed by the 250-foot-wide transmission line ROW (acres)	29			153			29			153			302			122		
Percentage of existing BHCA habitat within the Region III wildlife analysis area	<0.01			0.02			<0.01			0.02			0.04			0.02		
Audubon Important Bird Areas																		
IBA (acres) within 2-mile transmission line corridor	0			0			0			0			0			0		
IBA (acres) within the Region III wildlife analysis area	0			0			0			0			0			0		

Table 3.7-39 Summary of Region III Alternative Variation Impact Parameters for Wildlife

Impact Parameters	Ox Valley East Alternative Variation			Comparable Portion of Alternative III-A			Ox Valley West Alternative Variation			Comparable Portion of Alternative III-A			Pinto Alternative Variation			Comparable Portion of Alternative III-A		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Dixie National Forest MIS Not Otherwise Classified as Special Status Species[5]																		
Wild turkey potential Habitat categories: 1, 2, 5, 6, 7, 10, 11, 13, 16, 19, 21	299	50	0	242	43	8,943	292	47	5,815	242	43	9,223	495	56	19,532	252	46	11,689
Percentage of potential habitat within the Region III MIS Analysis Area	0.02	<0.01	0	0.02	<0.01	0.69	0.02	<0.01	0.45	0.02	<0.01	0.71	0.04	<0.01	1.52	0.02	<0.01	0.90
Northern flicker Habitat categories: 1, 2, 5, 6, 12, 16, 21	297	49	0	238	43	8,783	290	46	5,663	238	43	9,032	491	56	19,401	249	46	11,617
Percentage of potential habitat within the Region III MIS Analysis Area	0.02	<0.01	0	0.02	<0.01	0.69	0.02	<0.01	0.44	0.02	<0.01	0.71	0.04	<0.01	1.52	0.02	<0.01	0.91

[1] Vegetation communities/habitat categories used to calculate acreages of potential habitat disturbance include agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, dunes, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon-juniper, riparian, sagebrush shrubland, saltbush shrubland, tundra, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[2] Vegetation communities/habitat categories used to calculate acreages of disturbance to potential waterfowl habitat include open water, herbaceous wetland, riparian, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[3] Length refers to length of 600-kV transmission line and serves as a metric for avian collision potential.

[4] Special status raptor species are addressed in Section 3.8, Special Status Wildlife Species. A total of two raptor nests for which the species is not known are documented in the comparable portion of the Pinto Alternative Variation. These nests potentially could be utilized by special status raptor species, thus also are tabulated in Section 3.8, Special Status Wildlife Species.

[5] Potential construction impacts to northern goshawk habitat are less than five acres from the Ox Valley East and West Variations; potential construction impacts from the Pinto Variation are less than 1 acre.

Table 3.7-40 Summary of Region III Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Analysis
Moapa Alternative Connector	• Approximately 13 miles in length.[1] • Approximately 9 acres of construction, 2 acres of operation, and 358 acres of indirect impacts to desert bighorn sheep occupied habitat would occur. • Approximately 429 acres of construction, 34 acres of operation, and 13,407 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 136 acres of construction and 10 acres of operation and 2,972 acres of indirect impacts to waterfowl potential habitat would occur. • The Lower Muddy River BHCA is crossed by the 250 foot-wide transmission line ROW for a total of 30 acres. • No raptor nests are within 1 mile of the reference line.
Avon Alternative Connector	• Approximately 8 miles in length.[1] • Approximately 104 acres of construction, 21 acres of operation, and 8,614 acres of indirect impacts to pronghorn crucial yearlong range would occur. • Approximately 264 acres of construction and 21 acres of operation and 8,316 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 0 acres of construction, 0 acres of operation, and 108 acres of indirect impacts to waterfowl potential habitat would occur. • Five raptor nests are within 1 mile of the reference line.

[1]Length refers to length of transmission lines, and serves as a proxy metric for avian collision potential.

Table 3.7-41 provides a comparison of alternative electrode bed locations proposed in Region III. Some locations might serve multiple alternative routes, while others could only be associated with a particular alternative route.

Table 3.7-41 Summary of Region III Alternative Ground Electrode System Location Impact Parameters for Wildlife[1]

Alternative Ground Electrode System Locations	Analysis
Mormon Mesa - Carp Elgin Rd (Alternative III-A)	• Approximately 6 miles in length.[2] • No additional impacts to desert bighorn sheep occupied habitat would occur. • Approximately 91 acres of construction, 19 acres of operation, and 13,594 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 35 acres of construction, 7 acres of operation, and 3,746 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 999 acres of indirect impacts to the Virgin River BHCA would occur. • Approximately 764 acres of indirect impacts to the Virgin River IBA would occur.
Mormon Mesa - Carp Elgin Rd (Alternative III-B)	• Approximately 8 miles in length.[2] • No additional impacts to desert bighorn sheep occupied habitat would occur. • Approximately 103 acres of construction, 26 acres of operation, and 13,594 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 39 acres of construction, 10 acres of operation, and 3,746 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 999 acres of indirect impacts to the Virgin River BHCA would occur. • Approximately 764 acres of indirect impacts to the Virgin River IBA would occur.

Table 3.7-41 Summary of Region III Alternative Ground Electrode System Location Impact Parameters for Wildlife[1]

Alternative Ground Electrode System Locations	Analysis
Halfway Wash - Virgin River (Alternative III-A)	• Approximately 4 miles in length.[2] • No additional impacts to desert bighorn sheep occupied habitat would occur. • Approximately 84 acres of construction, 16 acres of operation, and 13,349 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 18 acres of construction, 3 acres of operation, and 2,347 acres of indirect impacts to waterfowl potential habitat would occur.
Halfway Wash – Virgin River (Alternative III-B)	• Approximately 6 miles in length.[2] • No additional impacts to desert bighorn sheep occupied habitat would occur. • Approximately 93 acres of construction, 20 acres of operation, and 13,349 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 20 acres of construction, 4 acres of operation, and 2,347 acres of indirect impacts to waterfowl potential habitat would occur.
Halfway Wash East (Alternative III-A)	• Approximately 8 miles in length.[2] • No additional impacts to desert bighorn sheep occupied habitat would occur. • Approximately 104 acres of construction, 26 acres of operation, and 13,278 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 28 acres of construction, 7 acres of operation, and 3,378 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 216 acres of indirect impacts of the Virgin River BHCA would occur.
Halfway Wash East (Alternative III-B)	• Approximately 8 miles in length.[2] • No additional impacts to desert bighorn sheep occupied habitat would occur. • Approximately 102 acres of construction, 25 acres of operation, and 13,278 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 28 acres of construction, 7 acres of operation, and 3,378 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 216 acres of indirect impacts of the Virgin River BHCA would occur.
Meadow Valley 2 (Alternative III-C)	• Approximately 22 miles in length.[2] • No additional impacts to desert bighorn sheep occupied habitat would occur. • Approximately 174 acres of construction, 66 acres of operation, 13,594 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 16 acres of construction, 6 acres of operation, and 797 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 1,075 acres of indirect impacts to the Lower Muddy River BHCA would occur.
Delta Ground Electrode Siting Area	• Approximately 19 miles in length.[1] • Approximately 131 acres of construction, 40 acres of operation, and 12,978 acres of indirect impacts to pronghorn crucial yearlong range would occur. • Approximately 1 acre of construction, 0.5 acres of operation, and 310 acres of indirect impacts to mule deer crucial winter range would occur. Approximately 381 acres of indirect impacts to the Vernon Unit migrating mule deer crucial winter range would occur. • Approximately 129 acres of construction, 39 acres of operation, and 13,232 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 2 acres of construction, 1 acre of operation, and 579 acres of indirect impacts to waterfowl potential habitat would occur. • Approximately 1,451 acres of indirect impacts to the Fish Springs National Wildlife Refuge BHCA would occur. • Approximately <1 acre of indirect impacts to Fish Springs National Wildlife Refuge UT16 IBA would occur.

[1] Ground electrode systems are described in detail in Section 2.5.1, Alternative Transmission Line Routes and Ancillary Facilities by Region.

[2] Length refers to length of transmission lines and serves as a metric for avian collision potential.

3.7.6.6 Region IV

Table 3.7-42 provides a tabulation of impacts associated with the alternative routes in Region IV. Key impact parameters that relate to the impact discussion in Section 3.7.6.2, Impacts Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below.

Table 3.7-42 Summary of Region IV Alternative Route Impact Parameters for Wildlife

Parameter	Alternative IV-A (Applicant Proposed and Agency Preferred)			Alternative IV-B			Alternative IV-C		
	Construction impacts	Operation Impacts	Indirect Impacts	Construction impacts	Operation Impacts	Indirect Impacts	Construction impacts	Operation Impacts	Indirect Impacts
Big Game Species									
Nevada desert bighorn sheep occupied habitat (acres)	122	39	8,259	69	31	4,444	39	19	4,562
Percentage of potential habitat within the Region IV big game analysis area	0.05	0.01	3.21	0.03	0.01	1.72	0.02	<0.01	1.77
Small Game and Nongame Species									
Upland game bird, small game mammal, furbearer, small nongame mammal, migratory bird, and reptile potential habitat (acres)[1]	900	98	30,576	897	121	25,722	924	122	28,901
Percentage of potential habitat within the Region IV wildlife analysis area	0.11	0.01	3.70	0.11	0.01	3.11	0.11	0.01	3.50
Waterfowl potential habitat (acres)[2]	13	1	433	21	7	1,076	21	7	1,171
Percentage of potential habitat within the Region IV wildlife analysis area	0.02	<0.01	0.59	0.03	<0.01	1.47	0.03	<0.01	1.59
Relative Collision Potential for Migratory Birds									
Length of transmission line (miles)[4]	37			39			44		
Raptor Nests (Non-special Status)									
Number within 1 mile of the reference line[3]	0			0			0		
Bird Habitat Conservation Areas									
Acres of BHCAs crossed by the 250 foot-wide transmission line ROW	124			328			604		
Percentage of existing BHCA habitat within the Region IV wildlife analysis area	0.03			0.08			0.14		
Audubon Important Bird Areas									
IBA (acres within 2-mile transmission line corridor)	0			643			643		
Percentage of existing IBA within the Region IV wildlife analysis area	0			1.01			1.01		

[1] Vegetation communities/habitat categories used to calculate acreages of potential habitat disturbance include agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, dunes, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, pinyon-juniper, riparian, sagebrush shrubland, saltbush shrubland, tundra, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[2] Vegetation communities/habitat categories used to calculate acreages of potential waterfowl habitat disturbance include open water, herbaceous wetland, riparian, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[3] Special status raptor species are addressed in Section 3.8, Special Status Wildlife Species.

[4] Length refers to potential length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Alternative IV-A (Applicant Proposed and Agency Preferred)

Alternative IV-A Habitat Disturbance and Fragmentation

Alternative IV-A would cross approximately 37 miles of wildlife habitat in southern Nevada. This alternative will be entirely co-located with other existing transmission lines as shown in **Table 3.7-43**. Existing conditions within the Alternative IV-A 2-mile transmission line corridor relative to wildlife can be characterized as highly disturbed and fragmented. Alternative IV-A in southern Nevada is highly fragmented and disturbed by three major highways; Highway 147, Highway 564, and Highway 93, as well as many other city and county roads within the 2-mile transmission line corridor. Major sources of disturbance within the Alternative IV-A 2-mile transmission line corridor include a residential portion along the eastern flank of the city of Henderson, Nevada, a Las Vegas Valley Water waste water treatment plant, and a Pabco gypsum quarry located northeast of the city of Las Vegas. A total of 95 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-43**.

Table 3.7-43 Summary of Existing Conditions by Alternative within Region IV

Alternative	Length (miles)	Length of Greenfield Construction	Length of Co-Located Construction	Miles of Roads within 2-Mile Corridor	Miles of Roads within 2-Mile Corridor/Mile of Alternative
IV-A	37	0	37	95	2.57
IV-B	39	12	34	132	3.38
IV-C	44	12	33	175	3.98

Key Parameters Summary

Game Species

The types of impacts to big game species under Alternative IV-A generally would be the same as described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-42** presents a comparison of impacts to potential habitat in Region IV. Desert bighorn sheep occupied habitat would be impacted under Alternative IV-A. Alternative IV-A would result in the construction and operation disturbance of 900 acres and 98 acres, respectively, of upland game bird, small game mammal, and furbearer potential habitat. These areas represent 0.11 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer potential habitat within the Region IV wildlife analysis area. Alternative IV-A also would result in the construction disturbance of 13 acres and operation disturbance of 1 acre of waterfowl potential habitat. These areas represent 0.02 percent and <0.01 percent of the available waterfowl potential habitat within the Region IV wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative IV-A would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative IV-A generally would be the same as those described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-42** presents a comparison of impacts to potential habitat in Region IV. Alternative IV-A would result in the construction and operation disturbance of 900 acres and 98 acres, respectively, of small mammal and reptile potential habitat. These areas represent 0.11 percent and 0.01 percent of the available small mammal and reptile potential habitat within the Region IV wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative IV-A would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative IV-A would generally be the same as described for Alternative I-A, but would differ in the amount of potential habitat disturbed. Alternative IV-A would result in the construction and operation disturbance of 900 acres and 98 acres, respectively, of potential suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.11 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region IV wildlife analysis area. The length of Alternative IV-A is found in **Table 3.7-41**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006).

No non-special status raptor nests have been identified within one mile of the reference line along Alternative IV-A. In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative IV-A would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative IV-A.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative IV-B

Alternative IV-B Habitat Disturbance and Fragmentation

Alternative IV-B would cross approximately 39 miles of wildlife habitat in Nevada. Approximately 34 miles (87 percent) of this alternative will be co-located with other existing transmission lines as shown in **Table 3.7-43**. Existing conditions within the Alternative IV-B 2-mile transmission line corridor relative to wildlife can be characterized as highly disturbed and fragmented. Alternative IV-B in southern Nevada is highly fragmented and disturbed by four major highways; Highway 147, Highway 564, Highway 93, and Highway 95, as well as many other city and county roads within the 2-mile transmission line corridor. Major sources of disturbance within the Alternative IV-B 2-mile transmission line corridor include the northern portion of Boulder City, Nevada, a Pabco gypsum quarry located northeast of the city of Las Vegas, and low density industrial operations to the west of Lake Las Vegas. Wildlife habitat along the Alternative IV-B is also fragmented by the existence of Lakeshore road, the River Mountain Loop Trial, and the Historic Railroad hiking trail, which parallel the 2-mile transmission line corridor immediately to the west of Lake Las Vegas. A total of 132 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-43**.

Game Species

The types of impacts to big game species under Alternative IV-B generally would be the same as described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-42** presents a comparison of impacts to potential habitat in Region IV. Alternative IV-B would result in the construction

and operation disturbance of 897 acres and 121 acres, respectively, of upland game bird, small game mammal, and furbearer potential habitat. These areas represent 0.11 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer potential habitat within the Region IV wildlife analysis area. Alternative IV-B also would result in the construction disturbance of 21 acres and operation disturbance of 7 acres of waterfowl potential habitat. These areas represent 0.03 percent and <0.01 percent of the available waterfowl potential habitat within the Region IV wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative IV-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative IV-B generally would be the same as those described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-42** presents a comparison of impacts to potential habitat in Region IV. Alternative IV-B would result in the construction and operation disturbance of 897 and 121 acres, respectively, of small mammal and reptile potential habitat. These areas represent 0.11 percent and 0.01 percent of the available small mammal and reptile potential habitat within the Region IV wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative IV-B would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative IV-B generally would be the same as described for Alternative I-A, but would differ in the amount of potential habitat disturbed. Alternative IV-B would result in the construction and operation disturbance of 897 acres and 121 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.11 percent and 0.01 percent of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat within the Region IV wildlife analysis area. The length of Alternative IV-B is found in **Table 3.7-42**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006).

No non-special status raptor nests have been identified within one mile of the reference line along Alternative IV-B. In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, there would be negligible potential for electrocution and remaining Project construction and operation impacts to raptors and other migratory birds under Alternative IV-B would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative IV-B.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures

included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Alternative IV-C

Alternative IV-C Habitat Disturbance and Fragmentation

Alternative IV-C would cross approximately 44 miles of wildlife habitat in Nevada. Approximately 33 miles (75 percent) of this alternative would be co-located with other existing transmission lines as shown in **Table 3.7-43**. Existing conditions within the Alternative IV-C 2-mile transmission line corridor relative to wildlife can be characterized as highly disturbed and fragmented. Alternative IV-C in southern Nevada is highly fragmented and disturbed by four major highways; Highway 147, Highway 564, Highway 93, and Highway 95, as well as many other city and county roads within the 2-mile transmission line corridor. Major sources of disturbance within the Alternative IV-C 2-mile transmission line corridor include a Pabco gypsum quarry located northeast of the city of Las Vegas, and low density industrial operations to the West of Lake Las Vegas. Wildlife habitat along the Alternative IV-C also is fragmented by the existence of Lakeshore road, the River Mountain Loop Trial, and the Historic Railroad hiking trail, which parallel the 2-mile transmission line corridor immediately to the West of Lake Las Vegas. A total of 175 miles of existing roads are located within the 2-mile transmission line corridor as shown **Table 3.7-43**.

Game Species

The types of impacts to big game species under Alternative IV-C generally would be the same as described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-42** presents a comparison of impacts to potential habitat in Region IV. Alternative IV-C would result in the construction and operation disturbance of 924 acres and 122 acres, respectively, of upland game bird, small game mammal, and furbearer potential habitat. These areas represent 0.11 percent and 0.01 percent of the available upland game bird, small game mammal, and furbearer potential habitat within the Region IV wildlife analysis area. Alternative IV-C also would result in the construction disturbance of 21 acres and operation disturbance of 7 acres of waterfowl potential habitat. These areas represent 0.03 percent and <0.01 percent of the available waterfowl potential habitat within the Region IV wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to small game species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative IV-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Nongame Species

The types of impacts to nongame species under Alternative IV-C generally would be the same as those described for Alternative I-A, but would differ in the amount of potential habitat disturbed. **Table 3.7-42** presents a comparison of impacts to potential habitat in Region IV. Alternative IV-C would result in the construction and operation disturbance of 924 acres and 122 acres, respectively, of small mammal and reptile potential habitat. These areas represent 0.11 percent and 0.01 percent of the available small mammal and reptile habitat within the Region IV wildlife analysis area. Through implementation of TWE's design feature (TWE-32), direct impacts to nongame species would be limited during sensitive periods (e.g., nesting and breeding). Therefore, impacts under Alternative IV-C would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Raptors and Other Migratory Birds

The types of impacts to raptors and other migratory birds under Alternative IV-C generally would be the same as described for Alternative I-A, but would differ in the amount of potential habitat disturbed. Alternative IV-C would result in the construction and operation disturbance of 924 acres and 122 acres, respectively, of potentially suitable raptor and other migratory bird breeding, roosting, and foraging habitat. These areas represent 0.11 percent and 0.01 percent of potentially suitable raptor and other migratory bird

breeding, roosting, and foraging habitat within the Region IV wildlife analysis area. The length of Alternative IV-C is found in **Table 3.7-42**. Potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution; however, TWE's design feature (TWE-30) requires that the Project meet or exceed the raptor safe design standards described in the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006).

No non-special status raptor nests have been identified within one mile of the reference line along Alternative IV-C. In order to minimize impacts to raptors during the breeding season (January 1 to August 15), TWE has committed to implementing seasonal timing restrictions in applicable areas (TWE-32). While this design feature and BMPs presented in **Appendix C** would help to minimize impacts, additional mitigation is proposed. **WLF-1** would require TWE to conduct a breeding raptor survey and implement appropriate mitigation measures, such as buffer zones around occupied nests, as needed. After considering design features and proposed mitigation measures, remaining Project construction and operation impacts to raptors and other migratory birds under Alternative IV-C would be limited to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities. There would be negligible potential for electrocution under Alternative IV-C.

TWE has committed to developing an operational policy and a comprehensive strategy for collecting data, minimizing impacts, and mitigating loss of migratory birds and essential habitats prior to the initiation of construction. This policy and strategy will be incorporated into a single, over-arching document (Avian Protection Plan or Bird Conservation Strategy) that will include a full listing of all minimization measures included in this analysis, as well as recommendations from the USFWS and additional information included within the Avian Protection Plan Guidelines, developed by the USFWS and APLIC in 2005 (APLIC 2012).

Region IV Conclusion

Based on a comparison of impact parameters for Region IV alternatives, potential construction and operation impacts to wildlife would be greatest for Alternative IV-C as shown in **Table 3.7-42**. Potential effects for Alternative IV-B would be similar to those of Alternative IV-C although less overall acreage would be impacted (**Table 3.7-42**). Potential effects for Alternative IV-A would be relatively low compared to those of Alternatives IV-B and IV-C. Alternative IV-C would result in the greatest combined direct and indirect impacts to big game habitat, small game habitat, and migratory bird habitat in comparison to the other Region IV alternatives (**Table 3.7-42**). Alternative IV-C also could result in the highest potential construction disturbance to riparian areas near perennial streams as discussed in Section 3.9, Aquatic Biological Resources, and displayed in **Table 3.9-19**. Even though the greatest level of impacts are associated with Alternative IV-C, project effects on wildlife species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.7.6.2 and 3.7.6.6 and **Appendix C**).

Alternative Variations in Region IV

The types of impacts to big game species under the Marketplace Alternative Variation in Region IV generally would be the same as the comparable portions of Alternatives IV-B, but would differ in the amount of potential habitat disturbed (**Table 3.7-44**). Similar to the comparable portions of Alternatives IV-B, after considering design features and mitigation measures, impacts to game and nongame species from Project construction and operation would be limited primarily to habitat loss, fragmentation, mortality from collisions, and disturbance during routine maintenance activities.

Table 3.7-44 Summary of Region IV Alternative Variation Impact Parameters for Wildlife

Impact Parameters	Marketplace Alternative Variation			Comparable Portion of Alternative IV-B		
	Construction Impacts	Operation Impacts	Indirect Impacts	Construction Impacts	Operation Impacts	Indirect Impacts
Big Game Species						
Nevada desert bighorn sheep occupied habitat (acres)	21	4	2,230	0	0	0
Percentage of existing habitat within the Region IV big game analysis area	<0.01	<0.01	0.87	0	0	0
Small Game and Nongame Species						
Small game and nongame potential habitat (acres)[1]	117	10	3,121	1	<1	51
Percentage of potential habitat within the Region IV wildlife analysis area	0.01	<0.01	0.38	<0.01	<0.01	0.01
Waterfowl potential habitat[2]	0	0	0	0	0	0
Percentage of potential habitat within the Region IV wildlife analysis area	0	0	0	0	0	0
Relative Collision Potential for Migratory Birds						
Length of transmission line (miles)[3]	8			7		
Raptor Nests (Non-special Status)						
Number of raptor nests within 1 mile of the reference line	0			0		
Bird Habitat Conservation Areas						
BHCAs crossed by the 250-foot-wide transmission line ROW (acres)	0			0		
Percentage of existing habitat within the Region IV wildlife analysis area	0			0		
Audubon Important Bird Areas						
IBA (acres) within 2-mile transmission line corridor	0			0		
IBA (acres) within the Region IV wildlife analysis area	0			0		

[1] Vegetation communities/habitat categories used to calculate acreages of potential habitat disturbance include agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, conifer forest, deciduous forest, desert shrubland, dunes, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, riparian, pinyon-juniper, sagebrush shrubland, saltbush shrubland, tundra, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[2] Vegetation communities/habitat categories used to calculate acreages of waterfowl potential habitat disturbance include open water, herbaceous wetland, riparian, and woody riparian and wetlands. Further discussion of these vegetation communities is included in Section 3.5.6, Impacts to Vegetation.

[3] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

The Marketplace Alternative Variation is 8 miles in length and potential impacts to raptors and other migratory birds may occur as a result of collision and electrocution. After considering design features and proposed mitigation measures, impacts to raptors and other migratory birds from construction and operation of the Marketplace Alternative Variation would be limited primarily to habitat loss, fragmentation, mortality from collisions, negligible potential for electrocution, and disturbance during routine maintenance activities.

Table 3.7-44 provides a tabulation of impacts associated with the Marketplace Alternative Variation in Region IV.

Alternative Connectors in Region IV

The five alternative connectors would include minimal increases of total habitat disturbance relative to the total impacts associated with Region IV alternatives if they were to be utilized. These alternative connectors would cross occupied desert bighorn sheep habitat. **Table 3.7-45** summarizes impacts associated with the alternative connectors in Region IV.

Table 3.7-45 Summary of Region IV Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Analysis
Sunrise Mountain Alternative Connector	• Approximately 3 miles in length.[1] • Approximately 87 acres of construction; 8 acres of operation; and 2,208 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 34 acres of indirect impacts would occur to waterfowl potential habitat. • No raptor nests are within 1 mile of the reference line.
Lake Las Vegas Alternative Connector	• Approximately 4 miles in length.[1] • Approximately 24 acres of construction; 9 acres of operation; and 779 acres of indirect impacts to desert bighorn sheep occupied habitat would occur. • Approximately 115 acres of construction, 15 acres of operation, and 1,305 acres of indirect impacts to small game and nongame potential habitat would occur. • 118 acres of BHCAs are within the 250 foot-wide transmission line ROW. • No raptor nests are within 1 mile of the reference line.
Three Kids Mine Alternative Connector	• Approximately 5 miles in length.[1] • Approximately 69 acres of construction, 26 acres of operation, and 1,507 acres of indirect impacts to desert bighorn sheep occupied habitat would occur. • Approximately 166 acres of construction, 29 acres of operation, and 1,657 acres of indirect impacts to small game and nongame potential habitat would occur. • 118 acres of BHCAs are within the 250-foot-wide transmission line ROW. • No raptor nests are within 1 mile of the reference line.
River Mountains Alternative Connector	• Approximately 7 miles in length.[1] • Approximately 136 acres of construction, 56 acres of operation, and 5,904 acres of indirect impacts to desert bighorn sheep occupied habitat would occur. • Approximately 270 acres of construction, 54 acres of operation, and 5,537 acres of indirect impacts to small game and nongame potential habitat would occur. • Approximately 1 acre of construction, 0.1 acres of operation, and 11 acres of indirect impacts to waterfowl potential habitat would occur. • No raptor nests are within 1 mile of the reference line.
Railroad Pass Alternative Connector (Alts IV-A & IV-B)	• Approximately 3 miles in length.[1] • Approximately 20 acres of construction, 4 acres of operation, and 679 acres of indirect impacts to desert bighorn sheep occupied habitat would occur. • Approximately 10 acres of construction, 3 acres of operation, and 830 acres of indirect impacts to small game and nongame potential habitat would occur. • No raptor nests are within 1 mile of the reference line.

[1]Length refers to length of transmission lines, and serves as a proxy metric for avian collision potential.

3.7.6.7 Residual Impacts

Although it is anticipated that wildlife mitigation measures would be successfully implemented, some residual impacts to wildlife would occur. Wildlife injuries and mortalities are expected to occur as a result of collisions with transmission towers, guy wires, transmission lines, and wildlife potential vehicles. Quantification of these impacts is not presented in this analysis due to the lack of available data and the variability of wildlife populations.

It is anticipated that reclamation efforts would be successful and no residual impacts to habitats will occur. Timeframes for successful reclamation can vary by habitat type and initial impact intensity. During extended periods of reclamation, it is expected that habitat function may be reduced until reclamation is complete.

3.7.6.8 Impacts to Wildlife from the No Action Alternative

Under the No Action Alternative, the BLM would not issue a ROW grant or temporary use permit, the USFS would not issue a special use permit for the ROW on lands administered by the USFS, and the proposed Project would not be implemented. The analysis areas would continue to be subject to current authorizations and land uses (e.g., livestock grazing, agriculture, energy development, mining, etc.). The previously described impacts to wildlife associated with the development of the proposed Project would not occur.

3.7.6.9 Irreversible and Irretrievable Commitment of Resources

Construction and operation of any of the project alternatives would result in the irretrievable commitment of both wildlife and potential habitats during the life of the Project. Depending on the selection of alternatives, the amount of wildlife habitat irretrievably committed would range from 23,984 acres to 29,539 acres. However, as discussed **Appendix D**, it is anticipated that upon decommissioning of the Project reclamation measures would result in the return of impacted areas to native habitats. Some vegetation communities are expected to return to a native state within in a relatively short period of time (i.e., 5 years). Other more sensitive habitats, such as sagebrush shrublands, may require up to 50 years or longer to return to native conditions. Regardless of timeframes, it is possible that wildlife habitat lost during construction could return to pre-project conditions, thus avoiding any irreversible commitments of wildlife habitat.

3.7.6.10 Relationship Between Local Short-term Uses and Long-term Productivity

Wildlife habitat would be diminished due to local short-term and long-term uses until reclaimed areas return to mature vegetation communities. As discussed above, these temporal losses can vary in the time required to return to pre-construction conditions. This range of temporal loss is expected to be between 5 and 50 years, depending on the vegetation community. Construction and operation of any of the Project alternatives is anticipated to result in minor impacts to the short-term productivity of local migratory bird populations and sagebrush obligate wildlife species due to the loss of habitat resulting from construction and the avoidance of suitable habitats resulting from increased temporary disturbance levels. These impacts are expected to be limited to mortality resulting from collisions with Project infrastructure and avoidance due to increased levels of human activity and predation. Impacts from direct habitat loss are expected to be negligible as the total anticipated loss of wildlife habitat as a result of Project construction will be less than 1 percent of available potential habitats within the wildlife analysis area.

3.8 Special Status Wildlife Species

3.8.1 Regulatory Background

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the ESA and species designated as sensitive by the BLM and USFS. In addition, there are state-protected and sensitive wildlife lists for Colorado, Utah, and Nevada (Colorado Revised Statutes 33-2-105, Utah Rules R657-3, R657-19, R657-48, and Nevada Administrative Code 501.100-503.104) that include many of the BLM and USFS sensitive species as well as ESA-listed species.

In accordance with the ESA, the lead agencies (BLM and Western) and USFS, in coordination with the USFWS, must ensure that any action that they authorize, fund, or carry out is not likely to jeopardize a federally listed species or result in the destruction or adverse modification of critical habitat. In addition, as stated in the BLM's Special Status Species Management Policy 6840 (6840 Policy) (Rel. 6-125), it is BLM policy "to conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA provisions are no longer needed for these species, and to initiate proactive conservation measures that reduce or eliminate threats to BLM sensitive species to minimize the likelihood of and need for listing of these species under the ESA." The USFS Manual (FSM) 2670 states "Sensitive species of native plant and animal species must receive special management emphasis to ensure their viability and to preclude trends toward endangerment that would result in the need for Federal listing".

Regulations that directly influence special status wildlife species management decisions within the special status species wildlife analysis area are primarily implemented by the BLM, USFS, and state wildlife agencies, which consist of the WGFD, CPW (formerly CDOW), UDWR, and NDOW. Specific special status species statutes, regulations, and policies relevant to the proposed project are presented in **Table 3.8-1**.

Table 3.8-1 Statutes, Regulations, and Policies Relevant to Special Status Species

Topic	Statutes, Regulations, and Policies
Wildlife (mammals, birds, reptiles, terrestrial invertebrates)	• Endangered Species Act (ESA) of 1973; • Migratory Bird Treaty Act (16 USC 703 et seq.); • BLM Special Status Species Management Policy 6840 (6840 Policy) (Rel. 6-125); • U.S. Forest Service Manual (FSM) 2670; • Colorado Revised Statutes 33-2-105; • Utah Rules R657-3, R657-19, and R657-48; • Nevada Administrative Code 501.100-503.104; • Bald and Golden Eagle Protection Act (16 USC, § 668 et seq.); • BLM Instruction Memorandums (IM) 2010-012, 2010-156, 2012-043, and 2012-044; and • State of Wyoming Executive Order 2011-5.

The USFS further defines MIS for each national forest. A MIS is a plant or animal species selected because its status is believed to: 1) be indicative of the status of a larger group of species; 2) be reflective of the status of a key habitat type; or 3) act as an early warning of an anticipated stressor to ecological integrity. The key characteristics of MIS are that their status and trends provide insight to the integrity of the larger ecological system to which they belong. Wildlife species that have been selected as MIS for the National Forests crossed by the project are presented in **Table 3.8-2**. Seven MIS also are categorized as special status species and are addressed in this section. The remainder is presented in Section 3.7, Wildlife. Mule deer and Rocky Mountain elk are analyzed as big game species in Section 3.7, Wildlife.

Table 3.8-2 USFS Management Indicator Species for National Forests Crossed by the Project

Species/Habitat Association[1]	Scientific Name	Ashley National Forest Region II	Dixie National Forest Region III	Fishlake National Forest Region II	Manti-La Sal National Forest Region II	Uinta-Wasatch-Cache National Forest Region II
Mammals						
Abert's squirrel Habitat Association: 6	*Sciurus aberti*				MIS, but does not occur in analysis area of this national forest	
American beaver Habitat Association: 15,21	*Castor Canadensis*					MIS
Mule deer Refer to Section 3.7.4.1	*Odocoileus hemionus*	MIS	MIS	MIS	MIS, Big Game	
Elk Refer to Section 3.7.4.1	*Cervus Canadensis*	MIS	MIS	MIS	MIS, Big Game	
Birds						
Northern goshawk Habitat Association: 2, 5, 6	*Accipiter gentilis*	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I	MIS, USFS, BLM, NV-P, UT-SS Tier I
Golden eagle Habitat Association: 1, 4, 7, 10, 13, 14, 16, 18, 19, 20	*Aquila chrysaetos*	MIS, BLM			MIS, BLM	
Greater sage-grouse Habitat Association: 18	*Centrocercus urophasianus*	MIS, FC, BLM, USFS, UT-SS Tier I				
White-tailed ptarmigan Habitat Association: 20	*Lagopus leucura*	MIS				
Wild turkey Habitat Association: 1, 2, 5, 6, 7, 10, 11, 13, 16, 19, 21	*Meleagris gallopavo*		MIS			
Red-naped sapsucker Habitat Association: 2, 5, 6, 21	*Sphyrapicus nuchalis*	MIS, BLM				
Hairy woodpecker Habitat Association: 1, 2, 6, 16, 21	*Picoides villosus*			MIS		
American three-toed woodpecker Habitat Association: 5	*Picoides dorsalis*					MIS, BLM, USFS, UT-SS Tier II
Northern flicker Habitat Association: 1, 2, 5, 6, 12, 16, 21	*Colaptes auratus*		MIS			
Warbling vireo Habitat Association: 2, 16, 21	*Vireo gilvus*	MIS				
Western bluebird Habitat Association: 1, 2, 5, 6, 10, 13, 16, 19, 21	*Sialia Mexicana*			MIS		
Mountain bluebird Habitat Association: 1, 2, 5, 6, 10, 13, 16, 19, 21	*Sialia currucoides*			MIS		
Sage thrasher Habitat Association: 18	*Oreoscoptes montanus*			MIS, BLM		

Table 3.8-2 USFS Management Indicator Species for National Forests Crossed by the Project

Species/Habitat Association[1]	Scientific Name	Ashley National Forest Region II	Dixie National Forest Region III	Fishlake National Forest Region II	Manti-La Sal National Forest Region II	Uinta-Wasatch-Cache National Forest Region II
Yellow warbler Habitat Association: 2, 16, 19, 21	*Dendroica petechia*			MIS		
MacGillivray's warbler Habitat Association: 2, 16, 19, 21	*Oporornis tolmiei*			MIS		
Brewer's sparrow Habitat Association: 18	*Spizella breweri*			MIS		
Vesper sparrow Habitat Association: 1, 10, 13, 18	*Pooecetes gramineus*			MIS, BLM		
Song sparrow Habitat Association: 1, 2, 5, 6, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21	*Melospiza melodia*	MIS		MIS		
Lincoln's sparrow Habitat Association: 2, 12, 16, 19, 21	*Melospiza lincolnii*			MIS		

[1] Habitat association refers to vegetation communities (by number) as presented in **Table 3.7-2**.

Note: Status is defined as: BLM = BLM Sensitive, USFS = USFS Sensitive, UT-SS = Utah Sensitive Species (Tier I and Tier II species are defined in Utah's Comprehensive Wildlife Strategy), NV-P = Nevada State Protected.

3.8.2 Data Sources

Information regarding special status wildlife species and their habitat within the special status species analysis area was obtained from a review of existing published sources, BLM RMPs, USFS forest management plans, BLM, USFS, WGFD, CPW, UDWR, NDOW, and USFWS file information, as well as WYNDD, CNHP, UNHP, and NNHP database information. In addition, information resulting from correspondence with agency wildlife biologists was incorporated into this section, as appropriate. Species-specific surveys will be conducted, as appropriate, after the agency preferred alternative has been finalized and preliminary engineering is complete.

3.8.3 Analysis Areas

The special status wildlife species analysis areas are presented in **Table 3.8-3**.

Table 3.8-3 Analysis Areas for Special Status Wildlife Species

Species	Region	Analysis Area
Federally listed and Candidate Species		
Desert tortoise	III and IV	USGS model rankings 0.7 – 1.0.
California condor	III	HUC10 watersheds traversed by the route alternatives in Region III.
Greater sage-grouse	I, II, III	• Core Areas in Wyoming. • Preliminary Priority Habitat (PPH) and Preliminary General Habitat (PGH) in Colorado. • Occupied, brood-rearing, and wintering habitat in Utah.

Table 3.8-3 Analysis Areas for Special Status Wildlife Species

Species	Region	Analysis Area
• Whooping crane • Piping plover • Interior least tern	I	Potentially suitable wetlands and waterbodies within the Platte River watershed.
Yuma clapper rail	III, IV	Herbaceous wetland areas within 0.5 mile of the 2-mile transmission line corridor along the Muddy River in Nevada.
Western yellow-billed cuckoo	I, II, III, IV	Compare Natural Heritage data within a 0.5 mile buffer of perennial waterbodies with developed riparian vegetation within the HUC10 watersheds traversed by the route alternatives.
Mexican spotted owl	II, III	Modeled habitat in the Vernal Field Office.
Southwestern willow flycatcher	III, IV	The following Management Units within the Lower Colorado Recovery Unit: Pahranagat, Virgin, western portion of the Middle Colorado, Hooter-Parker, and southern portion of the Amargosa. Also included is the area within 0.5 mile of the riparian corridor, which is crossed by the Project at Newcastle Reservoir and Pinto Creek.
Black-footed ferret	I, II	Non-essential Experimental Population Areas in Utah and Colorado, Continental Divide (2), Dad, and Desolation Flats non-block cleared areas in Wyoming.
Canada lynx	I, II	Forested habitats in the HUC10 watersheds traversed by the route alternatives in Region II.
Utah prairie dog	II, III	West Desert Recovery Unit, Paunsaugunt Recovery Unit, Awapa Plateau Recovery Unit.
Gray wolf	I, II	HUC10 watersheds traversed by the route alternatives in Regions I and II.
BLM, USFS Sensitive, and State-Protected Species		
Mammals		
Bats	All	HUC10 watersheds traversed by the route alternatives.
• Dark kangaroo mouse • Desert Valley kangaroo mouse • Idaho pocket gopher • White-tailed prairie dog	All	HUC10 watersheds traversed by the route alternatives.
Pygmy rabbit	I, II, III	Sagebrush within HUC10 watersheds traversed by the route alternatives in Regions I, II, and III.
Fisher	II	Uintah/Wasatch/Cache National Forest, conifer forest habitat within HUC10 watersheds traversed by the route alternatives.
• Kit fox • Swift fox	All	Suitable habitat within species' respective ranges in HUC10 watersheds traversed by the route alternatives.
Wolverine	I, II	• Ashley National Forest. • Tundra and conifer forest in CO within HUC10 watersheds traversed by the route alternatives.
River otter	I, II	Open water and woody riparian vegetation communities in HUC10 watersheds traversed by the route alternatives in Regions I and II.
Desert bighorn sheep	II, III, IV	• Big Game Management Units in Colorado, Utah, and Nevada. • Dixie, Fishlake and Manti-La Sal national forests.
Rocky Mountain bighorn sheep	I, II, III	• Big Game Management Units in Wyoming, Colorado, and Utah. • Ashley and Uintah/Wasatch/Cache national forests.

Table 3.8-3 Analysis Areas for Special Status Wildlife Species

Species	Region	Analysis Area
Raptors and Other Migratory Birds		
Birds except federally listed and candidate species[1]	All	• HUC10 watersheds traversed by the route alternatives. • Ashley, Dixie, Fishlake, Manti-La Sal, and Uintah/Wasatch/Cache national forests.
Reptiles		
Reptiles	All	HUC10 watersheds traversed by the route alternatives.
Terrestrial Invertebrates		
Terrestrial invertebrates	All	HUC10 watersheds traversed by the route alternatives.
USFS MIS Species (Those not addressed in Section 3.7)		
Northern goshawk	II and III	Suitable habitat within the Ashley, Dixie, Fishlake, Manti-La Sal, and Uintah/Wasatch/Cache national forests.
Golden eagle	II and III	• HUC10 watersheds traversed by the route alternatives. • Suitable habitat within the Ashley and Manti-La Sal national forests.
Red-naped sapsucker	II	Suitable habitat within the Ashley National Forest.
• Sage thrasher • Vesper sparrow	II	Suitable habitat within the Fishlake National Forest.
American three-toed woodpecker	II	Suitable habitat within the Uintah/Wasatch/Cache National Forest.

[1] The greater sage-grouse also is classified as an MIS for the Ashley National Forest, but the greater sage-grouse analysis area is defined more specifically as a candidate species.

The special status wildlife analysis area is defined as suitable habitat within the HUC 10 watershed areas crossed by the Project. This area is referred to as the special status wildlife analysis area. The HUC 10 watershed areas provide a clear delineation of vegetation communities supporting wildlife habitat that are separated by distinct geographical features, such as elevation and topography. Other special status species with more limited ranges and/or specifically defined habitat preferences are accorded more detailed analysis areas (**Table 3.8-3**). Section 3.4, Water Resources, presents tables and figures of HUC 10 watersheds in the wildlife analysis area.

The MIS Analysis Area for USFS MIS includes suitable habitat within the entire national forest(s) for which they are identified. This MIS Analysis Area was chosen because it allows disclosure of the context of impacts within the unique requirements of the USFS for monitoring and managing MIS species within the jurisdiction of NFS lands. The exceptions are mule deer and Rocky Mountain elk, which are analyzed under the big game analysis areas described in Section 3.7, Wildlife.

Special status wildlife analysis areas were chosen because they represent the combination of geographic areas containing habitats that would be impacted by the proposed Project, as well as management considerations to which these habitats are subject. Accordingly, these analysis areas provide a clear disclosure of the context of Project impacts in light of the management considerations for these areas.

Table 3.8-4 presents the acreages of the major vegetation communities present within the special status wildlife analysis area. These acreages also are presented in **Table 3.7-2**.

Table 3.8-4 Vegetation Communities Within the Special Status Wildlife Analysis Area

Vegetation Community	Acres Within the Special Status Wildlife Analysis Area[1]	Percent of the Special Status Wildlife Analysis Area
1. Agricultural Land	784,433	3.1
2. Aspen Forest and Woodland	641,483	2.6
3. Barren/Sparsely Vegetated	321,697	1.3
4. Cliff and Canyon	816,392	3.3
5. Conifer Forest	539,604	2.2
6. Deciduous Forest	13,933	0.1
7. Desert Shrubland	3,074,124	12.3
8. Developed/Disturbed Land[2]	988,126	4.0
9. Dunes	133,157	0.5
10. Grassland	1,537,916	6.2
11. Greasewood Flat	875,991	3.5
12. Herbaceous Wetland	188,239	0.8
13. Montane Grassland	70,313	0.3
14. Montane Shrubland	875,292	3.5
15. Open Water	154,328	0.6
16. Pinyon-juniper	4,081,539	16.4
17. Riparian	68,489	0.3
18. Sagebrush Shrubland	6,539,728	26.2
19. Saltbush Shrubland	2,991,796	12.0
20. Tundra	13,956	0.1
21. Woody Riparian and Wetlands	214,144	0.9
Total	24,924,680	100.0

[1] The special status wildlife analysis area includes suitable habitat within the HUC10 watershed areas crossed by the Project.

[2] The developed/disturbed vegetation community is not considered to be typical wildlife habitat and is not included in analyses.

Sources: USGS 2010, 2005, 2004 (SWReGAP and NWReGAP).

Table 3.8-5 presents the acreages of the major vegetation communities present within each national forest crossed by the Project. These acreages also are presented in **Table 3.7-3**.

3.8.4 Baseline Description

A total of 129 special status wildlife species were identified as potentially occurring within the special status wildlife analysis area. These species, their associated habitats, and their potential for occurrence in the special status wildlife analysis area are summarized in **Appendix G**, **Table G-2**. Occurrence potential within the special status wildlife analysis area was evaluated for each species based on its habitat requirements and known distribution. Based on these parameters, nine special status wildlife species (Aegialian scarab beetle, Gunnison sage-grouse, Baird's sparrow, Preble's meadow jumping mouse, Preble's shrew, silky pocket mouse, Mexican vole, Gunnison's prairie dog, and black-tailed prairie dog) have been eliminated from detailed analysis, as discussed in **Appendix G**, **Table G-2**. The basis for elimination of a species is that the special status wildlife analysis area does not include the geographic

Table 3.8-5 Vegetation Communities Within National Forests Crossed by the Project

Vegetation Community	Ashley National Forest Region II		Dixie National Forest Region III		Fishlake National Forest Region II		Manti-La Sal National Forest Region II		Uinta-Wasatch-Cache National Forest Region II	
	Acres	Percent of Forest	Acres	Percent of Forest	Acres	Percent of Forest	Acres	Percent of Forest	Acres	Percent of Forest
Agriculture	2,691	0.2	629	<0.1	623	<0.1	1,466	0.1	290	<0.1
Aspen Forest and Woodland	102,261	7.7	196,825	10.5	196,958	13.5	234,483	17.5	231,663	25.9
Barren/Sparsely Vegetated	136,429	10.2	26,266	1.4	11,977	0.8	16,519	1.2	11,182	1.2
Cliff and Canyon	39,266	2.9	93,023	4.9	38,891	2.7	43,352	3.2	25,335	2.8
Conifer Forest	543,194	40.7	537,641	28.5	224,021	15.4	289,618	21.7	114,549	12.8
Deciduous Forest	1,125	0.1	0	0.0	1	<0.1	0	0.0	28,171	3.1
Desert Shrubland	0	0.0	5,265	0.3	121	<0.1	1	<0.1	0	0.0
Developed/Disturbed[1]	42,056	3.1	26,479	1.4	28,664	2.0	4,505	0.3	497	0.1
Dunes	23	<0.1	2	<0.1	0	0.0	0	0.0	0	0.0
Grassland	1,591	0.1	2,010	0.1	7,453	0.5	104	<0.1	3,211	0.4
Greasewood Flat	1,891	0.1	19	<0.1	306	<0.1	80	<0.1	0	0.0
Herbaceous Wetland	28,424	2.1	4,438	0.2	4,530	0.3	2,789	0.2	15,225	1.7
Montane Grassland	25,557	1.9	12,854	0.7	9,129	0.6	26,225	2.0	26,455	3.0
Montane Shrubland	36,831	2.8	106,207	5.6	211,109	14.5	230,868	17.3	168,362	18.8
Open Water	21,383	1.6	2,445	0.1	4,334	0.3	2,282	0.2	16,673	1.9
Pinyon-Juniper	104,031	7.8	521,470	27.7	426,154	29.3	265,022	19.8	50,613	5.7
Riparian	119	<0.1	0	0.0	0	0.0	0	0.0	0	0.0
Sagebrush Shrubland	200,159	15.0	315,223	16.7	270,972	18.6	192,203	14.4	187,523	20.9
Saltbush Shrubland	15,422	1.2	497	<0.1	2,738	0.2	2,814	0.2	71	<0.1
Tundra	17,639	1.3	16,504	0.9	7,664	0.5	18,793	1.4	57	<0.1
Woody Riparian and Wetlands	15,120	1.1	15,660	0.8	8,234	0.6	6,028	0.5	15,377	1.7
Totals	**1,335,210**	**100**	**1,883,453**	**100**	**1,453,879**	**100**	**1,337,152**	**100**	**895,255**	**100**

[1] Developed/disturbed land is not considered to be typical wildlife habitat and is not included in analyses.

range of the species. In addition, the whooping crane, interior least tern, and piping plover do not occur in the special status wildlife analysis area, but are included because of the water depletion evaluation requirement in the Platte River Basin. Special status wildlife species carried forward in this EIS include 38 mammals, 51 birds, 19 reptiles, and 12 terrestrial invertebrates, for a total of 120 species (**Table 3.8-6**).

Table 3.8-6 Species Potentially Occurring in the Special Status Wildlife Analysis Area

Common Name	Scientific Name	Status[1]
Mammals		
Allen's big-eared bat	*Idionycteris phyllotis*	BLM; NV-P; UT-SS - Tier II
Big brown bat	*Eptesicus fuscus*	BLM
Big free-tailed bat	*Nyctinomops macrotis*	BLM; UT-SS - Tier II
Brazilian free-tailed bat	*Tadarida braziliensis*	BLM
California leaf-nosed bat	*Macrotus californicus*	NV-P
California myotis	*Myotis californicus*	BLM
Cave myotis	*Myotis velifer*	BLM
Fringed myotis	*Myotis thysanodes*	BLM; UT-SS; NV-P
Greater western mastiff bat	*Eumops perotis*	BLM; NV-P
Hoary bat	*Lasiurus cinereus*	BLM
Long-eared myotis	*Myotis evotis*	BLM
Long-legged myotis	*Myotis volans*	BLM
Pallid bat	*Antrozous pallidus*	BLM
Silver-haired bat	*Lasionycteris noctivagans*	BLM
Spotted bat	*Euderma maculatum*	BLM; USFS; UT-SS - Tier II; NV-P
Townsend's (Western) big-eared bat	*Corynorhinus townsendii*	BLM; USFS; UT-SS - Tier II; NV-P
Western pipistrelle	*Pipistrellus hesperus*	BLM
Western red bat	*Lasiurus blossevillii*	BLM; UT-SS - Tier II; NV-P
Western small-footed myotis	*Myotis ciliolabrum*	BLM
Yuma myotis	*Myotis yumanensis*	BLM
Black-footed ferret	*Mustela nigripes*	EXP/NE; BLM; UT-SS; CO-SE
Canada lynx	*Lynx canadensis*	FT; BLM; UT-SS - Tier I; CO-SE
Fisher	*Martes pennanti*	USFS
Gray wolf	*Canis lupus*	FE in CO and portions of UT; BLM; UT-SS - Tier I
Kit fox	*Vulpes macrotis*	BLM; UT-SS - Tier II; CO-SE
River otter	*Lontra canadensis*	BLM; CO-ST
Swift fox	*Vulpes velox*	BLM
Wolverine	*Gulo gulo*	FC; USFS; CO-SE
Desert bighorn sheep	*Ovis canadensis nelsoni*	BLM; USFS
Rocky Mountain bighorn sheep	*Ovis canadensis*	BLM; USFS
Dark kangaroo mouse	*Microdipodops megacephalus*	BLM; UT-SS - Tier II
Pale kangaroo mouse	*Microdipodops pallidus*	BLM
Desert Valley kangaroo mouse	*Microdipodops megacephalus albiventer*	BLM; NV-P
Idaho pocket gopher	*Thomomys idahoensis*	BLM
Utah prairie dog	*Cynomys parvidens*	FT; BLM; UT-SS - Tier I
White-tailed prairie dog	*Cynomys leucurus*	BLM; UT-SS - Tier II
Wyoming pocket gopher	*Thomomys clusius*	BLM
Pygmy rabbit	*Brachylagus idahoensis*	BLM; USFS; UT-SS - Tier II
Birds		
American white pelican	*Pelecanus erythrorhynchos*	BLM, UT-SS – Tier I
Least bittern	*Ixobrychus exilis*	BLM; NV-P
White-faced ibis	*Plegadis chihi*	BLM
California condor	*Gymnogyps californianus*	FE; EXP/NE-UT; BLM; UT-SS - Tier I

Table 3.8-6 Species Potentially Occurring in the Special Status Wildlife Analysis Area

Common Name	Scientific Name	Status[1]
Trumpeter swan	*Cygnus buccinator*	BLM
Barrow's goldeneye	*Bucephala islandica*	BLM
Bald eagle	*Haliaeetus leucocephalus*	BLM; USFS; CO-ST; NV-P; UT-SS - Tier I
Northern goshawk	*Accipiter gentilis*	BLM; USFS; MIS; NV-P; UT-SS - Tier I
Swainson's hawk	*Buteo swainsoni*	BLM
Ferruginous hawk	*Buteo regalis*	BLM; NV-P; UT-SS - Tier II
Golden eagle	*Aquila chrysaetos*	BLM, MIS
Peregrine falcon	*Falco peregrinus*	BLM; USFS; NV-P
Prairie falcon	*Falco mexicanus*	BLM
Greater sage-grouse	*Centrocercus urophasianus*	FC; BLM; USFS, MIS; UT-SS - Tier II
Columbian sharp-tailed grouse	*Tympanuchus phasianellus columbianus*	BLM; UT-SS - Tier II
Yuma clapper rail	*Rallus longirostris yumanensis*	FE; NV-P
Whooping crane[2]	*Grus americana*	FE; CO-SE; UT-SS - Tier I
Western snowy plover	*Charadrius alexandrinus nivosus*	BLM
Piping plover[2]	*Charadrius melodus*	FT; CO-ST
Mountain plover	*Chardrius montanus*	BLM; UT-SS
Long-billed curlew	*Numenius americanus*	BLM; UT-SS - Tier II
Interior least tern[2]	*Sternula antillarum*	FE; CO-SE
Black tern	*Chlidonias niger*	BLM
Yellow-billed cuckoo (western)	*Coccyzus americanus*	FC; BLM; USFS; NV-P; UT-SS – Tier I
Flammulated owl	*Otus flammeoulus*	BLM; USFS
Burrowing owl	*Athene cunicularia*	BLM; CO-ST; UT-SS - Tier II
Mexican spotted owl	*Strix occidentalis lucida*	FT; BLM; CO-ST; UT-SS
Long-eared owl	*Asio otus*	BLM
Short-eared owl	*Asio flammeus*	BLM; UT-SS - Tier II
Boreal owl	*Aegolius funereus*	USFS
Black swift	*Cypseloides niger*	BLM; UT-SS - Tier II
Lewis's woodpecker	*Melanerpes lewis*	BLM; UT-SS - Tier II
Red-naped sapsucker	*Sphyrapicus nuchalis*	BLM, MIS
American three-toed woodpecker	*Picoides dorsalis*	BLM; USFS; MIS; UT-SS - Tier II
Southwestern willow flycatcher	*Empidonax traillii extimus*	FE; BLM; UT-SS - Tier I; CO-SE; NV-P
Loggerhead shrike	*Lanius ludovicianus*	BLM
Gray vireo	*Vireo vicinior*	BLM
Pinyon jay	*Gymnorhinus cyanocephalus*	BLM
Juniper titmouse	*Baeolophus griseus*	BLM
Sage thrasher	*Oreoscoptes montanus*	BLM, MIS
Bendire's thrasher	*Toxostoma bendirei*	BLM; NV-P
Crissal thrasher	*Toxostoma crissale*	BLM
Le Conte's thrasher	*Toxostoma lecontei*	NV-P; BLM
Phainopepla	*Phainopepla nitens*	BLM; NV-P
Lucy's warbler	*Vermivora luciae*	BLM
Yellow-breasted chat	*Icteria virens*	BLM
Brewer's sparrow	*Spizella breweri*	BLM, MIS
Vesper sparrow	*Pooecetes gramineus*	BLM, MIS
Sage sparrow	*Amphispiza belii*	BLM
Grasshopper sparrow	*Ammodramus savannarum*	BLM; UT-SS - Tier II
Bobolink	*Dolichonyx oryzivorus*	BLM; UT-SS - Tier II
Reptiles		
Banded Gila monster	*Heloderma suspectum cinctum*	BLM; NV-P

Table 3.8-6 Species Potentially Occurring in the Special Status Wildlife Analysis Area

Common Name	Scientific Name	Status[1]
Chuckwalla	*Sauromalus obesus*	BLM; UT-SS - Tier II
Corn snake	*Elaphe guttata*	BLM; UT-SS - Tier II
Desert iguana	*Dipsosaurus dorsalis*	BLM; UT-SS - Tier II
Desert night lizard	*Xantusia vigilis*	BLM; UT-SS - Tier II
Desert tortoise	*Gopherus agassizii*	FT; BLM; UT-SS - Tier I; NV-P
Long-nosed leopard lizard	*Gambelia wislizenii*	BLM
Midget faded rattlesnake	*Crotalus viridis concolor*	BLM
Utah milk snake	*Lampropeltis triangulum taylori*	BLM
Mojave rattlesnake	*Crotalus scutulatus*	BLM; UT-SS - Tier II
Sidewinder	*Crotalus cerastes*	BLM; UT-SS - Tier II
Smooth greensnake	*Opheodrys vernalis*	BLM; UT-SS - Tier II
Speckled rattlesnake	*Crotalus mitchellii*	BLM; UT-SS - Tier II
Desert glossy snake	*Arizona elegans eburnata*	BLM
Western banded gecko	*Coleonyx variegates*	BLM; UT-SS - Tier II
Western red-tailed skink	*Eumeces gilberti rubricaudatus*	BLM
Western threadsnake (blindsnake)	*Leptotyphlops humilis*	BLM; UT-SS - Tier II
Zebra-tailed lizard	*Callisaurus draconoides*	BLM; UT-SS - Tier II
Mojave shovel-nosed snake	*Chionactis occipitalis occipitallis*	BLM
Terrestrial Invertebrates		
Eureka mountainsnail	*Oreohelix eurekensis*	BLM; UT-SS
Great Basin silverspot (Nokomis fritillary) butterfly	*Speyeria nokomis nokomis*	BLM
Great Basin small blue (Small blue) butterfly	*Philotiella speciosa septentrionalis*	BLM
Grey's silverspot (Grey's fritillary) butterfly	*Speyeria hesperis greyi*	BLM
Honey Lake blue butterfly	*Euphilotes pallescens calneva*	BLM
MacNeill sooty wing skipper (MacNeill saltbush sootywing) butterfly	*Hesperopsis gracielae*	BLM
Mojave gypsum bee	*Andrena balsamorhizae*	BLM
Mojave poppy bee	*Perdita meconis*	BLM
Mono Basin Skipper (Railroad Valley skipper) butterfly	*Hesperia uncas giulianii*	BLM
Northern Mojave blue (Mojave blue) butterfly	*Euphilotes mojave virginensis*	BLM
Rice's blue butterfly	*Euphilotes pallescens ricei*	BLM
White River wood nymph butterfly	*Cercyonis pegala pluvialis*	BLM

[1] Status: FE = Federally Endangered; FT = Federally Threatened; FC = Federal Candidate; FP = Federal Proposed for listing; EXP/NE = Experimental Non-essential population; BLM = BLM Sensitive; USFS = USFS Sensitive; MIS = USFS Management Indicator Species, CO-E = Colorado State Endangered; CO-T = Colorado State Threatened; NV-P = Nevada State-Protected; UT-SS = Utah Sensitive Species (Tier I and Tier II species are defined in Utah's Comprehensive Wildlife Strategy).

[2] Species is included because of the water depletion evaluation requirement in the Platte River Basin.

3.8.4.1 Federally Listed and Candidate Wildlife Species

A total of 11 federally listed wildlife species (one reptile, seven birds, and three mammals) occur within the special status wildlife analysis area, as well as three federal candidate species (greater sage-grouse, western yellow-billed cuckoo, and wolverine). A summary of the listing status, habitat, and general distribution for the federally listed and federal candidate wildlife species is provided below.

Desert Tortoise (Threatened)

The Mojave population of desert tortoise was designated as threatened in 1989 (54 FR 32326). On October 13, 1989, the USFWS published a proposed rule to list the Mojave population as threatened, but because the emergency rule expired on April 2, 1990, it was necessary to publish the final rule on the same day, in order to prevent a lapse in protection for the tortoise (55 FR 12178). In 1993, a Draft

Recovery Plan was issued. Critical habitat was designated in 1994, encompassing 6.4 million acres within six management units across California, Nevada, Utah, and Arizona (59 FR 5820). In 2011, the USFWS issued a Final Revised Recovery Plan which reduced to five the number of recovery units, and changed some boundaries of the 1994 recovery units (USFWS 2011a).

The desert tortoise inhabits the Mojave and Sonoran deserts of the United States and Mexico. Tortoises of the Mojave population are found primarily in desert shrubland. Typical habitat for the desert tortoise in the Mojave Desert has been characterized as creosote bush scrub below 5,500 feet amsl; where annual precipitation ranges from 2 to 8 inches; the diversity of perennial plants is relatively high; and production of ephemerals is high. In the Mojave Desert, tortoises occur most commonly on gently sloping terrain with sandy-gravel soils and where there is sparse cover of low-growing shrubs, which allows establishment of herbaceous plants. Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse (USFWS 2011a).

Adequate burrowing substrate and plants that can provide thermal cover are crucial habitat components for the desert tortoise. In the Mojave region, desert tortoises will construct their own burrows to avoid extreme hot or cold temperatures. Mojave desert tortoises often excavate burrows under vegetation, extending up to 33 feet. In addition to burrows, desert tortoises also construct shallow depressions (pallets) under low shrubs to serve as temporary resting sites.

The USGS has developed a habitat model that ranks desert tortoise potential habitat on a scale from 0 to 1, with 1 being greatest. The desert tortoise analysis area includes areas of high quality habitat that the USGS habitat model values 0.7 to 1.0. The entire desert tortoise analysis area is located within the northeastern Mojave Desert Recovery Unit (USFWS 2008a). Critical habitat units within this recovery unit, and within the desert tortoise analysis area are: 1) Gold Butte-Pakoon Unit, Clark County, Nevada; 2) Beaver Dam Slope Unit, Lincoln, County, Nevada; 3) Beaver Dam Slope Unit, Washington County, Utah; and 4) Mormon Mesa Unit, Clark and Lincoln counties, Nevada (59 FR 5820).

California Condor (Endangered; EXP/NE)

The California condor was designated as endangered on March 11, 1967 (FR 32: 4001). Despite protection, populations continued to decline, and by 1982 only 22 wild condors remained (AZGFD 2008; Peregrine Fund 2008). A decision was made to rely on captive breeding programs for recovery of the species, and the last wild condor was brought into captivity in 1987. In 1992, releases to the wild began in central and southern California, followed by releases in the Vermilion Cliffs area of Arizona in 1996 and in Baja California in 2002.

A special provision of the ESA, the 10(j) rule, allows for the designation of non-essential populations (NEP) of listed species (AZGFD 2008), and re-introduction efforts for the condor were developed under this rule. This listing covers only those populations within the U.S. and excludes the NEPs in specific portions of Arizona, Nevada, and Utah (61 Fed. Reg. 54043-54060). Current re-introduced condor populations are considered 10(j) populations, except where they occur within National Parks where, as noted below, they receive protection under the ESA endangered status.

In Utah, the condor population is considered an NEP south of Interstate 70 and east of Interstate15, except within National Parks. Any condors occurring outside of the experimental population area, including those on National Park lands, are protected under the ESA. In March 2009, a 5-Year Review of the status of the California condor was initiated. Critical habitat is not present within the California condor analysis area. The current recovery plan for the species was issued in April 1996 (Third Revision).

California condors occupy remote rugged areas at low to moderate elevation that support large mammals, which they consume as carrion. These birds require cliff sites or caves for nesting and cliffs, tall conifers, or snags for roosting (Snyder and Rea 1998). Because they are such large birds, they typically select roosting sites near cliffs where updrafts provide adequate lift for them to take flight (AOU 2004;

AZGFD 2008, 2004; Snyder and Rea 1998; USFWS 1996). The California condor analysis area is the HUC 10 watersheds crossed by the Project in Region III.

As of March, 2011, there were 97 wild condors in California, 74 in Arizona, and 20 in Baja California, for a total of 191 wild condors (AZGFD 2008). The current range of the condor population in Arizona is centered on the Colorado River Basin in northern Arizona and southern Utah. This population occurs outside the California condor analysis area, however; condors regularly forage, roost, and may nest in southern Utah. Condors commonly occur in Utah between April and November, but peak numbers usually occur from June through August. Condors can travel up to 200 miles in a day (UDNR 2011). Therefore, they could occur within the California condor analysis area (Gorell et al. 2005).

Greater Sage-grouse (Candidate)

Sagebrush steppe habitats across the western U.S. have been substantially altered, fragmented, and lost due to the introduction of invasive plant species, changes in fire regimes, and direct removal resulting from changes in land use (Knick et al. 2003; Knick and Connelly 2011). On February 26, 2008, the USFWS initiated a status review to determine whether the greater sage-grouse warranted protection under the ESA (73 FR 10218). On March 5, 2010, the USFWS determined that the greater sage-grouse warrants protection under the ESA; however, listing was precluded by the need to take action on other species facing more immediate and severe extinction threats. The USFWS concluded that the greater sage-grouse would be added to the candidate species list. Therefore, greater sage-grouse in Wyoming, Colorado, and Utah continue to be managed by the WGFD, CPW, and UDWR, respectively. Greater sage-grouse populations in Nevada are managed by NDOW and do not occur in areas potentially impacted the project. Currently, federally listed candidate species receive no statutory protection under ESA. Conservation efforts for this species in Wyoming, Colorado, and Utah are currently coordinated by the WGFD, CPW, and UDWR in cooperation with the USFWS, BLM, USFS, and greater sage-grouse working groups in an attempt to increase population levels and avoid federal listing under the ESA.

In an effort to prevent federal listing of the greater sage-grouse, Wyoming, Utah, Colorado, and Nevada have developed Greater Sage-grouse Management/Conservation Plans that outline goals and objectives for managing the species (CGSSC 2008; South Central Sage-grouse Working Group 2007; Southwest Wyoming Local Sage-grouse Working Group 2007; State of Nevada 2012; UDWR 2009). In addition, the Wyoming BLM and the State of Wyoming have issued several regulations regarding management of the greater sage-grouse in Wyoming. BLM Instruction Memoranda (IM) 2010-012, 2012-043, 2012-044, 2012-019, and State of Wyoming Executive Order 2011-5 include specific protection measures guiding development in greater sage-grouse habitat, specifically in core population areas. The WGFD has developed a map of greater sage-grouse core population areas in Wyoming. Greater sage-grouse core population areas include areas with the highest densities of breeding greater sage-grouse in the state, as well as areas important for connectivity between populations. The core population areas include roughly 25 percent of the state but contain 83.1 percent of the greater sage-grouse population in Wyoming.

BLM IM 2012-043 and BLM IM 2012-019 provide direction to field managers to ensure that interim conservation procedures are implemented when field offices authorize or carry out activities on public land while the BLM reviews how to best incorporate long-term conservation measures for greater sage-grouse into applicable Land Use Plans (LUPs). These interim conservation measures are consistent with the BLM's National Strategy for protecting and managing greater sage-grouse and incorporate the following principles:

1. Protection of un-fragmented habitats;
2. Minimization of habitat loss and fragmentation; and
3. Management of habitats to maintain, enhance, or restore conditions that meet greater sage-grouse life history needs.

BLM IM 2012-043 identifies policies and procedures that are to be applied to on-going and proposed BLM activities within areas identified as PPH and PGH. PPH consists of areas that have been identified as having the highest conservation value for maintaining sustainable greater sage-grouse populations. These areas include breeding, nesting, brood-rearing, and wintering habitats. PGH is identified as all other areas occupied either seasonally or year-round by greater sage-grouse. Among the conservation policies and procedures presented in BLM IM 2010-043, those that apply to the Project direct the BLM to:

1. Provide documentation of reasoning for ROW determinations and to require the ROW holder to implement measures to minimize impacts to greater sage-grouse habitat;
2. In cooperation with respective state wildlife agencies, consider the opportunities for both on-site and off-site mitigation measures to avoid or minimize habitat and population level impacts; and
3. In cooperation with respective state wildlife agencies, determine that the proposed ROW would cumulatively maintain or enhance greater sage-grouse habitat.

BLM IM 2012-044 provides the BLM direction to incorporate conservation measures identified in the 2011 report on national greater sage-grouse conservation measures published by the Sage-grouse National Technical Team (NTT 2011). NTT conservation measures relating to ROWs include:

1. Designating priority greater sage-grouse habitat areas as exclusion areas for new ROW permits;
2. Evaluating the feasibility of removing, burying, or modifying existing power lines within priority greater sage-grouse habitat; and
3. Designating greater sage-grouse general habitat areas as avoidance areas for new ROW permits.

Lekking/Breeding/Nesting Habitat

The center of breeding activity for the greater sage-grouse is referred to as a strutting ground or lek. Leks are characterized as flat, sparsely vegetated areas within large tracts of sagebrush (Connelly et al. 2004). Males begin to appear on leks in March, with peak attendance of Utah leks occurring in late-March and peak attendance in Colorado and Wyoming leks occurring in April (CGSSC 2008; UDWR 2009; WGFD 2003). Nesting generally commences 1 to 2 weeks after mating and may continue as late as early June (UDWR 2009). Greater sage-grouse nesting habitat typically is centered around active leks and consists of medium to tall sagebrush with a perennial grass understory (Connelly et al. 2000). Studies have shown that taller sagebrush with larger canopies and more residual understory cover usually lead to higher nesting success for this species (Connelly et al. 2004, 2000).

Brood-Rearing Habitat

During late spring and summer, hens and broods typically are found in more lush habitats consisting of a high diversity of grasses and forbs that attract insects. These habitats include wet meadows, riparian areas, and irrigated farmland within or near sagebrush. Hens with broods utilize these habitats until forbs desiccate and insect abundance decreases. Unsuccessful hens and cocks also will utilize these same habitats; however, due to their nutritional flexibility, they are able to occupy a wider variety of habitats during the spring and summer months (Connelly et al. 2004). In many greater sage-grouse populations, limited availability of high quality brood-rearing habitat often negatively impacts recruitment. Factors affecting the availability of brood-rearing habitat include drought, non-native grass and weed invasions, overgrazing associated with historic improper range management strategies (Oakleaf 1971; Klenbow 1985, 1982), and sagebrush removal.

Wintering Habitat

Depending on the severity of the winter, greater sage-grouse move to south- and west-facing slopes that maintain exposed sagebrush. Studies have shown that south-facing slopes with sagebrush at least 10 to

12 inches above the snow level are required for both food and cover. Windswept ridges, draws, and swales also may be used, especially if these areas are in close proximity to exposed sagebrush (Connelly et al. 2004). In years with severe winter conditions (i.e., deep snow), greater sage-grouse often gather in large flocks in areas with the highest quality winter habitat. It is suggested that high quality winter habitat is limited in portions of the greater sage-grouse's range (Connelly et al. 2000). Wintering habitat for greater sage-grouse has been defined for populations in Colorado and Utah, and is currently being defined for populations in Wyoming (WGFD 2012).

Overall Species Range

In Wyoming, the greater sage-grouse occurs throughout the state in appropriate habitat (Cervoski 2004). Colorado is on the southeastern edge of the known distribution for this species. Within the greater sage-grouse analysis area in Colorado, the species is likely to be found in Moffat and Rio Blanco counties (CGSSC 2008). Scattered populations of greater sage-grouse occur throughout Utah, excluding the Colorado Plateau region in the southeastern portion of the state. The largest populations within the Utah portion of the greater sage-grouse analysis area are in Uintah County, but smaller populations occur throughout central and southern portions of the state (UDWR 2009). The species also occurs outside of the greater sage-grouse analysis area in central Nevada, southern Idaho, southeastern Oregon, central Washington, eastern Montana, western North Dakota, western South Dakota, and northeastern California. The greater sage-grouse analysis area includes core areas within HUC 10 watersheds crossed by the Project in Wyoming, PPH and PGH within HUC 10 watersheds crossed by the Project in Colorado, and occupied (includes brood-rearing and wintering) habitat Utah. In Nevada, Alternative III-C crosses the southern boundary of the Lincoln Sage Grouse PMU but does not cross any occupied greater sage-grouse habitat.

Whooping Crane (Endangered)

The whooping crane was listed as endangered on March 11, 1967 (32 FR 4001). In May 2007, the third revision of the Whooping Crane Recovery Plan was issued (72 FR 29544). Critical habitat for the whooping crane is not present in the special status wildlife analysis area (USFWS 2011b). As of August 2011, the total population of whooping cranes in the wild was estimated at 437.

Whooping cranes nest in, and adjacent to, the Aransas-Wood Buffalo National Park (AWBP) in Canada, and winter in coastal marshes in Texas at the Aransas National Wildlife Refuge (USFWS 2011b). During spring and fall migration, the AWBP whooping crane population migrates through the central Great Plains. Birds from the AWBP population depart from their wintering grounds in Texas starting in late March through the beginning of May. Fall migration typically begins in mid-September, with most birds arriving on wintering grounds between late October and mid-November (CWS and USFWS 2005).

Whooping cranes utilize a variety of habitats during migration, including freshwater marshes, wet prairies, shallow portions of rivers, reservoirs, lakes, and lagoons; and forage in grain and stubble fields. Whooping cranes roost on submerged or barren sandbars.

The occurrence of this species within the special status wildlife analysis area would be limited to accidental migrants from the Aransas-Wood Buffalo population, and is highly unlikely. No new depletions will occur by the proposed Project in the Platte River system in Wyoming. No impacts are expected to the whooping crane and no whooping crane analysis area has been defined for the Project.

Yuma Clapper Rail (Endangered)

The Yuma clapper rail was designated as endangered on March 11, 1967 (32 FR 4001).This listing protects only the populations in California and Arizona; Mexican populations are not protected. No critical habitat has been designated for this subspecies. The Yuma Clapper Rail Recovery Plan was issued in 1983. A draft Revised Recovery Plan was issued on February 10, 2010.

The Yuma clapper rail is a subspecies of clapper rail. This subspecies breeds and forages in freshwater marshes with dense vegetation exceeding 16 inches in height, and water depth of 12 inches or less. Important habitat components include pond openings, flowing channels, and emergent soils. Yuma clapper rails that remain near their breeding grounds through the winter occupy tall, dense bulrush/cattail stands. They also utilize flooded salt cedar and willow stands (Rosenberg et al. 1991). Yuma clapper rails were originally thought to migrate to Mexico because they were not detected on their breeding grounds in the U.S. during the winter months (Todd 1986). It is possible that Yuma clapper rails were not detected during the winter because wintering populations are almost completely silent (Rosenberg et al. 1991).

The Yuma clapper rail was formerly restricted to an area near Yuma, Arizona, but has since expanded its range. Over 70 percent of the breeding population of this subspecies winters along the lower Colorado River (Rosenberg et al. 1991). The species potentially occurs only in the far southern limit of the Yuma clapper rail analysis area in southern Nevada along the Muddy River. The Yuma clapper rail analysis area is defined as herbaceous wetland areas along the Muddy River in Nevada within 0.5 mile of the 2-mile transmission line corridor.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The gray wolf (northern Rocky Mountain population) was designated as endangered on January 4, 1974 (39 FR 1175-1176) and a Recovery Plan was released on August 3, 1987. Currently, the species is listed as endangered in Utah and Colorado. The USFWS designated the gray wolf as an NEP in Wyoming. This status is defined as a reintroduced population believed not to be essential for the survival of the species, but important for its full recovery and eventual removal from the endangered and threatened list. These NEP populations are treated as threatened species, except that the Endangered Species Act (ESA) Section 7 regulations, which require consultation to reduce adverse impacts from federal actions do not apply (except when the species occurs within national parks or NWRs) and critical habitat cannot be designated.

The established northern Rocky Mountain population recovery goal of 30 breeding pairs of wolves well distributed throughout Idaho, Montana, and Wyoming for three consecutive years was achieved in December 2002. By 2007, the gray wolf population exceeded 1,500 individuals and the USFWS proposed delisting. The gray wolf population in the northern Rocky Mountains of Montana, Idaho, and Wyoming continued to increase its distribution and estimated wolf numbers have exceeded 1,600 individuals in recent years within the three-state area (USFWS et al. 2009). On March 28, 2008, the USFWS designated and removed the northern Rocky Mountain gray wolf from listing under the ESA (73 Federal Register 10514-10560). However, in July 2008, a federal judge issued an injunction to suspend this removal. A number of environmental groups have challenged the USFWS delisting decision. On March 6, 2009, Secretary Salazar confirmed the USFWS decision to delist the wolf in all states except Wyoming. In March 2011, the northeastern corner of Utah — east of Interstate 15 and north of I-80 and I-84 — was designated as a recovery area for gray wolves. Elsewhere in Utah, most notably the Uinta Mountains and the Book Cliff region of eastern Utah, the species remains protected. Colorado has no established gray wolf population, but has developed guidelines in anticipation of a time when strays from the northern Rocky Mountain population may become established in the state (Wolf Management Working Group 2004).

Gray wolves are considered habitat generalists and have few specific habitat requirements for survival. These requirements are primarily related to the density of prey species found within a given area. Wolf populations have been expanding since the northern Rocky Mountain reintroduction effort, which began in 1995 and 1996. Since the gray wolf utilizes a wide variety of habitats, the species could potentially be present along any portion of the project route regardless of habitat type, with the exception of intensively managed agricultural areas. The gray wolf analysis area includes the HUC 10 watersheds traversed by the Project in Regions I and II.

Interior Least Tern (Endangered)

The interior least tern was designated as endangered on May 28, 1985 (50 FR 21784). No critical habitat has been designated for this subspecies, but essential breeding habitat has been identified within its historic range (USFWS 2011c). The Interior Least Tern Recovery Plan was issued in September 1990.

Historically, the breeding range of this subspecies extended from Texas to Montana and from eastern Colorado and New Mexico to southern Indiana. It included the Rio Grande, Red, Missouri, Arkansas, Mississippi, and Ohio river systems. The interior least tern continues to breed in most of the historic river systems, although its distribution generally is restricted to less altered river segments (USFWS 1990). The interior least tern breeds and forages on barren or sparsely vegetated sandbars adjacent to waterbodies. This subspecies nests in colonies on sandy or pebbly, sparsely vegetated islands or shorelines. Interior least terns spend 4 to 5 months at their breeding sites. Nest locations are usually well above the water's edge, since nesting is typically initiated during high river flows, when only small amounts of sandy shoreline are exposed. Therefore, the size of nesting habitat depends on water levels and the extent of associated sandbars. The interior least tern also will nest on artificial habitats, including sand and gravel pits and dredge islands (USFWS 1990).

It is unlikely that nesting interior least terns would be present within the special status wildlife analysis area. No new depletions will occur by the proposed Project in the Platte River system in Wyoming. No impacts are expected to the interior least tern and no interior least tern analysis area has been defined for the Project.

Piping Plover (Threatened)

The piping plover was designated as endangered/threatened on December 11, 1985 (50 FR 50726). The Great Lakes piping plover population was listed as threatened, while the remaining Atlantic and northern Great Plains populations were listed as threatened. Migrating and wintering populations of piping plover also were classified as threatened. Designated critical habitat for the piping plover does not exist within the special status wildlife analysis area. A recovery plan for the Great Lakes and Northern Great Plains Piping Plover populations was issued on May 12, 1988. The 5-Year Review for this population was issued in September 2009.

The piping plover breeds and forages on sandy lakeshore beaches, sandbars within riverbeds, or sandy wet pastures. Nesting habitat for the piping plover consists of sparsely vegetated shorelines around small alkali lakes, large reservoir beaches; river islands and adjacent sandpits; and shorelines associated with industrial ponds. It constructs a scrape nest in sand or gravel (Haig and Plissner 1993). Nesting piping plovers have been found in least tern nesting colonies at a number of sites on Great Plains river sandbars and sand pits (USFWS 1988).

It is unlikely that nesting piping plovers would be present within the special status wildlife analysis area. No new depletions will occur by the proposed Project in the Platte River system in Wyoming. No impacts are expected to the piping plover and no piping plover analysis area has been defined for the Project.

Western Yellow-billed Cuckoo (Candidate)

The Western U.S. Distinct Population Segment (DPS) of the yellow-billed cuckoo became a candidate species for listing as threatened or endangered on October 30, 2001 (66 FR 54807-54832). Currently, federally listed candidate species receive no statutory protection under ESA.

Western populations of yellow-billed cuckoos breed in dense riparian woodlands along riparian corridors in otherwise arid areas (Hughes 1999). Dense undergrowth may be an important factor in selection of nest sites (Ehrlich et al. 1988). Western yellow-billed cuckoos appear to require relatively large tracts of riparian woodland. Several studies have reported the species to only nest in tracts greater than 25 acres in size.

The range of the western population of yellow-billed cuckoo has been determined as the portion of yellow-billed cuckoo range west of the crest of the Rocky Mountains (USFWS 2001). Currently the western yellow-billed cuckoo is very rare in scattered drainages in western Colorado, Idaho, Nevada, and Utah (NatureServe 2008). The species has been documented within the special status wildlife analysis area in Utah County, Utah. It also has been documented within 5 miles of the special status wildlife analysis area in Emery, Grand, Uintah, and Washington counties, Utah (UNHP 2010). The species has been documented in Meadow Valley Wash in Lincoln County, Nevada (NNHP 2010). It also is a confirmed breeder along the Muddy River in Nevada (Floyd et al. 2007). The western yellow-billed cuckoo analysis area is defined as areas within 0.5 mile of perennial waterbodies with developed riparian woodlands within the HUC 10 watersheds crossed by the Project.

Mexican Spotted Owl (Threatened)

The Mexican spotted owl was designated as threatened on March 16, 1993 (58 FR 14248-14271), and a Recovery Plan was released on June 6, 1995 (60 FR 29913-29951). Critical habitat was originally designated on March 16, 1993 (58 FR 14248-14271), and subsequently revoked on March 25, 1998 (63 FR 14378-14379). Critical habitat was re-established on February 1, 2001 (66 FR 8530-8553), and a comment period was re-opened on November 18, 2003 (68 FR 65020-65023). The currently defined critical habitat was established on August 31, 2004 (69 FR 53181-53298).

The Mexican spotted owl is one of three recognized subspecies of spotted owl in North America. The Mexican spotted owl is a permanent resident in the interior mountain ranges of western North America, ranging from southern Utah and central Colorado south through the mountains of Arizona, New Mexico, and extreme west Texas. The species typically occupies old growth forest in mixed conifer, pine-oak woodland, deciduous riparian, or a combination of these habitats that will support a home range of 1,400 to 4,500 acres (Ehrlich et al. 1988; Gutierrez et al. 1995). An undisturbed core area of approximately 600 acres centered on the nest site is the currently recommended disturbance buffer (Gutierrez et al. 1995).

Mexican spotted owls typically inhabit steep canyons with mature or old growth forest, but they also may occur in canyons with steep cliffs and relatively little forest habitat. Mexican spotted owl habitat typically has a structured canopy, a perennial water source, and a rodent-dominated prey base of adequate size (Gutierrez et al. 1995). Mexican spotted owls have been reported at elevations ranging from 3,700 feet amsl to the subalpine transition zone (Ganey 1998; Gutierrez et al. 1995; Johnsgard 1988).

Mexican spotted owls exhibit high nest fidelity and construct nests in rock crevices, tree cavities (usually in live trees) or on constructed platforms on tree limbs. In Utah, they nest almost exclusively in shallow caves (Gorell et al. 2005). Mexican spotted owls also will utilize abandoned raptor or corvid platform nests (Ehrlich et al. 1988; Terres 1980).

There are several areas where the subspecies could occur within the Mexican spotted owl analysis area in Utah including; the Desolation Canyon area of the Green River on the boundary between Carbon and Uintah Counties; and the Kolob Terrace area (including Zion National Park) near Cedar City (Gorell et al. 2005; UCDC 2008). The Mexican spotted owl analysis area is defined as the modeled habitat in the BLM Vernal Field Office. Although modeled habitat for other BLM field offices was not available for inclusion in this analysis, occurrences of this species in the Zion National Park area have been recorded. Therefore, this species and its habitat could potentially be impacted by project alternatives in southwestern Utah.

Southwestern Willow Flycatcher (Endangered)

The southwestern willow flycatcher was designated as endangered, without designated critical habitat, on February 27, 1995 (60 FR 10693-10715). Critical habitat was later designated on July 22, 1997 (62 FR 39129-39147), and the Final Recovery Plan for the subspecies was issued on March 5, 2003 (68 FR 10485). A court decision in 2001 resulted in a subsequent Final Rule on Critical Habitat on

October 19, 2005 (70 FR 60885-61009). A 5-year review of the subspecies was completed by the USFWS in 2005 (73 FR 14995-14997).

Four specific types of breeding habitat have been described for the southwestern willow flycatcher. The first is comprised of dense stands of willows 10 to 23 feet in height, with no distinct overstory. This community is often associated with sedges, rushes, or other herbaceous wetland plants. A second habitat type includes dense stands of salt cedar or Russian olive up to 33 feet in height. These species form a dense, closed canopy, with no distinct understory layer. Native broadleaf-dominated communities form a third habitat type. The final habitat type is a mixture of native and exotic riparian species (Sogge et al. 1997).

Regardless of the vegetation species composition, all of these habitats share common structural characteristics. Occupied southwestern willow flycatcher habitats always have dense vegetation in the interior, and dense areas are often interspersed with small clearings, open water, or areas of sparse shrubs. Habitat patches can vary in size and shape, with some occupied areas being relatively dense, linear, contiguous stands, and others being large, irregularly shaped mosaics of dense vegetation intermingled with open areas. Habitat patch sizes can range from as little as 2 acres to several hundred or a thousand acres. Southwestern willow flycatchers may occur at elevations as high as 7,875 feet amsl. They also inhabit willow or cottonwood riparian areas that extend out into desert regions (Terres 1980). Migration and winter habitat could differ from breeding habitat for this subspecies. During migration, riparian habitat along major southwestern drainages is commonly utilized, but a close association with water may not always exist. These drainages might be considered stopover areas, and could be very important migration habitat for the southwestern willow flycatcher (USFWS 2002).

The southwestern willow flycatcher has been documented within 5 miles of the 2-mile transmission line corridor in Washington County, Utah (UNHP 2010). It also has been documented in Iron County, Utah, near Newcastle Reservoir and Pinto Creek. Suitable habitat occurs in Emery, Grand, Iron, and Uintah counties, Utah, and in Clark and Lincoln counties, Nevada. Designated critical habitat exists in Clark County, Nevada and in Washington County, Utah. Additional critical habitat is proposed in Clark and Lincoln counties, Nevada, and Washington County, Utah (USFWS 2011d). In the Nevada portion of the southwestern willow flycatcher analysis area, essential habitat for the southwestern willow flycatcher is identified on the Pahranagat and Muddy rivers, and a portion of the Virgin River. Designated critical habitat consists of the Virgin River contiguous with the essential habitat section, upstream to the Arizona border. The entire segment of the mainstem Virgin River in Arizona is within designated critical habitat, and an approximately 18 mile-long segment of the river further upstream into Utah also is a part of this unit. The total length of critical habitat on the Virgin River is 73 miles (USFWS 2005a). Other potential suitable habitat for the southwestern willow flycatcher in Nevada includes portions of the Meadow Valley Wash, the Muddy River, Las Vegas Wash, and the Colorado River System (Hiatt and Boone 2003). The southwestern willow flycatcher analysis area is defined as the following Management Units within the Lower Colorado Recovery Unit: Pahranagat, Virgin, western portion of the Middle Colorado, Hooter-Parker, and southern portion of the Amargosa. Also included in the southwestern willow flycatcher analysis area is the area within 0.5 mile of the riparian corridor at Newcastle Reservoir and Pinto Creek, which is crossed by the Project.

Black-footed Ferret (Endangered; EXP/NE)

The black-footed ferret was designated as endangered in 1966. The species was subsequently listed as threatened with extinction under the Endangered Species Preservation Act on March 11, 1967 (32 FR 4001) and as endangered under the Endangered Species Act on June 2, 1970 (35 FR 8491). No critical habitat has been designated for the species. Eight reintroduced black-footed ferret populations have been designated as NEP under Section 10(j) of the ESA. The USFWS initiated a 5-year species status review for the black-footed ferret on July 7, 2005 (70 FR 39326). In the 2008 status review summary, the USFWS recommended no change in status and a Recovery Priority Number of 2C (USFWS 2008b). The current Black-footed Ferret Recovery Plan was approved in 1988 (USFWS 1988). This plan replaced the 1978

recovery plan, which was drafted when no extant, wild black-footed ferrets were known to exist (USFWS 1988).

The black-footed ferret is considered to be a prairie dog obligate species. The black-footed ferret is entirely dependent upon prairie dogs colonies, utilizing the burrows for shelter and den sites, and preying almost exclusively on prairie dogs (Biggins et al. 2006).

No wild black-footed ferret populations are known to occur within the black-footed ferret analysis area in Wyoming. Although the Shirley Basin supports the only known extant population of wild black-footed ferrets in Wyoming, there are numerous white-tailed prairie dog complexes within the black-footed ferret analysis area for both the Rawlins and Rock Springs BLM Field Offices that constitute suitable habitat for the black-footed ferret. Many of these complexes have not been surveyed for black-footed ferrets. The State of Wyoming is now entirely block-cleared for the black-footed ferret (USFWS 2013).

Besides the Shirley Basin reintroduction site in south-central Wyoming, there is only one other reintroduction site within the black-footed ferret analysis area: the Northwestern Colorado/Northeastern Utah Black-footed Ferret Experimental Population Area (ExPA). The ExPA encompasses portions of Rio Blanco and Moffat counties in Colorado, Sweetwater County, Wyoming, and Uintah and Duchesne counties, Utah. The ExPA has been separated into the Northwestern Colorado Experimental Population Sub-Area and the Northeastern Utah Experimental Population Sub-Area. Within the Northwestern Colorado Sub-Area, the Little Snake Black-footed Ferret Management Area was established as a specific reintroduction site. The Little Snake area is located in northwestern Moffat County, Colorado along the Colorado-Wyoming border. Within the Northeastern Utah Sub-Area, the Coyote Basin Black-footed Ferret Management Area was established as a specific reintroduction site. The Coyote Basin area is located in Uintah County, Utah along the Utah-Colorado state border.

A total of 255 black-footed ferrets have been released into the Coyote Basin Area since 1999. Reproduction was confirmed in Coyote Basin in 2000, and the population is currently estimated at 25 individuals (USFWS 2008b). Ferret releases at the Wolf Creek site northeast of Rangely, Colorado, were initiated in 2001, and to date a total of 189 individuals have been released at this location. The Wolf Creek population is currently estimated at 16 individuals (USFWS 2008b); although plague has impacted the Wolf Creek population of white-tailed prairie dogs and black-footed ferrets in recent years and no black-footed ferrets have been documented during surveys in 2009, 2010, and 2011. The USFWS classifies both populations as “marginal” (USFWS 2008b). The only non-NEP areas found within the black-footed ferret analysis area are located in Grand, Emery, or Carbon counties, Utah, and portions of Sweetwater and Carbon counties, Wyoming. The black-footed ferret analysis area includes the ExPA in Utah and Colorado, and the Continental Divide (2), Dad, and Desolation Flats non-block cleared areas in Wyoming.

Canada Lynx (Threatened)

The contiguous U.S. Distinct Population Segment (DPS) of the Canada lynx was designated as threatened on March 24, 2000 (65 FR 16051). This DPS includes lynx inhabiting forested portions of multiple states, including Colorado and Utah. In response to a 2002 court order, the USFWS reconfirmed the species’ status as threatened (68 FR 40076). A final rule on critical habitat for the Canada lynx was issued in February 2009. Designated critical habitat does not exist within the Canada lynx analysis area. A 5-year species status review was initiated in 2007 (72 FR 19549). Although a formal recovery plan has not been published for the Canada lynx, an interim Recovery Outline was issued in 2005 to guide recovery efforts and critical habitat designation for the DPS until a draft recovery plan is completed (USFWS 2005b). The Recovery Outline identifies preliminary Canada Lynx Recovery Areas throughout the contiguous United States. These areas are categorized as Core Areas, Provisional Core Areas, Secondary Areas, and Peripheral Areas based upon habitat quality and evidence of current Canada lynx occurrence.

At the time of listing, the USFWS identified the main threat to the DPS as the inadequacy of existing regulatory mechanisms to protect the Canada lynx and its habitat; particularly the lack of protection conferred by USFS Land and Resource Management Plans (65 FR 16051). To address this inadequacy, the USFS, BLM, and USFWS developed the Lynx Conservation Assessment Strategy (LCAS) to provide a consistent and effective approach to conserve Canada lynx on federal lands across the contiguous U.S. (Ruediger et al. 2000). The LCAS included the identification of Lynx Analysis Units (LAUs). LAUs are based upon 5th and 6th level Hydrologic Unit Codes (HUC), and a HUC becomes a LAU when at least 30 percent of the HUC is suitable Canada lynx habitat. LAUs have been identified in suitable lynx habitat throughout lands managed by the USFS and BLM.

The Canada lynx inhabits the boreal forests of North America. Lynx are secretive, nocturnal, and solitary. Home range sizes vary widely, depending on prey availability and regional habitat characteristics (Meaney and Beauvais 2004). Canada lynx require a complex mosaic within their home range to meet different habitat needs. Specifically, lynx utilize early successional habitats for foraging and mature forests with large woody debris for denning (Ruediger et al. 2000). While Canada lynx populations in northern boreal habitats are known to oscillate in direct response to natural snowshoe hare population cycles, southern populations rely more heavily on alternate prey species and do not exhibit the dramatic cycles experienced by northern populations.

The species has been documented within 5 miles of the 2-mile transmission line corridor in Uintah County, Utah, and Carbon County, Wyoming (UNHP 2010; WNHP 2010). Additionally, a reproducing population has been established in south-central Colorado as a result of a reintroduction program initiated in 1999 by the CPW and individuals from this population have been documented in northern Colorado and Utah. The Canada lynx analysis area is defined as forested habitat within the special status wildlife analysis area in Regions I and II.

Utah Prairie Dog (Threatened)

The Utah prairie dog was designated as endangered in 1968, but was subsequently delisted in1970. It was again designated as endangered on June 4, 1973, due to a substantial decline in population from 1970 to 1972 (Pizzimenti and Collier 1975). In 1979 the UDWR petitioned the USFWS to remove the Utah prairie dog from the endangered species list. The USFWS published a Final Rule on May 29, 1984 (49 FR 22330), to reclassify the Utah prairie dog as threatened, with a special rule to allow regulated take. In 2003, the USFWS received a petition to reclassify the species as endangered. In February 2004, the USFWS received a Notice of Intent to Sue for failure to issue a 90-day finding for the petition. Eventually the petitioning party and the USFWS reached a settlement agreement to make a 90-day finding on the petition by February 17, 2007. Published in the Federal Register on February 21, 2007, the USFWS issued a notice of the 90-day petition finding that the petition failed to provide substantial scientific or commercial information to warrant the reclassification of the species to endangered status (72 FR 7843). With this determination, the USFWS also initiated a 5-year review of the species to determine whether the status of the Utah prairie dog should be changed. The Final Recovery Plan for the Utah Prairie Dog was issued on September 9, 1991 (USFWS 1991).

The Utah prairie dog is a colonial species. It inhabits grassland and shrublands in central Utah, and is found at elevations ranging from approximately 4,900 to 9,800 feet amsl (Hoogland 2006). Because most of their water requirement is met through plant ingestion, there is a positive correlation between the amount of available moisture in vegetation and Utah prairie dog population densities. The species prefers swale formations where moist vegetation is available even during times of drought (USFWS 1991). Utah prairie dogs require well-drained soils for their burrows in order to be able to burrow deeply enough to be protected from predators and environmental temperature extremes (USFWS 1991). Colony population densities vary considerably (6.25 per acre to more than 185 per acre). Habitat condition is the most likely influence on population density (Pizzimenti and Collier 1975). Vegetation within a colony must be low enough to allow a standing Utah prairie dog to scan the environment for predators. Utah prairie dogs are true hibernators, and most surface activity ceases during harsh winters (72 FR 7843).

The Utah prairie dog has the most restricted range of all prairie dog species in the U.S. and is limited to the southwestern quarter of Utah (USFWS 1991). As of 2010, Utah prairie dog populations existed in only three areas: the Awapa Plateau; the Paunsaugunt region along the east fork and main stem of the Sevier River; and the West Desert region of eastern Iron County (USFWS 2010). Several isolated colonies exist in the mountain and desert valleys in western Iron and Beaver counties (Pizzimenti and Collier 1975; USFWS 1991).

Distribution records for the Utah prairie dog since 1983 show occurrences in Beaver, Garfield, Iron, Millard, Piute, Sanpete, Sevier, and Washington counties (Bosworth 2003). The species has been documented within the Utah prairie dog analysis area in Iron, Millard, and Sevier counties, Utah (UNHP 2010). The greatest concentrations of Utah prairie dogs occur in eastern Iron and southern Sevier counties. The Utah prairie dog analysis area is defined as the West Desert Recovery Unit, Paunsaugunt Recovery Unit, and the Awapa Plateau Recovery Unit.

3.8.4.2 BLM Sensitive, USFS Sensitive, USFS MIS, and State-Protected Wildlife Species

In addition to federally listed and candidate species, a total of 106 BLM, USFS, or state-protected species potentially occur within the special status wildlife analysis area (**Table 3.8-6**). This list includes 12 terrestrial invertebrate species, 18 reptile species, 42 bird species, and 34 mammal species. Descriptions of occurrence and habitat utilized by these species are provided in **Appendix G**, **Table G-2**.

3.8.5 Regional Summary

Special status wildlife species by Project region are summarized in **Table 3.8-7**.

Table 3.8-7 Summary of Special Status Wildlife Species by Terminal and Project Region

Species	Total Species Within the Special Status Wildlife Analysis Area (All Regions)[2]	Northern Terminal	Proposed Alternative Southern Terminal	Alternate Southern Terminal	Southern Terminals near IPP (DO2 and DO3)	Region I	Region II	Region III	Region IV
Mammals – Bats	20	12	20	20	18	13	16	19	20
Mammals – Other	18	7	4	4	4	13	13	7	4
Birds[1]	51	23	12	12	20	38	36	34	23
Reptiles	19	4	13	13	10	4	5	14	15
Terrestrial Invertebrates	12	0	5	5	8	1	2	10	7
Total	120	46	54	54	60	69	72	84	69

[1] Includes whooping crane, interior least tern, and piping plover.

[2] Total number of species is not equal to a sum of regions and other project components due to the fact that most species are present in multiple regions.

3.8.5.1 Northern Terminal

Vegetative communities located within the Northern Terminal siting area include: cliff and canyon, grassland, greasewood flat, herbaceous wetland, sagebrush shrubland, saltbush shrubland, and woody riparian and wetlands. Direct impacts resulting from the construction of the terminal and associated facilities could occur within grassland, greasewood flat, sagebrush shrubland, and saltbush shrubland vegetative communities only. A description of these communities is presented in Section 3.5, Vegetation.

Table 3.8-8 presents special status wildlife species potentially occurring at the Northern Terminal.

Table 3.8-8 Special Status Wildlife Species Potentially Occurring at the Northern Terminal

Mammals - Bats		
Big brown bat	California myotis	Hoary bat
Long-eared myotis	Long-legged myotis	Pallid bat
Silver-haired bat	Spotted bat	Townsend's (Western) big-eared bat
Western Pipestrelle	Western small-footed myotis	Yuma myotis
Mammals - Other		
Pygmy rabbit	River otter	Swift fox
White-tailed prairie dog	Wyoming pocket gopher	
Birds		
Least bittern	White-faced ibis	Trumpeter swan
Barrow's goldeneye	Bald eagle	Swainson's hawk
Ferruginous hawk	Golden eagle	Greater sage-grouse
Mountain plover	Long-billed curlew	Black tern
Burrowing owl	Long-eared owl	Short-eared owl
Loggerhead shrike	Sage thrasher	Yellow-breasted chat
Brewer's sparrow	Vesper sparrow	Sage sparrow
Grasshopper sparrow	Bobolink	
Reptiles		
Corn snake	Long-nosed leopard lizard	Midget faded rattlesnake
Smooth greensnake		

3.8.5.2 Proposed Alternative Southern Terminal

The Proposed Alternative Southern Terminal would be sited almost entirely within the developed/disturbed vegetation community. This category is not considered to be typical wildlife habitat and no special status wildlife species would be expected to occur in this community. A small amount of desert shrubland also would be within the siting area of the Proposed Alternative Southern Terminal. **Table 3.8-9** presents special status wildlife species potentially occurring at the Proposed Alternative Southern Terminal.

Table 3.8-9 Special Status Wildlife Species Potentially Occurring at the Proposed Alternative Southern Terminal

Mammals - Bats		
Allen's big-eared bat	Big brown bat	Big free-tailed bat
Brazilian free-tailed bat	California leaf-nosed bat	California myotis
Cave myotis	Fringed myotis	Greater western mastiff bat
Hoary bat	Long-eared myotis	Long-legged myotis
Pallid bat	Silver-haired bat	Spotted bat
Townsend's (Western) big-eared bat	Western pipistrelle	Western red bat
Western small-footed myotis	Yuma myotis	

Table 3.8-9 Special Status Wildlife Species Potentially Occurring at the Proposed Alternative Southern Terminal

Mammals - Other		
Dark kangaroo mouse	Desert bighorn sheep	Kit fox
Pale kangaroo mouse		
Birds		
Swainson's hawk	Ferruginous hawk	Golden eagle
Peregrine falcon	Prairie falcon	Burrowing owl
Long-eared owl	Gray vireo	Bendire's thrasher
Crissal thrasher	LeConte's thrasher	Phainopepla
Reptiles		
Banded Gila monster	Chuckwalla	Desert glossy snake
Desert iguana	Desert night lizard	Long-nosed leopard lizard
Mojave rattlesnake	Movave shovel-nosed snake	Sidewinder
Speckled rattlesnake	Western banded gecko	Western threadsnake (blindsnake)
Zebra-tailed lizard		
Terrestrial Invertebrates		
Great Basin small blue (small blue) butterfly	Mojave gypsum bee	Mojave poppy bee
Mono Basin skipper (Railroad Valley skipper) butterfly	Northern Mojave blue (Mojave blue) butterfly	

3.8.5.3 Alternate Southern Terminal

The Alternate Southern Terminal is sited within the same vegetation communities as the Proposed Alternative Southern Terminal. Special status wildlife species that could potentially occur at this terminal would be the same as presented in **Table 3.8-9**.

3.8.5.4 Southern Terminal Located Near IPP (Design Option 2)

Vegetative communities located within the Southern Terminal located near IPP (Design Option 2) siting area include, grassland, greasewood flat, herbaceous wetland, and saltbush shrubland. Direct impacts resulting from the construction of the terminal and associated facilities could occur within grassland, saltbush shrubland, and greasewood flat vegetative communities only.

Table 3.8-10 presents special status wildlife species potentially occurring at the Southern Terminal located near IPP (Design Option 2).

Table 3.8-10 Special Status Wildlife Species Potentially Occurring at the Southern Terminal Located near IPP (Design Option 2)

Mammals - Bats		
Allen's big-eared bat	Big brown bat	Big free-tailed bat
Brazilian free-tailed bat	California leaf-nosed bat	California myotis
Fringed myotis	Hoary bat	Long-eared myotis
Long-legged myotis	Pallid bat	Silver-haired bat

Table 3.8-10 Special Status Wildlife Species Potentially Occurring at the Southern Terminal Located near IPP (Design Option 2)

Spotted bat	Townsend's (Western) big-eared bat	Western pipistrelle
Western red bat	Western small-footed myotis	Yuma myotis
Mammals - Other		
Dark kangaroo mouse	Desert Valley kangaroo mouse	Kit fox
White-tailed prairie dog		
Birds		
Least bittern	White-faced ibis	Swainson's hawk
Ferruginous hawk	Golden eagle	Peregrine falcon
Prairie falcon	Columbian sharp-tailed grouse	Mountain plover
Long-billed curlew	Black tern	Burrowing owl
Long-eared owl	Short-eared owl	Black swift
Loggerhead shrike	Crissal thrasher	Gray vireo
Vesper sparrow	Bobolink	
Reptiles		
Banded Gila monster	Corn snake	Desert iguana
Long-nosed leopard lizard	Midget faded rattlesnake	Smooth greensnake
Speckled rattlesnake	Utah milk snake	Western banded gecko
Western threadsnake (blindsnake)		
Terrestrial Invertebrates		
Eureka mountainsnail	Great Basin silverspot (Nokomis fritillary) butterfly	Grey's silverspot (Grey's fritillary) butterfly
Honey Lake blue butterfly	MacNeill sooty wing skipper (MacNeill saltbush sootywing) butterfly	Mono Basin skipper (Railroad Valley skipper) butterfly
Rice's blue butterfly	White River wood nymph butterfly	

3.8.5.5 Southern Substation located near IPP (Design Option 3)

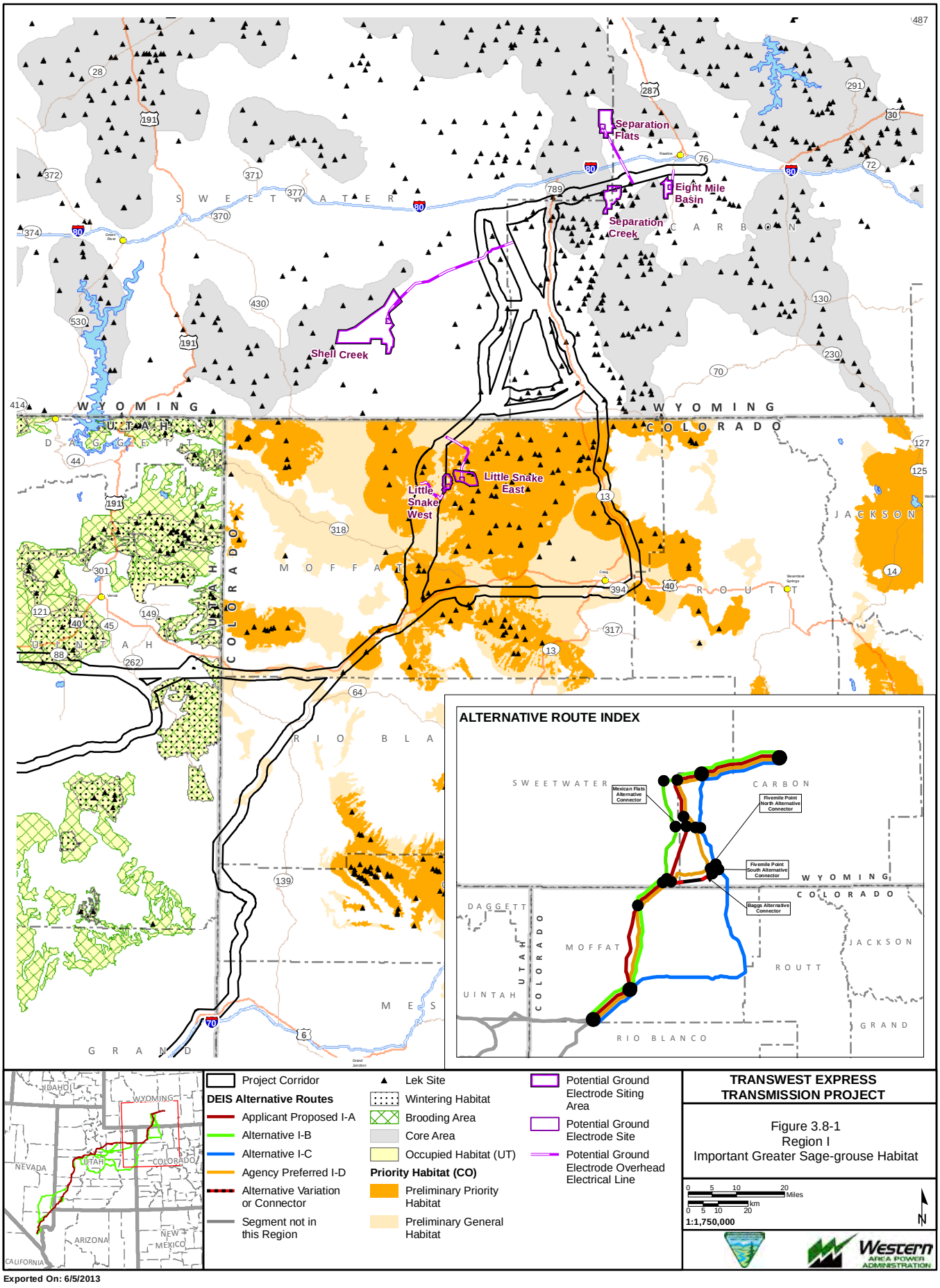
The Southern Substation located near IPP (Design Option 3) would be sited entirely within the boundaries of the Southern Terminal (Design Option 2). Special status wildlife species that could potentially occur at this terminal would be the same as presented in **Table 3.8-10**.

3.8.5.6 Region I

Region I extends from the Northern Terminal siting area near Rawlins, Wyoming, southwest through northeastern Utah and northwestern Colorado. Dominant vegetation community types are sagebrush shrubland and saltbush shrubland. All vegetation communities except deciduous forest, desert shrub, and riparian occur in Region I. A description of vegetation communities is presented in Section 3.5, Vegetation. Special status wildlife species that may occur in Region I are presented in **Table 3.8-11**. Habitat within the greater sage-grouse analysis area in Region I is presented in **Figure 3.8-1**. Black-footed ferret non block-cleared areas and white-tailed prairie dog colonies within the black-footed ferret analysis area in Wyoming are presented in **Figure 3.8-2**.

Table 3.8-11 Special Status Wildlife Species Potentially Occurring in Region I

Mammals – Bats		
Big brown bat	California myotis	Hoary bat
Long-eared myotis	Long-legged myotis	Pallid bat
Silver-haired bat	Spotted bat	Townsend's (Western) big-eared bat
Western pipistrelle	Western red bat	Western small-footed myotis
Yuma myotis		
Mammals – Other		
Black-footed ferret	Canada lynx	Wyoming pocket gopher
Fisher	Gray wolf	Idaho pocket gopher
Pygmy rabbit	River otter	Rocky Mountain bighorn sheep
Swift fox	White-tailed prairie dog	Wolverine
Birds		
American white pelican	Least bittern	White-faced ibis
Trumpeter swan	Barrow's goldeneye	Bald eagle
Northern goshawk	Swainson's hawk	Ferruginous hawk
Golden eagle	Peregrine falcon	Prairie falcon
Greater sage-grouse	Columbian sharp-tailed grouse	Mountain plover
Long-billed curlew	Black tern	Western yellow-billed cuckoo
Flammulated owl	Burrowing owl	Long-eared owl
Short-eared owl	Boreal owl	Black swift
Lewis' woodpecker	Red-naped sapsucker	American three-toed woodpecker
Loggerhead shrike	Gray vireo	Pinyon jay
Juniper titmouse	Sage thrasher	Yellow-breasted chat
Brewer's sparrow	Vesper sparrow	Sage sparrow
Grasshopper sparrow	Bobolink	
Reptiles		
Corn Snake	Long-nosed leopard lizard	Midget faded rattlesnake
Smooth greensnake		
Terrestrial Invertebrates		
Great Basin silverspot (Nokomis fritillary butterfly)		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Separation Flats
Eight Mile Basin
Separation Creek
Shell Creek
Little Snake East
Little Snake West
WYOMING
COLORADO
UTAH
SWEETWATER
CARBON
MOFFAT
ROUTT
JACKSON
DAGGETT
UINTAH
RIO BLANCO
GRAND
ALTERNATIVE ROUTE INDEX
Mexican Flats Alternative Connector
Fivemile Point North Alternative Connector
Fivemile Point South Alternative Connector
Baggs Alternative Connector
Project Corridor
DEIS Alternative Routes
Applicant Proposed I-A
Alternative I-B
Alternative I-C
Agency Preferred I-D
Alternative Variation or Connector
Segment not in this Region
Lek Site
Wintering Habitat
Brooding Area
Core Area
Occupied Habitat (UT)
Priority Habitat (CO)
Preliminary Priority Habitat
Preliminary General Habitat
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line
TRANSWEST EXPRESS TRANSMISSION PROJECT
Figure 3.8-1
Region I
Important Greater Sage-grouse Habitat
1:1,750,000
Western AREA POWER ADMINISTRATION
Exported On: 6/5/2013

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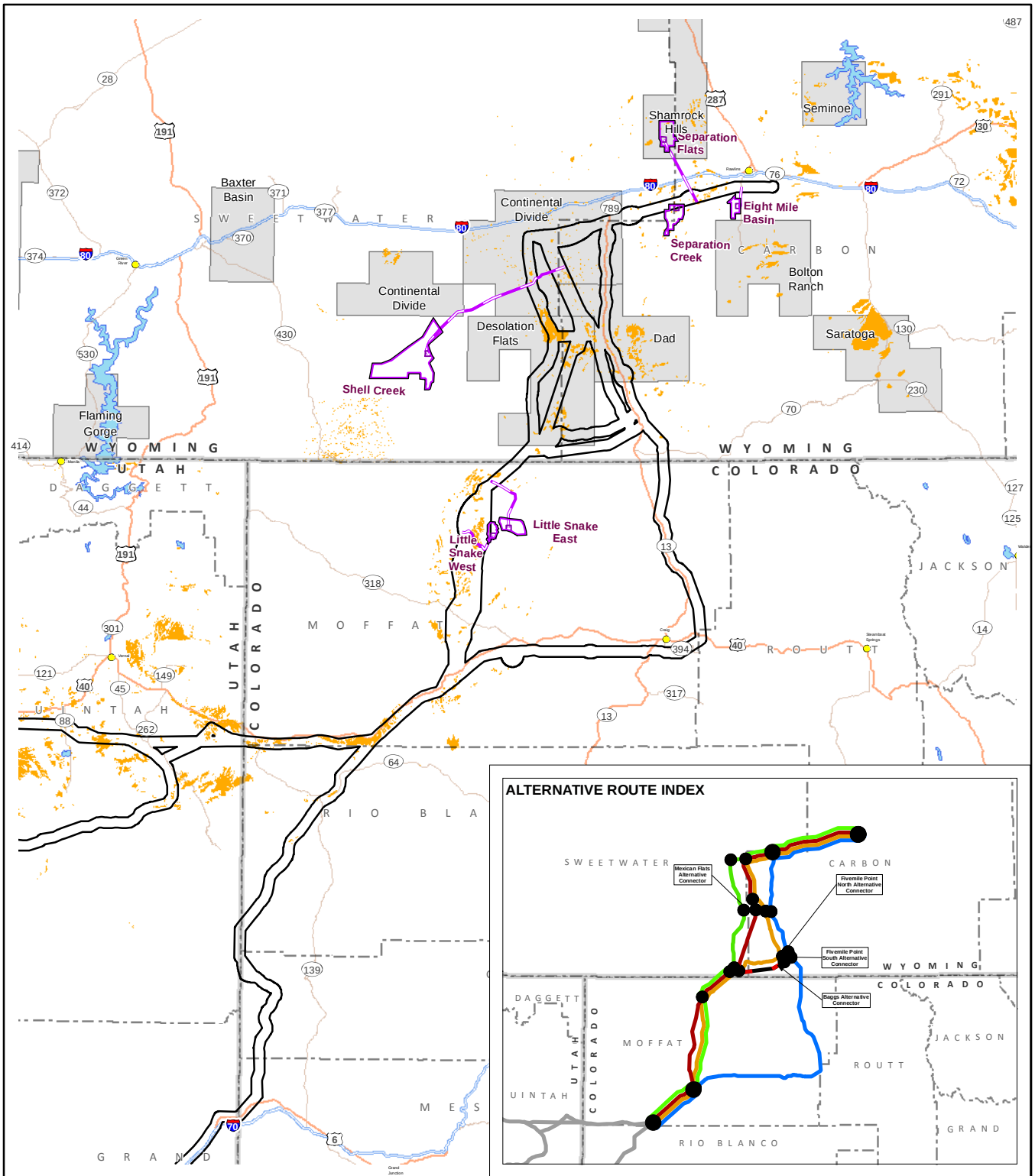

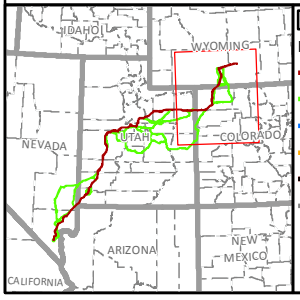

Project Corridor

DEIS Alternative Routes

- Applicant Proposed I-A
- Alternative I-B
- Alternative I_C
- Agency Preferred I-D
- Alternative Variation or Connector
- Segment not in this Region

- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line
- White-tailed Prairie Dog Colonies
- USFWS Black-footed Ferret Non Block-cleared Areas

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.8-2
Region I
Black-footed Ferret
USFWS Non Block-cleared Areas

0 5 10 20 Miles
0 5 10 20 km
1:1,750,000

N

Western AREA POWER ADMINISTRATION

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3.8.5.7 Region II

Region II extends from northeastern Utah and northwestern Colorado to the IPP in western Utah. Vegetation in Region II is diverse, with the dominant community types consisting of sagebrush shrubland, saltbush shrubland, and pinyon-juniper. All other vegetation communities also occur in Region II. A description of vegetation communities is presented in Section 3.5, Vegetation. Special status wildlife species that may occur in Region II are presented in **Table 3.8-12**. Habitat within the greater sage-grouse analysis area in Region II is presented in **Figure 3.8-3**. Miles of national forest crossed by region by alternative, alternative connector, or variation is presented in **Table 3.7-27** in Section 3.7, Wildlife.

Table 3.8-12 Special Status Wildlife Species Potentially Occurring in Region II

Mammals - Bats		
Big brown bat	Big free-tailed bat	Brazilian free-tailed bat
California myotis	Fringed myotis	Hoary bat
Long-eared myotis	Long-legged myotis	Pallid bat
Silver-haired bat	Spotted bat	Townsend's (Western) big-eared bat
Western pipistrelle	Western red bat	Western small-footed myotis
Yuma myotis		
Mammals - Other		
Black-footed ferret	Canada lynx	Dark kangaroo mouse
Desert bighorn sheep	Fisher	Gray wolf
Kit fox	Pygmy rabbit	River otter
Rocky Mountain bighorn sheep	Utah prairie dog	White-tailed prairie dog
Wolverine		
Birds		
American white pelican	White-faced ibis	Bald eagle
Northern goshawk	Swainson's hawk	Ferruginous hawk
Golden eagle	Peregrine falcon	Prairie falcon
Greater sage-grouse	Columbian sharp-tailed grouse	Mountain plover
Long-billed curlew	Black tern	Yellow-billed cuckoo (western)
Flammulated owl	Burrowing owl	Mexican spotted owl
Long-eared owl	Short-eared owl	Boreal owl
Black swift	Lewis's woodpecker	Red-naped sapsucker
American three-toed woodpecker	Loggerhead shrike	Gray vireo
Pinyon jay	Juniper titmouse	Sage thrasher
Bendire's thrasher	Yellow-breasted chat	Brewer's sparrow
Vesper sparrow	Sage sparrow	Bobolink
Reptiles		
Corn snake	Long-nosed leopard lizard	Midget faded rattlesnake
Smooth greensnake	Utah milk snake	
Terrestrial Invertebrates		
Eureka mountainsnail	Great Basin silverspot butterfly (Nokomis fritillary butterfly)	

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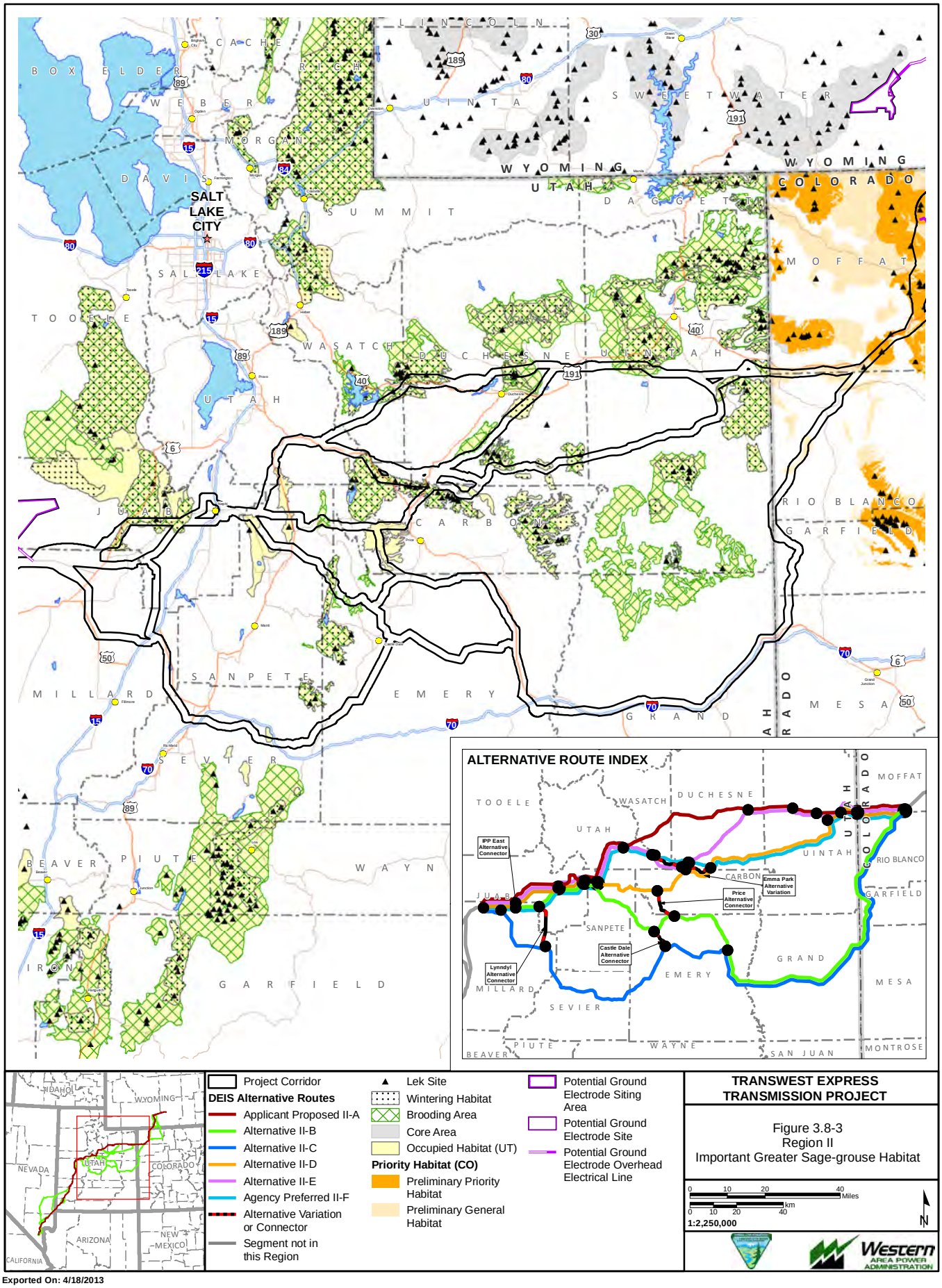

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3.8.5.8 Region III

Region III extends from the IPP in western Utah to northern Las Vegas, Nevada. In Region III, desert shrubland is the dominant community. All other vegetation communities occur in Region III. A description of vegetation communities is presented in Section 3.5, Vegetation. Special status wildlife species that may occur in Region III are presented in **Table 3.8-13**. Habitat within the desert tortoise analysis area in Region III is presented in **Figure 3.8-4**. Habitat within the greater sage-grouse analysis area in Region III is presented in **Figure 3.8-5**. The Dixie National Forest is crossed by the Project in Region III. **Table 3.7-27** presents the Region III alternatives and project components that occur in or cross the Dixie National Forest.

Table 3.8-13 Special Status Wildlife Species Potentially Occurring in Region III

Mammals - Bats		
Allen's big-eared bat	Big brown bat	Big free-tailed bat
Brazilian free-tailed bat	California leaf-nosed bat	California myotis
Cave myotis	Fringed myotis	Hoary bat
Long-eared myotis	Long-legged myotis	Pallid bat
Silver-haired bat	Spotted bat	Townsend's (Western) big-eared bat
Western pipistrelle	Western red bat	Western small-footed myotis
Yuma myotis		
Mammals - Other		
Dark kangaroo mouse	Desert bighorn sheep	Desert Valley kangaroo mouse
Kit fox	Pygmy rabbit	Rocky Mountain bighorn sheep
Utah prairie dog		
Birds		
Least bittern	White-faced ibis	California condor
Bald eagle	Swainson's hawk	Ferruginous hawk
Golden eagle	Peregrine falcon	Prairie falcon
Greater sage-grouse	Yuma clapper rail	Long-billed curlew
Yellow-billed cuckoo (western)	Burrowing owl	Mexican spotted owl
Long-eared owl	Short-eared owl	Lewis's woodpecker
Red-naped sapsucker	Southwestern willow flycatcher	Loggerhead shrike
Gray vireo	Pinyon jay	Sage thrasher
Bendire's thrasher	Crissal thrasher	Le Conte's thrasher
Phainopepla	Lucy's warbler	Yellow-breasted chat
Brewer's sparrow	Vesper sparrow	Sage sparrow
Bobolink		
Reptiles		
Banded Gila monster	Chuckwalla	Corn snake
Desert iguana	Desert night lizard	Desert tortoise
Long-nosed leopard lizard	Mojave rattlesnake	Sidewinder
Speckled rattlesnake	Western banded gecko	Western red-tailed skink
Western threadsnake (blindsnake)	Zebra-tailed lizard	
Terrestrial Invertebrates		
Great Basin small blue (Small blue) butterfly	Grey's silverspot (Grey's fritillary) butterfly	Honey Lake blue butterfly
MacNeill sooty wing skipper (MacNeill saltbush sootywing) butterfly	Mojave gypsum bee	Mojave poppy bee
Mono Basin skipper (Railroad Valley skipper) butterfly	Northern Mojave blue (Mojave blue) butterfly	Rice's blue butterfly
White River wood nymph butterfly		

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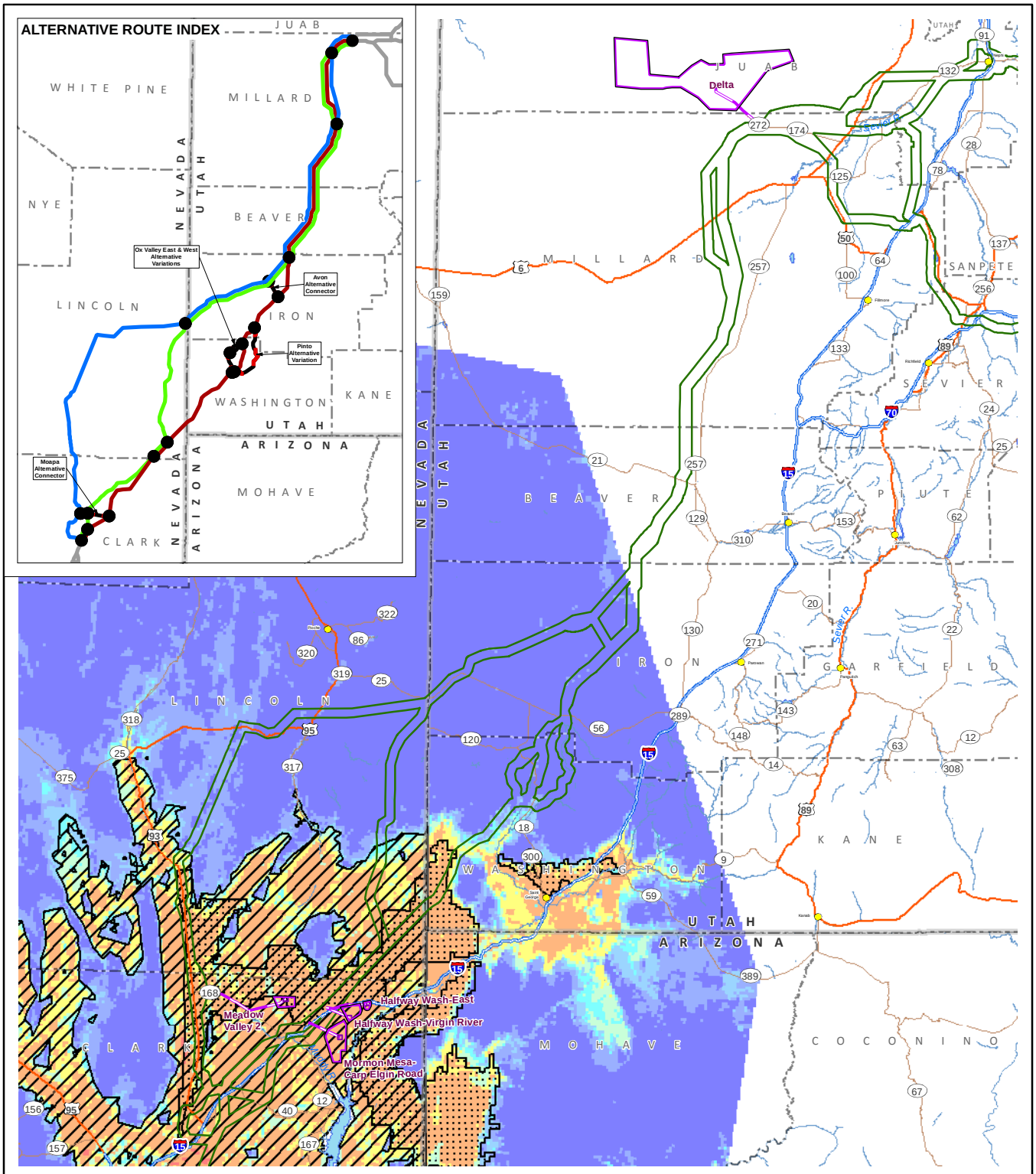

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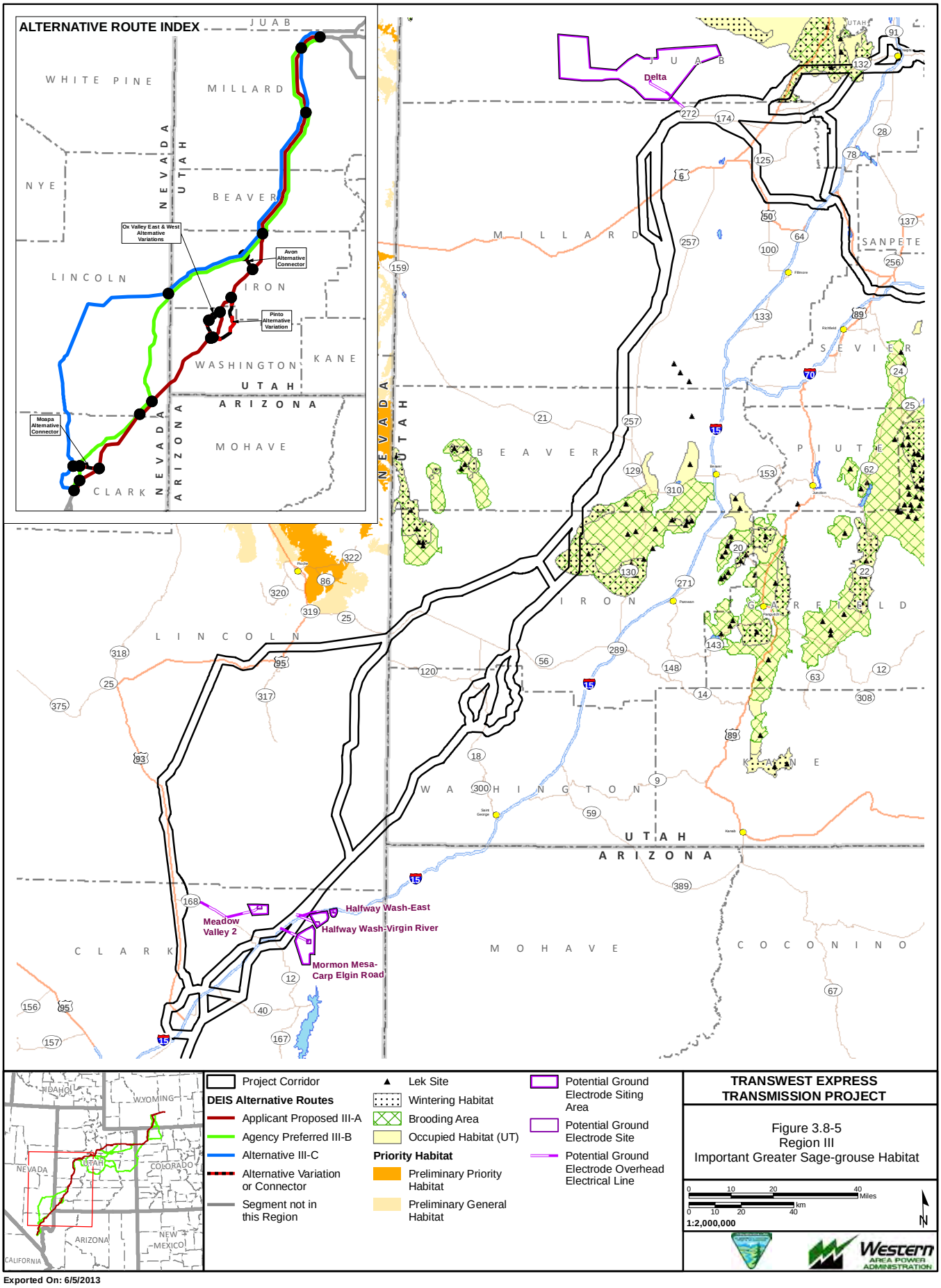

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3.8.5.9 Region IV

Region IV extends from northern Las Vegas, Nevada to Marketplace, Nevada. There is less diversity of vegetation communities in Region IV. The dominant community type is desert shrubland. The remaining vegetation communities include: barren/sparsely vegetated; cliff and canyon; desert shrub; grassland; herbaceous wetland; open water; pinyon-juniper; riparian; sagebrush shrubland; saltbush shrubland; and woody riparian and wetlands. A description of these communities is presented in Section 3.5, Vegetation. Special status wildlife species that may occur in Region IV are presented in **Table 3.8-14**. Habitat within the desert tortoise analysis area in Region IV is presented in **Figure 3.8-6**.

Table 3.8-14 Special Status Wildlife Species Potentially Occurring in Region IV

Mammals - Bats		
Allen's big-eared bat	Big brown bat	Big free-tailed bat
Brazilian free-tailed bat	California leaf-nosed bat	California myotis
Cave myotis	Fringed myotis	Greater western mastiff bat
Hoary bat	Long-eared myotis	Long-legged myotis
Pallid bat	Silver-haired bat	Spotted bat
Townsend's (Western) big-eared bat	Western pipistrelle	Western red bat
Western small-footed myotis	Yuma myotis	
Mammals - Other		
Dark kangaroo mouse	Desert bighorn sheep	Kit fox
Pale kangaroo mouse		
Birds		
Least bittern	White-faced ibis	Bald eagle
Swainson's hawk	Ferruginous hawk	Golden eagle
Peregrine falcon	Prairie falcon	Yuma clapper rail
Western snowy plover	Yellow-billed cuckoo (western)	Burrowing owl
Long-eared owl	Red-naped sapsucker	Southwestern willow flycatcher
Loggerhead shrike	Gray vireo	Bendire's thrasher
Crissal thrasher	Le Conte's thrasher	Phainopepla
Lucy's warbler	Yellow-breasted chat	
Reptiles		
Banded Gila monster	Chuckwalla	Desert glossy snake
Desert iguana	Desert night lizard	Desert tortoise
Long-nosed leopard lizard	Mojave rattlesnake	Mojave shovel-nosed snake
Sidewinder	Speckled rattlesnake	Western banded gecko
Western red-tailed skink	Western threadsnake (blindsnake)	Zebra-tailed lizard
Terrestrial Invertebrates		
Great Basin small blue (small blue) butterfly	Honey Lake blue butterfly	Mojave gypsum bee
Mojave poppy bee	Mono Basin skipper (Railroad Valley skipper) butterfly	Northern Mojave blue (Mojave blue) butterfly
Rice's blue butterfly		

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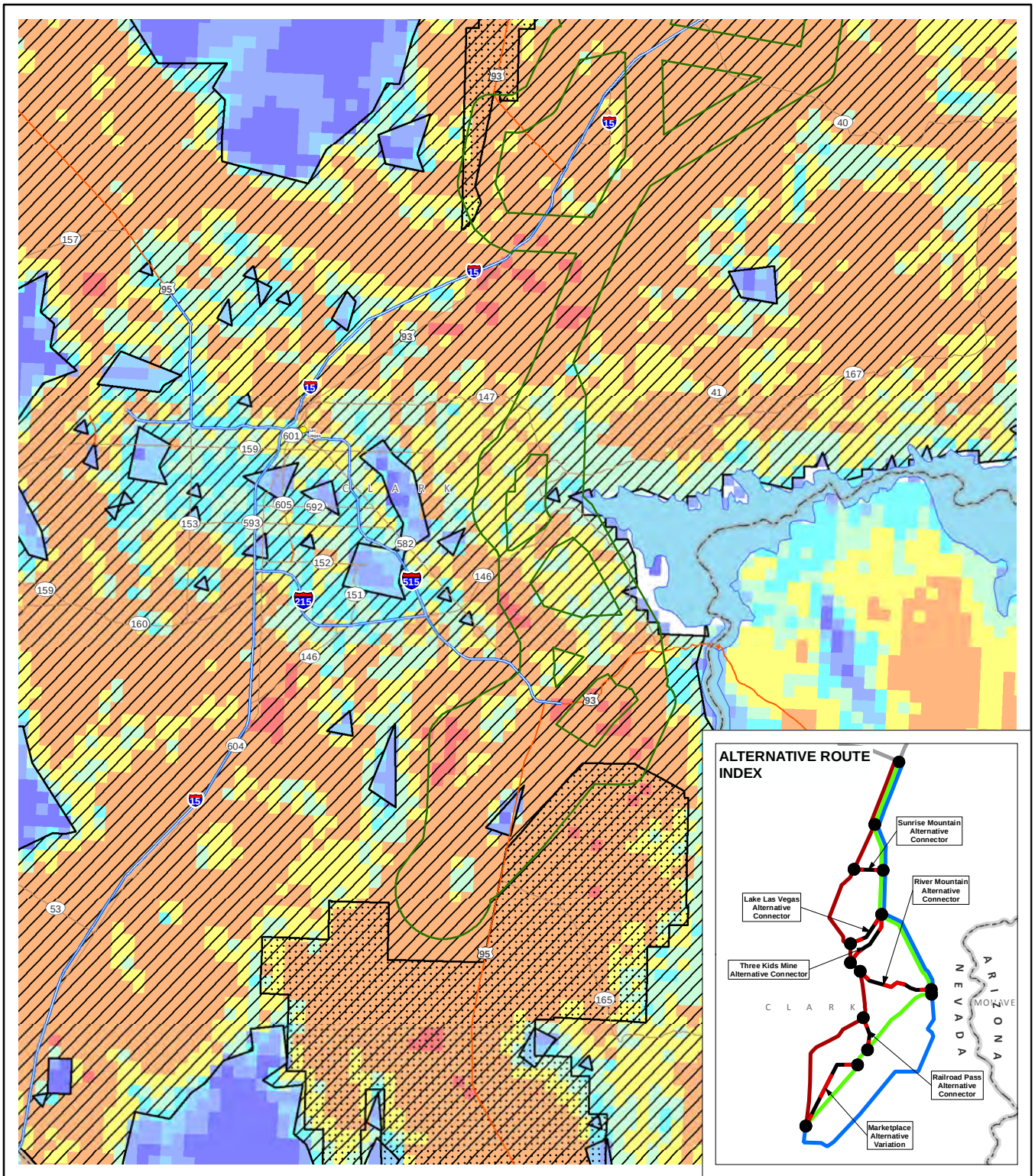

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3.8.6 Impacts to Special Status Wildlife Species

The impact assessment analysis area for special status wildlife species includes habitats within a 250-foot-wide transmission line ROW for each alternative route. The impact analysis area for potential access roads includes habitats that occur within a 2-mile transmission line corridor for each alternative route. This analysis area was assessed because the exact locations of access roads have not been determined. Identification of habitat potentially impacted by Project activities focused on vegetation communities that support various special status wildlife species seasonally or throughout the year.

Several small reroutes and micro-siting adjustments to the proposed alternative routes in Regions II and III have been included in analyses and are described in detail in Section 2.5.1. These adjustments would occur along Alternatives I-D, II-A, II-B, II-C, II-E, II-F, III-A, IV-A, and IV-C. Alternatives I-B and I-D have been widened slightly to accommodate possible micro-siting adjustments to avoid greater sage-grouse habitat. The slight changes in impact acreages for micro-siting, widening, reroutes, or merged alternative segments will be included in analyses, but are not expected to cause more than incremental differences in impacts to special status species. These project adjustments have been incorporated to address concerns regarding USFS IRAs, BLM designated utility corridors, and greater sage-grouse potential habitat.

The methodology for evaluating impacts to special status wildlife species focused on those species that were identified as potentially occurring within the special status wildlife analysis area. Species considered for the impact analysis are included in **Table 3.8-6**. Special status wildlife species included in this analysis include 38 mammals, 51 birds, 19 reptiles, and 12 terrestrial invertebrate species. In total, 4 federally listed mammals, 7 bird species, and 1 reptile species were analyzed. Two federal candidate species were analyzed, along with 106 BLM, USFS, and/or state-protected species. Three federally listed bird species do not occur in the special status wildlife analysis area, but are included on the special status species lists due to their occurrence in the North Platte sub-basin.

Special status wildlife species-related issues addressed by this impact assessment were determined through the public scoping process and in consultation with BLM, CPW, NDOW, UDWR, USFS, USFWS, Western, and WGFD. Issues ranged from direct loss and fragmentation of desert tortoise habitat and greater sage-grouse habitat, to the direct loss of birds, primarily greater sage-grouse and raptor species, as a result of electrocution and collision with transmission lines. Impact parameters were used in combination to quantify impacts. The impact parameters also allow comparisons among the applicant-proposed routes, alternatives, and alternative variations. Impact issues and the analysis considerations for special status wildlife species are listed in **Table 3.8-15**.

Table 3.8-15 Relevant Analysis Considerations for Special Status Wildlife Species

Resource Topic	Analysis Considerations and Relevant Assumptions
Habitat loss and fragmentation	• Acres of habitat for wildlife species located within the 250-foot-wide transmission line ROW and 2-mile transmission line corridor for access roads are quantified; • Species-specific avoidance measures are discussed; • The degree to which the loss or fragmentation of habitat would affect individuals and whether these effects could impact populations of affected species are qualitatively discussed; • Changes in vegetation communities that influence wildlife habitat are referenced; • The timeline for vegetation communities to recover to baseline levels is estimated; • Habitat disturbance is related to overall habitat availability in the respective analysis areas; and • Impacts resulting from habitat loss and fragmentation are evaulated using the best available literature.

Table 3.8-15 Relevant Analysis Considerations for Special Status Wildlife Species

Resource Topic	Analysis Considerations and Relevant Assumptions
Loss of or injury to a species, displacement of individuals, and loss of breeding success from exposure to increased noise and human activity	• Impacts of bird and bat collisions from transmission lines on overall populations are evaluated in qualitative terms; • A qualitative discussion of how construction and operation activities may displace or impact breeding activity for wildlife species is included; and • The wildlife/vehicle collision potential is described in both quantitative and qualitative terms.
Potential impacts of increased perches/predation from Project infrastructure	• Impacts of increased predation by raptors and corvids (e.g., ravens, crows) on wildlife species is evaluated in qualitative terms.

Potential direct and indirect effects of construction, operation, and decommissioning on special status wildlife species and their associated habitats are discussed below. After impacts are identified, relevant BMPs and TWE's design features are discussed in terms of reducing impacts. If impacts remain after application of BMPs and TWE's design features, additional mitigation is recommended to reduce impacts. As required under Section 7 of the Endangered Species Act, a BA will be prepared for the TransWest Express Transmission Project (Draft EIS) to determine whether the proposed Project is likely to affect any federally listed, candidate, or proposed species.

The impacts analysis for special status wildlife species assumes that the BLM and USFS will continue to manage special status wildlife species habitats in coordination with CPW, NDOW, UDWR, and WGFD and that the USFWS has jurisdiction over the management of federally endangered, threatened, and proposed species populations. It also assumes that the BLM will continue to manage BLM sensitive species in accordance with BLM Manual 6840 and the USFS will continue to manage MIS and their habitats in accordance with NFMA and Forest Plan requirements and USFS sensitive species in accordance with U.S. Forest Service Manual 2670. Further assumptions are that the design features committed to by TWE and the BMPs would be implemented under all alternatives (**Appendix C**).

Through the implementation of the following Project design features and BMPs (as outlined in **Appendix C**), the direct impacts to special status wildlife resources due to construction would be minimized:

- WWEC BMPs – ECO-1/ECO-2/ECO-4/ECO-6/ECO-7/ECO-8 (protection of sensitive wildlife and habitats); FIRE-1/FIRE-2 (fire management and fuels strategies); NOISE-2 (noise reduction strategy); REST-1 (topsoil salvage, seeding with weed-free, native seeds, and restoring pre-development contours) and REST-2 (restoring vegetation to values commensurate with the ecological setting);
- Agency BMPs – All applicable State and Federal agency No Surface Occupancy restrictions (NSO), Conditional Surface Occupancy (CSO) restrictions, and Timing Limitations (TL) as outlined in Appendix C;
- TWE Design Features – TWE-1/TWE-2 (compliance with agency stipulations, laws and regulations); TWE-4 (environmental training); TWE-13/TWE-14/TWE-16 (vegetation management, restoration, and erosion control); TWE-26/TWE-27/TWE-28 (vegetation and noxious weed management); TWE-29/TWE-30/TWE-31/TWE-32/TWE-33/TWE-34 (ecological and special status species protection).

In addition the following mitigation measure for wildlife should be implemented:

- ***SSWS-1****: In order to protect nesting mountain plovers, TWE would follow the USFWS 2002 Mountain Plover Survey Guidelines and would conduct mountain plover nest surveys if construction were to occur during the mountain plover breeding season (April 10 to July 10). If a nest is located, a 0.25 mile protection buffer would be implemented around the active nest until the birds fledge from the nest.*
- ***SSWS-2****: Prior to construction activities in suitable pygmy rabbit habitat, TWE would conduct presence/absence surveys following appropriate protocols. Areas within 0.5 mile of proposed disturbance that show characteristics of pygmy rabbit habitat will be surveyed in accordance with the Interagency Pygmy Rabbit Working Group Survey Protocols (Ulmschneider et al. 2004). If the surveys conclude that pygmy rabbits occur, the "Habitat Preservation and Restoration" conservation measures would apply (Keinath and McGee 2004).*
- ***SSWS-3****: Prior to construction activities in suitable Wyoming pocket gopher habitat, TWE would conduct presence/absence surveys following appropriate protocols. If active pocket gopher mounds are identified, the proposed surface disturbing activities would avoid the active pocket gopher mounds by 75 m (BLM 2009). However, if TWE does not wish to avoid the active pocket gopher mounds by 75 m, classification surveys (via live capture) must be completed to identify the pocket gopher responsible for the mounds to the species level. If the results conclude that the Wyoming pocket gopher is responsible for the mounds, the "Occupied Wyoming Pocket Gopher Habitat Protection Measures" would apply (BLM 2009). If the results conclude that the associated species is a northern pocket gopher, then the proposed surface disturbance may proceed without mitigation. If the classification survey fails to conclusively identify the associated pocket gopher to the species level, then it will be assumed that the species is a Wyoming pocket gopher and the "Occupied Wyoming Pocket Gopher Habitat Protection Measures" will apply (BLM 2009).*
- ***SSWS-4****: To avoid and minimize impacts to the desert tortoise and its habitat, TWE would conduct field surveys in identified desert tortoise habitat following approved USFWS protocols. TWE would coordinate with the BLM, Western, Boulder City, Clark County, Nevada, Bureau of Reclamation, and USFWS to implement appropriate mitigation measures during construction, including but not limited to, fencing, preconstruction surveys, and relocating desert tortoises.*
- ***SSWS-5****: To reduce impacts to greater sage-grouse from operation of the proposed Project, several specific design features would be implemented.*
  - *To limit raptor and corvid predation on greater sage-grouse, TWE would be required to construct anti-perching devices on segments of the proposed Project near high quality greater sage-grouse habitat (e.g., within 4 miles of occupied/active leks, within core areas, within PPH, etc.) in consultation with the BLM, Western, and applicable state wildlife agencies.*
  - *To limit the potential for greater sage-grouse collisions with guy wires, TWE would be required to outfit guy wires with agency approved bird diverters within high quality greater sage-grouse habitat, or alternatively, to construct alternative structures such as self-supporting steel lattice structures or self-supporting tubular H-frame structures instead of guyed lattice structures within greater sage-grouse habitat.*
- ***SSWS-6****: To prevent impacts to the western yellow-billed cuckoo during the breeding season, TWE would avoid construction within potentially suitable habitat from March 15 to October 15, or, alternatively, would conduct breeding western yellow-billed cuckoo surveys and implement appropriate mitigation in coordination with the BLM, Western, USFWS, and applicable state wildlife agencies.*
- ***SSWS-7****: To reduce impacts to Utah prairie dogs, TWE would be required to conduct a preliminary habitat assessment along portions of the proposed Project that is within historic Utah prairie dog habitat. Based on the results of the habitat survey, additional surveys may be required by the USFWS to determine whether occupied habitat occurs within the disturbance footprint of the proposed Project. If occupied habitat is found, appropriate mitigation measures such as*

reroutes, reducing the width of the ROW, and constructing alternative structures types (e.g. H-frame tubular) with anti-perching devices on transmission line segments within occupied habitat, would be implemented in coordination with the BLM, Western, UDWR, and USFWS.

- ***SSWS-8**: To prevent impacts to southwestern willow flycatchers during the breeding season, TWE would avoid construction within suitable habitat from March 15 to October 15, or, alternatively, conduct breeding southwestern willow flycatcher surveys and implement appropriate mitigation in coordination with the BLM, Western, USFWS, and applicable state wildlife agencies.*
- ***SSWS-9**: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented. To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

3.8.6.1 Impacts from Terminal Construction and Operation

Section 2.4, Elements Common to All Action Alternatives describes the Northern Terminal, the Proposed Alternative Southern Terminal, the Southern Terminal located near IPP (Design Option 2), and the Southern Substation located near IPP (Design Option 3). Vegetative communities potentially impacted at terminal siting areas are presented below. No national forests would be impacted by terminals.

Potential impacts to special status wildlife species at terminal sites can be grouped into two main categories: construction and operation. Construction-related impacts primarily are habitat disturbance, fragmentation, and direct mortalities as a result of vehicle collisions and crushing of nests/burrows. Habitat disturbance resulting from the construction of terminals can be further classified into construction and operation impacts. Construction impacts account for all disturbance during construction of the terminal sites. Operation impacts are defined as impacts that remain after construction reclamation efforts are complete and will last at least as long as the Project is in operation. Examples of operation impacts include habitat disturbance in areas where facilities will be sited that wouldn't be reclaimed until after the end of the Project's design life (decommissioning). Habitat impacts can be further categorized as direct and indirect. Direct habitat impact results when habitat is destroyed or converted to a form that is unsuitable for the impacted species. The primary potential indirect impact is species avoidance (displacement) of otherwise suitable habitat in and around terminal locations. The methodology for calculating indirect impacts to habitat is described in Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associated Components.

The primary operation-related impact associated with the terminals is mortality as a consequence of electrocution or collision with transmission line components.

<u>Raptor Nest Data Assumptions</u>

Raptor species are known to use nests for multiple years. The species using a particular nest may vary annually. For example, owls do not construct their own nests; they use previously constructed nests, or even burrows. Non-raptor species also use raptor nests and vice versa. Common ravens are not considered raptors, but raptor nest data often include common raven nests, for this reason.

When a raptor nest is identified outside of nesting season, or when no birds are present, it is often not possible to determine the species using the nest. Such nest occurrence data is still valuable and is included in analyses as unknown. Also, as previously described, the species using a nest can change over time. Nests for which the species is unknown are reported both in Section 3.7, Wildlife and Section 3.8, Special Status Wildlife Species.

Raptor nest data are compiled from seven BLM Field Offices, four National Forest datasets, NDOW, and two consultants. Every effort was made to compile the most accurate dataset for the project; however,

there is potential for duplication. The EIS analysis reports nests within 1 mile of the project reference lines and terminal sites. It is possible for a particular raptor nest to occur within 1 mile of multiple alternative routes, micro-siting options, alternative connectors, alternative variations, electrode sites, and terminal sites. Thus, the nest would be reported as potentially impacted multiple times.

Finally, while the most recent raptor nest data has been incorporated into analyses, nests and nest structures (i.e. trees) can be destroyed and new nests are constructed each year. A comprehensive raptor nest survey would be conducted along the agency preferred route prior to construction. This would provide the data needed to inform micro-siting adjustments, to avoid or minimize impacts to nesting raptors.

Construction Impacts

Northern Terminal

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted by construction and operation of the Northern Terminal include five federally listed; two federal candidate; and 45 BLM sensitive, USFS sensitive, and state-protected species. Suitable habitat for the western yellow-billed cuckoo and Canada lynx does not occur at the Northern Terminal; therefore, impacts to those species are not anticipated. Section 3.7.6.1 presents a description of existing disturbance at the Northern Terminal siting area.

Construction of the Northern Terminal would result in the construction and operation disturbance of 488 acres and 203 acres, respectively. These areas represent <0.01 percent of shrubland habitat within the Region I special status wildlife analysis area. The remaining disturbance area would be reclaimed at the end of the life of the Project (estimated at 50 years). Impacts to special status wildlife species that may be found at the Northern Terminal are presented below.

Whooping Crane (Endangered), Interior Least Tern (Endangered), Piping Plover (Threatened)

These species occur downstream of the Region I special status wildlife analysis area, along the Platte River in Nebraska. This area is located a considerable distance downstream of any construction or operation disturbance areas in Wyoming; thus, these activities would not affect the whooping crane, interior least tern, or piping plover. However, water depletion also must be evaluated for these species based on the Platte River Recovery Implementation Program (PRRIP), which was implemented in 2006. The goal of the PRRIP is to assist in the conservation and recovery of the target species and their associated habitats along the central and lower Platte River in Nebraska. Platte River water depletions include evaporative losses and consumptive use, which is characterized as diversions from the Platte River or its tributaries, less return flows. Any actions that may result in depletion to the Platte River system should be identified, and the amount and timing of the depletion calculated and provided to the USFWS. Since 1978, USFWS has concluded in all of its ESA Section 7 consultations on water projects in the Platte River basin in Nebraska that the Platte River ecosystem is in a state of jeopardy, and that any federal action resulting in further water depletion to the Platte River system will further or continue deterioration of the stressed habitats to be resources of national and international importance (USDOS 2008).

TWE has indicated that all water requirements for the Project will be met using existing water rights. Required water will be procured from municipal sources, from commercial sources, or under a temporary water use agreement with landowners holding existing water rights. No new water rights will be required. Therefore, construction of the Northern Terminal is anticipated to result in no new depletions within the Platte River basin, including the upper portion of the North Platte River and the downstream section of the Platte River basin in Nebraska. Confirmation of this determination will be ultimately made by the Wyoming State Engineers Office (SEO). Therefore, downstream impacts to habitat for these three federally listed species would not occur.

Greater Sage-grouse (Candidate)

A total of 2 occupied leks occur within 4 miles of the Northern Terminal. Approximately 230 acres of construction impacts and 150 acres of operation impacts would occur to BLM (Rawlins FO) mapped nesting and brood-rearing habitat as a result of the construction and operation of the Northern Terminal. However, due to the proposed location of the Northern Terminal near existing significant human disturbance, it is unlikely that greater sage-grouse typically occupy habitats in this area, especially for lekking. In addition, the Northern Terminal is not located within a greater sage-grouse core area. Nonetheless, potential mortality from construction of the Northern Terminal may occur if greater sage-grouse are present. The risk of direct mortality to greater sage-grouse from construction is most likely limited to nesting hens or young chicks that have limited mobility.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.) and implement seasonal timing restrictions and protection buffers in accordance with BLM IM 2010-012, EO 2011-5, and the BLM Rawlins FO RMP. Adherence to these regulations and guidelines would reduce impacts to greater sage-grouse during construction. In addition, implementation of TWE-26 and **VEG-1** would aid in reclamation activities to restore communities (e.g., sagebrush shrubland) to native ecosystems, especially in areas where reclamation is difficult. Implementation of **NX-1** and **NX-2** would minimize and mitigate impacts associated with the potential introduction or spread of noxious weeds and invasive plant species. Therefore, impacts to greater sage-grouse from the construction and operation of the Northern Terminal would be limited primarily to habitat loss and fragmentation.

Black-footed Ferret (Endangered)

No white-tailed prairie dog colonies occur at the Northern Terminal site. In addition, the USFWS has block-cleared all white-tailed prairie dog colonies in, and around the Northern Terminal location (USFWS 2004). The nearest non block-cleared area for black-footed ferrets is the Bolton Ranch Complex approximately 10 miles south of the Northern Terminal location. The nearest re-introduced population of black-footed ferrets is approximately 65 miles northeast of the Northern Terminal location in the Shirley Basin.

Due to the location of the Northern Terminal outside USFWS non block-cleared areas for black-footed ferrets, there is an extremely low likelihood of black-footed ferrets occurring at the Northern Terminal. No impacts to black-footed ferrets are expected.

BLM Sensitive and State-protected Species

BLM sensitive and state-protected species that may occur at the Northern Terminal are presented in **Table 3.8-16**. The types of direct and indirect impacts of construction and operation of the Northern Terminal to BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife from Terminal Construction and Operation. Estimates of impacts to habitat types utilized by these species as a result of the construction and operation of the Northern Terminal are presented in Section 3.5, Vegetation. Two burrowing owl, 5 golden eagle, 1 great horned owl, 1 prairie falcon, and 12 raptor nests for which the species is not known also are documented within 1 mile of the Northern Terminal. Species-specific mitigation measures are discussed below.

SSWS-1*: In order to protect nesting mountain plovers, TWE would follow the USFWS 2002 Mountain Plover Survey Guidelines and would conduct mountain plover nest surveys if construction were to occur during the mountain plover breeding season (April 10 to July 10). If a nest is located, a 0.25 mile protection buffer would be implemented around the active nest until the birds fledge from the nest.*

Table 3.8-16 BLM Sensitive and State-protected Species Potentially Occurring at the Northern Terminal

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Mammals - Bats	
Big brown bat	Grassland, greasewood flat, herbaceous wetland, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
California myotis	Greasewood flat, herbaceous wetland, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Hoary bat	Grassland, herbaceous wetland, woody riparian and wetlands
Long-eared myotis	Cliff and canyon, greasewood flat, herbaceous wetland, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Long-legged myotis	Herbaceous wetland, saltbush shrubland, woody riparian and wetlands
Pallid bat	Grassland, greasewood flat, woody riparian and wetlands
Silver-haired bat	Greasewood flat, herbaceous wetland, woody riparian and wetlands
Spotted bat	Greasewood flat, herbaceous wetland
Townsend's (Western) big-eared bat	Saltbush shrubland, sagebrush shrubland
Western pipistrelle	Herbaceous wetland
Western small-footed myotis	Cliff and canyon, greasewood flat, herbaceous wetland, woody riparian and wetlands
Yuma myotis	Cliff and canyon, greasewood flat, herbaceous wetland, sagebrush shrubland, saltbush shrubland
Mammals - Other	
Pygmy rabbit	Sagebrush shrubland
River otter	Woody riparian and wetlands
Swift fox	Grassland
White-tailed prairie dog	Grassland, greasewood flat, sagebrush shrubland, saltbush shrubland
Wyoming pocket gopher	Greasewood flat, sagebrush shrubland, saltbush shrubland
Birds	
Least bittern	Herbaceous wetland
White-faced ibis	Herbaceous wetland
Trumpeter swan	Herbaceous wetland
Barrow's goldeneye	Woody riparian and wetlands
Bald eagle	Woody riparian and wetlands
Swainson's hawk	Grassland, saltbush shrubland, sagebrush shrubland
Ferruginous hawk	Cliff and canyon, grassland, sagebrush shrubland, saltbush shrubland
Golden eagle	Cliff and canyon, grassland, sagebrush shrubland, saltbush shrubland
Mountain plover	Grassland
Long-billed curlew	Grassland, herbaceous wetland
Black tern	Herbaceous wetland
Burrowing owl	Grassland, sagebrush shrubland, saltbush shrubland
Long-eared owl	Woody riparian and wetlands

Table 3.8-16 BLM Sensitive and State-protected Species Potentially Occurring at the Northern Terminal

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Short-eared owl	Grassland, greasewood flat, herbaceous wetland, sagebrush shrubland
Loggerhead shrike	Grassland, greasewood flat, saltbush shrubland, sagebrush shrubland
Sage thrasher	Sagebrush shrubland
Yellow-breasted chat	Woody riparian and wetlands
Brewer's sparrow	Sagebrush shrubland
Vesper sparrow	Grassland, sagebrush shrubland
Sage sparrow	Sagebrush shrubland
Grasshopper sparrow	Grassland, sagebrush shrubland
Bobolink	Grassland, herbaceous wetland
Reptiles	
Corn snake	Grassland, greasewood flat, herbaceous wetland, woody riparian and wetlands
Long-nosed leopard lizard	Greasewood flat, sagebrush shrubland, saltbush shrubland,
Midget faded rattlesnake	Greasewood flat, sagebrush shrubland, saltbush shrubland
Smooth greensnake	Grassland, greasewood flat, herbaceous wetland, woody riparian and wetlands

Effectiveness: Mitigation measure **SSWS-1** requires TWE to avoid mountain plover nest sites identified within the areas of disturbance to prevent their removal and adhere to seasonal timing restrictions (April 10 to July 10) within applicable protection buffers (0.25 mile). As a result of this mitigation measure, project-related impacts to mountain plovers would not be anticipated and no take is expected as a result of the proposed Project.

***SSWS-2**: Prior to construction activities in suitable pygmy rabbit habitat, TWE would conduct presence/absence surveys following appropriate protocols. Areas within 0.5 mile of proposed disturbance that show characteristics of pygmy rabbit habitat will be surveyed in accordance with the Interagency Pygmy Rabbit Working Group Survey Protocols (Ulmschneider et al. 2004). If the surveys conclude that pygmy rabbits occur, the "Habitat Preservation and Restoration" conservation measures would apply (Keinath and McGee 2004).*

Effectiveness: Implementation of **SSWS-2** would be effective in reducing impacts to pygmy rabbits by limiting surface disturbance activities in suitable habitat and by implementing specific protection measures to protect individuals in occupied habitat.

***SSWS-3**: Prior to construction activities in suitable Wyoming pocket gopher habitat, TWE would conduct presence/absence surveys following appropriate protocols. If active pocket gopher mounds are identified, the proposed surface disturbing activities would avoid the active pocket gopher mounds by 75 m (BLM 2009). However, if TWE does not wish to avoid the active pocket gopher mounds by 75 m, classification surveys (via live capture) must be completed to identify the pocket gopher responsible for the mounds to the species level. If the results conclude that the Wyoming pocket gopher is responsible for the mounds, the "Occupied Wyoming Pocket Gopher Habitat Protection Measures" would apply (BLM 2009). If the results conclude that the associated species is a northern pocket gopher, then the proposed surface disturbance may proceed without mitigation. If the classification survey fails to conclusively identify the*

associated pocket gopher to the species level, then it will be assumed that the species is a Wyoming pocket gopher and the "Occupied Wyoming Pocket Gopher Habitat Protection Measures" will apply (BLM 2009).

Effectiveness: Implementation of SSW-3 would be effective in reducing impacts to Wyoming pocket gophers by limiting surface disturbance activities in suitable habitat and by implementing specific protection measures to protect individuals in occupied habitat.

Implementation of **SSWS-2** and **SSWS-3** would reduce impacts to pygmy rabbits and Wyoming pocket gophers by identifying suitable habitat and implementing appropriate mitigation measures, based on survey results. Additionally, TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many special status wildlife species. Remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species within the Region I special status wildlife analysis area, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact, given the extent of native habitats in the surrounding Project region.

Proposed Alternative Southern Terminal

BLM sensitive and state-protected species that may occur at the proposed alternative Southern Terminal are presented in **Table 3.8-17**. The types of direct and indirect impacts of construction and operation of the proposed alternative Southern Terminal to the 54 BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife from Terminal Construction and Operation. Estimates of impacts to habitat types utilized by these species as a result of the construction and operation of the proposed alternative Southern Terminal are presented in Section 3.5, Vegetation. No special status raptor nests are documented within the proposed alternative Southern Terminal siting area. Species-specific mitigation measures are discussed below. Section 3.7.6.1 presents a description of existing disturbance at the Proposed Alternate Southern Terminal siting area.

Table 3.8-17 BLM Sensitive and State-protected Species Potentially Occurring at the Proposed Alternative Southern Terminal and the Alternate Southern Terminal

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Mammals - Bats	
Allen's big-eared bat	Desert shrubland
Big brown bat	Desert shrubland
Big free-tailed bat	Desert shrubland
Brazilian free-tailed bat	Desert shrubland
California leaf-nosed bat	Desert shrubland
California myotis	Desert shrubland
Cave myotis	Desert shrubland
Fringed myotis	Desert shrubland
Greater western mastiff bat	Desert shrubland
Hoary bat	Desert shrubland
Long-eared myotis	Desert shrubland
Long-legged myotis	Desert shrubland
Pallid bat	Desert shrubland
Silver-haired bat	Desert shrubland
Spotted bat	Desert shrubland

Table 3.8-17 BLM Sensitive and State-protected Species Potentially Occurring at the Proposed Alternative Southern Terminal and the Alternate Southern Terminal

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Townsend's (Western) big-eared bat	Desert shrubland
Western pipistrelle	Desert shrubland
Western red bat	Desert shrubland
Western small-footed myotis	Desert shrubland
Yuma myotis	Desert shrubland
Mammals - Other	
Dark kangaroo mouse	Desert shrubland
Desert bighorn sheep	Desert shrubland
Kit fox	Desert shrubland
Pale kangaroo mouse	Desert shrubland
Birds	
Swainson's hawk	Desert shrubland
Ferruginous hawk	Desert shrubland
Golden eagle	Desert shrubland
Peregrine falcon	Desert shrubland
Prairie falcon	Desert shrubland
Burrowing owl	Desert shrubland
Long-eared owl	Desert shrubland
Gray vireo	Desert shrubland
Bendire's thrasher	Desert shrubland
Crissal thrasher	Desert shrubland
LeConte's thrasher	Desert shrubland
Phainopepla	Desert shrubland
Reptiles	
Banded Gila monster	Desert shrubland
Chuckwalla	Desert shrubland
Desert glossy snake	Desert shrubland
Desert iguana	Desert shrubland
Desert night lizard	Desert shrubland
Long-nosed leopard lizard	Desert shrubland
Mojave rattlesnake	Desert shrubland
Mojave shovel-nosed snake	Desert shrubland
Sidewinder	Desert shrubland
Speckled rattlesnake	Desert shrubland
Western banded gecko	Desert shrubland
Western threadsnake (blindsnake)	Desert shrubland

Table 3.8-17 BLM Sensitive and State-protected Species Potentially Occurring at the Proposed Alternative Southern Terminal and the Alternate Southern Terminal

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Zebra-tailed lizard	Desert shrubland
Terrestrial Invertebrates	
Great Basin small blue (Small blue) butterfly	Desert shrubland
Mojave gypsum bee	Desert shrubland
Mojave poppy bee	Desert shrubland
Mono Basin skipper (Railroad Valley skipper) butterfly	Desert shrubland
Northern Mojave blue (Mojave blue) butterfly	Desert shrubland

Alternate Southern Terminal

The Alternate Southern Terminal is sited within the same vegetation communities as the Proposed Alternative Southern Terminal. BLM sensitive and state-protected species that may occur at the Alternate Southern Terminal are presented in **Table 3.8-17**. The types of direct and indirect impacts of construction and operation of the Alternate Southern Terminal to the 54 BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife from Terminal Construction and Operation. Estimates of impacts to habitat types utilized by these species as a result of the construction and operation of the Alternate Southern Terminal are presented in Section 3.5, Vegetation. No special status raptor nests are documented within the Alternate Southern Terminal siting area. Species-specific mitigation measures are discussed below. Section 3.7.6.1 presents a description of existing disturbance at the Proposed Alternate Southern Terminal siting area.

Southern Terminal located near IPP (Design Option 2)

BLM sensitive and state-protected species that may occur at the proposed Southern Terminal located near IPP (Design Option 2) are presented in **Table 3.8-18**. The types of direct and indirect impacts of construction and operation of the Southern Terminal located near IPP (Design Option 2) to the 60 BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife from Terminal Construction and Operation. Estimates of impacts to habitat types utilized by these species as a result of the construction and operation of the Southern Terminal located near IPP (Design Option 2) are presented in Section 3.5, Vegetation. No special status raptor nests are documented within the Southern Terminal located near IPP (Design Option 2) siting area. Species-specific mitigation measures are discussed below.

Table 3.8-18 BLM Sensitive and State-protected Species Potentially Occurring at the Southern Terminal located near IPP (Design Option 2)

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Mammals - Bats	
Allen's big-eared bat	Greasewood flat, saltbush shrubland
Big brown bat	Grassland, greasewood flat, herbaceous wetland, saltbush shrubland
Big free-tailed bat	Grassland, herbaceous wetland, saltbush shrubland
Brazilian free-tailed bat	Herbaceous wetland, saltbush shrubland
California leaf-nosed bat	Saltbush shrubland

Table 3.8-18 BLM Sensitive and State-protected Species Potentially Occurring at the Southern Terminal located near IPP (Design Option 2)

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
California myotis	Greasewood flat, herbaceous wetland, saltbush shrubland
Fringed myotis	Grassland, greasewood flat, herbaceous wetland, saltbush shrubland
Hoary bat	Grassland, herbaceous wetland, saltbush shrubland
Long-eared myotis	Greasewood flat, herbaceous wetland, saltbush shrubland
Long-legged myotis	Herbaceous wetland, saltbush shrubland
Pallid bat	Grassland, greasewood flat, saltbush shrubland
Silver-haired bat	Greasewood flat, herbaceous wetland
Spotted bat	Grassland, greasewood flat, herbaceous wetland, saltbush shrubland
Townsend's (Western) big-eared bat	Greasewood flat, herbaceous wetland, saltbush shrubland
Western pipistrelle	Herbaceous wetland, saltbush shrubland
Western red bat	Herbaceous wetland
Western small-footed myotis	Grassland, greasewood flat, herbaceous wetland
Yuma myotis	Grassland, greasewood flat, herbaceous wetland, saltbush shrubland
Mammals - Other	
Dark kangaroo mouse	Grassland, saltbush shrubland
Desert Valley kangaroo mouse	Saltbush shrubland
Kit fox	Grassland, saltbush shrubland
White-tailed prairie dog	Grassland, greasewood flat, saltbush shrubland
Birds	
Least bittern	Herbaceous wetland
White-faced ibis	Herbaceous wetland
Swainson's hawk	Grassland, saltbush shrubland
Ferruginous hawk	Grassland, saltbush shrubland
Golden eagle	Grassland, saltbush shrubland
Peregrine falcon	Grassland, herbaceous wetland, saltbush shrubland
Prairie falcon	Grassland, saltbush shrubland
Columbian sharp-tailed grouse	Grassland, greasewood flat, herbaceous wetland
Mountain plover	Grassland
Long-billed curlew	Grassland, herbaceous wetland
Black tern	Herbaceous wetland
Burrowing owl	Grassland, saltbush shrubland
Long-eared owl	Grassland, saltbush shrubland
Short-eared owl	Grassland, greasewood flat, herbaceous wetland
Black swift	Herbaceous wetland
Loggerhead shrike	Grassland, greasewood flat, saltbush shrubland

Table 3.8-18 BLM Sensitive and State-protected Species Potentially Occurring at the Southern Terminal located near IPP (Design Option 2)

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Crissal thrasher	Saltbush shrubland
Gray vireo	Saltbush shrubland
Vesper sparrow	Grassland
Bobolink	Grassland, herbaceous wetland
Reptiles	
Banded Gila monster	Grassland
Corn snake	Grassland, greasewood flat, herbaceous wetland
Desert iguana	Saltbush shrubland
Long-nosed leopard lizard	Greasewood flat, saltbush shrubland
Midget faded rattlesnake	Greasewood flat, saltbush shrubland
Smooth greensnake	Grassland, greasewood flat, herbaceous wetland
Speckled rattlesnake	Saltbush shrubland
Utah milk snake	Grassland, greasewood flat, herbaceous wetland, saltbush shrubland
Western banded gecko	Saltbush shrubland
Western threadsnake (blindsnake)	Grassland, greasewood flat, herbaceous wetland, saltbush shrubland
Terrestrial Invertebrates	
Eureka mountainsnail	Grassland, saltbush shrubland
Great Basin silverspot (Nokomis fritillary) butterfly	Herbaceous wetland
Grey's silverspot (Grey's fritillary) butterfly	Grassland
Honey Lake blue butterfly	Saltbush shrubland
MacNeill sooty wing skipper (MacNeill saltbush sootywing) butterfly	Herbaceous wetland, saltbush shrubland
Mono Basin skipper (Railroad Valley skipper) butterfly	Grassland
Rice's blue butterfly	Saltbush shrubland
White River wood nymph butterfly	Grassland, herbaceous wetland

Southern Substation located near IPP (Design Option 3)

The Southern Substation located near IPP (Design Option 3) is sited entirely within the Southern Terminal located near IPP (Design Option 2) area. BLM sensitive and state-protected species that may occur at the Southern Substation located near IPP (Design Option 3) are presented in **Table 3.8-18**. The types of direct and indirect impacts of construction and operation of the Southern Substation located near IPP (Design Option 3) to the 60 BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife from Terminal Construction and Operation. Estimates of impacts to habitat types utilized by these species as a result of the construction and operation of the Southern Substation located near IPP (Design Option 3) are presented in Section 3.5 Vegetation. No special status raptor nests are documented within the Southern Substation located near IPP (Design Option 3) siting area. Species-specific mitigation measures are discussed below.

3.8.6.2 Impacts to Special Status Wildlife from Design Options

Design Option 2 –DC from Wyoming to IPP; AC from IPP to Marketplace Hub

Because the implementation of Design Option 2 would utilize the same alternative routes and construction techniques as the proposed Project, impacts to special status wildlife from construction and operation of Design Option 2 would be similar to those discussed under the alternative routes. Differences between Design Option 2 and the proposed Project include the location of the Southern Terminal and ground electrode system, as well as the addition of a series compensation station midway between IPP and Marketplace. The Southern Terminal would be located near IPP in Utah instead of near Marketplace in Nevada, and the ground electrode system would be within 50 miles of IPP.

Table 3.8-19 provides a summary of impacts associated with Design Option 2. Impacts from Design Option 2 facilities would be similar to impacts described in Section 3.8.6.1, Impacts from Terminal Construction and Operation, and Section 3.8.6.2, Impacts Common to all Alternative Routes and Associated Components. Greater sage-grouse and Utah prairie dogs do not occur in the area proposed for these facilities. The same design features, BMPs, and mitigation measure listed for the Northern Terminal would be implemented to minimize impacts resulting from Design Option 2.

Table 3.8-19 Summary of Design Option 2 Impact Parameters for Vegetation Communities Associated with Special Status Wildlife Species

Design Option 2 Converter/Substation
• Approximately 181 acres of total impacts to vegetation communities associated with special status species would occur.
• Approximately 18 acres of construction and 11 acres of operation impacts to grasslands would occur.
• Approximately 17 acres of construction and 11 acres of operation impacts to greasewood flats would occur.
• Approximately 7 acres of construction and 4 acres of operation impacts to herbaceous wetlands would occur.
• Approximately 139 acres of construction and 87 acres of operation impacts to saltbush shrublands would occur.

Design Option 3 Phased Build Out

Because the implementation of Design Option 3 would utilize the same alternative routes, facilities, and construction techniques as the proposed Project, albeit in a phased approach, impacts to special status wildlife from construction and operation of Design Option 3 would be the same as those discussed under the alternative routes.

3.8.6.3 Impacts Common to All Alternative Routes and Associated Components

Potential impacts to special status wildlife species from construction, operation, and maintenance of the proposed Project include habitat loss and fragmentation; displacement of wildlife during construction, operation, and maintenance; avoidance of the 2-mile transmission line corridor during construction and operation; cumulative effects from human disturbance and energy development; and mortality.

Habitat disturbance can be further categorized into construction and operation impacts. Construction impacts account for all disturbances caused during construction of the proposed Project, including vegetation removal, increased human activity, and increased noise levels. Operation impacts are defined as impacts that remain after construction-related reclamation efforts are complete and will last as long as the Project is in operation. Examples of operation impacts include habitat disturbance in areas where facilities will be sited, which would not be reclaimed until after the end of the Project's design life (decommissioning). Impacts to habitat can be further categorized as direct and indirect. Direct impacts to habitat result when habitat is destroyed or is converted to a form that is unsuitable for the affected species. The primary potential indirect impact to habitat occurs when wildlife avoids or is displaced from otherwise suitable habitat as a result of increased noise and human activity.

The primary impacts associated with operation of transmission lines and associated facilities are mortalities as a consequence of electrocution or collision with Project components. Electrocution is primarily associated with smaller (i.e., 100-kV or less) transmission lines, due to the size of towers and spacing of the wires (APLIC 2006). For the proposed Project, the 34.5-kV lines associated with the ground electrode beds are the only components with electrocution potential. The potential for collision impacts is influenced by species characteristics and environmental characteristics. The manner in which birds utilize habitats near transmission lines affects the probability of collisions (APLIC 1994). Other potential impacts include avoidance of otherwise suitable habitat due to the presence of a transmission line, and the increased noise and human presence that are the result of regular maintenance activities.

In addition, raptors commonly perch on transmission structures to hunt. Increased predation on special status species, such as greater sage-grouse, Wyoming pocket gopher, white-tailed prairie dog, and pygmy rabbit, could occur as a result of project operation. Increased predation by corvids and other predatory and scavenging species, which tend to accompany human presence, also may increase.

Construction Impacts

The types of direct and indirect impacts of construction activities to special status wildlife species are generally the same as discussed in Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associated Components.

Operation Impacts

The types of direct and indirect impacts of operation activities to special status wildlife species are generally the same as discussed in Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associated Components.

3.8.6.4 Region I

Tables 3.8-20, **3.8-21**, **3.8-22**, **3.8-23**, and **3.8-24** provide a tabulation of estimated impacts associated with the alternative routes and other Project components in Region I. Key impact parameters that relate to the impact discussion in Section 3.8.6.2, Impacts to Special Status Species Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below. No national forests are crossed by the Project in Region I.

Table 3.8-20 Summary of Region I Alternative Route Impact Parameters for Greater Sage-grouse Leks

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Wyoming				
Number of occupied leks within 0.5 mile of reference lines in Wyoming	0	0	1	3
Number of occupied leks within 1 mile of reference lines in Wyoming	9	9	12	14
Number of occupied leks within 2 miles of reference lines in Wyoming	16	17	24	23
Number of occupied leks within 3 miles of reference lines in Wyoming	21	21	28	28
Number of occupied leks within 4 miles of reference lines in Wyoming	28	28	38	35
Average distance of leks within 4 miles of reference lines in Wyoming (miles)	2.38	2.15	2.11	2.32

Table 3.8-20 Summary of Region I Alternative Route Impact Parameters for Greater Sage-grouse Leks

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Number of occupied leks within 11 miles of reference lines in Wyoming	99	95	131	121
Colorado				
Number of occupied leks within 0.5 mile of reference lines in Colorado	3	3	0	3
Number of occupied leks within 1 mile of reference lines in Colorado	8	7	4	7
Number of occupied leks within 2 miles of reference lines in Colorado	11	10	8	10
Number of occupied leks within 3 miles of reference lines in Colorado	13	11	14	11
Number of occupied leks within 4 miles of reference lines in Colorado	13	12	21	12
Average distance of leks within 4 miles of reference line in Colorado (miles)	1.63	1.68	2.33	1.68
Number of occupied leks within 11 miles of reference lines in Colorado	38	42	65	44
Region I Total				
Total number of occupied leks within 0.5 miles of reference lines Region I	3	3	1	6
Total number of occupied leks within 1 mile of reference lines Region I	17	16	16	21
Total number of occupied leks within 2 miles of reference lines Region I	27	27	32	33
Total number of occupied leks within 3 miles of reference lines Region I	34	32	42	39
Total number of occupied leks within 4 miles of reference lines Region I	41	40	59	47
Average distance of leks within 4 miles of reference lines in Region I (miles)	2.14	2.01	2.19	2.16
Number of occupied leks within 11 miles of reference lines in Region I	137	137	196	165
Length of transmission line in miles (habitat fragmentation and collision potential)[1]	155	159	186	171

Table 3.8-21 Summary of Region I Alternative Route Impact Parameters for Greater Sage-grouse Habitat

Parameter	Alternative I-A			Alternative I-B			Alternative I-C			Alternative I-D		
Habitat Disturbance	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Impacts to Wyoming core population areas (acres)	170	42	18,444	170	42	18,444	235	55	24,872	170	42	18,444
Percentage of existing habitat impacted within the Region I greater sage-grouse analysis area	0.02	<0.01	2.59	0.02	<0.01	2.59	0.03	0.01	3.49	0.02	<0.01	2.59
Impacts to Colorado Preliminary Priority Habitat (acres)	517	144	47,340	381	97	45,416	837	220	80,816	381	97	45,416
Percentage of existing habitat impacted within the Region I greater sage-grouse analysis area	0.04	0.01	3.75	0.03	<0.01	3.60	0.07	0.02	6.41	0.03	<0.01	3.60
Impacts to Colorado General Habitat (acres)	346	93	35,200	439	112	59,620	539	141	50,038	439	112	59,620
Percentage of existing habitat impacted within the Region I greater sage-grouse analysis area	0.04	0.01	4.39	0.05	0.01	7.44	0.07	0.02	6.25	0.05	0.01	7.44

[1] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Table 3.8-22 Summary of Region I Greater Sage-grouse Attendance at Leks within 4 Miles of the Reference Line

Parameter[1]	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Wyoming				
Number of active leks	28	28	38	35
Peak male attendance combined 2003 – 2012[2]	653	667	815	856
Minimum male attendance combined 2003 – 2012[3]	98	94	112	117
3-year average lek attendance[1]	11.51	12.23	10.23	10.99
Average attendance across all leks[4]	12.73	13.38	12.92	12.92
Total attendance 2003 – 2012[1]	2,560	2,676	3,425	3,361
Number of leks with no attendance 2008 – 2012[5]	6	6	12	9
Survey effort[6] (percent)	71.8	71.4	69.7	74.3
Colorado				
Number of active leks	13	12	21	12
Peak male attendance combined 2003 – 2012[2]	231	247	519	247
Minimum male attendance combined 2003 – 2012[3]	7	7	69	7
3-year average lek attendance	19.08	15.92	31.66	15.92
Average attendance across all leks[4]	7.28	8.08	13.51	8.08
Total attendance 2003 – 2012	925	946	2594	946
Number of leks with no attendance 2008 – 2012[5]	5	5	6	5
Survey effort[6] (percent)	97.7	97.5	91.4	97.5

[1] Lek count numbers are male birds only, most recent data used.

[2] Sum of the 10-year peak annual counts from all leks within 4 miles combined (2003-2012).

[3] Sum of the 10-year minimum count from all leks within 4 miles combined (2003-2012).

[4] Total males observed/Number of surveys.

[5] Although leks are classified as active or occupied, surveys have not observed male attendance over past 5 years.

[6] Number of surveys/Number of potential surveys (10 years x 28 leks = 280 potential surveys).

Table 3.8-23 Summary of Region I Greater Sage-grouse Lek Visibility by Alternative Route

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alterative I-D
Wyoming				
Number of visible occupied leks within 0.5 mile of reference lines[1]	0	0	0	3
Number of visible occupied leks within 1 mile of reference lines	7	8	10	12
Number of visible occupied leks within 2 miles of reference lines	11	14	20	18
Number of visible occupied leks within 3 miles of reference lines	17	20	26	22

Table 3.8-23 Summary of Region I Greater Sage-grouse Lek Visibility by Alternative Route

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alterative I-D
Number of visible occupied leks within 4 miles of reference lines	28	28	36	35
Average distance of visible leks within 4 miles of reference lines	2.38	2.15	2.08	2.09
Colorado				
Number of visible occupied leks within 0.5 mile of reference lines	2	1	0	1
Number of visible occupied leks within 1 mile of reference lines	6	4	3	4
Number of visible occupied leks within 2 miles of reference lines	6	8	6	8
Number of visible occupied leks within 3 miles of reference lines	11	10	14	10
Number of visible occupied leks within 4 miles of reference lines	12	12	21	12
Average distance of visible leks within 4 miles of reference lines	1.63	1.69	2.33	1.69
Region I Total				
Total number of visible occupied leks within 0.5 mile of reference lines in Region I	2	1	0	4
Total number of visible occupied leks within 1 mile of reference lines in Region I	13	12	13	16
Total number of visible occupied leks within 2 miles of reference lines in Region I	17	22	26	26
Total number of visible occupied leks within 3 miles of reference lines in Region I	28	30	40	32
Total number of visible occupied leks within 4 miles of reference lines in Region I	40	40	57	47
Average distance of visible leks within 4 miles of reference lines in Region I	2.14	2.01	2.17	2.16
Length of transmission line in miles (habitat fragmentation and collision potential)[2]	155	159	186	171

[1] Occupied habitat includes brood-rearing habitat and wintering habitat.

[2] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

The number of occupied greater sage-grouse leks visible from the reference lines and the average distance of occupied leks visible from the reference lines in Region I are presented in **Table 3.8-23**, Summary of Region I Alternate Route Impact Parameters (Visibility) for Greater Sage-grouse. The greatest number of occupied leks visible from the reference line, 57, would be impacted by Alternative I-C. However, the number of occupied leks and the average distance of occupied leks from the reference line are generally similar for all of the Alternative Routes in Region I. Occupied leks visible from within 4 miles of the reference line would potentially be at greater risk of predation by perching raptors. However, implementation of **SSWS-5** would limit raptor and corvid predation and impacts to greater sage-grouse

visible from the reference line. Thus, impacts associated with these occupied leks are expected to be low magnitude.

Explanation of Visibility Impact Analysis for Occupied Greater Sage-grouse Leks

The numbers of occupied greater sage-grouse leks visible from the reference lines, as presented in **Table 3.8-23**, were based on line of sight calculations, which accounted for a number of variables. The vertical distance above the reference line by which by raptors and corvids may perch on transmission tower structures was based on the assumption that raptors and corvids would perch an average of 150 vertical feet above ground surface on tower structures as well as an assumed raptor height of 2 feet. Thus, visibility of occupied greater sage-grouse leks was based on line of sight from 152 vertical feet above the reference line. Visibility calculations also were based on topographical variation within 4 miles of the reference line that would affect visibility of greater sage-grouse leks from potential perches 152 vertical feet above the reference line. For example, a greater sage-grouse lek in an area with flat terrain might be visible from 1 mile away, whereas a lek in an area with hilly or mountainous terrain may not be visible from 1 mile away due to an obstruction to line of sight. Due to a lack of data on vegetative structure and height within 4 miles of the reference line, vegetative height was not figured into line of sight calculations.

Alternative I-A (Applicant Proposed)

Federally Listed and Candidate Species

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region I include two federally listed and two candidate species, and 64 BLM sensitive and state-protected species. Species-specific impact discussions are presented below. No suitable habitat for the Canada lynx occurs along Alternative I-A, therefore impacts are not expected to occur to this species. The whooping crane, interior least tern, and piping plover do not occur in Region I; however, they are discussed in terms of potential depletions in the Platte River basin. **Table 3.8-24** provides a summary of special status raptor nests within 1 mile of the reference line in Region I. Section 3.7.6.3 presents a description of existing disturbance along Alternative I-A.

Greater Sage-grouse (Candidate)

Greater sage-grouse may be found along more that 95 percent of the Alternative I-A route in Carbon and Sweetwater counties, Wyoming and Moffat County, Colorado. Moffat County, Colorado contains the largest population of greater sage-grouse in Colorado. The WGFD and the CPW have designated “core population areas” within their respective states. These areas contain a majority of the breeding population of greater sage-grouse in a specific area and are considered vital to maintaining greater sage-grouse populations.

As presented in **Table 3.8-20**, a total of 41 occupied/active leks occur within 4 miles of Alternative I-A (i.e., 28 occupied leks in Wyoming and 13 active leks in Colorado). Occupied/active leks are those observed to have documented activity in the past 10 years. In addition, Alternative I-A crosses a variety of greater sage-grouse habitats in Wyoming and Colorado (**Figure 3.8-1**).

Impacts to greater sage-grouse from the construction and operation of the proposed Project can be grouped into two main categories, direct and indirect. Direct impacts include habitat loss, disturbance from construction activities resulting in temporary displacement of individuals, and mortality when greater sage-grouse collide with transmission lines or their supporting infrastructure, such as guy wires. Indirect impacts may include avoidance as a result of increased predation from perching raptors and human activity during construction and operation.

Table 3.8-24 Special Status Raptor Nests within 1 Mile of the reference Line in Region I[1]

Species	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D	Tuttle Easement Micro-siting Option 1	Tuttle Easement Micro-siting Option 2	Tuttle Easement Micro-siting Option 3	Tuttle Easement Micro-siting Comparable Portion of Alternative I-D	Mexican Flats alternative Connector	Baggs Alternative Connector	Fivemile Point North Alternative Connector	Fivemile Point South Alternative Connector
Bald eagle	2	0	0	0	0	0	0	0	0	0	0	0
Ferruginous hawk	102	97	145	91	0	0	0	0	6	2	8	2
Golden eagle	24	35	66	34	12	12	12	12	4	9	4	0
Prairie falcon	3	25	7	6	1	1	1	1	0	0	0	0
Swainson's hawk	2	1	5	1	0	0	0	0	0	0	0	0
Burrowing owl	7	7	5	7	0	0	0	0	1	0	0	0
Unknown raptor species	47	60	102	69	35	35	35	33	3	31	6	1
Totals	187	225	330	208	48	48	48	46	14	42	18	3

[1] Nests of raptor species, which are not classified as special status, are tabulated in Section 3.7, Wildlife. Nests of unknown raptor species are tabulated in both Sections 3.7 and 3.8 because nests may have been utilized by either special status raptors or non-special status raptors.

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012, Manti-La Sal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012; AECOM 2012.

Construction Impacts

Construction activities may result in permanent habitat loss, fragmentation, and the temporary displacement of greater sage-grouse from construction areas due to noise and increased human activity. The disturbance and degradation of sagebrush habitat can reduce the carrying capacity of local breeding populations of greater sage-grouse, especially in areas where high quality sagebrush habitat is limited (Braun 1998; Connelly et al. 2000). Alternatively, greater sage-grouse may simply avoid otherwise suitable habitat as the density of roads and transmission lines increases (Holloran 2005). Greater sage-grouse may avoid previously occupied areas due to noise and disturbance from vehicle traffic (Lyon and Anderson 2003). Depending on the season, displacement could impact birds on leks, nesting and brood-rearing hens, and birds on winter ranges. Greater sage-grouse that are displaced by construction activities might move to areas with lower quality habitat, resulting in an overall effect of reducing survival or breeding success. Fragmentation of sagebrush habitats also may interrupt the exchange of genetic material between distinct isolated areas of suitable breeding habitat. Additional impacts from transmission lines and associated access roads (e.g., two-tracks, mowed or cleared access ways) may include direct mortality of nesting hens and chicks, facilitation of travel ways for predators, and the spread of invasive and noxious plant species (Gelbard and Belknap 2003; Science Applications International Corporation [SAIC] 2001). Secondary roads that are used more often to access construction areas also may result in traffic that can negatively impact greater sage-grouse through increased noise or vehicular and pedestrian harassment. New secondary access roads (i.e., two-tracks) that are not gated to restrict public access or reclaimed immediately following construction also may provide increased human access to previously inaccessible greater sage-grouse habitats, allowing for increased pedestrian harassment at leks sites and increased hunting pressure. Ground disturbance associated with secondary road construction and use also increases the potential for noxious weed invasion, and vehicles driving these roads may increase the possibility of igniting fires (Leu et al. 2008).

The potential for greater sage-grouse mortality from construction equipment would likely be very low. Equipment used in transmission line construction generally moves at a slow rate or is stationary for long periods (e.g., cranes). The risk of direct mortality to greater sage-grouse from construction is most likely limited to nesting hens or young chicks that have limited mobility.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas for greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.) and implement seasonal timing restrictions and protection buffers in accordance with BLM IM 2010-012, BLM IM 2012-043, EO 2011-5, individual state greater sage-grouse management/conservation plans, BLM RMPs, and forest managements plans. Adherence to these regulations and guidelines would reduce impacts to greater sage-grouse during construction. In addition, implementation of TWE-26 and **VEG-1** would aid in reclamation activities and restoring communities (i.e., sagebrush shrubland) to native ecosystems, especially in areas where reclamation is difficult. Implementation of **NX-1** and **NX-2** would minimize and mitigate impacts associated with the potential introduction or spread of noxious weeds and invasive plant species.

Operation Impacts

In addition to potential impacts to greater sage-grouse from construction activities, operation-related impacts can include the following:

1. Increased predation on and harassment of greater sage-grouse from increased available perch locations for raptors and corvids.
2. Potential avoidance of tall structures that provide perching opportunities for raptors and corvids.
3. Increased fragmentation and reduction of habitat quality of otherwise suitable greater sage-grouse habitat.

4. Increased mortalities as a result of maintenance activities along new or improved access roads (e.g., two-tracks, mowed or cleared access ways), which could result in vehicle collisions and nest destruction. New or improved secondary access roads also may lead to increased public use of roads that were previously inaccessible if not properly gated or signed to restrict access. This may lead to increased greater sage-grouse disturbance as a result of recreation activities (e.g., four-wheeling, hunting, bird watching, etc.).

Avian mortality from collisions with transmission lines is well documented (Brown and Drewien 1995). While greater sage-grouse are predominantly a ground-dwelling species, the risk for collision during flight is heavily dependent upon transmission line sizes (e.g., 34.5-kV vs. 600-kV) and locations, such as locations between loafing and feeding areas or along migration routes. Highest collision probabilities appear to occur where greater sage-grouse typically fly between foraging and loafing habitats bisected with lower voltage overhead lines (SAIC 2001).

Factors that influence the risk of collision to individual birds as they encounter transmission lines are varied and include flight characteristics, previous experience with transmission lines (typically a function of the bird's age), location of the transmission line, weather, and transmission line structural characteristics (APLIC 1994). Past research has shown that the static wire, also referred to as the shield or groundwire, has posed the greatest collision danger to birds (APLIC 1994; Faanes 1987). Most of these collisions occur with static wires when birds increased their altitude in apparent attempts to avoid conductor wires. Birds maneuvering to avoid the conductor wires actually increased collision risk, and in the absence of static wires most collisions could have been avoided. For the proposed Project, static wires on the larger (e.g., 500-kV and 600-kV) transmission lines are typically positioned at the top of the structures and, therefore, pose less of a collision threat to low-flying greater sage-grouse. The greatest collision risks to greater sage-grouse from the proposed Project are the guy wires associated with each tower. The guy wires support the towers and are typically angled to the anchor point. Therefore, bird species, such as greater sage-grouse, may have a greater potential for collision risk because of the smaller wing to body ratio (i.e., heavy wing-load), resulting in lower flight heights and a greater occurrence of takeoffs and landings crossing guy wire heights. Because of their lack of flying efficiency, species such as the greater sage-grouse may potentially be more likely to collide with the guy wires unless the wires are properly marked or even eliminated in high use habitat areas (i.e., using self-supporting steel lattice structures instead of guyed lattice structures).

Documentation of direct mortality of greater sage-grouse resulting from collisions with transmission lines is limited. One study in Idaho showed that a substantial proportion of annual mortality can be caused by transmission line collisions. Beck et al. (2006) monitored survival of 15 radio-collared juvenile greater sage-grouse in the Medicine Lodge area of Clark County and 43 juvenile greater sage-grouse in the Table Butte area of Clark and Jefferson Counties, Idaho in 1997 and 1998. Although all mortality documented in the Medicine Lodge area was attributed to predation, 33 percent of the juvenile mortality (two of the six fatalities) in the Table Butte area was attributed to collisions with transmission lines. The actual occurrence of greater sage-grouse collisions with transmission lines is difficult to evaluate and juvenile mortality in the Table Butte area may have been more of a function of available habitat and the actual location of the transmission line rather than the transmission line design itself (i.e., transmission line was not sited properly to avoid important habitats). In addition, a majority of transmission lines are located in remote areas with little human presence and dead birds are often picked up by scavengers before humans are able to find and report them; therefore, reported losses must be considered a superficial measure of its actual collision mortality (Faanes 1987; Longridge 1986; Thompson 1978).

Avian predators, particularly raptors and corvids, are attracted to overhead utility lines because they provide perches for various activities, including hunting (APLIC 2006). Transmission poles increase a raptor's range of vision, allow for greater speed during attacks on prey, and serve as territorial markers (APLIC 2006; Manville 2002; Steenhof et al. 1993). Most research on transmission lines and raptor and corvid populations has documented a positive relationship between transmission lines and increased perches and nest sites. Although a direct correlation between transmission lines and increased predation

risks for greater sage-grouse has not been documented, greater sage-grouse may avoid transmission lines due to increased predation risk (Lammers and Collopy 2007). It also is important to note that in some regions of the U.S., greater sage-grouse are an important food item for raptor species (i.e., golden eagles). This is especially true when other prey populations are exhibiting down cycles (e.g., black-tailed jackrabbit, white-tailed prairie dog, etc.). Golden eagles follow greater sage-grouse during their seasonal migrations, and numerous researchers have documented golden eagle predation on greater sage-grouse (Gibson and Bachman 1992; Schroeder et al. 1999). Golden eagle predation of male birds at leks can be substantial in certain areas, especially if other prey populations are low. Golden eagles often fly over and attack birds on leks, disrupting lek behaviors and scattering birds (Hartzler 1974; Jenni and Hartzler 1978). Other documented avian predators of greater sage-grouse or their nests include black-billed magpie, common raven, ferruginous hawk, red-tailed hawk, rough-legged hawk, Swainson's hawk, gyrfalcon, and northern goshawk (Schroeder et al. 1999). Recent research conducted for the Sierra Pacific Power Company's Falcon-Gondor transmission line suggests that greater sage-grouse nests with more total shrub cover had a greater probability of success than nests with less cover, regardless of distance from the transmission line (Blomberg et al. 2010). Kolada et al. (2009) reported higher greater sage-grouse nest success in California as shrub cover increased. Therefore, this research suggests that the risk of increased raptor and corvid predation on greater sage-grouse may be mitigated by maintaining and restoring sagebrush canopy cover, particularly within important nesting and brood-rearing habitat.

In addition to direct mortality from collisions and increased predation on greater sage-grouse by raptors and corvids, transmission lines may cause greater sage-grouse to abandon otherwise suitable habitat or disrupt movement patterns among seasonal habitats (SAIC 2001). Transmission lines might also serve as barriers to movement as a result of avoidance behavior (Desholm and Kahlert 2005; Robel et al. 2004). Greater sage-grouse and other prairie gallinaceous birds have evolved in habitat devoid of tall structures. It is unclear how these species react to the height of these structures. Studies completed on greater and lesser prairie-chickens have suggested avoidance concerns because of the height of transmission lines. This avoidance may create an unintentional buffer along the transmission lines and roads of at least 328 feet in width (and probably more) for prairie-chickens. There also appears to be avoidance in the placement of nests and leks (Pruett et al. 2009a,b). These studies showed that greater and lesser prairie-chickens were not only more likely to avoid transmissions lines, but also less likely to nest, cross, or maintain a home range near transmission lines (Pruett et al. 2009a,b). The movement of the prairie-chickens was shown to be altered by the transmission lines, creating habitat fragmentation (Pruett et al. 2009a,b).

In northern California, transmission lines have had a negative impact on lek attendance and strutting activity has ceased on all leks within one mile of one particular transmission line, while other transmission lines located in greater sage-grouse habitat also are believed to be impacting populations (Bi-State Local Planning Group [Bi-State Plan] 2004). A study in Washington State found that 19 of 20 leks (95 percent) documented within five miles of 500-kV transmission lines are now vacant, while the vacancy rate for leks further than 5 miles is 59 percent (22 of 37 leks; Washington Department of Fish and Wildlife [WDFW] 2008). In Oregon, a 250-kV transmission line was constructed within 0.5 miles of a greater sage-grouse lek that had an average attendance of 41 males during the period 1949 to 1980. After the transmission line was constructed from 1981 to 1982, an average of only five males per lek was counted between 1982 and 2005, with no birds being counted on the lek since 2006 (Oregon Department of Fish and Wildlife [ODFW] 2009). The cause of this decline or perhaps extirpation cannot be directly linked to the transmission line, but it is likely part of a cumulative effect from development in the area. It also was noted that the Oregon statewide greater sage-grouse population from 1980 to 1988 (the period when the lek declined) reached relatively high levels.

A majority of literature on transmission line impacts was derived from studies that looked at several different facilities associated with energy development (e.g., oil and gas well pads, access roads, compressor stations, transmission lines, etc.). Additionally, due to very limited data on collision mortality of greater sage-grouse from transmission lines, it cannot be determined if collision rates vary by capacity of transmission lines. Based on the lack of specific research on transmission lines and ambiguity associated

with results of many of these studies, it also is not possible to differentiate the relative magnitude of indirect impacts based on capacity of the transmission line. To the extent that increased predation and harassment caused by raptors and corvids may influence greater sage-grouse use of adjacent habitats, there is probably little difference based on capacity of transmission lines, as all transmission lines provide opportunities for raptors and corvids to perch. Likewise, ground disturbance would occur regardless of transmission line capacity, and therefore all transmission lines would increase the potential for establishment of noxious weeds and lead to increased human activity for maintenance purposes. If the primary impact to greater sage-grouse is avoidance of tall structures, however, then it is likely that shorter towers used on 34.5-kV versus 500-kV lines would have less impact, but this cannot be confirmed based on available literature. It also is not known if smaller capacity lines result in less "behavioral" habitat fragmentation (i.e., fragmentation resulting from greater sage-grouse being more reluctant to cross 500-kV lines than 345-kV lines.

***SSWS-5**: To reduce impacts to greater sage-grouse from operation of the proposed Project, design features specific to greater sage-grouse would be implemented.*

- *To limit raptor and corvid predation on greater sage-grouse, TWE would be required to construct anti-perching devices on segments of the proposed Project near high quality greater sage-grouse habitat (e.g., within 4 miles of occupied/active leks, within core areas, within PPH, etc.) in consultation with the BLM, Western, and applicable state wildlife agencies.*
- *To limit the potential for greater sage-grouse collisions with guy wires, TWE would be required to outfit guy wires with agency approved bird diverters within high quality greater sage-grouse habitat, or alternatively, to construct alternative structures such as self-supporting steel lattice structures or self-supporting tubular H-frame structures instead of guyed lattice structures within greater sage-grouse habitat.*

Effectiveness: **SSWS-5** would help minimize the potential for increased predation on greater sage-grouse by limiting raptor and corvid perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors and corvids on greater sage-grouse. Marking guy wires would increase the visibility of guy wires and would reduce the potential for collisions, especially in areas between important roosting and foraging habitat. A study in South Carolina involving two 115-kV transmission lines showed that the bird collision rate was 53 percent lower for marked transmission lines versus unmarked transmission lines (Savereno et al. 1996). The study concluded that aviation markers were effective at increasing the transmission line visibility and reducing bird collisions. Alternatively, constructing alternative structures such as self-supporting steel lattice structures instead of guyed lattice structures would eliminate the collision potential from guy wires to greater sage-grouse.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). In addition, TWE has taken into account greater sage-grouse habitat (e.g., lek locations, core areas, etc.) during the design phase of the Project and routed the transmission line around sensitive habitat types, to the extent possible. **SSWS-5** would require TWE to construct anti-perching devices and mark guy wires or use alternative structures in high quality greater sage-grouse habitat. These features would help reduce disturbance to sensitive habitat types, reduce the potential for predation on greater sage-grouse by raptors and corvids, and reduce the collision potential from guy wires. Nonetheless, given the amount of important greater sage-grouse habitat crossed by the proposed Project under Alternative I-A in Wyoming and Colorado (**Table 3.8-21**), mortality from operation of the proposed Project may occur.

Offsite Compensatory Mitigation

In an effort to comply with BLM IM 2012-043 guidance, TWE has developed a framework for impact analysis that is focused on the listing factors considered by the USFWS for evaluating future listing and

protection of greater sage-grouse under the ESA. As part of the framework, consideration of compensation for both short-term and long-term direct and indirect loss of greater sage-grouse and its habitat will be included in the TWE Greater Sage-grouse Mitigation and Habitat Equivalency Analysis Plan. This framework is included in **Appendix G**. This plan will be completed upon the final assessment of the full range of impacts resulting from the construction, operation, and maintenance of the TWE project. Furthermore, the framework specifies the use of Habitat Equivalency Analysis (HEA), conducted by TWE, as a standardized basis for determining a one-to-one ratio for habitat services lost or mitigated. TWE intends to continue compliance with BLM IM 2012-043 through considering the implementation of both on-site and off-site compensatory mitigation measures developed during the HEA process.

Overview of Habitat Equivalency Analysis

The HEA is a process of quantifying interim and permanent habitat disturbance, measured as a loss of habitat services from pre-disturbance conditions, and scaling compensatory habitat requirements to those disturbances (Dunford et al. 2004; King 1997; Kohler and Dodge 2006; National Oceanic and Atmospheric Administration [NOAA] 2009, 2006). Habitat services are generally quantified using a metric that is representative of the functionality or quality of habitat (i.e., the ability of that habitat to provide wildlife "services" such as nest sites, forage, cover from predators, etc.). When wildlife habitat is the primary service of interest, areas with the highest habitat service levels are those areas with highest habitat quality. Interim (or short-term) habitat disturbances are those services that are absent during certain phases of the Project that would have been available if that disturbance had not occurred (e.g., temporary vegetation losses, temporary soil partitioning, temporary displacement of wildlife populations). Permanent (or long-term) habitat disturbances are those that remain after project construction and interim reclamation and recovery are complete (e.g., permanent vegetation loss, permanent loss of wildlife or fisheries populations, irrecoverable impacts to soils or water as a result of contamination). The benefits of applying HEA to the Project are that:

- The approach has been thoroughly evaluated and documented in scientific literature and has been tested in multiple court cases.
- It provides a quantitative analysis of direct and indirect impacts.
- It provides a standard framework for developing appropriate mitigation ratios.
- It is applicable to any ecosystem type where appropriate habitat service metrics can be defined.

Upon completion of the HEA, TWE will work with cooperating agencies and stakeholders to develop mitigation measures that can be used to compensate for the interim and permanent losses of habitat services resulting from project construction, operation, and maintenance. Mitigation measures likely to be considered include, but are not limited to:

1. Fence marking, modification, or removal – Fences would be marked, modified, or removed to reduce or remove threats to greater sage-grouse. Marking would be prioritized in areas near leks, in winter concentration areas, in known migration corridors, or in areas between known roosting and foraging habitats.
2. Sagebrush restoration or enhancement projects – Sagebrush restoration or enhancement projects might include seeding sagebrush and associated understory vegetation into previously disturbed or burned areas or transplanting already established sagebrush stems and seedlings into areas where sagebrush has been removed or thinned. Appropriate land management agency or landowner coordination would be important to ensure sagebrush enhancement activities support ongoing and future land use objectives.
3. Understory improvement projects – Understory habitat conditions could be improved by over-seeding existing greater sage-grouse habitats with appropriate forbs, grasses, or other desirable plant species; seeding previously disturbed areas with forbs and grasses to create a suitable mosaic of habitat for various life stages of greater sage-grouse; removing undesirable

non-native understory species; or improving residual cover of existing understory species to increase cover and improve nest success.

4. Conifer removal – In areas where conifers are encroaching into suitable greater sage-grouse habitat, conifer removal (specifically removal of pinyon pine and juniper) could be used to reduce habitat fragmentation and to restore previously unsuitable habitat.
5. Brood-rearing habitat improvement – During summer months, mesic habitats adjacent to appropriate cover are necessary for brood-rearing and summer use. In areas where these habitats have been removed, altered, or are not available for other reasons, habitat enhancements focused on restoring or creating mesic habitats could be used to improve brood-rearing conditions.
6. Conservation easements – Where possible, conservation easements could be used to provide long-term contractual protection of high-quality greater sage-grouse habitat, conservation efforts, and improvement projects. TWE's ability to acquire conservation easements would be dependent upon the willingness of private landowners to participate in a conservation program. Landowner coordination would be important to ensure that activities support ongoing and future land use objectives.

Whooping Crane (Endangered), Interior Least Tern (Endangered), Piping Plover (Threatened)

Construction, operation, and decommissioning impacts to the whooping crane, interior least tern, and piping plover under Alternative I-A are anticipated to be the same as discussed in Section 3.8.6.1, Impacts from Terminal Construction and Operation.

TWE has indicated that all water requirements for the Project will be met using existing water rights. Therefore, construction of Alternative I-A is anticipated to result in no new depletions within the Platte River basin, including the upper portion of the North Platte River and the downstream section of the Platte River Basin in Nebraska. Confirmation of this determination will be ultimately made by the Wyoming State Engineers Office (SEO). Therefore, downstream impacts to habitat for these three federally listed species would not occur and TWE would not be required to conduct Section 7 consultation with the USFWS or make a mitigation payment to the PRRIP.

Western Yellow-billed Cuckoo (Candidate)

Western yellow-billed cuckoos are extremely rare summer residents in western Wyoming and Colorado. The majority of suitable habitat for this species occurs along Alternative I-A, along the Yampa River in Moffat County, Colorado.

Alternative I-A would result in the construction and operation disturbance of 43 acres and 4 acres, respectively, of potentially suitable woody riparian and wetland habitat. These areas represent 0.09 percent and <0.01 percent, respectively, of available potential habitat within the Region I western yellow-billed cuckoo analysis area. Habitat loss is the primary threat to the western yellow-billed cuckoo (Floyd et al. 2005; Corman and Wise-Gervais 2005). Western yellow-billed cuckoos appear to require large tracts of contiguous habitat (UDWR 2005) and population declines across the western U.S. are primarily due to the loss of cottonwood riparian habitat. This loss is primarily a result of conversion to agriculture, dams and river flow management, bank protection, overgrazing, and competition from exotic plants such as tamarisk (Bennett and Keinath 2001). Western yellow-billed cuckoos are further threatened by their low population size, extreme population fluctuations, and patchy distribution (Bennett and Keinath 2001). Therefore, impacts to occupied habitat may have population level impacts if not properly mitigated (e.g., avoiding construction during the breeding season, etc.).

Additional indirect impacts, such as individual displacement and avoidance of preferred habitat, also would occur as a result of increased noise and human activity associated with construction during the breeding

season (March 15 to October 15). Improved access as a result of Project roads may further fragment suitable habitat and result in increased disturbance to the western yellow-billed cuckoo.

SSWS-6*: To prevent impacts to the western yellow-billed cuckoo during the breeding season, TWE would avoid construction within potentially suitable habitat from March 15 to October 15, or, alternatively, would conduct breeding western yellow-billed cuckoo surveys and implement appropriate mitigation in coordination with the BLM, Western, USFWS, and applicable state wildlife agencies.*

Effectiveness: To minimize impacts to the western yellow-billed cuckoo during the breeding season, TWE also has committed to implement seasonal timing restrictions in applicable areas (TWE-32). More specifically, **SSWS-6** would require TWE to avoid habitat removal between March 15 and October 15 or, alternatively, to conduct western yellow-billed cuckoo surveys and implement appropriate mitigation in coordination with the BLM, Western, and state wildlife agencies.

Operation of Alternative I-A would incrementally increase the collision potential for western yellow-billed cuckoos as they move to and from nesting and foraging areas. Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associate Components presents details regarding collision impacts to migratory birds.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. Additionally, implementation of TWE-32 and **SSWS-6** would reduce impacts during the breeding season. Remaining impacts to nesting western yellow-billed cuckoos under Alternative I-A would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact, given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered, EXNE)

As discussed in Section 3.8.4.1, Federally Listed and Candidate Species, the black-footed ferret is directly associated with prairie dog colonies and requires active prairie dog colonies of suitable size and density to maintain viable population levels. Portions of Alternative I-A are located within a USFWS designated "non-essential experimental population area" (USFWS 1998a). This area encompasses portions of Sweetwater County, Wyoming, and all of Moffat County, Colorado and Uintah County, Utah. A NEP designation allows the USFWS considerable flexibility in managing reintroduced populations of endangered species. The ESA allows for treating NEP as "proposed species" under the Act (USFWS 1998b). However, according to the ESA Consultation Handbook (USFWS 1998c), "*a "non-essential experimental population" is not essential to the continued existence of the species*." Areas designated as NEP areas do not require black-footed ferret surveys, although the USFWS encourages project applicants to protect all white-tailed prairie dog towns for their value to the prairie ecosystem and the myriad of species that rely on them.

Between 2001 and 2006, 217 black-footed ferrets were released within the Wolf Creek Management Area (WCMA) along Alternative I-A in Moffat and Rio Blanco counties, Colorado (BLM 2008). This area encompasses approximately 52,000 acres at the lower reach of the Wolf Creek watershed and was chosen as a reintroduction site due to its sizeable white-tailed prairie dog population. In 2006, approximately 19,000 acres of active white-tailed prairie dog colonies were distributed throughout the WCMA. Survival rates of introduced black-footed ferrets within the WCMA have been observed to be lower than other reintroduction sites (BLM 2008) and in 2008, a plague outbreak was detected. Results of spotlight surveys in 2010 were limted to the detection of one male black-footed ferret and no documented successful reproductive pairs within the WCMA. As a result of limited survival success and the occurrence of the 2008 plague outbreak, it generally is agreed that black-footed ferrets no longer inhabit the WCMA (CPW 2011).

The following analysis focused primarily on white-tailed prairie dog colonies and complexes that occur under Alternative I-A in areas that may require surveys for black-footed ferrets (i.e., areas outside the NEP area; **Figure 3.8-2**).

If black-footed ferrets are present within the Region I black-footed ferret analysis area, both direct and indirect impacts may occur as a result of surface-disturbing activities associated with construction of the proposed Project. Direct impacts to black-footed ferrets as a result of surface disturbance to white-tailed prairie dog colonies (**Table 3.8-25**) would include habitat loss, habitat fragmentation, animal displacement, and direct mortality associated with crushing of prairie dog burrows and vehicle collisions. Habitat fragmentation limits the dispersal of individual prairie dogs and increases the density of individuals within each smaller colony (Johnson and Collinge 2004). Higher densities within colonies may lead to increased incidence of sylvatic plague or canine distemper in black-footed ferret populations. Disease outbreaks may lead to the direct loss of individuals or entire populations. Indirect impacts would include increased noise and human activity associated with both construction and maintenance during operation. Increased human activity during construction and operation, as well as increased public access, may increase the prevalence of domestic dogs in construction areas. The presence of domestic dogs and raccoons could expose ferrets in the Region I black-footed ferret analysis area to diseases that could exterminate an entire population.

In contrast to the impacts mentioned above, certain surface-disturbing activities (e.g., blading/grading vegetation for pads, roads, ancillary facilities) may actually improve white-tailed prairie dog potential habitat and therefore possibly benefit black-footed ferrets. Decreasing vegetation cover creates open areas suitable for white-tailed prairie dog colonization, while subsequent re-vegetation increases forage for white-tailed prairie dogs. As prairie dogs increase the colony size, black-footed ferret potential habitat is increased. Potential direct impacts to black-footed ferrets, if present, would include the construction and operation disturbance of approximately 150 acres and 42 acres, respectively, of potentially suitable habitat. These areas represent 0.06 percent and 0.02 percent, respectively, of potentially suitable habitat within the Region I black-footed ferret analysis area.

Impacts to black-footed ferrets, if present, from operation of Alternative I-A would include disturbance from increased noise and human activity associated with maintenance during operation. Further impacts to black-footed ferrets may include a reduction of prey populations resulting from increased perching opportunity for raptors and corvids. Increased human activity during operation may increase the prevalence of domestic dogs and raccoons in work areas. The presence of domestic dogs and raccoons could expose ferrets in the Region I black-footed ferret analysis area to canine distemper and sylvatic plague. Disease outbreaks may lead to the direct loss of individuals or entire populations.

Based on the USFWS Black-footed Ferret 1989 Survey Guidelines, habitat evaluation for black-footed ferrets would include all white-tailed prairie dog colonies or complexes that have a burrow density of eight burrows per acre or greater (USFWS 1989). In addition, pre-construction clearance surveys for black-footed ferrets may be required within white-tailed prairie dog colonies or complexes exceeding 200 acres in size that are located within 0.5 mile of Alternative I-A. If black-footed ferret surveys are required, consultation with the USFWS would be initiated prior to surveys being conducted. These surveys would take place no more than one year prior to construction activities. If black-footed ferrets are identified, no disturbance would occur within the white-tailed prairie dog complex and all Project-related activities in such colonies or complexes would be suspended immediately. The USFWS would be notified within 24 hours if a black-footed ferret or its sign was observed. If black-footed ferrets were detected, additional consultation with the USFWS would be required and the Project would be modified to avoid impacts to the species.

SSWS-9*: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Table 3.8-25 Summary of Region I Alternative Route Impact Parameters for Federally Listed and Candidate Species

Species	Alternative I-A			Alternative I-B			Alternative I-C			Alternative I-D		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Black-footed ferret potential habitat (acres)	150	42	17,475	232	55	23,997	79	22	9,565	180	46	19,879
Percentage of existing habitat within the Region I black-footed ferret analysis area	0.06	0.02	6.83	0.09	0.02	9.37	0.03	<0.01	3.74	0.07	0.02	7.77
Greater Sage-grouse potential habitat (acres)	1,034	280	100,984	991	251	123,480	1,611	415	155,726	991	251	123,480
Percentage of existing habitat within the Region I greater sage-grouse analysis area	0.03	<0.01	3.32	0.03	<0.01	4.06	0.05	0.01	5.12	0.03	<0.01	4.06
Western yellow-billed cuckoo potential habitat (acres)	43	4	1,398	46	4	1,554	41	5	2,932	39	3	1,524
Percentage of existing habitat within the Region I western yellow-billed cuckoo analysis area	0.09	<0.01	2.92	0.10	<0.01	3.25	0.09	0.01	6.13	0.08	<0.01	3.18
Gray wolf potential habitat (acres)	5,125	507	205,758	5,205	477	227,030	5,575	531	208,800	5,597	511	245,592
Percentage of existing habitat within the Region I special status wildlife analysis area	0.10	0.01	4.11	0.10	<0.01	4.54	0.11	0.01	4.18	0.11	0.01	4.91

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The gray wolf is a habitat generalist and the species is rare throughout its range in the Rocky Mountain region. Habitat requirements primarily are related to the density of prey species in the area. The gray wolf potentially could utilize any habitat type present in Region I, except for heavily managed agricultural lands. If gray wolves are present within the Region I special status wildlife analysis area, both direct and indirect impacts may occur as a result of construction of the proposed Project. Direct impacts to gray wolves would include loss of foraging or denning habitat, habitat fragmentation, animal displacement (both wolf and prey species), and direct mortality from vehicle collisions.

Alternative I-A would result in the construction and operation disturbance of 5,125 acres and 507 acres, respectively, of potential gray wolf foraging and denning habitat, and the incremental increase of habitat fragmentation associated with vegetation removal. These areas represent 0.10 percent and 0.01 percent, respectively, of potential habitat within the Region I special status wildlife analysis area. Impacts would be more pronounced within occupied habitat. Habitat fragmentation disrupts the movements of large mammal prey species and foraging gray wolves. Indirect impacts would include increased noise and human activity associated with both construction and maintenance activities during operation. Indirect impacts would occur to 205,758 acres, which represent 4.11 percent of gray wolf potential habitat within the Region I special status wildlife analysis area. Further indirect impacts to the gray wolf may include a reduction or change in distribution of large mammal populations. Impacts to the gray wolf under Alternative I-A would be limited primarily to habitat loss and fragmentation.

A summary of habitat impacts to federally listed and candidate species in Region I is found in **Table 3.8-25**.

BLM Sensitive and State-Protected Species

BLM sensitive and state-protected species that may occur Region I are presented in **Table 3.8-26**. The types of direct and indirect impacts from construction and operation of Alternative I-A to BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative I-A (e.g., sagebrush shrubland, grassland, and saltbush shrubland) are more likely to be impacted. Impacts to habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM and applicable state wildlife agencies.

Implementation of **SSWS-2** and **SSWS-3** under Alternative I-A would reduce impacts to pygmy rabbits and Wyoming pocket gophers by identifying suitable habitat and implementing appropriate mitigation measures, based on survey results. Additionally, TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many BLM sensitive and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative I-A, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance and would vary by habitat type. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

Table 3.8-26 BLM Sensitive and State-protected Species Potentially Occurring in Region I

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Mammals – Bats	
Big brown bat	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, coniferous forest, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon/juniper, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
California myotis	Aspen forest and woodland, coniferous forest, greasewood flat, herbaceous wetland, montane shrubland, open water, pinyon/juniper, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Hoary bat	Agricultural land, aspen forest and woodland, coniferous forest, grassland, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon/juniper, riparian, sagebrush shrubland, woody riparian and wetlands
Long-eared myotis	Agricultural land, aspen forest and woodland, cliff and canyon, coniferous forest, greasewood flat, herbaceous wetland, montane shrubland, open water, pinyon/juniper, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Long-legged myotis	Aspen forest and woodland, coniferous forest, herbaceous wetland, montane shrubland, open water, pinyon/juniper, riparian, saltbush shrubland, woody riparian and wetlands
Pallid bat	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, coniferous forest, grassland, greasewood flat, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Silver-haired bat	Agricultural land, aspen forest and woodland, coniferous forest, greasewood flat, herbaceous wetland, open water, pinyon/juniper, riparian, sagebrush shrubland, woody riparian and wetlands
Spotted bat	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, coniferous forest, grassland, greasewood flat, herbaceous wetland, montane grassland, open water, pinyon/juniper, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Townsend's (Western) big-eared bat	Aspen forest and woodland, coniferous forest, greasewood flat, herbaceous wetland, montane shrubland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Western pipistrelle	Aspen forest and woodland, cliff and canyon, coniferous forest, herbaceous wetland, open water, pinyon/juniper, riparian, saltbush shrubland
Western red bat	Agricultural land, deciduous forest, herbaceous wetland, open water, riparian, woody riparian and wetlands
Western small-footed myotis	Barren/sparsely vegetated, cliff and canyon, coniferous forest, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon/juniper, riparian, woody riparian and wetlands
Yuma myotis	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, deciduous forest, grassland, greasewood flat, herbaceous wetland, montane shrubland, open water, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Mammals – Other	
Fisher	Aspen forest and woodland, coniferous forest
Idaho pocket gopher	Grassland, montane grassland, montane shrubland, sagebrush shrubland
Pygmy rabbit	Sagebrush shrubland
River otter	Open water, riparian, woody riparian and wetlands
Rocky Mountain bighorn sheep	Cliff and canyon, coniferous forest, montane grassland, montane shrubland
Swift fox	Agricultural land, barren/sparsely vegetated, grassland, sagebrush shrubland
White-tailed prairie dog	Barren/sparsely vegetated, grassland, greasewood flat, montane grassland, sagebrush shrubland, saltbush shrubland
Wolverine	Coniferous forest
Wyoming pocket gopher	Barren/sparsely vegetated, greasewood flat, saltbush shrubland
Birds	
American white pelican	Open water
Least bittern	Herbaceous wetland
White-faced ibis	Agricultural land, herbaceous wetland, open water
Trumpeter swan	Herbaceous wetland, open water

Table 3.8-26 BLM Sensitive and State-protected Species Potentially Occurring in Region I

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Barrow's goldeneye	Herbaceous wetland, open water, woody riparian and wetlands
Bald eagle	Open water, woody riparian and wetlands
Northern goshawk	Aspen forest and woodland, coniferous forest
Swainson's hawk	Agricultural land, barren/sparsely vegetated, grassland, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland
Ferruginous hawk	Cliff and canyon, grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Golden eagle	Agricultural land, cliff and canyon, grassland, pinyon/juniper, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Peregrine falcon	Aspen forest and woodland, cliff and canyon, coniferous forest, grassland, herbaceous wetland, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Prairie falcon	Cliff and canyon, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Columbian sharp-tailed grouse	Grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, sagebrush shrubland, woody riparian and wetlands
Mountain plover	Agricultural land, barren/sparsely vegetated, grassland, montane grassland
Long-billed curlew	Agricultural land, grassland, herbaceous wetland, woody riparian and wetlands
Black tern	Open water, herbaceous wetland
Flammulated owl	Aspen forest and woodland, coniferous forest
Burrowing owl	Agricultural land, barren/sparsely vegetated, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Long-eared owl	Agricultural land, aspen forest and woodland, coniferous forest, grassland, montane grassland, pinyon/juniper, riparian, saltbush shrubland, woody riparian and wetlands
Short-eared owl	Agricultural land, grassland, greasewood flat, herbaceous wetland, montane grassland, sagebrush shrubland
Boreal owl	Aspen forest and woodland, coniferous forest
Black swift	Cliff and canyon, open water, woody riparian and wetlands
Lewis' woodpecker	Aspen forest and woodland, coniferous forest, pinyon/juniper, woody riparian and wetlands
Red-naped sapsucker	Aspen forest and woodland, coniferous forest, woody riparian and wetlands
American three-toed woodpecker	Coniferous forest
Loggerhead shrike	Agricultural land, grassland, greasewood flat, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland
Gray vireo	Montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland
Pinyon jay	Coniferous forest, montane shrubland, pinyon/juniper
Juniper titmouse	Pinyon/juniper
Sage thrasher	Sagebrush shrubland
Yellow-breasted chat	Riparian, woody riparian and wetlands
Brewer's sparrow	Sagebrush shrubland
Vesper sparrow	Grassland, montane grassland, sagebrush shrubland
Sage sparrow	Sagebrush shrubland
Grasshopper sparrow	Agricultural land, grassland, montane grassland, sagebrush shrubland
Bobolink	Agricultural land, grassland, herbaceous wetland
Reptiles	
Corn snake	Agricultural land, grassland, greasewood flat, herbaceous wetland, riparian, woody riparian and wetlands
Long-nosed leopard lizard	Barren/sparsely vegetated, greasewood flat, sagebrush shrubland, saltbush shrubland
Midget faded rattlesnake	Cliff and canyon, coniferous forest, greasewood flat, pinyon/juniper, montane shrubland, sagebrush shrubland, saltbush shrubland
Smooth greensnake	Agricultural land, aspen forest and woodland, coniferous forest, grassland, greasewood flat, herbaceous wetland,

Table 3.8-26 BLM Sensitive and State-protected Species Potentially Occurring in Region I

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
	montane grassland, riparian, woody riparian and wetlands
Terrestrial Invertebrates	
Great Basin silverspot (Nokomis fritillary butterfly)	Agricultural land, herbaceous wetland, riparian, woody riparian and wetlands

Alternative I-B

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region I include two federally listed and two candidate species, 63 BLM sensitive and state-protected species. Species-specific impact discussions are presented below. No suitable habitat for the Canada lynx occurs along Alternative I-B; therefore, impacts are not expected to occur to this species. The whooping crane, interior least tern, and piping plover do not occur in Region I; however, they are discussed in terms of potential depletions in the Platte River basin. Section 3.7.6.3 presents a description of existing disturbance along Alternative I-B.

Greater Sage-grouse (Candidate)

As presented in **Table 3.8-20**, a total of 40 occupied/active leks occur within 4 miles of Alternative I-B (i.e., 28 occupied leks in Wyoming and 12 active leks in Colorado). In addition, Alternative I-B crosses a variety of greater sage-grouse habitats in Wyoming and Colorado (**Figure 3.8-1**).

The types of impacts to greater sage-grouse under Alternative I-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. The intensity of impacts to greater sage-grouse would differ in the number of leks crossed and the amount of habitat disturbed (**Table 3.8-20**). Analysis of lek attendance and productivity across alternatives is provided in **Table 3.8-22**. A summary of Wyoming and Colorado lek attendance data shows only minor differences in the average male sage-grouse lek attendance between Alternative I-A and I-B.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). These measures, along with **SSWS-5**, would require TWE to construct anti-perching devices in high quality habitat, which may help reduce potential raptor and corvid predation on greater sage-grouse. Nonetheless, given the amount of greater sage-grouse potential habitat crossed by the proposed Project under Alternative I-B (**Table 3.8-21**), operation would result in potential mortality of individuals and avoidance of sagebrush habitats within the transmission line corridor by local greater sage-grouse populations.

Whooping Crane (Endangered), Interior Least Tern (Endangered), Piping Plover (Threatened)

The types of impacts to the whooping crane, interior least tern, and piping plover under Alternative I-B would be the same as described for Alternative I-A. The whooping crane, interior least tern, and piping plover do not occur in Region I; however, they are discussed in terms of potential depletions in the Platte River basin.

TWE has indicated that all water requirements for the Project will be met using existing water rights. Therefore, construction of Alternative I-A is anticipated to result in no new depletions within the Platte River basin, including the upper portion of the North Platte River and the downstream section of the Platte River Basin in Nebraska. Confirmation of this determination will be ultimately made by the Wyoming State Engineers Office (SEO). Therefore, downstream impacts to habitat for these three federally listed species

would not occur and TWE would not be required to conduct section 7 consultations with the USFWS or make a mitigation payment to the PRRIP.

Western Yellow-billed Cuckoo (Candidate)

The types of impacts to the western yellow-billed cuckoo under Alternative I-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-B would result in the construction and operation disturbance of 46 acres and 4 acres, respectively, of potentially suitable riparian and wetland habitat. These areas represent 0.10 percent and <0.01 percent, respectively, of the available suitable habitat within the Region I western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. Additionally, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative I-B would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXNE)

The types of impacts to black-footed ferrets under Alternative I-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-B would result in the construction and operation disturbance of 232 acres and 55 acres, respectively, of white-tailed prairie dog colonies. These areas represent 0.09 percent and 0.02 percent, respectively, of the available white-tailed prairie dog colonies within the Region I black-footed ferret analysis area.

Between 2001 and 2006, 217 black-footed ferrets were released within the WCMA along Alternative I-B in Moffat and Rio Blanco counties, Colorado (BLM 2008). This area encompasses approximately 52,000 acres at the lower reach of the Wolf Creek watershed and was chosen as a reintroduction site due to its sizeable white-tailed prairie dog population. In 2006, approximately 19,000 acres of active white-tailed prairie dog colonies were distributed throughout the WCMA. Survival rates of introduced black-footed ferrets within the WCMA have been observed to be lower than other reintroduction sites (BLM 2008) and in 2008, a plague outbreak was detected. Results of spotlight surveys in 2010 were limited to the detection of one male black-footed ferret and no documented successful reproductive pairs within the WCMA. As a result of limited survival success and the occurrence of the 2008 plague outbreak, it generally is agreed that black-footed ferrets no longer inhabit the WCMA (BLM 2012).

Preconstruction clearance surveys for black-footed ferrets may be required within white-tailed prairie dog colonies or complexes exceeding 200 acres in size that are located within 0.5 mile of Alternative I-B. While habitat modifications may still occur, these surveys would be conducted to minimize direct impacts to black-footed ferrets.

SSWS-9*: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use

of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors and black-footed ferrets.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The types of impacts to the gray wolf under Alternative I-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-B would result in the construction and operation disturbance of 5,205 acres and 477 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.10 percent and <0.01 percent, respectively, of potential habitat within the Region I special status wildlife analysis area. Indirect impacts would occur to 227,030 acres, which represents 4.54 percent of gray wolf potential habitat within the Region I special status wildlife analysis area.

Impacts to the gray wolf under Alternative I-B would be limited primarily to habitat loss and fragmentation. Further indirect impacts to the gray wolf may include a reduction or change in distribution of large mammal populations.

BLM Sensitive and State-Protected Species

BLM sensitive and state-protected species that may occur along Alternative I-B in Region I are presented in **Table 3.8-26**. The types of impacts under Alternative I-B to BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative I-B (e.g., sagebrush shrubland, grassland, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of **SSWS-2** and **SSWS-3** under Alternative I-B would reduce impacts to pygmy rabbits and Wyoming pocket gophers by identifying suitable habitat and implementing appropriate mitigation measures, based on survey results. In addition, TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many BLM sensitive and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative I-B, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project.

Alternative I-C

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region I include two federally listed and two federal candidate species, 63 BLM sensitive and state-protected species. Species-specific impact discussions are presented below. No suitable habitat for the Canada lynx occurs along Alternative I-C; therefore, impacts are not expected to occur to this species. The whooping crane, interior least tern, and piping plover do not occur in Region I; however, they are discussed in terms of potential depletions in the Platte River basin. Section 3.7.6.3 presents a description of existing disturbance along Alternative I-C.

Greater Sage-grouse (Candidate)

As presented in **Table 3.8-20**, a total of 59 occupied/active leks occur within 4 miles of Alternative I-C (i.e., 38 occupied leks in Wyoming and 21 active leks in Colorado). In addition, Alternative I-C crosses a variety of greater sage-grouse habitats in Wyoming and Colorado (**Figure 3.8-1**).

The types of impacts to greater sage-grouse from under Alternative I-C generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and amount of habitat disturbed (**Table 3.8-20**). Potential impacts to sage-grouse under Alternative I-C will be greater in comparison to Alternative I-A due to the increased number of leks located within 4 miles of the Project reference line and the total number of individual greater sage-grouse observed attending these leks. Although data regarding greater sage-grouse lek attendance in Colorado has not been received in time for inclusion in this draft, a summary of Wyoming lek attendance data shows that average lek attendance across Alternative I-C is similar to that of Alternative I-A (**Table 3.8-22**). The inclusion of Colorado sage-grouse lek attendance data will be required to provide a full comparison of potential impacts to sage-grouse populations across Region I alternatives.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). These measures, along with **SSWS-5**, would require TWE to construct anti-perching devices in high quality habitat, which may help reduce potential raptor and corvid predation on greater sage-grouse. Nonetheless, given the amount of greater sage-grouse habitat crossed by the proposed Project under Alternative I-C (**Table 3.8-21**), operation would result in potential mortality of individuals and avoidance of sagebrush habitats within the transmission line corridor by local greater sage-grouse populations.

Whooping Crane (Endangered), Interior Least Tern (Endangered), Piping Plover (Threatened)

The types of impacts to the whooping crane, interior least tern, and piping plover under Alternative I-C would be the same as described for Alternative I-A.

TWE has indicated that all water requirements for the Project will be met using existing water rights. Therefore, construction of Alternative I-A is anticipated to result in no new depletions within the Platte River basin, including the upper portion of the North Platte River and the downstream section of the Platte River Basin in Nebraska. Confirmation of this determination will be ultimately made by the Wyoming State Engineers Office (SEO). Therefore, downstream impacts to habitat for these three federally listed species would not occur and TWE would not be required to conduct section 7 consultations with the USFWS or make a mitigation payment to the PRRIP.

Western Yellow-billed Cuckoo (Candidate)

The types of impacts to the western yellow-billed cuckoo under Alternative I-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-C would result in the construction and operation disturbance of 41 acres and 5 acres, respectively, of potentially suitable riparian and wetland habitat. These areas represent 0.09 percent and 0.01 percent, respectively, of the available suitable habitat within the Region I western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. Additionally, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative I-C would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXNE)

The types of impacts to the black-footed ferret under Alternative I-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-C would result in the construction and operation disturbance of 79 acres and 22 acres, respectively, of white-tailed prairie dog colonies. These areas represent 0.03 percent and <0.01 percent, respectively, of the white-tailed prairie dog colonies within the Region I black-footed ferret analysis area.

Between 2001 and 2006, 217 black-footed ferrets were released within the WCMA along Alternative I-C in Moffat and Rio Blanco counties, Colorado (BLM 2008). This area encompasses approximately 52,000 acres at the lower reach of the Wolf Creek watershed and was chosen as a reintroduction site due to its sizeable white-tailed prairie dog population. In 2006, approximately 19,000 acres of active white-tailed prairie dog colonies were distributed throughout the WCMA. Survival rates of introduced black-footed ferrets within the WCMA have been observed to be lower than other reintroduction sites (BLM 2008) and in 2008, an outbreak of the plague was detected. Results of spotlight surveys in 2010 were limited to the detection of one male black-footed ferret and no documented successful reproductive pairs within the WCMA. As a result of limited survival success and the occurrence of the 2008 plague outbreak, it generally is agreed that black-footed ferrets no longer inhabit the WCMA (BLM 2012).

Preconstruction clearance surveys for black-footed ferrets may be required within white-tailed prairie dog colonies or complexes exceeding 200 acres in size that are located within 0.5 mile of Alternative I-C. While habitat modifications may still occur, these surveys would be conducted to minimize direct impacts to black-footed ferrets.

***SSWS-9**: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The types of impacts to the gray wolf under Alternative I-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-C would result in the construction and operation disturbance of 5,575 acres and 531 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.11 percent and 0.01 percent, respectively, of potential habitat within the Region I special status wildlife analysis area. Indirect impacts would occur to 208,800 acres, which represents 4.18 percent of gray wolf potential habitat within the Region I special status wildlife analysis area. Impacts to the gray wolf under Alternative I-C would be limited primarily to habitat loss and fragmentation.

BLM Sensitive and State-Protected Species

BLM sensitive and state-protected species that may occur in Region I are presented in **Table 3.8-26**. The types of impacts under Alternative I-C to BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative I-C (e.g., sagebrush shrubland, grassland, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of **SSWS-2** and **SSWS-3** under Alternative I-C would reduce impacts to pygmy rabbits and Wyoming pocket gophers by identifying suitable habitat and implementing appropriate mitigation measures based on survey results. In addition, TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many BLM sensitive and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative I-C, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

Alternative I-D (Agency Preferred)

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region I include two federally listed and two candidate species, 63 BLM sensitive and state-protected species. No suitable habitat for the Canada lynx occurs along Alternative I-D; therefore, impacts are not expected to occur to this species. The whooping crane, interior least tern, and piping plover do not occur in Region I; however, they are discussed in terms of potential depletions in the Platte River basin. Species-specific impact discussions are presented below. Section 3.7.6.3 presents a description of existing disturbance along Alternative I-D.

Greater sage-grouse

As presented in **Table 3.8-20**, a total of 47 occupied/active leks occur within 4 miles of Alternative I-D (i.e., 35 occupied leks in Wyoming and 12 active leks in Colorado). In addition, Alternative I-D crosses a variety of greater sage-grouse habitats in Wyoming and Colorado (**Figure 3.8-1**).

The types of impacts to the greater sage-grouse under Alternative I-D generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and amount of habitat disturbed (**Table 3.8-20**). Potential impacts to greater sage-grouse from construction and operation of Alternative I-D may be higher in comparison to Alternative I-A, due to the greater number of leks located within 4 miles of the Project reference line. A summary of Wyoming and Colorado lek attendance data shows that average lek attendance across Alternative I-D is greater than that of Alternative I-A (**Table 3.8-22**). The inclusion of Colorado greater sage-grouse lek attendance data will be required to provide a full comparison of potential impacts to greater sage-grouse populations across Region I alternatives.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). These measures, along with **SSWS-5**, would require TWE to construct anti-perching devices in high quality habitat, which may help reduce potential raptor and corvid predation on greater sage-grouse. Nonetheless, given the amount of greater sage-grouse potential habitat crossed by the proposed Project under Alternative I-D (**Table 3.8-21**), operation would result in potential mortality of individuals and avoidance of sagebrush habitats within the 2-mile transmission line corridor by local greater sage-grouse populations.

Whooping Crane (Endangered), Interior Least Tern (Endangered), Piping Plover (Threatened)

The types of impacts to the whooping crane, interior least tern, and piping plover under Alternative I-D would be the same as described for Alternative I-A.

TWE has indicated that all water requirements for the Project will be met using existing water rights. Therefore, construction of Alternative I-A is anticipated to result in no new depletions within the Platte River basin, including the upper portion of the North Platte River and the downstream section of the Platte River Basin in Nebraska. Confirmation of this determination will be ultimately made by the Wyoming State Engineers Office (SEO). Therefore, downstream impacts to habitat for these three federally listed species would not occur and TWE would not be required to conduct section 7 consultations with the USFWS or make a mitigation payment to the PRRIP.

Western Yellow-billed Cuckoo (Candidate)

The types of impacts to the western yellow-billed cuckoo under Alternative I-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-D would result in the construction and operation disturbance of 39 acres and 3 acres, respectively, of potentially suitable riparian and wetland habitat. These areas represent 0.08 percent and <0.01 percent, respectively, of the available suitable habitat within the Region I western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. Additionally, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative I-D would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXNE)

The types of impacts to the black-footed ferret under Alternative I-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-D would result in the construction and operation of 180 acres and 46 acres, respectively, of white-tailed prairie dog colonies. These areas represent 0.07 percent and 0.02 percent, respectively, of the available white-tailed prairie dog colonies within the Region I black-footed ferret analysis area.

Between 2001 and 2006, 217 black-footed ferrets were released within the WCMA along Alternative I-D in Moffat and Rio Blanco counties, Colorado (BLM 2008). This area encompasses approximately 52,000 acres at the lower reach of the Wolf Creek watershed and was chosen as a reintroduction site due to its sizeable white-tailed prairie dog population. In 2006, approximately 19,000 acres of active white-tailed prairie dog colonies were distributed throughout the WCMA. Survival rates of introduced black-footed ferrets within the WCMA have been observed to be lower than other reintroduction sites (BLM 2008) and in 2008, an outbreak of the plague was detected. Results of spotlight surveys in 2010 were limited to the detection of one male black-footed ferret and no documented successful reproductive pairs within the WCMA. As a result of limited survival success and the occurrence of the 2008 plague outbreak, it generally is agreed that black-footed ferrets no longer inhabit the WCMA (BLM 2012).

Preconstruction clearance surveys for black-footed ferrets may be required within white-tailed prairie dog colonies or complexes exceeding 200 acres in size that are located within 0.5 mile of Alternative I-D. While habitat modifications may still occur, results of these surveys would be used to avoid and minimize direct impacts to black-footed ferrets.

***SSWS-9**: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The types of impacts to the gray wolf under Alternative I-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-25**). Alternative I-D would result in the construction and operation disturbance of 5,597 acres and 511 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.11 percent and 0.01 percent, respectively, of potential habitat within the Region I special status wildlife analysis area. Indirect impacts would occur to 245,592 acres, which represents 4.91 percent of gray wolf potential habitat within the Region I special status wildlife analysis area. Impacts to the gray wolf under Alternative I-D would be limited primarily to habitat loss and fragmentation.

BLM Sensitive and State-Protected Species

BLM sensitive and state-protected species that may occur in Region I are presented in **Table 3.8-26**. The types of impacts under Alternative I-D to BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative I-D (e.g., sagebrush shrubland, grassland, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of **SSWS-2** and **SSWS-3** under Alternative I-D would reduce impacts to pygmy rabbits and Wyoming pocket gophers by identifying suitable habitat and implementing appropriate mitigation measures based on survey results. In addition, TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many BLM sensitive and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative I-D, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

TWE has developed three potential options to avoid or minimize the crossing of the Tuttle Easement and the National Park Service Deerlodge Road along Alternative I-D. These are referred to as Tuttle Easement micro-siting options 1, 2, and 3. CPW holds a conservation easement over portions of the Tuttle Ranch, located east of the town of Elk Springs in Moffat County, Colorado. The Tuttle Ranch supports an important white-tailed prairie dog colony, which is suitable habitat for the black-footed ferret. It is intended that future black-footed ferret reintroductions will occur within this conservation easement.

In terms of potential impacts to suitable black-footed ferret habitat and active white-tailed prairie dog colonies, micro-siting options 2 and 3 would result in the less potential impacts in comparison to Alternative I-D as both options avoid crossing these resources and the conservation easement altogether (**Table 3.8-27**). Although micro-siting option 1 would cross the conservation easement and suitable habitat for black-footed ferret reintroduction, this option would be constructed adjacent to an existing 345-kV transmission line, therefore impacts to special status wildlife species from habitat fragmentation would be reduced in comparison to Alternative I-D. The differences in potential impact acreages to greater sage-grouse habitat and active leks from the three micro-siting options are negligible as all three options would impact a similar number of acres of greater sage-grouse habitat and are located similar distances from the nearest active lek.

Table 3.8-27 Summary of Region I Micro-siting Options Impact Parameters for Federally Listed and Candidate Species

Parameter	Tuttle Easement Micro-siting Option 1			Tuttle Easement Micro-siting Option 2			Tuttle Easement Micro-siting Option 3			Comparison – Tuttle Easement Micro-siting Options		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Black-footed ferret potential habitat (acres)	65	19	12,647	65	19	12,647	65	19	12,647	80	23	12,647
Percentage of existing habitat within the Region I black-footed ferret analysis area	0.03	0.01	4.94	0.03	0.01	4.94	0.03	0.01	4.94	0.03	0.01	4.94
Greater Sage-grouse potential habitat (acres)	688	178	88,909	688	178	88,909	688	177	88,909	685	176	88,909
Percentage of existing habitat within the Region I greater sage-grouse analysis area	0.02	<0.01	2.93	0.02	<0.01	2.93	0.02	<0.01	2.93	0.02	<0.01	2.93
Western yellow-billed cuckoo potential habitat (acres)	<1	<1	15	<1	<1	15	<1	<1	15	<1	<1	15

Table 3.8-27 Summary of Region I Micro-siting Options Impact Parameters for Federally Listed and Candidate Species

Parameter	Tuttle Easement Micro-siting Option 1			Tuttle Easement Micro-siting Option 2			Tuttle Easement Micro-siting Option 3			Comparison – Tuttle Easement Micro-siting Options		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Percentage of existing habitat within the Region I western yellow-billed cuckoo analysis area	<0.01	<0.01	0.03	<0.01	<0.01	0.03	<0.01	<0.01	0.03	<0.01	<0.01	0.03
Gray wolf potential habitat (acres)	1,727	174	86,923	1,712	173	86,923	1,727	174	86,923	1,723	173	86,923
Percentage of existing habitat within the Region I special status wildlife analysis area	0.03	<0.01	1.74	0.03	<0.01	1.74	0.03	<0.01	1.74	0.03	<0.01	1.74

Alternative Connectors in Region I

Both the Mexican Flats and Baggs alternative connectors would include minimal increases of total disturbance to special status wildlife species habitat, if they were to be utilized. Impacts associated with these connectors would be very similar to the other alternatives in Region I and would include minor disturbance to special status wildlife species habitat. **Table 3.8-28** summarizes impacts associated with the alternative connectors in Region I.

Table 3.8-28 Summary of Region I Alternative Connector Impact Parameters for Special Status Wildlife Species[1]

Alternative Connector	Impact Parameters
Mexican Flats Alternative Connector	• Approximately 10 miles in length.[2] • Not within Wyoming greater sage-grouse core areas. • Five greater sage-grouse leks within 4 miles of the reference line. • Within two black-footed ferret non block-cleared areas (Dad and Desolation Flats). • Eleven special status raptor species nests and 3 raptor nests of unknown species are within 1 mile of the reference line.
Baggs Alternative Connector	• Approximately 22 miles in length. • Not within Wyoming greater sage-grouse core areas. • Five greater sage-grouse leks within 4 miles of the reference line. • Not within black-footed ferret non block-cleared areas. • Eleven special status raptor species nests and 31 nests of unknown species are within 1 mile of the reference line.
Fivemile Point North Alternative Connector	• Approximately 3 miles in length. • Not within Wyoming greater sage-grouse core areas. • Three greater sage-grouse leks within 4 miles of the reference line. • Not within black-footed ferret non block-cleared areas. • Twelve special status raptor species nests and 6 nests of unknown species are within 1 mile of the reference line.
Fivemile Point South Alternative Connector	• Approximately 2 miles in length. • Not within Wyoming greater sage-grouse core areas. • One greater sage-grouse lek within 4 miles of the reference line. • Not within black-footed ferret non block-cleared areas. • Two special status raptor species nests and 1 nest of unknown species are within 1 mile of the reference line.

[1] Nests of raptor species, which are not classified as special status are tabulated in Section 3.7, Wildlife. Nests of unknown raptor species are tabulated in both Sections 3.7 and 3.8 because they may have been utilized by either special status raptors or non-special status raptors.

[2] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Alternative Ground Electrode Systems in Region I

The northern ground electrode system would be necessary within 100 miles of the Northern Terminal as discussed in Section 2.5.1, Alternative Transmission Line Routes and Ancillary Facilities by Region. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the proponent. The special status wildlife species impacts associated with constructing and operating this system are the same as discussed for Alternative I-A.

Table 3.8-29 summarizes impacts associated with the seven combinations of alternative route and location possibilities for the northern ground electrode system.

Table 3.8-29 Summary of Region I Alternative Ground Electrode System Location Impact Parameters for Special Status Wildlife Species

Alternative Ground Electrode System Locations	Habitat Disturbance (acres)		Analysis
	Construction	Operation	
Separation Flat – All Alt. Routes	128	39	Due to the programmatic nature of the seven potential ground electrode systems, the extent of impacts to special status wildlife species is not known at this time. However, due to the potential locations occurring in southern Wyoming, impacts are expected to be the same as discussed in Section 3.8.6.1, Impacts to Special Status Wildlife Species from Terminal Construction and Operation, and Section 3.8.6.2, Impacts to Special Status Wildlife Species Common to All Alternative Routes and Associated Components. To reduce impacts to special status wildlife species, species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFWS, and applicable state wildlife agencies.
Shell Creek (Alt. I-A, I-D)	223	89	
Shell Creek (Alt I-B)	216	77	
Little Snake East (Alts I-A, I-B, I-D)	108	29	
Little Snake West (Alt. I-A)	121	37	
Little Snake West (Alt. I-B, I-D)	93	21	
Cottonwood Creek (Alt. I-C)	89	19	
Eight Mile Basin	83	17	
Separation Creek	136	47	

Table 3.8-30 summarizes the potential impacts to sagebrush habitats associated with the seven combinations of alternative route and location possibilities in Region I.

Table 3.8-30 Summary of Region I Alternative Ground Electrode System Location Impact Parameters for Greater Sage-grouse

Alternative Ground Electrode System Locations	Sagebrush Habitat Disturbance (acres)	
	Construction	Operation
Separation Flat (All Alt. Routes)	108	33
Shell Creek (Alt. I-A, I-D)	124	49
Shell Creek (Alt. I-B)	119	43
Little Snake East (Alt. I-A, I-B, and I-D)	106	29
Little Snake West (Alt. I-A)	104	31
Little Snake West (Alt. I-B and I-D)	79	18
Cottonwood Creek (Alt. I-C)	78	17
Eight Mile Basin	61	12
Separation Creek	129	45

Table 3.8-31 presents special status raptor nests known to occur within 1 mile of the reference line, site, and siting area at alternative ground electrode system locations.

Table 3.8-31 Special Status Raptor Nests Within 1 Mile of the Reference Line, Site, and Siting Area at Alternative Ground Electrode System Locations[1]

Alternative Ground Electrode System Locations[2]	Special Status Raptor Nests[3]
Separation Flat (All Alternatives)	One burrowing owl, 33 ferruginous hawk, 6 golden eagle, 3 prairie falcon, and 3 unknown raptor species nests
Shell Creek (Alternatives I-A, I-B, and I-D)	One burrowing owl, 28 ferruginous hawk, 18 golden eagle, 2 prairie falcon, and one unknown raptor species nests
Little Snake East (Alternatives I-A, I-B, and I-D)	One bald eagle, 10 ferruginous hawk, 1 golden eagle, and 5 unknown raptor species nests
Little Snake West (Alternatives I-A, I-B, and I-D)	Two burrowing owl, 5 ferruginous hawk, 14 golden eagle, 2 prairie falcon, and 27 unknown raptor species
Eight Mile Basin (All Alternatives)	Three ferruginous hawk, 2 golden eagle, and 1 prairie falcon nests
Separation Creek (All Alternatives)	Seventy-five ferruginous hawk, 17 golden eagle, 10 prairie falcon, and 3 unknown raptor species nests

[1] Raptor nests are a total of those within 1 mile of the reference line, site, and siting area. Some duplication exists due to the unknown exact locations of electrode sites and associated features.

[2] Ground electrode systems are described in detail in Section 2.5.1, Alternative Transmission Line Routes and Ancillary Facilities by Region.

[3] Nests of raptor species, which are not classified as special status, are tabulated in Section 3.7, Wildlife. Nests of unknown raptor species are tabulated in both Sections 3.7 and 3.8 because they may have been utilized by either special status raptors or non-special status raptors.

Region I Conclusion

A comparison of impact parameters for Region I alternatives indicates that potential construction and operation impacts to special status wildlife species would be varied across all alternatives as shown in **Table 3.8-25**. Alternative I-C would result in the greatest direct and indirect impacts to greater sage-grouse potential habitat in comparison to the other Region I alternatives (**Table 3.8-25**). Alternative I-B would result in the greatest direct and indirect impacts to western yellow-billed cuckoo potential habitat in comparison to the other Region I alternatives (**Table 3.8-25**). Alternative I-B would result in the greatest direct and indirect impacts to black-footed ferret potential habitat in comparison to the other Region I alternatives (**Table 3.8-25**). Alternative I-D would result in the greatest direct and indirect impacts to gray wolf potential habitat in comparison to the other Region I alternatives (**Table 3.8-25**). The greatest level of impacts to special status wildlife species among all Region I alternatives associated with Alternative I-C is due to greater impacts to greater sage-grouse leks and potential habitat. However, Project effects on special status wildlife species and their potential habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation.

3.8.6.5 Region II

Tables 3.8-32, **3.8-33, 3.8-34**, **3.8-35**, and **3.8-36** provide a tabulation of impacts associated with the alternative routes in Region II. Key impact parameters that relate to the impact discussion in Section 3.8.6.2, Impacts to Special Status Species Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below. **Table 3.8-37** presents impacts to USFS sensitive species habitat on NFS lands that are crossed by route alternatives, or other Project components in Region II.

Table 3.8-32 Summary of Region II Alternative Route Impact Parameters for Greater Sage-grouse

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Colorado						
Number of occupied leks within 0.5 mile of reference lines	0	0	0	0	0	0
Number of occupied leks within 1 mile of reference lines	0	0	0	0	0	0
Number of occupied leks within 2 miles of reference lines	0	0	0	0	0	0
Number of occupied leks within 3 miles of reference lines	0	0	0	0	0	0
Number of occupied leks within 4 miles of reference lines	0	0	0	0	0	0
Number of occupied leks within 11 miles of reference lines	2	0	0	2	2	2
Utah						
Number of occupied leks within 0.5 mile of reference lines	2	0	0	0	0	0
Number of occupied leks within 1 mile of reference lines	3	0	0	3	1	3
Number of occupied leks within 2 miles of reference lines	4	0	0	7	7	10
Number of occupied leks within 3 miles of reference lines	7	0	0	10	9	13
Number of occupied leks within 4 miles of reference lines	7	0	0	10	10	15
Average distance of leks to reference line (Miles)	1.32	-	-	1.99	1.73	1.84
Number of occupied leks within 11 miles of reference lines	15	2	3	25	28	25
Length of transmission line in miles (habitat fragmentation and collision potential)[2]	257	345	364	262	266	267

Habitat Disturbance	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Colorado PPH (acres)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percentage of existing habitat within the Region II greater sage-grouse analysis area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colorado PGH (acres)	247	62	24,545	178	45	14,389	178	45	14,389	248	62	24,622	248	62	24,622	248	62	24,622
Percentage of existing habitat within the Region II greater sage-grouse analysis area	0.15	0.04	14.81	0.11	0.03	8.68	0.11	0.03	8.68	0.15	0.04	14.86	0.15	0.04	14.86	0.15	0.04	14.86

Table 3.8-32 Summary of Region II Alternative Route Impact Parameters for Greater Sage-grouse

Parameter	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F		
Utah nesting/brood-rearing habitat (acres)	856	241	83,719	170	59	10,541	0	0	0	633	174	52,573	830	210	73,699	375	107	25,785
Percentage of existing habitat within the Region II greater sage-grouse analysis area	0.06	0.02	6.03	0.01	<0.01	0.76	-	-	-	0.05	0.01	3.79	0.06	0.02	5.31	0.03	<0.01	1.86
Utah wintering habitat (acres)	676	191	64,643	139	48	8,707	0	0	0	597	161	50,936	856	216	70,837	397	108	27,984
Percentage of existing habitat within the Region II greater sage-grouse analysis area	0.07	0.02	6.52	0.02	<0.01	0.88	-	-	-	0.06	0.02	5.13	0.09	0.02	7.14	0.04	0.01	2.82
Utah occupied habitat[1]	885	253	87,487	264	95	16,489	16	4	1,089	907	262	72,919	991	256	88,248	413	117	30,215
Percentage of existing habitat within the Region II greater sage-grouse analysis area	0.05	0.02	5.12	0.02	<0.01	0.97	<0.01	<0.01	0.06	0.05	0.02	4.27	0.06	0.01	5.17	0.02	<0.01	1.77

[1] Occupied habitat includes brood-rearing habitat and wintering habitat.

[2] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Table 3.8-33 Summary of Region II Greater Sage-grouse Attendance of Leks within 4 miles

Parameter[1]	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Colorado						
Number of active leks	0	0	0	0	0	0
Peak[2] male attendance combined 2003 – 2012	0	0	0	0	0	0
Minimum[3] male attendance combined 2003 – 2012	0	0	0	0	0	0
3-year average lek attendance[1]	0	0	0	0	0	0
Average attendance across all leks[4]	0	0	0	0	0	0
Total attendance 2003 - 2012	0	0	0	0	0	0
Number of leks with attendance 2008-2012	0	0	0	0	0	0
Survey effort[5,7]	100%	100%	100%	100%	100%	100%
Utah						
Number of active leks	7	0	0	10	10	15
Peak[2] male attendance combined 2003 – 2012	51	-	-	190	187	310
Minimum[3] male attendance combined 2003 – 2012	2	-	-	14	24	27
3-year average lek attendance[1]	4.86	-	-	6.33	8.07	7.69
Average attendance across all leks[4]	3.66	-	-	4.52	9.42	13.28
Total attendance 2003 - 2012	256	-	-	860	942	1328
Number of leks with no attendance 2008-2012[6]	4	-	-	1	3	1
Survey effort[5]	100%	100%	100%	100%	100%	100%

[1] Lek count numbers are male birds only, most recent data used.

[2] Sum of the 10 year peak annual counts from all leks within 4 miles combined (2002-2011).

[3] Sum of the 10 year minimum count from all leks within 4 miles combined (2002-2011).

[4] Total males observed/Number of surveys.

[5] Number of surveys/Number of potential surveys (10 years x 28 leks = 280 potential surveys).

[6] Although leks are classified as active or occupied, surveys have not observed male attendance over past 5 years.

[7] One historic lek occurs within 4 miles of the project reference line; annual surveys have not observed any breeding activity 2003-2012.

Table 3.8-34 Summary of Region II Alternate Route Impact Parameters (Visibility) for Greater Sage-grouse

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alterative II-D	Alternative II-E	Alternative II-F
Colorado						
Number of visible occupied leks within 0.5 mile of reference lines[1]	0	0	0	0	0	0
Number of visible occupied leks within 1 mile of reference lines	0	0	0	0	0	0
Number of visible occupied leks within 2 miles of reference lines	0	0	0	0	0	0
Number of visible occupied leks within 3 miles of reference lines	0	0	0	0	0	0
Number of visible occupied leks within 4 miles of reference lines	0	0	0	0	0	0
Average distance of visible leks within 4 miles of reference lines	0	0	0	0	0	0
Utah						
Number of visible occupied leks within 0.5 mile of reference lines	2	0	0	0	0	0
Number of visible occupied leks within 1 mile of reference lines	3	0	0	0	3	0
Number of visible occupied leks within 2 miles of reference lines	4	0	0	5	6	1
Number of visible occupied leks within 3 miles of reference lines	7	0	0	9	9	3
Number of visible occupied leks within 4 miles of reference lines	8	0	0	12	11	5
Average distance of visible leks within 4 miles of reference lines	1.72	-	-	2.34	1.88	2.70
Length of transmission line in miles (habitat fragmentation and collision potential)[2]	257	345	364	262	266	267

[1] Occupied habitat includes brood-rearing habitat and wintering habitat.

[2] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Table 3.8-35 Summary of Region II Alternative Route Impact Parameters for Utah Prairie Dog

Parameter	Alternative II-A		Alternative II-B		Alternative II-C		Alternative II-D		Alternative II-E		Alternative II-F	
	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact
Utah prairie dog colonies in high intensity survey areas (acres)[1]	0	0	0	0	179	33	0	0	0	0	0	0
Utah prairie dog colonies in low intensity survey areas (acres)[1]	0	0	0	0	86	14	0	0	0	0	0	0

[1] Acreages of Utah prairie dog colonies will be updated with 2013 survey results.

Table 3.8-36 Special Status Raptor Nests and Winter Roosts Within 1 Mile of the Reference Line in Region II[1]

Species[2]	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F	Castle Dale Alternative Connector	Price Alternative Connector	Lynndyl Alternative Connector	IPP East Alternative Connector	Cedar Knoll Micro-siting Option 1	Cedar Knoll Micro-siting Option 2	Comparable Portion of Alternative II-F	Emma Park Alternative Variation	Comparable Portion of Alternative II-F	Strawberry IRA Micro-siting Option 1	Strawberry IRA Micro-siting Option 2	Strawberry IRA Micro-siting Option 3	Strawberry IRA Comparable Portion of Alternative II-A	Highway 191 Alternative Connector	Cedar Knoll IRA Micro-siting Option 1	Cedar Knoll IRA Micro-siting Option 2	Cedar Knoll IRA comparable Portion of Alternative II-A
Northern goshawk	0	3	0	17	5	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northern goshawk post-fledgling area	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ferruginous hawk	21	14	14	55	54	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Golden eagle	24	34	12	61	17	29	4	23	0	0	4	4	4	3	0	12	12	12	12	0	0	0	0
Peregrine falcon	0	2	0	3	0	3	2	3	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0
Prairie falcon	4	1	1	5	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Long-eared owl	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Short-eared owl	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Burrowing owl	0	3	3	21	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unknown raptor species[2]	80	95	91	87	77	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	129	154	124	250	156	200	6	30	0	0	5	5	5	3	0	12	12	12	12	0	0	0	0
Bald eagle winter roosts	6	0	0	2	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] Nests of raptor species, which are not classified as special status, are tabulated in Section 3.7, Wildlife. Nests of unknown raptor species are tabulated in both Sections 3.7 and 3.8 because they may have been utilized by either special status raptors or non-special status raptors.

[2] Nests of other special status raptor species such as bald eagle and Swainson's hawk are not included due to the lack of documented nest sites within 1 mile of the reference line.

Note: Bald eagle winter roosts are not considered in total.

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012, Manti-La Sal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012; AECOM 2012.

Table 3.8-37 Summary of Region II Alternative Route Impacts to Vegetation Communities on USFS Lands

Vegetation Community/Habitat Type	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F			Lynndyl Alternative Connector			Total Acres of Vegetation Community/Habitat Type in Forest
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	
Ashley National Forest																						
1. Agricultural Land										0	0	0	0	0	0	**0**	**0**	**0**				2,691
2. Aspen Forest and Woodland										<1	<1	71	8	1	326	9	2	269				102,261
3. Barren/Sparsely Vegetated										0	0	0	0	0	0	0	0	0				136,429
4. Cliff and Canyon										4	1	330	12	4	2,241	4	1	330				39,266
5. Conifer Forest										<1	<1	2	39	6	2,206	20	5	566				543,194
6. Deciduous Forest										0	0	0	0	0	0	0	0	0				1,125
7. Desert Shrubland										0	0	0	0	0	0	0	0	0				0
8. Developed/Disturbed Land										1	<1	28	43	3	136	4	1	89				42,056
9. Dunes										0	0	0	0	0	0	0	0	0				23
10 Grassland										0	0	0	14	1	39	0	0	0				1,591
11. Greasewood Flat										0	0	0	0	0	0	0	0	0				1,891
12. Herbaceous Wetland										0	0	0	4	<1	70	0	0	0				28,424
13. Montane Grassland										1	<1	154	57	5	830	3	1	178				25,557
14. Montane Shrubland										<1	<1	24	3	<1	146	<1	<1	24				36,831
15. Open Water										0	0	0	0	0	0	0	0	0				21,383
16. Pinyon-juniper										4	2	698	85	15	6,204	4	2	698				104,031
17. Riparian										0	0	0	0	0	0	0	0	0				119
18. Sagebrush Shrubland										17	6	2,811	91	10	3,278	28	10	3,229				200,159
19. Saltbush Shrubland										<1	<1	26	1	<1	25	<1	<1	26				15,422
20. Tundra										0	0	0	0	0	0	0	0	0				17,639
21. Woody Riparian and Wetlands										0	0	0	<1	<1	1	<1	<1	<1				15,120
Fishlake National Forest																						
1. Agricultural Land	<1	<1	<1	0	0	0	<1	<1	38							0	0	0	0	0	0	623
2. Aspen Forest and Woodland	0	0	0	<1	<1	2	48	6	1,809							<1	<1	2	0	0	0	196,958
3. Barren/Sparsely Vegetated	0	0	0	0	0	0	6	1	246							0	0	0	0	0	0	11,977
4. Cliff and Canyon	0	0	0	<1	<1	33	6	2	731							<1	<1	33	<1	<1	3	38,891

Table 3.8-37 Summary of Region II Alternative Route Impacts to Vegetation Communities on USFS Lands

Vegetation Community/Habitat Type	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F			Lynndyl Alternative Connector			Total Acres of Vegetation Community/Habitat Type in Forest
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	
5. Conifer Forest	0	0	0	0	0	0	51	6	1,535							0	0	0	0	0	0	224,021
6. Deciduous Forest	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0	1
7. Desert Shrubland	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0	121
8. Developed/Disturbed Land	<1	<1	<1	1	<1	69	20	3	950							1	<1	69	<1	<1	4	28,664
9. Dunes	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0	0
10. Grassland	<1	<1	<1	14	2	548	12	1	408							14	2	548	1	<1	163	7,453
11. Greasewood Flat	0	0	0	0	0	0	0	0	0							0	0	0	<1	<1	5	306
12. Herbaceous Wetland	0	0	0	0	0	0	<1	<1	1							0	0	0	0	0	0	4,530
13. Montane Grassland	0	0	0	4	1	445	<1	<1	52							4	1	445	2	<1	102	9,129
14. Montane Shrubland	<1	<1	<1	<1	<1	10	178	25	8,961							<1	<1	10	<1	<1	11	211,109
15. Open Water	0	0	0	0	0	0	<1	<1	10							0	0	0	0	0	0	4,334
16. Pinyon-juniper	<1	<1	<1	95	10	2,254	466	54	18,613							95	10	2,254	9	1	554	426,154
17. Riparian	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0	0
18. Sagebrush Shrubland	<1	<1	<1	19	3	769	218	22	7,022							19	3	769	3	<1	228	270,972
19. Saltbush Shrubland	0	0	0	<1	<1	6	3	<1	45							<1	<1	6	<1	<1	42	2,738
20. Tundra	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0	7,664
21. Woody Riparian and Wetlands	0	0	0	0	0	0	12	2	489							0	0	0	<1	<1	2	8,234
Manti-La Sal National Forest																						
1. Agricultural Land	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0				1,466
2. Aspen Forest and Woodland	2	<1	95	199	40	6,855				138	24	4,642	2	1	230	2	1	230				234,483
3. Barren/Sparsely Vegetated				3	<1	62				0	0	0	0	0	0	0	0	0				16,519
4. Cliff and Canyon	<1	<1	4	3	1	138				1	<1	2	1	<1	6	1	<1	6				43,352
5. Conifer Forest	3	2	470	185	36	6,269				66	13	2,590	3	2	537	3	2	537				289,618
6. Deciduous Forest	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0				0
7. Desert Shrubland	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0				1
8. Developed/Disturbed Land	2	<1	63	16	3	540				15	3	535	2	1	98	2	1	98				4,505
9. Dunes	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0				0

Table 3.8-37 Summary of Region II Alternative Route Impacts to Vegetation Communities on USFS Lands

Vegetation Community/Habitat Type	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F			Lynndyl Alternative Connector			Total Acres of Vegetation Community/Habitat Type in Forest
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	
10. Grassland	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0				104
11. Greasewood Flat	0	0	0	<1	<1	1				0	0	0	0	0	0	0	0	0				80
12. Herbaceous Wetland	<1	<1	1	6	1	124				1	<1	55	<1	<1	2	<1	<1	2				2,789
13. Montane Grassland	0	0	0	35	7	1,104				2	1	170	0	0	0	0	0	0				26,225
14. Montane Shrubland	62	12	2,047	50	8	1,420				30	6	1,183	73	14	2,372	73	14	2,372				230,868
15. Open Water				<1	<1	19				<1	<1	13	0	0	0	0	0	0				2,282
16. Pinyon-juniper	48	9	1,575	57	9	1,387				4	<1	47	51	10	1,609	51	10	1,609				265,022
17. Riparian	0	0	0	0	0	0				0	0	0	0	0	0	0	0	0				0
18. Sagebrush Shrubland	4	1	82	138	26	4,361				76	11	1,909	4	1	89	4	1	89				192,203
19. Saltbush Shrubland	0	0	0	5	<1	18				0	0	0	0	0	0	0	0	0				2,814
20. Tundra	0	0	0	23	3	345				1	<1	2	0	0	0	0	0	0				18,793
21. Woody Riparian and Wetlands	1	<1	3	<1	<1	12				<1	<1	12	1	<1	3	1	<1	3				6,028
Uinta-Wasatch-Cache National Forest																						
1. Agricultural Land	<1	<1	13							<1	<1	1	<1	<1	1	<1	<1	1				290
2. Aspen Forest and Woodland	193	21	5,356							0	0	0	3	2	450	16	4	587				231,663
3. Barren/Sparsely Vegetated	0	0	0							0	0	0	2	1	104	2	1	104				11,182
4. Cliff and Canyon	3	1	402							<1	<1	1	3	<1	61	3	<1	65				25,335
5. Conifer Forest	63	10	3,460							0	0	0	4	1	245	13	3	358				114,549
6. Deciduous Forest	32	3	882							0	0	0	<1	<1	23	<1	<1	23				28,171
7. Desert Shrubland	0	0	0							0	0	0	0	0	0	0	0	0				0
8. Developed/Disturbed Land	18	2	550							<1	<1	3	18	2	276	18	2	279				497
9. Dunes	0	0	0							0	0	0	0	0	0	0	0	0				0
10. Grassland	<1	<1	73							0	0	0	<1	<1	30	<1	<1	30				3,211
11. Greasewood Flat	0	0	0							0	0	0	0	0	0	0	0	0				0
12. Herbaceous Wetland	3	<1	64							0	0	0	<1	<1	2	<1	<1	4				15,225
13. Montane Grassland	11	1	258							0	0	0	1	<1	37	1	<1	37				26,455
14. Montane Shrubland	70	12	3,170							<1	<1	17	40	10	1,915	64	13	2,158				168,362
15. Open Water	0	0	0							0	0	0	0	0	0	0	0	0				16,673
16. Pinyon-juniper	67	10	2,436							<1	<1	52	175	31	5,121	175	31	5,125				50,613

Table 3.8-37 Summary of Region II Alternative Route Impacts to Vegetation Communities on USFS Lands

Vegetation Community/Habitat Type	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F			Lynndyl Alternative Connector			Total Acres of Vegetation Community/Habitat Type in Forest
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	
17. Riparian	0	0	0							0	0	0	0	0	0	0	0	0				0
18. Sagebrush Shrubland	178	25	7,534							<1	<1	13	67	12	2,107	78	14	2,292				187,523
19. Saltbush Shrubland	0	0	0							0	0	0	<1	<1	26	<1	<1	26				71
20. Tundra	0	0	0							0	0	0	0	0	0	0	0	0				57
21. Woody Riparian and Wetlands	2	<1	87							<1	<1	3	<1	<1	13	<1	<1	16				15,377

Alternative II-A (Applicant Proposed)

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region II include five federally listed and two candidate species, 65 BLM sensitive species, USFS sensitive species, and state-protected species. Species-specific impact discussions are presented below. Suitable habitat for the Mexican spotted owl and Utah prairie dog does not occur along Alternative II-A, therefore impacts are not expected to occur to these species. Section 3.7.6.4 presents a description of existing disturbance along Alternative II-A.

Greater Sage-grouse (Candidate)

Greater sage-grouse in northeastern Utah along Alternative II-A are found primarily in Uintah, Duchesne, Wasatch, and Juab counties. These counties support several of the largest greater sage-grouse populations in Utah.

As presented in **Table 3.8-32**, a total of 7 active leks occur within 4 miles of Alternative II-A (i.e., 7 active leks in Utah). In addition, Alternative II-A crosses a variety of greater sage-grouse habitats in Colorado and Utah (**Figure 3.8-3**).

The types of impacts to greater sage-grouse under Alternative II-A generally would be the same as discussed for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-A crosses fewer leks with lower observed attendance rates in comparison to Alternatives II-D and II-E (**Tables 3.8-32** and **3.8-33**).

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas for greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). In addition, TWE has taken into account greater sage-grouse habitat (e.g., lek locations, occupied habitat, etc.) during the design phase of the Project and routed the transmission line around sensitive habitat types, to the extent possible. **SSWS-5** would require TWE to construct anti-perching devices and mark guy wires or use alternative structures in high quality greater sage-grouse habitat. These features would help reduce disturbance to sensitive habitat types, reduce the potential for predation on greater sage-grouse by raptors and corvids, and reduce the collision potential from guy wires. Nonetheless, given the amount of important greater sage-grouse habitat crossed by the proposed Project under Alternative II-A in northeastern Utah (**Table 3.8-32**), potential mortality from operation of the proposed Project is likely to be higher in comparison to Alternatives II-B and II-C. Potential impacts to greater sage-grouse resulting from operation of Alternative II-A are likely to be lower in comparison to Alternatives II-D and II-E.

Western Yellow-billed Cuckoo (Candidate)

Along Alternative II-A, extensive riparian habitat occurs at the confluence of the Duchesne, White, and Green rivers on the Uinta and Ouray Reservation (Grand and Uintah counties, Utah) (Bosworth 2003; Parrish et al. 2002) and sustains the largest breeding population of western yellow-billed cuckoos in Utah. This area is approximately 2 miles south of Alternative II-A. Additional habitat and documented occurrences of western yellow-billed cuckoos along Alternative II-A occurs in Utah County, Utah.

The types of impacts to the western yellow-billed cuckoo under Alternative II-A generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-A would result in the construction and operation disturbance of 90 acres and 12 acres, respectively, of potentially suitable riparian and wetland habitat. These areas represent 0.08 percent and 0.01 percent, respectively, of the available potential habitat within the Region II western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting

western yellow-billed cuckoos under Alternative II-A would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXP/NE)

The USFWS has designated white-tailed prairie dog colonies in Rio Blanco County, Colorado and Duchesne and Uintah counties, Utah, as NEP areas for black-footed ferrets. Alternative II-A is adjacent to the northern boundary of the Coyote Basin Reintroduction Primary Management Zone (PMZ). The Coyote Basin population was reintroduced in eastern Utah and western Colorado (Wolf Creek) in 1999. These locations currently support a very small population of black-footed ferrets that primarily inhabit the core of the reintroduction areas (UDWR 2003).

The types of impacts to black-footed ferrets under Alternative II-A generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-A would result in the construction and operation disturbance of 217 acres and 53 acres, respectively, of potentially suitable white-tailed prairie dog habitat in Uintah County, Utah. These areas represent 0.04 percent and 0.01 percent, respectively, of white-tailed prairie dog colony habitat within the Region II black-footed ferret analysis area.

While impacts under Alternative II-A to white-tailed prairie dog colonies outside of the PMZ have a low potential to result in direct loss of ferrets due to the small scattered colonies, habitat disturbance would still occur. Black-footed ferrets are dependent upon white-tailed prairie dog colonies for their survival, and loss of white-tailed prairie dog habitat under Alternative II-A may indirectly impact black-footed ferrets that occur outside of the PMZ.

SSWS-9*: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors and black-footed ferrets.

Canada Lynx (Threatened)

Along Alternative II-A, the Canada lynx has the potential to occur within higher elevation coniferous forests in central Utah, primarily in the Uinta/Wasatch/Cache National Forest. This species is extremely rare in Utah, although transient Canada lynx from Colorado have been documented in Utah in the past 10 years. Impacts to the Canada lynx under Alternative II-A would include the construction and operation disturbance of 120 acres and 20 acres, respectively, of potential foraging and denning habitat and the incremental increase of habitat fragmentation from vegetation removal. These areas represent 0.03 percent and <0.01 percent, respectively, of coniferous forest habitat within the Region II special status wildlife analysis area (**Table 3.8-38**). Impacts would be more pronounced within occupied habitat. Impacts to habitat would include the loss of potential cover and den locations consisting of primarily large evergreen trees and downed woody debris. Loss of available foraging habitat (e.g., early succession high tree density areas preferred by the snowshoe hare) would result in impacts to Canada lynx. Indirect

Table 3.8-38 Summary of Region II Alternative Route Impact Parameters for Federally Listed and Candidate Species

	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Black-footed ferret potential habitat (acres)	217	53	21,182	67	15	5,375	122	27	9,169	201	51	18,896	254	63	24,719	201	51	18,896
Percent of existing habitat within the Region II black-footed ferret analysis area	0.04	0.01	4.09	0.01	<0.01	1.04	0.02	<0.01	1.77	0.04	<0.01	3.65	0.05	0.01	4.78	0.04	<0.01	3.65
Greater sage-grouse potential habitat (acres)	2,664	747	260,404	750	248	50,126	195	49	15,478	2,385	659	201,050	2,924	744	257,407	1,432	388	108,606
Percentage of existing habitat within the Region II greater sage-grouse analysis area	0.12	0.03	11.29	0.03	0.01	2.17	<0.01	<0.01	0.67	0.10	0.03	8.71	0.13	0.03	11.16	0.06	0.02	4.71
Western yellow-billed cuckoo potential habitat (acres)	90	12	3,706	63	7	3,160	56	8	3,151	26	4	813	62	9	2,635	32	7	1,606
Percentage of existing habitat within the Region II western yellow-billed cuckoo analysis area	0.08	0.01	3.34	0.06	<0.01	2.85	0.05	<0.01	2.84	0.02	<0.01	0.73	0.06	<0.01	2.38	0.03	<0.01	1.45
Canada lynx potential habitat (acres)	120	20	5,730	287	54	10,541	63	9	3,543	243	43	9,291	158	26	6,735	418	91	12,572
Percentage of existing habitat within the Region II Canada lynx analysis area	0.03	<0.01	1.20	0.06	0.01	2.21	0.01	<0.01	0.74	0.05	<0.01	1.94	0.03	<0.01	1.41	0.09	0.02	2.63
Utah prairie dog potential habitat (acres)	0	0	0	0	0	0	179	33	18,730	0	0	0	0	0	0	0	0	0

Table 3.8-38 Summary of Region II Alternative Route Impact Parameters for Federally Listed and Candidate Species

	Alternative II-A			Alternative II-B			Alternative II-C			Alternative II-D			Alternative II-E			Alternative II-F		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Percentage of existing habitat within the Region II Utah prairie dog analysis area	0	0	0	0	0	0	0.03	<0.01	13.8	0	0	0	0	0	0	0	0	0
Gray wolf potential habitat (acres)	7,829	1,017	289,969	11,130	1,299	402,949	11,679	1,203	429,949	8,724	1,137	313,162	8,349	1,064	297,851	8,982	1,295	303,756
Percentage of existing habitat within the Region II special status wildlife analysis area	0.08	0.01	2.96	0.11	0.01	3.98	0.12	0.01	4.25	0.09	0.01	3.10	0.08	0.01	2.94	0.09	0.01	3.00

impacts would include increased noise and human activity associated with Project construction. Indirect impacts to Canada lynx would include increased noise and human presence associated with maintenance activities.

Canada lynx habitat along Alternative II-A is scarce and primarily occurs in the Uinta National Forest in higher elevation north and west facing slopes with dense forest canopies. Alternative II-A does not cross any LAUs in Utah. Therefore, impacts to Canada lynx under Alternative II-A would be limited primarily to habitat loss and fragmentation.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

Impacts to the gray wolf under Alternative II-A generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-A would result in the construction and operation disturbance of 7,829 acres and 1,017 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.08 percent and 0.01 percent, respectively, of potential habitat within the Region II special status wildlife analysis area. Indirect impacts would occur to 289,969 acres, which represents 2.96 percent of gray wolf potential habitat within the Region II special status wildlife analysis area. Impacts to the gray wolf under Alternative II-A would be limited primarily to habitat loss and fragmentation.

Table 3.8-38 summarizes habitat impacts to federally listed species potentially occurring in Region II.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur in Region II are presented in **Table 3.8-39**. The types of impacts under Alternative II-A to BLM sensitive, USFS sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative II-A (e.g., sagebrush shrubland, pinyon-juniper, and montane shrubland) are more likely to be impacted under Alternative II-A. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Table 3.8-37 presents habitat acreage impacts by vegetation community/habitat type on USFS lands. Using **Table 3.8-37** in combination with the information presented in **Table 3.8-39**, habitat impacts for each species can be determined. For other sensitive species (BLM and state-protected), please refer to the corresponding vegetation community impacts tables in the Section 3.5, Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type.

Implementation of TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative II-A, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact to BLM sensitive, USFS sensitive, and state-protected species given the extent of native habitats in the surrounding Project region.

Table 3.8-39 BLM Sensitive and State-protected Species Potentially Occurring in Region II

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Mammals - Bats	
Big brown bat	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, coniferous forest, deciduous forest, desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Big free-tailed bat	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, grassland, herbaceous wetland, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Brazilian free-tailed bat	Aspen forest and woodland, coniferous forest, desert shrubland, herbaceous wetland, montane shrubland, open water, sagebrush shrubland, saltbush shrubland
California myotis	Aspen forest and woodland, coniferous forest, deciduous forest, desert shrubland, greasewood flat, herbaceous wetland, montane shrubland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Fringed myotis	Agricultural land, desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Hoary bat	Agricultural land, aspen forest and woodland, coniferous forest, deciduous forest, desert shrubland, grassland, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Long-eared myotis	Agricultural land, aspen forest and woodland, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, greasewood flat, herbaceous wetland, montane shrubland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Long-legged myotis	Aspen forest and woodland, coniferous forest, deciduous forest, desert shrubland, herbaceous wetland, montane shrubland, open water, pinyon/juniper, saltbush shrubland, woody riparian and wetlands
Pallid bat	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, coniferous forest, deciduous forest, desert shrubland, grassland, greasewood flat, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Silver-haired bat	Agricultural land, aspen forest and woodland, coniferous forest, deciduous forest, desert shrubland, greasewood flat, herbaceous wetland, open water, pinyon/juniper, sagebrush shrubland, woody riparian and wetlands
Spotted bat	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Townsend's (Western) big-eared bat	Aspen forest and woodland, coniferous forest, deciduous forest, desert shrubland, greasewood flat, herbaceous wetland, montane shrubland, open water, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Western pipistrelle	Aspen forest and woodland, cliff and canyon, coniferous forest, desert shrubland, herbaceous wetland, open water, pinyon/juniper, saltbush shrubland
Western red bat	Agricultural land, deciduous forest, desert shrubland, herbaceous wetland, open water, woody riparian and wetlands
Western small-footed myotis	Barren/sparsely vegetated, cliff and canyon, coniferous forest, desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, open water, pinyon/juniper, woody riparian and wetlands

Table 3.8-39 BLM Sensitive and State-protected Species Potentially Occurring in Region II

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Yuma myotis	Agricultural land, aspen forest and woodland, barren/sparsely vegetated, cliff and canyon, deciduous forest, desert shrubland, grassland, greasewood flat, herbaceous wetland, montane shrubland, open water, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Mammals - Other	
Dark kangaroo mouse	Desert shrubland, grassland, sagebrush shrubland, saltbush shrubland
Desert bighorn sheep	Cliff and canyon, desert shrubland, montane grassland
Fisher	Aspen forest and woodland, coniferous forest, deciduous forest
Kit fox	Agricultural land, barren/sparsely vegetated, desert shrubland, grassland, montane grassland, sagebrush shrubland, saltbush shrubland
Pygmy rabbit	Sagebrush shrubland
River otter	Open water, woody riparian and wetlands
Rocky Mountain bighorn sheep	Cliff and canyon, coniferous forest, montane grassland, montane shrubland, tundra
White-tailed prairie dog	Barren/sparsely vegetated, desert shrubland, grassland, greasewood flat, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Wolverine	Coniferous forest, tundra
Birds	
American white pelican	Open water
White-faced ibis	Agricultural land, herbaceous wetland, open water
Bald eagle	Open water, woody riparian and wetlands
Northern goshawk	Aspen forest and woodland, coniferous forest
Swainson's hawk	Agricultural land, barren/sparsely vegetated, desert shrubland, grassland, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland
Ferruginous hawk	Cliff and canyon, desert shrubland, grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Golden eagle	Agricultural land, cliff and canyon, desert shrubland, grassland, pinyon/juniper, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland, tundra
Peregrine falcon	Aspen forest and woodland, cliff and canyon, coniferous forest, deciduous forest, desert shrubland, grassland, herbaceous wetland, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Prairie falcon	Cliff and canyon, desert shrubland, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Columbian sharp-tailed grouse	Grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, sagebrush shrubland, woody riparian and wetlands
Mountain plover	Agricultural land, barren/sparsely vegetated, grassland, montane grassland
Long-billed curlew	Agricultural land, grassland, herbaceous wetland, open water, woody riparian and wetlands
Black tern	Open water, herbaceous wetland
Flammulated owl	Aspen forest and woodland, coniferous forest
Burrowing owl	Agricultural land, barren/sparsely vegetated, desert shrubland, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland

Table 3.8-39 BLM Sensitive and State-protected Species Potentially Occurring in Region II

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Long-eared owl	Agricultural land, aspen forest and woodland, coniferous forest, deciduous forest, desert shrubland, grassland, montane grassland, pinyon/juniper, saltbush shrubland, woody riparian and wetlands
Short-eared owl	Agricultural land, grassland, greasewood flat, herbaceous wetland, montane grassland, sagebrush shrubland
Boreal owl	Aspen forest and woodland, coniferous forest
Black swift	Cliff and canyon, herbaceous wetland, open water, woody riparian and wetlands
Lewis' woodpecker	Aspen forest and woodland, coniferous forest, deciduous forest, pinyon/juniper, woody riparian and wetlands
Red-naped sapsucker	Aspen forest and woodland, coniferous forest, deciduous forest, woody riparian and wetlands
American three-toed woodpecker	Coniferous forest
Loggerhead shrike	Agricultural land, grassland, greasewood flat, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland
Gray vireo	Desert shrubland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland
Piñon jay	Coniferous forest, montane shrubland, pinyon/juniper
Juniper titmouse	Pinyon/juniper
Sage thrasher	Sagebrush shrubland
Bendire's thrasher	Desert shrubland, pinyon/juniper
Yellow-breasted chat	Woody riparian and wetlands
Brewer's sparrow	Sagebrush shrubland
Vesper sparrow	Grassland, montane grassland, sagebrush shrubland
Sage sparrow	Sagebrush shrubland
Bobolink	Agricultural land, grassland, herbaceous wetland
Reptiles	
Corn snake	Agricultural land, grassland, greasewood flat, herbaceous wetland, woody riparian and wetlands
Long-nosed leopard lizard	Barren/sparsely vegetated, desert shrubland, greasewood flat, sagebrush shrubland, saltbush shrubland
Midget faded rattlesnake	Cliff and canyon, coniferous forest, desert shrubland, greasewood flat, pinyon/juniper, montane shrubland, sagebrush shrubland, saltbush shrubland
Smooth greensnake	Agricultural land, aspen forest and woodland, coniferous forest, deciduous forest, grassland, greasewood flat, herbaceous wetland, montane grassland, woody riparian and wetlands
Utah milk snake	Agricultural land, aspen forest and woodland, coniferous forest, deciduous forest, desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Terrestrial Invertebrates	
Eureka mountains	Barren/sparsely vegetated, cliff and canyon, desert shrubland, grassland, montane grassland, montane shrubland, pinyon/juniper, sagebrush shrubland, saltbush shrubland
Great Basin silverspot (Nokomis fritillary butterfly)	Agricultural land, herbaceous wetland, woody riparian and wetlands

Strawberry IRA Micro-siting Options

TWE has developed three potential options to avoid or minimize the crossing of national forest IRAs along Alternative II-A. These are referred to as Strawberry Park micro-siting options 1, 2, and 3. These three micro-siting options would result in similar direct impacts to special status wildlife species habitat in comparison to Alternative II-A as shown in **Table 3.8-40**. Micro-siting options 2 and 3 would reduce the amount of habitat fragmentation in comparison to Alternative II-A as they would be collocated adjacent to an existing 345kV transmission line for approximately 4 miles. Any other differences in impacts to special status wildlife habitat are anticipated to be negligible in comparison to Alternative II-A.

Alternative II-B

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region II include five federally listed and two federal candidate species, 65 BLM sensitive, USFS sensitive, and state-protected species. Species-specific impact discussions are presented below. Suitable habitat for the Utah prairie dog does not occur along Alternative II-B; therefore, impacts are not expected to occur to this species. Section 3.7.6.4 presents a description of existing disturbance along Alternative II-B.

Greater Sage-grouse (Candidate)

Greater sage-grouse distribution along Alternative II-B in Colorado is limited to a small area in Moffat County near Massadona and immediately south of U.S. Highway 40. Under Alternative II-B in Utah, greater sage-grouse are only found in very small areas of suitable habitat in western Emery County, western Sanpete County, and Juab County.

As presented in **Table 3.8-32**, no active leks occur within 4 miles of Alternative II-B. However, Alternative II-B crosses a variety of greater sage-grouse habitats in Colorado and Utah (**Figure 3.8-3**).

The types of impacts to greater sage-grouse under Alternative II-B generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and amount of habitat disturbed (**Table 3.8-32**).

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). These measures, along with **SSWS-5**, would require TWE to construct anti-perching devices in high quality habitat that may help reduce potential raptor and corvid predation on greater sage-grouse. Given the minor amount of greater sage-grouse habitat crossed by the proposed Project under Alternative II-B (**Table 3.8-32**), potential impacts from operation of the proposed Project would be limited primarily to habitat loss and fragmentation.

Mexican Spotted Owl (Threatened)

Eastern Uintah County, Utah, along the Colorado/Utah border is the primary area of potential Mexican spotted owl habitat along Alternative II-B. However, the USFWS recently downgraded the habitat quality within 0.5 mile of Alternative II-B to unsuitable.

Due to the lack of suitable habitat along Alternative II-B, no impacts to this species are expected to occur.

Western Yellow-billed Cuckoo

The primary areas of potential occurrence for the western yellow-billed cuckoo along Alternative II-B are in Rio Blanco and Mesa counties, Colorado, and Grand County, Utah (USFWS 2011e).

The types of impacts to western yellow-billed cuckoo under Alternative II-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-B would result in the construction and operation disturbance of 63 acres and 7 acres,

respectively, of potentially suitable riparian and wetland habitat. These areas represent 0.06 percent and <0.01 percent, respectively, of suitable habitat within the Region II western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative II-B would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXP/NE)

The USFWS has designated white-tailed prairie dog colonies in Rio Blanco County, Colorado, as NEP areas for black-footed ferrets. Alternative II-B is adjacent to the eastern boundary of the Coyote Basin Reintroduction PMZ. The Coyote Basin population was reintroduced in eastern Utah and western Colorado (Wolf Creek) in 1999. These locations currently support a very small population of black-footed ferrets that inhabit primarily the core of the reintroduction areas (UDWR 2003).

The types of impacts to black-footed ferrets under Alternative II-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-B would result in the construction and operation disturbance of 67 acres and 15 acres, respectively, of potentially suitable white-tailed prairie dog habitat in Rio Blanco County, Colorado. These areas represent 0.01 percent and <0.01 percent, respectively, of white-tailed prairie dog colony habitat within the Region II black-footed ferret analysis area.

While impacts under Alternative II-B to white-tailed prairie dog colonies outside of the PMZ have a low potential to result in direct loss of ferrets due to the small scattered colonies, habitat disturbance would still occur. Black-footed ferrets are dependent upon white-tailed prairie dog colonies for their survival, and loss of white-tailed prairie dog habitat under Alternative II-B may indirectly impact black-footed ferrets that occur outside of the PMZ.

***SSWS-9**: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Canada Lynx (Threatened)

Along Alternative II-B, the Canada lynx has the potential to occur within higher elevation coniferous forests in central Utah, primarily in the Manti-La Sal and Uinta National Forests. This species is extremely rare in Utah, although transient Canada lynx from Colorado have been documented in Utah in the past 10 years.

Table 3.8-40 Summary of Region II Micro-siting Options Impact Parameters for Federally Listed and Candidate Species

Species	Strawberry IRA Micro-siting Option 1			Strawberry IRA Micro-siting Option 2			Strawberry IRA Micro-siting Option 3			Comparable – Strawberry IRA Micro-siting Options			Cedar Knoll IRA Micro-siting Option 1			Cedar Knoll Micro-siting Option 2			Comparable – Cedar Knoll Micro-siting Options		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Black-footed ferret potential habitat (acres)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percentage of existing habitat within the Region II black-footed ferret analysis area	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Greater Sage-grouse potential habitat (acres)	1,112	356	109,018	1,112	356	109,018	1,111	356	109,018	1,107	355	109,018	10	7	1,533	10	7	1,533	10	7	1,533
Percentage of existing habitat within the Region II greater sage-grouse analysis area	0.05	0.02	4.73	0.05	0.02	4.73	0.05	0.02	4.73	0.05	0.02	4.73	<0.01	<0.01	0.07	<0.01	<0.01	0.07	<0.01	<0.01	0.07
Western yellow-billed cuckoo potential habitat (acres)	51	6	1,734	51	6	1,734	51	6	1,734	49	6	1,734	9	3	612	7	3	612	11	3	612
Percentage of existing habitat within the Region II western yellow-billed cuckoo analysis area	0.05	<0.01	1.56	0.05	<0.01	1.56	0.05	<0.01	1.56	0.04	<0.01	1.56	<0.01	<0.01	0.55	<0.01	<0.01	0.55	<0.01	<0.01	0.55
Canada lynx potential habitat (acres)	91	13	4,609	94	14	4,609	95	14	4,609	96	14	4,609	23	6	1,106	23	6	1,106	25	6	1,106
Percentage of existing habitat within the Region II Canada lynx analysis area	0.02	<0.01	<0.01	0.02	<0.01	<0.01	0.02	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Table 3.8-40 Summary of Region II Micro-siting Options Impact Parameters for Federally Listed and Candidate Species

Species	Strawberry IRA Micro-siting Option 1			Strawberry IRA Micro-siting Option 2			Strawberry IRA Micro-siting Option 3			Comparable – Strawberry IRA Micro-siting Options			Cedar Knoll IRA Micro-siting Option 1			Cedar Knoll Micro-siting Option 2			Comparable – Cedar Knoll Micro-siting Options		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Utah prairie dog potential habitat (acres)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percentage of existing habitat within the Region II Utah prairie dog analysis area	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gray wolf potential habitat (acres)	2,251	298	95,284	2,250	298	95,284	2,249	298	95,284	2,254	299	95,284	1,042	212	36,705	1,042	212	36,705	1,034	211	36,705
Percentage of existing habitat within the Region II special status wildlife analysis area	0.02	<0.01	0.94	0.02	<0.01	0.94	0.02	<0.01	0.94	0.02	<0.01	0.94	0.01	<0.01	0.36	0.01	<0.01	0.36	0.01	<0.01	0.36

The types of impacts to the Canada lynx under Alternative II-B generally would be the same as described for Alternative II-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-B would result in the construction and operation disturbance of 287 acres and 54 acres, respectively, of potentially suitable habitat. These areas represent 0.06 percent and 0.01 percent, respectively, of the available Canada lynx habitat within the Region II special status wildlife analysis area.

Canada lynx habitat along Alternative II-B is scarce and primarily occurs in the Manti-La Sal and Uinta national forests. Habitat is limited to the higher elevation north and west facing slopes with dense forest canopies. Alternative II-B does not cross any LAUs in Utah. Therefore, impacts to Canada lynx under Alternative II-B would be limited primarily to habitat loss and fragmentation.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

Impacts to the gray wolf under Alternative II-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-B would result in the construction and operation disturbance of 11,130 acres and 1,299 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.11 percent and 0.01 percent, respectively, of potential habitat within the Region II special status wildlife analysis area. Indirect impacts would occur to 402,949 acres, which represents 3.98 percent of gray wolf potential habitat within the Region II special status wildlife analysis area. Impacts to the gray wolf under Alternative II-B would be limited primarily to habitat loss and fragmentation.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur in Region II are presented in **Table 3.8-39**. The types of impacts under Alternative II-B to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative II-B (e.g., sagebrush shrubland, pinyon-juniper, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative II-B, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region. Impacts would primarily be the result of habitat loss and fragmentation.

Alternative II-C

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region II include five federally listed and two federal candidate species, 65 BLM sensitive, USFS sensitive, and state-protected species. Species-specific impact discussions are presented below. Section 3.7.6.4 presents a description of existing disturbance along Alternative II-C.

Greater Sage-grouse (Candidate)

As presented in **Table 3.8-32**, no active leks occur within 4 miles of Alternative II-C. However, Alternative II-C crosses a variety of greater sage-grouse habitats in Colorado and Utah (**Figure 3.8-3**).

The types of impacts to greater sage-grouse under Alternative II-C generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and the amount of habitat disturbed (**Table 3.8-32**).

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). In addition, TWE has taken into account greater sage-grouse habitat (e.g., lek locations, core areas, etc.) during the design phase of the Project and routed the transmission line around sensitive habitat types, to the extent possible. **SSWS-5** would require TWE to construct anti-perching devices and mark guy wires or use alternative structures in high quality greater sage-grouse habitat. These features would help reduce disturbance to sensitive habitat types, reduce the potential for predation on greater sage-grouse by raptors and corvids, and reduce the collision potential from guy wires. However, given the minor amount of greater sage-grouse habitat crossed by the proposed Project under Alternative II-C (**Table 3.8-32**), potential impacts would primarily be the result of habitat loss and fragmentation.

Mexican Spotted Owl (Threatened)

Eastern Uintah County, Utah, along the Colorado/Utah border is the primary area of potential Mexican spotted owl habitat along Alternative II-C. However, the USFWS has recently downgraded the habitat quality within 0.5 mile of Alternative II-C to unsuitable.

Due to the lack of suitable habitat along Alternative II-C, no impacts to this species are expected to occur.

Western Yellow-billed Cuckoo (Candidate)

The primary areas of potential occurrence for western yellow-billed cuckoo along Alternative II-C are in Rio Blanco and Mesa counties, Colorado, and Grand County, Utah (USFWS 2011e).

The types of impacts to the western yellow-billed cuckoo under Alternative II-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-C would result in the construction and operation disturbance of 56 acres and 8 acres, respectively, of potentially suitable riparian and wetland habitats. These areas represent 0.05 percent and <0.01 percent, respectively, of suitable habitat within the Region II western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative II-C would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project.

Black-footed Ferret (Endangered; EXNE)

The USFWS has designated white-tailed prairie dog colonies in Rio Blanco County, Colorado, as NEP areas for black-footed ferrets. Alternative II-C is located approximately 10 miles from the eastern boundary of the Coyote Basin Reintroduction Primary Management Zone (PMZ). The Coyote Basin population was reintroduced in eastern Utah and western Colorado (Wolf Creek) in 1999. These locations currently support a very small population of black-footed ferrets that inhabit primarily the core of the reintroduction areas (UDWR 2003).

The types of impacts to black-footed ferrets under Alternative II-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-C would result in the construction and operation disturbance of 122 acres and 27 acres, respectively, of potentially suitable white-tailed prairie dog colony habitat in Rio Blanco County, Colorado.

These areas represent 0.02 percent and <0.01 percent, respectively, of white-tailed prairie dog colony habitat within the Region II black-footed ferret analysis area.

While impacts under Alternative II-C to white-tailed prairie dog colonies outside of the PMZ have a low potential to result in direct loss of ferrets due to the small scattered colonies, habitat disturbance would occur. Black-footed ferrets are dependent upon white-tailed prairie dog colonies for their survival, and loss of white-tailed prairie dog habitat under Alternative II-C may indirectly impact black-footed ferrets that occur outside of the PMZ.

***SSWS-9**: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Canada Lynx (Threatened)

Along Alternative II-C, the Canada lynx has the potential to occur within higher elevation coniferous forests in central Utah, primarily in the Fishlake National Forest. This species is extremely rare in Utah, although transient Canada lynx from Colorado have been documented in Utah in the past 10 years.

The types of impacts to the Canada lynx under Alternative II-C generally would be the same as described for Alternative II-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-C would result in the construction and operation disturbance of 63 acres and 9 acres, respectively, of potentially suitable habitat. These areas represent 0.01 percent and <0.01 percent, respectively, of suitable habitat within the Region II special status wildlife analysis area.

Canada lynx habitat along Alternative II-C is scarce and primarily occurs in the Fishlake National Forest. Habitat is limited to the higher elevation north and west facing slopes with dense forest canopies. Alternative II-C does not cross any LAUs in Utah. Therefore, impacts to Canada lynx as a result of construction and operation under Alternative II-B would be limited primarily to habitat loss and fragmentation.

Utah Prairie Dog (Threatened)

Along Alternative II-C, the Utah prairie dog occurs in northern Sevier County, Utah. Alternative II-C also crosses a USFWS designated Utah Prairie Dog Recovery Unit.

The types of impacts to the Utah prairie dog may result in direct mortalities of individuals as a result of crushing from construction activities; vehicles and equipment; and from increased predation by raptors. Alternative II-C would result in the disturbance of potentially suitable habitat (**Table 3.8-38**). Alternative II-C would result in the construction and operation disturbance of 179 acres and 33 acres, respectively, of potentially suitable habitat. These areas represent 0.03 percent and <0.01 percent, respectively, of suitable habitat within the Region II Utah prairie dog analysis area. Additional impacts may result from increased habitat fragmentation, noxious weed invasion, and human activity and noise. Impacts to the Utah prairie dog may result from increased human activity and noise from maintenance.

SSWS-7*: To reduce impacts to Utah prairie dogs, TWE would be required to conduct a preliminary habitat assessment along portions of the proposed Project that is within historic Utah prairie dog habitat. Based on the results of the habitat survey, additional surveys may be required by the USFWS to determine whether occupied habitat occurs within the disturbance footprint of the proposed Project. If occupied habitat is found, appropriate mitigation measures such as reroutes, reducing the width of the ROW, and constructing alternative structures types (e.g. H-frame tubular) with anti-perching devices on transmission line segments within occupied habitat, would be implemented in coordination with the BLM, Western, UDWR, and USFWS.*

Effectiveness: **SSWS-7** would reduce impacts to Utah prairie dogs by potentially reducing habitat disturbance within occupied habitat (e.g., reroutes) and by limiting raptor predation on Utah prairie dogs (i.e., anti-perching devices within occupied habitat).

It is not anticipated that construction activities would permanently alter Utah prairie dog colonies that would be crossed by the Project, and installation of the transmission line would not restrict the colonization of the 250-foot-wide transmission line ROW by Utah prairie dogs. In fact, habitat disturbance may encourage future colonization temporarily, based on the availability of soft, permeable soils that would occur along the ROW subsequent to the Project construction. Additionally, **SSWS-7** would identify suitable habitat and appropriate mitigation measures would be implemented in occupied habitat in coordination with the BLM, Western, UDWR, and USFWS. Impacts would primarily be the result of habitat loss and fragmentation.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The types of impacts to the gray wolf under Alternative II-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-C would result in the construction and operation disturbance of 11,679 acres and 1,203 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.12 percent and 0.01 percent, respectively, of potential habitat within the Region I special status wildlife analysis area. Indirect impacts would occur to 429,949 acres, which represents 4.25 percent of gray wolf potential habitat within the Region II special status wildlife analysis area. Impacts to the gray wolf under Alternative II-C would be limited primarily to habitat loss and fragmentation.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur along Alternative II-C in Region II are presented in **Table 3.8-39**. The types of impacts under Alternative II-C to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative II-C (e.g., sagebrush shrubland, pinyon-juniper, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative II-C, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region. Impacts would primarily result from habitat loss and fragmentation.

Alternative II-D

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region II include five federally listed and two federal candidate species, 65 BLM sensitive, USFS sensitive, and state-protected species. Species-specific impact discussions are presented below. Section 3.7.6.4 presents a description of existing disturbance along Alternative II-D.

Greater Sage-grouse (Candidate)

As presented in **Table 3.8-32**, 10 active leks occur in Utah within 4 miles of Alternative II-D. Alternative II-D crosses a variety of greater sage-grouse habitats in Colorado and Utah (**Figure 3.8-3**).

The types of impacts to greater sage-grouse under Alternative II-D generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and the amount of habitat disturbed (**Table 3.8-32**). In comparison to Alternative II- A, impacts to sage-grouse under Alternative II-D are likely to be higher because this alternative crosses three more leks within 4 miles that have demonstrated increased attendance rates between 2003 and 2012 (**Table 3.8-33**).

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). In addition, TWE has taken into account greater sage-grouse habitat (e.g., lek locations, core areas, etc.) during the design phase of the Project and routed the transmission line around sensitive habitat types, to the extent possible. **SSWS-5** would require TWE to construct anti-perching devices and mark guy wires or to use alternative structures in high quality greater sage-grouse habitat. These features would help reduce disturbance to sensitive habitat types, reduce the potential for predation on greater sage-grouse by raptors and corvids, and reduce the collision potential from guy wires. However, given the minor amount of greater sage-grouse habitat crossed by the proposed Project under Alternative II-D (**Table 3.8-32**), impacts would primarily be the result of habitat loss and fragmentation.

Mexican Spotted Owl (Threatened)

Southern Duchesne County, Utah, along the southern border of the Ashley National Forest, is the primary area of potential Mexican spotted owl habitat along Alternative II-D. The types of impacts to the Mexican spotted owl under Alternative II-D generally would be the same as described for raptors and other migratory birds under Alternative II-A, but would differ in the amount of habitat disturbed. Under Alternative II-D, impacts to the Mexican spotted owl may occur as a result of the construction and operation disturbance of 8 acres and 2 acres, respectively, of potentially suitable coniferous forest habitat. These areas represent 0.02 percent and 0.01 percent, respectively, of suitable habitat within the Region II Mexican spotted owl analysis area.

Implementation of TWE's design features for meeting or exceeding the raptor safe design standards described in the "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) (TWE-30) would reduce operation-related impacts to Mexican spotted owls. Remaining impacts to Mexican spotted owls would be limited to temporary disturbance of potential foraging habitat. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of foraging habitat in the surrounding Project region.

Western Yellow-billed Cuckoo (Candidate)

The primary areas of potential western yellow-billed cuckoo occurrence along Alternative II-D are in Rio Blanco and Mesa counties, Colorado, and Grand County, Utah (USFWS 2011e).

The types of impacts to western yellow-billed cuckoo under Alternative II-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Under Alternative II-D, impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 26 acres and 4 acres, respectively, of potentially suitable woody riparian and

wetland habitats. These areas represent 0.02 percent and <0.01 percent, respectively, of suitable habitat within the Region II western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative II-D would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXNE)

The USFWS has designated white-tailed prairie dog colonies in Rio Blanco County, Colorado, as NEP areas for black-footed ferrets. Alternative II-D is located approximately 6 miles from the northern boundary of the Coyote Basin Reintroduction Primary Management Zone (PMZ). The Coyote Basin population was reintroduced in eastern Utah and western Colorado (Wolf Creek) in 1999. These locations currently support a very small population of black-footed ferrets that inhabit primarily the core of the reintroduction areas (UDWR 2003).

The types of impacts to black-footed ferrets under Alternative II-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-D would result in the construction and operation disturbance of 201 acres and 51 acres, respectively, of potentially suitable white-tailed prairie dog colony habitat in Rio Blanco County, Colorado. These areas represent 0.04 percent and <0.01 percent, respectively, of white-tailed prairie dog colony habitat within the Region II black-footed ferret analysis area.

While impacts under Alternative II-D to white-tailed prairie dog colonies outside of the PMZ have a low potential to result in direct loss of ferrets due to the small scattered colonies, habitat disturbance would still occur. Black-footed ferrets are dependent upon white-tailed prairie dog colonies for their survival, and loss of white-tailed prairie dog habitat under Alternative II-D may indirectly impact black-footed ferrets that occur outside of the PMZ.

***SSWS-9**: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Canada Lynx (Threatened)

Along Alternative II-D, the Canada lynx has the potential to occur within higher elevation coniferous forests in central Utah, primarily in the Manti-La Sal National Forest. This species is extremely rare in Utah, although transient Canada lynx from Colorado have been documented in Utah in the past 10 years.

The types of impacts to the Canada lynx under Alternative II-D generally would be the same as described for Alternative II-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-D would result in the construction and operation disturbance of 243 acres and 43 acres, respectively, of potentially

suitable habitat. These areas represent 0.05 percent and <0.01 percent, respectively, of suitable habitat within the Region II Canada lynx analysis area.

Canada lynx habitat along Alternative II-D is scarce and primarily occurs in the Manti-La Sal National Forest. Habitat is limited to the higher elevation north and west facing slopes with dense forest canopies. Alternative II-D does not cross any LAUs in Utah. Therefore, impacts to Canada lynx as a result of Alternative II-D are limited primarily to habitat loss and fragmentation.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The types of impacts to the gray wolf under Alternative II-D generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-D would result in the construction and operation disturbance of 8,724 acres and 1,137 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.09 percent and 0.01 percent, respectively, of potential habitat within the Region II special status wildlife analysis area. Indirect impacts would occur to 313,162 acres, which represents 3.10 percent of gray wolf potential habitat within the Region II special status wildlife analysis area. Impacts to the gray wolf under Alternative II-D would be limited primarily to habitat loss and fragmentation.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur along Alternative II-D are presented in **Table 3.8-39**. The type s of impacts under Alternative II-D to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative II-D (e.g., sagebrush shrubland, pinyon-juniper, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative II-D, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region. Impacts would primarily be the result of habitat loss and fragmentation.

Alternative II-E

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region II include five federally listed and two federal candidate species, 65 BLM sensitive, USFS sensitive, and state-protected species. Species-specific impact discussions are presented below. Section 3.7.6.4 presents a description of existing disturbance along Alternative II-E.

Greater Sage-grouse (Candidate)

As presented in **Table 3.8-32**, 10 active leks occur in Utah within 4 miles of Alternative II-E. Alternative II-E crosses a variety of greater sage-grouse habitats in Colorado and Utah (**Figure 3.8-3**).

The types of impacts to greater sage-grouse under Alternative II-E generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and the amount of habitat disturbed (**Table 3.8-32**). In comparison to Alternative II-A, impacts to sage-grouse are likely to be higher

because Alternative II-E crosses 3 more leks within 4 miles that have demonstrated increased attendance rates between 2003 and 2012 (**Table 3.8-33**).

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). In addition, TWE has taken into account greater sage-grouse habitat (e.g., lek locations, core areas, etc.) during the design phase of the Project and routed the transmission line around sensitive habitat types, to the extent possible. **SSWS-5** would require TWE to construct anti-perching devices and mark guy wires or to use alternative structures in high quality greater sage-grouse habitat. These features would help reduce disturbance to sensitive habitat types, reduce the potential for predation on greater sage-grouse by raptors and corvids, and reduce the collision potential from guy wires. However, given the minor amount of greater sage-grouse habitat crossed by the proposed Project under Alternative II-E (**Table 3.8-32**), impacts primarily would be the result of habitat loss and fragmentation.

Mexican Spotted Owl (Threatened)

No suitable habitat for this species is located within the 2-mile project corridor of Alternative II-E. The nearest suitable habitat for is located approximately 7 miles to the southwest at the confluence of Dry and Argyle Canyons, 25 miles northeast of Price, Utah. The types of impacts to the Mexican spotted owl under Alternative II-E generally would be the same as described for raptors and other migratory birds under Alternative II-A, but would differ in the amount of habitat disturbed (Section 3.7.6.3).

Due to the lack of suitable habitat along Alternative II-E, impacts to this species are expected to be negligible. Implementation of TWE's design features for meeting or exceeding the raptor safe design standards described in the "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) (TWE-30) would reduce operation-related impacts to Mexican spotted owls. Remaining impacts to Mexican spotted owls would be limited to temporary disturbance of potential foraging habitat.

Western Yellow-billed Cuckoo (Candidate)

The primary areas of potential western yellow-billed cuckoo occurrence along Alternative II-E are in Rio Blanco County, Colorado (USFWS 2011e).

The types of impacts to the western yellow-billed cuckoo under Alternative II-E generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Under Alternative II-E, impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 62 acres and 9 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 0.06 percent and <0.01 percent, respectively, of suitable habitat within the Region II western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative II-E would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXNE)

The USFWS has designated white-tailed prairie dog colonies in Rio Blanco County, Colorado, as NEP areas for black-footed ferrets. Alternative II-E is located approximately 6 miles from the northern boundary of the Coyote Basin Reintroduction Primary Management Zone (PMZ).

The types of impacts to black-footed ferrets under Alternative II-E generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Alternative II-E would result in the construction and operation disturbance of 254 acres and 63 acres, respectively, of potentially suitable white-tailed prairie dog colony habitat in Rio Blanco County, Colorado. These areas represent 0.05 percent and 0.01 percent, respectively, of white-tailed prairie dog colony habitat within the Region II black-footed ferret analysis area.

While impacts under Alternative II-E to white-tailed prairie dog colonies outside of the PMZ have a low potential to result in direct loss of ferrets due to the small scattered colonies, habitat disturbance would still occur. Black-footed ferrets are dependent upon white-tailed prairie dog colonies for their survival, and loss of white-tailed prairie dog habitat under Alternative II-E may indirectly impact black-footed ferrets that occur outside of the PMZ.

***SSWS-9**: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Canada Lynx (Threatened)

Along Alternative II-E, the Canada lynx has the potential to occur within higher elevation coniferous forests in central Utah, primarily in the Unitah-Wasatch-Cache and Ashley national forests. This species is extremely rare in Utah, although transient Canada lynx from Colorado have been documented in Utah in the past 10 years.

The types of impacts to the Canada lynx under Alternative II-E generally would be the same as described for Alternative II-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-E would result in the construction and operation disturbance of 158 acres and 26 acres, respectively, of potentially suitable habitat. These areas represent 0.03 percent and <0.01 percent, respectively, of suitable habitat within the Region II Canada lynx analysis area.

Canada lynx habitat along Alternative II-E is scarce and occurs primarily in the Fishlake National Forest. Habitat is limited to the higher elevation north and west facing slopes with dense forest canopies. Alternative II-E does not cross any LAUs in Utah. Therefore, impacts to Canada lynx as a result of Alternative II-E are limited primarily to habitat loss and fragmentation.

Gray Wolf (Endangered in Utah and Colorado, EXP/NE in Wyoming)

The types of impacts to the gray wolf under Alternative II-E generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-E would result in the construction and operation disturbance of 8,349 acres and 1,064 acres, respectively, of potential gray wolf foraging and denning habitat. These areas represent 0.08 percent and 0.01 percent, respectively, of potential habitat within the Region II special status wildlife analysis area. Indirect impacts would occur to 297,851 acres, which represents 2.94 percent of gray wolf potential habitat within the Region II special status wildlife analysis area. Impacts to the gray wolf under Alternative II-E would be limited primarily to habitat loss and fragmentation.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur along Alternative II-E are presented in **Table 3.8-39**. The types of impacts under Alternative II-E to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative II-E (e.g., sagebrush shrubland, pinyon-juniper, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative II-E, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

Alternative II-F (Agency Preferred)

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region II include five federally listed and two federal candidate species, 65 BLM sensitive, USFS sensitive, and state-protected species. Species-specific impact discussions are presented below. Section 3.7.6.4 presents a description of existing disturbance along Alternative II-F.

Greater Sage-grouse (Candidate)

As presented in **Table 3.8-32**, 15 active leks occur in Utah within 4 miles of Alternative II-F. Alternative II-F crosses a variety of greater sage-grouse habitats in Colorado and Utah (**Figure 3.8-3**).

The types of impacts to greater sage-grouse from Alternative II-F generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and amount of habitat disturbed (**Table 3.8-32**). In comparison to Alternative II-A, impacts to greater sage-grouse are likely to be higher because Alternative II-F crosses 8 more leks within 4 miles that have demonstrated increased attendance rates between 2003 and 2012 (**Table 3.8-33**).

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). In addition, TWE has taken into account greater sage-grouse habitat (e.g., lek locations, core areas, etc.) during the design phase of the Project and routed the transmission line around sensitive habitat types, to the extent possible. **SSWS-5** would require TWE to construct anti-perching devices and mark guy wires or to use alternative structures in high quality greater sage-grouse habitat. These features would help reduce disturbance to sensitive habitat types, reduce the potential for predation on greater sage-grouse by raptors and corvids, and reduce the collision potential from guy wires. However, given the minor amount of greater sage-grouse habitat crossed by the proposed Project under Alternative II-F (**Table 3.8-32**), potential mortality from operation of the proposed Project is expected to be limited primarily to habitat loss and fragmentation.

Mexican Spotted Owl (Threatened)

Southern Duchesne County, Utah, along the southern border of the Ashley National Forest, is the primary area of potential Mexican spotted owl habitat along Alternative II-F. The types of impacts to the Mexican spotted owl under Alternative II-F generally would be the same as described for raptors and other migratory birds under Alternative II-A, but would differ in the amount of habitat disturbed. Under

Alternative II-F, impacts to the Mexican spotted owl may occur as a result of the construction and operation disturbance of 8 acres and 2 acres, respectively, of potentially suitable coniferous forest habitat. These areas represent 0.021 percent and 0.005 percent, respectively, of suitable habitat within the Region II mexican spotted owl analysis area.

Implementation of TWE's design features for meeting or exceeding the raptor safe design standards described in the "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) (TWE-30) would reduce operation-related impacts to Mexican spotted owls. Remaining impacts to Mexican spotted owls would be limited to temporary disturbance of potential foraging habitat. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of foraging habitat in the surrounding Project region.

Western Yellow-billed Cuckoo (Candidate)

The primary area of potential western yellow-billed cuckoo occurrence along Alternative II-F is in Rio Blanco County, Colorado (USFWS 2011e).

The types of impacts to the western yellow-billed cuckoo from Alternative II-F generally would be the same as described for Alternative I-A (**Table 3.8-38**). Under Alternative II-F, impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation loss of 32 acres and 7 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 0.03 percent and <0.01 percent, respectively, of suitable habitat within the Region II western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts to the western yellow-billed cuckoo during the breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative II-F would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Black-footed Ferret (Endangered; EXNE)

The USFWS has designated white-tailed prairie dog colonies in Rio Blanco County, Colorado, as NEP areas for black-footed ferrets. Alternative II-F is located approximately 6 miles from the northern boundary of the Coyote Basin Reintroduction PMZ. The types of impacts to black-footed ferrets from Alternative II-F generally would be the same as described for Alternative II-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-F would result in the construction and operation disturbance of 201 acres and 51 acres, respectively, of potentially suitable white-tailed prairie dog colony habitat in Rio Blanco County, Colorado. These areas represent 0.04 percent and <0.01 percent, respectively, of white-tailed prairie dog colony habitat within the Region II black-footed ferret analysis area.

While impacts under Alternative II-F to white-tailed prairie dog colonies outside of the PMZ have a low potential to result in direct loss of ferrets due to the small scattered colonies, habitat disturbance would still occur. Black-footed ferrets are dependent upon white-tailed prairie dog colonies for their survival, and loss of white-tailed prairie dog habitat under Alternative II-F may indirectly impact black-footed ferrets that occur outside of the PMZ.

***SSWS-9**: To reduce impacts to black-footed ferret from operation of the proposed Project, design features specific to black-footed ferret would be implemented.*

- *To limit raptor predation on black-footed ferret, TWE would be required to construct anti-perching devices and alternative structure types on segments of the proposed Project near high quality black-footed ferret habitat (e.g., within areas of active white-tailed prairie dog colonies) in consultation with the BLM, Western, and applicable state wildlife agencies.*

Effectiveness: **SSWS-9** would help minimize the potential for increased predation on black-footed ferret by limiting raptor perching locations. While transmission lines fitted with anti-perching devices do not necessarily eliminate perching entirely (Lammers and Collopy 2007), they are designed to discourage use of the transmission line as a hunting perch which may in turn decrease the potential for predation by raptors on black-footed ferrets.

Canada Lynx (Threatened)

Along Alternative II-F, the Canada lynx has the potential to occur within higher elevation coniferous forests in central Utah, primarily in the Unitah-Wasatch-Cache and Ashley national forests. This species is extremely rare in Utah, although transient Canada lynx from Colorado have been documented in Utah in the past 10 years.

The types of impacts to the Canada lynx from Alternative II-F generally would be the same as described for Alternative II-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Alternative II-F would result in the construction and operation disturbance of 418 acres and 91 acres, respectively, of potentially suitable habitat. These areas represent 0.09 percent and 0.02 percent, respectively, of suitable habitat within the Region II Canada lynx analysis area.

Canada lynx habitat under Alternative II-F is scarce and occurs primarily in the Fishlake National Forest. Habitat is limited to the higher elevation north and west facing slopes with dense forest canopies. Alternative II-F does not cross any LAUs in Utah. Therefore, impacts to Canada lynx as a result of construction and operation under Alternative II-F are limited primarily to habitat loss and fragmentation.

Gray Wolf

The types of impacts to the gray wolf under Alternative II-F generally would be the same as described for Alternative II-A, but would differ in the amount of habitat disturbed (**Table 3.8-38**). Impacts to gray wolves under Alternative II-F would occur as the result of the construction and operation disturbance of 8,982 acres and 1,295 acres, respectively, of potential denning and foraging habitat. These areas represent 0.09 percent and 0.01 percent, respectively, of potential habitat within the Region II special status wildlife analysis area. Indirect impacts would occur to 303,756 acres, which represents 3.00 percent of gray wolf potential habitat within the Region II special status wildlife analysis area. Impacts to the gray wolf as a result of Alternative II-F are limited primarily to habitat loss and fragmentation.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur along Alternative II-F are presented in **Table 3.8-39**. The types of impacts under Alternative II-F to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative II-F (e.g., sagebrush shrubland, pinyon-juniper, and saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of TWE-32, **WLF-1**, and **SSWS-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative II-F, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

Cedar Knoll IRA Micro-siting Options

TWE has developed two potential options to avoid or minimize the crossing of national forest IRAs along Alternatives II-E and II-F. These are referred to as Cedar Knoll micro-siting options 1 and 2. Both of these micro-siting options would result in similar acreages of direct impacts to special status species wildlife habitat in comparison to Alternatives II-E and II-F. However, both of these micro-siting options would be collocated adjacent to an existing 345-kV transmission line while Alternatives II-E and II-F would not be collocated with existing transmission in this area. This aspect of the micro-siting options would result in reduced habitat fragmentation in comparison to Alternatives II-E and II-F. All other differences in impacts to wildlife habitat are anticipated to be negligible in comparison to Alternatives II-E and II-F.

Alternative Variation in Region II

Emma Park Alternative Variation

Several routes have been developed in the Emma Park area north of Price, Utah, to avoid greater sage-grouse potential habitat. One route is aligned east-west and is analyzed as the Emma Park Alternative Variation. This variation and the comparable portion of Alternative II-F do not cross the Fishlake or Manti-La Sal national forests. **Table 3.8-41** summarizes Region II alternative variation impact parameters for special status wildlife species. The Emma Park Alternative Variation would result in direct impacts to approximately 149 acres of construction impacts and 55 acres of operation impacts to greater sage-grouse occupied habitat as shown in **Table 3.8-41**. Comparable segments of Alternative II-F would avoid impacts to greater sage-grouse habitat. The Emma Park Alternative variation would be located within 4 miles of 7 active greater sage-grouse leks while comparable segments of Alternative II-F would be located greater than 4 miles from any active leks.

Table 3.8-41 Summary of Region II Alternative Variation Impact Parameters for Federally Listed and Candidate Species

Species	Emma Park Alternative Variation			Comparable – Emma Park Alternative Variation		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Black-footed ferret potential habitat (acres)	0	0	0	0	0	0
Percentage of existing habitat within the Region II black-footed ferret analysis area	0	0	0	0	0	0
Greater Sage-grouse potential habitat (acres)	149	55	8,975	0	0	0
Percentage of existing habitat within the Region II greater sage-grouse analysis area	<0.01	<0.01	0.39	0	0	0
Western yellow-billed cuckoo potential habitat (acres)	<1	<1	5	<1	<1	5
Percentage of existing habitat within the Region II western yellow-billed cuckoo analysis area	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Canada lynx potential habitat (acres)	63	15	2,992	358	79	9,788
Percentage of existing habitat within the Region II Canada lynx analysis area	0.01	<0.01	<0.01	0.07	0.02	0.02
Utah prairie dog potential habitat (acres)	0	0	0	0	0	0
Percentage of existing habitat within the Region II Utah prairie dog analysis area	0	0	0	0	0	0
Gray wolf potential habitat (acres)	1,242	214	35,514	1,182	234	27,323
Percentage of existing habitat within the Region II special status wildlife analysis area	0.01	<0.01	0.35	0.01	<0.01	0.27

Alternative Connectors in Region II

The Lynndyl, IPP East, and Castle Dale alternative connectors would increase the total special status wildlife species habitat disturbance, if they were to be utilized. These connectors do not cross greater sage-grouse habitat. The Price Alternative Connector does cross occupied greater sage-grouse habitat and would increase the total special status wildlife species habitat disturbance, if utilized. **Table 3.8-42** summarizes impacts associated with the alternative connectors in Region II.

Table 3.8-42 Summary of Region II Alternative Connector Impact Parameters for Special Status Wildlife Species

Alternative Connector	Analysis
Highway 191 Alternative Connector	• Approximately 5 miles in length.[1] • No special status raptor nests are within 1 mile of the reference line.
Lynndyl Alternative Connector (Alternatives II-B and II-C)	• Approximately 24 miles in length.[1] • No special status raptor nests are within 1 mile of the reference line.
IPP East Alternative Connector (Alternatives II-A and II-B)	• Approximately 3 miles in length.[1] • No special status raptor nests are within 1 mile of the reference line.
Castle Dale Alternative Connector	• Approximately 11 miles in length.[1] • Six special status raptor nests are within 1 mile of the reference line.
Price Alternative Connector	• Approximately 18 miles in length.[1] • Twenty-nine special status raptor nests are within 1 mile of the reference line.

[1] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Region II Conclusion

A comparison of impact parameters for Region II alternatives indicates that potential construction and operation impacts to special status wildlife species would be varied across all alternatives as shown in **Table 3.8-38**. Alternative II-E would result in the greatest direct and indirect impacts to greater sage-grouse potential habitat in comparison to the other Region II alternatives (**Table 3.8-38**). Alternative II-A would result in the greatest direct and indirect impacts to Western yellow-billed cuckoo potential habitat in comparison to the other Region II alternatives (**Table 3.8-38**). Alternative II-C would result in the greatest direct and indirect impacts to Utah prairie dog and gray wolf potential habitat in comparison to the other Region II alternatives (**Table 3.8-38**). Alternative II-E would result in the greatest direct and indirect impacts to black-footed ferret potential habitat in comparison to the other Region II alternatives (**Table 3.8-38**). Alternative II-F would result in the greatest direct and indirect impacts to Canada lynx potential habitat in comparison to the other Region II alternatives (**Table 3.8-38**). The greatest level of impacts to special status wildlife species among all Region II alternatives associated with Alternative II-E is due to significantly greater impacts to greater sage-grouse and black-footed ferret potential habitat. However, project effects on special status wildlife species and their potential habitat would be avoided or considered to be low magnitude and short-term after applying BMPs, design features, and additional mitigation.

3.8.6.6 Region III

Tables 3.8-43, **3.8-44**, **3.8-45**, **3.8-46**, and **3.8-47** provide a tabulation of impacts associated with the alternative routes in Region III. Key impact parameters that relate to the impact discussion in Section 3.8.6.2, Impacts to Special Status Species Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below. The Dixie National Forest is crossed by the Project in Region III. **Table 3.8-48** presents impacts to USFS sensitive species habitat on

Dixie National Forest lands, which are crossed by alternative routes and other project components in Region III.

Desert Tortoise (Threatened)

Potential impacts to the desert tortoise would result from incremental increases in habitat fragmentation caused by vegetation removal and other surface-disturbing activities associated with transmission line construction. Other direct impacts could occur as a result of mortality caused by construction equipment and support vehicles crushing individuals and destroying burrows. Long-term increases in vehicle traffic and human activity associated with operations also could have adverse effects on the desert tortoise.

The number of occupied greater sage-grouse leks visible from the reference lines and the average distance of occupied leks visible from the reference lines in Region III are presented in **Table 3.8-45**. There are no occupied leks visible from within 4 miles of the reference lines associated with either Alternative III-B or III-C. Alternative III-A would impact 1 occupied lek visible from the reference line. No impacts to greater sage-grouse leks are expected to occur under Alternatives III-B and III-C. Although Alternative III-A would impact 1 occupied lek, implementation of **SSWS-5** would limit raptor and corvid predation and impacts to greater sage-grouse visible from the reference line. Thus, impacts associated with this occupied lek are expected to be low magnitude. A summary of assumptions regarding the lek visibility analysis is located in Section 3.8.6.3 under the Region I discussion of impacts to greater sage-grouse.

These impacts would be more pronounced within occupied habitat and USFWS critical habitat. In most instances, suitable habitat adjacent to disturbed areas would continue to be available for use by this species. However, displacement would increase competition and could result in some local reductions in desert tortoise populations if adjacent habitats are at carrying capacity.

SSWS-4*: To avoid and minimize impacts to the desert tortoise and its habitat, TWE would conduct field surveys in identified desert tortoise habitat following approved USFWS protocols. TWE would coordinate with the BLM, Western, Boulder City, Clark County, Nevada, Bureau of Reclamation, and USFWS to implement appropriate mitigation measures during construction, including but not limited to, fencing, preconstruction surveys, and relocating desert tortoises.*

Effectiveness: The implementation of **SSWS-4** would avoid and minimize impacts to the desert tortoise in Region III by first identifying suitable and occupied habitat and then implementing appropriate mitigation measures in coordination with the BLM, Western, and USFWS.

Several factors would combine to help minimize impacts to the desert tortoise resulting from the construction of Region III alternatives routes. First, through implementation of ECO-1, ECO-4, and TWE-29, desert tortoise habitat would be identified and avoided where possible. Second, by implementing **SSWS-4**, direct impacts to desert tortoises would be reduced because appropriate mitigation measures approved by the USFWS would be implemented. Therefore, impacts to the desert tortoise resulting from the Region III alternative routes would be limited primarily to habitat loss and fragmentation.

Table 3.8-43 Summary of Region III Alternative Route Impact Parameters for Desert Tortoise

Parameter	Alternative III-A			Alternative III-B			Alternative III-C		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
USFWS critical habitat (acres)	502	162	42,946	328	87	27,525	587	151	63,104
USFWS potential habitat (acres)	993	299	85,863	1,081	279	98,374	985	242	100,923
USGS habitat model ranking 0.6 and higher (acres)	1,173	358	101,342	1,035	266	93,547	965	236	97,575

Table 3.8-44 Summary of Region III Alternative Route Impact Parameters for Greater Sage-grouse

Parameter	Alternative III-A			Alternative III-B			Alternative III-C		
Number of active leks within 4 miles of reference lines in Utah	1			0			0		
Length of transmission line in miles (habitat fragmentation and collision potential)	276			285			308		
Habitat Disturbance	**Construction Impact**	**Operation Impact**	**Indirect Impact**	**Construction Impact**	**Operation Impact**	**Indirect Impact**	**Construction Impact**	**Operation Impact**	**Indirect Impact**
Utah occupied habitat (acres)[1]	115	24	16,756	0	0	0	0	0	0
Utah brood-rearing areas (acres)	115	24	16,749	0	0	0	0	0	0
Utah wintering habitat (acres)	115	24	16,721	0	0	0	0	0	0

[1] Occupied habitat includes brood-rearing habitat and wintering habitat.

Table 3.8-45 Summary of Region III Alternate Route Impact Parameters (Visibility) for Greater Sage-grouse

Parameter	Alternative III-A	Alternative III-B	Alternative III-C
Utah			
Number of visible occupied leks within 0.5 miles of reference lines[1]	0	0	0
Number of visible occupied leks within 1 mile of reference lines	0	0	0
Number of visible occupied leks within 2 miles of reference lines	0	0	0
Number of visible occupied leks within 3 miles of reference lines	0	0	0
Number of visible occupied leks within 4 miles of reference lines	1	0	0
Average distance of visible leks within 4 miles of reference lines	3.44	-	-
Length of transmission line in miles (habitat fragmentation and collision potential)[2]	276	285	308

[1] Occupied habitat includes brood-rearing habitat and wintering habitat.

[2] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Table 3.8-46 Summary of Region III Alternative Route Impact Parameters for Utah Prairie Dog

Parameter	Alternative III-A		Alternative III-B		Alternative III-C	
	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact
Utah prairie dog colonies in high intensity survey areas (acres)[1]	54	21	57	24	65	29
Utah prairie dog colonies in low intensity survey areas (acres)[1]	23	10	29	12	36	15

[1] Acreages of Utah prairie dog colonies will be updated with 2013 survey results.

Table 3.8-47 Special Status Raptor Nests and Winter Roosts Within 1 Mile of the Reference Line in Region III[1]

Species	Alternative III-A	Alternative III-B	Alternative III-C	Ox Valley East Alternative Variation	Ox Valley West Alternative Variation	Ox Valley Alternative Variation Comparable Portion of Alternative III-A	Pinto Alternative Variation	Pinto Alternative Variation Comparable Portion of Alternative III-A	Avon Alternative Connector	Moapa Alternative Connector
Burrowing owl	7	6	6	0	0	0	0	0	0	0
Ferruginous hawk	30	13	13	0	0	0	1	3	0	0
Golden eagle	16	16	18	0	0	0	2	0	0	0
Prairie falcon	7	5	6	0	0	0	0	1	0	0
Long-eared owl	1	0	0	0	0	0	0	0	0	0
Unknown raptor species	147	79	82	1	1	11	3	50	0	0
Totals	208	119	125	1	1	11	6	54	0	0

[1] Nests of raptor species, which are not classified as special status, are tabulated in Section 3.7, Wildlife. Nests of unknown raptor species are tabulated in both Sections 3.7 and 3.8 because they may have been utilized by either special status raptors or non-special status raptors.

[2] Nests of other special status raptor species such as bald eagle and Swainson's hawk are not included due to the lack of documented nest sites within 1 mile of the reference line.

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012, Manti-La Sal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012; AECOM 2012.

Table 3.8-48 Summary of Region III Alternative Route Impacts to Vegetation Communities on USFS-Administered Lands

Vegetation Community/ Habitat Type	Alternative III-A			Ox Valley East			Ox Valley East Comparison			Ox Valley West			Ox Valley West Comparison			Pinto Variation			Pinto Variation Comparison			Total Acres of Vegetation Community/ Habitat Type in Forest
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	
Dixie National Forest																						
1. Agricultural Land	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	<1	<1	5	0	0	0	629
2. Aspen Forest and Woodland	<1	<1	11	5	1	90	<1	<1	85	5	1	78	<1	<1	11	<1	<1	17	<1	<1	11	196,825
3. Barren/ Sparsely Vegetated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26,266
4. Cliff and Canyon	<1	<1	62	6	<1	36	<1	<1	30	6	<1	30	<1	<1	62	<1	<1	15	<1	<1	62	93,023
5. Conifer Forest	<1	<1	1	<1	<1	4	0	0	4	<1	<1	4	0	0	0	<1	<1	8	<1	<1	1	537,641
6. Deciduous Forest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7. Desert Shrubland	33	4	1,031	1	<1	4	2	1	7	1	<1	5	2	1	154	<1	<1	1	<1	<1	29	5,265
8. Developed/ Disturbed Land	10	1	225	6	1	0	9	1	142	5	1	78	9	1	185	14	1	231	8	1	191	26,479
9. Dunes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
10. Grassland	3	<1	50	2	1	149	2	<1	153	2	1	146	2	<1	25	4	<1	122	2	<1	28	2,010
11. Greasewood Flat	<1	<1	6	0	0	0	<1	<1	0	0	0	0	<1	<1	6	0	0	0	<1	<1	6	19
12. Herbaceous Wetland	<1	<1	3	0	0	0	<1	<1	0	0	0	0	<1	<1	3	<1	<1	2	<1	<1	<1	4,438
13. Montane Grassland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12,854
14. Montane Shrubland	22	7	1,827	72	15	2,609	18	7	2,551	69	15	2,500	18	7	1,737	8	1	518	18	7	1,731	106,207
15. Open Water	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,445
16. Pinyon-juniper	293	53	13,966	285	45	8,402	233	42	8,153	277	43	5,054	233	42	8,822	490	56	19,225	245	45	11,410	521,470
17. Riparian	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18. Sagebrush Shrubland	251	33	6,419	194	30	5,107	210	29	4,840	196	31	3,790	210	29	5,373	215	20	5,009	235	31	5,666	315,223

Table 3.8-48 Summary of Region III Alternative Route Impacts to Vegetation Communities on USFS-Administered Lands

Vegetation Community/ Habitat Type	Alternative III-A			Ox Valley East			Ox Valley East Comparison			Ox Valley West			Ox Valley West Comparison			Pinto Variation			Pinto Variation Comparison			Total Acres of Vegetation Community/ Habitat Type in Forest
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	
19. Saltbush Shrubland	<1	<1	8	0	0	0	<1	<1	0	0	0	0	<1	<1	8	<1	<1	11	<1	<1	8	497
20. Tundra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16,504
21. Woody Riparian and Wetlands	5	1	213	8	3	547	5	1	540	8	3	526	5	1	197	1	<1	143	5	1	197	15,660

Alternative III-A (Applicant Proposed)

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region III include 5 federally listed and 2 federal candidate species, 76 BLM sensitive, USFS sensitive, and state-protected species. Species-specific impact discussions are presented below. Suitable habitat for the Mexican spotted owl does not occur along Alternative III-A, therefore impacts are not expected to occur to this species. Section 3.7.6.4 presents a description of existing disturbance along Alternative III-A.

Desert Tortoise (Threatened)

The desert tortoise occurs along Alternative III-A in southern Washington County, Utah and Clark and Lincoln counties, Nevada. This species occurs exclusively within the Mojave Desert shrub community.

Potential impacts to the desert tortoise would include the disturbance of potentially suitable habitat and the incremental increase of habitat fragmentation from vegetation removal and other surface-disturbing activities (**Table 3.8-43**). Direct impacts to the desert tortoise may occur as a result of the construction and operation disturbance of 993 acres and 299 acres, respectively, of potentially suitable habitat. These areas represent 0.07 percent and 0.02 percent, respectively, of suitable habitat within the Region III desert tortoise analysis area. Additional loss of habitat, especially undisturbed occupied habitat and USFWS-designated critical habitat would result in an incremental reduction in the amount of available habitat in the Region III desert tortoise analysis area. Mortality as a result of crushing and burying also may result from construction activities. In most instances, suitable habitat adjacent to disturbed areas would continue to be available for use by this species. However, displacement would increase competition and could result in some local reductions in desert tortoise populations if adjacent habitats are at carrying capacity. Potential impacts also could include burrow abandonment or loss of eggs or young.

Operation-related impacts to desert tortoises under Alternative III-A would include increased human presence and noise during maintenance activities, which may result in displacement. Increased vehicle traffic within occupied desert tortoise habitat may lead to mortalities as a result of crushing. Direct mortality could result from construction personnel or members of the public handling tortoises. Desert tortoises expel their water reserve as a defense mechanism and can die if they aren't able to access water and rehydrate quickly. Also, there is potential for increased public access along Project roads to contribute to the problem of members of the public bringing desert tortoises home for pets.

Several factors would combine to help minimize impacts to the desert tortoise as a result of the construction of Alternative III-A. First, through implementation of ECO-1, ECO-4, and TWE-29, desert tortoise habitat would be identified and avoided where possible. Second, by implementing **SSWS-4**, direct impacts to the desert tortoise would be reduced as appropriate mitigation measures approved by the USFWS would be implemented. Therefore, impacts under Alternative III-A would be limited primarily to habitat loss and fragmentation.

California Condor (Endangered; EXNE)

Condors regularly forage, roost, and may even nest in southern Utah (Gorell et al. 2005). Based on their ability to travel up to 200 miles in a day (UDNR 2011), this species may be found along Alternative III-A. The current range of this population is centered on the Colorado River Basin in northern Arizona and southern Utah. Although condors often winter in Arizona, many condors from the southwestern population forage over Utah. They can travel back and forth between the Grand Canyon and Zion National Park in a single day. Condors commonly occur in Utah between April and November, but peak numbers usually occur from June through August.

Because the species has such a large range, direct impacts from construction activities associated with Alternative III-A to foraging habitat would include the construction and operation disturbance of 4,810 acres and 525 acres, respectively. These areas represent 0.16 percent and 0.02 percent,

respectively, of the Region III California condor analysis area. Condors are cavity-nesting birds and most nest sites have been found in caves, on rock ledges, or in tree cavities. Direct impacts to condor nesting habitat from construction activities are unlikely because the species nests in rugged, remote locations.

Direct impacts from operation of Alternative III-A to the California condor include the potential for collision and electrocution associated with transmission lines (AZGFD 2011; 2004; Snyder and Rea 1998; Terres 1980; USFWS 1996). Since 1995 there have been a total of seven transmission line-related California condor deaths in California and Arizona (VWS 2007). The California condor is a very large avian scavenger, with a wingspan of 9.5 feet and a weight of up to 25 pounds. Using thermal updrafts, condors can soar and glide up to 50 miles per hour. Therefore, condors have low maneuverability, which contributes to the potential for transmission line collision and electrocution. The potential for electrocution mortality to California condors warrants special consideration regarding adequate spacing of transmission equipment (APLIC 2006). The wingspan of a condor could exceed typical separation distances of electrical conductors and other and other energized equipment. California condors normally produce only a single egg every other year (AZGFD 2008). Because they have a low reproductive rate, populations can be impacted by even sporadic mortality (USFWS 1996).

Implementation of TWE's design features for meeting or exceeding the raptor safe design standards described in the "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) (TWE-30) would reduce operation-related impacts to the California condor. Remaining impacts to the California condor would be limited to temporary disturbance of potential foraging habitat. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Greater Sage-grouse (Candidate)

Greater sage-grouse along Alternative III-A in southwestern Utah are found in portions of Beaver and Iron counties. These counties support the largest greater sage-grouse populations in southwestern Utah.

As presented in **Table 3.8-44**, 1 active lek occurs within 4 miles of Alternative III-A. Alternative III-A also crosses a variety of greater sage-grouse habitats in Utah (**Figure 3.8-5**).

The types of impacts to greater sage-grouse from construction and operation of Alternative III-A generally would be the same as described for Alternative I-A, but would differ in the number of leks crossed and amount of habitat disturbed (**Table 3.8-44**). Impacts under Alternative III-A would include the construction and operation disturbance of 346 acres and 73 acres, respectively. These areas represent 0.03 percent and <0.01 percent, respectively, of the Region III greater sage-grouse analysis area.

Implementation of **ECO-1**, **ECO-4**, and **TWE-32** would require TWE to identify sensitive areas to the greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). These measures, along with **SSWS-5**, would require TWE to construct anti-perching devices in high quality habitat that may help reduce potential raptor and corvid predation on greater sage-grouse. Given the minor amount of greater sage-grouse habitat crossed by the proposed Project under Alternative III-A (**Table 3.8-44**), potential impacts from operation of the proposed Project would be primarily limited to habitat loss and fragmentation.

Yuma Clapper Rail (Endangered)

The Yuma clapper rail may occur within suitable marsh habitat along the Muddy and Virgin rivers in southern Nevada along Alternative III-A.

Direct impacts to the Yuma clapper rail include habitat loss, modification, and fragmentation. Alternative III-A would result in the construction and operation disturbance of 22 acres and 3 acres, respectively, of potentially suitable wetland habitat. These areas represent 0.04 percent and

<0.01 percent, respectively, of suitable habitat within the Region III Yuma clapper rail analysis area (**Table 3.8-49**).

Improved access as a result of Project roads under Alternative III-A may result in increased human disturbance to the species. These impacts would be more pronounced if construction were to occur during the breeding season.

Operation of the proposed Project would incrementally increase the collision potential for Yuma clapper rails. Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associate Components, presents details regarding collision impacts to migratory birds.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 would reduce impacts during the Yuma clapper rail breeding season. Remaining impacts to Yuma clapper rails under Alternative III-A would be limited to a minor amount of temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Western Yellow-billed Cuckoo (Candidate)

This species may occur along Alternative III-A in several areas of southern Utah and Nevada. The western yellow-billed cuckoo is a confirmed breeder along the Muddy River in Clark County, Nevada (Floyd et al. 2007). Records also exist for the western yellow-billed cuckoo in the Beaver Dam Wash in Washington County, Utah (Bosworth 2003; Parrish et al. 2000).

The types of impacts to the western yellow-billed cuckoo under Alternative III-A generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Under Alternative III-A, direct impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 22 acres and 3 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 0.04 percent and <0.01 percent, respectively, of suitable habitat within the Region III western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative III-A would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Southwestern Willow Flycatcher (Endangered)

The southwestern willow flycatcher may occur within suitable riparian habitat along Alternative III-A in southwestern Utah and southern Nevada. In the Nevada portion of the region, essential habitat for the species is identified on the Pahranagat River, the Muddy River, and a portion of the Virgin River. Designated Critical Habitat does not occur along Alternative III-A.

Direct impacts to the southwestern willow flycatcher include habitat loss, modification, and fragmentation. Under Alternative III-A, direct impacts to the southwestern willow flycatcher may occur as a result of the construction and operation disturbance of 22 acres and 3 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 0.04 percent and <0.01 percent, respectively, of suitable habitat within the Region III southwestern willow flycatcher analysis area (**Table 3.8-49**).

Table 3.8-49 Summary of Region III Alternative Route Impact Parameters for Federally Listed and Candidate Species

Species	Alternative III-A			Alternative III-B			Alternative III- C		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Desert tortoise potential habitat (acres)	993	299	85,863	1,081	279	98,374	985	242	100,923
Percentage of existing habitat within the Region III desert tortoise analysis area	0.07	0.02	5.72	0.07	0.02	6.56	0.07	0.02	6.72
Greater sage-grouse potential habitat (acres)	346	73	50,225	0	0	0	0	0	0
Percentage of existing habitat within the Region III greater sage-grouse analysis area	0.03	<0.01	4.21	0	0	0	0	0	0
Utah prairie dog potential habitat (acres)	52	11	1901	37	8	694	37	8	694
Percentage of existing habitat within the Region III Utah prairie dog analysis area	0.04	<0.01	1.40	0.03	<0.01	0.51	0.03	<0.01	0.51
California condor potential habitat (acres)	4,810	525	179,459	4,308	401	160,820	4,624	426	188,549
Percentage of existing habitat within the Region III California condor analysis area	0.16	0.02	4.74	0.14	0.01	5.26	0.15	0.01	6.17
Yuma clapper rail potential habitat (acres)	22	3	3,706	81	6	3,160	19	2	3,151
Percentage of existing habitat within the Region III Yuma clapper rail analysis area	0.04	<0.01	3.34	0.15	0.01	2.85	0.04	<0.01	2.84
Western yellow-billed cuckoo potential habitat (acres)	22	3	3,706	81	6	3,160	19	2	3,151
Percentage of existing habitat within the Region III western yellow-billed cuckoo analysis area	0.04	<0.01	3.34	0.15	0.01	2.85	0.04	<0.01	2.84
Southwestern willow flycatcher potential habitat (acres)	22	3	3,706	81	6	3,160	19	2	3,151
Percentage of existing habitat within the Region III southwestern willow flycatcher analysis area	0.04	<0.01	3.34	0.15	0.01	2.85	0.04	<0.01	2.84

Southwestern willow flycatchers will nest in native riparian habitat where available, but also will nest in monocultures of salt cedar or Russian olive (USGS 2008). Improved access as a result of Project roads may further fragment suitable habitat and result in increased disturbance to the species. These impacts would be more pronounced if construction were to occur during the southwestern willow flycatcher breeding season (March 15 to October 15).

***SSWS-8**: To prevent impacts to southwestern willow flycatchers during the breeding season, TWE would avoid construction within suitable habitat from March 15 to October 15, or, alternatively, conduct breeding southwestern willow flycatcher surveys and implement appropriate mitigation in coordination with the BLM, Western, USFWS, and applicable state wildlife agencies.*

Effectiveness: To minimize impacts to southwestern willow flycatchers during the breeding season (March 15 to October 15), TWE also has committed to implement seasonal timing restrictions in applicable areas (TWE-32). More specifically, **SSWS-8** would require TWE to avoid habitat removal, between March 15 and October 15 or, alternatively, conduct southwestern willow flycatcher surveys and implement appropriate mitigation in coordination with the BLM, Western, and state wildlife agencies.

Operation of the proposed Project would incrementally increase the collision potential for southwestern willow flycatchers. Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associated Components presents details regarding collision impacts to migratory birds.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. Additionally, implementation of **TWE-32** and **SSWS-8** would avoid impacts during the breeding season. Remaining impacts to nesting southwestern willow flycatchers under Alternative III-A would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Utah Prairie Dog (Threatened)

Along Alternative III-A, the Utah prairie dog is found in Beaver, Iron, and Washington counties, Utah. Alternative III-A also crosses a USFWS-designated Utah Prairie Dog Recovery Unit.

The types of impacts to Utah prairie dogs under Alternative III-A generally would be the same as described for Alternative II-C, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Under Alternative III-A, direct impacts to the Utah prairie dog may occur as a result of the disturbance of potentially suitable habitat (**Table 3.8-46**). Impacts to the Utah prairie dog may occur as a result of the construction and operation disturbance of 52 acres and 11 acres, respectively, of potentially suitable habitat. These areas represent 0.04 percent and <0.01 percent, respectively, of suitable habitat within the Region III Utah prairie dog analysis area.

***SSWS-7**: To reduce impacts to Utah prairie dogs, TWE would be required to conduct a preliminary habitat assessment along portions of the proposed Project that is within historic Utah prairie dog habitat. Based on the results of the habitat survey, additional surveys may be required by the USFWS to determine whether occupied habitat occurs within the disturbance footprint of the proposed Project. If occupied habitat is found, appropriate mitigation measures such as reroutes, reducing the width of the ROW, and constructing alternative structures types (e.g. H-frame tubular) with anti-perching devices on transmission line segments within occupied habitat, would be implemented in coordination with the BLM, Western, UDWR, and USFWS.*

Effectiveness: **SSWS-7** would reduce impacts to Utah prairie dogs by potentially reducing habitat disturbance within occupied habitat (e.g., reroutes) and by limiting raptor predation on Utah prairie dogs (i.e., anti-perching devices within occupied habitat).

It is not anticipated that construction activities would permanently alter Utah prairie dog colonies that would be crossed by the Project, and installation of the transmission line would not restrict the colonization of the 250-foot-wide transmission line ROW by Utah prairie dogs. In fact, habitat disturbance may encourage future colonization temporarily, based on the availability of soft, permeable soils that would occur along the ROW subsequent to the Project construction. Additionally, **SSWS-7** would identify suitable habitat and appropriate mitigation measures would be implemented in occupied habitat in coordination with the BLM, Western, UDWR, and USFWS. Therefore, impacts to the Utah prairie dog under Alternative III-A primarily would be limited to habitat loss and fragmentation.

Table 3.8-49 presents a summary of impacts to federally listed species that potentially occur within Region III.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur in Region III are presented in **Table 3.8-50**. The types of impacts under Alternative III-A to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative III-A (e.g., desert shrub, grassland, and sagebrush shrubland) are more likely to be impacted under Alternative III-A. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies. **Table 3.8-48** presents habitat acreage impacts by vegetation community/habitat type on USFS lands. Using **Table 3.8-48** in combination with the information presented in **Table 3.8-50**, habitat impacts for each species can be determined. For other sensitive species (BLM and State), please refer to the corresponding vegetation community impacts tables in the Section 3.5, Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing trampling acreages and the facilities acreages to determine construction disturbance, and using the operations numbers alone to understand acres of operations disturbance for each vegetation community/habitat type. **Table 3.8-49** summarizes habitat impacts to federally listed species potentially occurring in Region III.

Implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS-sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative III-A, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

Alternative III-B (Agency Preferred)

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region III include six federally listed and two federal candidate species, 76 BLM sensitive species, USFS sensitive, and state-protected species. Species-specific impact discussions are presented below. Suitable habitat for the Mexican spotted owl does not occur along Alternative III-B; therefore, impacts are not expected to occur to this species. Alternative III-B does not occur within the known range of the California condor, therefore impacts to this species are not expected to occur. Section 3.7.6.5 presents a description of existing disturbance along Alternative III-B.

Table 3.8-50 BLM Sensitive and State-protected Species Potentially Occurring in Region III

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Mammals – Bats	
Allen's big-eared bat	Desert shrubland, greasewood flat, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Big brown bat	Desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Big free-tailed bat	Desert shrubland, grassland, herbaceous wetland, montane grassland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Brazilian free-tailed bat	Desert shrubland, herbaceous wetland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland
California leaf-nosed bat	Desert shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
California myotis	Desert shrubland, greasewood flat, herbaceous wetland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Cave myotis	Desert shrubland, montane grassland, riparian, woody riparian and wetlands
Fringed myotis	Desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Hoary bat	Desert shrubland, grassland, herbaceous wetland, montane grassland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Long-eared myotis	Desert shrubland, greasewood flat, herbaceous wetland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Long-legged myotis	Desert shrubland, herbaceous wetland, montane shrubland, riparian, saltbush shrubland, woody riparian and wetlands
Pallid bat	Desert shrubland, grassland, greasewood flat, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Silver-haired bat	Desert shrubland, greasewood flat, herbaceous wetland, riparian, sagebrush shrubland, woody riparian and wetlands
Spotted bat	Desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Townsend's (Western) big-eared bat	Desert shrubland, greasewood flat, herbaceous wetland, montane shrubland, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Western pipistrelle	Desert shrubland, herbaceous wetland, riparian, saltbush shrubland
Western red bat	Desert shrubland, herbaceous wetland, riparian, woody riparian and wetlands
Western small-footed myotis	Desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, riparian, woody riparian and wetlands
Yuma myotis	Desert shrubland, grassland, greasewood flat, herbaceous wetland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Mammals - Other	
Dark kangaroo mouse	Desert shrubland, grassland, sagebrush shrubland, saltbush shrubland
Desert bighorn sheep	Desert shrubland, montane grassland
Desert Valley kangaroo mouse	Desert shrubland, sagebrush shrubland, saltbush shrubland
Kit fox	Desert shrubland, grassland, montane grassland, sagebrush shrubland, saltbush shrubland
Pygmy rabbit	Sagebrush shrubland
Rocky Mountain bighorn sheep	Montane grassland, montane shrubland

Table 3.8-50 BLM Sensitive and State-protected Species Potentially Occurring in Region III

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Birds	
Least bittern	Herbaceous wetland
White-faced ibis	Herbaceous wetland
Bald eagle	Woody riparian and wetlands
Swainson's hawk	Desert shrubland, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Ferruginous hawk	Desert shrubland, grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Golden eagle	Desert shrubland, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Peregrine falcon	Desert shrubland, grassland, herbaceous wetland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Prairie falcon	Desert shrubland, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Long-billed curlew	Grassland, herbaceous wetland, woody riparian and wetlands
Burrowing owl	Desert shrubland, grassland, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Long-eared owl	Desert shrubland, grassland, montane grassland, riparian, saltbush shrubland, woody riparian and wetlands
Short-eared owl	Grassland, greasewood flat, herbaceous wetland, montane grassland, sagebrush shrubland
Lewis' woodpecker	Woody riparian and wetlands
Red-naped sapsucker	Woody riparian and wetlands
Loggerhead shrike	Grassland, greasewood flat, montane grassland, montane shrubland, sagebrush shrubland, saltbush shrubland
Gray vireo	Desert shrubland, montane shrubland, sagebrush shrubland, saltbush shrubland
Piñon jay	Montane shrubland
Sage thrasher	Sagebrush shrubland
Bendire's thrasher	Desert shrubland
Crissal thrasher	Desert shrubland, sagebrush shrubland, saltbush shrubland,woody riparian and wetlands
Le Conte's thrasher	Desert shrubland, woody riparian and wetlands
Phainopepla	Desert shrubland, woody riparian and wetlands
Lucy's warbler	Woody riparian and wetlands
Yellow-breasted chat	Riparian, woody riparian and wetlands
Brewer's sparrow	Sagebrush shrubland
Vesper sparrow	Grassland, montane grassland, sagebrush shrubland
Sage sparrow	Sagebrush shrubland
Bobolink	Grassland, herbaceous wetland
Reptiles	
Banded Gila monster	Desert shrubland, grassland
Chuckwalla	Desert shrubland
Corn snake	Grassland, greasewood flat, herbaceous wetland, riparian, woody riparian and wetlands
Desert iguana	Desert shrubland, sagebrush shrubland, saltbush shrubland
Desert night lizard	Desert shrubland
Long-nosed leopard lizard	Desert shrubland, greasewood flat, sagebrush shrubland, saltbush shrubland
Mojave rattlesnake	Desert shrubland
Sidewinder	Desert shrubland
Speckled rattlesnake	Desert shrubland, sagebrush shrubland, saltbush shrubland

Table 3.8-50 BLM Sensitive and State-protected Species Potentially Occurring in Region III

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Western banded gecko	Desert shrubland, sagebrush shrubland, saltbush shrubland
Western red-tailed skink	Riparian, woody riparian and wetlands
Western threadsnake (blindsnake)	Desert shrubland, grassland, greasewood flat, herbaceous wetland, montane grassland, montane shrubland, riparian, sagebrush shrubland, saltbush shrubland, woody riparian and wetlands
Zebra-tailed lizard	Desert shrubland
Terrestrial Invertebrates	
Great Basin small blue (Small blue) butterfly	Desert shrubland, riparian, sagebrush shrubland, woody riparian and wetlands
Grey's silverspot (Grey's fritillary) butterfly	Grassland, montane grassland, montane shrubland
Honey Lake blue butterfly	Saltbush shrubland
MacNeill sooty wing skipper (MacNeill saltbush sootywing butterfly)	Herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Mojave gypsum bee	Desert shrubland, sagebrush shrubland
Mojave poppy bee	Desert shrubland, sagebrush shrubland
Mono basin skipper (Railroad Valley skipper) butterfly	Desert shrubland, grassland, montane grassland, sagebrush shrubland,
Northern Mojave blue (Mojave blue) butterfly	Desert shrubland, sagebrush shrubland
Rice's blue butterfly	Saltbush shrubland
White River wood nymph butterfly	Grassland, montane grassland, herbaceous wetland

Desert Tortoise (Threatened)

The desert tortoise is known to occur along Alternative III-B in Clark and Lincoln counties, Nevada. This species is found exclusively with the Mojave Desert shrub community.

The types of impacts to the desert tortoise under Alternative III-B generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-43**). Direct impacts to the desert tortoise may occur as a result of the construction and operation disturbance of 1,081 acres and 279 acres, respectively, of potentially suitable habitat. These areas represent 0.07 percent and 0.02 percent, respectively, of potentially suitable habitat within the Region III desert tortoise analysis area.

Several factors would combine to help minimize impacts to the desert tortoise as a result of the construction of Alternative III-B. First, through implementation of ECO-1, ECO-4, and TWE-29, desert tortoise habitat would be identified and avoided where possible. Second, by implementing **SSWS-4**, direct impacts to desert tortoises would be reduced because appropriate mitigation measures approved by the USFWS would be implemented. Therefore, impacts under Alternative III-B would be limited primarily to habitat loss and fragmentation.

California Condor (Endangered; EXNE)

California condors regularly forage, roost, and may even nest in southern Utah (Gorell et al. 2005). Based on their ability to travel up to 200 miles in a day (UDNR 2011), this species may be found along Alternative III-B.

Because the species has such a large range, direct impacts from construction activities associated with Alternative III-B to foraging habitat would include the construction and operation disturbance of 4,308 acres and 401 acres, respectively. These areas represent 0.14 percent and 0.01 percent, respectively, of the Region III California condor analysis area (**Table 3.8-49**). California condors are cavity-nesting birds and most nest sites have been found in caves, on rock ledges, or in tree cavities. Impacts to California condor nesting habitat from construction activities are unlikely because the species nests in rugged, remote locations.

The types of impacts from the operation of Alternative III-B to the California condor generally would be the same as described under Alternative III-A, but would differ in the amount of habitat disturbed.

Implementation of TWE's design features for meeting or exceeding the raptor safe design standards described in the "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) (TWE-30) would reduce operation-related impacts to the California condor. Remaining impacts to the California condor would be limited to temporary disturbance of potential foraging habitat. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Greater Sage-grouse (Candidate)

Greater sage-grouse in southwestern Utah along Alternative III-B occur in portions of Beaver and Iron counties. These counties support the largest greater sage-grouse populations in southwestern Utah.

The types of impacts to the greater sage-grouse under Alternative III-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. However, as presented in **Table 3.8-44**, no active leks or UDWR mapped greater sage-grouse habitat would be impacted by Alternative III-B.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to the greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). These measures, along with **SSWS-5**, would require TWE to construct anti-perching devices in high quality habitat, which may help reduce potential raptor and corvid predation on greater sage-grouse. Given the lack of greater sage-grouse habitat crossed by the proposed Project under Alternative III-B (**Table 3.8-44**), potential mortality from operation of the proposed Project would be primarily limited to habitat loss and fragmentation.

Yuma Clapper Rail (Endangered)

The Yuma clapper rail may occur within suitable marsh habitat along the Muddy and Virgin rivers in southern Nevada along Alternative III-B.

The types of impacts to the Yuma clapper rail under Alternative III-B generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Alternative III-B would result in the construction and operation disturbance of 81 acres and 6 acres, respectively, of potentially suitable habitat. These areas represent 0.15 percent and 0.01 percent, respectively, of suitable habitat within the Region III Yuma clapper rail analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 would reduce impacts during the Yuma clapper rail breeding season. Remaining impacts to the Yuma clapper rail under Alternative III-B would be limited to a minor amount of temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Western Yellow-billed Cuckoo (Candidate)

This species may occur along Alternative III-B in southern Nevada. The western yellow-billed cuckoo is a confirmed breeder along the Muddy River in Clark County, Nevada (Floyd et al. 2007).

The types of impacts to the western yellow-billed cuckoo under Alternative III-B generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Under Alternative III-B, direct impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 81 acres and 6 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 0.15 percent and 0.01 percent, respectively, of suitable habitat within the Region III western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative III-B would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Southwestern Willow Flycatcher (Endangered)

The southwestern willow flycatcher may occur within suitable riparian habitat along Alternative III-B in southern Nevada. Essential habitat for the species is identified on the Pahranagat River, the Muddy River, and a portion of the Virgin River. Designated Critical Habitat does not occur along Alternative III-B, but does occur approximately 10 miles southeast at the Virgin River, contiguous with the essential habitat section and upstream to the Arizona border. Other potential suitable habitat for the southwestern willow flycatcher near Alternative III-B includes portions of the Meadow Valley Wash, the Muddy River, and the Colorado River System (Hiatt and Boone 2003).

The types of impacts to the southwestern willow flycatcher under Alternative III-B generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Alternative III-B would result in the construction and operation disturbance of 81 acres and 6 acres, respectively, of potentially suitable habitat. These areas represent 0.15 percent and 0.01 percent, respectively, of potentially suitable habitat within the Region III southwestern willow flycatcher analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-8** would reduce impacts during the southwestern willow flycatcher breeding season (March 15 to October 15). Remaining impacts to nesting southwestern willow flycatchers under Alternative III-B would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Utah Prairie Dog (Threatened)

Along Alternative III-B, the Utah prairie dog is found in Beaver, Iron, and Washington counties, Utah. Alternative III-B also crosses a USFWS-designated Utah Prairie Dog Recovery Unit.

The types of impacts to Utah prairie dogs under Alternative III-B generally would be the same as described for Alternative II-C, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Alternative III-B would result in the construction and operation disturbance of 37 acres and 8 acres, respectively, of potentially suitable grassland habitat. These areas represent 0.03 percent and <0.01 percent, respectively, of potential habitat within the Region III Utah prairie dog analysis area.

SSWS-7*: To reduce impacts to Utah prairie dogs, TWE would be required to conduct a preliminary habitat assessment along portions of the proposed Project that is within historic Utah prairie dog habitat. Based on the results of the habitat survey, additional surveys may be required by the USFWS to determine whether occupied habitat occurs within the disturbance footprint of the proposed Project. If occupied habitat is found, appropriate mitigation measures such as reroutes, reducing the width of the ROW, and constructing alternative structures types (e.g. H-frame tubular) with anti-perching devices on transmission line segments within occupied habitat, would be implemented in coordination with the BLM, Western, UDWR, and USFWS.*

Effectiveness: **SSWS-7** would reduce impacts to Utah prairie dogs by potentially reducing habitat disturbance within occupied habitat (e.g., reroutes) and by limiting raptor predation on Utah prairie dogs (i.e., anti-perching devices within occupied habitat).

It is not anticipated that construction activities would permanently alter Utah prairie dog colonies that would be crossed by the Project, and installation of the transmission line would not restrict the colonization of the 250-foot-wide transmission line ROW by Utah prairie dogs. In fact, habitat disturbance may encourage future colonization temporarily, based on the availability of soft, permeable soils that would occur along the ROW subsequent to Project construction. In addition, **SSWS-7** would identify potentially suitable habitat and appropriate mitigation measures would be implemented in occupied habitat in coordination with the BLM, Western, UDWR, and USFWS. Therefore, impacts to the Utah prairie dog under Alternative III-B would be primarily limited to habitat loss and fragmentation.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur under Alternative III-B are presented in **Table 3.8-50**. The types of impacts under Alternative III-B to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative III-B (e.g., desert shrub, sagebrush shrubland, saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative III-B, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

Alternative III-C

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted under Alternative III-C include 6 federally listed and 2 federal candidate species, and 76 BLM sensitive, USFS sensitive species, and state-protected species. Species-specific impact discussions are presented below. Suitable habitat for the Mexican spotted owl does not occur along Alternative III-C; therefore, impacts are not expected to occur to this species. Alternative III-C does not occur within the known range of the California condor; therefore, impacts to this species are not expected to occur. Section 3.7.6.5 presents a description of existing conditions along Alternative III-C.

Desert Tortoise (Threatened)

The desert tortoise occurs along Alternative III-C in Clark and Lincoln counties, Nevada. This species is found exclusively within the Mojave Desert shrub community.

The types of impacts to the desert tortoise under Alternative III-C generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-43**). Impacts to the desert tortoise may occur as a result of the construction and operation disturbance of 985 acres and 242 acres, respectively, of potentially suitable habitat. These areas represent 0.07 percent and 0.02 percent, respectively, of potentially suitable habitat within the Region III desert tortoise analysis area.

Several factors would combine to help minimize desert tortoise impacts as a result of Alternative III-C. First, through implementation of ECO-1, ECO-4, and TWE-29, desert tortoise potential habitat would be identified and avoided where possible. Second, by implementing **SSWS-4**, direct impacts to the desert tortoise would be reduced because appropriate mitigation measures approved by the USFWS would be implemented. Therefore, impacts under Alternative III-C would be limited primarily to habitat loss and fragmentation.

California Condor (Endangered; EXNE)

California condors regularly forage, roost, and may even nest in southern Utah (Gorell et al. 2005). Based on their ability to travel up to 200 miles in a day (UDNR 2011), this species may occur along Alternative III-C.

Because the species has such a large range, direct impacts under Alternative III-C to potential foraging habitat would include the construction and operation disturbance of 4,624 acres and 426 acres, respectively. These areas represent 0.15 percent and 0.01 percent, respectively, of the Region III California condor analysis area (**Table 3.8-49**). California condors are cavity-nesting birds and most nest sites have been found in caves, on rock ledges, or in tree cavities. Impacts to California condor nesting habitat from construction activities are unlikely because the species nests in rugged, remote locations.

The types of impacts from the operation of Alternative III-C to the California condor generally would be the same as described under Alternative III-A but would differ in the amount of habitat impacted.

Implementation of TWE's design features for meeting or exceeding the raptor safe design standards described in the "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (APLIC 2006) (TWE-30) would reduce operation-related impacts to California condors. Remaining impacts to the California condor would be limited to temporary disturbance of potential foraging habitat. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Greater Sage-grouse (Candidate)

Greater sage-grouse along Alternative III-C in southwestern Utah occur in portions of Beaver and Iron counties. These counties support the largest greater sage-grouse populations in southwestern Utah.

The types of impacts to the greater sage-grouse under Alternative III-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed (**Table 3.8-49**). However, as presented in **Table 3.8-44**, no active leks or UDWR mapped greater sage-grouse habitat would be impacted by Alternative III-C.

Implementation of ECO-1, ECO-4, and TWE-32 would require TWE to identify sensitive areas to the greater sage-grouse (e.g., leks, nesting habitat, wintering habitat, etc.). These measures, along with **SSWS-5**, would require TWE to construct anti-perching devices in high quality habitat that may help reduce potential raptor and corvid predation on greater sage-grouse. Given the lack of greater

sage-grouse habitat crossed by the proposed Project under Alternative III-C (**Table 3.8-44**), potential impacts from operation of the proposed Project would be limited primarily to habitat loss and fragmentation.

Yuma Clapper Rail (Endangered)

The Yuma clapper rail may occur within suitable marsh habitat along the Muddy and Virgin rivers in southern Nevada along Alternative III-C.

The types of impacts to the Yuma clapper rail under Alternative III-C generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Alternative III-C would result in the construction and operation disturbance of 19 acres and 2 acres, respectively, of potentially suitable habitat. These areas represent 0.04 percent and <0.01 percent, respectively, of potentially suitable habitat within the Region III Yuma clapper rail analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 would reduce impacts during the breeding season. Remaining impacts to Yuma clapper rails under Alternative III-C would be limited to a minor amount of temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Western Yellow-billed Cuckoo (Candidate)

This species may occur along Alternative III-C in southern Nevada. The western yellow-billed cuckoo is a confirmed breeder along the Muddy River in Clark County, Nevada (Floyd et al. 2007).

The types of impacts to the western yellow-billed cuckoo under Alternative III-C generally would be the same as described for Alternative I-A, but would differ in the amount of habitat disturbed. Under Alternative III-C, direct impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 19 acres and 2 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 0.04 percent and <0.01 percent, respectively, of potentially suitable habitat within the Region III western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative III-C would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Southwestern Willow Flycatcher (Endangered)

The southwestern willow flycatcher may occur within suitable riparian habitat along Alternative III-C in southern Nevada. Essential habitat for the species is identified on the Pahranagat River. Designated Critical Habitat does not occur along Alternative III-C, but does occur approximately 10 miles southeast at the Virgin River, contiguous with the essential habitat section and upstream to the Arizona border. Other potential habitat that has been recognized as suitable for the southwestern willow flycatcher near Alternative III-C includes portions of the Meadow Valley Wash, the Muddy River, and the Colorado River System (Hiatt and Boone 2003).

The types of impacts to the southwestern willow flycatcher under Alternative III-C generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Alternative III-C would result in the construction and operation disturbance of 19 acres and 2 acres, respectively, of potentially suitable habitat. These areas represent 0.04 percent and <0.01 percent,

respectively, of potentially suitable habitat within the Region III southwestern willow flycatcher analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-8** would reduce impacts during the southwestern willow flycatcher breeding season (March 15 to October 15). Remaining impacts to nesting southwestern willow flycatchers under Alternative III-C would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

Utah Prairie Dog (Threatened)

Along Alternative III-C, the Utah prairie dog is found in Beaver, Iron, and Washington counties, Utah. Alternative III-C also crosses a USFWS designated Utah Prairie Dog Recovery Unit.

The types of impacts to Utah prairie dogs under Alternative III-C generally would be the same as described for Alternative II-C, but would differ in the amount of habitat disturbed (**Table 3.8-49**). Alternative III-C would result in the construction and operation disturbance of 37 acres and 8 acres, respectively, of potentially suitable grassland habitat. These areas represent 0.03 percent and <0.01 percent, respectively, of potentially suitable habitat within the Region III Utah prairie dog analysis area.

It is not anticipated that construction activities would permanently alter Utah prairie dog colonies that would be crossed by the Project, and installation of the transmission line would not restrict the colonization of the 250-foot-wide transmission line by Utah prairie dogs. In fact, habitat disturbance may encourage future colonization temporarily, based on the availability of soft, permeable soils that would occur along the ROW subsequent to the Project construction. Additionally, **SSWS-7** would identify suitable habitat and appropriate mitigation measures would be implemented in occupied habitat in coordination with the BLM, Western, UDWR, and USFWS. Therefore, impacts to the Utah prairie dog under Alternative III-C would be primarily limited to habitat loss and fragmentation.

BLM Sensitive, USFS Sensitive, and State-Protected Species

BLM sensitive, USFS sensitive, and state-protected species that may occur along Alternative III-C are presented in **Table 3.8-50**. The types of impacts under Alternative III-C to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with the dominant habitat types along Alternative III-C (e.g., desert shrub, sagebrush shrubland, saltbush shrubland) are more likely to be impacted. Impacts to these habitat types are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFS, and applicable state wildlife agencies.

Implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative III-C, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the extent of native habitats in the surrounding Project region.

Alternative Variations in Region III

The types of impacts to special status wildlife species under the three alternative variations in Region III generally would be the same as the comparable portions of Alternatives III-A, but would differ in the amount of habitat disturbed (**Table 3.8-51**). No greater sage-grouse or desert tortoise habitat would be impacted by the alternative variations in Region III. Similar to the comparable portions of Alternative III-A, after considering design features and mitigation measures, impacts to special status wildlife species from Project construction and operation would be limited primarily to habitat loss and fragmentation.

Alternative Connectors in Region III

The Moapa and Avon alternative connectors would include minimal increases of total habitat disturbance if they were to be utilized. **Table 3.8-52** summarizes impacts associated with the alternative connectors in Region III.

Table 3.8-53 provides a comparison of alternative electrode bed locations proposed near the Southern Terminal. Some locations might serve multiple alternative routes, while others could only be associated with a certain alternative route.

No special status raptor nests are identified at Region III ground electrode sites. Data for this region is incomplete.

Region III Conclusion

A comparison of impact parameters for Region III alternatives indicates that potential construction and operation impacts to special status wildlife species would be varied across all alternatives as shown in **Table 3.8-49**. Alternative III-A would result in the greatest direct and indirect impacts to greater sage-grouse potential habitat in comparison to the other Region III alternatives (**Table 3.8-44**). In addition, Alternatives III-B and III-C would result in no construction, operation, or indirect impacts to greater sage-grouse potential habitat, whereas Alternative III-A would result in 346 acres of construction impact, 73 acres of operation impact, and 50,225 acres of indirect impact to greater sage-grouse potential habitat. Alternative III-B would result in the greatest direct and indirect impacts to desert tortoise potential habitat in comparison to the other Region III alternatives (**Table 3.8-43**). Alternative III-B would result in the greatest direct and indirect impacts to Southwest willow flycatcher, Western yellow-billed cuckoo, and Yuma clapper rail potential habitat in comparison to the other Region III alternatives (**Table 3.8-49**). The greatest level of impacts to special status wildlife species among all Region III alternatives associated with Alternative III-A is due to greater impacts to greater sage-grouse habitat. However, project effects on special status wildlife species and their potential habitat would be avoided or considered to be low magnitude and short-term after applying BMPs, design features, and additional mitigation.

3.8.6.7 Region IV

Tables 3.8-54 and **3.8-55** provide a tabulation of impacts associated with the alternative routes in Region IV. Key impact parameters that relate to the impact discussion in Section 3.8.6.2, Impacts to Special Status Species Common to All Alternative Routes and Associated Components, and specific differences by alternative are discussed below.

Alternative IV-A (Applicant Proposed and Agency Preferred)

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region IV include three federally listed and one federal candidate species, and 65 BLM sensitive, USFS sensitive species, and state-protected species. Species-specific impacts are discussed below. Suitable habitat for the Yuma clapper rail does not occur along Alternative IV-A, therefore impacts are not expected to occur to this subspecies. Section 3.7.6.6 presents a description of existing disturbance along Alternative IV-A.

Table 3.8-56 summarizes habitat impacts to federally listed species potentially occurring in Region IV.

Table 3.8-51 Summary of Impacts to Special Status Species Under Region III Alternative Variations[1]

Impact Parameters	Ox Valley East Alternative Variation		Comparable Portion of Alternative Route III-A		Ox Valley West Alternative Variation		Comparable Portion of Alternative III-A		Pinto Alternative Variation		Comparable Portion of Alternative Route III-A	
	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact	Construction Impact	Operation Impact
Special status wildlife species habitat (acres)	276	100	252	95	268	100	252	95	449	111	381	125
Length of transmission line (miles)	16		15		17		15		29		24	
Number of potential special status raptor species nests within 1 mile of the reference line[2]	1 unknown raptor species[2]		11 unknown raptor species[2]		1 unknown raptor species[2]		11 unknown raptor species[2]		2 golden eagle, 1 ferruginous hawk, 3 unknown raptor species[2]		50 unknown raptor species[2], 3 ferruginous hawk, 1 prairie falcon	

[1] Raptor nest data received for Utah is incomplete for this portion of Region III.

[2] Nests of raptor species, which are not classified as special status, are tabulated in Section 3.7, Wildlife. Nests of unknown raptor species are tabulated in both Sections 3.7 and 3.8 because they may have been utilized by either special status raptors or non-special status raptors.

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012, Manti-La Sal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012; AECOM 2012.

Table 3.8-52 Summary of Region III Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Analysis
Moapa Alternative Connector	• Approximately 13 miles in length.[1] • Approximately 425 acres of construction and 34 acres of operation impacts to special status wildlife species habitat would occur. • No special status raptor nests are within 1 mile of the reference line. • No occupied greater sage-grouse habitat crossed by reference line
Avon Alternative Connector	• Approximately 8 miles in length.[1] • Approximately 104 acres of construction and 21 acres of operation impacts to special status wildlife species habitat would occur. • No special status raptor nests are within 1 mile of the reference line. • No occupied greater sage-grouse habitat crossed by reference line.

[1] Length refers to length of 600-kV transmission line and serves as a proxy metric for avian collision potential.

Table 3.8-53 Summary of Region III Alternative Ground Electrode System Location Impacts for Special Status Wildlife Species

Alternative Ground Electrode System Locations	Estimated Habitat Disturbance (acres)		Analysis
	Construction Impact	Operation Impact	
Mormon Mesa- Carp Elgin Rd (Alternative III-A)	92	20	Due to the programmatic nature of the seven potential ground electrode systems, the extent of special status wildlife species impacts is not known at this time. However, due to the potential locations occurring in southern Nevada, impacts are expected to be the same as discussed in Section 3.8.6.1, Impacts from Terminal Construction and Operation, and Section 3.8.6.2, Impacts Common to All Alternative Routes and Associated Components. To reduce impacts to special status wildlife species, species-specific mitigation measures and habitat surveys will be coordinated with the BLM, USFWS, and applicable state wildlife agencies.
Mormon Mesa-Carp Elgin Rd (Alternative III-B)	103	26	
Halfway Wash- Virgin River (Alternative III-A)	84	15	
Halfway Wash- Virgin River (Alternative B)	92	20	
Halfway Wash East (Alternative III-A)	103	26	
Halfway Wash East (Alternative III-B)	102	25	
Meadow Valley 2 (Alternative III-C)	164	65	
Delta Ground Electrode (Design Option 2 and 3)	129	39	

Table 3.8-54 Summary of Region IV Alternative Route Impact Parameters for Desert Tortoise

Parameter	Alternative IV-A			Alternative IV-B			Alternative IV-C		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
USFWS critical habitat (acres)	0	0	0	0	0	0	172	22	8,298
USFWS potential habitat (acres)	738	566	38,679	802	553	37,454	877	172	60,862
USGS habitat model ranking 0.6 and higher (acres)	704	535	35,670	564	383	27,456	632	118	50,192

Table 3.8-55 Special Status Raptor Species Nests within 1 Mile of the Reference Line in Region IV

Species	Alternative IV-A	Alternative IV-B	Alternative IV-C	Marketplace Alternative Variation	Sunrise Mountain Alternative Connector	Lake Las Vegas Alternative Connector	Three Kids Mine Alternative Connector	River Mountain Alternative Connector	Railroad Pass Alternative Connector
Peregrine falcon	0	1	1	0	0	0	0	1	0
Prairie falcon	1	0	0	0	0	0	0	0	0
Total	1	1	1	0	0	0	0	1	0

[1] Total nests for Region I is not equal to a sum of alternate routes and other project components. This is due to the fact that nests could be present within 1 mile of the reference line or facility along multiple routes.

Sources: BLM Vernal FO 2009, 2011; BLM Rawlins FO 2009, 2010; BLM Rock Springs FO 2009; BLM Cedar City FO 2010; BLM Price FO 2008; BLM Ely FO 2007; BLM Little Snake FO 2011; EPG 2012, Manti-La Sal National Forest 2012; Ashley National Forest 2010; Uintah National Forest 2011; CDOW, BLM, USFS cooperative dataset 2009; NDOW 2012; AECOM 2012.

Table 3.8-56 Summary of Region IV Alternative Route Impact Parameters for Federally Listed and Candidate Species

Species	Alternative IV-A			Alternative IV-B			Alternative IV- C		
	Construction Impact	**Operation Impact**	**Indirect Impact**	**Construction Impact**	**Operation Impact**	**Indirect Impact**	**Construction Impact**	**Operation Impact**	**Indirect Impact**
Desert tortoise potential habitat (acres)	566	148	38,679	553	171	37,454	645	172	60,862
Percentage of existing habitat within the Region IV desert tortoise analysis area	0.12	0.03	8.03	0.11	0.04	7.78	0.13	0.04	12.63
Yuma clapper rail potential habitat (acres)	1	<1	2	12	2	240	12	2	242
Percentage of existing habitat within the Region IV Yuma clapper rail analysis area	0.06	<0.01	0.14	1.06	0.18	21.93	1.06	0.18	22.07
Western yellow-billed cuckoo potential habitat (acres)	1	<1	2	12	2	240	12	2	242
Percentage of existing habitat within the Region IV western yellow-billed cuckoo analysis area	0.06	<0.01	0.14	1.06	0.18	21.93	1.06	0.18	22.07
Southwestern willow flycatcher potential habitat (acres)	1	<1	2	12	2	240	12	2	242
Percentage of existing habitat within the Region IV southwestern willow flycatcher analysis area	0.06	<0.01	0.14	1.06	0.18	21.93	1.06	0.18	22.07

Desert Tortoise (Threatened)

The desert tortoise occurs along the entire length of Alternative IV-A (**Figure 3.8-6**). This species is found exclusively with the Mojave Desert shrub community.

The types of impacts to the desert tortoise under Alternative IV-A generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-54**). Impacts to the desert tortoise may occur as a result of the construction and operation disturbance of 566 acres and 148 acres, respectively, of potentially suitable habitat. These areas represent 0.12 percent and 0.03 percent, respectively, of potentially suitable habitat within the Region IV desert tortoise analysis area.

Several factors would combine to help minimize impacts to the desert tortoise as a result of the construction of Alternative IV-A (**Table 3.8-56**). Through implementation of ECO-1, ECO-4, and TWE-29, desert tortoise habitat would be identified and avoided where possible. By implementing **SSWS-4**, direct impacts to the desert tortoise would be reduced through implementation of appropriate mitigation measures approved by the USFWS. Therefore, impacts under Alternative IV-A would be limited primarily to habitat loss and fragmentation.

Western Yellow-billed Cuckoo (Candidate)

This species may occur along Alternative IV-A in southern Nevada in close proximity to perennial streams, wetlands, and lakes.

The types of impacts to the western yellow-billed cuckoo under Alternative IV-A generally would be the same as described for Alternative I-A. Under Alternative IV-A, direct impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 1 acre and <1 acre, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 0.06 percent and <0.01 percent, respectively, of potentially suitable habitat within the Region IV western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative IV-A would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Southwestern Willow Flycatcher (Endangered)

The southwestern willow flycatcher may occur within suitable riparian habitat along Alternative IV-A in southern Nevada. Potential suitable habitat for the southwestern willow flycatcher near Alternative IV-A includes portions of the Meadow Valley Wash, the Muddy River, and the Colorado River System (Hiatt and Boone 2003).

The types of impacts to the southwestern willow flycatcher under Alternative IV-A generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-56**). Alternative IV-A would result in the construction and operation disturbance of 1 acre and <1 acre, respectively, of potentially suitable habitat. These areas represent 0.06 percent and <0.01 percent, respectively, of potentially suitable habitat within the Region IV southwestern willow flycatcher analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-8** would reduce impacts during the southwestern willow flycatcher breeding season (March 15 to October 15). Remaining impacts to nesting southwestern willow flycatchers under Alternative IV-A would be limited to temporary habitat disturbance.

This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Yuma Clapper Rail (Endangered)

The Yuma clapper rail may occur within suitable marsh habitat in southern Nevada along Alternative IV-A.

Direct impacts to the Yuma clapper rail include habitat loss, modification, and fragmentation (**Table 3.8-56**). Alternative IV-A would result in the construction and operation disturbance of 1 acre and <1 acre, respectively, of potentially suitable wetland habitat. These areas represent 0.06 percent and <0.01 percent, respectively, of suitable habitat within the Region IV Yuma clapper rail analysis area.

Improved access as a result of Project roads under Alternative IV-A may result in increased human disturbance to the species. These impacts would be more pronounced if construction were to occur during the breeding season.

Operation of the proposed Project would incrementally increase the collision potential for Yuma clapper rails. Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associate Components, presents details regarding collision impacts to migratory birds.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 would reduce impacts during the Yuma clapper rail breeding season. Remaining impacts to Yuma clapper rails under Alternative III-A would be limited to a minor amount of temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

BLM Sensitive and State-Protected Species

BLM sensitive and state-protected species that may occur along Alternative IV-A are presented in **Table 3.8-57**. The types of impacts under Alternative IV-A to BLM sensitive, USFS sensitive, and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with desert shrubland are more likely to be impacted. Impacts to this habitat type are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, Western, and NDOW.

Table 3.8-57 BLM Sensitive and State-protected Species Potentially Occurring in Region IV

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Mammals – Bats	
Allen's big-eared bat	Desert shrubland, riparian, saltbush shrubland, woody riparian and wetlands
Big brown bat	Barren/sparsely vegetated, desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Big free-tailed bat	Barren/sparsely vegetated, cliff and canyon, desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Brazilian free-tailed bat	Desert shrubland, herbaceous wetland, riparian, saltbush shrubland
California leaf-nosed bat	Desert shrubland, riparian, saltbush shrubland, woody riparian and wetlands
California myotis	Desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands

Table 3.8-57 BLM Sensitive and State-protected Species Potentially Occurring in Region IV

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Cave myotis	Desert shrubland, herbaceous wetland, riparian, woody riparian and wetlands
Fringed myotis	Desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Greater western mastiff bat	Barren/sparsely vegetated, cliff and canyon, desert shrubland, riparian
Hoary bat	Desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Long-eared myotis	Cliff and canyon, desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Long-legged myotis	Desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Pallid bat	Barren/sparsely vegetated, desert shrubland, grassland, saltbush shrubland, woody riparian and wetlands
Silver-haired bat	Desert shrubland, herbaceous wetland, riparian, woody riparian and wetlands
Spotted bat	Barren/sparsely vegetated, cliff and canyon, desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Townsend's (Western) big-eared bat	Desert shrubland, herbaceous wetland, saltbush shrubland, woody riparian and wetlands
Western pipistrelle	Cliff and canyon, desert shrubland, herbaceous wetland, riparian, saltbush shrubland
Western red bat	Desert shrubland, herbaceous wetland, riparian, woody riparian and wetlands
Western small-footed myotis	Barren/sparsely vegetated, cliff and canyon, desert shrubland, herbaceous wetland, riparian, woody riparian and wetlands
Yuma myotis	Barren/sparsely vegetated, desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Mammals – Other	
Dark kangaroo mouse	Desert shrubland
Desert bighorn sheep	Cliff and canyon, desert shrubland
Kit fox	Barren/sparsely vegetated, desert shrubland, saltbush shrubland
Pale kangaroo mouse	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Birds	
Least bittern	Herbaceous wetland
White-faced ibis	Herbaceous wetland
Bald eagle	Woody riparian and wetlands
Swainson's hawk	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Ferruginous hawk	Cliff and canyon, desert shrubland, saltbush shrubland
Golden eagle	Cliff and canyon, desert shrubland, saltbush shrubland
Peregrine falcon	Cliff and canyon, desert shrubland, herbaceous wetland, saltbush shrubland, woody riparian and wetlands
Prairie falcon	Cliff and canyon, desert shrubland, saltbush shrubland
Western snowy plover	Barren/ sparsely vegetated, herbaceous wetland
Burrowing owl	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Long-eared owl	Desert shrubland, riparian, saltbush shrubland, woody riparian and wetlands
Red-naped sapsucker	Woody riparian and wetlands
Loggerhead shrike	Saltbush shrubland
Gray vireo	Cliff and canyon, desert shrubland, saltbush shrubland
Bendire's thrasher	Desert shrubland
Crissal thrasher	Desert shrubland, saltbush shrubland, woody riparian and wetlands
LeConte's thrasher	Desert shrubland, woody riparian and wetlands

Table 3.8-57 BLM Sensitive and State-protected Species Potentially Occurring in Region IV

BLM Sensitive and State-protected Species Associated with Vegetation Communities	Vegetation Communities
Phainopepla	Desert shrubland, woody riparian and wetlands
Lucy's warbler	Woody riparian and wetlands
Yellow-breasted chat	Riparian, woody riparian and wetlands
Reptiles	
Banded Gila monster	Barren/ sparsely vegetated, desert shrubland
Chuckwalla	Barren/ sparsely vegetated, desert shrubland
Desert glossy snake	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Desert iguana	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Desert night lizard	Barren/ sparsely vegetated, cliff and canyon, desert shrubland
Long-nosed leopard lizard	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Mojave rattlesnake	Desert shrubland
Mojave shovel-nosed snake	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Sidewinder	Barren/ sparsely vegetated, desert shrubland
Speckled rattlesnake	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Western banded gecko	Barren/ sparsely vegetated, desert shrubland, saltbush shrubland
Western red-tailed skink	Riparian, woody riparian and wetlands
Western threadsnake (blindsnake)	Barren/ sparsely vegetated, desert shrubland, herbaceous wetland, riparian, saltbush shrubland, woody riparian and wetlands
Zebra-tailed lizard	Barren/ sparsely vegetated, desert shrubland
Terrestrial Invertebrates	
Great Basin small blue (Small blue) butterfly	Barren/ sparsely vegetated, desert shrubland, riparian, woody riparian and wetlands
Honey Lake blue butterfly	Barren/ sparsely vegetated, saltbush shrubland
Mojave gypsum bee	Barren/ sparsely vegetated, desert shrubland
Mojave poppy bee	Barren/ sparsely vegetated, desert shrubland
Mono Basin skipper (Railroad Valley skipper) butterfly	Desert shrubland
Northern Mojave blue (Mojave blue) butterfly	Barren/ sparsely vegetated, desert shrubland
Rice's blue butterfly	Barren/ sparsely vegetated, saltbush shrubland

Implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season for many special status BLM sensitive, USFS sensitive, and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative IV-A, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Alternative IV-B

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region IV include three federally listed and one federal candidate species, 65 BLM

sensitive species, USFS sensitive species, and state-protected species. Species-specific impacts are discussed below. Suitable habitat for the Yuma clapper rail does not occur along Alternative IV-B; therefore, impacts to this species are not expected to occur. Section 3.7.6.6 presents a description of existing disturbance along Alternative IV-B.

Desert Tortoise (Threatened)

The desert tortoise occurs along the entire length of Alternative IV-B (**Figure 3.8-6**). This species is found exclusively with the Mojave Desert shrub community.

The types of impacts to the desert tortoise under Alternative IV-B generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-54**). Impacts to the desert tortoise may occur as a result of the construction and operation disturbance of 553 acres and 171 acres, respectively, of potentially suitable habitat. These areas represent 0.11 percent and 0.04 percent, respectively, of potentially suitable habitat within the Region IV desert tortoise analysis area.

Several factors would combine to help minimize desert tortoise impacts as a result of the construction of Alternative IV-B. First, through implementation of ECO-1, ECO-4, and TWE-29, desert tortoise habitat would be identified and avoided where possible. Second, by implementing **SSWS-4**, direct impacts to the desert tortoise would be reduced as appropriate mitigation measures approved by the USFWS would be implemented. Therefore, impacts under Alternative IV-B would be limited primarily to habitat loss and fragmentation.

Western Yellow-billed Cuckoo (Candidate)

This species may occur along Alternative IV-B in southern Nevada in close proximity to perennial streams, wetlands, and lakes.

The types of impacts to the western yellow-billed cuckoo under Alternative IV-B generally would be the same as described for Alternative I-A (**Table 3.8-56**). Under Alternative IV-B, direct impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 12 acres and 2 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 1.06 percent and 0.18 percent, respectively, of potentially suitable habitat within the Region IV western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoo under Alternative IV-B would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Southwestern Willow Flycatcher (Endangered)

The southwestern willow flycatcher may occur within suitable riparian habitat along Alternative IV-B in southern Nevada. Potential suitable habitat for the southwestern willow flycatcher near Alternative IV-B includes portions of the Meadow Valley Wash, the Muddy River, and the Colorado River System (Hiatt and Boone 2003).

The types of impacts to the southwestern willow flycatcher under Alternative IV-B generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-56**). Alternative IV-B would result in the construction and operation disturbance of 12 acres and 2 acres, respectively, of potentially suitable habitat. These areas represent 1.06 percent and 0.18 percent, respectively, of potentially suitable habitat within the Region IV southwestern willow flycatcher analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-8** would reduce impacts during the southwestern willow flycatcher breeding season (March 15 to October 15). Remaining impacts to nesting southwestern willow flycatchers under Alternative IV-B would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Yuma Clapper Rail (Endangered)

The Yuma clapper rail may occur within suitable marsh habitat in southern Nevada along Alternative IV-B.

Direct impacts to the Yuma clapper rail include habitat loss, modification, and fragmentation (**Table 3.8-56**). Alternative IV-B would result in the construction and operation disturbance of 12 acres and 2 acres, respectively, of potentially suitable wetland habitat. These areas represent 1.06 percent and 0.18 percent, respectively, of suitable habitat within the Region IV Yuma clapper rail analysis area.

Improved access as a result of Project roads under Alternative IV-B may result in increased human disturbance to the species. These impacts would be more pronounced if construction were to occur during the breeding season.

Operation of the proposed Project would incrementally increase the collision potential for Yuma clapper rails. Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associate Components, presents details regarding collision impacts to migratory birds.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 would reduce impacts during the Yuma clapper rail breeding season. Remaining impacts to Yuma clapper rails under Alternative III-B would be limited to a minor amount of temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

BLM Sensitive and State-Protected Species

BLM sensitive and state-protected species that may occur along Alternative IV-B are presented in **Table 3.8-57**. The types of impacts under Alternative IV-B to BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with desert shrubland are more likely to be impacted. Impacts to this habitat type are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, Western, and NDOW.

Implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season for many special status BLM sensitive and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative IV-B, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Alternative IV-C

Based on species occurrence information and habitat associations, special status wildlife species that may be impacted in Region IV include three federally listed and one federal candidate species, 65 BLM sensitive species and state-protected species. Species-specific impacts are discussed below. Suitable habitat for the Yuma clapper rail does not occur along Alternative IV-C; therefore, impacts to this species

are not expected to occur. Section 3.7.6.6 presents a description of existing disturbance along Alternative IV-C.

Desert Tortoise (Threatened)

The desert tortoise is found along the entire length of Alternative IV-C (**Figure 3.8-6**). This species is found exclusively with the Mojave Desert shrubland community.

The types of impacts to the desert tortoise under Alternative IV-C generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-54**). Impacts to the desert tortoise may occur as a result of the construction and operation disturbance of 645 acres and 172 acres, respectively, of potentially suitable habitat. These areas represent 0.13 percent and 0.04 percent, respectively, of potentially suitable habitat within the Region IV desert tortoise analysis area.

Several factors would combine to help minimize impacts to the desert tortoise as a result of the construction of Alternative IV-C. First, through implementation of ECO-1, ECO-4, and TWE-29, desert tortoise habitat would be identified and avoided where possible. Second, by implementing **SSWS-4**, direct impacts to desert tortoises would be reduced as appropriate mitigation measures approved by the USFWS would be implemented. Therefore, impacts under Alternative IV-C would be limited primarily to habitat loss and fragmentation.

Western Yellow-billed Cuckoo (Candidate)

This species may occur along Alternative IV-C in southern Nevada in close proximity to perennial streams, wetlands, and lakes.

The types of impacts to the western yellow-billed cuckoo under Alternative IV-C generally would be the same as described for Alternative I-A (**Table 3.8-56**). Under Alternative IV-C, direct impacts to the western yellow-billed cuckoo may occur as a result of the construction and operation disturbance of 12 acres and 2 acres, respectively, of potentially suitable woody riparian and wetland habitats. These areas represent 1.06 percent and 0.18 percent, respectively, of potentially suitable habitat within the Region IV western yellow-billed cuckoo analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-6** would reduce impacts during the western yellow-billed cuckoo breeding season (March 15 to October 15). Remaining impacts to nesting western yellow-billed cuckoos under Alternative IV-C would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Southwestern Willow Flycatcher (Endangered)

The southwestern willow flycatcher may occur within suitable riparian habitat along Alternative IV-C in southern Nevada. Potential suitable habitat for the southwestern willow flycatcher near Alternative IV-C includes portions of the Meadow Valley Wash, the Muddy River, and the Colorado River System (Hiatt and Boone 2003).

The types of impacts to the southwestern willow flycatcher under Alternative IV-C generally would be the same as described for Alternative III-A, but would differ in the amount of habitat disturbed (**Table 3.8-56**). Alternative IV-C would result in the construction and operation disturbance of 12 acres and 2 acres, respectively, of potentially suitable habitat. These areas represent 1.06 percent and 0.18 percent, respectively, of potentially suitable habitat within the Region IV southwestern willow flycatcher analysis area.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 and **SSWS-8** would reduce impacts during the southwestern willow flycatcher breeding season (March 15 to October 15). Remaining impacts to nesting southwestern willow flycatchers under Alternative IV-C would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and the extent of native habitats in the surrounding Project region.

Yuma Clapper Rail (Endangered)

The Yuma clapper rail may occur within suitable marsh habitat in southern Nevada along Alternative IV-C.

Direct impacts to the Yuma clapper rail include habitat loss, modification, and fragmentation (**Table 3.8-56**). Alternative IV-C would result in the construction and operation disturbance of 12 acres and 2 acres, respectively, of potentially suitable wetland habitat. These areas represent 1.06 percent and 0.18 percent, respectively, of suitable habitat within the Region IV Yuma clapper rail analysis area.

Improved access as a result of Project roads under Alternative IV-C may result in increased human disturbance to the species. These impacts would be more pronounced if construction were to occur during the breeding season.

Operation of the proposed Project would incrementally increase the collision potential for Yuma clapper rails. Section 3.7.6.2, Impacts to Wildlife Common to All Alternative Routes and Associate Components, presents details regarding collision impacts to migratory birds.

TWE's design features and BMPs for minimizing impacts to wetland/riparian habitats are described in **Appendix C**. In addition, implementation of TWE-32 would reduce impacts during the Yuma clapper rail breeding season. Remaining impacts to Yuma clapper rails under Alternative III-C would be limited to a minor amount of temporary habitat disturbance. This disturbance is anticipated to have little impact given the linear nature of the Project and extent of native habitats in the surrounding Project region.

BLM Sensitive and State-Protected Species

BLM sensitive and state-protected species that may occur along Alternative IV-C are presented in **Table 3.8-57**. The types of impacts of construction and operation to BLM sensitive and state-protected species generally would be the same as discussed in Section 3.7.6.1, Impacts to Wildlife Common to All Alternative Routes and Associated Components. Species associated with desert shrubland are more likely to be impacted. Impacts to this habitat type are presented in Section 3.5.6, Impacts to Vegetation. Total habitat impacts can be calculated from the vegetation tables by adding the ROW clearing/trampling acreages and the facilities acreages to determine construction disturbance. The operations numbers alone reflect acres of operations disturbance for each vegetation community/habitat type. Additional species-specific mitigation measures and habitat surveys will be coordinated with the BLM, Western, and NDOW.

Implementation of TWE-32 and **WLF-1** would reduce impacts during the breeding season for many special status BLM sensitive and state-protected species. Species-specific mitigation measures and habitat surveys also would reduce impacts to these species. Under Alternative IV-C, remaining impacts to special status wildlife species, especially nesting raptor and other migratory bird species, would be limited to temporary habitat disturbance. This disturbance is anticipated to have little impact to BLM sensitive and state-protected species given the extent of native habitats in the surrounding Project region.

<u>Alternative Variations in Region IV</u>

The types of impacts to special status wildlife species under the Marketplace Alternative Variation in Region IV generally would be the same as the comparable portions of Alternatives IV-B, but would differ in the amount of habitat disturbed (**Table 3.8-58**). After considering design features and mitigation measures,

impacts to special status wildlife species from Project construction and operation would be similar to the comparable portions of Alternatives IV-B.

Table 3.8-58 Summary of Region IV Alternative Variation Impact Parameters for Special Status Wildlife Species

Impact Parameters	Marketplace Alternative Variation			Comparable Portion of Alternative IV-B		
	Construction Impact	Operation Impact	Indirect Impact	Construction Impact	Operation Impact	Indirect Impact
Desert tortoise critical habitat (acres)	0	0	0	0	0	0
Desert tortoise potential habitat (acres)	109	21	5,232	80	18	7,038
USGS habitat model ranking 0.6 and higher (acres)	107	20	4,958	78	18	6,362
Length of transmission line (miles)	8			7		
Number of special status raptor nests within 1 mile of the reference line	0			0		

Alternative Connectors in Region IV

The five alternative connectors would include minimal increases of total special status wildlife habitat disturbance if they were to be utilized. These alternative connectors would cross desert tortoise potential habitat. **Table 3.8-59** summarizes impacts associated with the alternative connectors in Region IV.

Table 3.8-59 Summary of Region IV Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Analysis
Sunrise Mountain Alternative Connector	• Approximately 0 acres of construction and 0 acres of operation impacts to desert tortoise critical habitat would occur. • Approximately 38 acres of construction and 8 acres of operation impacts to desert tortoise potential habitat would occur. • Approximately 26 acres of construction and 6 acres of operation impacts to desert tortoise USGS habitat model ranking 0.6 and higher. • No special status raptor nests are within 1 mile of the reference line.
Lake Las Vegas Alternative Connector	• Approximately 0 acres of construction and 0 acres of operation impacts to desert tortoise critical habitat would occur. • Approximately 54 acres of construction and 19 acres of operation impacts to desert tortoise potential habitat would occur. • Approximately 52 acres of construction and 18 acres of operation impacts to desert tortoise USGS habitat model ranking 0.6 and higher. • No special status raptor nests are within 1 mile of the reference line.

Table 3.8-59 Summary of Region IV Alternative Connector Impact Parameters for Wildlife

Alternative Connector	Analysis
Three Kids Mine Alternative Connector	• Approximately 0 acres of construction and 0 acres of operation impacts to desert tortoise critical habitat would occur. • Approximately 93 acres of construction and 34 acres of operation impacts to desert tortoise potential habitat would occur. • Approximately 81 acres of construction and 30 acres of operation impacts to desert tortoise USGS habitat model ranking 0.6 and higher. • No special status raptor nests are within 1 mile of the reference line.
River Mountains Alternative Connector	• Approximately 0 acres of construction and 0 acres of operation impacts to desert tortoise critical habitat would occur. • Approximately 142 acres of construction and 57 acres of operation impacts to desert tortoise potential habitat would occur. • Approximately 104 acres of construction and 41 acres of operation impacts to desert tortoise USGS habitat model ranking 0.6 and higher. • One peregrine falcon nest is within 1 mile of the reference line.
Railroad Pass Alternative Connector (Alts IV-A & IV-B)	• Approximately 0 acres of construction and 0 acres of operation impacts to desert tortoise critical habitat would occur. • Approximately 58 acres of construction and 14 acres of operation impacts to desert tortoise potential habitat would occur. • Approximately 56 acres of construction and 13 acres of operation impacts to desert tortoise USGS habitat model ranking 0.6 and higher. • No special status raptor nests are within 1 mile of the reference line.

Region IV Conclusion

A comparison of impact parameters for Region IV alternatives indicates that potential construction and operation impacts to special status wildlife species would be varied across all alternatives as shown in **Table 3.8-56**. Alternative IV-C would result in the greatest direct and indirect impacts to desert tortoise potential habitat in comparison to the other Region IV alternatives (**Table 3.8-54**). Alternative IV-C also would result in the greatest direct and indirect impacts to Southwestern willow flycatcher, Western yellow-billed cuckoo, and Yuma clapper rail potential habitat in comparison to the other Region IV alternatives (**Table 3.8-56**). The greatest level of impacts to special status wildlife species among all Region IV alternatives associated with Alternative IV-C is due to greater impacts to desert tortoise habitat. However, project effects on special status wildlife species and their potential habitat would be avoided or considered to be low magnitude and short-term after applying BMPs, design features, and additional mitigation.

3.8.6.8 Impacts from the No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. The special status wildlife analysis area would exist under current authorizations and land uses (e.g., livestock grazing, agriculture, energy development, mining, etc.). Therefore, impacts to special status wildlife species associated with the development of the proposed Project would not occur.

3.8.6.9 Residual Impacts

Although it is anticipated that wildlife mitigation measures would be successfully implemented, some residual impacts to wildlife would occur. Wildlife injuries and mortalities are expected to occur as a result of

collisions with transmission towers and guy wires, collisions with transmission lines, and collisions with vehicles.

It is anticipated that reclamation efforts would be successful and thus no residual impacts to habitats would occur. Timeframes for successful reclamation can vary by habitat type and initial impact intensity. During extended periods of reclamation it is expected that habitat functionality may be reduced due to habitat fragmentation.

3.8.6.10 Irreversible and Irretrievable Commitment of Resources

Construction and operation of any of the proposed Project alternatives would result in the irretrievable commitment of both wildlife and wildlife habitats during the life of the project. Depending on the selection of alternatives, the amount of wildlife habitat irretrievably committed would range from 9,959 acres to 12,164 acres. However, as discussed **Appendix D**, it is anticipated that upon decommissioning of the Project reclamation measures should result in the return of impacted areas to native habitats. Some vegetation communities are expected to return to a native state within in a relatively short period of time (i.e., 5 years). Other more sensitive habitats such as sagebrush shrublands may require up to 50 years or longer to return to native conditions. Regardless of timeframes, it is possible that wildlife habitat disturbed during construction could return to pre-project conditions, thus avoiding any irreversible commitments of wildlife resources.

3.8.6.11 Relationship Between Local Short-term Uses and Long-term Productivity

Wildlife habitat would be diminished until reclaimed areas return to mature vegetation communities. As discussed above, these temporal losses can vary in the time required to return to pre-construction conditions. This range of temporal loss is expected to be between 5 and 50 years, depending upon the vegetation community. Construction and operation of any of the Project alternatives is anticipated to result in minor impacts to the short-term productivity of local migratory bird populations and sagebrush obligate wildlife species due to loss or degradation of habitat. These impacts are expected to be limited to mortality resulting from collisions with Project infrastructure and avoidance due to increased predation. Impacts from direct habitat loss are expected to be negligible because the total anticipated loss of wildlife habitat due to Project construction will be less than 1 percent of available habitats within the Project analysis area.

3.9 Aquatic Biological Resources

3.9.1 Regulatory Background

Regulations that directly influence aquatic species and habitat management decisions within the analysis area are primarily implemented by the BLM, USFS, and state wildlife agencies, which consist of the WGFD, CPW (formerly CDOW), UDWR, and NDOW. The aquatic species and habitat regulations relevant to the proposed project are presented in **Table 3.9-1**. Regulations and statutes related to special status aquatic species are provided in Section 3.10, Special Status Aquatic Species.

Table 3.9-1 Relevant Regulations for Aquatic Species

Topic	Regulation
Aquatic Species Jurisdiction	• Wyoming Statutes 23-1-103; • Colorado Revised Statutes 33-1-101; • Utah Code 23-15-2; and • Nevada Administrative Code 503-020 and Nevada Revised Statutes 501.097.
Aquatic Species Protection	• Wyoming Game and Fish Commission, Chapter 52, Section 9; • Colorado Revised Statutes 33-1-101; • Utah Code 23-14-1, 23-14-18, and 23-14-19 and Rules R657-3, R657-13, and R657-16; and • Nevada Administrative Code 503 (503.270 through 503.430) – Fishing and Miscellaneous Protective Measures.
Prevent Invasive Species Infestation	• Wyoming Game and Fish Commission, Chapter 62 • Colorado Revised Statutes 33-1-101, 33-2-104; • Utah Code 23-27-301 and 23-27-401 and Rules R657-60; and • Nevada Administrative Code 503-030, 503-050, 503-075, 503-080.

The analysis for aquatic biological resources assumed the BLM and the USFS would continue to assist in managing aquatic habitats in coordination with the USFWS and applicable state wildlife agencies (i.e., WGFD, CPW, UDWR, and NDOW). State agencies would manage aquatic species. The USFWS would have jurisdiction over the management of ESA-listed aquatic species.

3.9.2 Data Sources

Information regarding aquatic species and their habitat within the analysis area was obtained from a review of existing published sources, BLM resource management plans, USFS forest management plans, BLM, USFS, WGFD, CPW, UDWR, NDOW, and USFWS file information, as well as WYNDD, CNHP, UNHP, and NNHP database information. In addition, information as a result of correspondence with agency fishery biologists was incorporated as appropriate.

3.9.3 Analysis Area

The analysis area for aquatic biological resources consists of all alternative routes, and includes a buffer of 1-mile (2-mile width centered on each alternative route); specifically including a one-mile downstream reach of all waterways crossed by any potential route. This analysis area considers all aquatic habitats and species that may be present, based on available literature and data reviewed for the project. For

context, project-related impacts are also discussed in terms of a larger project analysis area comprised of the fifth-level Watersheds (HUC10) crossed by the alternative routes' 250-foot-wide transmission line ROW.

3.9.4 Baseline Description

3.9.4.1 Aquatic Habitats

Aquatic habitat in the analysis area includes a mixture of streams, springs, wetlands, and lakes/reservoirs that support aquatic species. Refer to Section 3.5, Vegetation for a description of wetlands. Stream habitats consist of perennial, intermittent, and ephemeral waterbodies. Perennial streams contain water continuously during a normal or average year, while intermittent (sporadic or periodic flows) and ephemeral (short-lived or transitory flow) provide temporary habitat during the year. Due to the presence of water throughout the year, perennial waterbodies provide key habitat for fish and other aquatic communities. Perennial streams represent the predominant type of aquatic habitat located within the analysis area. The highest number of perennial streams is crossed by the 2-mile transmission line corridors in Colorado and Utah. Lakes/reservoirs and springs also are located in the analysis area, although there are considerably fewer when compared to perennial streams.

Aquatic habitats are managed by the agency that owns or has jurisdiction for the land (e.g., BLM, USFS, and USFWS refuges). On lands with federally listed species, their habitat and species management is under the jurisdiction of the USFWS. Aquatic habitat quality is included in waterbody classifications that are used by the state agencies. The analysis area in Wyoming, Colorado, and Utah contains high quality trout habitat.

3.9.4.2 Fish

Within the analysis area, fish species are managed by the state agencies (WGFD, CPW, UDWR, and NDOW), with coordination and cooperation with federal agencies (BLM, USFS, and USFWS). Collectively, the state and federal agencies develop and implement management plans and strategies for both game and nongame fish species and determine management practices that involve fishing regulations and habitat protection. Management direction and guidance are provided through the implementation of management plans, agreements, and their wildlife plans (e.g., Colorado's Comprehensive Wildlife Conservation Strategy and Wildlife Action Plans [CDOW 2006], Wildlife Action Plan [2006], Utah Comprehensive Wildlife Conservation Strategy [Sutter et al. 2005], and Wyoming State Wildlife Action Plan [2012]).

As a result of their recreational value, game fish species are an important focus in the management of aquatic species within the analysis area. Recreational game fish species within the analysis area consist of coldwater (trout), cool water (pike, walleye, and smallmouth bass), and warm water species (sunfish, largemouth bass, yellow perch, and catfish). The three fishery categories are based on temperature tolerances, with warm water species having the highest temperature tolerance. In total, 26 game fish species, subspecies or hybrids occur within the analysis area (**Table 3.9-2**). The majority of the game fish species are represented by trout, which are distributed throughout the analysis area. Two of the trout species, Bonneville cutthroat trout and Colorado River cutthroat trout, are special status species, which are discussed in Section 3.10, Special Status Aquatic Species. Five additional families (catfish, sunfish, temperate bass, pike, and perch) with game fish species are present within the analysis area. General spawning periods and habitat for the more common game fish species within the analysis area are provided in **Table 3.9-3**. The spawning periods are approximate and could occur in only a portion of a particular month, and also could vary based on different temperature regimes within the northern and southern portions of the analysis area. Game fish species are summarized by Project region in Section 3.9.5, Regional Summary.

Table 3.9-2 Game Fish Species and General Habitat

Common Name	Scientific Name	General Habitat
Trout and Salmon	Salmonidae	
Bonneville cutthroat trout	*Oncorhynchus clarki utah*	Streams
Brook trout	*Salvelinus fontinalis*	Streams, lakes/reservoirs
Brown trout	*Salmo trutta*	Streams, lakes/reservoirs
Colorado River cutthroat trout	*Oncorhynchus clarki pleuriticus*	Streams
Cutthroat trout	*Oncorhynchus clarkii*	Streams
Grayling	*Thymallus thymallus*	Lakes and streams
Mountain whitefish	*Prosopium williamsoni*	Streams
Rainbow trout	*Oncorhynchus mykiss*	Streams, lakes/reservoirs
Snake River cutthroat trout	*Oncorhynchus clarkii bouvieri (form of Yellowstone cutthroat trout)*	Streams
Sockeye (kokanee)[1] salmon	*Oncorhynchus nerka*	Lakes/reservoirs
Tiger trout (brown x brook hybrid)	*Salmo trutta* x *Salvelinus fontinalis*	Streams, lakes/reservoirs
Catfish	Ictaluridae	
Black bullhead	*Ameiurus melas*	Streams, lakes/reservoirs
Channel catfish	*Ictalurus punctatus*	Streams, lakes/reservoirs
Sunfish	Centrarchidae	
Black crappie	*Pomoxis nigromaculatus*	Streams
Bluegill	*Lepomis macrochirus*	Lakes/reservoirs
Green sunfish	*Lepomis cyanellus*	Lakes/reservoirs
Largemouth bass	*Micropterus salmoides*	Streams, lakes/reservoirs
Rock bass	*Ambloplites rupestris*	Lakes/reservoirs
Smallmouth bass	*Micropterus dolomieu*	Streams, lakes/reservoirs
Temperate Bass	Percichthyidae	
White bass	*Morone chrysops*	Lakes/reservoirs
Wiper (striped x white bass hybrid)	*Morone saxatilis* x *Morone chrysops*	Lakes/reservoirs
Pike	Esocidae	
Northern pike	*Esox lucius*	Streams
Perch	Percidae	
Walleye	*Sander vitreus*	Streams, lakes/reservoirs
Yellow perch	*Perca flavescens*	Streams, lakes/reservoirs

[1] Kokanee is the name given to sockeye salmon that live in lake habitats.

Source: Unpublished occurrence data from WGFD (2011), CPW (2012-2011), UDWR (2013-2011), and NDOW (2011).

Table 3.9-3 Game Fish Spawning Periods and Habitat

Species or Group	Months												Spawning Habitat
	J	F	M	A	M	J	J	A	S	O	N	D	
Brook trout									■	■			Stream spawners that use gravel substrates and spring upwelling areas.
Brown trout									■	■			Stream spawners that use tributary streams with gravel substrates in riffle-run areas.
Cutthroat trout				■	■								Stream spawners that use tributary streams with gravel substrates in riffle areas.
Grayling										■	■	■	Stream spawners that use riffle areas with sand and gravel substrates.
Lake trout										■	■	■	Lake spawners that use areas with boulder, cobble, and gravel substrates.
Rainbow trout			■	■	■								Stream spawners that use gravel substrates at head of riffle or downstream portion of pool.
Walleye				■	■								Spawn in lakes and streams in shallow water over rock substrates.
Black bullhead						■	■						Usually spawn in weedy or muddy shallow areas by building nests.
Channel catfish					■	■	■						Prefers areas with structure such as rock ledges, undercut banks, logs, or other structure where it builds nests.
Largemouth bass					■	■	■						Shallow areas over clean gravel and sand bottoms.
Smallmouth bass				■	■	■	■						Builds nests in shallow areas over boulder, cobble, or gravel substrates.
Sunfishes					■	■	■	■					Nest builders in diverse substrates and shallow depths.
Temperate bass				■	■	■							Egg masses deposited over sand bars, submerged vegetation, or other instream debris.

Sources: Baxter and Simon 1970; Beauchamp 1990; Eddy and Underhill 1974; Hickman and Raleigh 1982; Raleigh et al. 1984; Raleigh et al. 1986; Raleigh 1982; and Sigler and Sigler 1996.

Waterbodies within the analysis area also support nongame fish species represented by suckers, minnows, and sculpins. Most of the sucker species occur in stream or river habitats and include species such as flannelmouth, bluehead, longnose, mountain, white, desert, and Meadow Valley Wash desert sucker. Minnow species known to occur in analysis area waterbodies include bigmouth shiner, brassy minnow, carp, creek chub, emerald shiner, fathead minnow, least chub, longnose dace, Meadow Valley

Wash speckled dace, redside shiner, roundtail chub, southern leatherside chub, speckled dace, Utah chub, and Virgin spinedace. Darter species include Iowa and Johnny. As a group, minnow species occupy all types of habitats within the analysis area. Numerous sucker and minnow species are considered special status species, which are discussed in Section 3.10, Special Status Aquatic Species.

Aquatic invasive species and whirling disease are issues within streams and lakes/reservoirs in all four states. Numerous streams have tested positive for whirling disease in Wyoming, Colorado, and Utah, some of which are located within the analysis area. Aquatic invasive species of concern in the four states include zebra and quagga mussels, New Zealand mudsnail, and rusty crayfish. Management plans (e.g., UDWR 2009; WGFD 2010) or regulations (see **Table 3.9-1**) are being used by federal and state agencies to prevent the spread of these aquatic invasive species.

USFS Management Indicator Species

Management Indicator Species (MIS) are selected because their status is believed to: 1) be indicative of the status of a larger group of species; 2) be reflective of the status of a key habitat type; or 3) act as an early warning of an anticipated stressor to ecological integrity. The key characteristics of a MIS are that its status and trend provide insights to the integrity of the larger ecological system to which it belongs. Aquatic species that have been selected as MIS for the NFS lands crossed by the project are presented in **Table 3.9-4**. Two MIS (Bonneville cutthroat trout and Colorado River cutthroat trout) are also categorized as Forest Sensitive (FS) species and are presented in Section 3.10, Special Status Aquatic Species. Specific MIS occurrence in waterbodies crossed by the 250-foot-wide transmission line ROW is discussed in the Region II and III impact sections.

Table 3.9-4 USFS Management Indicator Aquatic Species for National Forests Crossed by the Project[1]

Species	Ashley National Forest Region II	Dixie National Forest Region III	Fishlake National Forest Region II	Manti-LaSal National Forest Region II	Uintah National Forest Region II
Fish					
Bonneville cutthroat trout				FS[1] and MIS	FS[1] and MIS
Brown trout			MIS		
Colorado River cutthroat trout				FS[1] and MIS	FS[1] and MIS
Cutthroat trout			MIS	MIS	
Rainbow trout			MIS	MIS	
Southern leatherside chub			FS[1]		FS[1]
Virgin spinedace		MIS	FS[1]		
Aquatic macroinvertebrates	MIS		MIS	MIS	

[1]FS – Species also is classified as Forest Sensitive status and is addressed in Section 3.10, Special Status Aquatic Species.

3.9.4.3 Invertebrates

The characterization of invertebrate communities for this EIS is based on general information rather than specific survey results for waterbodies in the analysis area. The basis for this approach is that species composition and abundance information is not required for the impact analysis of invertebrate

communities. The exception would be the potential occurrence of special status invertebrate species, which are discussed in Section 3.10, Special Status Aquatic Species.

Invertebrate communities that occur in waterbodies located within the 2-mile transmission line corridors include a mixture of worms, immature and adult insect groups, crustaceans, snails, and numerous other groups. The composition and abundance of the invertebrate community can vary depending on the type of habitat (perennial stream, intermittent or ephemeral stream, wetland, pond, lake, or spring) and the physical characteristics of the waterbody such as flow, substrate, presence of submerged vegetation, depth, extent of riparian vegetation, elevation, gradient, and other factors. Invertebrate communities are present throughout the year in all perennial waterbodies within the analysis area. In contrast, invertebrate occurrence in intermittent or ephemeral waterbodies would be limited to the period when water is present.

Invertebrates serve important roles in the aquatic environment through their food web dynamics. They represent food sources for fish and also are used as indicators of water quality conditions (Barbour et al. 1999; Wallace and Webster 1996).

As a group, macroinvertebrates are considered USFS MIS in the Ashley and Manti-LaSal National Forests. The definition for MIS is provided in Section 3.9.4.2, Fish. This group of MIS is discussed in the Region II impact section.

3.9.4.4 Amphibians

Waterbodies located within the analysis area also provide habitat for amphibians (salamanders, toads, and frogs) and aquatic reptiles (turtles). Many of the toad species such as plains spadefoot toad, Great Basin spadefoot toad, and salamanders occur in terrestrial habitats throughout most of the year, but move to aquatic habitats for breeding in the spring or early summer. The types of habitats used for breeding include perennial streams, reservoirs, ponds, wetlands, or seasonal flooded areas. Salamander and toad species overwinter in burrows and other moist areas in terrestrial habitat. Most frog species are associated with permanent wet areas including streams, ponds, and wetlands (Cerovski et al. 2004; Hammerson 1999). Breeding typically occurs in the spring or early summer for frogs and aquatic reptiles. Most frog species overwinter in the bottom substrate of their occupied aquatic habitats. The potential occurrence for special status amphibian species such as Arizona toad, boreal toad, Columbia spotted frog, and northern leopard frog are discussed in Section 3.10, Special Status Aquatic Species.

3.9.5 Regional Summary of Aquatic Biological Resources

A summary of game fish occurrence by project region is provided in **Table 3.9-5**. The highest number of game fish species occurs in Regions I and II. Invertebrate and amphibian species are present in all four regions. A list of basins and watersheds that are located within the four regions is provided in **Table 3.4-2** in Water Resources. A summary of special status aquatic species is discussed in Section 3.10.5.

Table 3.9-5 Game Fish Species Occurrence by Project Analysis Area and Region

Fish Species	Region			
	I	II	III	IV
Trout and Salmon				
Bonneville cutthroat trout		X		
Brook trout	X	X		
Brown trout	X	X		
Colorado River cutthroat trout	X	X		
Cutthroat trout		X		

Table 3.9-5 Game Fish Species Occurrence by Project Analysis Area and Region

Fish Species	Region			
	I	II	III	IV
Mountain whitefish		X		
Rainbow trout	X	X	X	
Snake River cutthroat trout	X			
Sockeye (Kokanee) salmon	X	X		
Tiger trout (brown x brook hybrid)		X		
Catfishes				
Black bullhead	X	X		
Channel catfish	X	X		
Sunfishes				
Black crappie	X	X		
Bluegill	X	X		
Green sunfish	X	X	X	
Largemouth bass		X		X
Rock bass	X	X		
Smallmouth bass	X	X	X	X
Temperate Basses				
White bass	X	X	X	
Wiper (striped x white bass hybrid)			X	
Pike				
Northern pike	X	X		
Perches				
Walleye	X	X		
Yellow perch		X		

Sources: Unpublished occurrence data from WGFD (2011), CPW (2012-2011), UDWR (2013-2011), and NDOW (2011).

3.9.6 Impacts to Aquatic Biological Resources

Potential impacts to aquatic biological resources were identified based on feedback from federal and state agency biologists, public scoping, and literature related to surface disturbance effects on aquatic habitat and species. Potential effects from surface disturbance activities would include direct alteration of habitat or loss of individuals from equipment and vehicles. Habitat also could be affected by changes in water quality from increased sedimentation and potential fuel spills. The use of surface water for dust control and concrete foundations also was evaluated in terms of effects on aquatic habitat.

The methodology for evaluating impacts on aquatic biological resources involved comparisons of project activities within the analysis area to habitat that supports aquatic species with an emphasis on game and native fish species. The impact analysis area for aquatic biological resources included perennial streams and springs that are crossed by the alternative 250-foot-wide transmission line ROWs and contain game and native fish species. A downstream reach of approximately 1 mile also was considered part of the analysis area. The analysis area for roads focused on perennial streams, lakes, reservoirs, and springs

with game and native fish that are crossed by each alternative's 2-mile transmission line corridor. The larger analysis area for access roads was required because their locations have not been defined at this time. GIS analyses were conducted to identify perennial waterbodies and game fish occurrence within the proposed disturbance areas (i.e., 250-foot-wide transmission line ROWs and 2-mile transmission line corridors, terminals, electrode bed siting areas).

Impact issues and the analysis considerations for aquatic biological resources are listed in **Table 3.9-6**. Identification of aquatic habitat potentially affected by project activities focused on waterbodies that support aquatic species on a persistent basis throughout the year (perennial streams and springs). Lakes and reservoirs were included in the analysis to address potential sedimentation effects. However, construction traffic and equipment would not cross lake and reservoir habitats.

Table 3.9-6 Relevant Analysis Considerations for Aquatic Biological Resources

Impact Issues	Analysis Considerations and Relevant Assumptions
Potential direct and indirect effects of construction activities and roads on habitat and aquatic species	The analysis includes direct and indirect disturbance effects and potential water quality changes from sediment delivery and fuel spills.
Potential for introduction of invasive or nuisance aquatic species from construction equipment	The analysis considers the potential introduction or transfer of nuisance aquatic species resulting from vehicles crossing multiple drainages, based on nuisance species occurrence information.
Potential for increased fishing pressure on streams from construction work crews and the public from the construction area and access roads	The analysis evaluates the potential for increased fishing pressure on game fisheries, based on the presence of workers near streams.
Potential direct and indirect effects of construction water use on aquatic habitat and species	The analysis uses the results of the water resources impact analysis, which determines if water sources are linked to surface flows of streams crossed by the alternative 250-foot-wide transmission line ROWs. Flow reductions could detrimentally affect habitat for aquatic species.
Potential mortalities to amphibians from vehicle traffic during seasonal movement periods	The analysis evaluates the potential impacts of vehicle traffic within the ROW and access roads on amphibians.

Impact parameters were used in combination with effects information for the purpose of quantifying impacts. The impact parameters also allow comparisons among alternatives or alternative variations. The following impact parameters were used in this analysis:

- Number of perennial streams with game or native fish species crossed by the 250-foot-wide transmission line ROW associated with each of the alternatives.
- Number of perennial streams with game or native fish species crossed by 2-mile transmission line corridor widths (access road analysis).
- Potential loss of aquatic habitat (feet^2) due to culverts or low water construction.
- Acres of riparian area disturbance from roads.

3.9.6.1 Impacts from Terminal Construction and Operation

The Northern and Southern terminals would be constructed regardless of alternative route or design option.

Northern Terminal

Construction of the Northern Terminal would not result in direct disturbance effects on aquatic habitat and species, since no perennial waterbodies are located within the proposed disturbance area. In addition, road access would not affect special status aquatic species because existing or new roads would not cross waterbodies inhabited by these species.

Water use for substation/converter station construction would require approximately 1.8 acre-feet for dust control and concrete. Water would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. The effect determination of new and existing water depletions in Wyoming would be made by the Wyoming State Engineer after the water sources are identified and an evaluation of their potential connection to surface flows is completed. Water use for the terminals would not affect surface flows or reduce habitat for aquatic species.

Southern Terminal

Construction of the Southern Terminal would disturb previously developed upland areas in the Eldorado Valley watershed near Boulder, Nevada. Waterbodies located adjacent to the area include playa lakes. No perennial waterbodies are located in this area. No special status species habitat is located within the playa lakes. Surface disturbance and use of access roads would not affect aquatic species, since habitat is not located within the proposed disturbance area for the Southern Terminal.

Water required for dust control and concrete during construction of the Southern Terminal is estimated to be 1.2 acre-feet. The source of the water would be existing rights. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed. The evaluation would determine if water use could affect surface water quantity or habitat used by aquatic species.

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

Impacts to aquatic biological resources would be the same as discussed in Section 3.9.6.1, Impacts from Terminal Construction and Operation, and Section 3.9.6.2, Impacts Common to All Alternative Routes and Associated Components. No additional impacts would occur at the southern terminal or ground electrode site near IPP.

Design Option 3 – Phased Build Out

Impacts to aquatic biological resources would be the same as discussed in Section 3.9.6.1, Impacts from Terminal Construction and Operation, and Section 3.9.6.2, Impacts Common to All Alternative Routes and Associated Components. The only difference resulting from this option is that impacts would occur at later time frames due to the phased build out schedule.

3.9.6.2 Impacts Common to All Alternative Routes and Associated Components

Potential direct and indirect effects of Project construction, operation, and decommissioning on aquatic habitat and species are discussed below for each of the resource issues listed in **Table 3.9-6**. After impacts are identified, relevant agency BMPs and design features are discussed in terms of reducing impacts. If impacts of concern remain after application of BMPs and design features, additional mitigation is recommended to further reduce impact levels.

Construction Impacts

Direct Disturbance Effects on Habitat and Species

Equipment and vehicle traffic within the ROW and access roads could cross small and moderate-size streams (generally less than 100 feet in wetted width) or springs. The number of game fish streams crossed by the 250-foot-wide transmission line ROWs and 2-mile transmission line corridors are provided in the region sections.

Two types of crossings would be used for flowing streams: fords and culverts. The estimated disturbance per crossing for these two methods include 1,250 feet^2 (25-foot width X 50-foot length) for the ford technique, and 7,500 feet^2 (50-foot width X 150-foot length) for culverts. Flow would be maintained during construction involving stream crossings. If needed, culverts would be installed under the direction of a qualified engineer in coordination with hydrologists and aquatic biologists from the BLM, USFS, and state agencies. Compliance with necessary permits also would be required. For streams that contain fish, culverts would be designed to maintain or improve passage by aquatic species. Vehicle crossings would result in mortalities to macroinvertebrates and possibly early life stages of fish. Juvenile and adult fish would likely move from the disturbed area. Stream crossings also would alter bottom substrates. Habitat alteration could affect various activities or values for fish such as cover, feeding, or life stage functions for spawning or early life stage development. The disturbed area including bottom substrates would be restored to pre-construction conditions after construction is completed.

Construction at stream crossings also would remove riparian vegetation. Vegetative cover along streambanks provides cover for fish, shading, bank stability, and increased food and nutrient supply as a result of deposition of insect and vegetative matter into the watercourse. Riparian vegetation also contributes woody material to streams that are used for fish cover and can be part of forming habitat features such as pools. Disturbance to the streambank areas at stream crossings would represent a relatively small width (portion of 250-foot-wide transmission line ROW on each streambank). Given the relatively small width of the disturbance area associated with an individual stream crossing, impacts would be considered low in relation to the entire stream system. Potential ground disturbance effects to riparian habitat are provided in the region sections.

BMPs that would reduce impacts to aquatic habitat include the following: ECO-2 (develop a habitat restoration plan), ECO-3 (minimize stream crossings by roads), and WAT-11 (avoid alteration of existing drainages). Design features would be applied that would comply with federal, state, and local regulations, minimize disturbance to drainage channels, vegetation, and stream banks, and restore the disturbed area to equal or better conditions (TWE-8). This design feature also would restrict structures from being sited within 200 feet from streams. Design feature TWE-12 would avoid structures being placed near riparian areas. Examples of state regulations include the Stream Alteration Permit that would be required by the Utah Division of Water Rights in Regions II and III for each stream crossing. This permit would require that construction activities have minimal impacts both individually and cumulatively on the aquatic environment. In conclusion, when considering the relatively small disturbance area at stream crossings and the use of BMPs and design features, stream crossing construction would alter and permanently remove a relatively small amount of stream habitat. Construction could alter flow conditions and game fish spawning habitat depending on the timing of construction. Two additional mitigation measures are recommended for culvert construction if proposed for road crossing of streams.

AB-1 *(Fish Passage): When avoidance of perennial streams with fish populations is not feasible and a culvert is required during construction, flow would be maintained in a portion of the stream to allow unrestricted fish passage. Any plan for dewatering the stream at the culvert site must be approved by the appropriate federal and state agencies. Culvert size and type would be selected to facilitate the continued and long-term connectivity and movement of target aquatic species. If the culvert is proposed to be in place during project operation, approval must be obtained from the federal or state agency management authority. An alternative crossing method may be required.*

Effectiveness: This measure would be highly effective in maintaining fish movement through the construction area.

***AB-2** (Avoid Game Fish Spawning Periods): If spawning areas for game fish species are known to occur at streams proposed for vehicle crossing or culvert construction, instream disturbance would be scheduled to avoid the spawning period. The exact dates for avoidance would be determined through discussions with WGFD, CPW, or UDWR. All disturbed areas would be restored to pre-construction conditions prior to the next spawning season.*

Effectiveness: This measure would be highly effective in avoiding impacts on game fish spawning.

Through the implementation of BMPs, design measures, and additional mitigation measures, stream crossing construction would not permanently remove habitat and detrimentally affect fish population numbers. There could be temporary reductions in macroinvertebrate numbers at stream crossings; however, their composition and numbers would recover during subsequent colonization of the construction area by invertebrates. The installation of culverts would result in a permanent loss of aquatic habitat.

Water Quality Effects on Habitat and Species

Vehicle and equipment disturbance within or near waterbodies also would cause sedimentation. Road density estimates are provided as an indication of sediment effects by watershed in the region sections. Sediment entering the water column would be redeposited in areas downstream of the disturbed area. The extent of the sedimentation effect would depend on the flow conditions, substrate composition, stream configuration, and types of aquatic communities located within the affected areas. The indirect effects of sedimentation could range from potential detrimental effects on species behavior, physiological functions, or spawning (Waters 1995). In general, salmonid (trout) species are more sensitive to increased turbidity compared to many of the warmwater fish species. Sediment deposition in substrates used for spawning could detrimentally affect successful egg development. The impact level would be determined by fish species presence, the timing of the construction in relation to spawning periods, and the closest spawning areas to the disturbance area. The duration of sediment impacts could last for several months to approximately one year depending on the timing of construction in relation to spring flows and other precipitation events that would flush sediments. The recovery period for biological communities could range from several months for macroinvertebrates to one year for fish (Waters 1995). The recovery period could be less if sediment levels were at relatively low concentrations. BMPs that would reduce sedimentation impacts to aquatic habitat include WAT-9 (implement erosion control measures). Design feature TWE-13 would be applied to control erosion input to streams.

Vehicle and equipment use within or near waterbodies also would pose a risk to aquatic biota from fuel or lubricant spills. If fuel reached a waterbody, aquatic species could be exposed to toxic conditions. Spills also would result in chemical residues within or on substrate in waterbodies. Impacts could include direct mortalities or reduced health of aquatic organisms. The magnitude of impacts would depend on the volume of spilled fuel, flow conditions, channel configuration, and presence of aquatic species. Impacts from fuel spills would be avoided or minimized by design feature TWE-24 that restricts refueling within 100 feet of wetlands and streams. TWE-24 also would implement spill prevention and containment measures in the event that a spill occurred during construction. In conclusion, the use of design features would reduce potential detrimental water quality changes involving increased sediment and fuel spills to a level that would not affect aquatic habitat or fish population viability on a long-term basis.

Through the implementation of BMPs and design features related to erosion control and fuel spills, impacts to water quality and aquatic habitat and species would be minor or low magnitude. Impacts on aquatic habitat and species would be temporary and at a level that would not detrimentally affect fish and other aquatic species populations.

Invasive Species

Stream crossings by vehicles and equipment pose a risk of transferring invasive aquatic species between drainages during construction. Aquatic invasive species of concern in the four states include whirling disease, zebra and quagga mussels, New Zealand mudsnail, and rusty crayfish. Various life stages of these invasive species could attach to vehicles or equipment and be introduced to a waterbody during the waterbody crossings associated with construction and maintenance activities. Management plans (e.g., UDWR 2009; WGFD 2010) or regulations (see **Table 3.9-1**) are being used by federal and state agencies to prevent the spread of these aquatic invasive species. No BMPs or design features have been defined to require equipment or vehicle washings prior to crossing waterbodies. As a result of the potential risk of introducing or spreading invasive aquatic species, the following mitigation measure is recommended.

AB-3 *(Invasive Aquatic Species Protection): It is assumed that any waterbody could contain aquatic invasive species and invasive weed species. If work occurs in or near a waterbody, all equipment would be decontaminated. Decontamination would occur before arrival at a project site to avoid the transfer of aquatic invasive species from a previous work site in or near water. Decontamination would consist of either of these actions: 1) Drain all water from equipment and compartments; clean equipment of all mud, plants, debris, and aquatic organisms; and dry equipment for specified time by season (5 days in June through August, 18 days in March through May, and 3 days in December through February when temperatures are at or below freezing); or 2) Use a high pressure (2,500 psi) hot water (140°F) pressure washer to thoroughly clean equipment and flush all compartments that may hold water. A field monitor would be present to ensure that the cleaning was completed prior to vehicle and equipment moving to other streams and drainages.*

Effectiveness: This measure would be highly effective in avoiding the transfer of invasive aquatic species due to the cleaning technique.

By implementing mitigation measure **AB-3**, the introduction or transfer of invasive aquatic species would not occur.

Water Use Effects on Habitat and Species

The estimated water use required per mile of transmission line construction is approximately 3,400 gallons for foundation concrete and 240,000 gallons for dust control. Water would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners or irrigation companies holding existing water rights. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed.

Existing water rights would be used for concrete production and dust control during construction of project transmission line and associated facilities. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by aquatic species.

Additional Fishing Pressure on Game Fish Streams / Fish Regulations

Fishing pressure on streams with game fish species could increase as a result of construction crews. The increased fishing pressure could result in higher numbers of fish harvested in some of the streams near the Project. However, the work crews would have limited time off; therefore, the anticipated impact level is considered to be low. Two design features also would contribute to low level impacts from potential fishing pressure. TWE-2 states that the applicant and its contractors would comply with applicable environmental laws and regulations including fishing regulations on harvest limits and purchase of state fishing licenses. TWE-4 requires that all personnel would be instructed on the protection of ecological resources including

fish species. In conclusion, impacts from potential increased fishing pressure would not violate fishing regulations and affect game fish populations.

By following design features for the Project, impacts from potential increased fishing pressure would not violate fishing regulations and affect game fish populations.

Vehicle Effects on Amphibians

Construction traffic within the ROW could result in amphibian mortalities during spring and summer breeding migrations to and from flooded areas, wetlands, streams, ponds, or lakes. Vehicle crossings of streams could cause frog mortalities, since they use these habitats throughout the year. Vehicle traffic also could result in toad mortalities in upland terrestrial habitat. This potential reduction in amphibian numbers is expected to be relatively low due to low traffic levels. Vehicle activity also could cause increased sediment on a temporary basis in stream disturbance areas. BLM stipulations would provide protection to aquatic habitat and buffer distances around perennial streams and wetlands. The buffer distance varies from 100 to 500 feet depending on the BLM field office. Some field offices require complete avoidance of the 100-year floodplain. To provide consistency in the protection of wetland habitat, additional mitigation is proposed in Section 3.5, Vegetation. Mitigation measures WET-2 and WET-4 would require no disturbance within 500 feet of wetlands.

Operation Impacts

The direct and indirect effects of operation of the Project would involve use of access roads and the ROW for repair and maintenance activities and vegetation management. Impacts associated with operation activities would involve several of the same types of effects discussed for construction activities.

Direct Disturbance to Habitat and Species

Direct disturbance to stream habitat would occur due to vehicle traffic during the annual transmission line inspection and vegetation clearing. In most situations, vehicles would use existing access roads. However, movement along the ROW may require crossings of small streams where access roads do not exist. It is assumed that fewer stream crossings may be required because the access road system would have been constructed. Project design would limit stream crossings if feasible. Some of the roads that cross streams would have culverts to protect the waterbody from future vehicle disturbance. The types of direct impacts would be the same as discussed for construction. Some riparian vegetation may be trimmed to maintain the buffer zones from wires. However, the applicant would retain as much riparian vegetation as possible at stream crossings. BLM stipulations would protect riparian areas on public lands by restricting surface distance in these areas. The buffer distance varies from 100 to 500 feet. However, riparian stipulations do not exist for the entire project area. The reduction of riparian vegetation at stream crossings would result in the same types of impacts on aquatic habitat, as discussed for construction.

The BMPs, design features, and additional mitigation measures (**AB-1** and **AB-2**) also would be applied to vehicle movements and vegetation maintenance during operation. Operation activities would not permanently remove habitat and affect fish population numbers. Temporary reductions in macroinvertebrate numbers could occur at stream crossings, but this community would recover as they recolonize aquatic areas.

Water Quality Effects on Habitat and Species

Vehicle traffic within the ROW and access roads near streams could result in increased sediment and fuel spill risks. The effects of these water quality changes on aquatic habitat and species would be the same as discussed for construction. The same BMPs and design features would be applied to minimize these types of impacts on aquatic biological resources. Herbicides may be used to control vegetation as part of maintenance activities in the ROW. VEG-3 requires that herbicide use should be limited to non-persistent, immobile formulations to avoid effects on aquatic habitats. Design features involving erosion control and

spill response and containment also would be implemented. In addition to the BMPs, the following mitigation measure is recommended to avoid potential herbicide effects on biological resources.

AB-4 *(Herbicide Use Plan): As part of vegetation management, the applicant would prepare an Herbicide Use Plan. The Plan would identify a list of approved herbicides that may be used as well as locations of areas that may be treated. Licensed herbicide applicators would be used in the treatment process. All herbicides would be used in accordance with label instructions for the chemical. The Plan also would discuss compliance with applicable federal, state, and local agencies.*

Effectiveness: This measure would be highly effective in avoiding toxic effects of herbicide use on special status aquatic species.

By implementing BMPs and design features related to erosion control and fuel spills, impacts to water quality and aquatic habitat and species would be minor or low magnitude. Mitigation measure **AB-4** would avoid effects of herbicides on water quality and aquatic species and their habitat. Impacts on aquatic habitat and species would be temporary and at a level that would not detrimentally affect fish and other aquatic species populations.

Invasive Species

Stream crossings by vehicles and equipment pose a risk of transferring invasive aquatic species between drainages during operation and maintenance activities. Impacts would be similar to construction activities except that fewer stream crossings may be required, since the road access system would be established during construction. Mitigation measure **AB-3** also would be applied to operation and maintenance activities. By implementing mitigation measure **AB-3**, the introduction or transfer of invasive aquatic species would not occur.

Decommissioning Impacts

Removal of project structures during decommissioning would result in the same types of impacts discussed for construction activities. Direct disturbance to aquatic habitat would occur as a result of vehicle traffic across streams. The Applicant would be responsible for reclamation of access roads following abandonment in accordance with landowner's or land agency's direction. Water quality changes involving increased sediment and fuel spill risks would occur as a result of vehicle traffic within or near waterbodies. The potential spread of invasive aquatic species also could result from vehicle crossings and movement between drainages. The same BMPs and design features would be applied to reduce impacts during decommissioning activities. Removal of riparian vegetation would not be required as part of decommissioning.

3.9.6.3 Region I

Table 3.9-7 provides a comparison of impacts associated with the alternative routes in Region I. BMPs, design features, and mitigation measures would be implemented to reduce impacts to aquatic biological resources in the potentially affected waterbodies. Game fish occurrences for Region I's 2-mile transmission line corridors are provided in **Appendix G**, **Table G-4** for streams and **Table G-5** for waterbodies (i.e., reservoirs, lakes, and springs).

A road density analysis was used as an indicator of potential sediment effects on perennial streams. The methodology for this analysis is provided in Section 3.4, Water Resources. The results of the road density analysis for Region I alternatives is provided in **Table 3.4-7**.

Table 3.9-7 Summary of Region I Alternative Route Impact Parameters for Aquatic Biological Resources

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Number of Named Perennial Streams[1] Crossed by 250-foot-wide transmission line ROW	2	2	18	2
Number of Game Fish Streams Crossed by 250-foot-wide ROW	2	2	8	2
Number of Game Fish Stream 250-foot-wide ROW Crossings	2	2	16	2
Potential Aquatic Habitat Alteration or Loss[2] (feet^2)	0	0	3,600	0
Potential Aquatic Habitat Alteration or Loss (acres)	0	0	0.08	0
Percent of Potentially Affected Habitat Compared to Perennial Habitat in Watersheds	0	0	<0.1	0
Number of Reservoirs/Lakes Located within the 2-mile Wide Transmission Line Corridor	7	4	3	5
Number of Springs Located within the 2-mile Wide Transmission Line Corridor	0	1	1	2

[1] Additional unnamed perennial streams may be crossed by the 250-foot-wide transmission line ROWs.

[2] Habitat loss represents area that could be permanently or temporarily removed due to the use of a culvert or low water crossing or temporarily disturbed from the instream use of equipment. The calculation excludes large rivers such as the Little Snake and Yampa.

Potential ground disturbance effects associated with the construction and operation of Region I alternative ROWs on riparian habitat at 100 and 300-foot buffer distances from streams and lakes, reservoirs, and springs are listed in **Table 3.9-8**. The highest level of potential disturbance is indicated for Alternative I-C. By following stipulations for BLM FOs involving no disturbance or a buffer protection of 300 to 500 feet depending on the BLM FO (see **Appendix C**), impacts on riparian vegetation would be avoided.

Table 3.9-8 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat, Region I

	Alternatives							
	I-A		I-B		I-C		I-D	
	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Streams								
Construction	4	7	3	6	22	59	3	6
Operation	1	2	1	2	6	16	1	2
Reservoirs/Lakes/Springs								
Construction	1	2	<1	1	4	14	2	4
Operation	<1	1	<1	<1	1	3	<1	1

Alternative I-A (Applicant Proposed)

Key Parameters Summary

Alternative I-A would cross two named perennial streams (Little Snake and Yampa rivers), which contain two warmwater game fisheries. There would be no habitat loss or alteration since vehicle crossings or culverts would not occur for larger rivers. Seven reservoirs/lakes are located within Alternative I-A's 2-mile transmission line corridor. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat at the perennial streams located within the construction ROW. Water use for

concrete foundations and construction dust control would be 116 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region I, Alternative I-A. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species.

Alternative I-B

Key Parameters Summary

Alternative I-B would cross the same two named perennial streams (Little Snake and Yampa rivers), as discussed for Alternative I-A. There would be no habitat loss because culverts or direct disturbance would not occur in the Little Snake and Yampa rivers. Four reservoirs/lakes and one spring are located within the Alternative I-B 2-mile transmission line corridor. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat at the perennial streams located within the construction ROW. Water use for concrete foundations and construction dust control would be 119 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region I, Alternative I-B. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species.

Alternative I-C

Key Parameters Summary

Alternative I-C would cross 18 named perennial streams. Eight of the perennial streams contain game fisheries: Muddy Creek (3 crossings), Elkhead Creek (2 crossings), Fortification Creek, Fourmile Creek, Little Bear Creek, Little Cottonwood Creek, Little Snake River, and Yampa River (6 crossings). Three reservoirs/lakes and one spring are located within the Alternative I-C 2-mile transmission line corridor. Potential habitat loss due to possible use of culverts, low water crossing, or temporary disturbance from instream use of equipment could be 3,600 feet^2 (0.08 acre). Large river crossings such as the Green, Little Snake, and Yampa were excluded from the habitat loss estimate because vehicle crossings or culverts would not occur as part of construction. Mitigation measures **AB-1** and **AB-2** would avoid effects on fish passage and game fish spawning. BMPs, design features, and mitigation measures involving herbicide use would be implemented to minimize water quality effects on aquatic habitat at all perennial stream crossings. There could be temporary reductions in macroinvertebrates at stream crossings. Water use for concrete foundations and construction dust control would be 139 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region I, Alternative I-C. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert. Construction traffic could result in reductions in amphibian numbers if the schedule coincides with amphibian movements.

Alternative I-D (Agency Preferred)

Key Parameters Summary

Alternative I-D would cross two named perennial streams (Little Snake and Yampa rivers), both of which contain game fish species. In addition, five reservoirs/lakes and two springs are located within the Alternative I-D 2-mile transmission line corridor. There would be no habitat loss because culverts or direct disturbance would not occur in the Little Snake and Yampa rivers. The same BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat at perennial streams located within the construction ROW. Water use for concrete foundations and construction dust control would be 128 acre-feet. The effect determination of new and existing water depletions would be made after the

water sources are identified and an evaluation of their potential connection to surface flows is completed for Region I, Alternative I-D. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species.

If the Tuttle Easement micro-siting options were implemented, no additional perennial waterbodies would be crossed or impacted by this portion of Alternative I-D.

Alternative Connectors in Region I

The Fivemile Point North, Mexican Flats, and Baggs alternative connectors would include minimal increases of total crossed waterbodies, disturbed areas, and water use if they were to be utilized. The Mexican Flats and Fivemile Point North alternative connectors would cross one impaired waterbody; Muddy Creek would be crossed on the same reach as Alternative I-C. The Baggs Alternative Connector would cross one large floodplain. **Table 3.9-9** summarizes impacts and advantages associated with the alternative connectors in Region I.

Table 3.9-9 Summary of Region I Alternative Connector Impacts for Aquatic Biological Resources

Alternative Connector	Analysis	Impact Conclusion
Fivemile Point North, Fivemile Point South, and Mexican Flats Alternative Connectors	One additional perennial stream (Muddy Creek) is located within the 2-mile transmission line corridor for the Fivemile Point North and Mexican Flats connectors, and could be impacted by vehicle traffic on access roads. No streams are crossed by the Fivemile Point South Alternative Connector.	The disadvantage of using these alternative connectors would be potential increased disturbance to Muddy Creek and aquatic species (invertebrates and possibly nongame fish).
Baggs Alternative Connector	Two additional perennial streams (Little Snake River and Muddy Creek) are located within the 2-mile transmission line corridor. Muddy Creek is located within the ROW and 2-mile wide transmission line corridor.	The disadvantage of using this alternative connector would be potential increased disturbance to habitat in two streams and aquatic species (invertebrates and game and nongame fish).

Alternative Ground Electrode Systems in Region I

The northern ground electrode system would be necessary within 100 miles of the northern terminal as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the proponent. The impacts associated with constructing and operating these alternative systems are related to predominance of intermittent streams within the boundaries for these areas. All of the electrode system alternatives contain intermittent streams and no perennial waterbodies. Potential impacts to intermittent streams would only affect aquatic species if water is present. Short-term impacts could affect macroinvertebrates in 2 to 68 intermittent streams (**Table 3.9-10**). Surface disturbance near Eight Mile Lake (Eight Mile Basin Alternative) would represent a risk for sedimentation on water quality. Erosion control measures would be implemented as part of construction to reduce sediment impact to the lake.

Table 3.9-10 Summary of Region I Alternative Ground Electrode System Impact Indicators

Electrode System	Perennial Crossings	Intermittent Crossings	Total Stream Crossings	Water Use (Acre-Ft)
Separation Flat (All Alterative Routes)	0	25	25	10
Shell Creek (Alternatives I-A and I-D)	0	68	68	25
Little Snake East (Alternatives I-A, I-B, and I-D)	0	16	16	7

Table 3.9-10 Summary of Region I Alternative Ground Electrode System Impact Indicators

Electrode System	Perennial Crossings	Intermittent Crossings	Total Stream Crossings	Water Use (Acre-Ft)
Little Snake West (Alternative I-A)	0	15	15	7
Shell Creek (Alternative I-B)	0	62	62	20
Pio Springs (Alternative I-D)	0	12	12	4
Eight Mile Basin (All Alternatives)	0	7	7	3
Separation Creek (All Alternatives)	0	2	2	10

Region I Conclusion

Based on a comparison of impact parameters for Region I alternatives, potential impacts to aquatic biological resources would be greatest for Alternative I-C. Potential effects for Alternatives I-A, I-B, and I-D (Agency Preferred) would be similar and relatively low compared to Alternative I-C (**Table 3.9-7**). Alternative I-C could result in the greatest alteration or loss of habitat (3,600 feet^2 or 0.08 acre) compared to no loss or alternation of habitat for the other three alternatives. Even though there are differences in potential habitat effects, less than 0.1 percent of available game fish species habitat would be affected for each of the four alternatives. Alternative I-C could result in the highest potential construction disturbance to riparian areas near perennial streams (22 acres at a 100-foot buffer distance and 59 acres at a 300-foot buffer distance) compared to the other three alternatives (3 to 4 acres at the 100-foot buffer distance and 6 to 7 acres at the 300-foot buffer distance) (**Table 3.9-8**). Even though the greatest level of impacts are associated with Alternative I-C, project effects on aquatic species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.9.6.2 and 3.9.6.3 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of aquatic species inhabiting these streams.

3.9.6.4 Region II

Tables 3.9-11 and **3.9-12** provide a summary of impact parameters used to describe impacts for alternative routes in Region II. Game fish occurrences for Region II's 2-mile transmission line corridors are provided in **Appendix G**, **Table G-6** for streams and **Table G-7** for waterbodies.

The road density analysis for Region II alternatives is discussed in Section 3.4, Water Resources, with results provided in **Table 3.4-11**. These results would apply to perennial streams as aquatic habitat for game fish and other aquatic species.

Table 3.9-11 Summary of Region II Alternative Route Impact Parameters for Aquatic Biological Resources

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Number of Named Perennial Streams[1] Crossed by 250-foot-wide transmission line ROW	26	27	29	26	39	30
Number of Game Fish Streams Crossed by 250-foot-wide ROW	14	11	13	17	13	12
Number of Game Fish Stream 250-foot-wide ROW Crossings	14	16	13	18	21	18

Table 3.9-11 Summary of Region II Alternative Route Impact Parameters for Aquatic Biological Resources

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Potential Aquatic Habitat Alteration or Loss[2] (feet^2)	10,000	19,600	22,000	7,200	17,600	7,200
Potential Aquatic Habitat Alteration or Loss (acres)	0.23	0.45	0.51	0.17	0.40	0.17
Percent of Potentially Affected Habitat Compared to Perennial Habitat in Watersheds	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Number of Reservoirs/Lakes Located within the 2-mile Transmission Line Corridors	4	4	3	5	3	4
Number of Springs Located within the 2-mile Transmission Line Corridors	6	7	5	2	7	5

[1] Additional unnamed perennial streams may be crossed by the 250-foot-wide transmission line ROWs.

[2] Habitat loss represents area that could be permanently or temporarily removed due to the use of a culvert or low water crossing or temporarily disturbed from the instream use of equipment. The calculation excludes large rivers such as the Duchesne, Green, Price, Sevier, and White.

Table 3.9-12 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat, Region II

	Alternatives											
	II-A		II-B		II-C		II-D		II-E		II-F	
	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Streams												
Construction	40	102	53	126	39	105	33	110	99	273	46	126
Operation	14	38	15	38	10	28	11	34	26	72	18	51
Reservoirs/Lakes/Springs												
Construction	7	19	3	8	7	15	1	2	8	21	1	6
Operation	2	5	1	3	2	4	<1	1	1	4	<1	2

Potential ground disturbance effects associated with the construction and operation of Region II alternative ROWs on riparian habitat at 100 and 300-foot buffer distances from streams and lakes, reservoirs, and springs are listed in **Table 3.9-12**. The highest level of potential riparian disturbance is indicated for Alternative II-E. By following stipulations for BLM FOs and USFS restrictions involving no disturbance or a buffer protection of 100 to 500 feet (see **Appendix C**), impacts on riparian vegetation would be avoided.

Alternative II-A (Applicant Proposed)

Key Parameters Summary

Alternative II-A would cross 26 named perennial streams. Fourteen of these streams contain game fish species: Bennie Creek, Currant Creek (3 crossings – one each in Duchesne, Juab, and Wasatch counties), Duchesne River, Green River, Hop, Lake Fork, Nebo Creek, Red Creek, Salt Creek (2 crossings), Soldier Creek (2 crossings), Strawberry River (2 crossings), Thistle Creek, Tie Fork, and

Willow Creek. The Strawberry River has been designated a Blue Ribbon Fishery. Potential habitat loss due to possible use of culverts, low water crossings, or temporary disturbance from instream use of equipment would be 10,000 ft^2 (0.23 acre). Large rivers such as the Green were excluded from the habitat loss estimate. Four reservoirs/lakes (Box Elder Reservoir, Box Elder Reservoir 2, and Box Elder 3 in Moffat County, Colorado; and Starvation Reservoir in Duchesne County, Utah) and six springs are located within the Alternative II-A 2-mile transmission line corridor. All four reservoirs contain game fish species. Mitigation measures **AB-1** and **AB-2** would avoid effects on fish passage and game fish spawning in the game fish streams. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat at all 26 perennial stream crossings. There could be temporary reductions in macroinvertebrates in streams where vehicle crossings or culverts are required. Water use for concrete foundations and construction dust control would be 192 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region II, Alternative II-A. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert.

The Strawberry IRA (segments 320.101 through 320.103) micro-siting options 1 through 3 would not substantially affect aquatic biological resources in comparison to segment 320.10. Similarly, the Cedar Knoll IRA (segments 320.151 and 320.152) micro-siting options 1 and 2 would not substantially affect aquatic biological resources in comparison to segment 320.15.

USFS MIS

In total, six perennial streams (Sheep, Soldier [2 crossings], Tie Fork, Willow, and Salt creeks and the Strawberry River) are located within the Alternative II-A 2-mile transmission line corridor in one National Forest (Uinta-Wasatch-Cache) (**Appendix G**, **Table G-13**). Four of these streams (Soldier, Tie Fork, and Willow creeks and the Strawberry River) contain MIS (Bonneville cutthroat trout and Colorado River cutthroat trout).Three of the streams are crossed by the 250-foot-wide transmission line ROW, which could result in a direct loss of aquatic habitat of 1,200 ft^2 (0.03 acre), if culverts or low water construction is required.

Alternative II-B

Key Parameters Summary

Alternative II-B would cross 27 named perennial streams. Eleven of these streams contain game fish species: Bitter Creek, Dry Pole Creek, Green River (2 crossings), Huntington Creek (2 crossings), Lowry River, North Fork Pleasant Creek, Pleasant Creek, Price River, San Pitch River, Sevier River (2 crossings), and the White River. Potential aquatic habitat loss would be 19,600 ft^2 (0.45 acre). Large rivers such as the Green Price, Sevier, and White were excluded from the habitat loss estimate. Mitigation measures **AB-1** and **AB-2** would avoid effects on fish passage and game fish spawning in the 11 game fish streams. Four reservoirs/lakes (Cactus Reservoir in Rio Blanco County, Colorado; Huntington Reservoir and Potters Pond in Emery County, Utah; and Dog Valley Reservoir in Juab County, Utah) and seven springs are located within the Alternative II-B 2-mile transmission line corridor. Except for Dog Valley Reservoir, these reservoirs or ponds contain game fish species. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat at all 27 perennial stream crossings. There could be temporary reductions in macroinvertebrates in streams where vehicle crossings or culverts are required. Water use for concrete foundations and construction dust control would be 258 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region II, Alternative II-B. After implementing the BMPs, design features, and additional mitigation measures, there

would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert.

USFS MIS

In total, six perennial streams (Deer, Dry Pole, Indian, North Fork Coal, and Straight Fork creeks and the Lowry River), one spring, and one pond are located within the Alternative II-B 2-mile transmission line corridor in one National Forest (Manti-LaSal) (**Appendix G**, **Table G-13**). The MIS group, macroinvertebrates, occurs in all of these waterbodies. Two streams contain fish MIS (Bonneville cutthroat trout in Dry Pole Creek and Colorado River cutthroat trout in the Lowry River). Based on four 250-foot-wide transmission line ROW crossings of streams, there could be a direct loss of aquatic habitat of 1,600 ft^2 (0.04 acre), if culverts or low water construction is required.

The Strawberry IRA and Cedar Knolls IRA micro-siting adjustments would not substantially affect the impact analysis for aquatic biological resources.

Alternative II-C

Key Parameters Summary

Alternative II-C would cross 29 named perennial streams. Thirteen of these streams contain game fish species: Blackham Creek, Bitter Creek, Gooseberry Creek, Green River (2 crossings), Ivie Creek, Meadow Creek, Little Creek, Lost Creek, Niotche Creek, Sevier River (2 crossings), White River, Willow Creek, and Yogo Creek. Potential aquatic habitat loss would be 22,000 ft^2 (0.51 acre). Large rivers such as the Green and White were excluded from the habitat loss estimate. Three reservoirs/lakes (Cactus Reservoir in Rio Blanco County, Colorado; Saleratus Reservoir in Sevier County, Utah; and Scipio Lake in Millard County, Utah) and five springs are located within the Alternative II-C 2-mile transmission line corridor. Game fish are present in these three reservoirs/lakes. Mitigation measures **AB-1** and **AB-2** would avoid adverse effects on fish passage and game fish spawning in the game fish streams. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat at all 29 perennial stream crossings. There could be temporary reductions in macroinvertebrates at streams with substrate disturbance. Water use for concrete foundations and construction dust control would be 272 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region II, Alternative II-C. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area of disturbance associated with a culvert.

The Strawberry IRA micro-siting adjustments would not substantially affect the impact analysis for aquatic biological resources.

USFS MIS

In total, six perennial streams (Ivie, Little, Meadow, Niotche, Phara, and Saleratus creeks), one reservoir, and four springs are located within the Alternative II-C 2-mile transmission line corridor in one national forest (Fishlake) (**Appendix G**, **Table G-13**). Four of these streams (Ivie, Little, Meadow, and Niotche creeks) contain MIS (brown, cutthroat, or rainbow trout). Two of the streams are crossed by the 250-foot-wide transmission line ROW, which could result in a direct loss of aquatic habitat of 800 ft^2, if culverts or low water construction is required.

Alternative II-D

Key Parameters Summary

Alternative II-D would cross 26 named perennial streams, with 17 streams containing game fish species. Each of these streams would be crossed once by the ROW: Argyle Creek, Gooseberry Creek, Cottonwood Creek (Emery County, Utah), Green River, Hop Creek, Huntington Creek, North Fork Gordon Creek, Minnie Maud Creek, Mud Creek, Oak Creek, Price River, Salt Creek, San Pitch River, Soldier Creek, Upper Huntington Creek, White River, and Willow Creek. Potential aquatic habitat loss would be 7,200 ft^2 (0.17 acre). Large rivers such as the Green and White were excluded from the habitat loss estimate. Five reservoirs/lakes and two springs are located within the Alternative II-D 2-mile transmission line corridor. The reservoir/lakes include Box Elder, Box Elder 2, and Box Elder 3 in Moffat County, Colorado; Boulger Reservoir in Sanpete County, Utah; and Electric Lake in Emery County, Utah. Game fish are present in all five of these reservoirs/lakes. Mitigation measures **AB-1** and **AB-2** would avoid adverse effects on fish passage and game fish spawning in the game fish streams. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat at all 26 perennial stream crossings. There could be temporary reductions in macroinvertebrates at streams with substrate disturbance. Water use for concrete foundations and construction dust control would be 195 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region II, Alternative II-D. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area of disturbance associated with a culvert.

USFS MIS

Seven streams (Cottonwood, Dry, Gooseberry, Huntington, Maple Fork, Upper Huntington, and White Pine Fork) and two reservoirs (Boulger Reservoir and Electric Lake) in the Manti-LaSal NF occur within the Alternative II-D 2-mile transmission line corridor (**Appendix G**, **Table G-13**). All of these waterbodies contain the MIS group, macroinvertebrates. Two streams (Huntington and Cottonwood creeks) contain fish MIS, Bonneville cutthroat trout and Colorado River cutthroat trout, respectively. Six streams are crossed by the 250-foot-wide transmission line ROW, which could result in direct loss of aquatic habitat of 2,400 ft^2, if culverts or low water construction is required.

Alternative II-E

Key Parameters Summary

Alternative II-E would cross 39 named perennial streams, with 13 streams containing game fish species. Several of these streams would be crossed multiple times, with a total of 21 ROW crossings for this alternative. The number of ROW crossings by game fish stream would include Argyle Creek (3), Beaver Creek (1), Duchesne River (1), Green River (1), Hop Creek (1), Lake Fork Creek (1), Lake Fork River (1), Price River (2), Soldier Creek (5), Tabbyune Creek (1), Thistle Creek (1), Tie Fork Creek (1), and Willow Creek (2). Four additional streams (Bennie, Nebo, Tabbyune, and the White River) are located within the 2-mile transmission line corridor. Potential aquatic habitat loss would be 17,600 ft^2 (0.4 acre). Large rivers such as the Duchesne, Green, Price, and White were excluded from the habitat loss estimate. Three reservoirs/lakes (Box Elder Reservoir, Box Elder Reservoir 2, and Box Elder Reservoir 3 in Moffat County, Colorado) and seven springs are located within the Alternative II-E 2-mile transmission line corridor. Game fish occur in these three reservoirs. The same BMPs, design features, and mitigation measures discussed for other Region II alternatives would be applied to Alternative II-E. Water use for concrete foundations and construction dust control would be 199 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region II, Alternative II-E. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species, other than the small area of disturbance associated with a culvert.

The Strawberry IRA and Cedar Knoll IRA micro-siting options would not substantially affect aquatic biological resources in comparison to the comparable segments of Alternative II-E.

USFS MIS

The Alternative II-E 2-mile transmission line corridor overlaps with waterbodies in the following national forests: Uinta-Wasatch-Cache (Indian, Sheep, and Tie Fork creeks), Manti-LaSal (Long Hollow, Lookout, and Sky High springs), and Ashley (Sowers Creek). MIS occurrence includes Bonneville cutthroat trout in Tie Fork Creek and macroinvertebrates in Sowers Creek. Potential direct loss of aquatic habitat includes 1,200 ft^2 (0.03 acre) in the Uinta-Wasatch-Cache National Forest and 400 ft^2 (0.01 acre) in the Ashley National Forest, if culverts or low water construction is required. No habitat loss would occur in the Manti-LaSal National Forest, since the 250-foot-wide transmission line ROW does not cross the three springs.

Alternative II-F (Agency Preferred)

Key Parameters Summary

A total of 30 named perennial streams are located within the Alternative II-F 2-mile transmission line corridor. Game fish species occur in 21 of the streams located within the 2-mile transmission line corridor. Three reservoirs and eight springs also are located within the 2-mile transmission line corridor. The reservoirs contain game fish species (Box Elder, Box Elder Number 2, and Box Elder Number 3). Twelve game fish streams are crossed by the 250-foot-wide transmission line ROW, with a total of 18 crossings when considering multiple stream crossings. The number of ROW crossings by stream would include Argyle Creek (2), Green River (1), Hop Creek (1), Lake Fork Creek (1), Sevier River (2), Soldier Creek (5), Tabbyune Creek (1), Thistle Creek (1), Tie Fork Creek (1), White River (1), White River Right Fork (1), and Willow Creek (1). Potential habitat loss due to the addition of a culvert or equipment disturbance during low water construction would be approximately 9,600 ft^2 (0.22 acre). Large rivers such the Green, Sevier, and White were excluded from this estimate. Three reservoirs (Box Elder, Box Elder #2, and Box Elder #3 in Moffat County, Colorado) and five springs are located within the 2-mile transmission line corridor. All three reservoirs contain game fish species. Mitigation measures **AB-1** and **AB-2** would avoid effects on fish passage and game fish spawning periods in the game fish streams. The same BMPs, design features, and mitigation measures discussed for the other alternatives would be implemented to minimize water quality effects on aquatic habitat and species. Water use for concrete foundations and construction dust control would be 199 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects other than the small area of disturbance associated with a culvert.

The Strawberry IRA and Cedar Knoll IRA micro-siting options would not substantially affect aquatic biological resources in comparison to the comparable segments of Alternative II-F.

USFS MIS

The Alternative II-F transmission line corridor crosses five streams in the Uinta-Wasatch-Cache NF (Indian, Sheep, Tie Fork, Soldier, and Salt creeks) and three springs (Long Hollow, Lookout, and Sky High) in the Manti-LaSal National Forest (**Appendix G**, **Table G-13**). The MIS, Bonneville cutthroat trout, occurs in two streams: Tie Fork and Soldier creeks. Both streams are crossed by the 2-mile transmission line corridor, while Tie Fork Creek is also crossed by the 250-foot-wide transmission line ROW. Potential direct loss of habitat would be 400 ft^2 (0.01 acre), if a culvert or low water construction is required.

Alternative Variation in Region II

Emma Park Alternative Variation

Potential impacts of constructing the Emma Park Alternative Variation on aquatic biological resources would be similar to the comparable portion of Alternative II-F, based on the number of perennial streams located within the 2-mile transmission line corridors. In total, seven streams (Horse, Kyune, Kyune Right Fork, Tabbyune, Willow, and Bear creeks and White River Fork) are located within the 2-mile transmission line corridor compared to six streams (same as Emma Park Alternative Variation except for Horse Creek) for the comparable portion of Alternative II-F. Five of the streams contain game fish species (Kyune, Kyune Right Fork, Tabbyune, and Willow creeks and White River Right Fork) for both the Emma Park Alternative Variation and Alternative II-F comparable portion. There would be a slightly greater risk of sediment input to Kyune and Tabbyune creeks as a result of the 250-foot-wide transmission line ROW crossings by the Emma Park Alternative Variation. However, erosion control measures would be implemented to reduce sediment-related impacts for the Emma Park Alternative Variation and Alternative II-F.

Alternative Connectors in Region II

The Castle Dale and IPP East alternative connectors do not cross perennial streams. **Table 3.9-13** summarizes impacts and advantages associated with the Price and Highway 191 alternative connectors in Region II.

Table 3.9-13 Summary of Region II Alternative Connector Impacts for Aquatic Biological Resources

Alternative Connector	Analysis	Advantage
Price	There are two perennial streams (Miller and South Gordon creeks) within the 250-foot-wide transmission line ROW. These streams do not support game fish species.	There are no apparent unique opportunities or constraints for aquatic biological resources by utilizing this connector.
Highway 191	One perennial stream (Willow Creek) is crossed by this connector's 250-foot-wide transmission line ROW. This stream contains brown trout.	There is no apparent unique opportunities or constraints for aquatic biological resources by utilizing this connector.

USFS MIS

No National Forest System lands are crossed by the variations in Region II.

Region II Conclusion

Based on a comparison of potential habitat disturbance for Region II alternatives, potential impacts to aquatic biological resources would be greatest for Alternatives II-B, II-C, and II-E. Potential effects for Alternatives II-A, II-D, and II-F (Agency Preferred) would be similar and lower compared to Alternatives II-B, II-C, and II-E (**Table 3.9-11**). Alternatives II-B, II-C, and II-E could result in the greatest potential alteration or loss of habitat (17,600 to 22,000 ft^2 or 0.4 to 0.51 acre) compared to 7,200 to 10,000 ft^2 or 0.17 to 0.23 acre for Alternatives II-A, II-D, and II-F. Even though there are differences in potential habitat effects, less than 0.1 percent of the available game fish species habitat would be affected for each of the six alternatives. Alternative II-E could result in the highest potential construction disturbance to riparian areas near perennial streams (99 acres at a 100-foot buffer distance and 273 acres at a 300-foot buffer distance) (**Table 3.9-12**). Potential disturbance to riparian habitat for the other five alternatives were similar and less compared to Alternative II-E. Alternative II-F (Agency Preferred) ranked in the middle portion of the riparian disturbance estimates. Even though the greatest level of impacts are

associated with Alternatives II-B, II-C, and II-E, project effects on aquatic species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.9.6.2 and 3.9.6.4 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of aquatic species inhabiting these streams.

3.9.6.5 Region III

Tables 3.9-14 and **3.9-15** provide a summary of impact parameters used to describe impacts for alternative routes in Region III. Game fish occurrences for Region III's 2-mile transmission line corridors are provided in **Appendix G**, **Table G-8** for streams and **Table G-9** for waterbodies.

Table 3.9-14 Summary of Region III Alternative Route Impacts for Aquatic Biological Resources

Parameter	Alternative III-A	Alternative III-B	Alternative III-C
Number of Named Perennial Streams[1] Crossed by 250-foot-wide transmission line ROW	4	3	1
Number of Game Fish Streams Crossed by 250-foot-wide ROW	0	2	1
Number of Game Fish Stream 250-foot-wide ROW Crossings	0	2	1
Potential Aquatic Habitat Alteration or Loss[2] (ft^2)	1,600	1,200	400
Potential Aquatic Habitat Alteration or Loss (acres)	0.04	0.03	0.01
Percent of Potentially Affected Habitat Compared to Perennial Habitat in Watersheds	<0.1	<0.1	<0.1
Number of Reservoirs/Lakes Located within the 2-mile Transmission Line Corridors	3	7	4
Number of Springs Located within the 2-mile Transmission Line Corridors	16	9	10

[1] Additional unnamed perennial streams may be crossed by the 250-foot-wide transmission line ROWs.

[2] Habitat loss represents area that could be permanently or temporarily removed due to the use of a culvert or low water crossing or temporarily disturbed from the instream use of equipment.

Table 3.9-15 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat, Region III

	Alternatives					
	III-A		III-B		III-C	
	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Streams						
Construction	5	17	3	8	<1	<1
Operation	2	5	1	2	<1	<1
Reservoirs/Lakes/Springs						
Construction	3	5	3	4	3	5
Operation	1	1	1	1	1	1

The road density analysis for Region III alternatives is discussed in Water Resources, Section 3.4, with results provided in **Table 3.4-14**. These results would apply to perennial streams as aquatic habitat for game fish and other aquatic species.

Potential ground disturbance effects associated with the construction and operation of Region III alternative ROWs on riparian habitat at 100- and 300-foot buffer distances from streams and lakes, reservoirs, and springs are listed in **Table 3.9-15**. The highest level of potential riparian disturbance is indicated for Alternatives III-A and III-B. By complying with stipulations for BLM FOs that prohibit surface disturbance within 328 feet of streams and lakes (see **Appendix C**), impacts on riparian vegetation would be avoided.

Alternative III-A (Applicant Proposed)

Key Parameters Summary

Alternative III-A would cross four named perennial streams. None of the perennial streams crossed by this alternative contain game fish species. Potential habitat loss due to possible use of culverts, low water crossing, or temporary disturbance from instream use of equipment would be 1,600 ft^2 (0.04 acre), if culverts or low water construction is required. Three reservoirs/lakes (Smelter Knolls Reservoir in Millard County, Utah; Lower Big Wash Reservoir in Beaver County, Utah; and Newcastle Reservoir in Iron County, Utah) and sixteen springs are located within the Alternative III-A 2-mile transmission line corridor. One of these waterbodies (Newcastle Reservoir) contains game fish species. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat in the stream crossings. There could be temporary reductions in macroinvertebrates in streams with substrate disturbance. Water use for concrete foundations and construction dust control would be 206 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region III, Alternative III-A. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert.

USFS MIS

In total, two perennial streams (Magotsu and Spring creeks) and six springs are located within the Alternative III-A 2-mile transmission line corridor in the Dixie National Forest (**Appendix G, Table G-13**). Both streams (Magotsu and Spring creeks) contain MIS Virgin spinedace. No MIS occur in the springs. Both streams are crossed by the 250-foot-wide transmission line ROW, which could result in a direct loss of aquatic habitat of 800 ft^2 (0.02 acre), if culverts or low water construction is required.

Alternative III-B (Agency Preferred)

Key Parameters Summary

Alternative III-B would cross three named perennial streams. Two of the perennial streams (Clover Creek and Meadow Valley Wash) are crossed by the 2-mile transmission line corridor and the 250-foot-wide ROW. Meadow Valley Wash also is crossed by the 250-foot-wide transmission line ROW. These streams contain game fish species (rainbow trout) and nongame native fish species. Potential habitat loss would be 1,200 ft^2 (0.03 acre), if culverts or low water construction is required. Seven reservoirs/lakes and nine springs are located within the Alternative III-B 2-mile transmission line corridor. The reservoirs/lakes include Smelter Knolls, West Clay Knoll, and West Marshall Tract reservoirs in Millard County, Utah; Lower Big Wash Reservoir in Beaver County, Utah; and Rolling Hills, Jacks Canyon, and Lafes reservoirs in Lincoln County, Nevada. None of the waterbodies contain game fish species. Mitigation measures **AB-1** and **AB-2** would avoid effects on fish passage and game fish spawning in the two game fish streams. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat in the stream crossings. There could be temporary reductions in macroinvertebrates in streams with substrate

disturbance. Water use for concrete foundations and construction dust control would be 212 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region III, Alternative III-B. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than a small area associated with a culvert.

USFS MIS

No National Forest System lands are crossed by the Alternative III-B 2-mile transmission line corridor or 250-foot-wide transmission line ROW (**Appendix G**, **Table G-13**).

Alternative III-C

Key Parameters Summary

Alternative III-C would cross one named perennial stream, Meadow Valley Wash, which contains game fish species (rainbow trout). Potential habitat loss would be 400 ft^2 (0.01 acre). Four reservoirs/lakes (Smelter Knolls, West Clay Knoll, and West Marshall Tract reservoirs in Millard County, Utah; and Lower Big Wash Reservoir in Beaver County, Utah) and 10 springs are located within the Alternative III-C 2-mile transmission line corridor. None of these waterbodies contain game fish species. Mitigation measures **AB-1** and **AB-2** would avoid effects on fish passage and game fish spawning in the one game fish stream. BMPs, design features, and mitigation measures involving herbicide use, erosion control, and refueling restrictions near streams would be implemented to minimize water quality effects on aquatic habitat in the stream crossings. There could be temporary reductions in macroinvertebrates in streams with substrate disturbance. Water use for concrete foundations and construction dust control would be 230 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region III, Alternative III-C. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert.

USFS MIS

No National Forest System lands are crossed by the Alternative III-C 2-mile transmission line corridor or 250-foot-wide transmission line ROW.

Alternative Variations in Region III

Table 3.9-16 provides a comparison of impacts associated with the alternative variations in Region III. The number of perennial streams crossed by the Ox Valley East and West Variations is one compared to one perennial stream by the comparable portion of Alternative III-A. These streams (Spring and Magotsu creeks) do not contain game fish species. Potential road crossings of these streams could result in habitat alteration and potential water quality impacts. Five perennial streams (South Fork Pinto, Little Pinto, Magotsu, and Pinto creeks, and the Santa Clara River) are located within the 2-mile transmission line corridor, with 8 crossings of the 250-foot-wide transmission line ROW. Three of these streams (South Pinto Creek, Pinto Creek, and the Santa Clara River) contain game fish. The comparable portion of the Alternative III-A Alternative crosses one perennial stream (Spring Creek). BMPs and design features would minimize impacts to aquatic habitat and species. There would be slightly higher risk to amphibian mortalities during construction for the two variations due to the higher ROW mileage. These potential impacts to amphibians would be short-term in duration and expected to cause relatively low mortality numbers.

Table 3.9-16 Summary of Region III Alternative Variation Impacts for Aquatic Biological Resources

Parameter	Ox Valley East Alternative Variation	Comparable Portion of Alternative III-A	Ox Valley West Alternative Variation	Comparable Portion of Alternative III-A	Pinto Alternative Variation	Comparable Portion of Alternative III-A
Number of Named Perennial Streams[1] Crossings by 250-foot-wide transmission line ROW	1	1	1	1	8	1
Number of Game Fish Streams Crossed by 250-foot-wide transmission line ROW	0	0	0	0	1	0
Number of Game Fish Streams Crossed by 2-mile Transmission Line Corridors	0	0	0	0	1	0

[1]Additional unnamed perennial streams are crossed by the 250-foot-wide transmission line ROWs.

USFS MIS

Waterbodies that occur within Region III variations on Dixie National Forest lands are listed in **Appendix G**, **Table G-14**. The following alternative variations overlap with waterbodies in the Dixie National Forest:

- Ox Valley East – 2 streams and 6 springs with MIS (Virgin spinedace) in Spring Creek;
- Ox Valley West – 1 stream with MIS (Virgin spinedace) in Spring Creek;
- Ox Valley East and West – 1 stream and 3 springs with no MIS; and
- Pinto – 5 streams and 4 springs with MIS in Magotsu Creek (Virgin spinedace), South Fork Pinto Creek (rainbow trout), Pinto Creek (rainbow trout), and Santa Clara River (brook, brown, and rainbow trout).

Alternative Connectors in Region III

The Avon and Moapa Alternative Connectors does not cross perennial streams.

Alternative Ground Electrode Systems in Region III

The southern ground electrode system would be necessary within 100 miles of the southern terminal. Conceptual locations and connections are analyzed. Impacts associated with the construction and operation of this system would be the same as discussed for Alternative I-A. **Table 3.9-17** provides a comparison of alternative electrode bed locations proposed near the southern terminal. Some locations might serve multiple alternative routes, while others could only be associated with a certain alternative route. Impacts on aquatic biological resources would be limited to intermittent streams. Macroinvertebrate communities could be affected on a short-term basis if water is present.

Table 3.9-17 Summary of Region III Alternative Ground Electrode System Location Impacts for Aquatic Biological Resources

	Number of Perennial	Number of Intermittent	Number of Reservoirs/ Lakes	Total Number of Waterbodies	Water Use (acre-feet)
Mormon Mesa- Carp Elgin Rd (Alternative III-A)	0	4	8	12	4
Halfway Wash- Virgin River (Alternative III-A)	0	3	0	3	3

Table 3.9-17 Summary of Region III Alternative Ground Electrode System Location Impacts for Aquatic Biological Resources

	Number of Perennial	Number of Intermittent	Number of Reservoirs/ Lakes	Total Number of Waterbodies	Water Use (acre-feet)
Halfway Wash E (Alternative III-A)	0	12	0	12	6
Mormon Mesa- Carp Elgin Rd (Alternative III-B)	0	5	8	13	6
Halfway Wash-Virgin River (Alternative III-B)	0	3	0	3	4
Halfway Wash E (Alternative III-B)	0	1	0	1	6
Meadow Valley 2 (Alternative III-C)	0	27	0	27	16
Delta (Design Option 2)	0	16	0	16	14

[1] Estimation of water use based on assumptions provided for construction of 500-kV DC transmission line.

Region III Conclusion

Based on a comparison of impact parameters for Region III alternatives, potential impacts to aquatic biological resources would be slightly higher for Alternatives III-A (Applicant Proposed) and III-B (Agency Preferred) compared to Alternative III-C (**Table 3.9-14**). Alternatives III-A and III-B could result in the greatest potential alteration or loss of habitat (1,200 ft^2 to 1,600 ft^2 or 0.03 to 0.04 acre) compared to 400 ft^2 or 0.01 acre for Alternative III-C. Even though there are differences in potential habitat effects, less than 0.1 percent of the available aquatic habitat would be affected for each of the three alternatives. Alternatives III-A and III-B also could result in the highest potential construction disturbance to riparian areas near perennial streams (3 to 5 acres at a 100-foot buffer distance and 8 to 17 acres at a 300-foot buffer distance) compared to Alternative III-C (<1 acre for both buffer distances) (**Table 3.9-15**). Even though the greatest level of impacts are associated with Alternatives III-A and III-B, project effects on aquatic species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.9.6.2 and 3.9.6.5 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of aquatic species inhabiting these streams.

3.9.6.6 Region IV

Tables 3.9-18 provide a list of impact parameters associated with alternative routes in Region IV. Game fish occurrences for Region IV's 2-mile transmission line corridors are provided in **Appendix G**, **Table G-10** for streams and **Table G-11** for waterbodies.

Table 3.9-18 Summary of Region IV Alternative Route Impacts for Aquatic Biological Resources

Parameter	Alternative IV-A (Applicant Proposed)	Alternative IV-B	Alternative IV-C
Number of Named Perennial Streams[1] Crossed by 250-foot-wide transmission line ROW	1	4	3
Number of Game Fish Streams Crossed by 250-foot-wide ROW	1	1	1
Number of Game Fish Stream 250-foot-wide ROW Crossings	1	0	0
Potential aquatic habitat alteration or loss[2] (ft^2)	400	1,600	1,200
Potential Aquatic Habitat Alteration or Loss (acres)	0.01	0.04	0.03

Table 3.9-18 Summary of Region IV Alternative Route Impacts for Aquatic Biological Resources

Parameter	Alternative IV-A (Applicant Proposed)	Alternative IV-B	Alternative IV-C
Percent of Potentially Affected Habitat Compared to Perennial Habitat in Watersheds	<0.1	<0.1	<0.1
Number of Reservoirs/Lakes Located within the 2-mile Transmission Line Corridors	1	1	4
Number of Springs Located within the 2-mile Transmission Line Corridors	0	0	0

[1] Additional unnamed perennial streams are crossed by the 250-foot-wide transmission line ROWs.

[2] Habitat loss represents area that could be permanently or temporarily removed due to the use of a culvert or low water crossing or temporarily disturbed from the instream use of equipment.

The road density analysis for Region IV alternatives is discussed in Water Resources, Section 3.4, with results provided in **Table 3.4-19**. These results would apply to perennial streams as aquatic habitat for game fish and other aquatic species.

Table 3.9-19 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat, Region IV

	Alternatives					
	IV-A		IV-B		IV-C	
	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Streams						
Construction	<1	<1	2	5	1	3
Operation	<1	<1	<1	1	<1	1
Reservoirs/Lakes/Springs						
Construction	3	5	2	3	2	3
Operation	1	1	2	2	2	2

Potential ground disturbance effects associated with the construction and operation of Region IV alternative ROWs on riparian habitat at 100 and 300-foot buffer distances from streams and lakes, reservoirs, and springs are listed in **Table 3.9-19**. The potential riparian disturbance associated with perennial streams would be slightly higher for Alternatives IV-B and IV-C compared to IV-A. Potential disturbance to riparian areas associated with reservoirs was slightly higher for Alternative IV-A. There are no stipulations for BLM FOs involving buffer protection for riparian areas.

Alternative IV-A (Applicant Proposed and Agency Preferred)

Key Parameters Summary

Alternative IV-A would cross one named perennial stream (Las Vegas Wash), which contains one warmwater game fish species, largemouth bass. Potential habitat loss due to possible use of culverts, low water crossing, or temporary disturbance from instream use of equipment would be 400 feet^2 or 0.01 acre One reservoir/lake is located within the Alternative IV-A 2-mile transmission line corridor. Mitigation measure WR-1 would avoid crossing Las Vegas Wash to eliminate additional impacts to an impaired

stream. As a result of this measure, there would be no impacts on aquatic habitat and species on game fish streams for Alternative IV-A. BMPs, design features, and mitigation measures involving herbicide use would be implemented to minimize water quality effects on aquatic habitat at the perennial stream crossings. There could be temporary reductions in macroinvertebrates at stream crossings. Water use for concrete foundations and construction dust control would be 28 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region IV, Alternative IV-A. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert.

Alternative IV-B

Key Parameters Summary

Alternative IV-B would cross four named perennial streams. Hemenway Wash is crossed at three locations by the 250-foot-wide transmission line ROW and 2-mile transmission line corridor. Las Vegas Wash is crossed only by the 2-mile wide corridor. Las Vegas Wash is a game fish stream. Potential habitat loss due to possible use of culverts, low water crossing, or temporary disturbance from instream use of equipment would be 1,600 ft^2 or 0.04 acre. One reservoir/lake is located within the Alternative IV-B 2-mile transmission line corridor. There would be no impacts on aquatic habitat and species in Las Vegas Wash for Alternative IV-B due to the implementation of mitigation measure WR-1 (avoid crossing impaired streams). BMPs, design features, and mitigation measures involving herbicide use would be implemented to minimize water quality effects on aquatic habitat in the stream crossings. There could be temporary reductions in macroinvertebrates at the other stream crossings. Water use for concrete foundations and construction dust control would be 29 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region IV, Alternative IV-B. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert.

Alternative IV-C

Key Parameters Summary

Alternative IV-C would cross three named perennial streams (Hemenway Wash at two locations and Las Vegas Wash). Las Vegas Wash is a game fish stream. Potential habitat loss due to possible use of culverts, low water crossing, or temporary disturbance from instream use of equipment would be 1,200 $feet^2$ or 0.03 acre. Four reservoirs/lakes are located within the Alternative IV-C 2-mile transmission line corridor. There would be no impacts on aquatic habitat and species in Las Vegas Wash for Alternative IV-C due to the implementation of mitigation measure WR-1 (avoid crossing impaired streams). BMPs, design features, and mitigation measures involving herbicide use would be implemented to minimize water quality effects on aquatic habitat in the stream crossings. There could be temporary reductions in macroinvertebrates at the other stream crossings. Water use for concrete foundations and construction dust control would be 33 acre-feet. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed for Region IV, Alternative IV-C. After implementing the BMPs, design features, and additional mitigation measures, there would be no long-term effects on aquatic habitat and species other than the small area associated with a culvert.

Alternative Variations in Region IV

No waterbodies are crossed by the Marketplace Alternative Variation.

Alternative Connectors in Region IV

Table 3.9-20 tabulates impacts for the alternative connectors in Region IV. There would be no impacts for the Sunrise Mountain, Lake Las Vegas, Three Kids Mine, and Railroad Pass alternative connectors.

Table 3.9-20 Summary of Region IV Alternative Connector Impacts for Aquatic Biological Resources

Alternative Connector	Analysis	Advantage
River Mountains Alternative Connector	Impacts would be limited to one stream (Hemenway Wash) crossed by this alternative.	There is a slight disadvantage in this alternative, since there would be one stream crossing with perennial reaches.

Region IV Conclusion

Based on a comparison of impact parameters for Region IV alternatives, potential impacts to aquatic biological resources would be slightly higher for Alternatives IV-B and IV-C. Potential effects for Alternatives IV-A (Applicant Proposed and Agency Preferred) would be similar and slightly lower compared to Alternatives IV-B and IV-C (**Table 3.9-18**). Alternatives IV-A and IV-B could result in the greatest potential alteration or loss of habitat (1,200 to 1,600 ft^2 or 0.03 to 0.04 acre) compared to 400 ft^2 or 0.01 acre for Alternative IV-A. Even though there are differences in potential habitat effects, less than 0.1 percent of the available aquatic habitat would be affected for each of the three alternatives. Alternatives IV-B and IV-C also could result in the slightly higher potential construction disturbance to riparian areas near perennial streams (1 to 2 acres at a 100-foot buffer distance and 3 to 5 acres at a 300-foot buffer distance) (**Table 3.9-19**). Potential disturbance to riparian habitat for Alternative IV-A would be <1 acre for both buffer distances. Even though the greatest level of impacts are associated with Alternatives IV-B and IV-C, project effects on aquatic species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Sections 3.9.6.2 and 3.9.6.6 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of aquatic species inhabiting these streams.

3.9.6.7 Impacts to Aquatic Biological Resources from the No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. No project-related disturbance would occur in waterbodies as a result of vehicle traffic or removal of riparian vegetation. No project-related sedimentation or risks to aquatic species from potential fuel spills or introduction of invasive species would occur from the Project. Impacts to aquatic habitat and species would continue at present levels as a result of natural conditions (e.g., annual fluctuations in stream flow due to varying precipitation, erosion, and wildfires) and existing development in drainages within the analysis area.

3.9.6.8 Residual Impacts

The following residual impacts would occur after implementation of BMPs, agency stipulations, design features, and additional mitigation:

- Potential loss or alteration of aquatic habitat in smaller streams that require culverts or vehicle crossings.
- Potential short-term sedimentation effects on aquatic habitat and species as a result of direct disturbance within or adjacent to streams from vehicle traffic.

- Potential loss or disturbance to riparian vegetation along streams on private lands or public lands where the ROW is parallel and adjacent to streams.
- Potential amphibian mortalities from vehicle traffic during amphibian movements to and from waterbodies located within the ROWs.

3.9.6.9 Irreversible and Irretrievable Commitment of Resources

- Potential loss of aquatic habitat in streams that require culverts for vehicle crossings would be irretrievable. However, the habitat loss would be reversible if the culvert was removed at a later time.
- Potential amphibian mortalities from vehicle traffic would be an irretrievable and irreversible loss of a portion of amphibian populations.

3.9.6.10 Relationship Between Local Short-term Uses and Long-term Productivity

The proposed action and alternatives would result in short-term disturbance to aquatic habit but these effects would not affect the long-term productivity of fish, invertebrate, or amphibian populations.

1

3.10 Special Status Aquatic Species

3.10.1 Regulatory Background

Background information on regulatory protection for special status species is provided in Section 3.6, Special Status Plant Species. Regulations that directly influence special status aquatic species management decisions within the analysis area are primarily implemented by the BLM, USFWS, USFS, and state wildlife agencies, which consist of the WGFD, CPW, UDWR, and NDOW. Specific special status species regulations relevant to the proposed project are presented in **Table 3.10-1**.

Table 3.10-1 Relevant Regulations for Special Status Aquatic Species

Topic	Regulation
Aquatic Species (Amphibians, Fish, and Aquatic Invertebrates)	• Endangered Species Act (ESA) of 1973; • BLM Special Status Species Management Policy 6840 (6840 Policy) (Rel. 6-125); • U.S. Forest Service Manual (FSM) 2670; • Colorado Revised Statutes 33-2-105; • Utah Rules R657-3, R657-19, and R657-48; and • Nevada Administrative Code 501.100-503.104.

The analysis for special status aquatic species assumed the BLM and USFS would continue to manage special aquatic status species' habitats on their lands in coordination with the applicable state wildlife agencies (i.e., WGFD, CPW, UDWR, and NDOW). The USFWS would have jurisdiction over the management of ESA-listed species.

3.10.2 Data Sources

Information regarding special status aquatic species and their habitat within the analysis area was obtained from a review of existing published sources, BLM RMPs, USFS Forest Management Plans, BLM, USFS, WGFD, CPW, UDWR, NDOW, and USFWS file information, as well as WYNDD, CNHP, UNHP, and NNHP database information. In addition, information as a result of correspondence with agency fishery biologists was incorporated into this section as appropriate.

3.10.3 Study Area

The analysis area for special status aquatic species encompasses all alternative routes and locations of other project components including terminals and ground electrodes. The analysis area included perennial streams, reservoirs, lakes, and springs that would be crossed by the alternative 250-foot-wide transmission line ROWs and 2-mile-wide transmission line corridors. A downstream reach of approximately 2 miles also was considered as part of the analysis area. This analysis area considered all special status aquatic species and their habitats that may be present, based on available literature and data reviewed for the project. For federally listed fish in the Colorado River Basin, the downstream analysis area extended for at least 10 miles to include potential water depletions. The Platte River Basin also is included in the analysis area for consideration of potential water depletions. For context, impacts are in the project analysis area are discussed in comparison to the watershed area.

3.10.4 Baseline Description

In total, 55 special status aquatic species were evaluated in terms of potential occurrence within the project analysis area. As documented in **Appendix G**, **Table G-3**, 27 species were eliminated from further consideration in this EIS because of a lack of habitat or documented occurrence within the project analysis area. Species carried forward in this EIS include 20 fish, 5 amphibians, and 3 invertebrates (**Table 3.10-2**).

Table 3.10-2 Special Status Aquatic Species Analyzed for the TransWest Express Transmission Project

Common Name	Scientific Name	Status[1]
Arizona toad	*Bufo microscaphus*	BLM; UTSC; CAS
Boreal toad	*Bufo boreas boreas*	FS; CO-E; CAS
Columbia spotted frog	*Rana luteiventris*	FS; NV-P; UTSC
Great Basin spadefoot toad	*Spea intermontana*	BLM
Northern leopard frog	*Rana pipiens*	BLM; NV-P
Bluehead sucker	*Catostomus discobolus*	BLM; CAS
Bonneville cutthroat trout	*Oncorhynchus clarki utah*	BLM; FS; UTSC; CAS
Bonytail (CH)[3]	*Gila elegans*	FE; BLM
Colorado pikeminnow (CH)[3]	*Ptychocheilus lucius*	FE; BLM
Colorado River cutthroat trout	*Oncorhynchus clarki pleuriticus*	BLM; FS; CAS
Flannelmouth sucker	*Catostomus latipinnis*	BLM; CAS
Humpback chub (CH)[3]	*Gila cypha*	FE, BLM
June sucker	*Chasmistes liorus*	FE; BLM; UTSC
Least chub	*Iotichthys phlegethontis*	FC; BLM; UTSC; CAS
Meadow Valley Wash desert sucker	*Catostomus clarkii* spp.	BLM; NV-P
Meadow Valley Wash speckled dace	*Rhinicthys osculus* subspecies	BLM
Moapa speckled dace	*Rhinichthys osculus moapae*	NV
Moapa White River springfish	*Crenichthys baileyi moapae*	NV
Mountain sucker	*Catostomus platyrhynchus*	BLM
Pallid sturgeon[2]	*Scaphirhynchus antillarum*	FE
Razorback sucker (CH)[3]	*Xyrauchen texanus*	FE; BLM
Roundtail chub	*Gila robusta robusta*	BLM
Southern leatherside chub	*Lepidomeda aliciae*	BLM; FS; CAS
Virgin River chub	*Gila robusta seminuda*	FE; BLM
Virgin River spinedace	*Lepidomeda mollispinis mollispinis*	BLM, NV; CAS
California floater	*Anodonta californiensis*	BLM
Moapa Warm Spring riffle beetle	*Stenelmis moapa*	BLM
Southern Bonneville pyrg	*Pyrgulopsis transversa*	UTSC

[1] Status: FE = Federally Endangered; FT = Federally Threatened; FP = Federally Petitioned; BLM = BLM Sensitive; FS = Forest Sensitive; CO-E = Colorado Endangered; NV-P = Nevada State Protected; UTSC = Utah Special Concern; CAS = Utah Conservation Agreement Species.

[2] Species is included because of the water depletion evaluation requirement in the Platte River Basin.

[3] Critical habitat is located within and/or downstream of the analysis area.

In total, seven federally listed fish species were analyzed. Except for pallid sturgeon, their occurrence within the analysis area is shown in **Figure 3.10-1**. A summary of the listing status, habitat, and general distribution for the federally listed and candidate aquatic species are provided below.

Aquatic habitat in the analysis area used by special status aquatic species includes streams, springs, and wetlands. No lakes or reservoirs are inhabited by special status aquatic species. Stream habitats range from small channels with widths less than 10 feet to large rivers such as the Green, White, and Yampa. Habitat conditions vary depending on flow, gradient, channel configuration, water depth, substrate composition,

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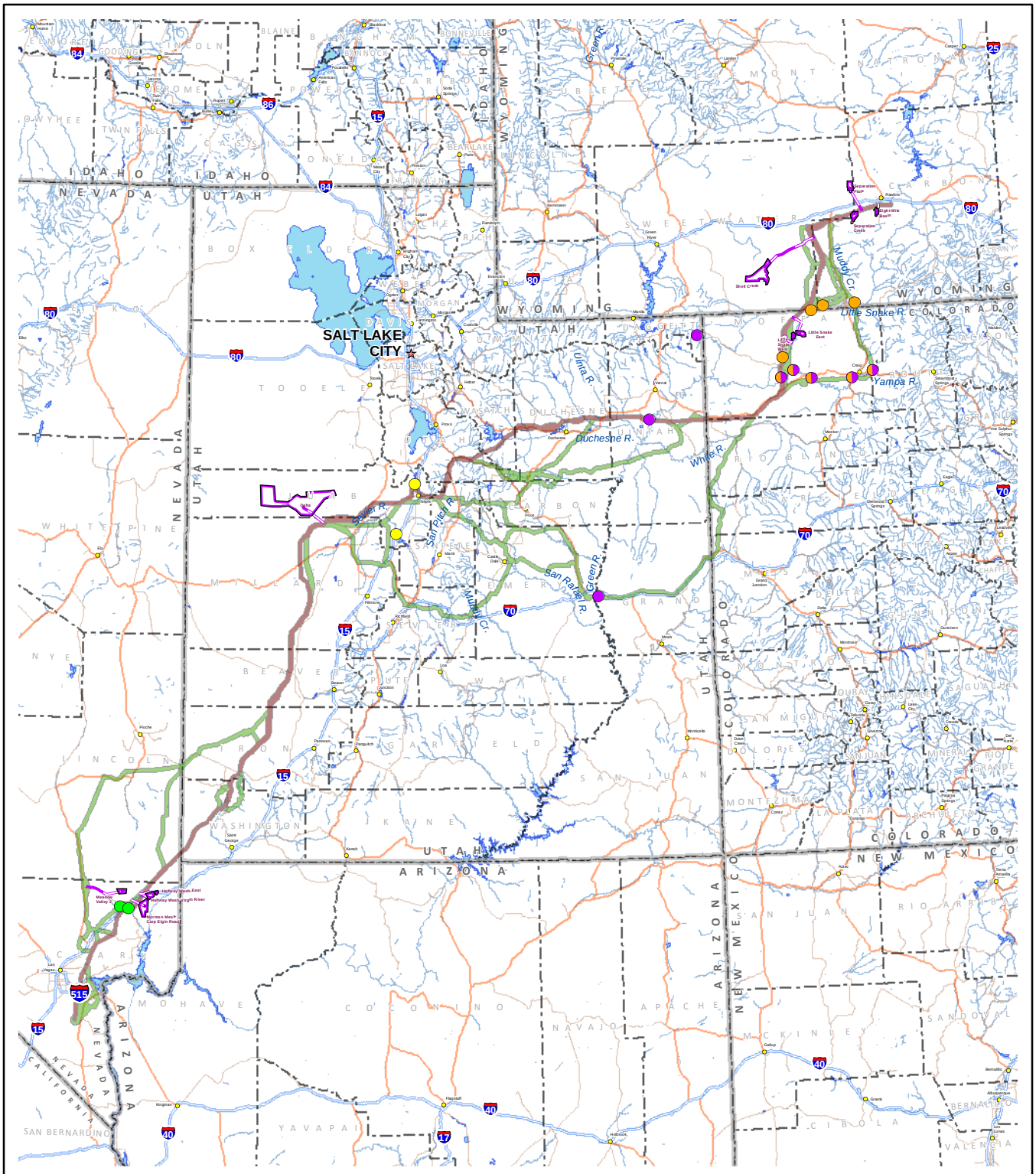

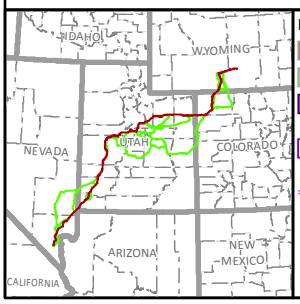

Project Corridors

- Applicant Proposed
- Alternative
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

Listed Aquatic Species

- Least chub
- Colorado pikeminnow
- Razorback sucker
- Colorado pikeminnow and razorback sucker
- Virgin River chub

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.10-1
Occurrence of Federally Listed Fish Species Within or Near Project Corridors

0 20 40 80 Miles
0 20 40 80 km
1:4,750,000
N

Western AREA POWER ADMINISTRATION

Exported On: 6/5/2013

presence of pools, runs, and riffles, types of instream cover, and extent of riparian vegetation. Specific habitat conditions for waterbodies with special status aquatic species that are located within the analysis area are not described in this section, since information is lacking for most of the proposed waterbody crossings. Instead, reference is made to habitat preferences for federally listed and candidate species and species with conservation agreements, which are identified in Section 3.10.4.1. Habitat information also is provided for all special status aquatic species in **Appendix G**, **Table G-3**.

3.10.4.1 Federally Listed and Candidate Aquatic Species

Bonytail (Federally Endangered)

The USFWS determined the species to be endangered in 1980 (45 FR 27710). In 1994 the USFWS designated seven reaches of the Colorado River system, including portions of the Colorado, Green, and Yampa rivers in the Upper Basin and the Colorado River in the Lower Basin, totaling 312 miles of critical habitat for the species (59 FR 13374). A recovery plan was published for bonytail in 2002 (USFWS 2002a). The upper basin recovery subunit is composed of the Green River and upper Colorado basin and the lower basin recovery subunit includes the mainstem and tributaries of the Colorado River from Lake Mead downstream to the southerly International Boundary with Mexico. The general types of habitat used by bonytail include mainstem riverine areas and impoundments in the Colorado River system. Deep pools and eddies with slow to fast currents are characteristic of the riverine habitat (Kaeding et al. 1986). It is assumed that spawning occurs in June or July (Maddux et al. 1993).

Known occurrence includes the Yampa River in Dinosaur National Monument, the Green River in Gray and Desolation canyons, the Colorado River near Black Rocks (Kaeding et al. 1986) and Cataract Canyon (59 FR 13374), Lake Mohave near the Arizona-Nevada border, and Lake Havasu in Arizona and California (USFWS 2002a). No occupied or critical habitat would be crossed by project 250-foot-wide transmission line ROWs or 2-mile transmission line corridors. The closest known population is the Desolation and Gray Canyon areas in the Green River in Utah, which are approximately 55 and 120 miles, respectively, downstream and approximately 15 miles upstream of the closest alternative transmission line corridors.

Colorado Pikeminnow (Federally Endangered)

This species (originally named Colorado squawfish) was listed as endangered under the Endangered Species Act (ESA) on March 11, 1967 (32 FR 4001). With the 1973 passage of the ESA, the fish retained its endangered status. On March 21, 1994 the USFWS designated six reaches of the Colorado River system, including portions of the Colorado, Green, Yampa, White, and San Juan rivers, totaling 1,148 miles of critical habitat for the species (59 FR 13374). Two reintroduced Colorado pikeminnow populations have been designated as Nonessential Experimental under Section 10(j) of the ESA (50 FR 30188). A recovery plan for this species was published in 2002 (USFWS 2002b). The entire population of the Colorado pikeminnow has been reduced to three recovery subunits in the upper Colorado River Basin: the Green River, the upper Colorado River, and the San Juan River subbasins. Habitat requirements of Colorado pikeminnow vary depending on the life stage and time of year. Young-of-the-year (YOY) and juveniles prefer shallow backwaters, while adults use pools, eddies, and deep runs (Miller et al. 1982). During peak runoff in the spring and early summer, fish usually move into backwater areas of flooded riparian zones to avoid swift velocities, feed, and prepare for the upcoming spawning period. Adults are highly mobile during the spawning period, which occurs after peak runoff in mid-June to mid-August.

Colorado pikeminnow occurs within three subbasins and includes the following rivers: Green River subbasin (Green, Yampa, Little Snake, White, Price, and Duchesne), Upper Colorado subbasin (Upper Colorado, Gunnison, and Dolores), and San Juan (San Juan River). The 250-foot-wide transmission line ROWs and 2-mile transmission line corridors would cross occupied habitat in the Yampa and Little Snake rivers. Critical habitat would be crossed by project 250-foot-wide transmission line ROWs in the Green, White, and Yampa rivers. Occupied habitat also is located downstream of 250-foot-wide transmission line ROWs and corridors in the Colorado River and tributaries near the confluence with the Colorado River and the Price and White

rivers. The only two known spawning sites of the species are located downstream of project 250-foot-wide transmission line ROWs and 2-mile transmission line corridors at Three Fords Canyon in the Gray Canyon area of the Green River (Carbon and Uintah counties, Utah) and the lower 20 miles of the Yampa River (Moffat County, Colorado).

Humpback Chub (Federally Endangered)

The dates for listing humpback chub are the same as discussed for Colorado pikeminnow. On March 21, 1994, the USFWS designated seven reaches of the Colorado River system including portions of the Colorado, Green, and Yampa Rivers in the Upper Basin and portions of the Colorado and Little Colorado Rivers in the Lower Basin, totaling 379 miles of critical habitat for the species (59 FR 13374). The current recovery plan for the humpback chub was published in 1990 and amended in 2002 (USFWS 2002c). Humpback chub mainly occur in river canyons where they utilize a variety of habitats including deep pools, eddies, upwells near boulders, and areas near steep cliff faces. Young and spawning adults are generally found in sandy runs and backwaters (USFWS 1990). Spawning occurs in May through July after peak spring flows.

Currently, there are six known self-sustaining populations. Five occur in the Upper and one on the Lower Basin Recovery Units. The Upper Recovery Unit consists of populations on the Colorado River (Black Rocks and Westwater Canyon in Utah and Cataract Canyon in Colorado), one population on the Yampa River (Yampa Canyon in Colorado), and on the Green River (Desolation/Gray Canyons in Utah). The only population in the Lower Basin Recovery Unit occurs on the mainstem Colorado River in Marble and Grand Canyons and the Little Colorado River. No occupied or critical habitat would be crossed by the alternative 250-foot-wide transmission line ROWs or 2-mile transmission line corridors. Occupied and critical habitat exists downstream of the project 250-foot-wide transmission line ROWs and 2-mile transmission line corridors in the Colorado, Yampa, and Green rivers.

June Sucker (Federally Endangered)

The June sucker was federally listed in 1986 (USFWS 1986). This species is endemic to Utah Lake in Utah and uses the lower portion of the Provo River for spawning and early life stage development. A recovery plan was finalized for this species in 1999, with actions being implemented from 1995 through 2007 (USFWS 1999, 2012a). The lake and lower portion of the Provo River were designated as critical habitat for the June sucker. Utah Lake is a relatively large and shallow lake with slightly saline, turbid, and eutrophic conditions. June sucker adults leave Utah Lake and swim up the Provo River in June of each year (UDWR 2012a). Spawning occurs in shallow riffles over gravel or rock substrate. No occupied or critical habitat would be crossed by project 250-foot-wide transmission line ROWs or 2-mile transmission line corridors.

Least Chub (Federal Candidate)

The least chub was petitioned for listing under the ESA in 2007. The USFWS conducted a 12-month status review and released their finding in June 2010 (USFWS 2010). The USFWS determined that the status was “warranted but precluded” and it was identified as a candidate species. The species is endemic to the Bonneville Basin of Utah where it was once widely distributed and occupied a variety of habitats including rivers, streams, springs, ponds, marshes, and swamps (Sigler and Sigler 1996). Currently, there are five known wild, extant populations of least chub. Three populations are in the Snake Valley in Utah’s West Desert and two are located on the eastern border of the native range near the Wasatch Range in the Sevier River drainage (Mills Valley and Clear Lake). An extirpated site exists at the Mona Springs in the Utah Lake drainage (USFWS 2012b). Since the initial Least Chub Conservation Agreement Strategy in 1998, the UDWR has had an ongoing monitoring program for least chub populations in Utah. The least chub is a schooling species that prefers areas of dense vegetation in slow-moving waters (UDWR 2012b). Spawning occurs in the spring or summer. Occupied habitat is located approximately 1.5 from a 2-mile transmission line corridor in Region II (Utah).

Pallid Sturgeon (Federally Endangered)

Pallid sturgeon was listed as endangered in 1990 (55 FR 36641) and a recovery plan was published in 1993 (USFWS 1993). This species is included in the analysis due to the consideration of water depletions in the Platte River drainage in Wyoming. Project 250-foot-wide transmission line ROWs and 2-mile transmission line corridors would not cross habitat for this species. This species occurs in the Lower Platte River defined as downstream of the mouth of the Elkhorn River. No critical habitat has been designated for this species. Pallid sturgeon is a bottom-dweller that prefers areas with strong current and firm sandy bottoms in the main channel of large turbid rivers (National Research Council 2004).

Razorback Sucker (Federally Endangered)

The razorback sucker was first proposed for listing as a threatened species under the ESA in 1978 (43 FR 17375). In 1980, the USFWS withdrew the proposal because it was not finalized within the 2-year time limit from the initial publication in the Federal Register (45 FR 35410). In 1989, the USFWS received a petition requesting that the razorback sucker be added to the list of endangered species. A positive finding was made and subsequently published by the USFWS in 1991 (56 FR 54957). In 1994, the USFWS designated 15 reaches of the Colorado River system, including portions of the Green, Yampa, Duchesne, Colorado, White, Gunnison, and San Juan rivers in the Upper Basin and portions of the Colorado, Gila, Salt, and Verde rivers in the Lower Basin, totaling 1,724 miles as critical habitat for the species (59 FR 13374). The current recovery plan for the razorback sucker was published in 1998 and amended in 2002 (USFWS 2002d). The upper basin recovery subunit is composed of the Green River, upper Colorado River, and San Juan River subbasins and the lower basin recovery subunit includes the mainstem and tributaries of the Colorado River from Lake Mead downstream to the southerly International Boundary with Mexico. Habitat requirements for this species reflect both riverine and reservoir environments. General habitats used by adults include eddies, pools, and backwaters during the non-breeding period (July through March) (Maddux et al. 1993). Seasonal habitat use includes pools and eddies from November through April, runs and pools from July through October, runs and backwaters in May, and backwaters and flooded gravel pits during June. Juveniles prefer shallow water with minimal flow in backwaters, tributary mouths, off-channel impoundments, and lateral canals (Maddux et al. 1993). Spawning usually occurs in April through mid-June. They migrate long distances and congregate in large numbers at spawning sites.

In the Upper Colorado River Basin, razorback suckers are considered extant in four locations: Westwater and Cataract Canyons and the Utah-Colorado state line on the Colorado River, Desolation/Gray Canyons of the Green River, and a population in northeastern Colorado on the Yampa River. The razorback sucker is more widely distributed in the Lower Basin. In Lake Mead, the population is estimated at about 400 individuals with an average age of 20 to 25 years, indicating recent recruitment. Approximately 1,000 individuals are believed to inhabit a 60-mile reach between Davis Dam and Lake Havasu, which have demonstrated reproduction (USFWS 2002d). Project 250-foot-wide transmission line ROWs and transmission line corridors would cross two rivers inhabited by this species, the Yampa and Green rivers. The 250-foot-wide transmission line ROW also would cross designated critical habitat for razorback sucker in the Green River. Occupied habitat also is located downstream of 250-foot-wide transmission line ROWs and corridors in the Little Snake River in Wyoming, the Colorado River and White rivers in Colorado, and Las Vegas Wash in Nevada.

Virgin River Chub (Federally Endangered)

The Virgin River chub was officially listed as endangered in 1989, but designation of critical habitat was postponed (54 FR 35305). In 2000, 87.5 miles of the Virgin River in Utah, Arizona, and Nevada including the mainstem and 100-year floodplain was designated as critical habitat (65 FR 4140). When the species was listed, the USFWS recognized that a closely related species was found in the Moapa (Muddy) River in Nevada, but it was not affected by the listing in 1989. A recovery plan for the Virgin River chub was published in 1995 (USFWS 1995). The Virgin River chub occurs within the Muddy River in Nevada and the mainstem portion of the Virgin River from Pah Tempe Hot Springs, Utah, downstream to the confluence with Lake Mead in Nevada (USFWS 1995). The Muddy River population is not considered to be part of the

federal listing at this time. However, a proposed rule change regarding federal listing is under review by the USFWS. The present distribution of this species in the Muddy River extends from the Warm Springs area downstream to the Wells Siding (approximately 8 miles below the Meadow Valley Wash confluence). The species is usually associated with deep runs or pool habitats that have slow to moderate velocities and an abundance of cover provided by boulders, undercut banks or woody debris (USFWS 1995). Spawning is suspected to occur in April through June.

A refugium population also is located at the Dexter National Fish Hatchery and Technology Center (USFWS 1995). Project 250-foot-wide transmission line ROWs and 2-mile transmission line corridors would cross one stream, the Muddy River, which is inhabited by this species. As previously mentioned, the Muddy River population is not federally listed at this time.

3.10.4.2 BLM Sensitive, Forest Sensitive, and State Protected Aquatic Species

Fish

In total, 20 BLM sensitive, Forest sensitive or state-protected aquatic species potentially occur within the project analysis area (**Table 3.10-2**). This list includes 12 additional fish species. In general, most of these fish species are associated with stream habitat within the project analysis area. Some of the sensitive fish species such as Meadow Valley Wash desert sucker, Meadow Valley Wash speckled dace, Moapa speckled dace, and Moapa White River springfish are associated with stream or spring habitats. Occurrence and habitat information is summarized below for two fish species (Bonneville cutthroat trout and Colorado River cutthroat), which are BLM, Forest, and Utah sensitive species with conservation agreements. Descriptions of occurrence and habitat used by the other sensitive fish species are provided in **Appendix G**, **Table G-3**.

Bonneville Cutthroat Trout

The Bonneville cutthroat trout, a BLM and Forest sensitive species and Utah conservation agreement species, was petitioned for listing under the ESA, but the 12-month finding determined that the species was not warranted for listing. A conservation agreement was published in 2000 to assist in the management of this species in Utah (Lentsch et al. 2000). This cutthroat subspecies prefers small headwater streams with pool and riffle habitat and slow, deep water with vegetated streambanks (Sigler and Sigler 1996). Spawning usually occurs in May through June (Lentsch et al. 2000). Project 250-foot-wide transmission line ROWs and transmission line corridors would cross Bonneville cutthroat trout habitat in Utah counties including Duchesne, Sanpete, and Utah. These streams are part of the Bonneville Basin group.

Colorado River Cutthroat Trout

The Colorado River cutthroat trout is a BLM and Forest sensitive species and is considered a species of special concern in Wyoming and Colorado and a Tier 1 species in Utah (species with a conservation agreement). A conservation agreement was updated in 2006 to assure the long-term viability of this cutthroat subspecies throughout its historic range (CRCT Conservation Team 2006).This cutthroat subspecies typically is associated with isolated headwater streams with cool temperatures and clear conditions (Behnke 1981). Spawning typically occurs in April through early July depending on the water temperature. Colorado River cutthroat historically occupied portions of the Colorado River drainage in Wyoming, Colorado, Utah, Arizona, and New Mexico and probably included portions of larger streams such as the Green, Yampa, White, Colorado, and San Juan rivers (CRCT Conservation Team 2006). A recent assessment of Colorado River cutthroat trout distribution identified a total of 3,022 miles of occupied stream habitat, which represents approximately 14 percent of its historic range. Project 250-foot-wide transmission line ROWs and 2-mile transmission line corridors would cross Colorado River cutthroat trout habitat in Sweetwater County, Wyoming; Moffat County in Colorado; and Daggett, Uintah, Emery, Grand, Duchesne, and Wasatch counties in Utah.

Amphibians

Five additional special status amphibian species potentially occur within the project study area: Arizona toad, boreal toad, Columbia spotted frog, Great Basin spadefoot toad, and northern leopard frog. Descriptions of occurrence and habitat used by these amphibian species are provided in **Appendix G**, **Table G-3**. Additional information is provided below for the boreal toad, Columbia spotted frog, and northern leopard frog, which have conservation agreements.

Boreal Toad

The boreal toad is a subspecies of the western toad. The Southern Rocky Mountain population of boreal toad in Colorado, Wyoming, and New Mexico has been proposed for listing as endangered under the ESA. However, the subspecies was precluded from listing because the population is not recognized as a species. In Utah, it is considered a state sensitive species and it is a conservation agreement species (Hogrefe et al. 2005). In general, boreal toads are more independent of water compared to other amphibian species, although they must re-hydrate daily. Habitat used during the nonbreeding period (August through March) consists of forested areas and upland vegetation such as sagebrush and grassland. Boreal toads migrate from terrestrial habitats to aquatic habitats during the breeding period (April through July). Breeding habitats in Utah consist of low velocity, low gradient streams, off-channel marshes, beaver ponds, small lakes, reservoirs, stock ponds, wet meadows, seeps, and associated woodlands (Hogrefe et al. 2005). Burrows are used by boreal toads and other amphibians during the summer and winter to maintain stable body temperatures and prevent water loss. The alternative 250-foot-wide transmission line ROWs and 2-mile transmission line corridors would cross habitat in Juab (Birch Creek area), Wasatch (Willow Creek), and Duchesne (Sowers Creek) counties, Utah.

Columbia Spotted Frog

This species was placed on a candidate list in 1993. After the Candidate Notice of Review was completed in 1999, the West Desert population was taken off the candidate list (USFWS 1999). A conservation agreement was published in 2005 for Utah (Bailey et al. 2005). This species occurs in streams, wet meadows, springs, and springbrooks, marshes, lakes, and reservoirs (Orabona et al. 2009). It is highly aquatic, since it is rarely found far from permanent waterbodies. It may traverse upland areas during wet periods or movement to wintering sites. Stream and pond habitat is located within project transmission line corridors in Juab, Sanpete, and Wasatch counties in Utah.

Northern Leopard Frog

This species was petitioned for listing under the ESA. A 90-day finding was issued and a 12-month status review was conducted to determine if listing the species in the western part of its range is warranted (USFWS 2009). The status review and 12-month finding concluded that listing the western population or the entire species is not warranted at this time (USFWS 2011). The distribution of northern leopard frog includes portions of Wyoming, Colorado, Utah, and Wyoming (Orabona et al. 2009; Smith and Keinath 2007). Habitat consists of marshes, beaver ponds, streams, rivers, lakes, and wet meadows at elevations up to approximately 9,000 feet above mean sea level (amsl) (Smith and Keinath 2007). Northern leopard frog uses underwater areas as overwinter habitat. Project 250-foot-wide transmission line ROWs and transmission line corridors would cross habitat for northern leopard frog in Red Wash and Antelope and Muddy creeks and the Little Snake River in Wyoming; Douglas Creek and the Yampa and White rivers in Colorado; and Soldier and Currant creeks in Utah. Northern leopard frog also occurs in wetlands and springs in the Pahranagat National Wildlife Refuge in Region III.

Invertebrates

Three special status invertebrate species, Moapa Warm Spring riffle beetle, California floater, and southern Bonneville pyrg (springsnail) potentially occur within the project analysis area. Descriptions of occurrence and habitat used by these invertebrate species are provided in **Appendix G**, **Table G-3**, and summarized below.

- California Floater – This mollusk species occurs in stream (Currant Creek) and spring (Mona) habitats in Juab County, Utah within the Region II portion of the analysis area. This species has been collected at depths ranging from approximately 0.5 to 1.5 feet over mud, sand, or gravel bottoms (Oliver and Bosworth 1999). The abundance is not reported at most Utah locations.
- Moapa Warm Spring Riffle Beetle – This beetle species occurs in the Muddy River drainage in Nevada just north of a portion of the Region IV analysis area. Habitat consists of outflow streams immediately downstream of spring sources in relatively swift, shallow water.
- Southern Bonneville Pyrg – This springsnail species in a spring near Thistle Creek in Utah County, Utah, which is within the Region II analysis area. Habitat consists of small mineralized springs at elevations between approximately 5,830 and 6,740 feet amsl (Oliver and Bosworth 1999).

3.10.5 Regional Summary of Special Status Aquatic Species

A summary of the number of special status aquatic species by Project regions is provided in **Table 3.10-3**. Region II contained the highest number of species (19) followed by 12 species in Regions I and III. One species occurs within the Region IV analysis area.

Table 3.10-3 Summary of Special Status Aquatic Groups by Region

Species	Total within the Analysis Area (All Regions)	Region I	Region II	Region III	Region IV
Amphibians	5	2	4	2	0
Fish[1]	20	10	13	9	1
Aquatic Invertebrates	3	0	2	1	0
Total	**28**	**12**	**19**	**12**	**1**

[1] Number includes pallid sturgeon. This species has no potential for occurrence in the analysis area, but it is analyzed to determine if water use could affect habitat in the North Platte sub-basin.

3.10.5.1 Region I

Region I extends from the Terminal Siting Area southeast of Rawlins, Wyoming, southwest through northeastern Utah and northwestern Colorado. Habitat for aquatic species in Region I includes waterbodies in the North Platte, Great Divide, Upper Green, and White-Divide basins. Watersheds in these basins are listed in the Regional Summary of Water Resources, **Table 3.4-2**. Special status aquatic species that occur in Region I are listed in **Table 3.10-4**.

Table 3.10-4 Special Status Species Potentially Occurring in Region I

Amphibians		
Great Basin spadefoot toad	Northern leopard frog	
Fish		
Bluehead sucker	Bonytail[2]	Colorado pikeminnow
Colorado River cutthroat trout	Flannelmouth sucker	Humpback chub[2]
Mountain sucker	Razorback sucker	Roundtail chub
Pallid sturgeon[1]		
Aquatic Invertebrates - None		

[1] Pallid sturgeon has no potential for occurrence in the study area, but it is analyzed to determine if water use could affect habitat in the North Platte sub-basin.

[2] Bonytail and humpback chub do not occur within the project analysis area, but they are included in the analysis to determine if water use could affect their habitat in the Colorado River basin.

3.10.5.2 Region II

Region II extends from northeastern Utah and northwestern Colorado to the IPP in western Utah. Habitat for aquatic species in Region II includes waterbodies in the White-Yampa, Colorado Headwaters, Lower Green, Jordan, Upper Colorado – Dirty Devil, Devil, and the Escalante Desert-Sevier Lake basins. Watersheds in these basins are listed in the Regional Summary of Water Resources, **Table 3.4-2**. Special status aquatic species that occur in Region II are presented in **Table 3.10-5**.

Table 3.10-5 Special Status Species Potentially Occurring in Region II

Amphibians		
Boreal toad	Columbia spotted frog	Great Basin spadefoot toad
Northern leopard frog		
Fish		
Bluehead sucker	Bonneville cutthroat trout	Bonytail[1]
Colorado pikeminnow	Colorado River cutthroat trout	Flannelmouth sucker
Humpback chub[1]	June sucker[2]	Least chub
Mountain sucker	Razorback sucker	Roundtail chub
Southern leatherside chub		
Aquatic Invertebrates		
California floater	Southern Bonneville pyrg	

[1] Bonytail and humpback chub do not occur within the project study area, but they are included in the analysis to determine if water use could affect their habitat in the Colorado River basin.

[2] June sucker does not occur within the project study area, but it is included in the analysis to determine if water use could affect habitat in the Utah Lake and Provo River areas.

3.10.5.3 Region III

Region III extends from the IPP in western Utah to north Las Vegas, Nevada. Habitat for aquatic species in Region III includes waterbodies in the Escalante Desert-Sevier Lake and Lower Colorado-Lake Mead basins. Watersheds in these basins are listed in the Regional Summary of Water Resources, **Table 3.4-2**. Special status aquatic species that occur in Region III are presented in **Table 3.10-6**.

Table 3.10-6 Special Status Species Potentially Occurring in Region III

Amphibians		
Arizona toad	Northern leopard frog[1]	
Fish		
Bluehead sucker	Meadow Valley Wash desert sucker	Meadow Valley Wash speckled dace
Moapa speckled dace	Moapa White river springfish	Razorback sucker
Roundtail chub	Virgin River chub	Virgin River spinedace
Aquatic Invertebrates		
Moapa Warm Spring riffle beetle		

[1] Northern leopard frog is included in the analysis since it occurs in a spring located approximately 600 feet west of the 2-mile transmission line corridor.

3.10.5.4 Region IV

Region IV extends from north Las Vegas, Nevada to Marketplace. Habitat for aquatic species in Region IV is located in the Lower Colorado-Lake Mead Basin and Las Vegas Wash Watershed. Special status species that may occur in Region IV are presented in **Table 3.10-7**.

Table 3.10-7 Special Status Species Potentially Occurring in Region IV

Amphibians - None
Fish
Razorback sucker
Aquatic Invertebrates - None

3.10.6 Impacts to Special Status Aquatic Species

Potential impacts to special status aquatic species were identified based on feedback from federal and state agency biologists, public scoping, and literature related to surface disturbance effects on aquatic habitat and species. Potential effects from surface disturbance activities would include direct alteration of habitat or loss of individuals from equipment and vehicles. Habitat also could be affected by changes in water quality from increased sedimentation and potential fuel spills. The use of surface water for dust control and concrete foundations also was evaluated in terms of effects on aquatic habitat.

The methodology for evaluating impacts on special status aquatic species involved comparisons of project activities within the analysis area to habitat that supports aquatic species. The impact analysis area for special status aquatic species included perennial streams, reservoirs, lakes, ponds, and springs that would be crossed by the alternative 250-foot-wide transmission line ROWs and contain sensitive species. A downstream reach of approximately 2 miles also was considered part of the analysis area for direct disturbance. The study area for water use and potential surface water depletions extended at least 10 miles downstream of diversion points. The analysis area for roads focused on perennial streams and waterbodies with special status aquatic species that would be crossed by the 2-mile transmission line corridor. The larger study area for access roads was required because their locations have not been defined at this time. A road density analysis also was used to assess road effects on species. GIS analyses were conducted to identify perennial waterbodies and special status aquatic species occurrence within the proposed disturbance areas (i.e., ROWs and 2-mile transmission line corridors, terminals, and electrode bed areas).

Special status aquatic species included 5 amphibians, 20 fish, and 3 invertebrate species (**Table 3.10-2**). In total, seven federally listed fish species and one candidate were evaluated. The analysis also included 22 BLM sensitive species, 5 Forest sensitive species, and 16 species with state protection.

Impact parameters were used in combination with effects information for the purpose of quantifying impacts. The impact parameters also allow comparisons among the applicant-proposed routes, alternatives, and alternative variations. Impact issues and the analysis considerations for special status aquatic species are listed in **Table 3.10-8**.

Table 3.10-8 Relevant Analysis Considerations for Special Status Aquatic Species

Resource Topic	Analysis Considerations and Relevant Assumptions
Potential loss and effects from construction activities and roads on special status aquatic species or habitat from construction equipment and access roads.	The analysis includes direct disturbance effects and potential water quality changes from sediment delivery and fuel spills.
Potential effects of construction water use on aquatic habitat and species.	The analysis uses the results of the water resources analysis, which determined if water sources are linked to surface flows of streams that would be crossed by the project 250-foot-wide transmission line ROWs. Flow changes could detrimentally affect habitat for aquatic species.
Potential for increased fishing pressure on streams from construction crews and the public from the construction area and access roads.	This analysis for game fish species, some of which are special status species, is included in Section 3.9.6.

Table 3.10-8 Relevant Analysis Considerations for Special Status Aquatic Species

Resource Topic	Analysis Considerations and Relevant Assumptions
Potential mortalities to special status amphibians during movement periods from vehicle traffic.	The analysis evaluates vehicle traffic within the ROW and access roads on amphibians.

Impact parameters included the following:

- Number of perennial streams with special status aquatic species that would be crossed by alternative 250-foot-wide transmission line ROWs and 2-mile transmission line corridors.
- Number of perennial streams with federally-listed species that would be crossed by alternative 250-foot-wide transmission line ROWs and 2-mile transmission line corridors.
- Acres of critical habitat for federally listed species that would be crossed by alternative 250-foot-wide transmission line ROWs and 2-mile transmission line corridors.
- Potential loss of habitat (ft^2 and acres) due to construction of culverts or low-water crossings.
- Acres of road disturbance on riparian habitat for special status aquatic species.
- Road density effects (linear miles/$mile^2$) on special status species.

Potential direct and indirect effects of construction, operation, and decommissioning on special status aquatic species and their associated habitats are discussed below. After impacts are identified, relevant agency BMPs and design features are discussed in terms of reducing impacts. If impacts of concern remain after application of BMPs and design features, additional mitigation is recommended to reduce impacts to levels acceptable to the BLM and cooperating agencies.

The impacts analysis for special status species assumes that the BLM and USFS will continue to manage special status species habitats in coordination with CPW, NDOW, UDWR, and WGFD. It also assumes that the USFWS will continue to have jurisdiction over the management of federally endangered, threatened, proposed, and candidate species populations, the BLM will continue to manage BLM sensitive species in accordance with BLM Manual 6840, and the USFS will continue to manage Forest sensitive species in accordance with U.S. Forest Service Manual 2670. Further assumptions are that the design features committed to by TWE and the BMPs (**Appendix C**) would be implemented under all alternatives.

3.10.6.1 Impacts from Terminal Construction, Operation, and Decommissioning

The northern and southern terminals would be constructed regardless of which alternative route or design option is approved.

Northern Terminal

Construction of the Northern Terminal would not result in direct disturbance effects, since waterbodies (i.e., Eightmile Lake and Separation Creek) located within the proposed general siting area do not contain special status aquatic species. In addition, road access would not adversely affect special status aquatic species because existing or new roads would not cross waterbodies inhabited by any species. In summary, surface disturbance and use of access roads would not adversely affect special status aquatic species, since habitat is not located within the proposed disturbance area for the Northern Terminal.

Water use for substation/converter station construction would require approximately 1.8 acre-feet for dust control. Water would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners or irrigation companies holding existing water rights. The effect determination of new and existing water depletions in Wyoming would be made by the Wyoming State Engineer.

Consultation with the USFWS would be completed to determine if construction water use could affect surface flows for species using the Platte River system such as pallid sturgeon.

Southern Terminal

Construction of the Southern Terminal would disturb upland areas in the Eldorado Valley watershed near Boulder, Nevada. Waterbodies located adjacent to the area include playa lakes. No perennial waterbodies are located in this area. No special status aquatic species habitat is located within the playa lakes. Surface disturbance and use of access roads would not adversely affect special status aquatic species, since habitat is not located within the proposed disturbance area for the Southern Terminal.

Water required for the construction of the Southern Terminal is estimated to be 1.2 acre-feet. The source of the water would be existing rights. The effect determination of new and existing water depletions would be made after the water sources are identified and an evaluation of their potential connection to surface flows is completed. Consultation with the USFWS would be completed to determine if construction water use could affect federally listed fish species (razorback sucker) in the Lower Colorado River Basin.

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Marketplace Hub

The impacts of constructing and operating Design Option 2 would be similar to those discussed under the alternative routes because the implementation of this design would utilize the same alternative routes and construction techniques. Differences between this design option and the Proposed Project include the locations of the southern converter station and ground electrode system, as well as the addition of a series compensation station midway between the IPP and Marketplace. The southern converter station would be located near the IPP in Utah instead of at the Marketplace in Nevada and the ground electrode system would be within 50 miles of the IPP. Construction and operation of a converter station near IPP, ground electrode system, and a series compensation station would not be expected to impact special status aquatic resources.

Design Option 3 – Phased Build Out

Impacts from construction and operation of Design Option 3 would be the same as discussed for the Applicant Proposed Alternative, since the same alternative routes, facilities, and construction would be used.

3.10.6.2 Impacts Common to All Alternative Routes and Associated Components

Construction Impacts

The types of direct and indirect effects of construction activities are generally the same as those discussed for aquatic biological resources in Section 3.9.6.2. Direct disturbance to aquatic habitat due to vehicle crossings and culvert installation for some of the access roads could detrimentally affect habitat in streams that contain special status aquatic species. Removal of riparian vegetation also would alter habitat and indirectly affect ecological functions provided by this type of vegetation. Vehicle traffic near waterbodies also could result in sedimentation and fuel spill risks. BMPs such as ECO-3 (minimize stream crossings by roads) and WAT-11 (avoid alteration of existing drainages) would be implemented to reduce these types of impacts. Design features (TWE-8 and TWE-12) also would minimize disturbance to stream channels and riparian vegetation. Other BMPs such as ECO-1, ECO-2, and ECO-4 require that project activities should avoid or minimize effects on sensitive species and their habitat. Design features TWE-2 (ESA Compliance), TWE-29 (Biological Protection Plan), TWE-31 (Development of Mitigation Measures), TWE-32 (Seasonal Restrictions), TWE-33 (Worker Training), and TWE-34 (Identification of New Locations for Protected Species) would provide additional protection for special status species. Species impacts by region and alternative are provided separately in Sections 3.10.6.3 through 3.10.6.6.

The estimated quantities of water needed per mile for construction would include approximately 3,400 gallons for foundation concrete and 240,000 gallons for dust control, totaling approximately 243,000

gallons or 0.75 acre-feet per mile. Water would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An effect determination of new and existing water depletions would be completed after identifying the water sources for construction and whether there is any connection between these water sources and surface flows in the Colorado Basin, Utah Lake/Provo River drainage, and the Platte sub-basin. Additional discussion for water use effects on federally listed species is provided in each of the Region impact sections.

The following mitigation measure is recommended to protect habitat for conservation agreement trout species, Colorado River cutthroat trout, and Bonneville cutthroat trout. Potential water depletion effects on federally listed fish species in the Upper Colorado River Basin are mitigated by the Recovery Implementation Program for Endangered Fish in the Upper Colorado River (Recovery Plan), as discussed in Section 3.10.6.3, Region I, and Section 3.10.6.4, Region II.

SSS-1 *(Water Use): No new surface water or groundwater withdrawals that are hydrologically connected to streams containing Colorado River cutthroat trout and Bonneville cutthroat trout would be allowed. Any water necessary for construction, operation, or maintenance (including dust abatement) would not be acquired from existing water sources.*

Operation Impacts

The direct and indirect effects of operation of the Project would involve use of access roads and the ROW for repair and maintenance activities and vegetation management. Impacts associated with operation activities would involve several of the same types of effects discussed for construction activities. These impacts would include potential direct disturbance to aquatic habitat for special status aquatic species due to vehicle crossings of small to mid-size streams without access roads and removal of vegetation as part of maintenance activities. Indirect effects on water quality would adversely affect habitat for special status aquatic species from soil disturbance within or near waterbodies by vehicles or equipment. Potential fuel spills could affect species and habitat if fuel entered waterbodies. The same BMPs and design features described under Construction Impacts, would be applied to minimize these types of impacts on special status aquatic species resulting from operations. Herbicides may be used to control vegetation as part of maintenance activities in the ROW. VEG-3 requires that herbicide use should be limited to non-persistent, immobile formulations to avoid effects on aquatic habitats and species. In addition, design features involving erosion control and use of a spill containment and control plan would be implemented. In addition to the BMPs, the following mitigation measure is recommended to avoid potential herbicide effects on biological resources.

AB-4 *(Herbicide Use Plan) – As part of vegetation management, the applicant would prepare an Herbicide Use Plan. The Plan would identify a list of approved herbicides that may be used as well as locations of areas that may be treated. Licensed herbicide applicators would be used in the treatment process. The Plan also would discuss compliance with applicable federal, state, and local agencies.*

Effectiveness: This measure would be highly effective in avoiding toxic effects of herbicide use on special status aquatic species.

Decommissioning Impacts

Removal of project structures during decommissioning would result in the same types of impacts as those discussed for construction activities. Direct disturbance to special status aquatic species habitats would occur as a result of vehicle traffic across streams. The Applicant would be responsible for reclamation of access roads following abandonment in accordance with landowner's or land agency's direction. Water quality changes involving increased sediment and fuel spill risks would occur as a result of vehicle traffic within or near waterbodies. The same BMPs and design features that are described above for construction impacts would be applied to reduce impacts during decommissioning activities. Removal of riparian vegetation would not be required as part of decommissioning.

Impact discussions and conclusions for special status aquatic species are provided for the four Project regions. This organization was used because species occurrence varies by region and few species are present in all regions.

3.10.6.3 Region I

Table 3.10-9 provides a comparison of impact parameters with the alternative routes in Region I. Based on species occurrence information and habitat associations, special status aquatic species that may be impacted by the Region I alternatives include 2 amphibians and 10 fish species (**Table 3.10-4**). Species occurrence in Region I streams is provided in **Appendix G**, **Table G-4**. Project Segment ID numbers referenced in this section are listed in **Table G-4** and depicted in **Figure 2-21**. Parameter information in **Table 3.10-9** is discussed separately for each of the Region I alternatives.

Table 3.10-9 Summary of Region I Alternative Route Impacts for Special Status Aquatic Species

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Number of streams with special status aquatic species that would be crossed by 250-foot-wide transmission line ROWs	2	2	7	2
Number of streams with special status aquatic species that would be crossed by 2-mile transmission line corridors or located within 2 miles downstream of corridor boundaries	3	4	10	2
Number of streams with federally listed aquatic species that would be crossed by 250-foot-wide transmission line ROWs	2	2	1	2
Acres of critical habitat for federally listed Colorado pikeminnow that would be crossed by 250-foot-wide transmission line ROWs	1	1	3	1
Potential Aquatic Habitat Alteration or Loss[1] (ft^2) (acres shown in parentheses)				
Colorado River cutthroat trout	0	0	800 (0.02)	0
Bluehead sucker	0	0	1,600 (0.04)	0
Flannelmouth sucker	0	0	2,400 (0.06)	0
Mountain sucker	0	0	3,000 (0.05)	0
Roundtail chub	0	0	1,600 (0.04)	0

[1] Habitat loss represents area that could be permanently or temporarily removed due to the use of a culvert or low water crossing or temporarily disturbed from the instream use of equipment. The calculation excludes large rivers such as the Little Snake and Yampa.

Parameter information regarding riparian disturbance and road density is provided in **Tables 3.10-10** and **3.10-11**. The analyses focus on streams that contain special status aquatic species. A summary of these parameters is provided below.

Table 3.10-10 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat Associated with Special Status Species, Region I Corridor

	Alternatives							
	I-A		I-B		I-C		I-D	
	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Streams								
Construction	2	5	2	4	17	51	3	10
Operation	1	2	<1	1	5	13	1	2

Table 3.10-11 Open Road Density (Miles/Mile^2) within 100 and 300 Feet of Stream Crossings Associated with Special Status Species in Region I Corridor

Watershed	I-A					Watershed	I-B				
	Current Density		Density Increase		Streams with Special Status Species (# of Segments)		Current Density		Density Increase		Streams with Special Status Species (# of Segments)
	100 feet	300 feet	100 feet	300 feet			100 feet	300 feet	100 feet	300 feet	
Greasewood Gulch-Little Snake River	0.38	0.66	0.05	0.04	Little Snake River (1)	Greasewood Gulch-Little Snake River	0.38	0.66	0.04	0.03	Little Snake River (1)
Spring Creek-Yampa River	0.47	1.01	0.03	0.03	Yampa River (1)	Spring Creek-Yampa River	0.47	1.01	0.03	0.04	Yampa River (1)
Watershed	I-C					Watershed	I-D				
	Current Density		Density Increase		Streams with Special Status Species (# of Segments)		Current Density		Density Increase		Streams with Special Status Species (# of Segments)
	100 feet	300 feet	100 feet	300 feet			100 feet	300 feet	100 feet	300 feet	
Deception Creek-Yampa River	0.65	1.56	0.09	0.09	Yampa River (2)	Greasewood Gulch-Little Snake River	0.38	0.66	0.04	0.03	Little Snake River (1)
Elkhead Creek	0.83	1.41	0.01	0.01	Elkhead Creek (2)	Spring Creek-Yampa River	0.47	1.01	0.03	0.04	Yampa River (1)
Fortification Creek	1.19	2.02	0.13	0.13	Fortification Creek (1)						
Fourmile Creek	0.59	1.04	0.09	0.40	Fourmile Creek (1)						
Little Snake River-Willow Creek	0.54	1.13	0.06	0.04	Willow Creek (2)						
Lower Muddy Creek	1.08	2.13	0.07	0.05	Muddy Creek (3)						
Upper Muddy Creek	1.02	1.92	0.06	0.05	Muddy Creek (1)						

- Riparian Disturbance – A comparison of the construction and operation effects to riparian vegetation near streams containing special status aquatic species indicates that Alternative I-C would have greatest potential disturbance. By following stipulations for BLM FOs involving no disturbance or a buffer protection of 300 to 500 feet, the disturbance to riparian vegetation would be avoided on BLM lands.
- Road Density – The number of watersheds that would be crossed by the Region I alternative 250-foot-wide transmission line ROWs would range from 2 (I-A, I-B, and I-D) to 7 (I-C). The road density units are highest for Alternative I-C. The increase in new road density would range from <0.1 to 0.4 miles/mile^2, with the highest increase in the Fourmile Creek watershed (Alternative I-C). BMPs and design features would be implemented to reduce sediment input to streams including those that support special status aquatic species.

Alternative I-A (Applicant Proposed)

Two streams (Little Snake and Yampa rivers) that contain special status aquatic species are located within the transmission line corridor. Both of these streams would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative I-A.

Colorado Pikeminnow and Razorback Sucker (Federally Endangered and BLM Sensitive)

The 250-foot-wide transmission line ROW for Alternative I-A would cross occupied and critical habitat for Colorado pikeminnow in the Yampa River. Critical habitat for Colorado pikeminnow consists of the 100-year floodplain in the Yampa River. The 250-foot-wide transmission line ROW also would cross one other stream that contains Colorado pikeminnow: Little Snake River (noncritical habitat). The pikeminnow occurrence in the Little Snake River is located in the lower 1-mile section near the confluence with the Yampa River. In total, 0.9 acre of Colorado pikeminnow critical habitat would be crossed. Occupied and critical habitat for razorback sucker is located approximately 7 miles downstream of the Alternative I-A 250-foot-wide transmission line ROW crossing at a point where the Yampa River enters the Green River. Potential effects on Colorado pikeminnow could include surface disturbance to critical habitat located within the 100-year floodplain. Indirect effects on both species could include sedimentation, riparian removal, and potential fuel spill risks. These effects could occur within the 250-foot-wide transmission line ROW and use of new or upgraded access roads. BMPs such as ECO-1 and ECO-4 require the consideration of sensitive or unique habitats and the avoidance, minimization, or mitigation for impacts to sensitive species and their habitat through project design. Two BMPs require that no instream disturbance should occur between July 1 and September 30 to avoid impacts to the four federally endangered fish species in the Upper Colorado River Basin (WWEC) and construction activities should avoid modification of critical habitat for any species (BLM Vernal RMP). Design features such as TWE-2 (ESA Compliance), TWE-29 (Biological Protection Plan), and TWE-31 (Development of Section 7 Mitigation Measures) would be used to reduce impacts to important, sensitive, or unique habitats and develop appropriate mitigation measures. The following mitigation measure is recommended to further protect critical habitat for Colorado pikeminnow.

SSS-2 *(No Permanent Structures or New Roads in Critical Habitat for Federally Listed Fish Species): No permanent structures or new roads would be constructed in critical habitat for federally endangered fish species. Any temporary disturbance to soils in the 100-year floodplain within critical habitat would be minimized to the extent possible and restoration would be completed to maintain existing conditions.*

Effectiveness: This measure would be highly effective in avoiding direct disturbance to critical habitat for Colorado pikeminnow.

Alternative I-A would cross 1 acre of critical habitat for Colorado pikeminnow. Surface disturbance activities near the Yampa River pose a risk for sediment and fuel spills. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat

for Colorado pikeminnow and downstream reaches occupied by Colorado pikeminnow and razorback sucker.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered) Water Depletions

As part of flow requirements for the four endangered fish species in the Upper Colorado River Basin (Colorado pikeminnow, humpback chub, bonytail, and razorback sucker), water use for projects must comply with the *Recovery Implementation Program for Endangered Fish Species in the Upper Colorado Basin* (Recovery Plan) (USFWS 2013). To ensure the survival and recovery of the four endangered fish species in the Upper Colorado River, water users with depletions are required to make a one-time payment to the Recovery Plan. In 1995, an intra-USFWS Opinion determined that the fee for depletions of less than 100 acre-feet (annual average) would no longer be required. Water use for this project (i.e., approximately 2 acre-feet for foundation concrete and 114 acre-feet for dust control) would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 106 acre-feet of the water use would be within the Colorado River Basin. In Wyoming, the effect determination for new and existing depletions would be completed by the Wyoming State Engineer. The evaluation would determine if specific construction water sources have any contributions to surfaces flows in the Upper Colorado Basin. If water sources are not connected to surface flows, no fee payment would be required.

In summary, the determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Pallid Sturgeon (Federally Endangered)

The pallid sturgeon is located in the lower Platte River downstream of the Elk River confluence in Nebraska. This area is located a considerable distance downstream of any construction or operation disturbance areas in Wyoming, and so these activities would not affect pallid sturgeon. Water depletion also must be evaluated for pallid sturgeon. The Platte River Recovery Implementation Program (PRRIP) was implemented in 2006 to assist in the conservation and recovery of the target species and their associated habitats along the central and lower Platte River in Nebraska. As mentioned above for the Colorado River Basin species, the effect determination for new and existing depletions would be completed by the Wyoming State Engineer. Approximately 0.9 acre-feet of the construction use would occur within the Platte River Basin. The evaluation would determine if specific construction water sources have any contributions to surface flows in the upper portion of the North Platte River and the downstream section of the Platte River Basin in Nebraska. This evaluation would be used to determine if a mitigation payment to the PRRIP would be required.

The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by the pallid sturgeon in the Platte River system.

Northern Leopard Frog (BLM Sensitive and Nevada Protected)

One stream, the Little Snake River at Project Segment 180.2, contains potential habitat for northern leopard frog and would be crossed by Alternative I-A. The potential effects of construction activities on northern leopard frog would include potential direct disturbance to habitat (i.e., flooded areas, wetlands, streams, or ponds) from vehicle traffic and riparian vegetation. Vehicle traffic also could cause mortalities as frogs move to or from aquatic habitats during breeding periods in the spring and summer months. Indirect effects on frog habitat would consist of sedimentation from soil disturbance near aquatic habitats and potential fuel spills. BMPs and design features would minimize erosion effects on waterbodies and restrict refueling within 100 feet of wetlands and streams. BMPs and design features associated with WWEC would be applicable

to northern leopard frog habitat in Region I. In addition, Stipulation 310 would be applied to wetlands within the Rock Springs FO, which would require a buffer of 500 feet around wetlands, streams, springs, ponds, and lakes. This measure would minimize effects on amphibian habitat.

BMPs and design features would be implemented to minimize effects of construction activities on northern leopard frog aquatic habitat. Impacts from these activities during construction would be considered of a low magnitude. Vehicle traffic could cause northern leopard frog mortalities, if traffic movement coincides with frog movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Great Basin Spadefoot Toad (BLM Sensitive)

The Great Basin spadefoot toad has potential to occur in sagebrush habitats below 6,000 feet amsl in Wyoming, Colorado, and Utah, although there are no specific records of occurrence within the Alternative I-A transmission line corridor. Spadefoot toads utilize burrows in terrestrial habitats during the nonbreeding period. This toad species requires water sources for breeding such as rain pools, roadside and irrigation ditches, flooded fields, intermittent and permanent desert streams, and pond and reservoir edges (Buseck et al. 2005). Surface disturbance activities could alter their terrestrial habitat during the nonbreeding period or their aquatic habitat during the breeding period. Vehicle traffic during construction could cause mortalities during movements to and from water sources used for breeding in the spring months.

In summary, surface disturbance activities could alter terrestrial habitat used by Great Basin spadefoot toad during the nonbreeding period or aquatic habitat in the breeding period in the spring months. Potential mortalities from vehicles could occur if construction occurs in the spring near breeding water sources.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Two streams (Yampa and Little Snake rivers) that contain Colorado River cutthroat trout would be crossed by the Alternative I-A 250-foot-wide transmission line ROW. Construction activities near these rivers could result in sediment and fuel spill risks. There would be no habitat loss from construction because culverts or low water construction techniques would not be required for large rivers. The same BMPs and design features for erosion control and spill prevention discussed for game fish streams would also apply to streams containing Colorado River cutthroat trout. Due to the large size of the Yampa and Little Snake rivers, new roads would not be constructed across these streams. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Colorado River cutthroat trout habitat in the Yampa and Little Snake rivers during construction would be of a low magnitude.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

Two streams (Little Snake and Yampa rivers) that contain bluehead sucker, flannelmouth sucker, and roundtail chub would be crossed by the Alternative I-A 250-foot-wide transmission line ROW. Vehicles and equipment would not cross large rivers such as the Yampa and Little Snake. Indirect impacts would be the same as discussed for other fish species. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species. By implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in the Yampa River and Little Snake rivers during construction would be of a low magnitude.

Alternative I-B

In total, two streams (Little Snake and Yampa rivers) that contain special status aquatic species are located within the Alternative I-B transmission line corridor and would be crossed by its 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative I-B.

Colorado Pikeminnow and Razorback Sucker (Federally Endangered and BLM Sensitive)

Construction activities could result in direct disturbance to 1 acre of Colorado pikeminnow critical habitat in the Yampa River. Mitigation measure **SSS-2** would be implemented to avoid disturbance to critical habitat by restricting structures or new roads from being located within the critical habitat area. Potential impacts of sedimentation and fuel spills on Colorado pikeminnow habitat near the Yampa River crossing and downstream reaches occupied by razorback sucker would be minimized by BMPs and design features involving erosion control and spill prevention.

In summary, Alternative I-B would cross 1 acre of critical habitat for Colorado pikeminnow. Surface disturbance activities near the Yampa River pose a risk for sediment and fuel spills. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and downstream reaches occupied by Colorado pikeminnow and razorback sucker.

Colorado Pikeminnow, Humpback chub, Bonytail, and Razorback Sucker (Federally Endangered) Water Depletions

Approximately 2 acre-feet for foundation concrete and 117 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 109 acre-feet of the construction water use would occur within the Colorado River Basin. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Pallid Sturgeon (Federally Endangered)

Construction water use for Alternative I-B would be approximately 9 acre-feet from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights in the Platte River Basin. After specific water sources are identified, an evaluation would be completed to determine if the water sources could result in new depletions in the North Platte watershed in Wyoming or the downstream section of the Platte River Basin in Nebraska. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by the pallid sturgeon in the Platte River system.

Northern Leopard Frog (BLM Sensitive and Nevada Protected)

One stream, the Little Snake River at Project Segment 186, contains potential habitat for northern leopard frog and would be crossed by Alternative I-B. The potential effects of construction activities on northern leopard frog would be the same as discussed for Alternative I-A. BMPs and design features associated with WWEC would be applicable to northern leopard frog habitat in Region I. In addition, BMP-310 would be applied to wetlands within the Rock Springs FO, which would require a buffer of 500 feet around wetlands, streams, springs, ponds, and lakes. This measure would minimize effects on amphibian occurrence and mortalities during movements to these areas. Impacts from vehicle movement during construction would be considered of a low magnitude. Vehicle traffic could cause northern leopard frog mortalities, if traffic movement coincides with frog movements during breeding periods.

Great Basin Spadefoot Toad (BLM Sensitive)

The Great Basin spadefoot toad has potential to occur in sagebrush habitats below 6,000 feet amsl in Wyoming, Colorado, and Utah, although there are no specific records of occurrence within the Alternative I-B corridor. Surface disturbance activities could alter Great Basin spadefoot toad terrestrial habitat during the nonbreeding period or aquatic habitat during the breeding period. Potential impacts to habitat would be considered short-term in duration and low magnitude due to low traffic volume and one-time vehicle movement. Vehicle traffic during construction could cause mortalities during movements to

and from water sources used for breeding in the spring months. Mortalities are expected to be relatively low considering the traffic volume.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Two streams (Yampa and Little Snake rivers) that contain Colorado River cutthroat trout would be crossed by the Alternative I-B 250-foot-wide transmission line ROW. There would be no habitat loss from construction because culverts or low water construction techniques would not be required. Construction and operation maintenance effects on Colorado cutthroat trout habitat would be the same as discussed for Alternative I-A.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

Two streams (Little Snake and Yampa rivers) would be crossed by the Alternative I-B 250-foot-wide transmission line ROW. There would be no habitat loss from construction because culverts or low water construction techniques would not be required. Impacts would be the same as discussed for Alternative I-A. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species.

Alternative I-C

In total, 10 streams are located within the Alternative I-C 2-mile transmission line corridor that contain special status aquatic species. These streams include Separation Creek, Antelope Creek, Elkhead Creek, Fortification Creek, Fourmile Creek, Little Cottonwood Creek, Little Snake River, Muddy Creek (two crossings), Willow Creek, and the Yampa River. Except for Separation, Muddy, and Willow creeks, these streams would be crossed by the Alternative I-C 250-foot-wide transmission line ROW. Species-specific impacts associated with Alternative I-C are discussed below.

Colorado Pikeminnow and Razorback Sucker (Federally Endangered and BLM Sensitive)

Construction activities could result in direct disturbance to 3 acres of Colorado pikeminnow critical habitat in the Yampa River. Mitigation measure **SSS-2** would be implemented to avoid disturbance to critical habitat by restricting structures or new roads from being located within the critical habitat area. Potential impacts of sedimentation and fuel spills on Colorado pikeminnow habitat near the Yampa River crossing and downstream reaches occupied by Colorado pikeminnow and razorback sucker would be minimized by BMPs and design features involving erosion control and spill prevention.

In summary, Alternative I-C would cross 3 acres of critical habitat for Colorado pikeminnow. Surface disturbance activities near the Yampa River pose a risk for sediment and fuel spills. A combination of BMPs, design features, and mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and downstream reaches occupied by Colorado pikeminnow and razorback sucker.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered) Water Depletions

Approximately 2 acre-feet for foundation concrete and 137 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 130 acre-feet of the construction water use would occur within the Colorado River Basin. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Pallid Sturgeon (Federally Endangered)

Construction water use for Alternative I-C would be approximately 9 acre-feet from the Platte River Basin. This water would be obtained from municipal sources, commercial sources, or a temporary water use

agreement with landowners holding existing water rights. After specific water sources are identified, an evaluation would be completed to determine if the water sources could result in new depletions in the North Platte watershed in Wyoming or the downstream section of the Platte River Basin in Nebraska.

In summary, the determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by the pallid sturgeon in the Platte River system.

Northern Leopard Frog (BLM Sensitive, and Nevada Protected)

Potential habitat for northern leopard frog would be crossed by Alternative I-C in one stream, Muddy Creek. The potential effects of construction activities on northern leopard frog would be the same as discussed for Alternative I-A. BMPs and design features associated with WWEC would be applicable to northern leopard frog habitat in Region I. In addition, BMP-310 would be applied to wetlands within the Rock Springs FO, which would require a buffer of 500 feet around wetlands, streams, springs, ponds, and lakes. This measure would minimize effects on amphibian occurrence in and movements to these areas. Impacts from vehicle movement during construction would be considered of a low magnitude. Vehicle traffic could cause northern leopard frog mortalities if traffic movement coincides with frog movements during breeding periods.

Great Basin Spadefoot Toad (BLM Sensitive)

The Great Basin spadefoot toad has potential to occur in sagebrush habitats below 6,000 feet amsl in Wyoming, Colorado, and Utah, although there are no specific records of occurrence within the Alternative I-C transmission line corridor. Surface disturbance activities could alter Great Basin spadefoot toad terrestrial habitat during the nonbreeding period or aquatic habitat during the breeding period. Potential impacts to habitat would be considered short-term and low magnitude due to low traffic volume and one-time vehicle movement. Vehicle traffic during construction could cause mortalities during movements to and from water sources used for breeding in the spring months.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Four streams (Fourmile, Little Cottonwood, and Willow creeks, and the Yampa River) that contain Colorado River cutthroat trout would be crossed by the Alternative I-C 250-foot-wide transmission line ROW. Potential instream disturbance to their habitat could occur if vehicles cross smaller streams such as Fourmile and Little Cottonwood creeks using ford or culvert techniques for road access. Vehicle traffic within the ROW also could cross streams that contain these species. Direct habitat loss could be 800 ft^2 (0.02 acre), if a culvert or low water construction is required at the Fourmile and Little Cottonwood Creek crossings. The same BMPs and design features discussed for game fish streams would also apply to streams containing Colorado River cutthroat trout. Other applicable BMPs would be used to protect these species. BMP 287 (White River National Forest) restricts construction of new roads within 350 feet of occupied cutthroat trout streams and 150 feet from the edge of historic floodplain. The following mitigation measure is recommended to avoid potential effects on cutthroat trout spawning.

SSS-3 *(Avoid Spawning Habitat Disturbance for Special Status Trout Species): If spawning areas for Colorado River cutthroat trout are known to occur at streams proposed for vehicle crossing or culvert construction, instream disturbance would be scheduled to avoid the spawning period from April through May. The exact dates for avoidance would be determined through discussions with WGFD, CPW, or UDWR. All disturbed areas would be restored to pre-construction conditions prior to the next spawning season. The state agencies also would determine if a habitat survey would be required prior to any project disturbance, which would assist in defining habitat conditions for restoration.*

Effectiveness: This measure would be highly effective in avoiding spawning periods for special status trout species and restoring any disturbed habitat.

By implementing erosion control and spill prevention BMPs and design features, water quality effects on Colorado River cutthroat trout habitat during construction would be of a low magnitude. Impacts on spawning special status trout species would be avoided by implementing mitigation measure **SSS-2**.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

The following BLM sensitive sucker and chub species are located in streams that would be crossed by the transmission line corridor for Alternative I-C: bluehead sucker (Yampa River and Little Snake rivers and Fortification and Muddy creeks), flannelmouth sucker (Elkhead Creek, Fortification Creek, Muddy Creek, Little Snake River, and the Yampa River), and roundtail chub (Fortification Creek, Muddy Creek, and the Little Snake and Yampa rivers). The Alternative I-C 250-foot-wide transmission line ROW would cross the Little Snake River, Yampa River, Muddy Creek, Elkhead Creek, Fortification Creek, and Fourmile Creek. Direct disturbance to these species' habitats could occur in the small to mid-size streams such as Elkhead, Fortification, Fourmile, and Muddy Creek due to vehicle traffic. Habitat loss could be 1,600 to 2,400 ft^2 (0.04 to 0.06 acre) for these species, if culverts or low water construction are required in the smaller streams. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species.

By implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in six streams during construction would be of a low magnitude. If roads are constructed across small and mid-sized streams such as Elkhead, Fourmile, Fortification, and Muddy creeks, construction impacts would occur to habitat for special status sucker species and roundtail chub. Disturbed habitat would be restored to pre-construction conditions resulting in impacts of relatively low net magnitude.

Mountain Sucker (BLM Sensitive)

The Alternative I-C 250-foot-wide transmission line ROW would cross two streams (Fourmile and Muddy creeks) containing mountain sucker. Muddy Creek would be crossed three times and Fourmile Creek would be crossed once by the 250-foot-wide transmission line ROW. Habitat loss could be 1,600 ft^2 (0.04 acre), if culverts or low water construction are required for the four 250-foot-wide transmission line ROW crossings. Potential sediment input and fuel spill risks could occur as a result of construction. The same BMPs and design features discussed for game fish streams would also apply to streams containing this BLM sensitive species.

By implementing erosion control and spill prevention BMPs and design features, water quality effects on mountain sucker habitat in two streams potentially crossed during construction would be of a low magnitude. If a culvert or road is constructed across two perennial stream crossings, direct loss of habitat could occur. Disturbed habitat from road construction would be restored to pre-construction conditions resulting in construction impacts of a relatively low net magnitude.

Alternative I-D (Agency Preferred)

In total, two streams (Little Snake and Yampa rivers) that contain special status aquatic species are located within the 2-mile transmission line corridor and would be crossed by 250-foot-wide transmission line ROWs. Species-specific impacts are discussed below for Alternative I-D.

Colorado Pikeminnow and Razorback Sucker (Federally Endangered and BLM Sensitive)

Construction activities could result in direct disturbance to 1 acre of Colorado pikeminnow critical habitat in the Yampa River. Mitigation measure **SSS-2** would be implemented to avoid disturbance to critical habitat by restricting structures or new roads to be located within the critical habitat area. Potential impacts of sedimentation and fuel spills on Colorado pikeminnow habitat near the Yampa River crossing and downstream reaches occupied by razorback sucker would be minimized by BMPs and design features involving erosion control and spill prevention.

In summary, Alternative I-D would cross 1 acre of critical habitat for Colorado pikeminnow. Surface disturbance activities near the Yampa River pose a risk for sediment and fuel spills. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and downstream reaches occupied by Colorado pikeminnow and razorback sucker.

Colorado Pikeminnow, Humpback chub, Bonytail, and Razorback Sucker (Federally Endangered) Water Depletions

Approximately 2 acre-feet for foundation concrete and 126 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 119 acre-feet would occur within the Colorado River Basin.

In summary, the determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Pallid Sturgeon (Federally Endangered)

Construction water use for Alternative I-D would require approximately 9 acre-feet from the Platte River Basin. This water would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. After specific water sources are identified, an evaluation would be completed to determine if the water sources could result in new depletions in the North Platte watershed in Wyoming or the downstream section of the Platte River Basin in Nebraska.

In summary, the determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by the pallid sturgeon in the Platte River system.

Northern Leopard Frog (BLM Sensitive and Nevada Protected)

One stream, the Little Snake River at Project Segment 186, contains potential habitat for northern leopard frog and would be crossed by Alternative I-D. The potential effects of construction activities on northern leopard frog would be the same as those discussed for Alternative I-A. BMPs and design features associated with WWEC would be applicable to northern leopard frog habitat in Region I. These measures would minimize adverse effects on amphibian occurrence and movements in these areas. Impacts from vehicle movement during construction would be considered of a low magnitude. Vehicle traffic could cause northern leopard frog mortalities if traffic movement coincides with frog movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Great Basin Spadefoot Toad (BLM Sensitive)

The Great Basin spadefoot toad has potential to occur in sagebrush habitats below 6,000 feet amsl in Wyoming, Colorado, and Utah, although there are no specific records of occurrence within the Alternative I-D transmission line corridor. Surface disturbance activities could alter Great Basin spadefoot toad terrestrial habitat during the nonbreeding period or aquatic habitat during the breeding period. Potential impacts to habitat would be considered short-term in duration and low magnitude due to low traffic volume and one-time vehicle movements. Vehicle traffic during construction could cause mortalities during movements to and from water sources used for breeding in the spring months.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Two streams (Yampa and Little Snake rivers) that contain Colorado River cutthroat trout would be crossed by the Alternative I-D 250-foot-wide transmission line ROW. There would be no habitat loss due to construction because culverts or low water construction techniques would not remove habitat. Construction and operation maintenance effects on Colorado cutthroat trout habitat would be the same as discussed for

Alternative I-A. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Colorado River cutthroat trout habitat in the Yampa and Little Snake rivers during construction would be of a low magnitude.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive)

Two streams (Little Snake and Yampa rivers) would be crossed by the Alternative I-D 250-foot-wide transmission line ROW. There would be no habitat loss due to construction because culverts or low water construction techniques would not remove habitat. Impacts would be the same as discussed for Alternative I-A. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species. By implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in the Yampa and Little Snake rivers during construction would be of a low magnitude.

The Tuttle Easement micro-siting options would not affect special status aquatic species since no aquatic habitat is located within the areas associated with these variations.

Alternative Connectors in Region I

The Mexican Flats, Fivemile Point North, and Baggs alternative connectors each would cross one stream, Muddy Creek, which contains special status sucker and chub species. Fivemile Point South Alternative Connector would not cross any perennial streams. **Table 3.10-12** summarizes the impacts and advantages/disadvantages associated with the two alternative connectors.

Table 3.10-12 Summary of Region I Alternative Connector Impacts for Special Status Aquatic Species

Alternative Connector	Analysis	Impact Conclusion
Mexican Flats and Fivemile Point North Alternative Connectors	One additional perennial stream (Muddy Creek) containing special status aquatic species is located within the transmission line corridor, and could be impacted by vehicle traffic on access roads.	The disadvantage of using these alternative connectors would be potential increased disturbance to Muddy Creek and special status species, flannelmouth sucker and roundtail chub.
Baggs Alternative Connector	One additional perennial stream (Muddy Creek) containing special status aquatic species is located within the proposed ROW and the transmission line corridor, and could be impacted by vehicle traffic.	The disadvantage of using this alternative connector would be potential increased disturbance to Muddy Creek and special status species, flannelmouth sucker and roundtail chub.

Alternative Ground Electrode Systems in Region I

The northern electrode system would be required within 100 miles of the northern terminal, which is based on the conceptual locations and connections to the alternative routes. There would be no impacts on special status aquatic species, since the conceptual locations do not support habitat for special status fish, amphibian, or invertebrate species.

Region I Conclusion

Based on a comparison of impact parameters for Region I alternatives, potential impacts to special status aquatic species would be greatest for Alternative I-C. Potential effects for Alternatives I-A (Applicant Proposed), I-B, and I-D (Agency Preferred) would be similar and relatively low compared to Alternative I-C (**Table 3.10-9**). Alternative I-C would cross the highest number of streams with special status aquatic species (10) and critical habitat for federally listed Colorado pikeminnow (3 acres). In comparison, the other three alternatives would cross 2 to 4 streams with special status aquatic species and would cross 1 acre of critical habitat for federally endangered fish. Alternative I-C also could result in the greatest alteration or loss of habitat (800 to 2,400 ft^2 or 0.02 to 0.06 acre) compared to no loss or alternation of habitat for the other

three alternatives. Less than 0.1 percent of special status species habitat would be affected by Alternative I-C and the other three alternatives. Alternative I-C could result in the highest potential construction disturbance to riparian areas (17 acres at a 100-foot buffer and 51 acres at a 300-foot buffer) compared to the other three alternatives (2 to 3 acres at a 100-foot buffer and 4 to 10 acres at a 300-foot buffer) (**Table 3.10-10**). Alternative I-D (Agency Preferred) ranks in the low range of potential riparian effects. Alternative I-C also would result in increased new road density in seven watersheds compared to two watersheds for the other alternatives (**Table 3.10-11**). Alternative I-D (Agency Preferred) could affect road densities in two watersheds. Even though the greatest level of impacts are associated with Alternative I-C, project effects on special status species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Section 3.10.6.3 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of special status aquatic species inhabiting these streams.

3.10.6.4 Region II

Table 3.10-13 provides a summary of impact parameters used to describe impacts for alternative routes in Region II. Based on species occurrence information and habitat associations, special status aquatic species that may be impacted by the proposed Project in Region II include 4 amphibians, 13 fish, and 2 invertebrate species (**Table 3.10-5**). Species occurrence in Region II streams is provided in **Appendix G**, **Table G-6**. Project Segment ID numbers referenced in this section are listed in **Table G-6** and depicted in **Figure 2-22**. Parameter information in **Table 3.10-13** is discussed separately for each of the Region II alternatives.

Table 3.10-13 Summary of Region II Alternative Route Impacts for Special Status Aquatic Species

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Number of streams with special status aquatic species that would be crossed by 250-foot-wide transmission line ROWs	12	8	11	7	13	11
Number of streams with special status aquatic species that would be crossed by the 2-mile transmission line corridors or located within 2 miles downstream of corridor boundaries	18	12	12	7	17	18
Number of streams with federally listed aquatic species that would be crossed by 250-foot-wide transmission line ROWs	1	2	2	2	1	2
Acres of critical habitat for federally listed fish species that would be crossed by 250-foot-wide transmission line ROWs						
Colorado pikeminnow	2	4	4	4	2	4
Razorback sucker	2	3	3	3	2	3
Potential Aquatic Habitat Alteration or Loss[1] (ft^2) (acres shown in parentheses)						
Northern leopard frog	400 (0.01)	800 (0.02)	800 (0.02)	0	2,000 (0.05)	2,000 (0.05)
Columbia spotted frog	400 (0.01)	400 (0.01)	0	400 (0.01)	0	0
Boreal toad	800 (0.02)	0	0	0	6,000 (0.14)	0
Bonneville cutthroat trout	2,800 (0.06)	1,200 (0.03)	0	1,200 (0.03)	3,200 (0.07)	3,200 (0.07)
Colorado River cutthroat trout	400 (0.01)	400 (0.01)	0	800 (0.02)	0	1,200 (0.03)
Southern leatherside chub	1,200 (0.03)	1,200 (0.03)	2,800 (0.06)	800 (0.02)	2,800 (0.06)	1,600 (0.04)
Bluehead sucker	2,800 (0.04)	400 (0.01)	1,200 (0.03)	0	1,200 (0.03)	0

Table 3.10-13 Summary of Region II Alternative Route Impacts for Special Status Aquatic Species

Parameter	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Flannelmouth sucker	2,800 (0.04)	0	1,600 (0.04)	0	1,200 (0.03)	0
Mountain sucker	800 (0.02)	1,200 (0.03)	1,600 (0.04)	800 (0.02)	2,000 (0.05)	2,800 (0.06)
Roundtail chub	2,000 (0.05)	0	0	0	1,200 (0.03)	0
California floater	400 (0.01)	0	0	0	0	0
Southern Bonneville pyrg	0	0	0	0	0	0

[1] Habitat loss represents area that could be permanently or temporarily removed due to the use of a culvert or low water crossing or temporarily disturbed from the instream use of equipment. The calculation excludes large rivers such as the Duchesne, Green, Price, San Pitch, Sevier, Uinta, and White.

Parameter information regarding riparian disturbance and road density is provided in **Tables 3.10-14** and **3.10-15**. The analyses focus on streams that contain special status aquatic species. A summary of these parameters is provided below.

Table 3.10-14 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat Associated with Special Status Species, Region II Corridor

	Alternatives											
	II-A		II-B		II-C		II-D		II-E		II-F	
Streams	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Construction	22	64	25	63	15	42	15	55	30	82	28	76
Operation	8	24	7	19	5	12	5	17	11	30	11	30

- Riparian Disturbance – A comparison of the construction effects to riparian vegetation near streams containing special status aquatic species indicates similar potential disturbance (i.e., 15 to 30 acres for the 100-foot buffer distance and 42 to 82 acres for the 300-foot buffer distance). These impacts would be reduced by BLM and USFS requirements, which range from avoiding a riparian buffer area of 200 to 1,200 feet adjacent to perennial streams to total avoidance of riparian areas. In conclusion, the disturbance to riparian vegetation would be avoided on BLM and USFS lands. There could be disturbance on private lands if riparian vegetation is present.
- Road Density – The number of watersheds that would be crossed by the Region II alternative 250-foot-wide transmission line ROWs range from 8 (II-D) to 13 (II-A). The road density units are highest for Alternative II-A. The increase in road density ranged from <0.1 to 0.5 mile/mile^2, with the highest increase in the Upper San Pitch River (Alternative II-B); Soldier Creek (Alternatives II-E and II-F); Outlet Douglas Creek (Alternative II-C); and Willow Creek (Alternative II-E) watersheds. BMPs and design features would be implemented to reduce sediment input to streams including those that support special status aquatic species.

The Strawberry IRA (Option 1 Section 320.101, Option 2 Segment 320.102, and Option 3 Segment 320.103) and Cedar Knoll IRA (Option 1 Segment 320.151 and Option 2 Section 320.152) micro-siting adjustments would not substantially affect the impact analysis for special status aquatic species.

Alternative II-A (Applicant Proposed)

In total, 17 streams that contain special status aquatic species are located within the 2-mile transmission line corridor. These include Bennie, Cottonwood, Currant, Dry Gulch, Hop, Lake Fork, Montes, Nebo, Red, Soldier, Thistle, Tie Fork, and Willow creeks, and the Duchesne, Green, Strawberry, Uinta, and Lake Fork

Table 3.10-15 Open Road Density (Miles/Mile^2) within 100 and 300 Feet of Stream Crossings Associated with Special Status Species in Region II Corridor

	II-A						II-B				
	Current Density		Density Increase		Streams with Special Status Species		Current Density		Density Increase		Streams with Special Status Species
Watershed	100 feet	300 feet	100 feet	300 feet	(# of Segments)	Watershed	100 feet	300 feet	100 feet	300 feet	(# of Segments)
Cottonwood Creek-Dry Gulch Creek	1.95	2.74	0.18	0.11	Cottonwood Creek (1), Montes Creek (1), Dry Gulch Creek (2)	Coal Creek-Price River	2.03	2.90	0.12	0.08	Price River (1)
Currant Creek	3.46	3.43	0.01	0.03	Currant Creek (2)	Cottonwood Creek	1.63	2.97	0.01	0.01	Lowry River (1)
Dry Gulch Creek	1.64	2.45	0.21	0.18	Dry Gulch Creek (1)	Huntington Creek	3.94	4.22	0.03	0.03	Huntington Creek (2)
Strawberry River-Duchesne River	1.57	1.95	0.10	0.08	Duchesne River (1)	Middle Sevier River	1.45	2.18	0.01	0.02	Sevier River (1)
Middle Strawberry River	8.03	5.55	0	0.08	Willow Creek (1)	Outlet Douglas Creek	1.14	3.28	0.16	0.38	Douglas Creek (1)
Pelican Lake-Green River	0.55	1.44	0.03	0.03	Green River (1)	Red Wash-White River	1.18	2.61	0.06	0.05	White River (1)
Pigeon Water Creek-Lake Fork River	0.84	1.47	0.06	0.06	Lake Fork River (1)	Salt Wash-Green River	0.13	0.64	0.04	0.04	Green River (2)
Red Creek	3.50	4.73	0.05	0.09	Red Creek (1)	Upper San Pitch River	4.29	4.57	0.54	0.45	San Pitch River (1), Dry Pole Fork (1), North Fork Pleasant Creek (1), Pleasant Creek (1)
Soldier Creek	8.48	6.99	0.27	0.19	Soldier Creek (2), Tie Fork (1), Lake Fork (1)	Upper Sevier River	0.99	1.90	0.06	0.06	Sevier River (1)
Thistle Creek	10.98	7.25	0.23	0.19	Thistle Creek (2), Nebo Creek (1)						
Uinta River	1.41	2.20	0.01	0.01	Uinta River (1)						
Upper Strawberry River	1.03	1.61	<0.01	<0.01	Strawberry River (2)						
West Creek	3.67	4.24	0.22	0.24	Hop Creek (2), Currant Creek (1), Birch Creek (1)						

Table 3.10 15 Open Road Density (Miles/Mile^2) within 100 and 300 Feet of Stream Crossings Associated with Special Status Species in Region II Corridor

	II-C						II-D				
	Current Density		Density Increase		Streams with Special Status Species		Current Density		Density Increase		Streams with Special Status Species
Watershed	100 feet	300 feet	100 feet	300 feet	(# of Segments)	Watershed	100 feet	300 feet	100 feet	300 feet	(# of Segments)
Cottonwood Creek	1.63	2.97	0.01	0.01	Cottonwood Creek (1)	Agency Draw-Willow Creek	3.30	4.19	0.07	0.06	Willow Creek (1)
Ferron Creek	1.57	2.10	0.01	0.02	Ferron Creek (1)	Beaver Creek-Price River	7.16	6.85	0.03	0.06	Price River (1)
Headwaters Muddy Creek	2.01	2.10	0.03	0.04	Muddy Creek (1)	Cottonwood Wash-White River	0.15	0.25	0.05	0.05	White River (1)
Ivie Creek	3.91	6.30	0.05	0.15	Quitchupah Creek (2)	Huntington Creek	3.94	4.22	0.01	0.01	Huntington Creek (2)
Lost Creek-Sevier River	9.67	9.84	0.06	0.08	Lost Creek (1), Sevier River (1)	Scofield Reservoir	3.90	4.66	0.03	0.16	Mud Creek (1)
Middle Sevier River	1.45	2.18	0.04	0.04	Sevier River (1)	Sheep Wash-Green River	0.09	0.33	0.06	0.06	Green River (1)
Outlet Douglas Creek	1.14	3.28	0.16	0.38	Douglas Creek (1)	Upper San Pitch River	4.29	4.57	0.08	0.18	Oak Creek (1), Cottonwood Creek (1)
Red Wash-White River	1.18	2.61	0.06	0.05	White River (1)	West Creek	3.67	4.24	0.14	0.16	Hop Creek (1)
Salina Creek	8.89	12.15	0.13	0.13	Gooseberry Creek (1), Little Creek (1)						
Salt Wash-Green River	0.13	0.64	0.04	0.04	Green River (2)						

Table 3.10 15 Open Road Density (Miles/Mile2) within 100 and 300 Feet of Stream Crossings Associated with Special Status Species in Region II Corridor

	II-E						II-F				
	Current Density		Density Increase		Streams with Special Status Species		Current Density		Density Increase		Streams with Special Status Species
Watershed	100 feet	300 feet	100 feet	300 feet	(# of Segments)	Watershed	100 feet	300 feet	100 feet	300 feet	(# of Segments)
Beaver Creek-Price River	7.16	6.85	0.12	0.20	Price River (1), Kyune Creek (1)	Agency Draw-Willow Creek	3.30	4.19	0.07	0.06	Willow Creek (1)
Cottonwood Creek-Dry Gulch Creek	1.95	2.74	0.18	0.11	Cottonwood Creek (1), Montes Creek (1), Dry Gulch Creek (2)	Beaver Creek-Price River	7.16	6.85	0.03	0.03	Price River (1), Kyune Creek (1), Kyune Creek Right Fork (1)
Dry Gulch Creek	1.64	2.45	0.21	0.16	Dry Gulch Creek (1)	Cottonwood Wash-White River	0.15	0.25	0.05	0.05	White River (1)
Pelican Lake-Green River	0.55	1.44	0.03	0.03	Green River (1)	Middle Sevier River	1.45	2.18	0.01	0.02	Sevier River (1)
Pigeon Water Creek-Lake Fork River	0.84	1.47	0.11	0.16	Lake Fork River (1)	Sheep Wash-Green River	0.09	0.33	0.06	0.06	Green River (1)
Soldier Creek	8.48	6.99	0.53	0.44	Clear Creek (1), Soldier Creek (2), Tie Fork (1), Lake Fork (1)	Soldier Creek	8.48	6.99	0.53	0.44	Soldier Creek (2), Tie Fork (1), Lake Fork (1)
Strawberry River-Duchesne River	1.57	1.95	0.16	0.13	Duchesne River (1)	Thistle Creek	10.98	7.25	0.23	0.19	Bennie Creek (1), Thistle Creek (1)
Thistle Creek	10.98	7.25	0.23	0.19	Bennie Creek (1), Thistle Creek (1), Nebo Creek (1)	Upper Sevier River	0.99	1.90	0.06	0.06	Sevier River (1)
Uinta River	1.41	2.20	0.01	0.01	Uinta River (1)	West Creek	3.67	4.29	0.16	0.19	Hop Creek (2)
West Creek	3.67	4.24	0.16	0.19	Hop Creek (2)	White River	6.37	6.29	0.19	0.24	White River (2), Tabbyune Creek (1), White River Right Fork (1)
White River	6.37	6.29	0.04	0.06	White River (2), Tabbyune Creek (1)	Willow Creek	4.16	4.26	0	0	West Fork Willow Creek (1)
Willow Creek	4.16	4.26	0.43	0.45	West Fork Willow Creek (1)						

Note: Zero indicates no new roads within the buffer area.

rivers. All of these streams except Bennie, Cottonwood, Hop, Nebo, Thistle, and Willow creeks would be crossed by the Alternative II-A 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative II-A.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered and BLM Sensitive)

Direct Disturbance and Indirect Water Quality Effects

Construction activities could result in direct disturbance to 2 acres of Colorado pikeminnow and razorback sucker critical habitat in the Green River. The 250-foot-wide transmission line ROW would cross critical habitat in Project Segment 213. Critical habitat for both species is defined as the 100-year floodplain in the Green River. Vehicles and equipment would not enter the wetted area of the river channel; however, disturbance could occur in the dry area of the 100-year floodplain on both sides of the Green River. It should be clarified that this area is an overestimate of disturbance because it includes the wet portion of the floodplain. Mitigation measure **SSS-2** would be implemented to avoid disturbance to critical habitat by restricting structures or new roads from being located within the critical habitat area. Potential impacts of sedimentation and fuel spills on Colorado pikeminnow and razorback sucker habitat near the Green River crossing and downstream reaches occupied by all four federally endangered fish species would be minimized by BMPs and design features involving erosion control and spill prevention.

In summary, Alternative II-A would cross 2 acres of critical habitat for Colorado pikeminnow and razorback sucker. Surface disturbance activities near the Green River pose a risk for sediment and fuel spills for all four federally endangered fish species. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and razorback sucker and downstream reaches occupied by all four federally endangered fish species.

Water Depletions

Approximately 3 acre-feet for foundation concrete and 189 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 111 acre-feet of construction water use would occur within the Colorado River Basin. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

June Sucker (Federally Endangered, BLM Sensitive, and Utah Special Concern)

June sucker habitat in Utah Lake and the Provo River is located approximately 15 miles upgradient from the Region II corridors. There would be no direct disturbance to habitat. In addition, there would be no effects of construction water use on June sucker habitat, as the proposed water sources are not connected to surface flows in the Provo River or Utah Lake. As a result, there would be no direct or indirect effects of project construction and operation on the June sucker. This conclusion also would apply to the other Region II alternatives.

Least Chub (Federal Candidate)

Least chub habitat occurs in springs and wetland areas within the Currant Creek drainage, which are located approximately 1.5 miles downgradient of the Alternative II-A 2-mile transmission line corridor and 3.5 miles from the 250-foot-wide transmission line ROW. There would be no direct disturbance on least chub habitat. In addition, there would be no indirect effects on least chub habitat from construction, since water sources for the springs and wetlands would not be disturbed or used as dust control or concrete

formation. Least chub habitat is not located near or within the 2-mile transmission line corridors for the other Region II alternatives.

Boreal Toad (Forest Sensitive Species and Colorado Endangered and Utah CAS)

Potential breeding habitat for boreal toad overlaps with the Alternative II-A 250-foot-wide transmission line ROW near Birch Creek and Willow Creek. Potential direct habitat loss could be 800 ft^2 (0.02 acre), if a culvert or low water construction is required. Vehicle traffic could cause toad mortalities, if construction coincides with migration periods to and from a water source used for breeding or terrestrial habitat during the non-breeding period. By applying a 2-mile dispersal distance around Willow and Birch creeks, potential effects could occur in approximately 17,420 acres of terrestrial habitat. BMPs and design features associated with WWEC would be applicable to boreal toad habitat in Region II.

Impacts from vehicle movement would be considered of a low magnitude. Vehicle traffic could cause toad mortalities, if traffic movement coincides with their movements during breeding periods.

Columbia Spotted Frog (Forest Sensitive Species and Nevada and Utah Protected)

Four habitat areas (Soldier and Willow creeks in Project Segment 320.1 and Currant Creek and unnamed tributary to Currant in segment 340) that contain Columbia spotted frog would be crossed by the Alternative II-A 2-mile transmission line corridor. One of these areas (Soldier Creek) would be crossed by the 250-foot-wide transmission line ROW. Construction activities within these streams could alter habitat used for eggs and rearing of young. Potential direct habitat loss could be 400 ft^2 (0.01 acre), if a culvert or low water crossing is required at the one ROW crossing. Direct effects of construction activities and maintenance could include mortalities to frogs from vehicle traffic within the ROW or along access roads due to stream crossings or periods when frogs move to upland areas for overwintering. Vehicle traffic also could cause sedimentation in the disturbance area near these streams. BMPs and design features for Columbia spotted frog would be the same as discussed for northern leopard frog. As discussed for California floater, mitigation measures WET-2 and WET-4 would restrict disturbance in the wetland near Currant Creek. Impacts from vehicle traffic during construction would be considered of a low magnitude. Vehicle traffic could cause Columbia spotted frog mortalities, if traffic movement coincides with frog movements during breeding periods.

Northern Leopard Frog (BLM Sensitive and Nevada State Protected)

Three areas (Soldier Creek, Project Segment 320.1 and 320.15, and Currant Creek, Project Segment 340) contain potential habitat for northern leopard frog and would be crossed by Alternative II-A. The potential effects of construction activities on northern leopard frog would be the same as discussed for Region I. Potential loss of habitat would be 400 ft^2 (0.01 acre), if a culvert is used at the 250-foot-wide transmission line ROW crossing. BMPs and design features associated with WWEC would be applicable to northern leopard frog habitat in Region II. As discussed for California floater, mitigation measures WET-2 and WET-4 would restrict disturbance in the wetland near Currant Creek. Impacts from vehicle traffic would be considered of a low magnitude. Vehicle traffic could cause northern leopard frog mortalities, if traffic movement coincides with frog movements during breeding periods.

Bonneville Cutthroat Trout (BLM and Forest Sensitive Species and Utah Protected and CAS)

Eight streams including Bennie, Currant (Wasatch County), Lake Fork, Nebo, Red, Soldier, Thistle, and Tie Fork creeks would be crossed by the Alternative II-A 2-mile transmission line corridor. All of these streams except Bennie and Nebo creeks would be crossed by the 250-foot-wide transmission line ROW. Direct disturbance to habitat would occur if vehicles or equipment cross any of these streams or if culverts were constructed as part of developing new access roads. Potential loss or alteration of habitat would be 2,800 ft^2 (0.06 acre), if culverts or low water crossings are required at seven 250-foot-wide transmission line ROW crossings involving small streams. Indirect effects of instream work or surface disturbance near the streams could result in sedimentation or potential fuel spills. The same BMPs and design features discussed for

game fish streams would also apply to streams containing Bonneville cutthroat trout. Other applicable BMPs would be used to protect these species. A White River National Forest management requirement restricts construction of new roads within 350 feet of occupied cutthroat trout streams and 150 feet from the edge of historic floodplains. A Uinta National Forest requirement specifies that work in Tie Fork and Willow creeks in Utah should avoid disturbance to Bonneville and Colorado River cutthroat habitat. These streams are considered to be recovery habitat for these cutthroat subspecies. Mitigation measure **SSS-3** also would be applied to streams that contain spawning habitat for Bonneville cutthroat trout.

In summary, by implementing erosion control and spill prevention BMPs and design features, water quality effects on Bonneville cutthroat trout habitat in up to eight streams would be minimized during construction and be considered of a low magnitude. Impacts on spawning special status trout species would be avoided by implementing mitigation measure **SSS-3**.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Three streams (Willow Creek and Green and Strawberry rivers) that contain Colorado River cutthroat trout would be crossed by the Alternative II-A 2-mile transmission line corridor and 250-foot-wide transmission line ROW. Construction- and operations-related effects on Colorado River cutthroat trout could disturb habitat in the smaller stream, Willow Creek. Potential loss of habitat would be 400 ft^2 (0.01 acre), if a culvert is used on Willow Creek. No crossings would be constructed across the Green or Strawberry rivers. BMPs, design features, and mitigation measure **SSS-3** would minimize effects to Colorado River cutthroat trout.

Southern Leatherside Chub (BLM and Forest Sensitive Species and Utah CAS)

Three streams (Soldier, Hop, and Thistle creeks) containing southern leatherside chub would be crossed by the 250-foot-wide transmission line ROW and 2-mile-wide transmission line corridor. Potential direct effects on southern leatherside chub habitat could occur in these small and mid-size streams due to vehicle and equipment crossings and removal of riparian vegetation. Potential direct habitat loss could be 1,200 ft^2 (0.03 acre), if culverts or low water crossings are required at three 250-foot-wide transmission line ROW crossings. Indirect effects involving sedimentation and potential fuel spills on southern leatherside chub habitat would the same as discussed for other fish species. The same BMPs and design features discussed for other sensitive fish species also would be applied to construction activities in or near streams containing southern leatherside chub. The following mitigation measure would be implemented to avoid impacts on spawning chub.

SSS-4 *(Avoid Spawning Habitat Disturbance for Southern Leatherside Chub): If spawning areas for southern leatherside chub are known to occur at streams proposed for vehicle crossing or culvert construction, instream disturbance would be scheduled to avoid the spawning period from April through June. The exact dates for avoidance would be determined through discussions with UDWR. All disturbed areas would be restored to pre-construction conditions prior to the next spawning season.*

Effectiveness: This measure would be highly effective in avoiding spawning periods for southern leatherside chub and restoring any disturbed habitat.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

The following number of streams that contain these BLM sensitive sucker and chub species would be crossed by the transmission line corridor for Alternative II-A: bluehead sucker (nine streams), flannelmouth sucker (eight streams), and roundtail chub (seven streams). The Alternative II-A 250-foot-wide transmission line ROW would cross nine streams (Cottonwood Creek, Currant Creek, Dry Gulch, Montes Creek, Lake Fork River, and Green, Strawberry, Uinta and White rivers) that contain one or more of these species. Direct disturbance to their habitat could occur in the small to mid-size streams such as Currant, Dry Gulch, Lake Fork, and Montes creeks due to vehicle traffic. Habitat loss could be 2,000 to 2,800 ft^2 (0.05 to 0.06 acre) for these species, if culverts or low water construction are required in the smaller streams. The same BMPs and

design features discussed for game fish streams would also apply to streams containing these BLM sensitive species.

In summary, by implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in nine streams during construction would be of a low magnitude. If roads are constructed across Currant, Dry Gulch, Lake Fork, and Montes creeks, impacts during construction would occur to habitat for special status sucker species and roundtail chub. Disturbed habitat would be restored to pre-construction conditions resulting in construction impacts of a relatively low net magnitude.

Mountain Sucker (BLM Sensitive)

The Alternative II-A 250-foot-wide transmission line ROW would cross two streams (Soldier and Thistle creeks) containing mountain sucker. Habitat loss could be 800 ft^2 (0.02 acre), if culverts or low water construction are required in this small stream. Potential sediment input and fuel spill risks could occur as a result of construction. The same BMPs and design features discussed for game fish streams would also apply to streams containing this BLM sensitive species.

By implementing erosion control and spill prevention BMPs and design features, water quality effects on mountain sucker habitat in one stream during construction would be of a low magnitude. If a culvert or road is constructed across Soldier Creek, direct loss of habitat could occur. Disturbed habitat from road construction would be restored to pre-construction resulting in construction impacts of a relatively low net magnitude.

Southern Bonneville Pyrg (Utah Protected)

The transmission line corridor for Alternative II-A would cross one unnamed spring near Thistle Creek that is inhabited by the springsnail, southern Bonneville pyrg. The spring is located approximately 600 feet east of the 250-foot-wide transmission line ROW or approximately 500 feet from the ROW. Direct effects of construction could include the potential disturbance to habitat or springsnail mortalities as a result of access road traffic within or near the spring. Disturbance to habitat features involving bottom substrates or aquatic vegetation used by this species would reduce the number of individuals and possibly eliminate the population in this spring. Habitat loss or alteration could occur if vehicles cross this small spring. This spring contains one of six populations known to occur in Utah. Indirect effects of construction could adversely affect water quality and habitat from sediment input or a potential fuel spill near the spring. BMPs and design features involving sediment control and restrictions on refueling within 100 feet of waterbodies would minimize potential indirect effects on this species and habitat. The following mitigation measure is recommended to avoid potential direct effects on southern Bonneville pyrg.

SSS-5 *(Avoid Direct Disturbance to Habitat for Southern Bonneville Pyrg): No vehicle or equipment disturbance from ROW work or access road construction would be allowed within 300 feet of the unnamed spring located near Thistle Creek that contains southern Bonneville pyrg.*

California Floater (BLM Sensitive)

California floater habitat would be crossed by the Alternative II-A 250-foot-wide transmission line ROW at Currant Creek in Juab County. Direct effects of construction could include the potential disturbance to habitat or mortalities as a result of access road traffic within or near the stream or adjacent wetland complex. Two vegetation mitigation measures, WET-2 and WET-4, would protect wetlands by establishing a 500-foot buffer that would restrict direct disturbance. Habitat loss could be 400 ft^2 (0.01 acre), if a culvert or low water construction is required in Currant Creek. The following mitigation measure is proposed to protect California floater in Currant Creek.

SSS-6 *(Survey to Avoid Direct Disturbance to California Floater Habitat): If instream construction is proposed for Currant Creek, a survey would be conducted to determine if California floater is present. If the species is absent, construction would be allowed after meeting UDWR requirements for restoration. If the species is present, relocation of individuals in the disturbance area would be considered to avoid impacts to it.*

In summary, potential direct impacts to California floater would be minimized by implementing mitigation measures **SSS-6**, **WET-2**, and **WET-4**. BMPs, BLM stipulations, and design features would be followed to minimize potential sedimentation or fuel spill impacts to California floater habitat. These protection measures would assist in maintaining the population and contribute to a trend in avoiding federal listing.

USFS Sensitive Species

In total, seven perennial streams are located within the Alternative II-A transmission line corridor in one National Forest (Uinta-Wasatch-Cache) **(Appendix G**, **Table G-13**). Four of these streams (Soldier, Tie Fork, and Willow creeks and the Strawberry River) contain USFS sensitive species. Species include Bonneville cutthroat trout and southern leatherside chub in Soldier and Tie Fork creeks, and Colorado River cutthroat trout in Willow Creek and Strawberry River. Columbia spotted frog also occurs in Soldier Creek at Project Segment 320.1 and 320.15. Three of the streams would be crossed by the 250-foot-wide transmission line ROW, which could result in a direct loss of aquatic habitat of 400 ft^2 (0.01 acre) in each stream, if construction of culverts or low water crossings is required. A stipulation for the Uinta-Wasatch-Cache National Forest requires that no actions affect cutthroat trout in Tie Fork and Willow creeks, Therefore, direct disturbance to habitat or other indirect effects involving sediment or fuel spills would not be allowed in these two streams. Sediment input and riparian disturbance would be avoided by following the Uinta-Wasatch-Cache National Forest stipulation that requires a 300-foot buffer along perennial streams.

Alternative II-B

In total, 11 streams (Bitter, Douglas, Dry Pole, Huntington, North Fork Pleasant, and Pleasant creeks and the Green, Lowry, Price, San Pitch, Sevier, and White rivers) that contain special status aquatic species are located within the Alternative II-B 2-mile transmission line corridor. Except for Bitter Creek, Dry Pole Creek, North Fork Pleasant Creek, and the Lowry River, these streams would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative II-B.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered and BLM Sensitive)

Direct Disturbance and Indirect Water Quality Effects

Construction activities could result in direct disturbance to 4 acres of Colorado pikeminnow critical habitat in the Green and White rivers and 3 acres of razorback sucker critical habitat in the Green River. The 250-foot-wide transmission line ROW would cross critical habitat in Project Segment 220.1 at the two locations. Mitigation measure **SSS-2** would be implemented to avoid disturbance to critical habitat by restricting structures or new roads from being located within the critical habitat area. Potential impacts of sedimentation and fuel spills on Colorado pikeminnow and razorback sucker habitat near the Green River crossing and downstream reaches occupied by all four federally endangered fish species would be minimized by BMPs and design features involving erosion control and spill prevention.

In summary, Alternative II-B would cross 4 acres of critical habitat for Colorado pikeminnow and 3 acres for razorback sucker. Surface disturbance activities near the Green and White rivers pose a risk for sediment and fuel spills for all four federally endangered fish species. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and razorback sucker and downstream reaches occupied by all four federally endangered fish species.

Water Depletions

Approximately 4 acre-feet for foundation concrete and 254 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 191 acre-feet of construction water use would occur within the Colorado River Basin. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Columbia Spotted Frog (Forest Sensitive Species and Nevada and Utah CAS)

One stream (San Pitch River in Sanpete County, Project Segment 310) containing Columbia spotted frog would be crossed by the Alternative II-B 250-foot-wide transmission line ROW and 2-mile transmission line corridor. Direct effects of construction and maintenance activities would be the same as discussed for Alternative II-A. Potential direct loss of aquatic habitat could be 400 ft^2 (0.01 acre), if a culvert or low water construction is required. BMPs and design features for Columbia spotted frog would be the same as discussed for northern leopard frog. Impacts from construction traffic would be considered a low magnitude. Vehicle traffic could cause Columbia spotted frog mortalities, if traffic movement coincides with frog movements during breeding periods.

Northern Leopard Frog (BLM Sensitive and Nevada State Protected)

Two streams (White River and Douglas Creek) contain potential habitat for northern leopard frog and would be crossed by Alternative II-B. The potential effects of construction activities on northern leopard frog would be the same as discussed for Region I. Potential loss of habitat would be 800 ft^2, if culverts are used at the 250-foot-wide transmission line ROW crossings. BMPs and design features associated with WWEC would be applicable to northern leopard frog habitat in Region II. Impacts from construction activities would be considered a low magnitude. Vehicle traffic could cause northern leopard frog mortalities if traffic movement coincides with frog movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Bonneville Cutthroat Trout (BLM and Forest Sensitive Species and Utah Protected and CAS)

Three streams consisting of Dry Pole, North Fork Pleasant, and Pleasant creeks would be crossed by the Alternative II-B 2-mile transmission line corridor. Pleasant Creek is the only stream that would be crossed by the 250-foot-wide transmission line ROW. Direct disturbance to habitat would occur if vehicles or equipment cross any of these streams or if culverts were constructed as part of developing new access roads. Potential habitat loss would be 1,200 ft^2 (0.03 acre) associated with the Pleasant Creek crossings. Indirect effects of instream work or surface disturbance near the streams could result in sedimentation or potential fuel spills. The same BMPs and design features discussed for game fish streams would also apply to streams containing Bonneville cutthroat trout. Other applicable BMPs would be used to protect these species. Mitigation measure **SSS-3** also would be applied to streams that contain spawning habitat for Bonneville cutthroat trout.

In summary, by implementing erosion control and spill prevention BMPs and design features, water quality effects on Bonneville cutthroat trout habitat in up to six streams during construction would be a low magnitude. Impacts on spawning special status trout species would be avoided by implementing mitigation measure **SSS-3**.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Five streams (Bitter and Huntington creeks and the Green, Lowry, and White rivers) containing Colorado River cutthroat trout habitat would be crossed by the Alternative II-B 2-mile transmission line corridor. The Green and White rivers and Huntington Creek also would be crossed by the 250-foot-wide transmission line ROW. Potential habitat loss of 400 ft^2 (0.01 acre) would occur, if a culvert or low water construction occurred

at the Huntington Creek crossing. BMPs, design features, and mitigation measure **SSS-3** would minimize effects to Colorado River cutthroat trout.

Southern Leatherside Chub (BLM and Forest Sensitive Species and Utah CAS)

Two streams (San Pitch and Sevier rivers) contain southern leatherside chub habitat and would be crossed by the 250-foot-wide transmission line ROW and the 2-mile transmission line corridor. Potential effects of construction and maintenance operations on southern leatherside habitat would be the same as discussed for Alternative II-A. Direct habitat loss could be 1,200 ft^2 (0.03 acre), if culverts or low water construction is required. The same BMPs and design features discussed for other sensitive fish species also would be applied to construction activities in or near streams containing southern leatherside chub. In addition, mitigation measure **SSS-4** also would be implemented to avoid impacts on spawning.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

The following BLM sensitive sucker and chub species occur in streams that would be crossed by the transmission line corridor for Alternative II-B: bluehead sucker (Green River, Huntington Creek, Lowry River, Price River, and White River), flannelmouth sucker (Green, Price, and White rivers), and roundtail chub (Green and White rivers). The number of 250-foot-wide transmission line ROW crossings for these species include four for bluehead sucker, three for flannelmouth sucker, and three for roundtail chub. Direct disturbance to their habitat could occur in the small to mid-size streams such as Huntington Creek due to vehicle traffic. Habitat loss could be 0 to 400 ft^2 (0.01 acre) for these species, if culverts or low water crossings are required in the smaller streams. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species.

In summary, by implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in five streams during construction would be of a low magnitude. If roads are constructed across Huntington Creek, impacts during construction would occur in habitat for special status sucker species and roundtail chub. Disturbed habitat would be restored to pre-construction resulting in construction impacts of a relatively low net magnitude.

Mountain Sucker (BLM Sensitive)

The Alternative II-B 250-foot-wide transmission line ROW would cross two streams (San Pitch and Sevier rivers) containing mountain sucker. Habitat loss could be 1,200 ft^2 (0.03 acre), if culverts or low water crossings are required in these streams. Potential sediment input and fuel spill risks could occur as a result of construction. The same BMPs and design features discussed for game fish streams would also apply to streams containing this BLM sensitive species. By implementing erosion control and spill prevention BMPs and design features, water quality effects on mountain sucker habitat in two streams during construction would be of a low magnitude.

USFS Sensitive Species

In total, six perennial streams, one spring, and one pond are located within the Alternative II-B transmission line corridor in one National Forest (Manti-LaSal) (**Appendix G, Table G-13**). Two streams in the Manti-LaSal National Forest contain USFS sensitive species (Bonneville cutthroat trout in Dry Pole Creek and Colorado River cutthroat trout in Lowry River). There would be no direct habitat loss in these two streams, since they would not be crossed by the 250-foot-wide transmission line ROW. Potential sediment input and riparian disturbance would be minimized by Forest management direction that avoids impacts to riparian habitat.

Alternative II-C

In total, 12 streams (Bitter, Cottonwood, Douglas, Ferron, Gooseberry, Little, Lost, Muddy, and Quitchupah creeks and the Green, Sevier, and White rivers.) are located within the 2-mile transmission line corridor that

contains special status aquatic species. All of these streams except Bitter Creek would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative II-C.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered and BLM Sensitive)

Direct Disturbance and Indirect Water Quality Effects

Direct and indirect effects on the federally endangered fish species in the Upper Colorado River Basin for Alternative II-C would be the same as discussed for Alternative II-B. Alternative II-C would cross 4 acres of critical habitat for Colorado pikeminnow in the Green and White rivers and 3 acres for razorback sucker in the Green River (Project Segment 220.1). Surface disturbance activities near the Green and White rivers pose a risk for sediment and fuel spills for all four federally endangered fish species. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and razorback sucker and downstream reaches occupied by all four federally endangered fish species.

Water Depletions

Approximately 4 acre-feet for foundation concrete and 269 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 197 acre-feet of construction water use would occur within the Colorado River Basin. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Northern Leopard Frog (BLM Sensitive and Nevada State Protected)

Impacts of Alternative II-C on northern leopard frog would be the same as discussed for Alternative II-B. Two streams, the White River and Douglas Creek, with northern leopard frog habitat would be crossed by the Alternative II-C. Potential loss of habitat would be 800 ft^2 (0.02 acre), if a culvert is used at the 250-foot-wide transmission line ROW crossing on Douglas Creek. Impacts from construction activities would be considered of a low magnitude. Vehicle traffic could cause northern leopard frog mortalities, if traffic movement coincides with frog movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Bonneville Cutthroat Trout (BLM and Forest Sensitive Species and Utah Protected and CAS)

No streams containing Bonneville cutthroat trout habitat would be crossed by Alternative II-C. Therefore, this alternative would cause no effects on Bonneville cutthroat trout.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Three streams (Bitter Creek and the Green and White rivers) that contain Colorado River cutthroat trout would be crossed by the 2-mile transmission line corridor. The Green and White rivers would be crossed by the 250-foot-wide transmission line ROW for Alternative II-C. Construction- and operations-related effects on Colorado cutthroat trout would not disturb habitat in the two larger rivers. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Colorado River cutthroat trout habitat during construction would be of a low magnitude.

Southern Leatherside Chub (BLM and Forest Sensitive Species and Utah CAS)

Six streams (Gooseberry, Little, Lost, Muddy, and Quitchupah creeks and the Sevier River) contain southern leatherside chub habitat and would be crossed by the 2-mile transmission line corridor. All of these streams except Little Creek would be crossed by the Alternative II-C 250-foot-wide transmission line ROW.

Potential effects of construction and maintenance operations on southern leatherside habitat would be the same as discussed for Alternative II-A. Direct habitat loss could be 2,800 ft^2 (0.06 acre), if culverts or low water construction is required at seven 250-foot-wide transmission line ROW crossings. The same BMPs and design features discussed for other sensitive fish species also would be applied to construction activities in or near streams containing southern leatherside chub along with mitigation measure **SSS-4**.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

The following sucker and chub species occur in streams that would be crossed by the 2-mile transmission line corridor for Alternative II-C: bluehead sucker (Cottonwood Creek, Ferron Creek, Green River, Muddy Creek, and White River), flannelmouth sucker (Ferron Creek, Green River, Muddy Creek, Quitchupah Creek, and White River), and roundtail chub (Green and White rivers). The number of 250-foot-wide transmission line ROW crossings for these species include six for bluehead sucker, seven for flannelmouth sucker, and three for roundtail chub.. Habitat loss could be 0 to 1,600 ft^2 (0.04 acre) for these species, if culverts or low water construction are required in the smaller streams. No direct disturbance to their habitat would be expected due to the relatively large size of these streams. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species.

In summary, by implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in seven streams during construction would be of a low magnitude. Road disturbance and effects on habitat for these species would not be expected for these larger streams.

Mountain Sucker (BLM Sensitive)

The Alternative II-C 250-foot-wide transmission line ROW would cross three streams (Muddy and Quitchupah creeks and the Sevier River) containing mountain sucker. Habitat loss could be 1,600 ft^2 (0.04 acre), if culverts or low water construction are required in this small stream. Potential sediment input and fuel spill risks could occur as a result of construction. The same BMPs and design features discussed for game fish streams would also apply to streams containing this BLM sensitive species. By implementing erosion control and spill prevention BMPs and design features, water quality effects on mountain sucker habitat in three streams during construction would be of a low magnitude. If a culvert or road is constructed across Muddy and Quitchupah creeks, direct loss of habitat could occur. Disturbed habitat from road construction would be restored to pre-construction resulting in construction impacts of a relatively low net magnitude.

USFS Sensitive Species

In total, six perennial streams, one reservoir, and four springs are located within the Alternative II-C transmission line corridor in the Fishlake National Forest (**Appendix G**, **Table G-13**). One of these streams (Little Creek) contains a USFS sensitive species, the southern leatherside chub. The 250-foot-wide transmission line ROW would cross this stream, which could result in a direct loss of aquatic habitat of 400 ft^2 (0.01 acre), if culverts or low water construction is required. By following the Forest management guidance involving avoidance of riparian areas near streams, effects on riparian vegetation and sediment input would be minimized.

Alternative II-D

In total, seven streams (Cottonwood, Huntington, Mud, and Oak creeks and the Green, San Pitch, and White rivers) are located within the 2-mile transmission line corridor that contains special status aquatic species. All of these streams would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative II-D.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered and BLM Sensitive)

Direct Disturbance and Indirect Water Quality Effects

Direct effects on critical habitat due to potential disturbance within the 250-foot-wide transmission line ROW crossing would be 4 acres for Colorado pikeminnow in the Green and White rivers and 3 acres for razorback sucker in the Green River. Indirect effects on the federally endangered fish species in the Upper Colorado River Basin for Alternative II-D would be the same as discussed for Alternative II-A.

In summary, Alternative II-D would cross 4 acres of critical habitat for Colorado pikeminnow and 3 acres for razorback sucker. Surface disturbance activities near the Green and White rivers pose a risk for sediment and fuel spills for all four federally endangered fish species. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and razorback sucker and downstream reaches occupied by all four federally endangered fish species.

Water Depletions

Approximately 3 acre-feet for foundation concrete and 193 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 132 acre-feet of construction water use would occur within the Colorado River Basin. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Columbia Spotted Frog (Forest Sensitive Species and Nevada and Utah Protected)

One stream (San Pitch River in Sanpete County, Project Segment 217.15) containing Columbia spotted frog would be crossed by the Alternative II-D 250-foot-wide transmission line ROW and 2-mile transmission line corridor. Direct effects of construction and maintenance activities would be the same as discussed for Alternative II-A. Potential direct loss of aquatic habitat could be 400 ft^2 (0.01 acre) if a culvert or low water construction is required. BMPs and design features for Columbia spotted frog would be the same as discussed for northern leopard frog. Impacts from construction activities would be considered a low magnitude. Vehicle traffic could cause Columbia spotted frog mortalities, if traffic movement coincides with frog movements during breeding periods.

Northern Leopard Frog (BLM Sensitive and Nevada State Protected)

One stream with northern leopard frog habitat, the White River, would be crossed by the Alternative II-D 2-mile transmission line corridor. The potential effects of construction activities on northern leopard frog would be the same as discussed for Region I, but only one habitat area would be crossed by the Alternative II-D 250-foot-wide transmission line ROW. There would be no loss of habitat, since culverts or low water construction would not occur at the White River crossing. Impacts from construction activities would be considered a low magnitude. Vehicle traffic could cause northern leopard frog mortalities, if traffic movement coincides with frog movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Bonneville Cutthroat Trout (BLM and Forest Sensitive Species and Utah Protected and CAS)

Three streams consisting of Mud, Oak, and Cottonwood creeks would be crossed by the Alternative II-D 2-mile transmission line corridor and 250-foot-wide transmission line ROW. Direct disturbance to habitat would occur if vehicles or equipment cross any of these streams or if culverts were constructed as part of developing new access roads. Potential habitat loss would be 1,200 ft^2 (0.03 acre) associated with the three 250-foot-wide transmission line ROW crossings. Indirect effects of instream work or surface disturbance

near the streams could result in sedimentation or potential fuel spills. The same BMPs and design features discussed for game fish streams would also apply to streams containing Bonneville cutthroat trout. Other applicable BMPs would be used to protect these species. Mitigation measure **SSS-3** also would be applied to streams that contain spawning habitat for Bonneville cutthroat trout.

By implementing erosion control and spill prevention BMPs and design features, water quality effects on Bonneville cutthroat trout habitat in three streams during construction would be of a low magnitude. Impacts on spawning special status trout species would be avoided by implementing mitigation measure **SSS-3**.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Four streams (Huntington and Willow creeks and the Green and White rivers) that contain Colorado River cutthroat trout would be crossed by the 2-mile transmission line corridor and 250-foot-wide transmission line ROW for Alternative II-D. Construction- and operations-related effects on Colorado River cutthroat trout could disturb habitat in Huntington and Willow creeks. Direct loss of habitat could be 800 ft^2 (0.02 acre), if culverts or low water construction is required at the Willow Creek crossing. BMPs, design features, and mitigation measure **SSS-3** would minimize effects to Colorado River cutthroat trout. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Colorado River cutthroat trout habitat in four streams during construction would be of a low magnitude.

Southern Leatherside Chub (BLM and Forest Sensitive Species and Utah CAS)

Two streams (Hop Creek and the San Pitch River) contain southern leatherside chub habitat and would be crossed by the 2-mile transmission line corridor and the 250-foot-wide transmission line ROW. Potential effects of construction and maintenance operations on southern leatherside habitat would be the same as discussed for Alternative II-A. Direct habitat loss could be 800 ft^2 (0.02 acre) if culverts or low water construction is required. The same BMPs and design features discussed for other sensitive fish species also would be applied to construction activities in or near streams containing southern leatherside chub along with mitigation measure **SSS-4**.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

The following number of streams that contain these sucker and chub species would be crossed by the 2-mile transmission line corridor for Alternative II-D: bluehead sucker (Green and White rivers), flannelmouth sucker (Green and White rivers), and roundtail chub (Green and White rivers). The Alternative II-D 250-foot-wide transmission line ROW would cross two streams (Green and White rivers) that contain one or more of these species. No direct disturbance to their habitat would be expected due to the relatively large size of these streams. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species.

In summary, by implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in two streams during construction would be of a low magnitude. Road disturbance and effects on habitat for these species would not be expected for these larger streams.

Mountain Sucker (BLM Sensitive)

The Alternative II-D 250-foot-wide transmission line ROW would cross two streams (Mud Creek and the San Pitch River) containing mountain sucker. Habitat loss could be 800 ft^2 (0.02 acre), if culverts or low water construction are required in these streams. Potential sediment input and fuel spill risks could occur as a result of construction. The same BMPs and design features discussed for game fish streams would also apply to streams containing this BLM sensitive species. By implementing erosion control and spill prevention BMPs and design features, water quality effects on mountain sucker habitat in two streams during construction would be of a low magnitude. If a culvert or road is constructed across Mud Creek and the San

Pitch River, direct loss of habitat could occur. Disturbed habitat from road construction would be restored to pre-construction resulting in construction impacts of a relatively low net magnitude.

USFS Sensitive Species

Seven streams and two reservoirs in the Manti-LaSal National Forest occur within the Alternative II-D 2-mile transmission line corridor (**Appendix G**, **Table G-13**). Two streams (Huntington and Cottonwood creeks) contain USFS sensitive species, Bonneville cutthroat trout (Huntington Creek) and Colorado River cutthroat trout (Cottonwood Creek). Cottonwood Creek would be crossed by the 250-foot-wide transmission line ROW, which could result in direct loss of aquatic habitat of 400 ft^2 (0.01 acre), if culverts or low water construction is required. By following the Forest management guidance involving avoidance of riparian areas near streams, effects on riparian vegetation and sediment input would be minimized.

Alternative II-E

In total, 17 streams (Bennie, Clear, Cottonwood, Dry Gulch, Kyune, Lake Fork, Montes, Nebo, Soldier, Tabbyune, Thistle, Tie Fork, and West Fork Willow creeks and the Duchesne, Green, Uinta, and White rivers) are located within the 2-mile transmission line corridor that contains special status aquatic species. Except for Clear, Kyune, and Tabbyune creek and the White River, these streams would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative II-E.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered and BLM Sensitive)

Direct Disturbance and Indirect Water Quality Effects

Surface disturbance within the Alternative II-E 250-foot-wide transmission line ROW crossing near the Green River could affect 2 acres for both Colorado pikeminnow and razorback sucker. Indirect effects on Colorado pikeminnow and razorback sucker and on the downstream reaches occupied by all four federally endangered fish species would be the same as discussed for Alternative II-A.

In summary, Alternative II-E would cross 2 acres of critical habitat for both Colorado pikeminnow and razorback sucker in the Green River. Surface disturbance activities near the Green River pose a risk for sediment and fuel spills for all four federally endangered fish species. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and razorback sucker and downstream reaches occupied by all four federally endangered fish species.

Water Depletions

Approximately 3 acre-feet for foundation concrete and 196 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 117 acre-feet of construction water use would occur within the Colorado River Basin. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by federally endangered fish species in the Upper Colorado River Basin.

Boreal Toad (Forest Sensitive Species and Colorado Endangered and Utah CAS)

Boreal toad habitat within the Sowers Creek drainage is located within the Alternative II-E 2-mile transmission line corridor and would be crossed 15 times by the 250-foot-wide transmission line ROW. Potential breeding habitat for this toad species could be disturbed by vehicle crossings or culvert construction in Sowers Creek (6,000 ft^2 or 0.14 acre for 15 crossings). Vehicle traffic within the 2-mile transmission line corridor also could disturb upland habitat used by this toad species during non-breeding periods. By applying a 2-mile dispersal distance around Sowers Creek, potential effects could occur within

approximately 28,536 acres. Vehicle traffic could cause mortalities to boreal toads, if construction activities overlap with dispersal periods to and from Sowers Creek. However, mortalities are expected to be minor due to low traffic volumes. Indirect effects involving sedimentation and potential fuel spills on breeding habitat in Sowers Creek would be minimized by BMPs and design features for erosion control and refueling restrictions near waterbodies. The following mitigation measure is proposed to reduce potential direct disturbance on breeding habitat for boreal toad.

SSS-7 *(Reduce Crossings of Sowers Creek to Protect Boreal Toad Breeding Habitat): The ROW alignment would be evaluated so that the number of Sowers Creek crossings can be reduced. The portion of the creek that would be crossed by the ROW also would be evaluated as breeding habitat for boreal toad to identify any priority areas that should be avoided if possible.*

Effectiveness: This measure would be highly effective in reducing direct disturbance effects on breeding habitat for boreal toad.

In summary, implementation of BMPs, design features, and additional mitigation measure **SSS-7** would minimize direct and indirect effects to a minor level for boreal toad.

Northern Leopard Frog (BLM Sensitive and Nevada State Protected)

Two streams, Soldier Creek and the White River, with northern leopard frog habitat would be crossed by the Alternative II-E 250-foot-wide transmission line ROW. The 250-foot-wide transmission line ROW crossings are five for Soldier Creek and one for the White River. Potential impacts would consist of habitat disturbance and mortalities due to construction traffic. Potential loss of habitat would be 2,000 ft^2 (0.05 acre), if culverts are used at the Soldier Creek 250-foot-wide transmission line ROW crossings. BMPs and design features would be implemented to minimize effects of construction activities and on northern leopard habitat. Impacts from construction activities would be considered a low magnitude. Vehicle traffic could cause northern leopard frog mortalities, if traffic movement coincides with frog movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Bonneville Cutthroat Trout (BLM and Forest Sensitive Species and Utah Protected and CAS)

Seven streams consisting of Bennie, Clear, Lake Fork, Nebo, Soldier, Thistle, and Tie Fork creeks would be crossed by the Alternative II-E 2-mile transmission line corridor. There are eight 250-foot-wide transmission line ROW crossings for these streams. Potential loss of habitat would be 3,200 ft^2 (0.07 acre), if culverts or low water construction is required. Indirect effects of instream work or surface disturbance near the streams could result in sedimentation or potential fuel spills. The same BMPs and design features discussed for game fish streams would also apply to streams containing Bonneville cutthroat trout. Other applicable BMPs would be used to protect these species, as discussed for Alternative II-A. Mitigation measure **SSS-3** also would be applied to streams that contain spawning habitat for Bonneville cutthroat trout.

By implementing erosion control and spill prevention BMPs and design features, water quality effects on Bonneville cutthroat trout habitat in seven streams during construction would be of a low magnitude. Impacts on spawning special status trout species would be avoided by implementing mitigation measure **SSS-3**.

Colorado River Cutthroat Trout (BLM and Forest Sensitive Species and Utah CAS)

Five streams that contain Colorado River cutthroat trout would be crossed by the 2-mile transmission line corridor (Kyune, Tabbyune, and West Fork Willow creeks and the Green and White rivers). The Green and White rivers are the only streams that would be crossed by the 250-foot-wide transmission line ROW. There would be no direct loss of habitat from construction activities at these large river crossings. BMPs, design features, and mitigation measure **SSS-2** would minimize effects to Colorado River cutthroat trout.

Southern Leatherside Chub (BLM and Forest Sensitive Species and Utah CAS)

Three streams (Hop, Soldier, and Thistle creeks) contain southern leatherside chub habitat and would be crossed by the transmission line corridor. Potential effects of construction and maintenance operations on southern leatherside chub habitat would be the same as discussed for Alternative II-A. Direct habitat loss could be 2,800 ft^2 (0.06 acre), if culverts or low water construction is required. The same BMPs and design features discussed for other sensitive fish species also would be applied to construction activities in or near streams containing southern leatherside chub along with mitigation measure **SSS-4**. By implementing these protection measures, effects on southern leatherside chub habitat during construction would be of a low magnitude.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

The following number of streams that contain these sucker and chub species would be crossed by the 2-mile transmission line corridor for Alternative II-E: seven streams (Cottonwood Creek, Dry Gulch Creek, Duchesne River, Green River, Montes Creek, Uinta River, and White River) each for bluehead sucker, flannelmouth sucker, and roundtail chub. The Alternative II-E 250-foot-wide transmission line ROW would cross six streams (Duchesne, Green, Uinta, and White rivers and Dry Gulch and Montes creeks) that contain one or more of these species. Habitat loss could be 1,200 ft^2 (0.03 acre) for each of these species, if culverts or low water construction are required in the smaller streams such as Dry Fork and Montes creeks. The same BMPs and design features discussed for game fish streams would also apply to streams containing these BLM sensitive species.

In summary, by implementing erosion control and spill prevention BMPs and design features, water quality effects on special status sucker and roundtail chub habitat in seven streams during construction would be of a low magnitude. Road disturbance and effects on habitat for these species would not be expected for the larger streams.

Mountain Sucker (BLM Sensitive)

The Alternative II-E 250-foot-wide transmission line ROW would cross one stream (Soldier Creek) containing mountain sucker. Habitat loss could be 2,000 ft^2 (0.05 acre), if culverts or low water construction are required at the five 250-foot-wide transmission line ROW crossings. Potential sediment input and fuel spill risks could occur as a result of construction. The same BMPs and design features discussed for game fish streams would also apply to streams containing this BLM sensitive species. By implementing erosion control and spill prevention BMPs and design features, water quality effects on mountain sucker habitat in one stream during construction would be of a low magnitude. If a culvert or road is constructed across Soldier Creek, direct loss of habitat could occur. Disturbed habitat from road construction would be restored to pre-construction conditions resulting in construction impacts of relatively low net magnitude.

Southern Bonneville Pyrg (Utah Protected)

One unnamed spring near Thistle Creek containing the springsnail, southern Bonneville pyrg, is located within the Alternative II-E 2-mile transmission line corridor. The spring would not be crossed by the 250-foot-wide transmission line ROW. Potential impacts to this special status springsnail would be the same as discussed for Alternative II-A. BMPs, design features, and mitigation measure **SSS-5** would avoid direct habitat impacts and minimize water quality effects from sedimentation or spills on springsnail habitat. Indirect effects to southern Bonneville pyrg habitat could occur in an unnamed spring near Thistle Creek due to vehicle traffic. Mitigation measure **SSS-5** would be implemented to avoid direct impacts to this springsnail species and its habitat.

USFS Sensitive Species

The Alternative II-E 2-mile transmission line corridor overlaps with waterbodies in the following national forests: Uinta-Wasatch-Cache (Indian, Sheep, and Tie Fork creeks), Manti-LaSal (Long Hollow, Lookout,

and Sky High springs), and Ashley (Sowers Creek). One of these waterbodies (Tie Fork Creek) contains the USFS sensitive species, Bonneville cutthroat trout. Potential direct loss of aquatic habitat includes 400 ft^2 (0.01) if culverts or low water construction is required. A stipulation for the Uinta-Wasatch-Cache National Forest requires that no actions affect cutthroat trout in Tie Fork Creek, Therefore, direct disturbance to habitat or other indirect effects involving sediment or fuel spills would not be allowed in Tie Fork Creek. Sediment input and riparian disturbance would be avoided by following the Uinta-Wasatch-Cache National Forest stipulation that requires a 300-foot buffer along perennial streams.

Alternative II-F (Agency Preferred)

Eighteen streams with special status aquatic species are located within the Alternative II-F 2-mile transmission line corridor (Bennie, Clear, Hop, Kyune, Kyune Creek Right Fork, Lake Fork, Nebo, Soldier, Tabbyune, Thistle, Tie Fork, West Fork Willow, and Willow creeks, White River Fork and White River [tributaries to the Price River], and the Green, Price, Sevier, and White rivers). Eleven of these streams (Hop, Lake Fork, Soldier, Tabbyune, Thistle, Tie Fork, and Willow creeks, White River [tributary to the Price River], and the Green, Sevier, and White rivers) also would be crossed by the 250-foot-wide transmission line ROW. Species-specific effects are discussed below for Alternative II-F.

Colorado Pikeminnow, Humpback Chub, Bonytail, and Razorback Sucker (Federally Endangered and BLM Sensitive)

Direct Disturbance and Indirect Water Quality Effects

Surface disturbance within the Alternative II-F 250-foot-wide transmission line ROW crossing could affect critical habitat within the 100-year floodplain of the Green and White rivers. Potential disturbance could include 4 acres for Colorado pikeminnow (1 acre in the White River and 3 acres in the Green River) and 3 acres for razorback sucker in the Green River. Indirect effects on Colorado pikeminnow and razorback sucker and downstream reaches containing these two species plus bonytail and humpback chub would be the same as discussed for Alternative II-A.

In summary, critical habitat for Colorado pikeminnow and razorback sucker could be affected by project construction within the 100-year floodplain of the Green and White river crossings by the 250-foot-wide transmission line ROW. In total, approximately 4 and 3 acres, respectively, could be affected for these species. A combination of BMPs, design features, and additional mitigation measure **SSS-2** would be implemented to avoid impacts to critical and occupied habitat for Colorado pikeminnow and razorback sucker and downstream reaches occupied by all four federally listed species.

Water Depletions

Approximately 3 acre-feet for foundation concrete and 197 acre-feet for dust control would be obtained from municipal sources, commercial sources, or a temporary water use agreement with landowners holding existing water rights. An estimated 117 acre-feet of construction water use would occur within the Colorado River Basin. Specific water sources would be evaluated to determine if there are connections to surface water in the Upper Colorado River Basin, which provides habitat for four federally listed fish species. The determination of potential depletions would be made after specific water sources are identified. The evaluation would determine if water use could affect surface water quantity or habitat used by the federally listed fish species in the Upper Colorado River Basin.

Northern Leopard Frog (BLM Sensitive and Nevada State Protected)

Northern leopard frog habitat associated with Soldier Creek and the White River crossings by the Alternative II-F 250-foot-wide transmission line ROW potentially could be disturbed by construction vehicles and equipment. Potential impacts would consist of habitat disturbance associated with up to five Soldier Creek crossings and mortalities due to construction traffic. Potential habitat loss or alteration would be

2,000 ft^2 (0.05 acre), if culverts or low water construction occurs at the Soldier Creek crossings. BMPs and design features would be implemented to minimize effects of construction activities on this amphibian species. Vehicle traffic near Soldier Creek and the White River could cause mortalities, if traffic coincides with movement periods to and from aquatic habitat.

Bonneville Cutthroat Trout (BLM and Forest Sensitive and Utah Protected and CAS)

Seven streams with habitat for Bonneville cutthroat trout would be crossed by the Alternative II-F 2-mile transmission line corridor (Bennie, Clear, Lake Fork, Nebo, Soldier, Thistle, and Tie Fork creeks). Habitat could be altered at four of these streams, with the number of 250-foot-wide transmission line ROW crossings noted in parentheses: Lake Fork (1), Soldier (5), Thistle (1), and Tie Fork (1). Potential loss of habitat could be 3,200 ft^2 (0.07 acre), if culverts or low water construction is required. Indirect effects of construction on habitat for this species could include sedimentation or fuel spills. The same BMPs and design features discussed for game fish species would be implemented for streams containing Bonneville cutthroat trout. Mitigation measure **SSS-3** also would be applied to the seven streams containing spawning habitat for this species. By implementing BMPs, design features, and additional mitigation, impacts would be reduced for streams containing Bonneville cutthroat trout. Construction of culverts could remove a small amount of habitat for this species in four streams. Mitigation measure **SSS-3** would avoid direct impacts to Bonneville cutthroat trout spawning during construction.

Colorado River Cutthroat Trout (BLM and Forest Sensitive and Utah CAS)

Nine streams that contain Colorado River cutthroat trout would be crossed by the Alternative II-F 2-mile transmission line corridor (Kyune, Kyune Creek Right Fork, Tabbyune, West Fork Willow, and Willow creeks, White River and White River Right Fork [tributaries to the Price River], and the Green and White rivers). Five of these streams (Green and White rivers, Tabbyune Creek, Willow Creek, and the White River [tributary to the Price River]) would be crossed by the 250-foot-wide transmission line ROW. Potential loss or alteration of approximately 1,200 ft^2 (0.03 acre) of habitat could occur if a culvert or low water construction is required in Tabbyune and Willow creeks and the White River (Price River tributary). Other direct and indirect effects of construction on cutthroat habitat would be the same as discussed for Alternative II-A. BMPs, design features, and mitigation measure **SSS-3** would minimize effects on Colorado River cutthroat trout. By implementing erosion control, spill prevention, and riparian protection BMPs and design features, other direct and indirect effects of construction on habitat for this cutthroat species would be of low magnitude.

Southern Leatherside Chub (BLM and Forest Sensitive Species and Utah CAS)

Potential impacts from access road use could affect southern leatherside chub habitat in four streams located within the Alternative II-F 2-mile transmission line corridor (Hop, Soldier, and Thistle creeks and the Sevier River). Direct effects on habitat also could occur at four 250-foot-wide transmission line ROW crossings (one crossing each in Hop and Thistle creeks and two Sevier River crossings). Potential habitat loss or alteration would be approximately 1,600 ft^2 (0.04 acre), if culverts or low water construction are required. The same BMPs and design features discussed for other sensitive fish species also would be implemented for streams containing southern leatherside chub. In addition, mitigation measure **SSS-4** would avoid direct impacts to spawning chub. By implementing erosion control, spill prevention, and riparian protection BMPs and design features, other direct and indirect effects of construction on habitat for this chub species would be of low magnitude.

Bluehead Sucker, Flannelmouth Sucker, and Roundtail Chub (BLM Sensitive and Utah CAS)

Two streams, the Green and White rivers, would be crossed by the Alternative II-F 2-mile transmission line corridor and 250-foot-wide transmission line ROW for these three special status sucker species. When considering multiple crossings of the White River, there would be total of four ROW crossings for the three species. There would be no direct loss or alteration of habitat, since vehicles or equipment would not cross or enter the Green and White rivers. Other indirect effects of construction on sucker habitat would be the

same as discussed for Alternative II-A. BMPs and design features would minimize effects on these three sucker species. In summary, by implementing erosion control, spill prevention, and riparian protection BMPs and design features, effects on special status sucker species in the Green and White rivers would be of low magnitude. Alternative II-F would cause direct loss of alteration of special status sucker habitat, since culverts or low water construction would not be used.

Mountain Sucker (BLM Sensitive)

Potential impacts from access road use could affect mountain sucker habitat in two streams located within the Alternative II-F 2-mile transmission line corridor (Soldier Creek and the Sevier River). Direct effects on habitat also could occur at seven 250-foot-wide transmission line ROW crossings (five Soldier Creek crossings and two Sevier River crossings). Potential habitat loss or alteration would be approximately 2,800 ft^2 (0.06 acre), if culverts or low water construction are required. Other effects on mountain sucker and its habitat would be the same as discussed for Alternative II-A. The same BMPs and design features for sediment control, spill prevention, and riparian protection discussed for other special status fish species would be implemented for construction near streams containing mountain sucker. By implementing erosion control, spill prevention, and riparian protection BMPs and design features, other direct and indirect effects of construction on mountain sucker habitat would be of low magnitude.

Southern Bonneville Pyrg (Utah Protected)

One unnamed spring near Thistle Creek containing the springsnail, southern Bonneville pyrg, is located within the Alternative II-F 2-mile transmission line corridor. The spring would not be crossed by the 250-foot-wide transmission line ROW. Potential impacts to this special status springsnail would be the same as discussed for Alternative II-A. BMPs, design features, and mitigation measure **SSS-5** would avoid direct habitat impacts and minimize water quality effects from sedimentation or spills on springsnail habitat.

USFS Sensitive Species

The Alternative II-F 2-mile transmission line corridor would cross two streams (Tie Fork and Soldier creeks) in the Uinta-Wasatch-Cache National Forest (**Appendix G**, **Table G-13**). Both streams contain USFS sensitive species, Bonneville cutthroat trout and southern leatherside chub. The 250-foot-wide transmission line ROW for Alternative II-F would only cross Tie Fork Creek. Potential direct loss or alteration of habitat in Tie Fork Creek would be 400 ft^2 (0.01 acre), if a culvert or low water crossing is required. However, Uinta-Wasatch-Cache National Forest stipulations require that no actions affect cutthroat trout populations in Tie Fork Creek. Impacts on riparian vegetation would be avoided by a stipulation that requires a 300-foot buffer along perennial streams. BMPs and design features involving sediment control and spill prevention would be implemented during construction to minimize adverse effects on water quality in the two streams inhabited by Bonneville cutthroat trout and southern leatherside chub.

Alternative Variation in Region II

Emma Park Alternative Variation

Potential impacts of constructing the Emma Park Alternative Variation on special status aquatic species would be similar to the comparable portion of Alternative II-F, based on the number of streams located within the 2-mile transmission line corridors that contain special status species. In total, four streams (Kyune, Kyune Right Fork, Tabbyune, and White River Right Fork) are located within the 2-mile transmission line corridor for the Emma Park Alternative Variation and the comparable portion of Alternative II-F. All of these streams contain the special status species, Colorado River cutthroat trout. There would be a slightly greater risk of sediment input to Kyune and Tabbyune creeks as a result of 250-foot-wide transmission line ROW crossings by the Emma Park Alternative Variation. However, erosion control measures would be implemented to reduce sediment-related impacts for the Emma Park Alternative Variation and Alternative II-F.

Alternative Connectors in Region II

The Castle Dale, Highway 191, Price, Lyndyll, and IPP East alternative connectors would have no impacts on special status aquatic species, since these alternatives would not cross streams that support habitat for special status fish, amphibian, or invertebrate species.

Region II Conclusion

Based on a comparison of impact parameters for Region II alternatives, potential impacts to special status aquatic species would be greatest for Alternative II-A (Applicant Proposed), II-E, and II-F (Agency Preferred). Potential effects for Alternatives II-B, II-C, and II-D would be similar and lower compared to Alternatives II-A, II-E, and II-F (**Table 3.10-13**). Alternatives II-A, II-E, and II-F would cross the highest number of streams with special status aquatic species (17 or 18) and potential alteration or loss of habitat (upper end of range for some species being 2,800 to 6,000 ft^2 or 0.06 to 0.14 acre). In comparison, the other three alternatives would cross 7 to 12 streams with special status aquatic species and result in loss or alternation of habitat of 1,200 to 2,800 ft^2 or 0.03 to 0.06 acre (upper end of range for some species). Less than 0.1 percent of special status species habitat would be affected by each of the six alternatives. Potential effects on critical habitat for federally listed fish species (Colorado pikeminnow and razorback sucker) would be similar for all alternatives (2 to 4 acres that would be crossed by the 250-foot-wide transmission line ROW). Potential disturbance to riparian areas near streams containing special status aquatic species would be similar for all alternatives (**Table 3.10-14**). Alternatives II-A and II-E also would result in increased new road density in 13 and 12 watersheds, respectively, compared to 8 or 11 watersheds for the other alternatives (**Table 3.10-15**). Alternative II-F (Agency Preferred) could affect road densities in 11 watersheds. Even though the greatest level of impacts are associated with Alternatives II-A, II-E, and II-F, project effects on special status species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Section 3.10.6.4 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of special status aquatic species inhabiting these streams.

3.10.6.5 Region III

Table 3.10-16 provides a summary of impact parameters used to describe impacts for alternative routes in Region III. Based on species occurrence information and habitat associations, special status aquatic species that were analyzed by the proposed Project in Region III included two amphibians, nine fish, and one invertebrate species (**Table 3.10-6**). Species occurrence in Region III streams is provided in **Appendix G**, **Tables G-8** for streams and **G-9** for waterbodies. Project Segment ID numbers referenced in this section are listed in **Tables G-8** and **G-9** and depicted in **Figure 2-23**. Parameter information in **Table 3.10-16** is discussed separately for each of the Region III alternatives.

Table 3.10-16 Summary of Region III Alternative Route Impacts for Special Status Aquatic Species

Parameter	Alternative III-A	Alternative III-B	Alternative III-C
Number of streams with special status aquatic species that would be crossed by 250-foot-wide transmission line ROWs	4	3	1
Number of streams with special status aquatic species that would be crossed by 2-mile transmission line corridors or located within 2 miles downstream of corridor boundaries	4	3	1
Number of streams with federally listed aquatic species[1] that would be crossed by 250-foot-wide transmission line ROWs	1	1	0
Acres of critical habitat for federally listed aquatic species that would be crossed by 250-foot-wide transmission line ROWs	0	0	0

Table 3.10-16 Summary of Region III Alternative Route Impacts for Special Status Aquatic Species

Parameter	Alternative III-A	Alternative III-B	Alternative III-C
Potential Aquatic Habitat Alteration or Loss[2] (ft^2) (acres shown in parentheses)			
Virgin River chub	400 (0.01)	400 (0.01)	0
Virgin River spinedace	1,200 (0.03)	0	0
Bluehead sucker	400 (0.01)	0	0
Roundtail chub	400 (0.01)	0	0
Meadow Valley Wash desert sucker	400 (0.01)	1,200 (0.03)	400 (0.01)
Meadow Valley Wash speckled dace	400 (0.01)	1,200 (0.03)	400 (0.01)
Moapa speckled dace	400 (0.01)	400 (0.01)	0
Moapa White River springfish	400 (0.01	400 (0.01)	0
Arizona toad	800 (0.02)	400 (0.01)	400 (0.01)

[1] Federal listing is under review for Virgin River chub.

[2] Habitat loss represents area that could be permanently or temporarily removed due to the use of a culvert or low water crossing or temporarily disturbed from the instream use of equipment.

Parameter information regarding riparian disturbance and road density is provided in **Tables 3.10-17** and **3.10-18**. The analyses focus on streams that contain special status aquatic species. A summary of these parameters is provided below.

Table 3.10-17 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat Associated with Special Status Species, Region III Corridor

	Alternatives					
	III-A		III-B		III-C	
Streams	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Construction	6	20	7	21	2	8
Operation	2	6	2	5	1	2

- Riparian Disturbance – A comparison of the construction and operation effects to riparian vegetation near streams containing special status aquatic species indicates that Alternatives III-A and III-B would have the highest acres of potential disturbance. However, these impacts would be reduced by BLM and USFS stipulation requirements that range from avoiding a buffer area of 200 to 1,200 feet adjacent to perennial streams to total avoidance of riparian areas. In conclusion, the disturbance to riparian vegetation would be avoided on BLM and USFS lands. There could be disturbance on private lands.
- Road Density – The number of watersheds that would be crossed by the Region III alternative 250-foot-wide transmission line ROWs range from 1 (III-C) to 3 (III-B). The road density units are highest for Alternative III-B. The increase in new road density ranged from <0.1 to 0.4 mile/$mile^2$, with the highest density increase in the Lower Meadow Valley Wash watershed (Alternative III-B). BMPs and design features would be implemented to reduce sediment input to streams including those that support special status aquatic species.

Table 3.10-18 Open Road Density (Miles/Mile^2) within 100 and 300 Feet of Stream Crossings Associated with Special Status Species in Region III Corridor

	III-A						III-B				
	Current Density		Density Increase		Streams with Special Status Species		Current Density		Density Increase		Streams with Special Status Species
Watershed	100 feet	300 feet	100 feet	300 feet	(# of Segments)	Watershed	100 feet	300 feet	100 feet	300 feet	(# of Segments)
Lower Muddy River	1.70	2.80	0.11	0.23	Muddy River	Clover Creek	7.75	5.63	0	0	Clover Creek (1)
Moody Wash	2.09	3.02	0	0	Magotsu Creek (1), Moody Wash (1), Spring Creek (1)	Lower Meadow Valley Wash	0.38	1.00	0.31	0.36	Meadow Valley Wash (1)
						Upper Muddy River	1.02	1.92	0.07	0.09	Muddy River (1)

	III-C				
	Current Density		Density Increase		Streams with Special Status Species
Watershed	100 feet	300 feet	100 feet	300 feet	(# of Segments)
Cathedral Gorge-Meadow Valley Wash	5.05	4.66	0	0	Meadow Valley Wash (1)

Note: Zero indicates no new roads within the buffer area.

Alternative III-A (Applicant Proposed)

In total, four streams (Magotsu Creek, Spring Creek, Moody Wash, and the Muddy River) are located within the 2-mile transmission line corridor that contains special status aquatic species. All four streams would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative III-A.

Virgin River Chub (Federally Endangered and BLM Sensitive)

The 250-foot-wide transmission line ROW and transmission line for Alternatives III-A would cross one stream, the Muddy River, which contains Virgin River chub. The types of impacts that could result from vehicle traffic and equipment disturbance within the ROW and access roads would be the same as discussed for other fish species. Direct disturbance to habitat would occur if vehicles cross the river, culverts are constructed, or riparian vegetation is removed during construction. Habitat loss could be 400 ft^2 (0.01 acre), if culverts or low water construction is required. Indirect effects involving sedimentation or fuel spill risks would result from disturbance near the Muddy River. BMPs and design features would minimize erosion effects on waterbodies and restrict refueling within 100 feet of the Muddy River. The following mitigation measure is proposed to avoid vehicle crossing and road disturbance effects on this species:

SSS-8 *(No Vehicle Crossings or New Roads in the Muddy River): No vehicle crossings or new roads would be constructed for the Muddy River. This measure would protect habitat for special status fish species (Virgin River chub, Moapa speckled dace, Moapa White River springfish, Meadow Valley Wash desert sucker, and Meadow Valley Wash speckled dace) in the Muddy River.*

Effectiveness: This measure would be highly effective in avoiding direct disturbance to habitat for special status fish species in the Muddy River.

By implementing erosion control and spill prevention BMPs and design features, water quality effects on Virgin River chub habitat in the Muddy River during construction would be of a low magnitude. Direct impacts on Virgin River chub habitat would be avoided by implementing mitigation measure **SSS-8**.

Virgin River Spinedace (BLM Sensitive, Nevada Protected, and Utah CAS)

Three streams containing Virgin River spinedace, Magotsu Creek, Moody Wash, and Spring Creek in Utah, would be crossed by the Alternative III-A 250-foot-wide transmission line ROW and 2-mile transmission line corridor. Direct disturbance to habitat could occur if vehicles cross these streams or culverts are constructed. Direct loss of habitat could be 1,200 ft^2 (0.03 acre), if culverts or low water construction is required. Indirect effects on this species would be the same as discussed for other fish species. The same BMPs and design features would be implemented to reduce impacts from erosion and fuel spills. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Virgin River spinedace habitat during construction would be of a low magnitude. If roads are constructed across Magotsu and Spring creeks or Moody Wash, construction would directly disturb habitat for this species. Disturbed habitat from any instream construction would be restored to pre-construction conditions resulting in construction impacts of a relatively low net magnitude. Culvert installation would be a permanent loss of habitat.

Bluehead Sucker and Roundtail Chub (BLM Sensitive and Utah CAS)

Potential impacts to these two fish species could occur as a result of the Alternative III-A 250-foot-wide transmission line ROW crossings and potential access road use within the transmission line corridor at the Magotsu Creek crossing. Direct and indirect effects would be the same as discussed for other fish species such as the Virgin River spinedace. Direct loss of habitat could be 400 ft^2 (0.01 acre) for each species, if a culvert or low water construction is required. The same BMPs and design features would be implemented to minimize direct impacts on habitat and indirect effects from erosion and fuel spill effects. By implementing erosion control and spill prevention BMPs and design features, water quality effects on bluehead sucker and

roundtail chub habitat during construction would be of a low magnitude. If roads are constructed across Magotsu Creek, construction impacts would occur to habitat for this species. Disturbed habitat from instream construction would be restored to pre-construction conditions resulting in construction impacts of a relatively low magnitude. A culvert installation would result in permanent loss of habitat.

Meadow Valley Wash Desert Sucker and Meadow Valley Wash Speckled Dace (BLM Sensitive and Nevada Protected)

Construction activities could adversely affect habitat for these two species at the Muddy River crossing. Direct loss of habitat could be 400 ft^2 (0.01 acre) for each species if a culvert or low water construction is required. The same BMPs and design features and additional mitigation measure **SSS-8** would be implemented to minimize direct and indirect impacts on these species. By implementing erosion control and spill prevention BMPs and design features during construction, water quality effects on Meadow Valley Wash desert sucker and speckled dace habitat in the Muddy River would be of a low magnitude. Direct impacts on habitat would be avoided by implementing mitigation measure **SSS-8**.

Moapa Speckled Dace and Moapa White River Springfish (Nevada Protected)

Construction activities could adversely affect habitat for these two species at the Muddy River crossing. Habitat loss could be 400 ft^2 (0.01 acre) for each species, if a culvert is used. The same BMPs and design features and additional mitigation measure **SSS-8** would be implemented to minimize direct and indirect impacts on these species. By implementing mitigation measure **SSS-8**, there would be no direct loss of habitat.

Arizona Toad (BLM Sensitive and Utah Protected and CAS)

This species, also commonly referred to as the southwestern toad, has been collected in standing water with marsh or riparian vegetation within Meadow Valley Wash (BIO-WEST 2005). It also is known to occur in gravelly areas of streams and arroyos in the drier portion of range; often on the sandy banks of quiet water in other areas. This species also occurs in Abe and Hiway springs, Magotsu Creek, and Moody Wash, which are located within the 2-mile transmission line corridor for Alternative III-A. Vehicle traffic on access roads near marsh or riparian vegetation could result in mortalities to toads particularly during movement to breeding habitat consisting of wet areas. Risk of effects also could occur within approximately 9,850 acres of terrestrial habitat by applying a 2-mile dispersal distance around Magotsu Creek and Moody Wash. Vehicle traffic also could result in sediment input and fuel spill risks to habitat for Arizona toad. The same BMPs and design features would be implemented to minimize direct impacts on habitat and indirect effects from erosion and fuel spill effects. The following mitigation measure is proposed to protect breeding habitat in springs used by Arizona toad.

SSS-9 *(Avoid Direct Disturbance to Abe and Hiway Springs Used by Arizona Toad): No vehicle or equipment disturbance from ROW work or access road construction would be allowed in Abe and Hiway Springs to protect Arizona toad breeding habitat.*

BMPs and design features would be implemented to minimize effects of construction activities and on Arizona toad habitat. Impacts from these activities during construction would be considered of a low magnitude. Vehicle traffic could cause toad mortalities, if traffic movement coincides with toad movements during breeding periods. Mitigation measure **SSS-9** would protect breeding habitat in Abe and Hiway springs.

Moapa Warm Springs Riffle Beetle (BLM Sensitive)

The Moapa Warm Springs riffle beetle is restricted to the Warm Springs area within the Muddy River. Direct and indirect impacts could occur if construction activities occur within or near the Warm Springs area that would be crossed by the 250-foot-wide transmission line ROW and 2-mile transmission line corridor for Alternative III-A. The same BMPs and design features would be implemented to minimize direct impacts on

habitat and indirect effects from erosion and fuel spill effects. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Moapa Warm Springs riffle beetle habitat in the Muddy River during construction would be of a low magnitude. Direct impacts on habitat would be avoided by implementing mitigation measure **SSS-8**.

USFS Sensitive Species

No USFS sensitive species occur in the two perennial streams and six springs that are located within the Alternative III-A transmission line corridor in the Dixie National Forest (**Appendix G**, **Table G-13**).

Alternative III-B (Agency Preferred)

In total, three streams (Clover Creek, Meadow Valley Wash, and the Muddy River) that contain special status aquatic species are located within the Alternative III-B 2-mile transmission line corridor. All three of these streams would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative III-B.

Virgin River Chub (Federally Endangered and BLM Sensitive)

The potential impacts of constructing and maintaining Alternative III-B on Virgin River chub would be the same as those discussed for Alternative III-A. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Virgin River chub habitat in the Muddy River during construction would of a low magnitude. Direct impacts on Virgin River chub habitat would be avoided by implementing mitigation measure **SSS-8**.

Meadow Valley Wash Desert Sucker and Meadow Valley Wash Speckled Dace (BLM Sensitive and Nevada Protected)

The 250-foot-wide transmission line ROW and 2-mile transmission line corridor would cross habitat for these two species in Meadow Valley Wash and the Muddy River. Direct loss of habitat could be 1,200 ft^2 (0.03 acre) for both species, if a culvert or low water construction is required. Mitigation measure **SSS-8** would avoid direct effects to habitat in the Muddy River. Vehicle crossings or new road construction could adversely affect habitat in Meadow Valley Wash. By implementing erosion control and spill prevention BMPs and design features during construction, water quality effects on Meadow Valley Wash desert sucker and speckled dace habitat would be of a low magnitude. If roads are constructed across Meadow Valley Wash, construction impacts would occur to habitat for this species. Disturbed habitat would be restored to pre-construction conditions resulting in construction impacts of a relatively low net magnitude. Direct effects to habitat in the Muddy River would be avoided by mitigation measure **SSS-8**.

Moapa Speckled Dace and Moapa White River Springfish (Nevada Protected)

The potential impacts of constructing and operating Alternative III-B on Virgin River chub are the same as discussed for Alternative III-A. By implementing erosion control and spill prevention BMPs and design features during construction, water quality effects on Meadow Valley Wash desert sucker and speckled dace habitat in the Muddy River would be of a low magnitude. Direct impacts on habitat would be avoided by implementing mitigation measure **SSS-8**.

Arizona Toad (BLM Sensitive and Utah Protected and CAS)

Meadow Valley Wash would be crossed by the transmission line corridor for Alternative III-B. Vehicle traffic on access roads near marsh or riparian vegetation could result in mortalities to toads particularly during movement to breeding habitat consisting of wet areas. Direct loss of habitat could be 400 ft^2 (0.01 acre), if a culvert or low water construction is required. Risk of effects also could occur within approximately 7,900 acres of terrestrial habitat by applying a 2-mile dispersal distance around Meadow Valley Wash. Vehicle traffic also could result in sediment input and fuel spill risks to habitat for Arizona toad. The same BMPs and design features would be implemented to minimize direct impacts on habitat and indirect effects

from erosion and fuel spill effects. Impacts from construction activities would be considered of a low magnitude. Vehicle traffic could cause toad mortalities, if traffic movement coincides with toad movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Moapa Warm Springs Riffle Beetle (BLM Sensitive)

The potential impacts of constructing and maintaining Alternative III-B on Moapa Warm Springs riffle beetle are the same as discussed for Alternative III-A. By implementing erosion control and spill prevention BMPs and design features, water quality effects on Moapa Warm Springs riffle beetle habitat in the Muddy River during construction would be of a low magnitude. Direct impacts on habitat would be avoided by implementing mitigation measure **SSS-8**.

USFS Sensitive Species

No NFS lands would be crossed by the Alternative III-B 2-mile transmission line corridor or 250-foot-wide transmission line ROW.

Alternative III-C

One stream (Meadow Valley Wash) that contains special status aquatic species is located within the Alternative III-C 2-mile transmission line corridor. This stream also would be crossed by the 250-foot-wide transmission line ROW. Species-specific impacts are discussed below for Alternative III-C.

Meadow Valley Wash Desert Sucker and Meadow Valley Wash Speckled Dace (BLM Sensitive and Nevada Protected)

Vehicle crossings or new road construction could detrimentally affect habitat in Meadow Valley Wash. Habitat loss could be 400 ft^2 (0.01 acre), if a culvert or low water construction is required. By implementing erosion control and spill prevention BMPs and design features during construction, water quality effects on Meadow Valley Wash desert sucker and speckled dace habitat would be of a low magnitude. If roads are constructed across Meadow Valley Wash, construction impacts would occur to habitat for this species. Disturbed habitat would be restored to pre-construction conditions resulting in construction impacts of a relatively low net magnitude. Culvert installation would result in a permanent loss of habitat.

Arizona Toad (BLM Sensitive and Nevada Protected)

Arizona toad habitat would be crossed by the Alternative III-C 250-foot-wide transmission line ROW in Meadow Valley Wash. Potential impacts of construction and operation would be the same as discussed for Alternative III-B. The same BMPs and design features would be implemented to minimize direct impacts on habitat and indirect effects from erosion and fuel spill effects. Impacts from these activities would last through construction and be considered of low magnitude. Vehicle traffic could cause toad mortalities, if traffic movement coincides with toad movements during breeding periods. Mortalities are expected to be relatively low considering the traffic volume.

Northern Leopard Frog (BLM Sensitive and Nevada Protected)

The Alternative III-C 2-mile transmission line corridor would cross through the Pahranagat National Wildlife Refuge, which contains habitat for the northern leopard frog. Although there is no northern leopard frog habitat within the 2-mile transmission line corridor, the species occurs in Maynard Spring located approximately 600 feet west of the corridor. Since the spring is located outside of the transmission line corridor, project construction and road access would not affect habitat or movements to and from breeding areas for northern leopard frog in the Pahranagat National Wildlife Refuge. Furthermore, northern leopard frog would not be expected to disperse from the Refuge springs into the transmission line corridor due to the lack of waterbodies. In conclusion, Alternative III-C would not affect northern leopard frog.

USFS Sensitive Species

No NFS lands would be crossed by the Alternative III-C 2-mile transmission line corridor or 250-foot-wide transmission line ROW.

Alternative Variations in Region III

The Ox Valley East and West alternative variations 250-foot-wide transmission line ROW and 2-mile transmission line corridor would cross one stream (Spring Creek) that contains one special status species (Virgin River spinedace). The comparable portion of III-A would cross two streams, Spring and Magotsu creeks. Special status species in Magotsu Creek includes Arizona toad, Virgin River spinedace, bluehead sucker, flannelmouth sucker, and roundtail chub. Two springs, Abe and Hiway, also are located adjacent to the III-A 250-foot-wide transmission line ROW. These springs contain habitat for Arizona toad.

The Pinto Alternative Variation would cross two streams (Magotsu Creek and the Santa Clara River) that contain special status species Arizona toad, bluehead sucker, flannelmouth sucker, roundtail chub, and Virgin spinedace. The comparable portion of Alternative III-A would cross one stream (Spring Creek) with special status species, Virgin River spinedace.

Alternative Connectors in Region III

No perennial streams would be crossed by the Avon and Moapa Alternative Connectors in Region III.

Alternative Ground Electrode Systems in Region III

The southern electrode system would be required within 100 miles of the southern terminal, which is based on the conceptual locations and connections to the alternative routes. There would be no impacts on special status aquatic species, since the conceptual locations do not support habitat for fish, amphibian, or invertebrate species.

No Forest sensitive species occur in the streams or springs that would be crossed by alternative variations on NFS lands in Region III (**Appendix G**, **Table G-14**).

Region III Conclusion

Based on a comparison of impact parameters for Region III alternatives, potential impacts to special status aquatic species would be greatest for Alternatives III-A and III-B. Potential effects for Alternatives III-C would be relatively low compared to Alternatives III-A and III-B (**Table 3.10-16**). Alternative III-A and III-B would cross the highest number of streams with special status aquatic species (4 and 3, respectively). In addition, Alternatives III-A and III-B also could result in the greatest potential alteration or loss of habitat (upper end of range being 1,200 ft^2 or 0.03 acre for several species). In comparison, Alternative III-C would cross one stream with special status aquatic species and disturb less habitat (upper end of range being 400 ft^2 or 0.01 acre for several species). Less than 0.1 percent of special status species habitat would be affected by each of the three alternatives. Alternatives III-A and III-B could result in the highest potential construction disturbance to riparian areas (6 and 7 acres at a 100-foot buffer and 20 and 21 acres at a 300-foot buffer, respectively) compared to Alternative III-C (2 acres at a 100-foot buffer and 8 acres at a 300-foot buffer) (**Table 3.10-17**). Alternative III-B also would result in increased new road density in three watersheds compared to one or two watersheds for the other two alternatives (**Table 3.10-18**). The highest increase in road densities also could occur as a result of Alternative III-B. Even though the greatest level of impacts are associated with Alternatives III-A or III-B, project effects on special status species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Section 3.10.6.5 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of special status aquatic species inhabiting these streams.

3.10.6.6 Region IV

Table 3.10-19 provides a summary of impact parameters used to describe impacts for alternative routes in Region IV. Based on species occurrence information and habitat associations, special status aquatic species that may be impacted by the proposed Project in Region IV includes one fish species (**Table 3.10-7**). Species occurrence in Region IV streams is provided in **Appendix G**, **Tables G-10** for streams and **G-11** for waterbodies. Project Segment ID numbers referenced in this section are listed in **Tables G-10** and **G-11** and depicted in **Figure 2-24**. Parameter information in **Table 3.10-19** is discussed separately for each of the Region IV alternatives.

Table 3.10-19 Summary of Region IV Alternative Route Impacts for Special Status Aquatic Species

Parameter	Alternative IV-A	Alternative IV-B	Alternative IV-C
Number of streams with special status aquatic species that would be crossed by 250-foot-wide transmission line ROWs	1	0	0
Number of streams with special status aquatic species that would be crossed by 2-mile-wide transmission line corridors or located within 2 miles downstream of corridor boundaries	1	1	1
Number of streams with federally listed aquatic species that would be crossed by 250-foot-wide transmission line ROWs	1	0	0
Acres of critical habitat for federally listed aquatic species that would be crossed by 250-foot-wide transmission line ROWs	0	0	0

Parameter information regarding riparian disturbance and road density is provided in **Tables 3.10-20** and **3.10-21**. The analyses focus on streams that contain special status aquatic species. A summary of these parameters is provided below.

Table 3.10-20 Ground Disturbance (Acres) for Buffer Distances from Riparian Habitat Associated with Special Status Species, Region IV Corridor

	Alternatives					
	IV-A		IV-B		IV-C	
Streams	100 feet	300 feet	100 feet	300 feet	100 feet	300 feet
Construction	1	2	2	5	1	3
Operation	<1	<1	1	2	<1	1

- Riparian Disturbance – A comparison of the construction and operation effects to riparian vegetation near streams containing special status aquatic species indicates that Alternative IV-B would have the highest acres of potential disturbance. However, these impacts would be reduced by BLM stipulations that range from avoiding a buffer area of 300 to 500 feet adjacent to perennial streams to total avoidance of riparian areas. In conclusion, the disturbance to riparian vegetation would be avoided on BLM lands. There could be disturbance on private lands.
- Road Density – Two watersheds would be crossed by the Region IV alternative 250-foot-wide transmission line ROWs. The road density units are highest for Alternative IV-A. The increase in new road density ranged from 0 to 0.2 mile/mile^2, with the highest increase in the Duck Creek-Las Vegas Wash watershed (Alternative IV-A). BMPs and design features would be implemented to reduce sediment input to streams including those that support special status aquatic species.

Table 3.10-21 Open Road Density (Miles/Mile^2) within 100 and 300 Feet of Stream Crossings Associated with Special Status Species in Region IV Corridor

	IV-A						IV-B				
	Current Density		Density Increase		Streams with Special Status Species (# of Segments)		Current Density		Density Increase		Streams with Special Status Species (# of Segments)
Watershed	100 feet	300 feet	100 feet	300 feet		Watershed	100 feet	300 feet	100 feet	300 feet	
Duck Creek-Las Vegas Wash	2.93	4.39	0.16	0.09	Las Vegas Wash (1)	Government Wash-Colorado River	0.05	0.12	0	0	Las Vegas Wash (1)
	IV-C										
	Current Density		Density Increase		Streams with Special Status Species (# of Segments)						
Watershed	100 feet	300 feet	100 feet	300 feet							
Government Wash-Colorado River	0.05	0.12	0	0	Las Vegas Wash (1)						

Note: Zero indicates no new roads within the buffer area.

Alternative IV-A (Applicant Proposed and Agency Preferred)

The 250-foot-wide transmission line ROW and 2-mile transmission line corridor would cross one stream (Las Vegas Wash) that contains a special status fish species in a downstream area near Lake Mead. Species-specific impacts are discussed below for Alternative IV-A.

Razorback Sucker (Federally Endangered and BLM Sensitive)

The 250-foot-wide transmission line ROW and 2-mile transmission line corridor for Alternative IV-A would cross Las Vegas Wash. Razorback sucker occurs in the Lake Mead and Las Vegas Bay, which is located approximately 6 miles downstream of the Las Vegas Wash crossing. Construction activities within Las Vegas Wash would not adversely affect water quality or razorback sucker habitat in Las Vegas Bay due to the considerable distance between the crossing and Las Vegas Bay. Even if sediment entered Las Vegas Wash, wetland areas would filter and reduce any increased sediment levels.

Alternative IV-B

The 2-mile transmission line corridor would cross Las Vegas Wash, which contains one special status fish species in a downstream area near Lake Mead. Species-specific impacts are discussed below for Alternative IV-B.

Razorback Sucker (Federally Endangered and BLM Sensitive)

Construction and maintenance activities would not affect razorback sucker due to habitat being located at least 2 miles downstream of the Las Vegas Wash crossing.

Alternative IV-C

The 2-mile transmission line corridor would cross Las Vegas Wash, which contains a special status fish species in a downstream area near Lake Mead. Species-specific impacts are discussed below for Alternative IV-C.

Razorback Sucker (Federally Endangered and BLM Sensitive)

Construction and maintenance activities would not affect razorback sucker due to habitat being located at least 2 miles downstream of the Las Vegas Wash crossing.

Alternative Variations in Region IV

No waterbodies would be crossed by the Marketplace Alternative Variation in Region IV that contain special status aquatic species.

Alternative Connectors in Region IV

One alternative connector (River Mountain) could be utilized through various combinations to avoid crossing Las Vegas Wash. There is no advantage or disadvantage from the perspective of special status aquatic species, since Alternatives IV-A, IV-B, or IV-C would not affect razorback sucker. There are no apparent unique opportunities or constraints for special status aquatic species by utilizing the River Mountain Alternative connector.

Region IV Conclusion

Based on a comparison of impact parameters for Region IV alternatives, potential impacts to special status aquatic species would be similar. All three alternatives including IV-A (Applicant Proposed and Agency Preferred) would cross one stream with a special status aquatic species (**Table 3.10-19**). Less than 0.1 percent of special status species habitat would be affected by each of the four alternatives. Construction and operation disturbance on riparian habitat would be similar for the three alternatives, with values ranging from <1 to 5 acres (**Table 3.10-20**). There would be minor effects of road use on stream buffers for

Alternative IV-A, and no road effects on Alternatives IV-B and IV-C (**Table 3.10-21**). Project effects on special status species and their habitat would be avoided or considered to be low magnitude and short-term in duration after applying BMPs, design features, and additional mitigation (Section 3.10.6.6 and **Appendix C**). The only potential long-term impacts would be in streams where a culvert would displace stream bottom habitat. In comparison with available stream habitat, the relatively small long-term impacts of all alternatives are unlikely to impact the population viability of special status aquatic species inhabiting these streams.

3.10.6.7 Impacts to Special Status Aquatic Species from the No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed or operated. No Project-related disturbance would occur in waterbodies as a result of vehicle traffic or removal of riparian vegetation. No Project-related sedimentation or risks to aquatic species from potential fuel spills or introduction of invasive species would occur in the Project area. Impacts to aquatic habitat and species would continue at present levels as a result of natural conditions (e.g., annual fluctuations in stream flow due to varying precipitation, erosion, and wildfires) and existing development in drainages within the Project area.

3.10.6.8 Residual Impacts

- Potential loss or alteration of aquatic habitat for special status fish species in smaller streams that require culverts or vehicle crossings.
- Potential short-term sedimentation effects on aquatic habitat for special status species as a result of direct disturbance within or adjacent to streams from vehicle traffic.
- Potential loss or disturbance to riparian vegetation along streams containing special status fish species on private lands or public lands where the ROW is parallel and adjacent to streams.
- Potential special status amphibian mortalities from vehicle traffic during amphibian movements to and from waterbodies located within the ROWs.

3.10.6.9 Irreversible and Irretrievable Commitment of Resources

- Potential loss of aquatic habitat for special status fish species in streams that require culverts for vehicle crossings would be irretrievable. However, the habitat loss would be reversible if the culvert was removed at a later time.
- Potential amphibian mortalities from vehicle traffic would be an irretrievable and irreversible loss of a portion of amphibian populations.

3.10.6.10 Relationship Between Local Short-term Uses and Long-term Productivity

The proposed action and alternatives would result in short-term disturbance to aquatic habitat and use of these habitats by aquatic species, but these effects would not affect the long-term productivity of special status fish, invertebrate, or amphibian populations.

3.11 Cultural Resources and Native American Concerns

Cultural resources are locations of human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral history. The term includes archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and may include locations (sites or places) of traditional, religious, and cultural importance to specified social and/or cultural groups. Cultural resources are material places and things that are located, classified, ranked, and managed through the system of identifying, protecting, and utilizing for public benefit.

3.11.1 Regulatory Background

3.11.1.1 Historic Properties

Federal historic preservation laws provide a legal framework for documentation, evaluation, and protection of cultural resources that may be affected by federal undertakings. NEPA states that federal agencies shall take into consideration impacts to the environment with respect to an array of resources, and that alternatives must be considered. The courts have made clear that cultural resources are regarded as part of the environment and are to be considered under NEPA. The NHPA of 1966, as amended, established the ACHP and the NRHP, and mandates that federal agencies consider an undertaking's effects on cultural resources that are listed or eligible for listing on the NRHP. Cultural resources listed on or eligible for inclusion on the NRHP are referred to as historic properties. It should be noted that unevaluated cultural resources or those requiring additional data are treated as eligible for inclusion on the NRHP until final eligibility is determined. For the purposes of this EIS, the term "historic properties" will be used to be consistent with historic preservation laws and regulations.

In addition to the NHPA, other federal historic preservation laws include, but are not limited to:

- The Antiquities Act of 1906 (16 U.S.C. 431-433), which was the first general law providing protection for archaeological resources. The Act protects all historic and prehistoric sites on federal lands and prohibits excavation or destruction of such antiquities without the permission (antiquities permit) of the secretary of the department having jurisdiction.
- The Archaeological Resources Protection Act (ARPA) of 1979 (16 U.S. C. 470aa-mm) was enacted ..."to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals" (Sec. 2(4)(b)). The Act makes it illegal to excavate or remove from federal or Indian lands any archaeological resources without a permit from the land manager. Major penalties for violating the law include both fines and imprisonment.
- National Trails System Act of 1968 (P.L. 90-543 as amended through P.L. 111-11, March 30, 2009) established a national trails system to promote preservation of, public access to, travel within, and enjoyment of the open-air, outdoor areas, and historic resources of the nation. Furthermore, the Act designated initial trail system components and established methods and standards for adding additional components.

The ACHP is authorized by Section 211 of the NHPA to issue regulations to govern the implementation of Section 106 of the NHPA. These regulations, "Protection of Historic Properties" (36 CFR Part 800), establish the process that federal agencies must follow in order to take into account the effects of their undertakings on historic properties and provide the ACHP its required opportunity to comment. Section 106 establishes a four-step review process by which historic properties are given consideration during the conduct of federal undertakings.

The four steps are as follows:

1. Initiate the Section 106 process by establishing the undertaking, defining the Area of Potential Effect (APE), and consulting with the appropriate parties, including federal agencies, SHPOs, ACHP, Native American Tribes, local governments, interested parties, and the public;
2. Identify historic properties through inventory and evaluation;
3. Determine effects to historic properties using the criteria of adverse effects found in 36 CFR 800.5; and
4. If adverse effects occur, take appropriate measures to avoid, minimize, or mitigate those effects.

Regulations in 36 CFR 800 outline the process through which historic preservation legislation under the NHPA is administered. Regulations in 36 CFR 800.14 allow federal agencies to adopt program alternatives to 36 CFR 800 and to tailor the Section 106 process to better fit agency procedures or a specific project. The most common program alternative is a Programmatic Agreement (PA), which is negotiated between the federal agency, SHPO, and ACHP (if they choose to participate). A PA for a complex project lays out the steps the agency, SHPO, Native American Tribes, and other consulting parties agree to take to consider and resolve any adverse effects the Project might have on historic properties. A draft PA among BLM, Western, USFS, ACHP, Bureau of Reclamation, BIA, NPS, USFWS, TWE, and the Wyoming, Colorado, Utah, and Nevada SHPOs currently is being developed as allowed in 36 CFR 800.14 b(1) (ii) when effects on historic properties cannot be fully determined prior to approval of the undertaking. The draft PA outlines general and specific measures the federal agencies will take to fulfill their objectives and responsibilities regarding the protection of historic properties under the NHPA. Western and the BLM will consult with Native American Tribes and other consulting parties on the PA.

As part of the PA process, the BLM and Western sent letters to local governments, organizations, agencies, interested parties, and Native American Tribes in September 2011 inviting them to be consulting parties to the agreement. In addition, these groups were invited to participate in an all-day meeting on October 18, 2011, in Salt Lake City, Utah, to discuss the Project, Section 106, NEPA, and development of the draft PA. These groups included the following:

- Oregon-California Trail Association (OCTA)
- Alliance for Historic Wyoming
- The Old Spanish Trail Association
- Moffat County
- Mesa County
- Utah Governor's Public Lands Policy Coordination Office (PLPCO)
- Church History Department of the Church of Jesus Christ of Latter Day Saints (LDS Church)
- Milford Archaeological Research Institute
- Mountain Meadows Association
- Mountain Meadows Descendents
- Mountain Meadows Monument Foundation
- National Trust for Historic Preservation
- Utah Rock Art Research Association
- Utah Professional Archaeological Council (UPAC)
- Huntington Eccles Scenic Byway
- Utah Statewide Archaeology Society (USAS)
- Archaeo-Nevada Society
- Nevada Rock Art Foundation
- Nevada Archaeological Association (NAA)
- Lincoln County Chapter of the NAA
- Clark County Cultural Site Stewardship Program
- National Park Service

See Section 3.11.4.3 for a list of the Native American Tribes who were invited to the October 18, 2011, meeting.

Representatives of the OCTA, USAS, LDS Church, PLPCO, and Mountain Meadows Massacre Descendents were able to attend the meeting on October 18, 2011, in Salt Lake City. Two additional groups (NPS and Alliance for Historic Wyoming) participated in the meeting via conference call.

Consulting parties are defined by the NHPA regulations as "certain individuals and organizations with a demonstrated interest in the undertaking [who] may participate as consulting parties due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effect on historic properties" (36 CFR 800.2[c][5]). The regulations emphasize that the "views of the public are essential to informed Federal decision-making in the Section 106 process" (36 CFR 800.2[d][1]). Each of the consulting parties will be afforded an opportunity to participate in development of the draft PA and may be invited to participate as a concurring party. A concurring party concurs with the terms of the PA and may participate in implementing the stipulations of the PA or may benefit from the PA. It should be noted that consulting and concurring parties do not have authority to execute, amend, or terminate the PA; that authority is confined to the signatories (36 CFR 800.6[c][1]). For the Project, the signatories include BLM, Western, ACHP, USFS, Bureau of Reclamation, NPS, BIA, USFWS, TWE, and the Wyoming, Colorado, Utah, and Nevada SHPOs.

In addition to the organizations, local governments, interested parties, and agencies listed above, the BLM and Western have made a reasonable and good faith effort to identify and seek government-to-government consultation with federally recognized Native American Tribes with religious and cultural ties to the files search area that "attach religious and cultural significance to historic properties that may be affected by an undertaking" (Section 101[d][6][B] of the NHPA). "Such Indian Tribes shall be a consulting party" (36 CFR 800.2[c][2][B][ii]). Each of the Native American Tribes will be afforded an opportunity to participate in development of the draft PA and may be invited to participate as a concurring party. See Section 3.11.4.3 for a list of the Native American Tribes who have been invited to participate in development of the draft PA.

3.11.1.2 NRHP Criteria of Eligibility

Cultural resources are assessed for integrity and qualities that make the resources eligible for the NRHP, which provides for management and protection of these resources. There are three main standards that a cultural resource must meet to qualify for listing on the NRHP: age, integrity, and significance. To meet the age criteria, the resource generally must be at least 50 years old. To meet the integrity criteria, the resources must possess the applicable aspects of integrity, which may include: location, design, setting, materials, workmanship, feeling, and association. Finally, the resource must be significant according to one or more of the following criteria:

- Criterion A – Be associated with events that have made a significant contribution to the broad patterns of history;
- Criterion B – Be associated with the lives of persons significant in history;
- Criterion C – Embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D – Have yielded, or may be likely to yield, information important in prehistory or history.

Traditional Cultural Properties

If a cultural resource has been identified as having importance in traditional cultural practices and the continuing cultural identity of a community, it may be considered a traditional cultural property (TCP). The term "traditional cultural property" first came into use within the federal legal framework for historic preservation and cultural resource management in an attempt to categorize historic properties containing traditional cultural significance.

A TCP is defined as one that is eligible for the NRHP because of its association with cultural practices or beliefs of a living community that are: 1) rooted in that community's history and 2) important in maintaining the continuing cultural identity of the community (NPS 1998). To qualify for eligibility to the NRHP, a TCP must be more than 50 years old, must be a place with definable boundaries, must retain integrity, and must meet the criteria of eligibility as described above for cultural resources.

Examples of TCPs include:

- A rural community whose organization, buildings and structures, or patterns of land use reflect the cultural traditions valued by its long-term residents;
- An urban neighborhood that is the traditional home of a particular cultural group and reflects its beliefs and practices;
- A location where a community has traditionally carried out economic, artistic, or other cultural practices important in maintaining it historic identity; and
- A location associated with the traditional beliefs of a Native American Tribe about its origins, its cultural history, or the nature of the world (NPS 1998).

In addition to NRHP eligibility and TCP evaluation, places of cultural and religious importance to Native American Tribes also must be evaluated to determine if they should be considered under other federal laws or Executive Orders (EOs). These include, but are not limited to, the Native American Graves Protection and Repatriation Act (NAGPRA), American Indian Religious Freedom Act (AIRFA), and EO 13007 (Sacred Sites).

The NAGPRA established a means for Native Americans, including Indian Tribes, to request the return of human remains and funerary objects, sacred objects, or objects of cultural patrimony held by federal agencies or federally assisted museums or institutions. NAGPRA also contains provisions regarding the intentional excavation and removal of, inadvertent discovery of, and illegal trafficking in Native American human remains and sensitive cultural items.

The AIRFA established federal policy for protecting and preserving the inherent right of individual Native Americans to believe, express, and exercise their traditional religions including, but not limited to, access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.

EO 13007 requires federal agencies, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions to: 1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and 2) avoid adversely affecting the physical integrity of such sacred sites. It also requires agencies to develop procedures for reasonable notification of proposed actions or land management policies that may restrict access to or ceremonial use of, or adversely affect, sacred sites. Sacred sites are defined in EO 13007 as "any specific, discrete, narrowly delineated location on federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site."

Indian Trust Assets (ITAs) are legal interests in property held in trust by the U.S. for Native American Tribes or Native American individuals. The Secretary of the Interior, acting as the trustee, holds many assets in trust. Examples of objects that may be trust assets are lands, minerals, hunting and fishing rights, and water rights. While most ITAs are on reservations, they also may be found off-reservations. The U.S. has an Indian trust responsibility to protect and maintain rights reserved by or granted to Indian Tribes or Indian individuals by treaties, statutes, and EOs. These sources of trust responsibility are sometimes further interpreted through court decisions and regulations.

3.11.2 Data Sources

In winter and spring 2011, a cultural resource files search was conducted to identify all previously conducted archaeological investigations and previously recorded cultural resources within the 2-mile transmission line corridor (SWCA 2011a,b,c,d). During the first phase of the files search, cultural data were collected online through the individual SHPOs. The second phase of the files search included visits to relevant BLM and USFS field offices to collect information on sites not available online. Bureau of Reclamation offices responsible for administering lands crossed by the Project also were contacted regarding cultural resources previously recorded within their jurisdiction. Additional information was collected through review of General Land Office (GLO) survey plats and historic maps. All of the collected cultural resources information was incorporated into four individual reports submitted to the BLM, Western, Bureau of Reclamation, USFS, and SHPOs. The information provided in the files search reports was used to prepare Section 3.1.1.4, Baseline Description.

3.11.3 Analysis Area

The baseline information was compiled from the cultural resources files search, which covered a 2-mile-wide corridor along each alternative. For the environmental consequences section, the analysis focuses on the 250-foot-wide transmission line ROW, which is where most of the potential impacts would occur. The 2-mile-wide files search area was used for the baseline section to provide the reader with an overall cultural context of the region crossed by the proposed Project.

3.11.4 Baseline Description

Based on the files search data, cultural resources in the files search area have been classified according to one or more site types (e.g., lithic scatter, open camp, structure). Complete information may not be readily available during the original recordation to determine the functional or cultural site type. Consequently, some sites may be re-categorized after additional research or survey. Sites fitting into more than one category usually are more complex and have more information potential than do single-category sites. At the broadest level, cultural resources are categorized as either prehistoric or historic.

3.11.4.1 Prehistoric Resources

Prehistoric sites in the files search area represent a wide range of human activities. Most of the sites are surface manifestations of hunter-gatherer campsites, which represent repeated occupations over thousands of years. Other sites are buried and contain intact, stratified cultural components. A broad range of activities, including lithic reduction, animal butchering, plant processing, heating/cooking, and lithic procurement, are represented at prehistoric sites previously documented in the files search area. Less common sites intersected by the Project corridors are rock shelters, conical wooden structures, rock art, bison kill sites, burials, stone circles, cairns, and house pits. These sites typically are considered important to Native Americans Tribes.

Wyoming

South-central Wyoming has been broadly defined as the Northwestern Plains prehistoric culture area. There are six periods of human occupation in the Northwestern Plains that span approximately

12,000 years: Paleoindian (ca.12,000-7,500 Before Present [B.P.]), Early Plains Archaic (ca. 7,500-5,000 B.P.), Middle Plains Archaic (ca. 5,000-3,000 B.P.), Late Plains Archaic (ca. 3,000-1,500 B.P.), Late Prehistoric (ca. 1,500-300 B.P.), and Protohistoric (ca. 300-150 B.P.). Of the previously documented prehistoric sites, one yielded a radiocarbon date of 8,840 B.P., which falls within the Paleoindian period. In addition, two sites (lithic scatter and open camp) have Paleoindian components.

Archaic and Late Prehistoric period sites are more common within the files search area than Paleoindian sites. A total of 77 are dated to the Archaic and 45 to the Late Prehistoric. Most of the Archaic and Late Prehistoric sites are surface lithic scatters or open camps with one or more features, although stone circles, cairns, and potential sites of tribal importance also are present.

Lastly, two of the previously recorded prehistoric sites yielded radiocarbon dates that fall within the Protohistoric period. The first is a large site containing dated components ranging in age from the Early Archaic to the Protohistoric. Excavations conducted at the site revealed dozens of Archaic-period pit features and intact activity areas. The second site contained fur trade items such as gun parts, horse tack, trade jewelry, glass beads, and metal points.

Colorado

The Northern Colorado River Basin was used by a variety of Native American Tribes, which began with the Clovis hunter gatherers at the end of the Pleistocene and continued to European occupation of the area. Regional prehistory of the area is divided into the Paleoindian era (ca. 13,500-8,400 B.P.), Archaic era (ca. 8,400-2,400 B.P.), Formative era (ca. 2,400-700 B.P., which includes the Fremont tradition [ca. 2,000-700 B.P.], and Protohistoric era (ca. 700-130 B.P.). Of the previously recorded prehistoric sites, four within the Northern Colorado River Basin have provided radiocarbon dates and diagnostic artifacts, including bone beds associated with Paleoindian projectile points indicative of temporary human occupation prior to 7,500 B.P.

A total of 31 Archaic period sites have been previously recorded within the files search area, the majority of which are open camps and open lithic sites. A large number of the Archaic period sites that have undergone test excavations have yielded radiocarbon dates as early as 5,000 B.P. Open camps and lithic scatters constitute the majority of the 24 Formative era sites previously recorded in the files search area. Of the Formative era sites, several yielded architectural remains (e.g., stone circles) and rock art. Most of the Fremont sites in northwestern Colorado consist of open and sheltered artifact scatters, open and sheltered architectural sites, and rock art.

A total of 4 Protohistoric sites have been previously documented in the files search area. The majority of the previously recorded Protohistoric sites are open camps and open lithic scatters. Documented Protohistoric components have been located at open architectural sites, sheltered camps, rock art sites, a burial, and a trail (Ute Trail/Meeker Massacre Trail).

Utah

In general, the prehistory of the area is divided into eight time periods, some of which have associated phases. These periods are: Paleoindian (ca. 11,000-8,000 B.P.), Early Archaic (ca. 8,000-5,000 B.P.), Middle Archaic (ca. 5,000-3,000 B.P.), Late Archaic (ca. 3,000-2,000 B.P.), Terminal Archaic (ca. 2,000-1,500 B.P.), Formative (ca. 1,500-800 B.P. including both the Fremont Complex [ca. 1,500-800 B.P.] and Virgin River Anasazi Complex [ca. 1,600-800 B.P.]), and Late Prehistoric (ca. 800-200 B.P. including the Protohistoric Phase [ca. 500-150 B.P.], during which there was an expansion of Numic-speaking peoples [Ute, Shoshone, Paiute] into the region from the Mojave Desert area).

As a result of the files search, only 14 previously recorded sites were identified that fall within the Paleoindian period. These sites are categorized as sparse lithic scatters with temporally diagnostic flaked stone tools. A total of 255 Archaic period sites have been previously recorded in the files search

area. Most of the sites consist of lithic scatters, open and sheltered campsites, and lithic quarries. Several of the sites contain large amounts of ground stone and small to large thermal features with fire-cracked rock, which become more prevalent in sites dating to the Late Archaic.

The majority of the 709 identified Formative period sites are artifact scatters. Of the 709 sites, 18 exhibit evidence of long-term habitation, some of which are located in caves and rockshelters. Other identified Formative period sites include lithic and ceramic scatters, villages, Fremont mounds, rock art, lithic scatters with pit house remains, and burials.

Only 94 sites identified during the files search are dated to the Late Prehistoric or Protohistoric periods. The majority of the sites are open campsites, caves, and shelters. Of the 94 sites, one is a prehistoric rockshelter that was identified as a TCP by a Ute spiritual leader. A number of TCPs have been documented within an area encompassing a creek and associated canyon. The area, which contains rock art and human occupation sites, was identified as a sacred site by Southern Paiute tribal representatives during an ethnographic study. Although none of the TCPs are located within the files search area, the creek would be intersected by one of the alternatives.

Nevada

Although commonly grouped within the Great Basin culture area, a number of major prehistoric and Native American culture areas overlap in southeastern Nevada. Particularly in the period postdating A.D. 500, various cultural influences are evident in the region, include the Ancestral Puebloan (Anasazi), Patayan, Fremont, and Numic traditions. For purposes of synthesizing prehistoric culture history, a variant of the terminology used by Fowler and Madsen (1986) is presented here. For the early periods, the Fowler and Madsen chronology works well; however, for the later periods, several subdivisions are provided to summarize the diversity represented by the archaeological record in the Las Vegas area. This chronology divides prehistory into a Paleoarchaic Period (ca. 11,200-7,000 B.P.); Archaic Period (ca. 7,000-1,500 B.P.); Formative Period (ca. 1,500-800 B.P.), including the Virgin Anasazi, Patayan, Fremont, and Numic traditions; Late Prehistoric Shoshonean or Numic Period (ca. 800-400 B.P. [A.D. 1200-1600]); and Protohistoric Period (A.D. 1600-1826).

Paleoarchaic sites are rare, with only six sites containing components dated to this period. The components consist of lithic scatters, isolated projectile points, and a rockshelter. A total of 63 Archaic period sites, including caves and rockshelters, habitation sites, subsistence/resource extraction sites, rock art sites, milling assemblages, and lithic or artifact scatters, have been previously recorded in the files search area.

Archaeological traditions present in southern Nevada during the Formative Period include the Ancestral Puebloan (Anasazi), Patayan, Fremont, and Numic. A branch of the Anasazi culture, called the “Virgin Anasazi,” occupied the Moapa Valley and Virgin River area northeast of the Las Vegas Valley. “Patayan” refers to groups located primarily south of the Las Vegas and Ivanpah valleys to the lower Colorado River drainage and incorporates groups previously called “Yuman.” The Fremont complex extended into eastern Nevada as far south and west as the Pahranagat Valley (Madsen and Simms 1998). Typically, the Numic tradition is associated with the immediate ancestors of the historic Paiute and Chemehuevi people of southern Nevada. A total of 79 sites dating to the Formative Period have been previously documented in the files search area. Rockshelters, ceramic scatters, artifact scatters, roasting pit sites, and habitation sites comprise the site types.

A total of 46 previously recorded sites are dated to the Shoshonean or Numic period, 41 with Numic tradition components and 5 are affiliated with the Patayan tradition. Site types consist of rockshelters, ceramic scatters, campsites and roasting pits, and lithic scatters. Only four sites, consisting of lithic and artifact scatters, date to the Protohistoric Period.

Notable prehistoric sites previously recorded within the files search area include an NRHP-listed TCP dating to the Middle to Late Archaic periods and the NRHP-eligible Panaca Summit Archaeological District. The District contains over 70 prehistoric sites, including residential bases, short-term campsites, activity loci, and isolates ranging in age from approximately 5,500 B.P. to the Protohistoric Period.

3.11.4.2 Historic Resources

Historic resources are districts, sites, buildings, structures, or other objects that are associated with or convey some aspect of history, architecture, engineering, and/or culture. Historic resources in the files search area could be eligible for the NRHP if they relate directly to national, state, regional, or local themes such as exploration, transportation, communication, mining, ranching and farming, urban development, or government and political activity. Historic sites can be significant under Criteria A, B, C, or D. Examples of historic resources previously identified in the files search area include, but are not limited to, railroad construction camps, railroad alignments, debris scatters, mining activities, roads, trails, structures, ranches, homesteads, rock art, and stone cairns.

Wyoming

Approximately 122 historic sites and 72 historic components have been previously documented in the Wyoming files search area. Common sites types include railroad construction camps, mining sites, highways and trails, debris scatters, railroad alignments, structures, and habitations. Most notable of the historic sites are the Cherokee Trail, Overland Trail, Lincoln Highway, Rawlins to Baggs Road, Rock Springs to Browns Park Road, Stockgrowers Bank/Dixon Town Hall, and the Red Rock.

The Cherokee Trail is most commonly known for its use by the Cherokee emigrants as an alternative route to the Oregon Trail, but it also served as a transportation route for freight, cattle, and passengers between Utah and Colorado to the Union Pacific Railroad in Wyoming. A segment of the Cherokee Trail eventually became known as the Overland Trail, which was heavily used by emigrants and prospectors largely as an alternative route to the Oregon Trail. In southern Wyoming, the Union Pacific Railroad generally followed the route of the Overland Trail and ultimately rendered the Oregon and Overland trails obsolete. All subsequent major transportation developments would parallel the Union Pacific Railroad route. One of the most notable is the Lincoln Highway, which was the first transcontinental automotive travel-way developed in the U.S. The Cherokee and Overland trails as well as the Lincoln Highway all are eligible for inclusion on the NRHP; however, not all of their segments contribute to the overall NRHP eligibility of these resources.

Throughout the late nineteenth century and continuing into the first decades of the twentieth century, the Rawlins to Baggs Road, known alternatively as the Rawlins to White River Agency Road, was a primary stage and mail route connecting the White River Ute Indian Agency in present-day Rio Blanco, Colorado, to the railhead at Rawlins. During the 1800s, the Rock Springs to Browns Park Road traveled through the Jesse Ewing Canyon taking travelers to the Browns Park area of Utah. Both of the roads are eligible for inclusion on the NRHP. The Stockgrowers Bank/Dixon Town Hall is a single-story ornamented block structure with a canted façade within the Dixon township plat. Lastly, the Red Rock is one of several landmarks located along the Overland Trail and contains inscribed names of people who traveled along the trail. Both the Stockgrowers Bank/Dixon Town Hall and Red Rock are listed on the NRHP.

Colorado

Approximately 257 historic sites and 33 historic components have been previously documented in the Colorado files search area. The most common site types are railroad construction camps, railroad alignments, habitations, trails/roads, debris scatters, highways, and transmission lines. Review of GLO maps indicates numerous named and unnamed roads and ranches, houses, railroads, trails, irrigation ditches, telephone lines, mining operations, pipelines, and fences. The majority of the roads, telephone

lines, irrigation ditches, ranches, and homesteads are near the towns of Craig and Hayden and most likely are associated with the original establishment of these towns as a result of the Union Pacific Railroad first crossing southern Wyoming around 1868 and the Denver and Salt Lake Railroad reaching Craig in 1913.

Notable previously recorded historic sites within the files search area include the Thornburg Wagon Road, Baggs to Craig Road, Victory Highway (U.S. 40), Road to Browns Park, Meeker to Bear River Road, and Road from Lily Park to Maybell. The Thornburg Road, which is eligible for the NRHP, was constructed between 1877 and 1906 and served as an important transportation route for freight wagons between Maybell, Colorado, and Baggs, Wyoming. From the late 1870s to the 1920s, the Baggs to Craig Road was a major transportation route between the Union Pacific Railroad in Wyoming and Colorado communities. In Moffat County, there are two segments of the road that are eligible for the NRHP. The Victory Highway, which was established following WWI as a memorial to those who fought and died in the war, ran from Kansas City to San Francisco and for the most part follows the path of U.S. 40. Although, the Road to Browns Park, Meeker to Bear River Road, and Road from Lily Park to Maybell are not eligible for the NRHP, they provided a connection between local communities or to larger communities outside of the Region.

Utah

Approximately 721 historic sites and 61 historic components have been previously documented in the Utah files search area. Common site types include debris scatters, railroads, roads, canals and ditches, homesteads, mining sites, and telegraph lines. Notable historic sites in the files search area include, but are not limited to, the Old Spanish Trail, Mountain Meadows Massacre Site, Soldier Creek Kilns (NRHP-listed), Aspen-Cloud Rock Shelters (NRHP-listed), Red Creek Canal, Dry Gulch Creek Bridge (Old 593), Durfey Farmstead, Sorensen's Country Store, Aurora LDS Meetinghouse, Nebeker Adelman House, Emery Town Site, Helper Town Site, Denver & Rio Grande Western Railroad, Old U.S. Highway 6 and 50, and Modena Elementary School (NRHP-listed).

The Old Spanish Trail is a NHT that was established in the early 1800s as a trade, transportation, and communication corridor between Santa Fe and Los Angeles. Multiple variants of the trail allowed travelers to take alternative routes or shortcuts based on the time of year, weather, size of the traveler's caravan, or the traveler's preference (see Section 3.15, Special Designation Areas, for additional information on the Old Spanish Trail). Other notable travel routes in the Project vicinity include the Rivera Expedition of 1765 and the Dominguez-Escalante expedition that crossed the Uintah Basin and continued through southwest Utah in 1776.

The Mountain Meadows Massacre site is a National Register District. Portions of the District recently attained status as a National Historic Landmark (NHL). The District is the location of the September 11, 1857, massacre of 120 Arkansas emigrants by Mormon militiamen. There are two separate parcels within the larger site, each a known location of a significant event associated with the massacre. One of the parcels includes the encampment, siege, and monument, as well as the militia approach and exit routes. It's possibly a Paiute Indian camp site. The second parcel includes the site of the massacre and gravesites.

Also included in the Utah files search area are the Rock Art ACEC, Nine Mile Canyon ACEC, and Browns Park SRMA. The Rock Art ACEC is a collection of rock art sites encompassed in a 5,300-acre area. These sites represent some of the best examples of prehistoric rock art in the Colorado Plateau. Protection of these sites is afforded by the ACEC status, but some designated areas also are protected under Mexican Mountain and San Rafael Reef's WSA. Nine Mile Canyon ACEC is known for its many petroglyphs and pictographs, many of which were created by the Fremont culture and Ute people. In addition to rock art, cultural sites such as granaries, ancient village sites, pit houses, rock shelters, settlers' cabins, and ranches also have been identified within the canyon. Browns Park SRMA is

significant because of its high value scenery, wildlife habitats, and cultural resources, including some of the earliest visible cultural sites associated with the Fremont culture (see Section 3.14, Land Use, and Section 3.15, Special Designation Areas, for an expanded discussion of the ACECs and SRMA).

Nevada

Approximately 221 historic sites and 18 historic components have been previously documented in the Nevada files search area. Some of the historic components are affiliated with Native American, Chinese/Oriental, or Euro-American cultures. Common site types are railroad construction camps, railroad alignments, debris scatters, mining sites, highways, transmission lines, structures, ditches, trails, and habitations. Notable historic sites are the Old Spanish Trail, 48 historic-built environment resources, and five NRHP-listed historic or archaeological districts. As stated previously, the Old Spanish Trail had multiple variants that broke off of the main trail allowing travelers to take alternative routes or shortcuts. In southern Nevada, one of the well-traveled variants or routes became known as the Mormon Road.

The 48 historic-built environmental resources are all within or immediately adjacent to Boulder City, Nevada. These resources consist of residential homes, the Boulder City Pumping Station, Old Airport Hangar, and Lake Mead NRA Maintenance Warehouse Complex.

Boulder City Historic District, Sloan Canyon Petroglyph Site, Tule Springs Archaeological Site, Tule Springs Ranch, and Las Vegas Wash Archaeological District constitute the five NRHP-listed historic or archaeological districts located within the files search area. The Boulder City Historic District is Nevada's largest listing on the NRHP with 408 buildings. Sloan Canyon Petroglyph Site contains more than 300 rock art panels with 1,700 individually designed elements created by native cultures from the Archaic to historic era. The Tule Springs Archaeological Site contained extinct mammoth, bison, horse, ground sloth, and camel dating to 28,000 years ago that were recovered during excavations conducted in the 1930s, 1950s, and 1960s. Inside Floyd Lamb State Park is Tule Springs Ranch, which served as a watering hole for Native Americans and prospectors traveling across Nevada in the 1800s. The Las Vegas Wash Archaeological District falls primarily within the Clark County Wetlands Park and contains over 30 prehistoric and historic sites.

Also included in the files search area are the Sloan Canyon National Conservation Area/Sloan Rock Art ACEC, Rainbow Gardens ACEC, proposed Shooting Gallery ACEC, and proposed Pahroc Rock Art ACEC. The Sloan Rock Art District, which is listed on the NRHP, is a 1,920-acre ACEC within the North McCullough Wilderness Area consisting of prehistoric habitation and rock art sites. Rainbow Gardens (36,412 acres) was designated as an ACEC because of its high geological, scientific, scenic, cultural, and sensitive plant values. The proposed Shooting Gallery ACEC is located in Lincoln County and is a multi-component cultural landscape consisting of a large complex of scattered rock art sites in association with several well-developed habitation areas. The Pahroc Rock Art site, located in Lincoln County, is proposed as an ACEC based on the prehistoric values in the form of archaeological rock art and rock shelter sites. (see Section 3.14, Land Use, and Section 3.15, Special Designation Areas, for an expanded discussion of the Sloan Canyon National Conservation Area and Rainbow Gardens ACEC).

3.11.4.3 Native American Consultation

It is the responsibility of all federal agencies to comply with the requirements of Section 106 of the NHPA and the ACHP regulations when planning and carrying out their undertakings. In doing so, they are required to consult with Native American Tribes depending on the specifics of the undertaking. Such consultation with Native American Tribes is central to the Section 106 process. Consultation is defined in the ACHP regulations as "the process of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters arising in the Section 106 process" [36 CFR § 800.16(f)]. Other consultation statutory requirements include:

- EO 13175, Consultation and Coordination with Indian Tribal Governments, 63 FR 96 (November 6, 2000). EO 13175 was issued to establish regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications. When implementing such policies, agencies shall consult with tribal officials as to the need for federal standards and any alternatives that limit their scope or otherwise preserve the prerogatives and authority of Indian tribes.
- Government-to-Government Relations with Native American Tribal Governments (Memorandum signed by President Clinton, April 29, 1994), 59 Federal Register 22951 (May 4, 1994). The Memorandum directs federal agencies to consult, to the greatest extent practicable and to the extent permitted by law, with tribal governments prior to taking actions that affect federally recognized tribal governments. Federal agencies must assess the impact of federal government plans, projects, programs, and activities on tribal trust resources and assure that tribal government rights and concerns are considered during such development.

For purposes of Section 106 compliance, tribal consultation for the Project began when a certified letter was mailed on July 20, 2010, to all federally recognized Native American Tribes either residing in or with cultural ties to the files search area as depicted in **Table 3.11-1**. The letter initiated formal government-to-government consultation, informed the Tribes of the proposed undertaking, and solicited their concern/comments regarding possible historical and/or traditional ties to the area or the presence of properties of traditional religious and cultural importance. Included in the letters were a Project map, response form, and return address stamped envelope. The response form and return address envelope were enclosed with the letters as a means to inform the BLM and Western if any of the Tribes wished to participate in the consultation efforts or had any concerns associated with the Project.

Table 3.11-1 Initial Contact with Federally Recognized Native American Tribes, July 20, 2010

Eastern Shoshone Tribe of the Wind River Reservation	Winnemucca Indian Colony of Nevada
Northern Arapaho Tribe of the Wind River Reservation	Yerington Paiute Tribe of the Yerington Colony & Campbell Ranch
Southern Ute Indian Tribe of the Southern Ute Reservation	Yomba Shoshone Tribe of the Yomba Reservation
Ute Mountain Tribe of the Ute Mountain Reservation	Fort Mojave Indian Tribe
Confederated Tribes of the Goshute Reservation	Hopi Tribe of Arizona
Northwestern Band of Shoshone Nation	Kaibab Paiute Tribe
Paiute Indian Tribe of Utah	Navajo Nation
Skull Valley Band of Goshute Indians of Utah	San Juan Southern Paiute Tribe
Ute Indian Tribe of the Uintah and Ouray Reservation	Jicarilla Apache Tribe
Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho	Pueblo of Acoma
Duckwater Shoshone Tribe of the Duckwater Reservation	Pueblo of Cochiti
Ely Shoshone Tribe of Nevada	Pueblo of Isleta
Fort McDermitt Paiute-Shoshone Tribe of the Fort McDermitt Indian Reservation	Pueblo of Jemez
Las Vegas Tribe of Paiute Indians of the Las Vegas Indian Colony	Pueblo of Laguna
Lovelock Paiute Tribe of the Lovelock Indian Colony	Pueblo of Nambe
Moapa Band of Paiute Indians of the Moapa River Indian Reservation	Pueblo of Picuris
Paiute-Shoshone Tribe of the Fallon Reservation and Colony	Pueblo of Pojoaque
Pyramid Lake Paiute Tribe of the Pyramid Lake Reservation	Pueblo of San Felipe
Reno-Sparks Indian Colony	Pueblo of San Juan
Shoshone-Paiute Tribes of the Duck Valley Reservation	Pueblo of Santa Ana
Summit Lake Paiute Tribe of Nevada	Pueblo of Santo Domingo

Table 3.11-1 Initial Contact with Federally Recognized Native American Tribes, July 20, 2010

Te-Moak Tribe of Western Shoshone Indians of Nevada	Pueblo of Tesuque
Walker River Paiute Tribe of the Walker River Reservation	Pueblo of Zuni
Washoe Tribe of Nevada & California	Chemehuevi Indian Tribe

Seven of the Native American Tribes responded to the initial consultation letter dated July 20, 2011 (Confederated Tribes of the Goshute Reservation, Duckwater Shoshone Tribe of the Duckwater Reservation, Ely Shoshone Tribe of Nevada, Las Vegas Paiute Tribe, Paiute Indian Tribe of Utah, Pueblo of Laguna, and Pueblo of Santo Domingo). A tribal member of the Ely Shoshone Tribe of Nevada requested copies of the Project maps, which were provided via email. The Las Vegas Paiute Tribe and Pueblo of Santo Domingo indicated on the response form that they did not require consultation at this time; however, they may request other opportunities to consult with the BLM and Western in the future. In their response, the Pueblo of Laguna indicated that the Project would not have a significant impact, but requested an opportunity to review any newly discovered archaeological sites and that photographs be taken of the sites. Face-to-face meetings with the BLM and Western were requested by the remaining three tribes (Goshute, Duckwater Shoshone, and Paiute Tribe of Utah).

On December 1, 2010, the BLM and Western met with the Tribal Council of the Paiute Tribe of Utah during their scheduled council meeting to provide a presentation on the Project. A large format map showing the proposed route and alternatives was displayed during the presentation. Council members had questions regarding construction of the transmission line and asked if there was a Project website where they could find additional Project information; the BLM provided the Council members with the website. At the end of the meeting, the Council provided the BLM and Western with the appropriate tribal contact for any future correspondence. To date, no other meetings have been held with the Paiute Tribe of Utah.

The BLM and Western met with the Duckwater Shoshone and Ely Shoshone tribes in Ely, Nevada, on January 12, 2011, to present an overview of the Project. At the start of the meeting, the Tribal chair stated that the meeting was an informational meeting and not considered government-to-government consultation because not all of the Tribal council was present. The tribes had questions regarding the status of the cultural resources investigations and selection of the cultural contractor. Railroad Valley was mentioned as an area of concern by several tribal members. At the end of the meeting, the Tribes requested large-scale maps of the Project where it would cross or be close to their tribal lands. Following the meeting, the BLM delivered the maps to the tribes. To date, no other meetings have been held with the Duckwater Shoshone and Ely Shoshone tribes.

On January 19, 2011, the BLM telephoned the Confederated Tribe of the Goshute Reservation to discuss their request for a face-to-face meeting. During the call, the BLM provided additional information on the Project, in particular, the location of the proposed transmission lines. Since the proposed location of the transmission line would not be within Goshute Tribal lands, the tribal Administrator indicated there was no need for additional information or a face-to-face meeting.

In late September 2011, a second set of letters was sent to the Native American Tribes listed on **Table 3.11-1** inviting them to participate in development of the draft PA. The letters included details of the Project, a description of historic properties identified through the files search, and information on an upcoming meeting on October 18, 2011, in Salt Lake City, Utah, to discuss the PA process. Enclosed with the letters was a Project map and a flyer with specific information regarding the date, time, and location of the meeting in Salt Lake City. Only the Hopi Tribe responded to the second letter. The Hopi are interested in ongoing consultation on the Project and requested copies of the cultural resources

inventory report and any proposed treatment plans for review and comment. In addition, the Hopi requested an ethnographic overview of the Project area.

Follow-up calls to all of the Native American Tribes were conducted after the second set of letters to verify receipt of the letters and to ask if a tribal representative would be attending the October 18 PA meeting in Salt Lake City. None of the Tribes attended the October 18 meeting in Salt Lake City.

On December 21, 2011, and January 4, 2012, letters were sent to the Native American Tribes listed in **Table 3.11-1** inviting them to attend the Rapid Response Transmission Team (RRTT) meetings held on:

- January 9, 2012, in Cheyenne, Wyoming;
- January 10, 2012, in Denver, Colorado;
- January 11, 2012, in Las Vegas, Nevada; and
- January 12, 2012, in Salt Lake City, Utah.

The BLM and Western, on behalf of the RRTT, held these meetings to help the RRTT better understand the Project as the RRTT worked to expedite and improve the federal government's evaluation of transmission line applications. Representatives from the RRTT who attended the meetings included the BLM Deputy Chief of Staff, Department of Energy-Renewable Energy Senior Advisor, Department of the Interior Special Assistant to the Counselor, and BLM Rights-of-Way Branch Chief. A conference line (call-in number) was provided to those who were unable to attend the meetings in person. None of the invited Native American Tribes attended the meetings.

On April 19, 2012, the BLM and Western held an online conference call to discuss the status of the draft PA. The consulting parties listed in Section 3.11.1.1 and the Native American Tribes listed in **Table 3.11-1** were invited to participate on the conference call. None of the invited Native American Tribes participated on the call.

At the request of the Ute Tribal Council, the BLM and Western attended a Ute Tribal Council Meeting on May 31, 2012, and met with the Ute Mountain Ute Tribe, Southern Ute Tribe, and Ute Indian Tribe of the Uintah and Ouray Reservation to discuss the Project. The BLM and Western gave a presentation of the Project and answered questions from the Tribes. In general, the questions focused on Project components, tribal consultation, BIA responsibilities, and ROWs on tribal lands. The Ute Mountain Ute were concerned about Project impacts to human remains, cultural landscapes, TCPs, and sacred sites.

Western and the BLM attended another Ute Tribal Council meeting on August 28, 2012. During this meeting, detailed Project maps of the 2-mile transmission line corridors, a Project description, and a schedule for completion of the draft EIS were presented to the Council members. As requested by the Council, Western and the BLM also met with the Ute Tribe's Energy and Minerals Department. Project information, a Project map, and contact information were left with the Council members and the Energy and Minerals Department. To date, no other meetings have been held with the Ute Tribal Council.

On November 8, 2012, the BLM and Western held an online conference call to discuss the status of the draft PA. The consulting parties listed in Section 3.11.1.1 and the Native American Tribes listed in **Table 3.11-1** were invited to participate on the conference call. None of the invited Native American Tribes participated on the call.

On November 26, 2012, the BLM and Western sent letters to five additional pueblos as part of the consultation process. The five pueblos included the Pueblo of San Ildefonso, Pueblo of Santa Clara, Pueblo of Sandia, Pueblo of Taos, and Pueblo of Zia. Included in the letters were a Project map, response form, and return address stamped envelope. The letters included information on the Project,

APE, PA process, and historic properties identified as a result of the files search. None of the contacted pueblos responded to the letters.

To date, no places of traditional religious and cultural importance to the contacted Native American Tribes have been identified in or near the files search area through the government-to-government consultation efforts. Concerns expressed by the Tribes have been with human remains, TCPs, cultural landscapes, and sacred sites. Opportunities for the identification of locations of possible traditional religious and cultural importance that may be affected by the Project, as well as opportunities for the Tribes to express their concerns would remain open throughout the consultation process, which currently is ongoing and would continue through construction.

3.11.5 Regional Summary

Tables 3.11-2 and **3.11-3** summarize the cultural types and eligibility status by region and state of those sites identified through the files search, GLO review, visits to the BLM and USFS field offices, and contacts with the Bureau of Reclamation. **Table 3.11-2** summarizes the findings for those sites located within the 2-mile-wide files search area; whereas, **Table 3.11-3** summarizes the findings for those sites located within the 250-foot-wide transmission line ROW.

Table 3.11-2 Site Types and NRHP Status by Region and State within the Files Search Area (2-mile Transmission Line Corridor)

Site Types and NRHP Status by Region and State - 2-Mile Corridor									
	Summary of Site Types					Summary of NRHP Status			
State	Prehistoric Sites	Historic Sites	Multi-component Sites	Potential TCPs[1,2]	No Information	Listed	Eligible for Listing	Not Eligible	Unevaluated
Region I									
Wyoming	1,455	122	145	14	91	2	447	858	506
Colorado	408	44	26	7	5	0	59	321	103
Region II									
Colorado	693	213	41	49	27	2	73	693	206
Utah	1,417	694	104	144	53	2	788	1,062	416
Region III									
Utah	530	27	18	27	22	0	284	235	78
Nevada	763	103	20	188	122	0	150	563	295
Region IV									
Nevada	231	118	17	117	11	7	88	205	77

[1] In general, sites in which Native American Tribes attach traditional religious and cultural significance are referred to as "TCPs" by the Tribes. TCPs can include, but are not limited to, stone cairns, stone circles, rock shelters, rock art, prehistoric campsites, and village sites. At this time, no tribal consultation regarding verification of these sites as TCPs or other sites of importance to the Tribes has occurred. Until consultation with Native American Tribes to evaluate these sites has occurred, these sites are considered "potential TCPs" based on their site type and description.

[2] All of the potential TCPs are also prehistoric sites. As such, they are counted twice in the site totals.

Sources: SWCA 2012a-e, 2011a-d.

Table 3.11-3 Site Types and NRHP Status by Region and State within the 250-foot Transmission Line ROW

Site Types and NRHP Status by Region and State – 250-foot ROW									
	Summary of Site Types					Summary of NRHP Status			
State	Prehistoric Sites	Historic Sites	Multi-component Sites	Potential TCPs[1,2]	No Information	Listed	Eligible for Listing	Not Eligible	Unevaluated
Region I									
Wyoming	124	33	36	0	27	0	86	83	51
Colorado	48	5	5	12	0	0	20	34	4
Region II									
Colorado	60	38	6	12	4	2	34	42	30
Utah	116	152	17	16	13	0	144	135	19
Region III									
Utah	81	19	4	2	8	0	72	28	12
Nevada	63	23	2	19	12	1	25	42	32
Region IV									
Nevada	27	60	1	23	1	2	41	29	17

[1] In general, sites in which Native American Tribes attach traditional religious and cultural significance are referred to as "TCPs" by the Tribes. TCPs can include, but are not limited to, stone cairns, stone circles, rock shelters, rock art, prehistoric campsites, and village sites. At this time, no tribal consultation regarding verification of these sites as TCPs or other sites of importance to the Tribes has occurred. Until consultation with Native American Tribes to evaluate these sites has occurred, these sites are considered "potential TCPs" based on their site type and description.

[2] All of the potential TCPs are also prehistoric sites. As such, they are counted twice in the sites totals.

Sources: SWCA 2012a-e, 2011a-d.

3.11.6 Impacts to Historic Properties and Sites of Native American Concern

The impact files search area for historic properties and Native American concerns is the APE. Under Section 106 of the NHPA, the APE is defined as "those areas in which impacts are planned or are likely to occur. Specifically, the APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. Additionally, the APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking (36 CFR 800.16[d])."

Per the draft PA and for purposes of this EIS, the APE for direct effects is the area within which historic properties may sustain physical alteration or destruction as a result of the Project. The APE for direct effects is limited to the area of potential ground disturbance by activities related to the Project that may directly cause alterations in the character or use of historic properties.

The APE, as currently defined, encompasses an area sufficient to accommodate all of the Project components under consideration. The APE may be modified when tribal consultation, additional field research or literature review, consultation with consulting parties, or other factors indicate that the qualities and values of historic properties that lie outside the boundaries of the currently defined APE may be affected directly, indirectly, or cumulatively.

If the BLM determines that the Project or changes to the Project may cause unforeseen direct, indirect, or cumulative effects to historic properties beyond the extent of the established APE, then the BLM may use the process set forth in the PA to determine whether to modify the APE.

The APE for indirect effects on historic properties considers visual, audible, and atmospheric elements that could diminish the integrity of properties for which setting, feeling, and/or association are qualifying characteristics of NRHP eligibility. The indirect APE for the Project extends for five miles on either side of the transmission line centerline or to the visual horizon, whichever is closer. Where the indirect APE includes TCPs, NHLs, NHTs, or other classes of historic properties for which setting contributes to eligibility, additional analyses may be required and the indirect APE may need to be modified accordingly, as it may extend beyond the five-mile convention when effects have been determined to extend beyond this distance.

Cumulative effects include reasonably foreseeable effects caused by the Project that may occur later in time, be farther removed in distance or be cumulative [(36 C.F.R. part 800.5(a)(1)]. For purposes of this EIS and per the draft PA, the APE for cumulative effects is the same as described for direct and indirect effects.

Impacts to historic properties, including TCPs and properties of traditional religious and cultural importance to Native Americans, were evaluated for each alternative using the following methods:

- The analysis of potential direct and indirect impacts was based on review of existing files and information obtained from the Wyoming, Colorado, Utah, and Nevada SHPOs, BLM, USFS, and Bureau of Reclamation, and by review of GLO maps.
- Potential effects were quantified where possible. Where quantitative data are unavailable, best professional judgment or qualitative assessments were used to describe impacts.

To date, no Class III pedestrian inventories have been conducted for the Project. Once the final route has been selected and the ROD has been issued, an intensive Class III inventory of previously uninventoried areas would be conducted to identify historic properties in the APE. A combination of inventory and consultation would be used to determine the presence of historic properties within the APE. In recognition of their particular expertise, Native American Tribes and their designated representatives would be consulted to establish the locations and significance of properties of traditional religious and cultural importance to the Tribes. The BLM would be responsible for reviewing the results of the inventories, determine NRHP eligibility, assess effects, and seek resolution of adverse effects in consultation with Western, the SHPOs, USFS, Bureau of Reclamation, NPS, USFWS, Native American Tribes, and other consulting parties.

In addition to the pedestrian inventory, an in-depth visual analysis along the final route would be conducted to accurately identify whether any historic properties, including properties of traditional religious and cultural importance in which setting contributes to their eligibility, would be visually impacted by the Project. In addition to properties of traditional religious and cultural importance, sacred sites or other sensitive sites identified by Native Americans during consultation also may require visual analysis. The analysis would include on-the-ground verification of historic property/tribal site locations, as well as verification of Project visibility from the historic property or site. In some instances it may be necessary to set up a Key Observation Point (KOP) at the location of the historic property or site to observe and analyze the visibility of aboveground Project facilities during different times of day and during different weather conditions (e.g., cloudy versus sunny skies). Results of the analysis would be used to determine the magnitude of visual effects to the setting of historic properties or sites from which aboveground Project facilities are visible.

Although no Class III inventories or in-depth visual analyses have been conducted to date for the Project, the EIS analysis of impacts to the Old Spanish Trail, which is a congressionally designated NHT, was supplemented with data obtained from the National Historic Trails Inventory (AECOM 2012). The inventory was not conducted for the Project, but was a separate endeavor conducted by the BLM using Recover Act funding and staff resources to develop and apply new inventory and management

tools that include consistent standards for trail resource documentation, protection, use, and preservation. BLM's National Trails Inventory was a significant undertaking to document national historic trail settings, record trail attributes and resources, create trail information archives, and manage trail data. The inventory's goal was to: 1) understand the resources associated with each trail, which meant determining where the route lies in some instances; 2) determine where physical traces or archaeological resources are present; and, 3) evaluate settings where trail segments are located and identify those locations where historic integrity and scenic quality have been maintained. A total of six NHTs across the western U.S. were investigated as part of the inventory. Of these six trails, only the Old Spanish Trail is located within the impacts analysis area. The Cherokee and Overland trails, which also are located in the impacts analysis area, currently are being evaluated for inclusion in the NHT system.

In general, primary issues identified by federal and state agencies during previous NEPA transmission line analyses that are related to the Project include:

- Construction of the transmission line and associated facilities could adversely affect historic properties such as prehistoric or historic archaeological sites, districts, buildings, structures, roads and trails, and objects.
- Previously undiscovered cultural resources, including burials and associated funerary objects, could be discovered and adversely affected during ground-disturbing activities associated with construction.
- Unauthorized artifact collection and/or vandalism.
- Introduction of visual or auditory elements that diminish the integrity of a historic property's setting.

Issues identified at the public scoping meetings included:

- Potential impacts to the Mountain Meadows Massacre site and Mountain Meadows NHL.
- Potential impacts to the Old Spanish Trail and Overland and Cherokee trails.
- Potential impacts to the archaeological resources within the Adobe Town WSA.

For purposes of this EIS, impacts are considered significant if management actions result in adverse effects to the qualities that make a property eligible for inclusion in the NRHP or considered important to Native American Tribes as measured by:

- Physical destruction or alteration of a property or relocation from its historic location;
- Isolation or restriction of access;
- Change in the character of the property's use or of physical features within the property's setting, or the introduction of visible, audible, or atmospheric elements that are out of character with the significant historic features of the property;
- Neglect that leads to deterioration or vandalism; and
- Transfer, sale, or lease from federal to non-federal control, without adequate and legally enforceable restrictions or conditions to ensure the preservation of the historic significance of the property.

3.11.6.1 Impacts from Terminal Construction and Operation

Northern Terminal

Construction of the Northern Terminal would result in 504 acres of ground disturbance. Surface disturbance activities associated with the terminal would include pre-development geotechnical sample drilling and site development, which would involve vegetation clearing, grading, and facility construction. Construction-associated surface disturbance would include land cleared for storage areas, a concrete batch plant site, temporary work areas, and pulling, tensioning, and splicing sites. Operation surface disturbance would include footprints of the access roads, the footprints of the station facilities, and installation of the perimeter fence. The types of direct, indirect, and visual impacts to historic properties that could occur during construction and operation of the terminal would be the same as discussed in Section 3.11.6.2, Impacts Common to Alternative Routes and Associated Components.

No previously recorded cultural resources were identified within the proposed location of the Northern Terminal. Prior to construction, a Class III pedestrian inventory would be conducted for the proposed location of the terminal. If historic properties, including TCPs and properties of traditional religious and cultural importance are identified within proposed disturbance areas and would be adversely affected, the property would be avoided through Project redesign. However, if avoidance is not feasible, adverse effects would be minimized or mitigated as stipulated in the draft PA and through implementation of design features. Any previously unknown cultural resources (other than isolates) discovered during construction and operation activities would be handled as detailed in the draft PA (see Section 3.11.6.2 for additional details regarding the draft PA).

Summary: Unavoidable adverse effects to historic properties that may be located within the disturbance area of the Northern Terminal would be minimized or mitigated as stipulated in the PA and through implementation of design features. Unanticipated discoveries would be handled as stipulated in the PA. As such, no adverse effects to known and unknown historic properties would be anticipated as a result of constructing and operating the Northern Terminal.

Southern Terminal

Construction of the Southern Terminal would result in 412 acres of ground disturbance. Surface disturbance activities and site clearing associated with the Southern Terminal would be identical to those associated with the Northern Terminal. Potential direct, indirect, and visual impacts to historic properties as a result of constructing and operating the Southern Terminal would be the same as described in Section 3.11.6.2, Impacts Common to All Alternatives and Project Components.

As a result of the files search, only one previously recorded isolated artifact was identified within the proposed location of the Southern Terminal. As described for the Northern Terminal, a Class III inventory would be conducted prior to construction. If historic properties are identified as a result of the inventory, the properties would be avoided. If avoidance is not feasible, adverse effects would be minimized or mitigated as stipulated in the draft PA and through implementation of design features.

Summary: Unavoidable adverse effects to historic properties that may be located within the disturbance area of the Southern Terminal would be minimized or mitigated as stipulated in the PA and through implementation of design features. Unanticipated discoveries would be handled as stipulated in the PA. As such, no adverse effects to known and unknown historic properties would be anticipated as a result of constructing and operating the Southern Terminal.

Design Option 2

The impacts of constructing and operating Design Option 2 would be similar to those discussed under the alternative routes because the implementation of this design would utilize the same alternative

routes and construction techniques. Differences between this design option and the Project include the locations of the southern converter station and ground electrode system as well as the addition of a series compensation station midway between the IPP and Marketplace. The southern converter station would be located near the IPP in Utah instead of at the Marketplace in Nevada and the ground electrode system would be within 50 miles of the IPP. Potential adverse effects to known and unknown historic properties would be the same as described in 3.11.6.2, Impacts Common to All Alternative Routes and Associated Components. The same design features and stipulations outlined in the draft PA would be implemented to minimize or mitigate potential adverse effects to known and unknown historic properties associated with Design Option 2.

Design Option 3

Implementation of Design Option 3 would utilize the same alternative routes, facilities, and construction techniques as the Project; therefore, impacts from construction and operation of this design option would be the similar to those discussed under the alternative routes. Differences between this design option and the Project include the construction of an interim substation and connection at IPP and a series compensation station midway between Sinclair, Wyoming and IPP. These would operate during Phase I of the design option as described in Chapter 2.0. The series compensation station would be located adjacent to the transmission line; therefore impacts are disclosed within the description of the Project routes. Potential adverse effects to known and unknown historic properties would be the same as described in Section 3.11.6.2, Impacts Common to All Alternative Routes and Associated Components. The same design features and stipulations outlined in the draft PA would be implemented to minimize or mitigate impacts to known and unknown historic properties associated with Design Option 3.

3.11.6.2 Impacts Common to All Alternative Routes and Associated Components

Construction Impacts

Ground-disturbing activities, such as installation of the transmission line foundations and anchors; construction of new access roads and upgrade of existing access roads; construction of electrical substations and other ancillary facilities; and, use of temporary work areas and staging areas for storing equipment and supplies would have the potential to directly impact historic properties, including TCPs and properties of traditional religious and cultural importance to Native American Tribes. These physical impacts could occur to both known sites and subsurface sites and could result in the vertical and horizontal displacement of soil containing cultural materials, damage to or destruction of artifacts and features, and loss of archaeological data.

Other potential effects associated with the Project could include off-road vehicle traffic associated with construction and erosion due to construction activities, soil compaction, or vegetation removal. In addition, vandalism, inadvertent damage, or illegal artifact collection could occur as a result of increased access via newly constructed roads and numbers of construction personnel working within and adjacent to the 250-foot-wide transmission line ROW. New road construction would make sites more accessible and studies have shown most site vandalism happens near roads. The presence of more people in the construction zone may lead to artifact collection during work breaks or after hours.

Visual impacts to historic properties (as well as cultural /historic landscapes) where setting is an aspect of integrity could occur as a result of introducing visual elements out of character with a property located within the visual APE. Introduction of structures such as the proposed transmission line and associated towers into an otherwise rural or natural setting could diminish the integrity of a property's features that contribute to its significance. Assessment of effects (including visual effects) on historic properties is based in part on the evaluation of integrity. According to the NRHP guidelines, integrity is defined as the ability of an historic property to convey its own significance; evaluations of integrity must always be grounded in an understanding of a property's physical features and whether they remain sufficiently

intact to convey its significance. A historic property's integrity includes seven unique aspects: location, setting, design, materials, feeling, workmanship, and association. Based on these aspects, the types of sites considered visually sensitive include, but are not limited to, National Historic Monuments, Districts, Landmarks, and Trails; sites eligible under criteria A, B, or C; and TCPs.

During public scoping, concerns were expressed regarding possible direct and visual impacts to the Cherokee and Overland trails, Old Spanish Trail, Mountain Meadows Massacre Site and Mountain Meadows NHL, and Adobe Town WSA. The Cherokee and Overland trails would be crossed by the alternatives in Wyoming; whereas, the Old Spanish Trail would be crossed by the alternatives in Utah and Nevada. In Wyoming, there are two routes of the Cherokee Trail, a northern route and a southern route. The northern route has been erased and no visible remnants remain; therefore, the EIS analysis focuses on the southern route. It should be noted that the NPS guidelines disqualify cultural sites listed under the NRHP when their physical features are no longer visible (NPS 2002). Although none of the alternatives cross the Mountain Meadows Massacre Site and Mountain Meadows NHL, there were concerns about visual effects to the site and possible disturbance to unmarked graves that may be located outside of the site's boundary. The Adobe Town WSA is located more than 6 miles from the alternatives; therefore, no impacts to historic properties located in the WSA would be anticipated.

The potential for the discovery of unanticipated historic properties during construction activities exists within proposed disturbance areas and could result in an adverse effect. Unanticipated discoveries could result in displacement or loss (either complete or partial) of the discovered cultural material. Displacement of cultural material affects the potential to understand the context of the property and limits the ability to extrapolate data regarding prehistoric settlement and subsistence patterns. Potential impacts to unanticipated discoveries could be greater than impacts to properties previously identified because damage to unanticipated discoveries occurs prior to their recordation and evaluation, thereby complicating mitigation procedures.

Resolution of Construction Impacts

To date, the number of historic properties that would be adversely affected by the Project is unknown. As stipulated in the draft PA, an intensive Class III pedestrian inventory would be required after the final route is selected by the BLM and Western. The pedestrian inventory of the final route would be completed prior to construction and with enough lead time to allow for NRHP evaluation of identified sites, impact assessments, and resolution of adverse effects, if necessary. The inventory would be performed regardless of land ownership. All cultural resources located within the APE would be evaluated for eligibility to the NRHP and for Native American traditional religious and cultural importance in consultation with Native American Tribes.

Per the draft PA, the BLM Wyoming State Office is lead for compliance with Section 106 of the NHPA on behalf of the federal agencies (36 CFR 800.2(a)(2)), as evidenced by the Memorandum of Understanding between BLM and Western. In consultation with Western, the four SHPOs (Wyoming, Colorado, Utah, and Nevada), USFS, Bureau of Reclamation, Native American Tribes, and other consulting parties, the BLM would determine whether construction and operation of the Project would have an adverse effect on any historic properties, including TCPs and properties of traditional religious and cultural importance to Native American Tribes. If the BLM determines that a property would be adversely affected, mitigation would be proposed to minimize or mitigate those effects in accordance with the PA. Mitigation to minimize or mitigate adverse effects may include, but would not be limited to, one or more of the following measures:

- Data recovery, which might include the systematic professional excavation of a historic property;
- Use of landscaping or other techniques that would minimize or eliminate visual effects to a property's setting;

- Development of interpretive materials (e.g., historic markers, exhibits, interpretive brochures, or publications);
- Historic American Buildings Survey/Historic American Engineering Record or other agreed upon historic recordation process; or
- Other mitigation determined by the BLM through consultation with Western, the SHPOs, USFS, Bureau of Reclamation, Native American Tribes, and other consulting parties.

Mitigation measures would be based on the types of impacts relevant to the site type and to the scope and nature of the impact. Per the draft PA, unavoidable adverse effects to historic properties, including TCPs and properties of traditional religious and cultural importance, would be minimized or mitigated through implementation of a historic properties treatment plan (HPTP). The HPTP would address the property adversely affected and set forth means to minimize or mitigate the Project's effects. A detailed description of treatment proposed for historic properties, including TCPs and properties of traditional religious and cultural importance, as well as the rationale would be provided in the plan. Proposed treatment also would take into account visual and auditory effects to a property's setting where those aspects of integrity help convey its significance. If data recovery is the preferred treatment option for a site, then the BLM would ensure that the developed treatment is based on an appropriate research design and is reviewed and approved by Western, the SHPOs, USFS, Bureau of Reclamation, Native American Tribes, and other consulting parties.

Visual impacts to historic properties where setting contributes to their NRHP eligibility and from which the Project would be visible would be determined through viewshed analysis, on-site inspection, and photo inspection. The analysis also may be conducted for sites identified by tribal representatives as those sites in which visual impacts could occur. The viewshed analysis would be used to determine which physical feature of the Project would be visible from a property for which setting is an important aspect of integrity. Non-specular conductors and shield/ground wires would be used as a design feature to reduce potential visual effects (see applicant-committed design features in **Appendix C**, **Table C-2**). Adverse effects to the integrity of a property's setting would be minimized or mitigated as stipulated in the draft PA and HPTP.

Based on the proposed surface water control system and implementation of erosion control measures, potential effects to historic properties located within and outside of the APE as a result of drainage or soil erosion are anticipated to be minor (see design features in **Appendix C**, **Table C-2**).

To minimize the potential for illegal collection, vandalism, and inadvertent damage associated with increases in the number of construction personnel in the construction zone, Project personnel would be instructed on the federal, state, and tribal laws that protect historic properties, including prohibition of collection and removal of cultural material (see applicant-committed design features in **Appendix C**, **Table C-2**). To minimize impacts associated with off-road vehicles, construction and maintenance traffic outside of the ROW normally would be restricted to pre-designated access or public roads as stipulated in the applicant-committed design features (**Appendix C, Table C-2**).

As provided in the PA, if any previously unknown archaeological sites are discovered during construction, all construction activities would cease in the area of the discovery, and the BLM or applicable land management agency would be notified of the find. The BLM would implement an Inadvertent Discovery Plan, which would be developed prior to issuance of a Notice to Proceed. The plan would be included as an appendix to the HPTP.

Per the PA, Native American human remains, funerary objects, and items of cultural patrimony encountered on federal land during construction would be handled according to the provisions of the NAGPRA and its implementing regulations (43 CFR §10). Construction would not resume in the area of the discovery until the BLM or applicable land management agency has issued a Notice to Proceed.

Native American human remains and associated grave offerings found on state or private land would be handled in accordance with applicable state law. Non-Native American human remains found on federal, state, or private land would be treated in accordance with applicable state laws.

Summary: As previously stated, once the final route has been selected by the agencies, an intensive Class III inventory and viewshed analysis would be conducted to identify historic properties within the direct, indirect, and visual APEs and determination of adverse effects to those properties would occur. Until that time, it is unknown how many historic properties would be adversely affected by the Project. Currently, a PA is being developed for the Project. Unavoidable adverse effects to historic properties, including TCPs and properties of traditional religious and cultural importance as a result of construction would be minimized or mitigated as stipulated in the PA, and through implementation of the HPTP and design features. Any previously unknown cultural resources (other than isolates) discovered during construction activities would be handled as detailed in the PA.

Information obtained from the National Historic Trails Inventory was used to assess impacts to the Old Spanish Trail, which is a congressionally designated NHT. Many segments of the Old Spanish Trail would be crossed by alternatives in Utah and Nevada; several of those segments are categorized as NHT 1 (verified, evident, and unaltered). Additionally, some of the alternatives in Utah and Nevada would be visible from segments of the trail that are categorized as NHT 1 for several miles. Those segments crossed by the alternatives or from which the alternatives would be visible are identified later in this section under the comparison of alternatives for each region. Depending on which alternative is chosen as the final route, direct and visual impacts to the Old Spanish Trail could occur as a result of the Project. If direct and/or visual impacts to the Old Spanish Trail would occur, the impacts would be minimized or mitigated as stipulated in the PA and HPTP as well as through implementation of the applicant-committed design features (**Appendix C, Table C-2**).

Operation Impacts

Direct adverse effects to historic properties, including TCPs and properties of traditional religious and cultural importance to Native American Tribes, would be minimized or mitigated as stipulated in the PA and HPTP prior to construction. In some instances, impacts to these properties would be avoided by spanning the property. Although spanning the property would eliminate direct effects, the property itself would be left in place and at risk of inadvertent damage, illegal collecting of artifacts, and/or vandalism during routine maintenance or if emergency maintenance is required. To minimize the potential for illegal collection, vandalism, and inadvertent damage, Project personnel would be instructed on the federal, state, and tribal laws that protect historic properties, including prohibition of collection and removal of cultural material, as stipulated in the applicant-committed design features (**Appendix C**, **Table C-2**).

Summary: The design feature prohibiting collection or removal of cultural material would reduce the incidence of vandalism or illegal collection of artifacts by Project personnel. However, these types of impacts may still occur as a result of increased public access to previously inaccessible areas.

Decommissioning Impacts

Decommissioning impacts to historic properties, including TCPs and properties of traditional religious and cultural importance would be similar to those described for operation impacts. There would be a beneficial effect to historic properties located in the viewshed of the Project as the transmission line structures are removed from view.

Summary: The design feature prohibiting collection or removal of cultural material would reduce the incidence of vandalism, inadvertent damage, and/or illegal collection of artifacts by Project personnel during activities associated with decommission. Visual impacts to historic properties and cultural landscapes would be reduced.

3.11.6.3 Region I

Construction, operation, and decommissioning impacts in Region I and the means to minimize or mitigate those impacts would be the same as those discussed in Section 3.11.6.2, Impacts Common to All Alternative Routes and Associated Components. However, the magnitude of impacts would vary depending on the amount of ground disturbance, the length of the transmission line, and the visibility of the transmission line and other aboveground facilities. It should be noted that the site totals provided in the site summary tables are based on databases of previously recorded sites documented during field inventories conducted for other projects that fall within the files search area. As such, if areas along an alternative have been previously inventoried, site totals most likely will be high; however, there are occasions when a small number of sites or no sites are located during field inventories. Conversely, if no or limited field inventories have been previously conducted along an alternative, site totals will be low or zero. Given this bias, the site totals may not be indicative of actual site occurrence, but do provide a baseline for the impact analysis.

Table 3.11-4 provides a comparison of site totals (within the 250-foot-wide transmission line ROW), NRHP eligibility, historic trail/road crossings, visibility of the alternative from the historic trail/road, inventory coverage, site density, disturbance acreage, and miles of transmission line and access roads associated with each alternative route in Region I. The site information is based on the files search data.

Table 3.11-4 Summary of Region I Alternative Route Impacts

Parameter		Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Site Types	Prehistoric	33	25	22	38
	Historic	4	8	11	6
	Multi-component	8	8	5	9
	Potential TCPs[1]	0	1	0	1
	No information	7	7	7	6
Site Totals[2]		52	49	45	60
Historic Trails/Roads Crossed and Visibility	Cherokee Trail	1 contributing segment crossed; visibility of the alternative – 24 miles	1 contributing segment crossed; visibility of the alternative – 9 miles	1 contributing segment crossed; visibility of the alternative – 11 miles	3 non-contributing segments crossed; visibility of the alternative – 28 miles
	Overland Trail	1 contributing segment crossed; visibility of the alternative – 9 miles	1 contributing segment crossed; visibility of the alternative – 9.7 miles	1 contributing segment crossed; visibility of the alternative – 7 miles	1 contributing segment crossed; visibility of the alternative – 9.2 miles
	Lincoln Highway	No segments crossed; visibility of the alternative – 50 miles	No segments crossed; visibility of the alternative – 55 miles	No segments crossed; visibility of the alternative – 48 miles	No segments crossed; visibility of the alternative – 50 miles
	Rawlins to Baggs Road	1 segment crossed (unknown if contributing); visibility of the alternative – 9 miles	1 segment crossed (unknown if contributing); visibility of the alternative – 9 miles	3 segments crossed (1 contributing; 2 unknown if contributing); visibility of the alternative – 33 miles	1 segment crossed (unknown if contributing); visibility of the alternative – 13.5 miles
Average Percent Inventory Coverage		14 percent	9 percent	9 percent	35 percent
Average Site Density[3]		3 sites per 100 acres inventoried	5 sites per 100 acres inventoried	4 sites per 100 acres inventoried	4.7 sites per 100 acres inventoried
Initial Disturbance[4]		2,057 acres	2,083 acres	2,511 acres	2,306 acres
Miles of Transmission Line and Access		155 miles; 227 miles	159 miles; 223 miles	186 miles; 269 miles	171 miles; 242 miles

Table 3.11-4 Summary of Region I Alternative Route Impacts

Parameter		Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Roads					
NRHP Status[5]	Listed	0	0	0	0
	Eligible for Listing	19	19	24	19
	Not Eligible	24	21	7	29
	Unevaluated	9	8	14	11

[1] In general, sites in which Native American Tribes attach traditional religious and cultural significance are referred to as "TCPs" by the Tribes. TCPs can include, but are not limited to, stone cairns, stone circles, rock shelters, rock art, prehistoric campsites, and village sites. At this time, no tribal consultation regarding verification of these sites as TCPs or other sites of importance to the Tribes has occurred. Until consultation with Native American Tribes to evaluate these sites has occurred, these sites are considered "potential TCPs" based on their site type and description.

[2] Site totals are for the 250-foot-wide transmission line ROW.

[3] Site densities are more likely reflective of inventory coverage rather than geographic trends (e.g., proximity to water).

[4] In general, direct impacts to historic properties could increase in relation to the amount of ground disturbance associated with construction.

[5] The discrepancy between the overall site total and the total for the NRHP-eligibility status is due to the fact that the potential TCPs are also prehistoric sites and are therefore counted twice. As such, the difference between the overall site total and total for eligibility is equal to the number of potential TCPs.

Source: SWCA 2012a,b, 2011a,b.

Alternative I-A (Applicant Proposed)

Under Alternative I-A, there would be approximately 2,057 acres of initial ground disturbance with 155 miles of transmission line and 227 miles of access roads. A total of 52 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative I-A, including 33 prehistoric sites, 4 historic sites, 8 multi-component sites containing both prehistoric and historic components, and 7 sites with no descriptive information. The majority of prehistoric sites are open lithic sites with no features, ground stone or ceramics, and open camps. Historic sites consist mainly of artifact scatters with no evidence of structures or features, campsites, and historic trails and roads (including the Victory Highway [U.S. 40]). Of the 52 sites, 19 are eligible for the NRHP, 24 are not eligible, and 9 are unevaluated. It should be noted that unevaluated sites are treated as eligible until a determination of NRHP eligibility can be made. Average site density is comparatively low at 3 sites per 100 acres inventoried, with an average 14 percent of the alternative inventoried.

Alternative I-A would cross one segment of the Cherokee and Overland trails and one segment of the Rawlins to Baggs Road; the Lincoln Highway would not be crossed (**Figure 3.11-1** and **Figure 3.11-2**). The segments of the Cherokee and Overland trails crossed by the alternative are both contributing segments to each trail's overall NRHP eligibility. At this time, it is unknown whether the segment of the Rawlins to Baggs Road crossed by the alternative is a contributing segment. This alternative would be visible from the Cherokee Trail for approximately 24 miles (10 of the 24 miles from contributing segments), the Rawlins to Baggs Road for approximately 9 miles (5 of the 9 miles from contributing segments), and the Overland Trail for approximately 9 miles (4 of the 9 miles from contributing segments). Although the Lincoln Highway would not be crossed by Alternative I-A, the alternative would be visible from the highway for approximately 50 miles (4 of the 50 miles from contributing segments). Visibility of the alternative from historic trails, road, and highway is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.

Alternative I-B

Under Alternative I-B, there would be approximately 2,083 acres of initial ground disturbance with 159 miles of transmission line and 223 miles of access roads. A total of 49 previously recorded cultural

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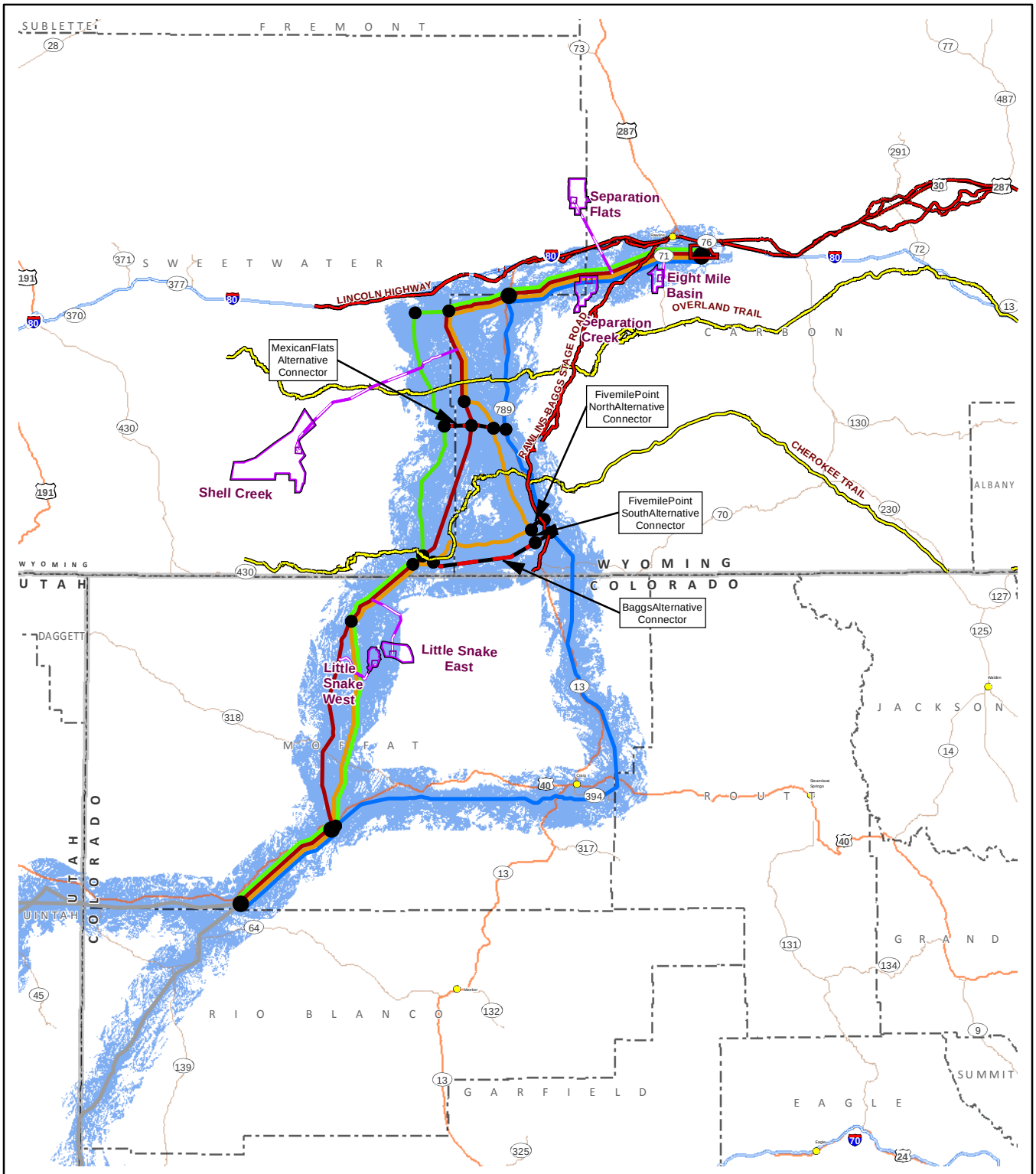

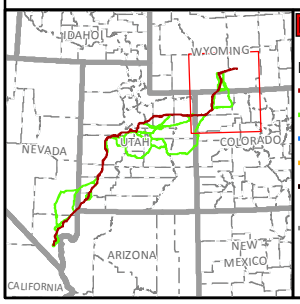

Terminal Siting Area
Node

DEIS Alternative Routes
- Applicant Proposed I-A
- Alternative I-B
- Alternative I-C
- Agency Preferred I-D
- Alternative Variation or Connector
- Segment not in this Region

- Transmission Line Visibility to 5 Miles
- Historic Highway
- Historic Trail or Road
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.11-1
Region I
Historic Trails and Roads

0 5 10 20 Miles
0 5 10 20 km
1:1,500,000

N

Western AREA POWER ADMINISTRATION

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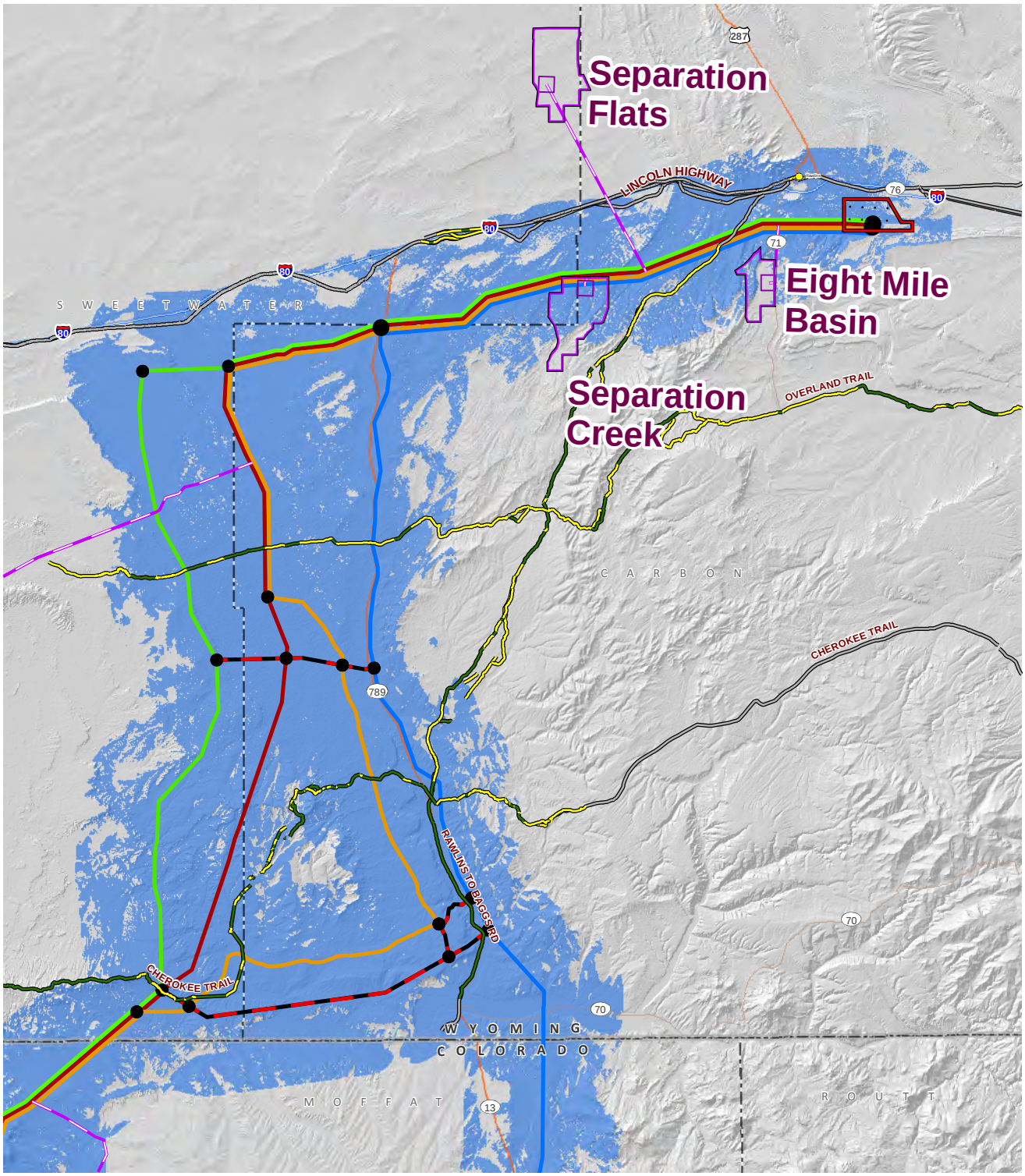

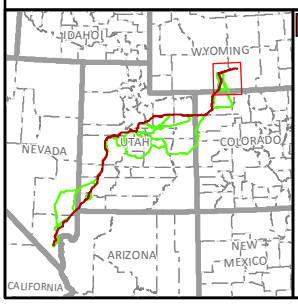

Terminal Siting Area
Node

DEIS Alternative Routes
- Applicant Proposed I-A
- Alternative I-B
- Alternative I-C
- Agency Preferred I-D
- Alternative Variation or Connector
- Segment not in this Region

- Transmission Line Visibility to 5 Miles
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

Historic Trails and Roads
- Contributing Segment
- Non-contributing Segment
- Unknown Contribution

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.11-2
Region I
Historic Trails and Roads Detail

0 2.5 5 10 Miles
0 2.5 5 10 km
1:600,000
N

Western AREA POWER ADMINISTRATION

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resources have been identified within the 250-foot-wide transmission line ROW of Alternative I-B, including 25 prehistoric sites, 8 historic sites, 8 multi-components sites with both prehistoric and historic components, 1 potential TCP, and 7 sites with no descriptive information. The majority of prehistoric sites are open lithic sites with no features, ground stone or ceramics, open camps, and stone features. Historic sites consist mainly of artifact scatters with no evidence of structures or features, campsites, and historic trails and roads (including the Victory Highway [U.S. 40]). Of the previously recorded sites in the 250-foot-wide wide transmission line ROW, 19 are eligible for the NRHP, 21 are not eligible, and 8 are unevaluated. Average site density is comparatively high at 5 sites per 100 acres inventoried, with an average 9 percent of the alternative inventoried.

The Cherokee and Overland trails and Rawlins to Baggs Road each would be crossed once by Alternative I-B; no segments of the Lincoln Highway would be crossed (**Figure 3.11-1** and **Figure 3.11-2**). The segments of the Cherokee and Overland trails crossed by the alternative are both contributing segments to each trail's overall NRHP eligibility. At this time, it is unknown whether the segment of the Rawlins to Baggs Road crossed by the alternative is a contributing segment. Alternative I-B would be visible from the Cherokee Trail for approximately 9 miles (4 of the 9 miles from contributing segments), the Overland Trail for approximately 9.7 miles (4 of the 9.7 miles from contributing segments), and the Rawlins to Baggs Road for approximately 9 miles (5 of the 9 miles from contributing segments). Although the Lincoln Highway would not be crossed by Alternative I-B, the alternative would be visible from the highway for approximately 55 miles (4 of the 55 miles from contributing segments). Visibility of the alternative from the historic trails, road, and highway is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.

Alternative I-C

Under Alternative I-C, there would be approximately 2,511 acres of initial ground disturbance with 186 miles of transmission line and 269 miles of access roads. A total of 45 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative I-C, including 22 prehistoric sites, 11 historic sites, 5 multi-component sites, and 7 sites with no descriptive information. Prehistoric sites consist mainly of open camps and open lithic sites while the majority of historic sites consist of artifact scatters, trails, roads (including the Victory Highway [U.S. 40]), and ditches/canals. Of the 45 sites previously recorded in the 250-foot-wide transmission line ROW, 24 are eligible for the NRHP, 7 are not eligible, and 14 are unevaluated. Average site density is 4 sites per 100 acres inventoried with an average 9 percent of the alternative inventoried.

Alternative I-C would cross the Overland and Cherokee trails once, and the Rawlins to Baggs Road three times; no segments of the Lincoln Highway would be crossed (**Figure 3.11-1** and **Figure 3.11-2**). The segments of the Cherokee and Overland trails crossed by Alternative I-C are both contributing segments to the trail's overall NRHP eligibility. Of the three segments of the Rawlins to Baggs Road crossed by the alternative, one is a contributing segment. At this time, it is unknown whether the remaining two segments of the road are contributing segments. This alternative would be visible from the Overland Trail for approximately 7 miles (6 of the 7 miles from contributing segments), the Cherokee Trail for approximately 11 miles (4 of the 11 miles from contributing segments), and the Rawlins to Baggs Road for approximately 33 miles (10 of the 33 miles from contributing segments). Although the Lincoln Highway would not be crossed by Alternative I-C, the alternative would be visible from the highway for approximately 48 miles (3 of the 48 miles from contributing segments). Visibility of Alternative I-C from the historic trails, road, and highway is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.

Alternative I-D (Agency Preferred)

Under Alternative I-D, there would be approximately 2,306 acres of initial ground disturbance with 171 miles of transmission line and 242 miles of access roads. A total of 60 previously recorded cultural resources have been identified within of the 250-foot-wide transmission line ROW of Alternative I-D,

including 38 prehistoric sites, 6 historic sites, 9 multi-component sites, 1 potential TCP, and 6 sites with no descriptive information. Prehistoric sites mainly consist of open camps, open lithic, stone circles, and cairns. Historic sites mainly consist of artifact scatters, trails, roads (including the Victory Highway [U.S. 40]), and structures. Of the previously recorded sites, 19 are eligible for the NRHP, 29 are not eligible, and 11 are unevaluated. Average site density is 4.7 sites per 100 acres inventoried with a comparatively high average inventory coverage at 35 percent. The Tuttle Easement micro-siting option would not substantially affect the results of the cultural resources analysis.

Alternative I-D would cross the Cherokee Trail three times, and the Overland Trail and Rawlins to Baggs Road would be crossed once; the Lincoln Highway would not be crossed (**Figure 3.11-1** and **Figure 3.11-2**). The three segments of the Cherokee Trail crossed by Alternative I-D are non-contributing segments to the trail's overall NRHP eligibility; whereas, the segment of the Overland Trail crossed by this alternative is a contributing segment. At this time, it is unknown whether the segment of the Rawlins to Baggs Road crossed by the alternative is a contributing segment. This alternative would be visible from the Cherokee Trail for approximately 28 miles (10 of the 28 miles from contributing segments), the Overland Trail for approximately 9.2 miles (4 of the 9.2 miles from contributing segments), and the Rawlins to Baggs Road for approximately 13.5 miles (5 of the 13.5 miles from contributing segments). Although the Lincoln Highway would not be crossed by Alternative I-D, the alternative would be visible from the highway for approximately 50 miles (4 of the 50 miles from contributing segments). Visibility of the alternative from the historic trails, road, and highway is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.

Region I Conclusion

Initial ground disturbance associated with Alternative I-A would be less than the other alternatives. Decreased ground disturbance could decrease the potential for direct impacts to known and unknown historic properties compared to the other alternatives. Under Alternative I-A, historic trail and road crossings would be less than Alternatives I-C and I-D, but similar to Alternative I-B. Overall visibility of the transmission line from the historic trails, road, and highway would be 92 miles under Alternative I-A, which would be less than under alternatives I-C and I-D. There are 28 historic properties (including eligible and unevaluated sites) previously identified within the 250-foot-wide transmission line ROW of Alternative I-A, which is less than under Alternatives I-C and I-D. Compared to the other alternatives, Alternative I-A has fewer average sites per 100 acres inventoried with an average inventory coverage of 14 percent.

Alternative Connectors in Region I

Table 3.11-5 provides a summary of impacts for the alternative connectors.

Table 3.11-5 Summary of Region I Alternative Connector Impacts

Alternative Connector	Analysis	Conclusion
Mexican Flats Alternative Connector	A total of 14 cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of this alternative connector. Of these, 4 are NRHP-eligible, 6 are not eligible, and 4 are unevaluated. No historic trails or roads would be crossed by this alternative connector.	It is unknown at this time as to how many historic properties would be adversely affected by this alternative connector. Unavoidable adverse effects to historic properties would be minimized or mitigated as stipulated in the PA and through implementation of design features and BMPs. Any previously unknown cultural resources (other than isolates) discovered during construction activities would be handled as detailed in the PA.

Table 3.11-5 Summary of Region I Alternative Connector Impacts

Alternative Connector	Analysis	Conclusion
Baggs Alternative Connector	A total of 21 cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of this connector. Of these, 6 are NRHP-eligible, 7 are not eligible, and 8 are unevaluated. The 21 resources include non-contributing segments of the Cherokee Trail and Rawlins to Baggs Road. This alternative connector would be visible from the trail for approximately 12 miles and from the road for approximately 12 miles.	Same conclusion as described above for the Mexican Flats Alternative Connector.
Fivemile Point North Alternative Connector	A non-contributing segment of the Rawlins to Baggs Road would be crossed once by this alternative connector. This alternative connector would be visible from the road for approximately 7.3 miles. No other cultural resources have been previously documented within the 250-foot-wide transmission line ROW of this connector.	Same conclusion as described above for the Mexican Flats Alternative Connector.
Fivemile Point South Alternative Connector	No cultural resources have been previously documented within the 250-foot-wide transmission line ROW of this connector. Although no historic trails or roads would be crossed by this alternative connector, it would be visible from the Rawlins to Baggs Road for approximately 3.5 miles.	Same conclusion as described above for the Mexican Flats Alternative Connector.

Sources: SWCA 2012a, 2011a.

Alternative Ground Electrode Systems in Region I

The northern ground electrode system would be necessary within 100 miles of the northern terminal as discussed in Chapter 2. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided in the Project POD. At this time, no files searches have been completed for the alternative ground electrode system locations in Region I. Cultural resources inventories, including a files search, would be conducted prior to construction. If historic properties are located within proposed disturbance areas and would be adversely affected, the properties would be avoided by Project redesign. However, if avoidance is not feasible, adverse effects would be minimized or mitigated as stipulated in the PA and through implementation of design features. Unanticipated discoveries would be handled as outlined in the PA.

Table 3.11-6 provides a summary of potential impacts associated with the eight combinations of alternative route and location possibilities for the northern ground electrode system. Included in the table are disturbance acreages, miles of transmission line and access road, and the number of historic roads or trails crossed by the siting area and/or access road. It should be noted that direct impacts to historic properties could increase in relation to the amount of ground disturbance associated with construction of the electrode systems.

Table 3.11-6 Summary of Region I Alternative Ground Electrode System Impacts

Alternative Ground Electrode System Locations	Analysis
Separation Flat – All Alternative Routes	Ground disturbance associated with this alternative ground electrode system location would be 128 acres. There would be 13 miles of transmission line and 17 miles of access road. The access road associated with the Separation Flat alternative ground electrode system would cross three non-contributing segments of the Lincoln Highway.
Shell Creek (Alternative I-A and I-D)	Ground disturbance associated with this alternative ground electrode system location would be 223 acres. There would be 33 miles of transmission line and 43 miles of access road. The access road associated with the Shell Creek alternative ground electrode system would cross one non-contributing segment of the Overland Trail.

Table 3.11-6 Summary of Region I Alternative Ground Electrode System Impacts

Alternative Ground Electrode System Locations	Analysis
Shell Creek (Alternative I-B)	Ground disturbance associated with this alternative ground electrode system location would be 189 acres. There would be 26 miles of transmission line and 34 miles of access road. No historic trails or roads would be crossed by this alternative ground electrode system.
Little Snake East (Alternatives I-A, I-B, and I-D)	Ground disturbance associated with this alternative ground electrode system location would be 108 acres. There would be 9 miles of transmission line and 12 miles of access road. No historic trails or roads would be crossed by this alternative ground electrode system.
Little Snake West (Alternative I-A)	Ground disturbance associated with this alternative ground electrode system location would be 121 acres. There would be 10 miles of transmission line and 14 miles of access road. No historic trails or roads would be crossed by this alternative ground electrode system.
Little Snake West (Alternatives I-B and I-D)	Ground disturbance associated with this alternative ground electrode system location would be 93 acres. There would be 5 miles of transmission line and 7 miles of access road. No historic trails or roads would be crossed by this alternative ground electrode system.
Separation Creek (All Alternative Routes)	Ground disturbance associated with this alternative ground electrode system location would be 138 acres. There would be 14 miles of transmission line and 20 miles of access road. No historic trails or roads would be crossed by the Separation Creek alternative ground electrode system.
Eight Mile Basin (All Alternative Routes)	Ground disturbance associated with this alternative ground electrode system location would be 86 acres. There would be 4 miles of transmission line and 6 miles of access road. No historic trails or roads would be crossed by the Eight Mile Basin alternative ground electrode system.

Sources: SWCA 2012a, 2011a.

3.11.6.4 Region II

Construction, operation, and decommissioning impacts in Region II and the means to minimize or mitigate those impacts would be the same as those discussed in Section 3.11.6.2, Impacts Common to All Alternative Routes and Associated Components. However, the magnitude of impacts would vary depending on the amount of ground disturbance, the length of the transmission line, and the visibility of the transmission line and other aboveground facilities. **Table 3.11-7** provides a comparison of site totals (within the 250-foot-wide transmission line ROW), NRHP eligibility, historic trail crossings, visibility of the alternative from the historic trail, inventory coverage, site density, disturbance acreage, and miles of transmission line and access roads associated with each alternative route in Region II.

Table 3.11-7 Summary of Region II Alternative Route Impacts

Parameter		Alternative					
		II-A	II-B	II-C	II-D	II-E	II-F
Site Type	Prehistoric	8	44	58	26	8	26
	Historic	16	38	40	28	22	14
	Multi-component	1	7	7	3	2	1
	Potential TCPs[1]	1	8	10	4	1	4
	No information	1	7	5	1	1	2
Site Totals[2]		27	104	120	62	34	47

Table 3.11-7 Summary of Region II Alternative Route Impacts

Parameter		Alternative					
		II-A	II-B	II-C	II-D	II-E	II-F
Historic Trails Crossed	Old Spanish Trail	No segments crossed	4 segments crossed: 1 segment NHT II, 1 segment NHT III, 2 segments NHT V	9 segments crossed: 1 segment NHT II, 1 segment NHT III, 3 segments NHT V, and 4 segments not categorized	No segments crossed	No segments crossed	No segments crossed
	Visibility of the alternative from the Trail	No visibility	58 miles – 7 miles NHT II, 6 miles NHT III, 27 miles NHT IV, and 18 miles NHT V	107 miles – 17 miles NHT II, 8 miles NHT III, 31 miles NHT IV, 27 miles of NHT V, and 24 miles not categorized	No visibility	No visibility	No visibility
Average Percent Inventory Coverage		20 percent	19 percent	23 percent	19 percent	18 percent	22.4 percent
Average Site Density[3]		0.12 sites per 100 acres inventoried	0.25 sites per 100 acres inventoried	0.5 sites per 100 acres inventoried	0.1 sites per 100 acres inventoried	0.67 sites per 100 acres inventoried	0.09 sites per 100 acres inventoried
Initial Disturbance[4]		3,743 acres	5,003 acres	5,066 acres	4,055 acres	3,935 acres	4,276 acres
Miles of Transmission Line and Access Roads		257 miles; 463 miles	345 miles; 580 miles	364 miles: 556 miles	262 miles: 474 miles	266 miles; 471 miles	267 miles; 526 miles
NRHP Status[5]	Listed	0	1	1	0	0	0
	Eligible for Listing	13	48	45	26	17	20
	Not Eligible	13	30	40	29	16	20
	Unevaluated	0	17	24	3	0	3

[1] In general, sites in which Native American Tribes attach traditional religious and cultural significance are referred to as "TCPs" by the Tribes. TCPs can include, but are not limited to, stone cairns, stone circles, rock shelters, rock art, prehistoric campsites, and village sites. At this time, no tribal consultation regarding verification of these sites as TCPs or other sites of importance to the Tribes has occurred. Until consultation with Native American Tribes to evaluate these sites has occurred, these sites are considered "potential TCPs" based on their site type and description.

[2] Site totals are for the 250-foot-wide transmission line ROW.

[3] Site densities are more likely reflective of inventory coverage rather than geographic trends (e.g., proximity to water).

[4] In general, direct impacts to historic properties could increase in relation to the amount of ground disturbance associated with construction.

[5] The discrepancy between the overall site total and the total for the NRHP-eligibility status is due to the fact that the potential TCPs are also prehistoric sites and are therefore counted twice. As such, the difference between the overall site total and total for eligibility is equal to the number of potential TCPs.

Sources: SWCA 2012b,c,e, 2011b,c.

Alternative II-A (Applicant Proposed)

Under Alternative II-A, there would be approximately 3,743 acres of initial ground disturbance with 257 miles of transmission line and 463 miles of access roads. A total of 27 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative II-A, including 8 prehistoric sites, 16 historic sites, 1 multi-component site, 1 potential TCP, and 1 site with no descriptive information. The majority of prehistoric sites are lithic scatters, open campsites, and lithic and ceramic scatters. Historic sites consist mainly of trash scatters, railroads, roads, and ditches/canals. Of the previously recorded sites in the 250-foot-wide transmission line ROW, 13 are eligible for the NRHP and 13 are not eligible. Average site density is 0.12 sites per 100 acres inventoried with comparatively high average inventory coverage at 20 percent. The Strawberry IRA micro-siting options would not

substantially affect the results of the cultural resources impact analyses. Alternative II-A would not cross or parallel the Old Spanish Trail.

Alternative II-B

Key Parameters Summary

Under Alternative II-B, there would be approximately 5,003 acres of initial ground disturbance with 345 miles of transmission line and 580 miles of access roads. A total of 104 previously recorded cultural resources have been identified within the 250-foot transmission line ROW of Alternative II-B, including 44 prehistoric sites, 38 historic sites, 7 multi-component sites, 8 potential TCPs, and 7 sites with no descriptive information. The majority of sites recorded in the ROW are prehistoric open campsites, lithic scatters, and limited activity areas, and historic artifact scatters, irrigation ditches, railroads, and roads. Of the previously recorded sites in the 250-foot transmission line ROW, 1 is listed on the NRHP, 48 are eligible for the NRHP, 30 are not eligible, and 17 are unevaluated. It should be noted that unevaluated sites are treated as eligible until a determination of NRHP eligibility can be made. Average site density is 0.25 site per 100 acres inventoried with an average of 19 percent inventory coverage.

As previously discussed, the information obtained from the National Historic Trails Inventory was used in the analysis of impacts to the Old Spanish Trail, which is a congressionally designated NHT. As part of the inventory, each trail segment was categorized under the NHT Condition Categories, which are inter-agency standard classifications designed to assess the comparative character of visible trail remnants observed during the inventory (AECOM 2012). The categories only encompass the condition of the trail tread, and do not reflect the scenic or historic character or integrity of the NHT setting or surrounding landscape. In addition, the categories are not intended to, nor do they provide criteria for, assessing the NRHP eligibility; however, they do provide an assessment of conditions that can be used as part of the NRHP evaluation. There are six NHT Condition Categories:

NHT I – Location verified, evident, and unaltered

NHT II – Location verified and evident with minor alteration

NHT III – Location verified with little remaining evidence

NHT IV – Location verified and permanently altered

NHT V – Location approximate or not verified

NHT VI – Location verified with historic reconstruction

Alternative II-B would cross the Old Spanish Trail four times (**Figure 3.11-3** and **Figure 3.11-4**). Of the four segments crossed by the alternative, one is categorized as NHT II, one is categorized as NHT III, and two are categorized as NHT V. This alternative would be visible from the Old Spanish Trail for approximately 58 miles. Of those 58 miles, approximately 7 miles of trail segments are categorized as NHT II, approximately 6 miles of trail segments are categorized as NHT III, approximately 27 miles of trail segments are categorized as NHT IV, and, approximately 18 miles are categorized as NHT V. Visibility of Alternative II-B from the historic trail is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.

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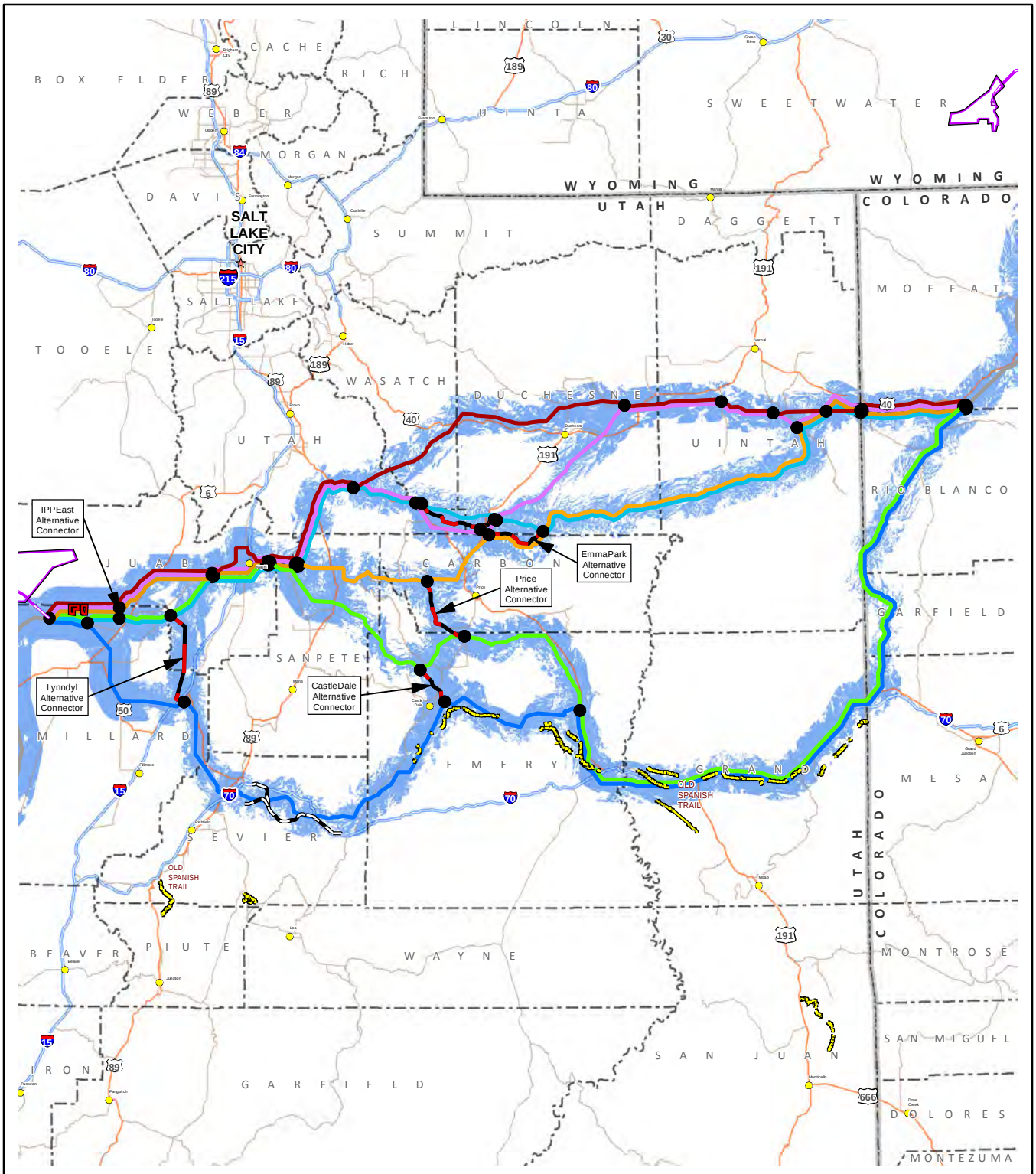

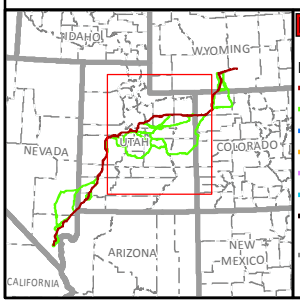

Terminal Siting Area
Node

DEIS Alternative Routes
Applicant Proposed II-A
Alternative II-B
Alternative II-C
Alternative II-D
Alternative II-E
Agency Preferred II-F
Alternative Variation or Connector
Segment not in this Region

Old Spanish Trail Traces (NHT)
Old Spanish Trail (USFS)
Tranmission Line Visibility to 5 Miles
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.11-3
Region II
Historic Trails

0 10 20 40 Miles
0 10 20 40 km
1:2,250,000

N

Western AREA POWER ADMINISTRATION

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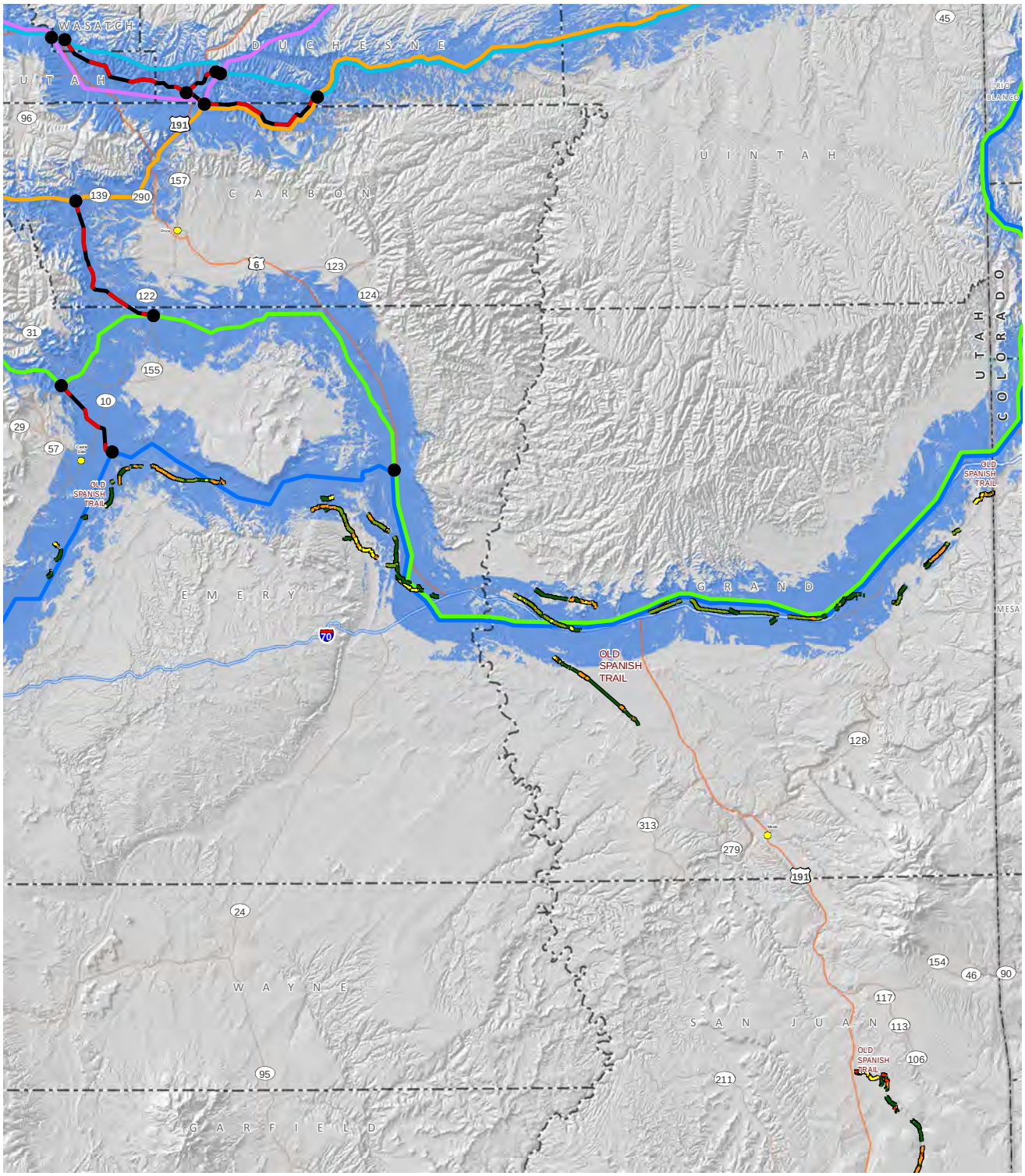

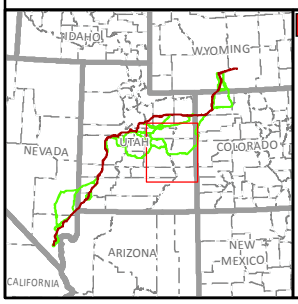

Terminal Siting Area
Node

DEIS Alternative Routes
- Applicant Proposed II-A
- Alternative II-B
- Alternative II-C
- Alternative II-D
- Alternative II-E
- Agency Preferred II-F
- Alternative Variation or Connector
- Segment not in this Region

- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line
- Tranmission Line Visibility to 5 Miles

Old Spanish Trail Condition (NHT)
- NHT I
- NHT II
- NHT III
- NHT IV
- NHT V

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.11-4
Region II
Historic Trails Detail

0 5 10 20 Miles
0 5 10 20 km
1:1,100,000
N

Western AREA POWER ADMINISTRATION

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Alternative II-C

Under Alternative II-C, there would be approximately 5,066 acres of initial ground disturbance with 364 miles of transmission line and 556 miles of access roads. A total of 120 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative II-C, including 58 prehistoric sites, 40 historic sites, 7 multi-component sites, 10 potential TCPs, and 5 sites with no descriptive information. Prehistoric sites mainly consist of lithic scatters and temporary campsites, while historic sites mainly consist of artifact scatters, habitation, roads, railroads, and ditches. Of the sites previously recorded in the 250-foot-wide transmission line ROW, 1 is listed on the NRHP, 45 are eligible for the NRHP, 40 are not eligible, and 24 are unevaluated. Average site density is 0.5 sites per 100 acres inventoried with comparatively high average inventory coverage at 23 percent.

This alternative would cross the Old Spanish Trail nine times (**Figure 3.11-3** and **Figure 3.11-4**). Of the nine segments crossed by the alternative, one is categorized as NHT II, one is categorized as NHT III, three are categorized as NHT V, and four are not categorized. The four segments not categorized are located on NFS lands; therefore, they were not part of the BLM's NHT inventory. Alternative II-C would be visible from the Old Spanish Trail for approximately 107 miles. Of those 107 miles, approximately 17 miles of trail segments are categorized as NHT II, approximately 8 miles are categorized as NHT III, approximately 31 miles are categorized as NHT IV, approximately 27 miles are categorized as NHT V, and approximately 24 miles are not categorized and are located on NFS lands. Visibility of the alternative from the historic trail is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.

Alternative II-D

Under Alternative II-D, there would be approximately 4,055 acres of initial ground disturbance with 262 miles of transmission line and 474 miles of access roads. A total of 62 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative II-D, including 26 prehistoric sites, 28 historic sites, 3 multi-component sites, 4 potential TCPs, and 1 site with no descriptive information. The majority of sites include prehistoric lithic scatters and temporary campsites, and historic ditches, roads, structures, and artifact scatters. Of the sites previously recorded in the 250-foot-wide transmission line ROW, 26 are eligible for the NRHP, 29 are not eligible, and 3 are unevaluated. Average site density is 0.1 sites per 100 acres inventoried with an average of 19 percent inventory coverage.

Alternative II-D would not cross or parallel the Old Spanish Trail.

Alternative II-E

Under Alternative II-E, there would be approximately 3,935 acres of initial ground disturbance with 266 miles of transmission line and 471 miles of access roads. A total of 34 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative II-E, including 8 prehistoric sites, 22 historic sites, 2 multi-component sites, 1 potential TCP, and 1 site with no descriptive information. Of the previously recorded sites, 17 are eligible for the NRHP and16 are not eligible. The majority of previously recorded sites include historic trash scatters, structures, ditches/canals, and roads, and prehistoric open campsites and lithic scatters. Average site density is comparatively high at 0.67 sites per 100 acres inventoried with a comparatively low average inventory coverage of 18 percent.

Alternative II-E would not cross or parallel the Old Spanish Trail.

Alternative II-F (Agency Preferred)

Under Alternative II-F, there would be approximately 4,276 acres of initial ground disturbance with 267 miles of transmission line and 526 miles of access roads. A total of 47 previously recorded cultural

resources have been identified within the 250-foot-wide transmission line ROW of Alternative II-F, including 26 prehistoric sites, 14 historic sites, 1 multi-component site, 4 potential TCPs, and 2 sites with no descriptive information. The majority of previously recorded sites include historic trash scatters, structures, ditches/canals, and roads and prehistoric open campsites and lithic scatters. Of the sites previously recorded in the 250-foot-wide transmission line ROW, 20 are eligible for the NRHP, 20 are not eligible, and 3 are unevaluated. Average site density is comparatively low at 0.09 sites per 100 acres inventoried with a comparatively high average inventory coverage of 22.4 percent.

Alternative II-F would not cross or parallel the Old Spanish Trail. The Cedar Knoll IRA micro-siting options would not substantially affect the results of the cultural resources impact analyses.

Region II Conclusion

Initial ground disturbance associated with Alternative II-A would be less than the other alternatives. Decreased ground disturbance could decrease the potential for direct impacts to known and unknown historic properties compared to the other alternatives. Under Alternative II-A, no segments of the Old Spanish Trail would be crossed nor would the alternative be visible from the trail. In comparison, Alternatives II-B and II-C would cross the trail 4 times and 9 times, respectively, and would be visible from the trail for more than 50 miles. There are 13 historic properties previously identified within the 250-foot-wide transmission line ROW of Alternative II-A, which is less than the other alternatives. Average site density for Alternative II-A is relatively similar to the other alternatives; whereas, the average inventory coverage of 20 percent is lower than Alternatives II-C and II-F.

Alternative Variation in Region II

Table 3.11-8 summarizes the impacts associated with the alternative variation in Region II.

Table 3.11-8 Summary of Region II Alternative Variation Impacts

Alternative Variation	Analysis
Emma Park Alternative Variation	No cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of the Emma Park Alternative Variation. In comparison, one ineligible historic site has been previously recorded within the 250-foot-wide transmission line ROW of the portion of Alternative II-F it would replace. No segments of the Old Spanish Trail would be crossed by the alternative variation or portion of the alternative it would replace. Ground disturbance associated with the Emma Park Alternative Variation would be 1,959 acres (including access roads) compared to 1,909 acres (including access roads) of initial disturbance associated with the portion of Alternative II-F it would replace.

Alternative Connectors in Region II

Table 3.11-9 summarizes the impacts associated with the alternative connectors in Region II.

Table 3.11-9 Summary of Region II Alternative Connector Impacts

Alternative Connector	Analysis	Conclusion
Highway 191 Alternative Connector	No cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of this alternative connector.	It is unknown at this time as to how many historic properties would be adversely affected by this alternative connector. Unavoidable adverse effects to historic properties would be minimized or mitigated as stipulated in the PA and through implementation of the design

Table 3.11-9 Summary of Region II Alternative Connector Impacts

Alternative Connector	Analysis	Conclusion
		features. Any previously unknown cultural resources (other than isolates) discovered during construction activities would be handled as detailed in the PA.
Lynndyl Alternative Connector	A total of two cultural resources have been previously documented within the 250-foot-wide transmission line ROW of this alternative connector. Both resources have been previously evaluated as not eligible for the NRHP.	Same conclusion as described above for the Highway 191 Alternative Connector.
IPP East Alternative Connector	No cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of this alternative connector.	Same conclusion as described above for the Highway 191 Alternative Connector.
Price Alternative Connector	A total of 11 cultural resources have been previously documented in the 250-foot-wide transmission line ROW of this alternative connector. Of these, four are eligible for the NRHP, six are not eligible, and one is unevaluated.	Same conclusion as described above for the Highway 191 Alternative Connector.
Castle Dale Alternative Connector	A total of four cultural resources have been previously documented in the 250-foot-wide transmission line ROW of this alternative connector. Of these, one is eligible for the NRHP, two are not eligible, and one is unevaluated.	Same conclusion as described above for the Highway 191 Alternative Connector.

Sources: SWCA 2012c,e, 2011c.

3.11.6.5 Region III

Construction, operation, and decommissioning impacts in Region III and the means to minimize or mitigate those impacts would be the same as those discussed in Section 3.11.6.2, Impacts Common to All Alternative Routes and Associated Components. However, the magnitude of impacts would vary depending on the amount of ground disturbance, the length of the transmission line, and the visibility of the transmission line and other aboveground facilities. **Table 3.11-10** provides a comparison of site totals (within the 250-foot-wide transmission line ROW), NRHP eligibility, historic trail crossings, visibility of the alternative from the historic trail, inventory coverage, site density, disturbance acreage, and miles of transmission line associated with each alternative route in Region III.

Table 3.11-10 Summary of Region III Alternative Route Impacts for Cultural Resources

Parameter		Alternative III-A	Alternative III-B	Alternative III-C
Site Type	Prehistoric	23	40	49
	Historic	13	7	10
	Multi-component	1	1	1
	Potential TCPs[1]	3	11	5
	No Information	7	4	5
Site Totals[2]		47	63	70

Table 3.11-10 Summary of Region III Alternative Route Impacts for Cultural Resources

Parameter		Alternative III-A	Alternative III-B	Alternative III-C
Historic Trail Crossed and Visibility	Old Spanish Trail	3 segments crossed: 1 segment categorized as NHT I; 2 segments not categorized	No segments crossed	No segments crossed
	Visibility of the alternative from the Trail	23 miles - 8 miles NHT I, 2 miles NHT II, 0.1 mile NHT IV, and 13 miles not categorized	6.2 miles – 4.8 miles NHT I, 1.3 miles NHT II, and 0.1 mile NHT IV	No visibility
Average Percent Inventory Coverage		20 percent	23 percent	20 percent
Average Site Density[3]		0.02 sites per 100 acres inventoried	1.7 sites per 100 acres inventoried	0.01 sites per 100 acres inventoried
Initial Disturbance[4]		3,641 acres	3,593 acres	3,926 acres
Miles of Transmission Line and Access Roads		276 miles; 423 miles	285 miles; 401 miles	308 miles; 433 miles
NRHP Status[5]	Listed	0	1	1
	Eligible for Listing	23	15	29
	Not Eligible	10	22	24
	Unevaluated	11	14	11

[1] In general, sites in which Native American Tribes attach traditional religious and cultural significance are referred to as "TCPs" by the Tribes. TCPs can include, but are not limited to, stone cairns, stone circles, rock shelters, rock art, prehistoric campsites, and village sites. At this time, no tribal consultation regarding verification of these sites as TCPs or other sites of importance to the Tribes has occurred. Until consultation with Native American Tribes to evaluate these sites has occurred, these sites are considered "potential TCPs" based on their site type and description.

[2] Site totals are for the 250-foot-wide transmission line ROW.

[3] Site densities are more likely reflective of inventory coverage rather than geographic trends (e.g., proximity to water).

[4] In general, direct impacts to historic properties could increase in relation to the amount of ground disturbance associated with construction.

[5] The discrepancy between the overall site total and the total for the NRHP-eligibility status is due to the fact that the potential TCPs are also prehistoric sites and are therefore counted twice. As such, the difference between the overall site total and total for eligibility is equal to the number of potential TCPs.

Sources: SWCA 2012c,d,e, 2011c,.

Alternative III-A (Applicant Proposed)

Under Alternative III-A, there would be approximately 3,641 acres of initial ground disturbance with 276 miles of transmission line and 423 miles of access roads. A total of 47 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative III-A, including 23 prehistoric sites, 13 historic sites, 1 multi-component site with both prehistoric and historic components, 3 potential TCPs, and 7 sites with no descriptive information. Prehistoric sites consist mainly of open campsites and lithic scatters; historic sites mainly consist of artifact scatters, structures, and roads. Of the previously recorded sites, 23 are eligible for the NRHP, 10 are not eligible, and 11 are unevaluated. It should be noted that unevaluated sites are treated as eligible until a determination of NRHP eligibility can be made. The Mountain Meadows Massacre Site and Mountain Meadows NHL are located approximately 0.5 mile from Alternative III-A (see Section 3.12, Visual Resources, for the results of the viewshed analysis conducted for the Mountain Meadows Massacre Site). Average site density is 0.02 sites per 100 acres inventoried with an average 20 percent inventory coverage.

The Old Spanish Trail would be crossed three times by Alternative III-A (**Figures 3.11-5**, **3.11-6**, and **3.11-7**); one segment is categorized as NHT I (location verified, evident, and unaltered) and two segments are not categorized. The two segments not categorized are located on NFS lands; therefore, they were not part of the BLM's NHT inventory. Alternative III-A would be visible from the Old Spanish Trail for approximately 23 miles. Of those 23 miles, approximately 8 miles of trail segments are

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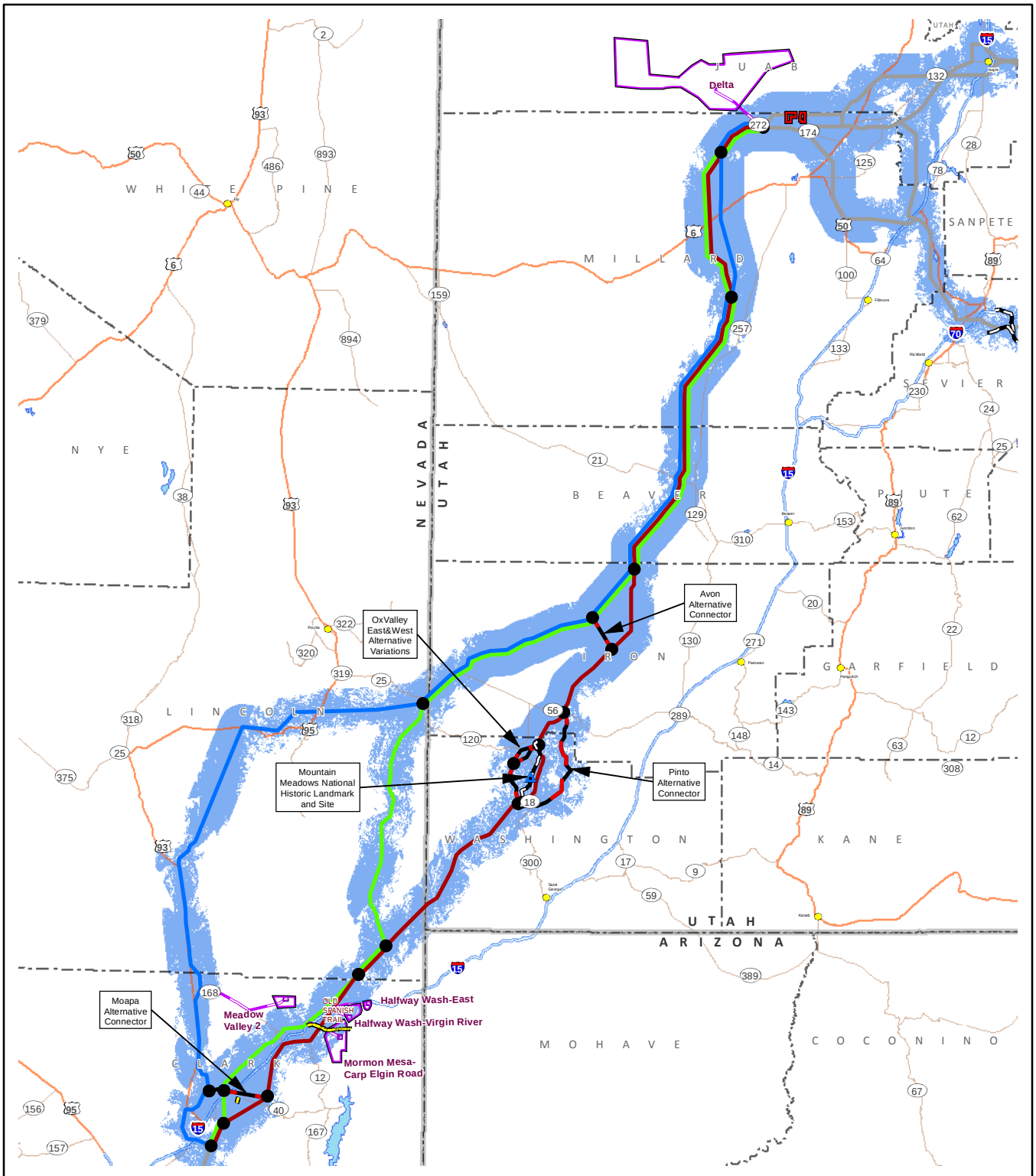

Terminal Siting Area
Node

DEIS Alternative Routes
- Applicant Proposed III-A
- Agency Preferred III-B
- Alternative III-C
- Alternative Variation or Connector
- Segment not in this Region

- Tranmission Line Visibility to 5 Miles
- Old Spanish Trail Traces (NHT)
- Old Spanish Trail (USFS)
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.11-5
Region III
Historic Trails

0 10 20 40 Miles
0 10 20 40 km
1:2,000,000

N

Western AREA POWER ADMINISTRATION

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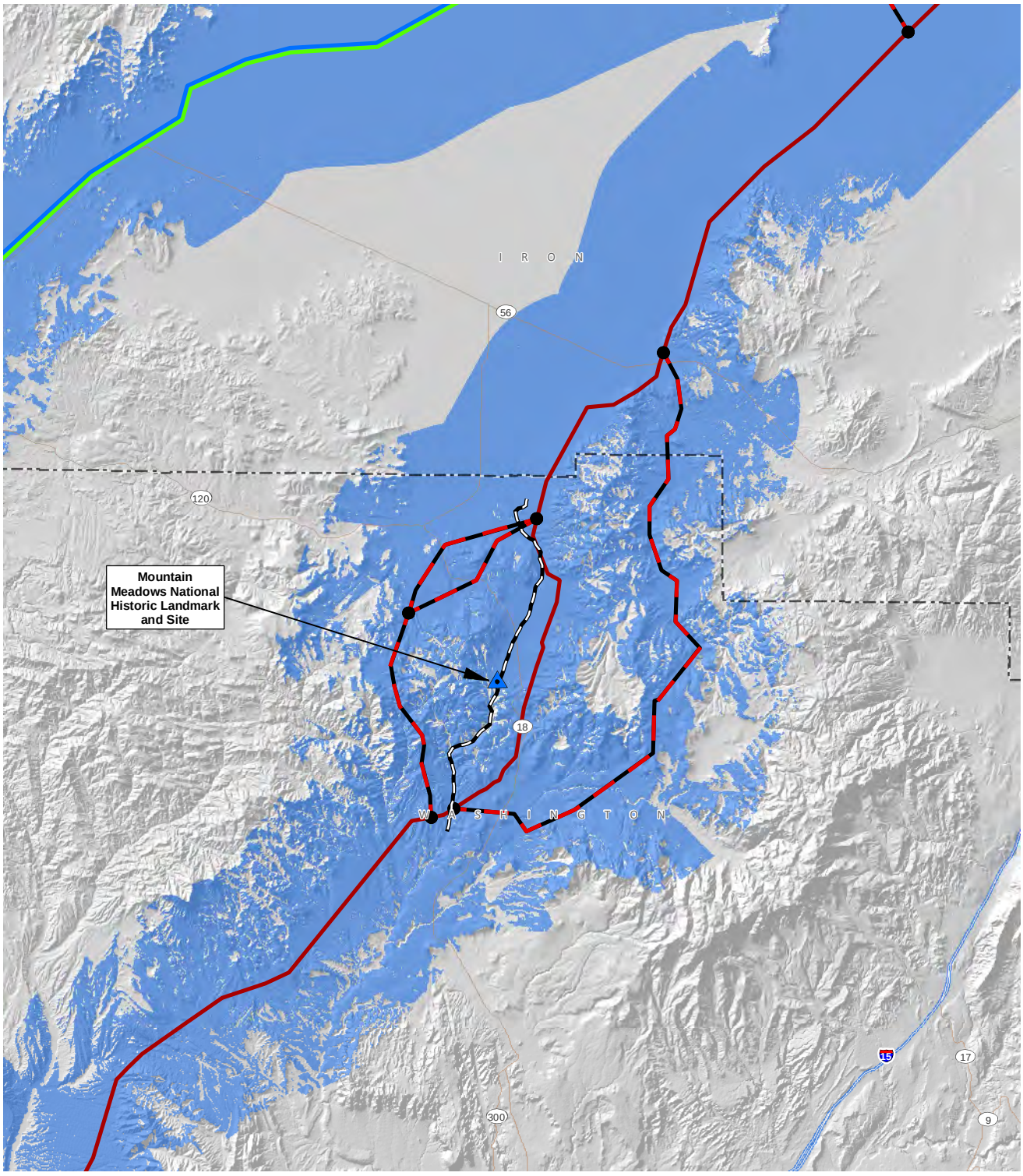

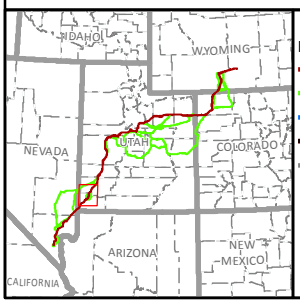

Node

DEIS Alternative Routes

- Applicant Proposed III-A
- Agency Preferred III-B
- Alternative III-C
- Alternative Variation or Connector
- Segment not in this Region

- Tranmission Line Visibility to 5 Miles
- Old Spanish Trail (USFS)
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.11-6
Region III
Historic Trails Detail

0 2 4 8 Miles
0 2 4 8 km
1:400,000

N

Western AREA POWER ADMINISTRATION

Exported On: 6/5/2013

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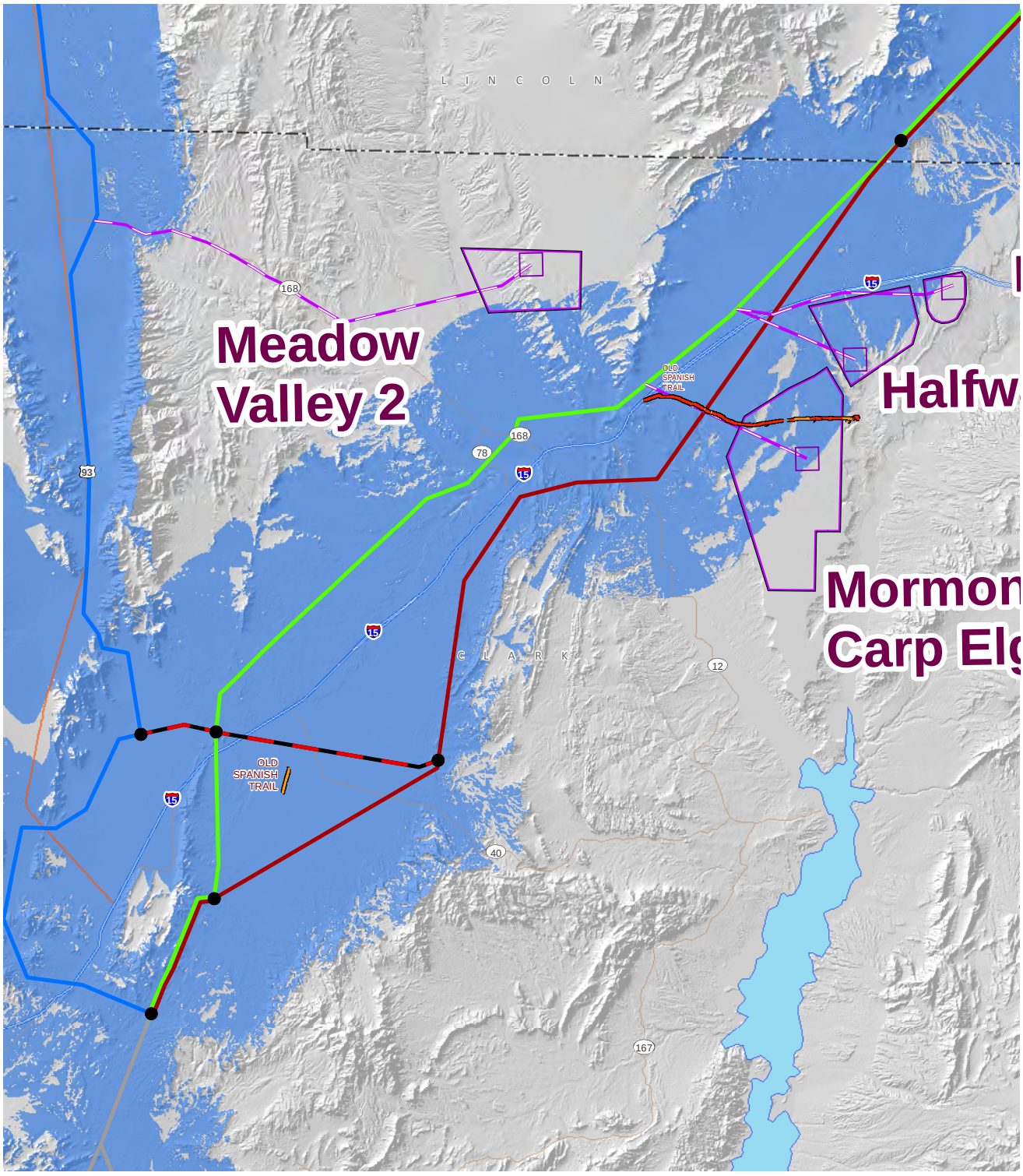

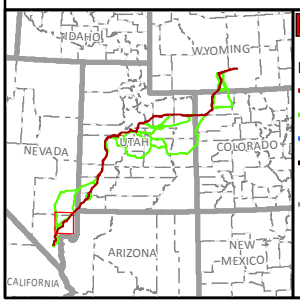

Terminal Siting Area
Node

DEIS Alternative Routes
- Applicant Proposed III-A
- Agency Preferred III-B
- Alternative III-C
- Alternative Variation or Connector
- Segment not in this Region

- Tranmission Line Visibility to 5 Miles
- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line

Old Spanish Trail Condition
- NHT I
- NHT II
- NHT III
- NHT IV
- NHT V

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.11-7
Region III
Historic Trails Detail

0 2 4 8 Miles
0 2 4 8 km
1:400,000
N

Western AREA POWER ADMINISTRATION

Exported On: 6/5/2013

categorized as NHT I, approximately 2 miles of trail segments are categorized as NHT II (location verified and evident with minor alteration), approximately 0.1 mile is categorized as NHT IV (location verified and permanently altered), and approximately 13 miles are not categorized. Visibility of Alternative III-A from the historic trail is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.

Alternative III-B (Agency Preferred)

Under Alternative III-B, there would be approximately 3,593 acres of initial ground disturbance with 285 miles of transmission line and 401 miles of access roads. A total of 63 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative III-B, including 40 prehistoric sites, 7 historic sites, 1 multi-component sites, 11 potential TCPs, and 4 sites with no descriptive information. The majority of prehistoric sites are open camps, temporary campsites, and lithic scatters, while the majority of historic sites are artifact scatters. Of the previously recorded sites, 1 is listed on the NRHP, 15 are eligible for the NRHP, 22 are not eligible, and 14 are unevaluated. Included in the 63 sites is the NRHP-listed Panaca Summit Archaeological District, which contains over 70 prehistoric sites in an area extending over 7,000 acres. The Mountain Meadows Massacre Site and Mountain Meadows NHL are located approximately 31 miles from Alternative III-B. Average site density is comparatively high at 1.7 sites per 100 acres inventoried with a comparatively high average inventory coverage of 23 percent.

The Old Spanish Trail would not be crossed by Alternative III-B (**Figures 3.11-5**, **3.11-6**, and **3.11-7**). Although the Old Spanish Trail would not be crossed by the Alternative III-B, the alternative would be visible from the trail for approximately 6.2 miles. Of those 6.2 miles, approximately 4.8 miles of trail segments are categorized as NHT I (location verified, evident, and unaltered), approximately 1.3 miles of trail segments are categorized as NHT II (location verified and evident with minor alteration), and approximately 0.1 mile is categorized as NHT IV (location verified and permanently altered). Visibility of the alternative from the historic trail is based on the 5-mile (either side of the 250-foot-wide transmission line ROW) viewshed or indirect APE.

Alternative III-C

Under Alternative III-C, there would be approximately 3,926 acres of initial ground disturbance with 308 miles of transmission line and 433 miles of access roads. A total of 70 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative III-C, including 49 prehistoric sites, 10 historic sites, 1 multi-component site, 5 potential TCPs, and 5 sites with no descriptive information. Most of the sites consist of prehistoric open and sheltered lithic sites and open camps, while most of the historic sites are trash scatters. Of the previously recorded sites, 1 is listed on the NRHP, 29 are eligible for the NRHP, 24 are not eligible, and 11 are unevaluated. Included in the 70 sites is the NRHP-listed Panaca Summit Archaeological District, which contains over 70 prehistoric sites in an area extending over 7,000 acres. The Mountain Meadows Massacre Site and Mountain Meadows NHL are located approximately 28 miles from Alternative III-C. Average site density is 0.01 sites per 100 acres inventoried with an average inventory coverage of 20 percent.

The Old Spanish Trail would not be crossed by or parallel to Alternative III-C.

Region III Conclusion

Alternative III-A would have more acres of initial ground disturbance than Alternative III-B, but less than Alternative III-C. Fewer previously recorded historic properties (including both eligible and unevaluated sites) have been identified within Alternative III-A compared to the other alternatives, with an average site density of 0.02 sites per 100 acres inventoried and an average of 20 percent inventory coverage. In addition, Alternative III-A would not cross the NRHP-listed Panaca Summit Archaeological District. Alternative III-A would be located 0.5 mile from the Mountain Meadows Massacre Site and NHL; whereas, the other two alternatives are over 28 miles from the site and NHL. As such, Alternative III-A

would have a greater potential to visually impact the Mountain Meadows Massacre Site and Mountain Meadows NHL due to its close proximity and a greater potential to directly impact unmarked graves associated with the massacre site (the exact locations of all of the gravesites are unknown). The Old Spanish Trail would be crossed by Alternative III-A, but not by the other alternatives. Additionally, Alternative III-A would be visible from the trail for approximately 23 miles (8 miles categorized as NHT I), which would be more than the other two alternatives.

Alternative Variations in Region III

Table 3.11-11 provides a comparison of impacts associated with the alternative variations in Region III.

Table 3.11-11 Summary of Region III Alternative Variation Impacts

Alternative Variation	Analysis
Ox Valley East Alternative Variation	A total of 5 cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of the Ox Valley East Alternative Variation compared to 36 cultural resources previously recorded within the 250-foot-wide transmission line ROW of the portion of Alternative III-A it would replace. For the variation, 4 of the sites are NRHP-eligible. Along the portion of Alternative III-A that would be replaced by the variation, 18 of the 36 sites are NRHP-eligible, 12 are not eligible, and 6 are unevaluated. Based on the files search of the Ox Valley East Alternative Variation, the average percentage of cultural resources inventory coverage is approximately 39 percent of the files search area (2-mile transmission line corridor). Average site density for the files search area is approximately 0.003 sites per 100 acres inventoried. In comparison, the average percentage of inventory coverage is approximately 11 percent with average site density at 0.006 sites per 100 sites inventoried for the portion of Alternative III-A, which would be replaced by the alternative variation. A non-categorized segment of the Old Spanish Trail would be crossed by the alternative variation, whereas two non-categorized segments of the trail would be crossed by the portion of the alternative it would replace. Visibility of the alternative variation from the trail would be approximately 6 miles compared to 13 miles for the portion of Alternative III-A it would replace. The variation would be located approximately 3 miles from the Mountain Meadows Massacre Site and Mountain Meadows NHL. In comparison, the portion of Alternative III-A that would be replaced by the variation would be located 0.12 mile from the Mountain Meadows Massacre Site and Mountain Meadows NHL. Ground disturbance associated with the Ox Valley East Alternative Variation would be 276 acres compared to 252 acres of initial disturbance associated with the portion of Alternative III-A it would replace.
Ox Valley West Alternative Variation	A total of 3 cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of the Ox Valley West Alternative Variation compared to 36 cultural resources previously recorded within the 250-foot-wide transmission line ROW of the portion of Alternative III-A it would replace. For the variation, 2 of the sites are NRHP-eligible. Along the portion of Alternative III-A that would be replaced by the variation, 18 of the 23 sites are NRHP-eligible, 12 are not eligible, and 6 are unevaluated. Based on the files search of the Ox Valley West Alternative Variation, the average percentage of cultural resources inventory coverage is approximately 43 percent of the files search area (2-mile transmission line corridor). Average site density for the files search area is approximately 0.003 sites per 100 acres inventoried. In comparison, the average percentage of inventory coverage is approximately 11 percent with average site density at 0.006 sites per 100 sites inventoried for the portion of Alternative III-A that would be replaced by the alternative variation. A non-categorized segment of the Old Spanish Trail would be crossed by the alternative variation, whereas two non-categorized segments of the trail would be crossed by the portion of the alternative it would replace. Visibility of the alternative variation from the trail would be approximately 6 miles compared to 13 miles for the portion of Alternative III-A it would replace. The variation would be located approximately 3 miles from the Mountain Meadows Massacre Site and Mountain Meadows NHL. In comparison, the portion of Alternative III-A that would be replaced by the variation would be located 0.1 mile from the Mountain Meadows Massacre Site and Mountain Meadows NHL. Ground disturbance associated with the Ox Valley West Alternative Variation would be 268 acres compared to 252 acres of initial disturbance associated with the portion of Alternative III-A it would replace.

Table 3.11-11 Summary of Region III Alternative Variation Impacts

Alternative Variation	Analysis
Pinto Alternative Variation[1]	A total of 40 cultural resources have been previously recorded within the transmission line ROW of the Pinto Alternative Variation compared to 39 cultural resources previously recorded within the 250-foot-wide transmission line ROW of the portion of Alternative III-A it would replace. For the variation, 13 of the sites are NRHP-eligible, 15 are not eligible, and 12 are unevaluated (BLM 2011). Along the portion of Alternative III-A that would be replaced by the variation, 20 of the 39 sites are NRHP-eligible, 13 are not eligible, and 6 are unevaluated. Based on the files search of the Pinto Alternative Variation, the average percentage of cultural resources inventory coverage is approximately 46 percent compared to 11 percent for the portion of Alternative III-A it would replace. No segment of the Old Spanish Trail would be crossed by the alternative variation, but a non-categorized segment would be crossed by the portion of the alternative it would replace. Although the alternative variation would not cross the trail, it would be visible from the trail for approximately 3 miles. In comparison, the portion of the alternative that would be replaced by the variation would be visible for 13 miles. This alternative variation would be located approximately 5 miles from the Mountain Meadows Massacre Site and Mountain Meadows NHL. In comparison, the portion of Alternative III-A that would be replaced by the variation would be located 0.1 mile from the Mountain Meadows Massacre Site and Mountain Meadows NHL. Ground disturbance associated with the Pinto Alternative Variation would be 449 acres compared to 381 acres of initial disturbance associated with the portion of Alternative III-A it would replace.

[1] The cultural resources information for the Pinto Alternative Variation was tiered off of the Sigurd to Red Butte No. 2 – 345kV Transmission Project EIS (BLM 2011). The Sigurd to Red Butte transmission line ROW is 350 feet; whereas, the TWE transmission line ROW is 250 feet. As such, the site counts for the Pinto Alternative Variation are based on a larger area and are not a direct comparison to the portion of Alternative III-A it would replace.

Sources: BLM 2011; SWCA 2012c,e, 2011c.

Alternative Connectors in Region III

Table 3.11-12 summarizes the impacts associated with the alternative connectors in Region III.

Table 3.11-12 Summary of Region III Alternative Connector Impacts

Alternative Connector	Analysis	Conclusion
Moapa Alternative Connector	A total of four cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of this alternative connector. Of those, one is NRHP-eligible, one is not eligible, and two are unevaluated. The alternative connector would be visible from the Old Spanish Trail for approximately 1 mile. The 1-mile segment is categorized as NHT II (location verified and evident with minor alteration).	It is unknown at this time as to how many historic properties would be adversely affected by this alternative connector. Unavoidable adverse effects to historic properties would be minimized or mitigated as stipulated in the PA and through implementation of design features. Any previously unknown cultural resources (other than isolates) discovered during construction activities would be handled as detailed in the PA.
Avon Alternative Connector	One NRHP-eligible cultural resource has been previously recorded within the 250-foot-wide transmission line ROW of the Avon Alternative Connector.	Same as described above for the Moapa Alternative Connector.

Sources: SWCA 2012c,d,e, 2011c,d.

Alternative Ground Electrode Systems in Region III

The southern ground electrode system would be necessary within 100 miles of the southern terminal as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided in the Project POD. At this time,

no files searches have been completed for the alternative ground electrode system locations in Region III. Cultural resources inventories, including a files search, would be conducted prior to construction. If historic properties are located within proposed disturbance areas and would be adversely affected, the properties would be avoided by Project redesign. However, if avoidance is not feasible, adverse effects would be minimized or mitigated as stipulated in the PA and through implementation of design features. Unanticipated discoveries would be handled as outlined in the PA.

Table 3.11-13 provides a summary of impacts associated with the four combinations of alternative route and location possibilities for the southern ground electrode system. Included in the table are disturbance acreages, miles of transmission line and access road, and the number of historic roads or trails crossed by the siting area and/or access road. It should be noted that direct impacts to historic properties could increase in relation to the amount of ground disturbance associated with construction of the electrode systems.

Table 3.11-13 Summary of Region III Alternative Ground Electrode System Location Impacts

Alternative Ground Electrode System Locations	Analysis
Mormon Mesa- Carp Elgin Rd (Alternative III-A)	Ground disturbance associated with this alternative ground electrode system location would be 91 acres. There would be 6 miles of transmission line and 7 miles of access road. The access road associated with this ground electrode system would intersect and parallel the Old Spanish Trail for approximately 4.45 miles. Of those 4.45 miles, 3.65 miles are categorized as NHT I (location verified, evident, and unaltered), 0.7 mile as NHT II (location verified and evident with minor alteration), and 0.1 mile as NHT IV (location verified and permanently altered).
Halfway Wash –Virgin River (Alternative III-A)	Ground disturbance associated with this alternative ground electrode system location would be 84 acres. There would be 4 miles of transmission line and 5 miles of access road. No segments of the Old Spanish Trail would be crossed by this ground electrode system.
Halfway Wash East (Alternative III-A)	Ground disturbance associated with this alternative ground electrode system location would be 104 acres. There would be 8 miles of transmission line and 10 miles of access road. No segments of the Old Spanish Trail would be crossed by this alternative ground electrode system.
Mormon Mesa-Carp Elgin Rd (Alternative III-B)	Ground disturbance associated with this alternative ground electrode system location would be 103 acres. There would be 8 miles of transmission line and 10 miles of access road. The Mormon Mesa-Carp Elgin Rd (Alternative III-B) alternative ground electrode system associated access road would intersect and parallel the Old Spanish Trail for approximately 4.45 miles. Of those 4.45 miles, 3.65 miles are categorized as NHT I (location verified, evident, and unaltered), 0.7 mile as NHT II (location verified and evident with minor alteration), and 0.1 mile as NHT IV (location verified and permanently altered).
Halfway Wash –Virgin River (Alternative III-B)	Ground disturbance associated with this alternative ground electrode system location would be 93 acres. There would be 6 miles of transmission line and 7 miles of access road. No segments of the Old Spanish Trail would be crossed by this alternative ground electrode system.
Halfway Wash East (Alternative III-B)	Ground disturbance associated with this alternative ground electrode system location would be 102 acres. There would be 8 miles of transmission line and 10 miles of access road. No segments of the Old Spanish Trail would be crossed by this alternative ground electrode system.
Meadow Valley 2 (Alternative III-C)	Ground disturbance associated with this alternative ground electrode system location would be 174 acres. There would be 22 miles of transmission line and 29 miles of access road. No segments of the Old Spanish Trail would be crossed by the Meadow Valley 2 alternative ground electrode system.
Delta (Design Option 2)	Ground disturbance associated with this alternative ground electrode system location would be 160 acres. There would be 19 miles of transmission line and 23 miles of access road. No segments of the Old Spanish Trail would be crossed by the Delta ground electrode system.

Sources: SWCA 2012a,c,d, 2011a,c,d.

3.11.6.6 Region IV

Construction, operation, and decommissioning impacts in Region IV and the means to minimize or mitigate those impacts would be the same as those discussed in Section 3.11.6.2, Impacts Common to All Alternative Routes and Associated Components. However, the magnitude of impacts would vary depending on the amount of ground disturbance, the length of the transmission line, and the visibility of the transmission line and other aboveground facilities. **Table 3.11-14** provides a comparison of site totals (within the 250-foot-wide transmission line ROW), NRHP eligibility, historic trail crossings, inventory coverage, site density, disturbance acreage, and miles of transmission line associated with each alternative route in Region IV.

Table 3.11-14 Summary of Region IV Alternative Route Impacts

Parameter		Alternative IV-A	Alternative IV-B	Alternative IV-C
Site Types	Prehistoric	10	7	7
	Historic	8	16	29
	Multi-component	0	0	0
	Potential TCPs[1]	8	7	7
	No Information	1	0	0
Site Totals[2]		27	30	43
Historic Trail Crossed	Old Spanish Trail	No segments crossed	No segments crossed	No segments crossed
Average Percent Inventory Coverage		39 percent	34 percent	32 percent
Average Site Density[3]		0.007 sites per 100 acres inventoried	0.005 sites per 100 acres inventoried	0.005 sites per 100 acres inventoried
Initial Disturbance[4]		566 acres	573 acres	663 acres
Miles of Transmission Line and Access Roads		37 miles; 60 miles	39 miles; 71 miles	44 miles; 74 miles
NRHP Status[5]	Listed	2	0	0
	Eligible for Listing	6	12	17
	Not Eligible	7	5	12
	Unevaluated	4	6	7

[1] In general, sites in which Native American Tribes attach traditional religious and cultural significance are referred to as "TCPs" by the Tribes. TCPs can include, but are not limited to, stone cairns, stone circles, rock shelters, rock art, prehistoric campsites, and village sites. At this time, no tribal consultation regarding verification of these sites as TCPs or other sites of importance to the Tribes has occurred. Until consultation with Native American Tribes to evaluate these sites has occurred, these sites are considered "potential TCPs" based on their site type and description.

[2] Site totals are for the 250-foot-wide transmission line ROW.

[3] Site densities are more likely reflective of inventory coverage rather than geographic trends (e.g., proximity to water).

[4] In general, direct impacts to historic properties could increase in relation to the amount of ground disturbance associated with construction.

[5] The discrepancy between the overall site total and the total for the NRHP-eligibility status is due to the fact that the potential TCPs are also prehistoric sites and are therefore counted twice. As such, the difference between the overall site total and total for eligibility is equal to the number of potential TCPs.

Sources: SWCA 2012d,e, 2011d.

Alternative IV-A (Applicant Proposed/Agency Preferred)

Under Alternative IV-A, there would be approximately 566 acres of initial ground disturbance with 37 miles of transmission line and 60 miles of access roads. A total of 27 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative IV-A, including 10 prehistoric sites, 8 historic sites, 8 potential TCPs, and 1 site with no descriptive information. The majority of prehistoric sites are open lithic and open architectural (e.g., stone circles,

stone features), while the majority of historic sites are artifact scatters and structures. Of the previously recorded sites, 2 are listed on the NRHP, 6 are eligible for the NRHP, 7 are not eligible, and 4 are unevaluated. It should be noted that unevaluated sites are considered eligible until a determination of NRHP eligibility can be made. A historic ditch/canal and prehistoric open lithic site are listed on the NRHP and are located within the 250-foot-wide transmission line ROW. Average site density is 0.007 sites per 100 acres inventoried with a comparatively high average inventory coverage of 39 percent.

The Old Spanish Trail would not be crossed by or parallel to Alternative IV-A.

Alternative IV-B

Under Alternative IV-B, there would be approximately 573 acres of initial ground disturbance with 39 miles of transmission line and 71 miles of access roads. A total of 30 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative IV-B, including 7 prehistoric sites, 16 historic sites, and 7 potential TCPs. Prehistoric sites mainly consist of sheltered lithic and open lithic sites, while historic sites are mainly habitation sites, roads, and structures. Of the previously recorded sites, 12 are eligible for the NRHP, 5 are not eligible, and 6 are unevaluated. Average site density is 0.005 sites per 100 acres inventoried with an average inventory coverage of 34 percent.

The Old Spanish Trail would not be crossed by or parallel to Alternative IV-B.

Alternative IV-C

Under Alternative IV-C, there would be approximately 663 acres of initial ground disturbance with 44 miles of transmission line and 74 miles of access roads. A total of 43 previously recorded cultural resources have been identified within the 250-foot-wide transmission line ROW of Alternative IV-C, including 7 prehistoric sites, 29 historic sites, and 7 potential TCPs. Open and sheltered lithic sites comprise the majority of prehistoric sites, while artifact scatters, roads, and structures comprise the majority of historic sites. Of the previously recorded sites, 17 are eligible for the NRHP, 12 are not eligible, and 7 are unevaluated. Average site density is 0.005 sites per 100 acres inventoried with a comparatively low average inventory coverage of 32 percent.

The Old Spanish Trail would not be crossed by or parallel to Alternative IV-C.

Region IV Conclusion

Alternative IV-A would have less acres of ground disturbance than Alternatives IV-B and IV-C. Decreased ground disturbance could decrease the potential for direct impacts to known and unknown historic properties compared to the other alternatives. Alternative IV-A also has a smaller number of previously recorded NRHP-eligible and unevaluated sites than the other alternatives, with an average site density of 0.007 sites per 100 acres inventoried and average inventory coverage of 39 percent.

Alternative Variations in Region IV

Table 3.11-15 provides a comparison of impacts associated with the alternative variations in Region IV.

Table 3.11-15 Summary of Region IV Alternative Variation Impacts

Alternative Variation	Analysis
Marketplace Alternative Variation	No cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of this alternative variation, compared to one previously recorded cultural resources along the portion of Alternative IV-B that would be replaced by the variation. The one cultural resource is eligible for the NRHP. Based on the files search of the Marketplace Alternative Variation, the average percentage of cultural resources inventory coverage is approximately 34 percent of the files search area (2-mile transmission line corridor). Average site density for the files search area is approximately 0.001 sites per 100 acres inventoried. In comparison, the average percentage of inventory coverage is approximately 36 percent with average site density at 0.001 sites per 100 sites inventoried for the portion of Alternative IV-B would be replaced by the alternative variation. Ground disturbance associated with the Marketplace Alternative Variation would be 109 acres compared to 82 acres of initial disturbance associated with the portion of Alternative IV-B it would replace.

Source: SWCA 2011d.

Alternative Connectors in Region IV

Table 3.11-16 summarizes the impacts associated with the alternative connectors in Region IV.

Table 3.11-16 Summary of Region IV Alternative Connector Impacts

Alternative Connectors	Analysis	Conclusion
Sunrise Mountain Alternative Connector	No cultural resources have been previously recorded within the alternative connector 250-foot-wide transmission line ROW.	It is unknown at this time as to how many historic properties would be adversely affected by this alternative connector. Unavoidable adverse effects to historic properties would be minimized or mitigated as stipulated in the PA and through implementation of design features. Any previously unknown cultural resources (other than isolates) discovered during construction activities would be handled as detailed in the PA.
Lake Las Vegas Alternative Connector	A total of three cultural resources, including the Las Vegas Wash Archaeological District, have been previously recorded within the 250-foot-wide transmission line ROW of this alternative connector. Two of the three resources are eligible for the NRHP.	Same conclusion as described above for the Sunrise Mountain Alternative Connector.
Three Kids Mine Alternative Connector	A total of four cultural resources, including the Las Vegas Wash Archaeological District, have been previously recorded within the 250-foot-wide transmission line ROW of this alternative connector. One of the four resources is eligible for the NRHP.	Same conclusion as described above for the Sunrise Mountain Alternative Connector.
River Mountains Alternative Connector	A total of one cultural resource has been previously recorded within the 250-foot-wide transmission line ROW. The one cultural resource is eligible for the NRHP.	Same conclusion as described above for the Sunrise Mountain Alternative Connector.

Table 3.11-16 Summary of Region IV Alternative Connector Impacts

Alternative Connectors	Analysis	Conclusion
Railroad Pass Alternative Connector	A total of three cultural resources have been previously recorded within the 250-foot-wide transmission line ROW of this alternative connector. Of these, one is eligible for the NRHP, and two are not eligible.	Same conclusion as described above for the Sunrise Mountain Alternative Connector.

Source: SWCA 2011d.

3.11.6.7 Residual Impacts

The Project would result in the loss of cultural resources that are not eligible for the NRHP and located in proposed disturbance areas. Although these sites would be recorded to BLM standards and the information integrated into local and statewide archaeological databases, the sites ultimately would be destroyed by construction. It currently is unknown how many historic properties (including TCPs or other properties of tribal importance) would be affected by the Project. Design features for cultural resources protection would be followed. Adverse effects to historic properties would be avoided or, if avoidance is not feasible, minimized or mitigated as stipulated in the PA. Mitigation could include data recovery, the use of landscaping to minimize visual effects, development of interpretive materials, or other measures determined by the BLM in consultation with the SHPO and interested parties and Tribes. Some of the cultural value associated with these properties cannot be fully mitigated; therefore, it is anticipated that residual impacts to these properties would occur.

Accidental disturbance, vandalism, and illegal collecting of artifacts would be expected to increase as a result of increased access.

3.11.6.8 Impacts to Cultural Resources from the No Action Alternative

Under the No Action Alternative, the proposed facilities that would comprise the Project would not be developed. No additional ground-disturbance would occur. Potential direct, indirect, and visual effects to historic properties, including TCPs and properties of traditional religious and cultural importance to Native Americans, located within the APE or within the viewshed of the Project would not occur.

3.11.6.9 Irreversible and Irretrievable Commitment of Resources

Historic properties (including TCPs and other properties of tribal importance) could be irreversibly and irretrievably lost if inventory, avoidance, and/or mitigation efforts are not sufficient to identify and protect these properties.

3.11.6.10 Relationship Between Local Short-term Uses and Long-term Productivity

The Project would result in the loss of short-term use and long-term productivity of cultural resources not eligible for the NRHP and located in proposed disturbance areas. For historic properties (including TCPs and other properties of tribal importance) located in proposed disturbance areas that cannot be avoided, data recovery or other forms of mitigation would be conducted prior to construction. Mitigation of impacts to TCPs and other properties of tribal importance would be developed in consultation with interested Tribes. The scientific information obtained through data recovery would be preserved for the long term. However, the site itself ultimately would be lost. There would be a long-term loss of cultural resources due to illegal collecting and vandalism associated with increased human activity in, and access to, the analysis area.

3.12 Visual Resources

This section describes the affected environment and impact assessment based on construction, operation, and maintenance of the Project in each of the four geographic regions. Visual resources are defined as the visible features of the landscape. The affected environment and impact assessment were focused within a 5-mile visual study corridor for non-forested landscapes and a 20-mile corridor for forested landscapes centered on the reference line for each alternative route under consideration within this EIS. The affected environment and impact assessment methodology, including the locations of key observation points (KOPs), was developed and approved in consultation with the BLM and USFS. **Appendix I** contains details that support this section, and **Figure I-1** depicts the Project viewshed and KOP locations.

3.12.1 Regulatory Background

3.12.1.1 Federal Land Policy and Management Act as amended

The FLPMA of 1976 (90 Stat. 2743; 43 U.S.C. 1601, et seq.) established BLM as the jurisdictional agency for expanses of land in the West to be managed as multiuse lands. The following sections of the FLPMA relate to the management of visual resources on federal lands:

> § 102(a): "The public lands [shall] be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values."
>
> § 201(a): "The Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resources and other values (including…scenic values)."
>
> § 202(c)(1-9): "...in developing land use plans, the BLM shall use…the inventory of the public lands; consider present and potential uses of the public lands, consider the scarcity of the values involved and the availability of alternative means and sites for realizing those values; weigh long-term benefits to the public against short term benefits."
>
> § 505(a): "Each right-of-way shall contain terms and conditions which will … (ii) minimize damage to the scenic and esthetic values" (BLM 2001).

3.12.1.2 BLM Resource Management Plans

The BLM manages land under its jurisdiction according to the goals and policies outlined in the RMPs. VRM classifications are developed by BLM based on landscape character, scenic quality, sensitivity levels, distance zones, and management direction as outlined in BLM Manual H-8410 (BLM 1986). Each of four VRM classes has an objective that prescribes the amount of change allowed in the characteristic landscape, ranging from Class I-no change to Class II-minor change, Class III-moderate change, and Class IV-major change (BLM 1986). Compliance with VRM classes is determined by comparison of the objective of the applicable class with the effects of the Project.

3.12.1.3 National Forest Land and Resource Management Plans

The LRMP guides all natural resource management activities and establishes management standards and guidelines for scenery within the national forests. The LRMP outlines SIOs and VQOs which prescribe the level of visible change allowable within forest boundaries. Scenic Classes are determined based on distance zones, concern level, and existing scenic integrity and managed to ensure that changes and development fit with existing type, form, line, color, and texture (USFS 1996). The five SIO or VQO categories are: Very High (unaltered-Preservation VQO), High (appears unaltered-Retention VQO), Medium (appears slightly altered-Partial Retention VQO), Low (moderately altered-Modification VQO), and Very Low (highly altered-Maximum Modification VQO) (USFS 1996). Consistency with SIOs and VQOs is

determined by comparison of the objective or integrity level of the applicable VQO or SIO, respectively, with the effects or alteration caused by the Project.

3.12.1.4 National Trails System Act

National Trails were established under the National Trail System Act of 1968 (16 U.S.C. §1241-51), designating and protecting national scenic trails, national historic trails, and national recreational trails. National trails are administered by BLM, the NPS, and the USFS; these agencies provide coordination and oversight for the entire length of a trail. However, as these trails traverse both public and private lands as well as lands controlled by various agencies, on-site management activities are performed by the jurisdictional agency, the state, or the landowner (NPS 2008).

3.12.1.5 National Historic Preservation Act

The NHPA includes language protecting the visual integrity of sites listed or eligible for the National Register of Historic Places: "Examples of adverse effects…include…introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features…" (36 CFR Part 800.5). Impacts to visual resources protected by the NHPA are discussed in Section 3.11, Cultural Resources and Native American Concerns.

3.12.2 Data Sources

3.12.2.1 Visual Resource Inventory

Existing VRIs were available for BLM lands. The landscape scenery and sensitive viewer inventory and mapping are unavailable for private and state lands in the project area or for the Ashley National Forest, Fishlake National Forest, Manti-La Sal National Forest, and Uinta National Forest. The inventory report for the Dixie National Forest was prepared for purposes of the Sigurd-Red Butte Transmission Project (2010) and obtained for the Project from the USFS. The methodology used to establish landscape scenery and sensitive viewers inventory and mapping for the Project included hand-digitizing from detailed aerials, data download from USGS and ReGap, GIS spatial analyses and field verification.

Localized physiography and land surface forms mapping (*New Map of Standardized Terrestrial Ecosystems of the Conterminous United States* [USGS, 2009]) was used to delineate landscape scenery rating units for the landscape scenery inventory. These scenery quality rating units were evaluated based on landform, water, vegetation, geology, land use and land cover sources, including Northwest and Southwest ReGap, and digital terrain data.

Sensitive viewers' locations, including residences and recreation sites, were hand-digitized in all areas within a 10-mile corridor. Navigable waterways, trails, and roads were included in the inventory.

Project-specific visibility and distance zone analyses and mapping were conducted in GIS (ArcGIS).

<u>Landscape Scenery</u>

Landscape scenery for the Project portrays the aesthetic value of landscapes on BLM, private, state and USFS lands. Scenic quality is defined by the BLM as the visual appeal of a tract of land (BLM 1986). BLM lands are rated Class A, Class B, and Class C, for highest to lowest scenic quality. Scenic attractiveness is defined by the USFS as the intrinsic scenic beauty of the landscape in a particular landscape character (USFS 1995). USFS lands are rated Class A-Distinctive, Class B-Common, and Class C-Indistinctive, for highest to lowest scenic attractiveness. Please see **Appendix I**, **Table I-1** for milepost locations and **Figure I-2** for map locations of Class A, B, and C scenery on BLM lands, for Class A-Distinctive, Class B-Common, and Class C-Indistinctive scenery on USFS lands, and for Class A-High, Class B-Medium, and Class C-Low in private lands. Scenic quality ratings were conducted at a 10-mile corridor-specific scale for USFS (with exception of Dixie National Forest), state, and private lands (**Appendix I, Table I-1** and **Appendix I**, **Figure I-3**), employing methods similar to the inventory systems of the BLM and USFS.

View distance, vegetation, topographic slopes, and characteristic landscape (particularly, the presence or absence of existing cultural modifications), play important roles in the assessment of change caused by the Project on landscape scenery.

Sensitive Viewers

Sensitive viewers' analysis and mapping for the Project encompasses public and private viewer's concern for landscape scenery. Sensitivity levels are defined by the BLM as the measure of public concern for scenic quality. Public lands are assigned high, medium, or low sensitivity levels (BLM 1986) (**Appendix I**, **Table I-2**). The USFS's constituent analysis is similar in intent. Constituent analysis leads to a determination of the relative importance of aesthetics to the public; this importance is expressed as a concern level. Sites, travelways, special places, and other areas are assigned a Concern Level value of 1, 2, or 3 to reflect the relative High, Medium, or Low importance of aesthetics (USFS 1995). Please see **Appendix I**, **Table I-3** and **Table I-4** for locations by alternative, segment, and milepost for High Sensitivity and Moderate Sensitivity Viewers, and **Appendix I, Figure I-4** for locations of mapped sensitivity levels.

View distance plays an important role in the assessment of change caused by the Project on sensitive viewers.

Distance Zones

Distance zones are defined by the BLM as relative visibility from travel routes or observation points. The three zones are foreground-middleground, background, and seldom seen. All BLM Field Offices' visual resource inventories show all distance zones as foreground-middleground throughout the field office. The foreground-middleground zone includes areas seen from highways, roads, trails, rivers, or other viewing locations that are less than 3 to 5 miles away. Seen areas beyond the foreground-middleground zone, but usually less than 15 miles away, are in the background zone. Areas not seen (hidden from view) in the foreground-middleground or background are designated as seldom-seen (BLM 1986). The USFS approach applies seen areas and distance zones as mapped from 1, 2, or 3 concern level areas to determine the relative sensitivity of scenes based on their distance from an observer; these zones are identified as foreground (up to 0.5 mile from the viewer), middleground (up to 4 miles from the foreground), and background (4 miles from the viewer to the horizon) (USFS 1995).

The distance and visibility analyses for the Project are based on visibility factors of the TWE structures, conductors, and ROWs and divided into four zones as follows: 1) immediate foreground (0 to 0.5 mile); foreground (0.5 to 2.5 miles); middleground (2.5 to 5.0 miles); and background (greater than 5 miles). These distances and viewsheds are integral to the Viewer Sensitivity analyses and shown in **Appendix I**, **Figures I-5** and **I-6** and **Appendix I, Tables I-3** and **I-4** for milepost information based on distance zones.

Visual Resource Inventory Classes

VRI classes represent the relative value of the visual resources and provide the basis for considering visual values in the resource management planning process. VRI Classes II, III, and IV are determined based on a combination of scenic quality, sensitivity level, and distance-zone overlays. Class II has a higher level of value than Class III, which is moderately valued. Class IV is least valued. A fourth VRI class, Class I, is assigned to special management areas. This includes Wilderness Areas or Wilderness Study Areas, Wild and Scenic Rivers, National Recreation Areas and other congressionally and administratively designated areas where decisions have been made to preserve a natural landscape. Please see **Appendix I**, **Table I-5** for VRIs by alternative, segment and milepost, and **Appendix I**, **Figure I-7** for map locations of VRI classes.

3.12.2.2 Agency Management Objectives and Local Planning

The RMP land use planning process results in VRM class assignments for all BLM-administered lands. The recent visual resource inventories have not yet been included in the BLM RMPs. VRM classes

(**Table 3.12-1**) are based on visual resource inventories and management decisions that must take into consideration the value of visual resources. Please refer to **Appendix I**, **Table I-6** for VRM locations by alternative, segment, and milepost.

Table 3.12-1 BLM Visual Resource Management Class Objectives

Class I Objective	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
Class II Objective	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic (design) elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
Class III Objective	The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
Class IV Objective	The objective of this class is to provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic (design) elements.

Source: BLM 1986.

SIOs (**Table 3.12-2**) establish limits of acceptable human alteration in form, line, color, and texture as the landscape moves toward a landscape character goal. SIOs are assigned for all USFS-administered lands through the national forest planning process. However, the forest plans in the Project area have not yet been updated with scenic integrity objectives. With exception of the Dixie National Forest, the forest plans do include VQOs, which predate the current SIOs. These objectives are based on visual inventories and management decisions made in forest plans, which must take into consideration the value of scenery. At present, the Dixie National Forest and Fishlake National Forest have established SIOs, and the Ashley National Forest, Manti-La Sal National Forest, and Uinta National Forest have VQOs.

Table 3.12-2 USFS Scenic Integrity Objectives

Very High (SIO) or Unaltered-Preservation (VQO)	Very high scenic integrity refers to landscapes where the valued landscape character "is" intact with only minute if any deviations. The existing landscape character and sense of place is expressed at the highest possible level.
High (SIO) or Appears Unaltered-Retention (VQO)	High scenic integrity refers to landscapes where the valued landscape character "appears" intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident.
Moderate (SIO) or Slightly Altered-Partial Retention (VQO)	Moderate scenic integrity refers to landscapes where the valued landscape character "appears slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.
Low (SIO) or Moderately Altered-Modification (VQO)	Low scenic integrity refers to landscapes where the valued landscape character "appears moderately altered." Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect, and pattern of natural openings, vegetative type changes, or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed, but also compatible or complimentary to the character within.

Table 3.12-2 USFS Scenic Integrity Objectives

Very Low (SIO) or Highly Altered-Maximum Modification (VQO)	Very low scenic integrity refers to landscapes where the valued lands appears heavily altered." Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles within or outside landscape being viewed. However deviations must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.

Source: USFS 1995.

Refer to **Appendix I**, **Table I-7** for SIO and VQO locations by alternative, segment, and milepost, and **Appendix I**, **Figure I-8** for map locations of visual resource management classes and scenic integrity objectives or visual quality objectives.

3.12.3 Analysis Area

The analysis area is comprised of the viewsheds of the Project's reference lines out to 20 miles in locations where they cross tree-covered landscapes and out to 5 miles in shrub, grassland, and cropland landscapes. The difference in the two distances is based on visibility of cleared vegetation in ROWs in forested landscapes (20 miles) versus the visibility of only the transmission line structures and conductors (5 miles) in locations with no requirement for clearing of trees. Please see **Figures 3.12-1** through **3.12-4** for extents of the analysis area and the Project (also depicted in **Appendix I**, **Figure I-1**).

3.12.4 Baseline Description

Locations, natural features, and cultural elements of Physiographic Provinces surrounding the Project are depicted in **Appendix I** as **Figure I-9**. Detailed listings, by region and segment, of public places, roads, historic trails, towns, scenic overlooks, rivers, recreational sites and areas, and designated scenic byways and backways, within 0.5 mile (immediate foreground viewshed) of the Project are located in each regional impact section.

3.12.4.1 Developed and Natural Settings

The majority of the Project would cross developed landscapes. **Appendix I**, **Figure I-10** shows the Project's reference lines and developed and natural settings. Forty-three percent (1,082 miles) of the Project reference lines (2,502 miles) are located within one/half mile of one or more existing electrical transmission lines. **Appendix I**, **Table I-8** shows this information by milepost. **Appendix I**, **Table I-9** shows the visual contrasts of the Project's guyed and self-supported structures in connection with existing transmission line structures. Other human-made developments situated in close proximity to the Project include agricultural fields and structures, commerce, oil and gas developments, pipeline rights-of-way, railroads, industrial, residences, and roads. Portions of the Project traverse natural landscapes in viewsheds that contain little development beyond roads or trails. These include: the Cedar Breaks Draw (Segment 120) and Colloid Draw (Segment 115.07) viewsheds and Muddy Creek viewsheds (Segments 140, 140.05, and 190) northwest and north, respectively, of Baggs in Wyoming; the Sand Wash Basin (Segment 180.2), Seven Mile Ridge (Segment 180.2 and 186), Little Snake River (Segments 180.2 and 186), Nine Mile Basin (Segment 186), Peck Mesa (Segments 180.2 and 186), and portions of the Yampa River/Cross Mountain (Segments 180.2 and 186) viewsheds west of Craig and Davis Canyon and Texas Creek viewsheds (Segment 220.1) north of Baxter Pass in Colorado; the Nine Mile Canyon, Electric Lake,

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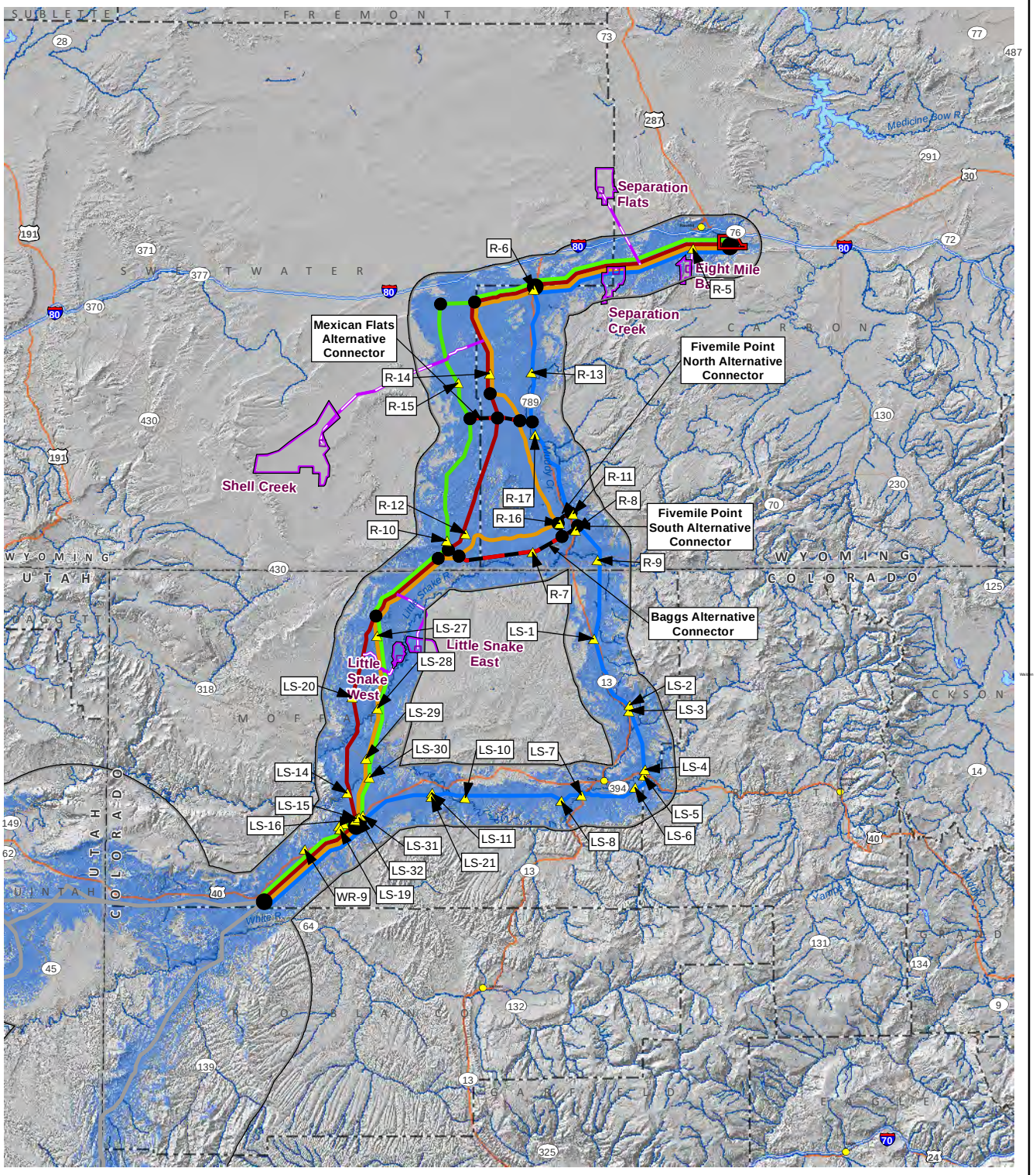

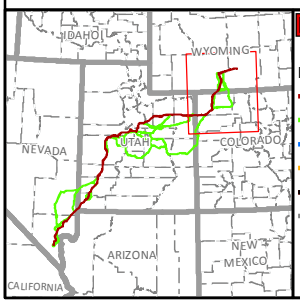

- Terminal Siting Area
- Node

DEIS Alternative Routes

- Applicant Proposed I-A
- Alternative I-B
- Alternative I-C
- Agency Preferred I-D
- Alternative Variation or Connector
- Segment not in this Region

- Potential Ground Electrode Siting Area
- Potential Ground Electrode Site
- Potential Ground Electrode Overhead Electrical Line
- Stream/River
- Waterbody

Project Visibility

- Towers Visible
- Visibility Study Area
- Key Observation Point

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.12-1
Region I
Key Observation Points
and Project Visibility

0 5 10 20 Miles
0 5 10 20 km
1:1,500,000

N

Western Area Power Administration

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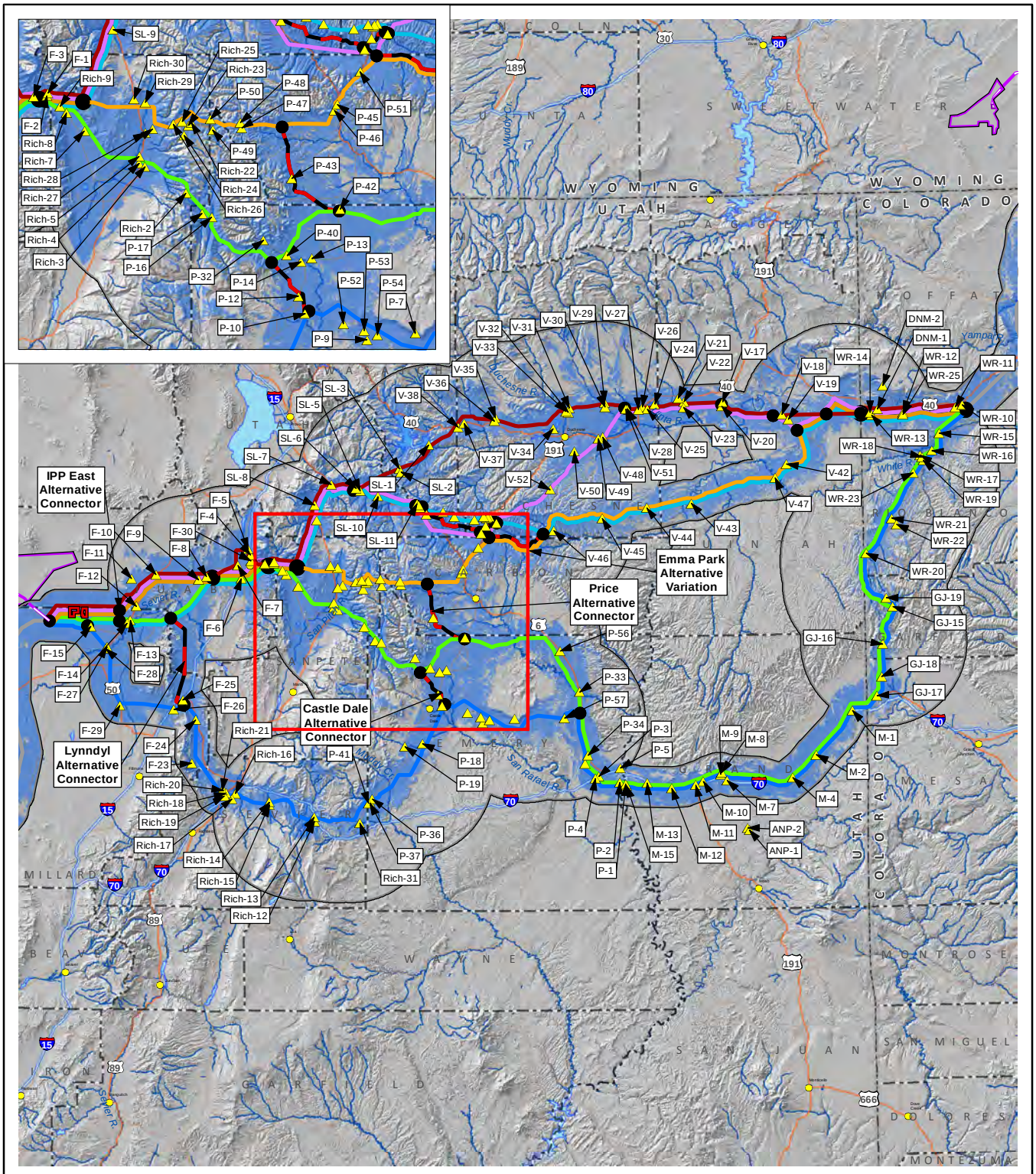

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.12-2
Region II
Key Observation Points
and Project Visibility

0 10 20 40 Miles
0 10 20 40 km
1:2,250,000
N

Western AREA POWER ADMINISTRATION

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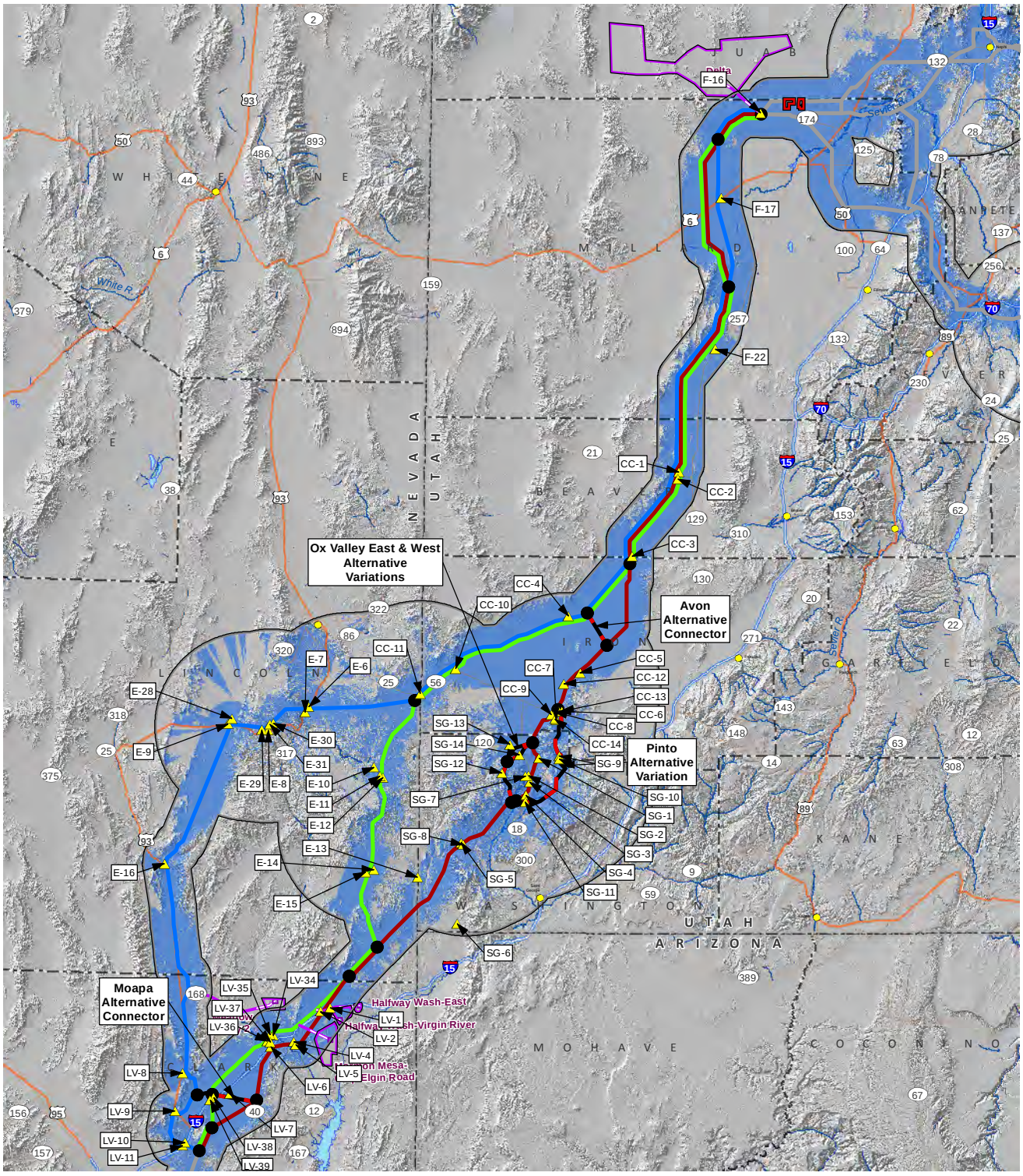

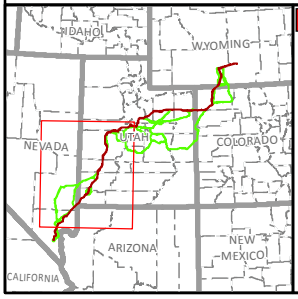

Terminal Siting Area
Node

DEIS Alternative Routes

Applicant Proposed III-A
Agency Preferred III-B
Alternative III-C
Alternative Variation or Connector
Segment not in this Region
Stream/River

Waterbody
Key Observation Point
Potential Ground Electrode Siting Area
Potential Ground Electrode Site
Potential Ground Electrode Overhead Electrical Line

Project Visibility

Towers Visible
Visibility Study Area

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.12-3
Region III
Key Observation Points
and Project Visibility

0 10 20 40 Miles
0 10 20 40 km
1:2,000,000

N

Western AREA POWER ADMINISTRATION

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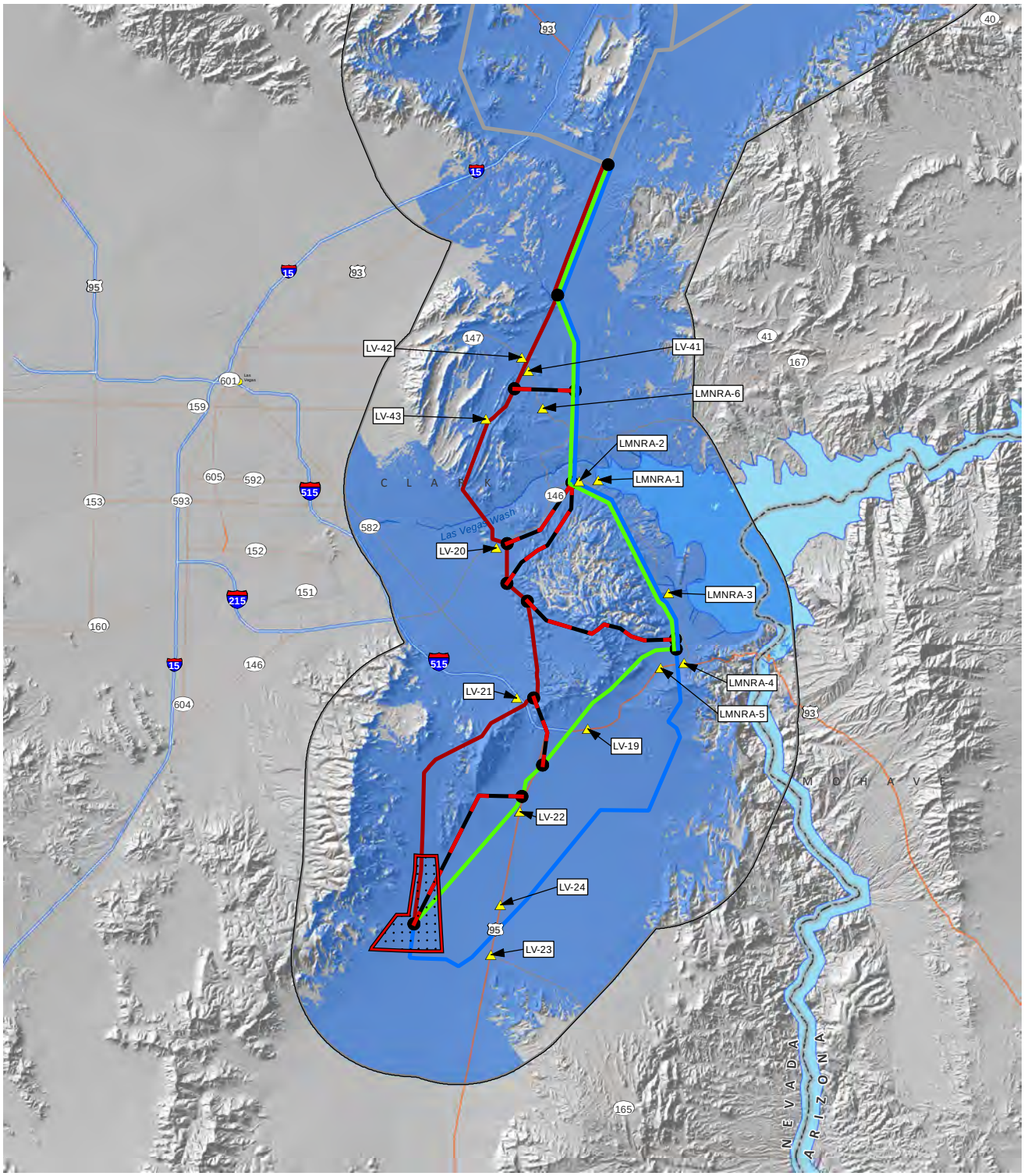

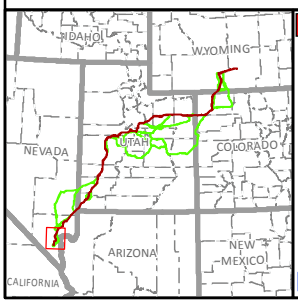

Terminal Siting Area
Node
DEIS Alternative Routes
Applicant Proposed/ Agency Preferred IV-A
Alternative IV-B
Alternative IV-C
Alternative Variation or Connector
Segment not in this Region
Stream/River
Waterbody
Key Observation Point
Project Visibility
Towers Visible
Visibility Study Area

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.12-4
Region IV
Key Observation Points
and Project Visibility

0 1.5 3 6 Miles
0 1.5 3 6 km
1:400,000
N

Western AREA POWER ADMINISTRATION

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and Fairview Canyon viewsheds (Segment 217.15), Cisco Desert viewsheds (Segment 220.1), Dry Mesa and Chimney Rock viewsheds (Segment 225.2), Ox Valley viewsheds (Segment 505), and Pinto viewsheds (Segment 506) in Utah; all of the viewsheds, including those of the Silver State Trail (Segments 520) and Rainbow Backcountry Byway (Segment 510) north, west, east, and southeast of Caliente in Nevada; and the Rainbow Gardens viewshed (Segment 660) between Lake Mead National Recreation Area and Henderson, Nevada.

3.12.5 Regional Summary

The Project's setting intersects the high plains, mountains, plateaus, valleys, and desert landscapes of Wyoming, Colorado, Utah, and Nevada, respectively. Landscape character is identified and described by the combination of the scenic attributes that make each landscape identifiable or unique. A region's landscape character creates a "Sense of Place," and describes the visual image of an area. The Study area's landscape character is defined by the landforms, vegetation, water, and cultural features of the following physiographic provinces (Fenneman 1931): Wyoming Basin Province, Uinta Basin section of the Colorado Plateaus Province, Northern Canyonlands section of the Colorado Plateaus Province, Middle Rocky Mountains Province, High Plateaus of Utah section of the Colorado Plateaus Province, Great Basin section of the Basin and Range Province, and Sonoran Desert section of the Basin and Range Province.

3.12.5.1 Wyoming Basin Province (Region I)

The Wyoming Basin Province is intersected by the Project in northwestern Colorado and southern Wyoming. Project jurisdictions include the Little Snake FO and Rawlins FO. The characteristic landscape is typified by a broad, open plain interrupted by linear escarpments, rolling hills and low mountains. Elevation ranges from 6,000 to 8,000 feet. Vegetation types are mostly grass, sage, rabbit brush, and greasewood with juniper and pinyon pine on higher-elevation slopes. Riparian vegetation, especially cottonwood and willow, is common along the Yampa River and the Little Snake River. These are both recreation rivers. Cultural features in the analysis area include the National Historic Old Cherokee Trail, Continental Divide Trail, Lincoln Highway, and National Historic Overland Trail. Baggs, Craig, Maybell, Rawlins, Sinclair, and Wamsutter are viewer population centers. Major roads with viewing opportunities are Interstate 80, Wyoming SH 70 from Baggs to Encampment, Wyoming SH 789 from Baggs to I-80, U.S. 40, Colorado State Highways 13 and 395, and numerous recreational BLM and county roads. Designated scenic roads include the Battle Scenic Highway from Baggs to Encampment; the Outlaw Trail Scenic Highway from Baggs to I-80; and the Dinosaur Diamond National Scenic Byway from Vernal to I-70.

3.12.5.2 Uinta Basin Section of the Colorado Plateaus Province (Region I and Region II)

The Uinta Basin Section of the Colorado Plateaus Province is intersected by the Project in western Colorado and northern Utah. Project jurisdictions include the Little Snake FO, Salt Lake FO, Vernal FO, White River FO, Ashley National Forest, and Uinta National Forest. The characteristic landscape is defined by low mountains, rolling hills, and broad valleys. Elevation ranges from 6,200 to 7,300 feet. Vegetation types include juniper-pinyon woodlands and saltbush-greasewood and grasslands-shrubs with big sagebrush. Dinosaur National Monument's lower visitor center and middle and upper scenic overlooks are within the viewshed of the analysis area. Major recreational rivers include the Green River, Duchesne River, Strawberry River, and Currant Creek. Water-related recreational facilities include the Bottle Hollow Reservoir, campground, and boat launch; San Rafael River boat launch and overlook; and Starvation Reservoir, campground, beach, and boat launch. Cultural features in the Project area consist of Dinosaur, Duchesne, Roosevelt, and Vernal, which are major viewer population centers. Major roads with viewing opportunities include Colorado SH 64, Utah SH 35, Utah SH 45, Utah SH 87, Utah SH 88, and Utah SH 208. Designated scenic roads include Brown's Park Road Scenic Backway; Dinosaur Diamond Scenic Byway/U.S. Highway 40; and Jones Hole Road Scenic Backway.

3.12.5.3 Northern Canyonlands Section of the Colorado Plateaus Province (Regions I and II)

The Northern Canyonlands Section of the Colorado Plateaus Province is intersected by the Project in western Colorado and eastern Utah. Project jurisdictions include the Grand Junction FO, Moab FO, and Price FO. The characteristic landscape is defined by steep, sheer-walled canyons, canyonlands, linear cliffs, low plateaus, mesas, buttes, and badlands. The region's major landforms are the San Rafael Swell and Book Cliffs and overall elevation ranges from 4,200 to 12,700 feet. Vegetation types are blackbrush, juniper-pinyon woodlands, saltbush-greasewood, and shrub steppe. The Colorado River and Green River are major visual and recreational destinations of the region. Cultural features in the analysis area consist of numerous pictograph sites. Viewer population centers include Green River, Thompson Center, and Ferron. The Huntington Lake State Park, beach, and campground is located within view of the Project. Major roads with viewing opportunities include I-70, U.S. 6, Utah SH 10, Utah SH 31. Designated scenic roads include: Dinosaur Quarry-Cedar Overlook Scenic Backway; Energy Loop-Huntington-Eccles Canyons Scenic Byway; Wedge Overlook-Buckhorn Drive Scenic Backway; and Old Railroad Grade/pictograph access.

3.12.5.4 Middle Rocky Mountains Province (Region II)

The Middle Rocky Mountains Province is intersected by the Project in western Colorado and northern Utah. Project jurisdictions include the Little Snake FO, Richfield FO, Salt Lake FO, Vernal FO, and Ashley National Forest, Manti-La Sal National Forest, and Uinta National Forest. The characteristic landscape is defined by steep mountains and inclined to flat valleys, with elevations ranging from 5,000 to 8,000 feet. Vegetation types include the spruce-fir, aspen and ponderosa pine, mountain shrub, valley grassland, and riparian communities. Recreational features in the analysis area consist of the Indian Creek and Potters Ponds Campgrounds and recreational facilities associated with Cleveland Lake, Electric Lake, Fairview Lakes, Huntington Reservoir, and Joe Reservoir. Major roads with viewing opportunities include U.S. Highway 6, U.S. Highway 87, Utah SH 31, Utah SH 264, and Utah 764. Designated scenic roads include the Skyline Drive Scenic Backway and Strawberry-White River Scenic Backway.

3.12.5.5 High Plateaus of Utah Section of the Colorado Plateaus Province (Region II)

The High Plateaus of Utah Section of the Colorado Plateaus Province is intersected by the Project in central Utah. Project jurisdictions are the Richfield FO, and Fishlake National Forest, and Manti-La Sal National Forest. USFS campgrounds and recreational locations in the affected environment include the Maple Grove Campground and Scipio Lake. Viewer population centers include Aurora and Mount Pleasant. Major roads with viewing opportunities include I-70, U.S. 89, U.S. 50, and numerous recreational roads. Designated scenic roads include the Gooseberry-Fremont Road Scenic Backway, Skyline Drive Scenic Backway, and Bitter Springs Backcountry Byway.

3.12.5.6 Great Basin Section of the Basin and Range Province (Region II and Region III)

The Great Basin Section of the Basin and Range Province is intersected by the Project in western Utah and eastern Nevada. Project jurisdictions include the Cedar City FO, Caliente FO, Fillmore FO, Las Vegas FO, Richfield FO, and St. George FO, and Dixie National Forest, Fishlake National Forest, and Manti-La Sal National Forest. The characteristic landscape is defined by steep mountain ranges and wide, flat valleys. Elevation ranges from 3,000 to 10,000 feet. Vegetation types are sagebrush, juniper-pinyon woodlands, dwarf-cedar, mountain mahogany, and saltbush-greasewood. The towns of Caliente, Central, Enterprise, Newcastle, and Pinto represent viewer population centers. Recreational viewer locations include the Little Sahara Recreation Area and Newcastle Reservoir. Cultural features include the Antelope Springs-Old Spanish Trail and Mountain Meadows Massacre Site and Overlook. Major roads with viewing opportunities include I-15, U.S. 50, U.S. 93, U.S. 95, U.S. 93/95, Nevada SH 40, Nevada SH 55, Nevada SH 147, Nevada SH 168, Nevada SH 319, Utah SH 18, Utah SH 21, Utah SH 56, Utah SH 100, Utah SH 132, Utah SH 174, and Utah SH 257. The Silver State Trail is crossed by the Project and its trailheads are located within the Project's immediate foreground viewsheds. Designated scenic roads include the Mojave Desert-Joshua Tree Scenic Backway and Rainbow Backcountry Byway.

3.12.5.7 Sonoran Desert Section of the Basin and Range Province (Region IV)

The Sonoran Desert Section of the Basin and Range Province is intersected by the Project in southern Nevada. The Project jurisdiction is the Las Vegas FO. The characteristic landscape is defined by steep, arid, widely separated short mountain ranges in desert plains, fans, and terraces. Elevation ranges from 300 to 3,500 feet. Lake Mead is the major water formation in the region and the McCullough Mountain Range, Highland Range, and Eldorado Valley are the major landforms. Vegetation communities include palo verde, creosote bush, saguaro, mesquite series, and bursage. The Colorado River is the major visual and recreational destination in the region. Cultural features in the analysis area include the National Historic Old Spanish Trail. Lake Mead, Lake Mead National Recreation Area, and Valley of Fire State Park are major recreational viewing opportunity areas. Viewer population centers include Boulder City, Henderson, and Las Vegas. Numerous recreational roads, recreational sites, and hiking trails are associated with these communities and recreation areas. Roads with viewing opportunities include U.S. 93, U.S. 95, U.S. 93/95, Nevada SH 146, Nevada SH 147, Nevada SH 166, and Nevada SH 582.

3.12.6 Impacts to Visual Resources

Potential impacts to visual resources were identified through BLM and USFS consultation and public scoping. These include potential impacts to people (the viewing public), impacts to scenery, and compliance with BLM visual resource management objectives or consistency with USFS scenic integrity or visual quality objectives.

Visual resources impacts would occur during the construction phase of the project and be caused by vegetation clearing within the ROW and ground disturbance for access roads, transmission line, terminal, and electrode bed construction. Impacts would continue into the operational phase with visibility of structures, overhead conductors, cleared ROWs in tree-covered landscapes, access roads, terminal areas, and electrode bed areas and associated roads and small voltage (nn-kV) electrical lines. Visible elements would be steel lattice guyed towers (with four guy wires), and/or tubular pole towers, steel lattice free-standing towers, up to 180 feet in height, two sets of three (bundled) electrical conductors, not less than 38 feet above the ground, and two shield wires connecting the tops of the towers. The guyed towers are constructed along tangents (straight lines) of the ROW at 1,200- to 1,500-foot spans and the free-standing towers are constructed at the points-of-intersection (angles) and any spans greater than 1,500 feet. This latter detail becomes a compliance issue when applying mitigation **VR-3** (see Section 3.12.6.3), due to the need to replace guyed structures with self-supporting structures for spans greater than 1,500 feet. The larger, more contrasting self-supported structures increase visual impact. Impacts of the decommissioning phase would be similar to those of construction. A Visual Resources Mitigation Plan would be developed prior to construction and will include plans to address specific impacts.

Figure 3.12-5 portrays the visible features of guyed steel lattice (left-hand image) and self-supporting steel lattice (right-hand image) transmission line structures. **Figures 3.12-6** and **3.12-7** portray the comparisons of guyed, self-supporting, and tubular pole structures at 0.25 mile, 0.5 mile, 1 mile, and 2 miles with sky as background and landforms as background, respectively. Nine standard BLM criteria for determination of visual contrasts are analyzed for the two structure types in the tables in **Appendix I**.

Construction and operation phase impacts from any needed access roads are considered along with vegetation clearing of the 250-foot ROW. An Access Road Plan would be developed for the Agency Preferred Alternative during final engineering and design, which would define site-specific access to each structure and temporary work area and would be included as part of the COM Plan.

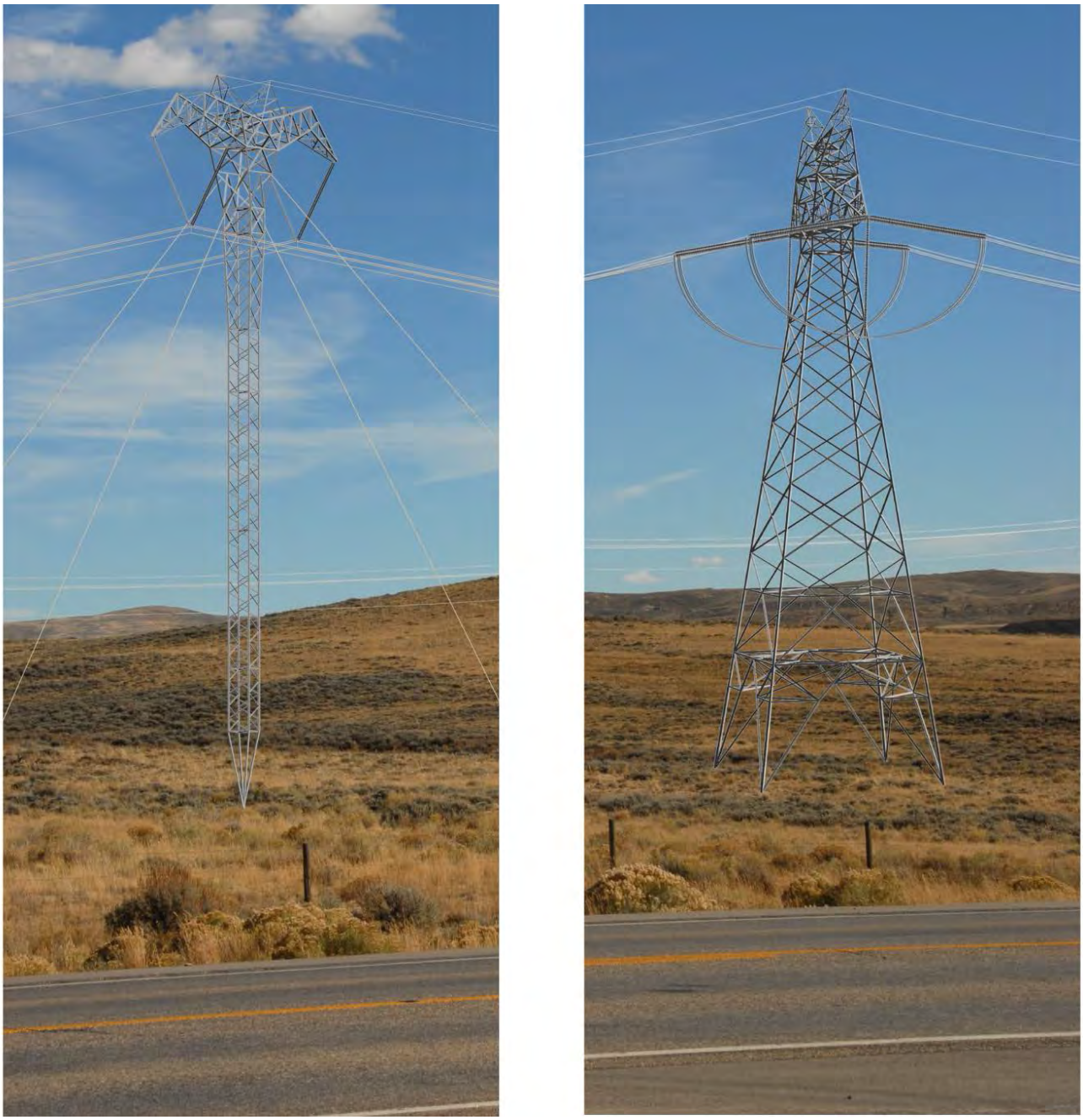

Figure 3.12-5 Guyed Steel Lattice (left) and Self-supporting Steel Lattice (Right) Transmission Line Structures

Figure 3.12-6 Comparisons of Guyed, Self-supporting, and Tubular Pole Structures at 2.0, 1.0, 0.5, and 0.25 miles with Sky as Background

TRANSWEST EXPRESS TRANSMISSION PROJECT

Western AREA POWER ADMINISTRATION

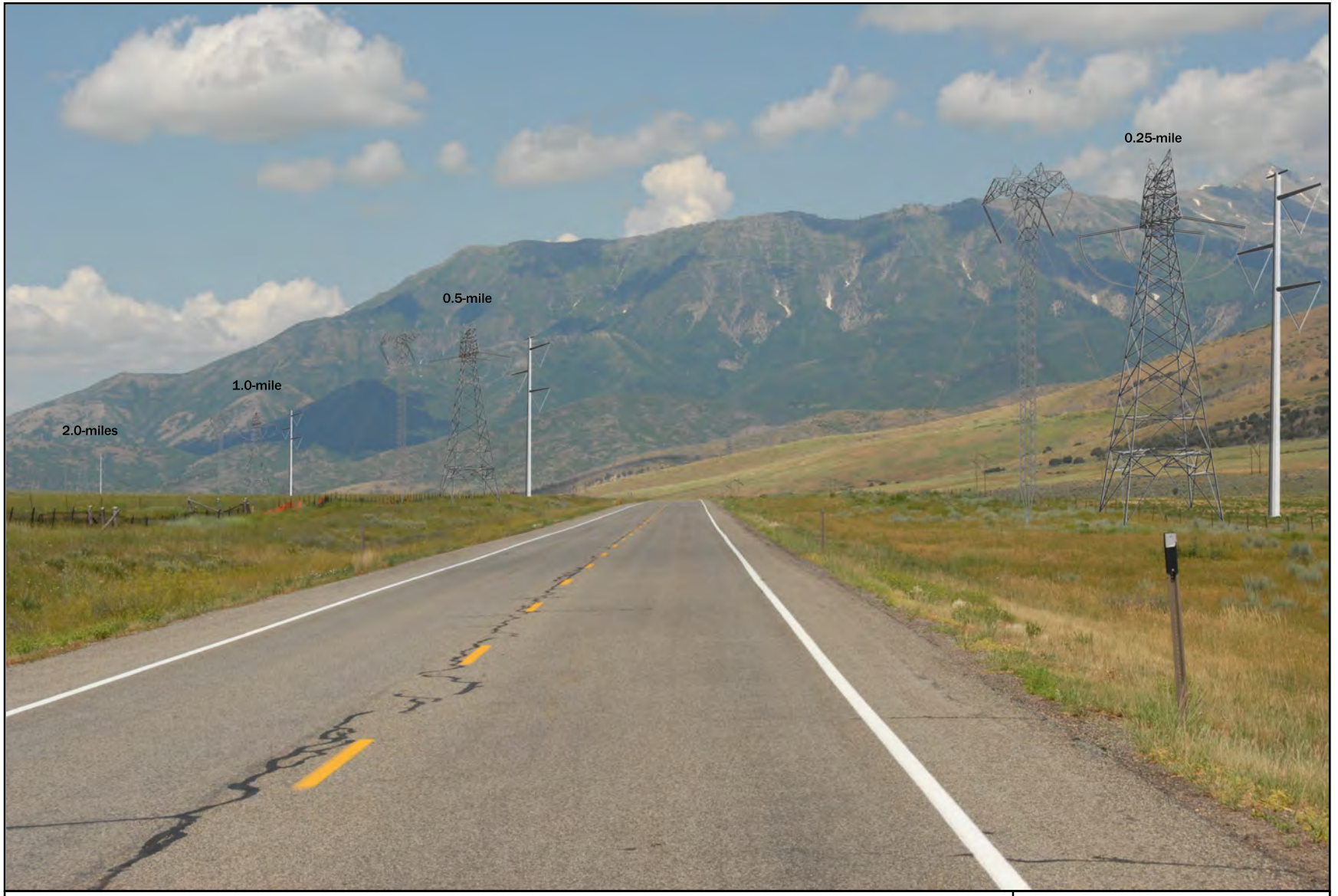

Figure 3.12-7 Comparisons of Guyed, Self-supporting, and Tubular Pole Structures at 2.0, 1.0, 0.5, and 0.25 miles with Landforms as Background

TRANSWEST EXPRESS TRANSMISSION PROJECT

Western AREA POWER ADMINISTRATION

Overall analysis considerations for visual resources are described in **Table 3.12-3**. The analysis of visual resources impacts is based on the assumptions that disturbance of people's views and changes in the scenic landscape are impact parameters. In addition, non-compliance or inconsistency with agency management objectives indicates impact significance. Steel transmission line structures and conductors create visual contrasts out to 5 miles in project landscapes, depending on sun-lighting conditions and relative viewer positions. Vegetation management, which includes tree removal in linear ROWs, exerts visual contrasts in views up to 20 miles in tree-covered landscapes. These contrasts remain until decommissioning and replanting or feathering of the ROW. Visual contrasts from vegetation management in landscapes without tree cover would remain until grasses and shrubs re-inhabit disturbed areas. These contrasts typically diminish within 3 to 5 years. **Appendix I**, **Table I-12** shows estimates of reclamation recovery time based on topographic slopes, topographic aspects, and vegetation cover.

Table 3.12-3 Analysis Considerations for Visual Resources

Topic	Analysis Considerations and Relevant Assumptions
Impacts to people (the viewing public).	Measure the extent of and describe the effects of the Project's structures and disturbed ROWs on people through spatial analysis of BLM's visual resource inventory sensitivity levels and distance zones, USFS viewer concern levels and distances, and viewer sensitivity levels on private, state, and other federal receptors (**Appendix I Tables**).
Impacts to the scenic landscape.	Measure the extent of and describe the effects of the Project's structures and disturbed ROWs on the scenic landscape through spatial analysis of BLM's visual resource inventory visual quality classifications, USFS scenic attractiveness ratings, and scenic quality on private, state, and other federal lands (**Appendix I Tables**).
Compliance or consistency with agency management objectives.	Apply the BLM's visual contrast rating process and forms for views from key observation points to describe the form, line, color, and texture of the characteristic landscape's landform/water, vegetation, and structures and the form, line, color, and texture of the Project's landform/water, vegetation, and structures. Compare the Project with the characteristic landscape to determine visual contrasts between proposed conditions and existing conditions (**Appendix I Tables**). Visual contrast determination includes application of BLM's nine standard criteria for assessing visual contrasts.

A significant impact to visual resources would result if any of the following were to occur from construction or operation of the proposed Project:

- Visually obvious degradation of the foreground character or scenic quality of a visually important landscape.
- Dominant visual changes in the landscape that are seen from highly sensitive viewer locations such as community enhancement areas (e.g., community gateways, roadside parks, viewpoints and historic markers) or locations with special scenic, historic, recreation, cultural, archaeological and/or natural qualities that have been recognized as such through legislation or some other official declaration.
- Impacts to visual resources that are not in compliance with the BLM VRM classifications and/or consistent with Forest Service SIO or VQO classifications.

3.12.6.1 Methodology

Study methods were developed in close coordination with, and direction from, the BLM and USFS and comply with policies of both agencies. The BLM provided visual resource inventories and resource management plans for each of the 15 FOs: Cedar City FO, Caliente FO, Fillmore FO, Grand Junction FO, Las Vegas FO, Little Snake FO, Moab FO, Price FO, Rawlins FO, Richfield FO, Rock Springs FO, Salt Lake FO, St. George FO, Vernal FO, and White River FO. The USFS provided scenic integrity objectives

or visual quality objectives and land management plans for each of the five national forests; Ashley National Forest, Dixie National Forest, Fishlake National Forest, Manti La-Sal National Forest, and Uinta National Forest. KOPs were selected based on visibility of the Project and through approval by each field office and forest. Please see **Figures 3.12-1** through **3.12-4** (Project Regions I through IV) for general locations of alternative routes, KOPs, and viewsheds of the Project. Please see **Appendix I**, **Figure I-1** for specific locations of KOPs, Project reference lines, mileposts, and viewsheds.

Impacts to landscape scenery were determined by measuring the extent of effects of the Project's structures, access roads, and disturbed ROWs on the scenic landscape through spatial analysis of BLM's visual resource inventory visual quality classifications, USFS scenic attractiveness ratings, and scenic quality on private, state, and other federal lands

Impacts to viewers were determined by measuring the extent effects of the Project's structures, access roads, and disturbed ROWs on people through spatial analysis of BLM's visual resource inventory sensitivity levels and distance zones, USFS viewer concern levels and distances, and viewer sensitivity levels on private (including residences), state, and other federal receptors.

Compliance or consistency with agency management objectives involves application of the BLM's visual contrast rating process forms for views from key observation points to describe the form, line, color, and texture of the characteristic landscape's landform/water, vegetation, and structures and the form, line, color, and texture of the Project's landform/water, vegetation, and structures. It also involves comparison of the Project with the characteristic landscape to determine visual contrasts between proposed conditions and existing conditions. Visual contrast determination includes application of BLM's nine standard criteria for assessing visual contrasts. For USFS lands, consistency with SIOs or VQOs involves the comparison of existing landscape integrity with integrity that would occur with implementation of proposed conditions. The presence of utility corridors or utility windows will take precedence over issues of compliance or consistency with agency management objectives.

Impact Parameters

Impacts were assessed by comparing the Project's visual contrasts with landscape scenery, sensitive viewers, and compliance and consistency with BLM and USFS visual management objectives, respectively. Existing transmission lines within 0.5 mile (immediate foreground) of the Project reference line are documented by segment and milepost in **Appendix I**, **Table I-8**. The visual contrasts (strong, moderate, and weak) between the Project's guyed or self-supporting transmission line structures' form, line, and color and existing structures' form, line, and color, within 0.5 mile, are documented in **Appendix I**, **Table I-9**.

The ten standard BLM criteria for determination of visual contrasts were interpreted for applicability for a transmission line and ancillary facilities project of the magnitude of TWE and reduced to nine criteria. The nine criteria are documented in **Appendix I**, **Table I-10** and listed as follows: 1) the distance between observer and Project; 2) length of time the project is in view (linear or stationary viewers – KOPs); 3) the angle of observation; 4) whether the structures and conductors are sun lit (brighter, lighter grays) or in shade (darker, less apparent grays); 5) the presence of guyed, steel lattice tangent structures or larger self-supported, steel lattice angle structures; 6) types of structures in view; 7) relative size or scale; 8) scenic or historic; 9) presence of residential; and 10) reclamation recovery time.

Landscape scenery impacts (**Table 3.12-4**) were determined based on the comparison of contrasts with the scenic quality inventory of the affected environment (**Appendix I**, **Figure I-11** and **Appendix I**, **Table I-11**). Segments were documented and mapped where the existing scenic quality would be lowered by the Project to a lower class (Class A to Class B or Class B to Class C) as shown by milepost in **Appendix I**, **Table I-12**. The results are based on consideration of existing scenic quality rating/scores, existing landscape character, presence or absence of existing industrial development (transmission lines, pipelines, etc.), and the effect of introducing the Project into the landscape as either a new or additional

cultural modification. The range of scores for Class A scenery is 19 to 32 and 12 to 18 for Class B Scenery. The Class C scenery threshold is 11 or less. The most impactful score for a detracting cultural modification is minus four (-4). If there are existing cultural modification scores from minus one (-1) through minus four (-4), the effect of the Project would result in no less than a minus four (-4) in total. Thus, the range of possibilities for reducing Class A to Class B is based on an existing Class A score of 19 to 22 and for reducing Class B to Class C, 12 to 15.

Table 3.12-4 Landscape Scenery Impacts

Landscape Scenery Impacts			
	Project Visual Contrast		
Scenic Quality	**Strong**	**Moderate**	**Weak**
Class A	High	High	Moderate
Class B	High	Moderate	Low
Class C	Moderate	Low	Low

Sensitive viewers' impacts were determined based on the comparison of contrasts with sensitivity/user concern levels, distance zones (0 to 0.5 mile, 0.5 to 2.5 miles, 2.5 to 5 miles, and greater than 5 miles) (**Table 3.12-5**), and visibility of the Project (**Table 3.12-6**) (**Appendix I**, **Figures I-5** and **I-6**). The sensitive viewers' impact tables are located in the regional summaries (by Alternative) and Impacts sections (by alternative and segment) and shown by segment and milepost in **Appendix I**, **Table I-13** for high sensitivity viewers, and in **Appendix I**, **Table I-14** for moderate sensitivity viewers.

Table 3.12-5 Sensitivity Level/User Concern Impacts

High Sensitivity Level/User Concern Impacts			
	Project Visual Contrast		
Project Visibility	**Strong**	**Moderate**	**Weak**
0 – 0.5 Miles	High	Moderate	Moderate
0.5 – 2.5 Miles	Moderate	Moderate	Low
2.5 – 5 Miles	Moderate	Low	Low
Greater Than 5 Miles	Low	Low	Low
Medium Sensitivity Level/User Concern Impacts			
0 – 0.5 Miles	High	Moderate	Moderate
0.5 – 2.5 Miles	Moderate	Low	Low
2.5 – 5 Miles	Low	Low	Low
Greater Than 5 Miles	Low	Low	Low

Table 3.12-6 Distance Zones and Project Visibility

Distance Zones and Project Structures Visibility	
Distances	**Project**
Immediate Foreground	0 – 0.5 Miles
Foreground-Middleground	0.5 – 2.5 Miles
Background	2.5 – 5 Miles
Seldom Seen	Greater Than 5 Miles

Table 3.12-6 Distance Zones and Project Visibility

Distance Zones and Project ROW Visibility	
Immediate Foreground	0 – 0.5 Miles
Foreground-Middleground	0.5 – 5 Miles
Background	5 – 20 Miles
Seldom Seen	Greater Than 20 Miles

Compliance with BLM VRM objectives and consistency with USFS SIOs and VQOs was determined by comparison of objectives with visual contrast ratings from 309 KOPs and in High SIO and Retention VQO areas irregardless of the presence of KOPs. Mitigations **VR-1** through **VR-9** (see Section 3.12.6.3) are applied where appropriate and feasible to reduce impacts as much as possible and to identify location and level of residual impacts. The agency management objectives compliance and consistency tables are located in the regional summaries (by alternative) and Impacts sections (by alternative and segment) and in **Appendix I**, **Tables I-15**, **I-16**, and **I-17**. Visual impact levels are summarized in **Table 3.12-7**. BLM compliance or USFS consistency criteria are summarized in **Table 3.12-8**.

Table 3.12-7 Impact Level Criteria

Impact	Criteria
High	The project would be dominant in Class A or Class B landscape scenery. The project would be visible within 0.5 miles of high sensitivity or high user concern viewers.
Moderate	The project would be co-dominant in Class B landscape scenery. The project would be visible within 0.5 to 2.5 miles of medium sensitivity or medium user concern viewers. The project would parallel existing linear features such as roads or pipeline ROWs, or transmission line features at 1,500 feet or more.
Low	The project would be dominant or co-dominant in Class C landscape scenery. The project would be visible with greater than 2.0 miles of medium sensitivity or medium user concern viewers. The project would parallel and be co-dominant with existing transmission line features.

Table 3.12-8 BLM Compliance or USFS Consistency Criteria

VRM/SIO/VQO	Standard
No	The project would have a high or moderate contrast in areas with VRM Class II, SIO High, or VQO Retention management objectives. The project would have a high contrast in areas with VRM Class III, SIO Moderate, or VQO Partial Retention management objectives. The project would have a moderate contrast in areas with VRM Class III, SIO Moderate, or VQO Partial Retention management objectives.
Yes	The project would be in VRM Class IV, SIO Low, or Very Low, or VQO Modification or Maximum Modification.

In addition to the KOP-based compliance analyses of the BLM applied for consistency on USFS lands, analysis has been conducted in those areas of the national forests with High and Moderate SIO and areas of Retention and Partial Retention VQO crossed by the Project where the Project would be inconsistent with management objectives. Portions of the Project that include one or more existing transmission lines and ROW clearings would be fully consistent with the definition of a High and Moderate SIO or Retention and Partial Retention VQO because the landscape character is not intact and the introduction of strong

forms in the landscape would not deviate substantially from the existing character. Where the Project does not parallel an existing transmission line, it would not meet the definition of a High or Moderate SIO or Partial Retention VQO if located within 0.5 miles of the viewer, and more so, in moderate to steep terrain.

If the Project is located within a USFS-designated utility window or corridor, which allows for the construction and operation of transmission line projects, the SIO or VQO classification is negated.

Project Visibility

The visible height threshold for structures was set at 150 feet, the height of the tallest structures' crossarms. That threshold assumes that a person seeing at least the crossarms would perceive the presence of the Project. Permanent access roads were assumed to be 14 feet wide. The cleared ROW was assumed to be 250 feet wide. The ArcGIS viewshed application was used to determine visibility of the Project out to five miles where the reference line would be in shrub, grassland, and cropland landscapes and out to 20 miles where there would be cleared ROWs in forested landscapes.

Landscape character and scenic integrity for USFS lands crossed by the Project is described by alternative, segment, and milepost in **Appendix I**, **Table I-18**. Landscape character for BLM land (by Region and Alternative) is described at the scenic quality rating unit level by Segment and milepost in **Appendix I**, **Table I-19**.

3.12.6.2 Impacts from Terminal Construction and Operation

The Northern and Southern terminals would be constructed regardless of alternative route or design option.

Northern Terminal

The Northern Terminal would be sited on private land (BLM-private checkerboard), 3 miles south of I-80 and Sinclair, Wyoming, and would require initial disturbance of 504 acres for construction and long-term disturbance of 234 acres for operation. This location is in a largely undisturbed, flat area of sage brush and un-vegetated playa.

Due to limited visibility of the Project by the casual observer, impacts to people would be low. Due to diminished visual quality, impacts to Class B scenery would be moderate to high, which would lower the Scenic Quality rating in the immediate area (0.5 mile) to Class C scenery. Project elements would have moderate to strong contrast with the existing landscape. These contrasts would be due to cylindrical and pyramidal forms, vertical and horizontal lines of structures and conductors, silvery-grey and tan colors, smooth textures resulting from the structures of the terminal site, multiple guyed steel lattice structures along the tangent near the terminal site, wider, larger-appearing self-supporting steel lattice structures at the points-of-intersection, fences, and vegetation clearing for roads. Since the color of terminal materials would cause contrasts with the characteristic landscape and also emphasizes form, line, and texture contrasts of those materials, application of **VR-2** (see Section 3.12.6.3) through use of the BLM standard environmental colors (Standard Environmental Color Chart, CC-001, 2008) for the surfaces of terminal structures, tanks and fencing would mitigate contrasts to a weak to moderate level for the terminal in this landscape. Implementation of **VR-8** (see Section 3.12.6.3) lighting guidelines would reduce night-time glare to minimal levels.

Southern Terminal

The Southern Terminal would be sited on private land in the Eldorado Valley near Boulder City, Nevada, in an area that is already developed with numerous transmission lines, two substations and two solar facilities. This terminal would require initial disturbance of 412 acres for construction and long-term disturbance of 203 acres for operation.

The Project would be located in flat topography that is largely devoid of vegetation.

Due to visual compatibility of the Project with existing electrical utility structures and developments, the casual observer would not consider visual quality to be substantially diminished. As such, impacts to people and Class C scenery would be low. Project elements would have weak to moderate contrast with the existing landscape. These contrasts would be due to cylindrical and pyramidal forms, vertical and horizontal lines of structures and conductors, silvery-grey and tan colors, smooth textures resulting from the structures of the terminal site, multiple guyed steel lattice structures near the terminal site, wider, larger-appearing self-supporting steel lattice structures at the points-of-intersection, fences, and vegetation clearing for roads. Implementation of mitigation **VR-2** and **VR-8** would diminish the visibility of the Project and further reduce contrasts.

Design Option 2 – Southern Terminal near IPP

The implementation of Design Option 2 would utilize the same alternative routes and construction techniques as the proposed action. As such, impacts from construction and operation of this design option would be the similar to those discussed under the alternative routes. Differences between this design option and the proposed action include the locations of the southern converter station and ground electrode system, as well as the addition of a series compensation station midway between IPP and Marketplace. The southern converter station would be located near IPP in Utah instead of Marketplace in Nevada, and the ground electrode system would be within 50 miles of IPP. Construction and operation of a converter station near IPP, ground electrode system, and series compensation station would be expected to impact visual resources as discussed under the Southern Terminal.

Design Option 3 – Phased Build Out

The implementation of Design Option 3 would utilize the same alternative routes, facilities, and construction techniques as the proposed action. Impacts from construction and operation of this design option would be the same as those discussed under the other terminals and design options.

3.12.6.3 Impacts Common to all Alternative Routes and Associated Components

Construction Impacts

Visual resources would be impacted from transmission line construction due to the activities necessary to build the transmission line and related facilities. Viewshed disturbance includes guyed steel lattice and self-supporting steel lattice structures (**Figure 3.12-5**), conductors, cleared ROWs, temporary buildings and shelters, fences, and construction-related equipment, debris storage, and ground areas cleared for construction, such as Project access roads, transmission line tower work areas, conductor stringing and tensioning sites, communication and regeneration sites, material storage yards, batch plants, fly yards, staging areas, ground electrode systems, and one low voltage electrical line associated with each ground electrode system.

Direct impacts to people and scenery would occur from modifications of the characteristic landscape, and from introductions of contrasting forms, lines, colors and textures of landform, vegetation, and structures needed to accommodate Project construction activities.

In undeveloped areas, pyramidal forms of structures, vertical and horizontal lines of structures and conductors, silvery-grey and tan (ROW) colors, and smooth textures would result from multiple guyed steel lattice structures along the tangents, a single, wider, larger appearing, self-supporting steel lattice structure at the points-of-intersection and longer spans, and vegetation clearing, fences, and roads. These elements would contrast with existing characteristic landscapes to a moderate to strong degree. In viewsheds with existing electrical transmission line structures and ground disturbances, contrasts would be weak to moderate, depending on distance from the observer and number and type of structures (**Appendix I**,

Tables I-8 and **I-9**). In all cases, construction activities occurring in the immediate foreground of the observer would cause greater contrasts than those appearing at a further distance.

The introduction of the Project's construction-related structures, equipment, and areas' cubed forms, horizontal and vertical lines, multiple colors, and smooth textures in undeveloped areas would contrast with the characteristic landscape to a strong degree. In viewsheds with existing developed activities, contrasts would be weak to moderate, depending on proximity of the Project with similar activities and distance from observers.

In the short term of construction, direct impacts to people and scenery would be expected to be moderate to high and contrasts would comply with BLM VRM Class IV management objectives, and be consistent with USFS Low and Very Scenic Integrity Objectives and USFS Modification and Maximum Modification Visual Quality Objectives. Project construction activities, as discussed in the plan of development, that are located within 0.5 mile of high or moderate sensitivity viewers and have strong or moderate contrasts, would not be expected to comply with BLM VRM Classes III, or be consistent with USFS SIO High, or Medium, and USFS VQO Retention, or Partial Retention management objectives. Mitigations involving distances greater than 0.5 mile typically would reduce visual contrasts to moderate and, therefore, result in compliance with VRM Class III, and consistency with SIO Medium, and VQO Partial Retention management objectives.

Mitigation

The following nine mitigations are proposed for the Project. These mitigations would be applied to all high and moderate impacts to reduce impact levels for landscape scenery, sensitive viewers, compliance with BLM VRM objectives, and consistency with USFS SIOs or VQOs. For the purposes of analysis, impacts of these mitigations and residuals are disclosed in the following sections.

VR-1*: Remove pinyon-juniper trees only as necessary for construction and maintenance of transmission towers and access roads. Feather the edges of any clearings. Pinyon-juniper trees in the ROW that are outside of the tower and road construction zone are left in place. Leave other trees in the ROW that would not present a safety or engineering hazard or otherwise interfere with operations. Where feasible, top rather than remove trees that exceed the allowable height. Openings in vegetation for facilities, structures, and roads should mimic, to the extent possible, the size, shape, and characteristics of naturally occurring openings.*

Effectiveness: This mitigation would substantially reduce impacts in immediate foreground, foreground-middleground, and background viewing situations.

VR-2*: Use BLM environmental colors (Standard Environmental Colors, Color Chart CC-001, 2008) for surface coatings of permanent buildings, fences, gates, and tanks at terminal sites. Color selection is based on site-specific assessment at each site. Paint grouped structures the same color to reduce visual complexity and color contrast.*

Effectiveness: This mitigation would substantially reduce impacts of the terminal sites.

VR-3*: Locate structures, roads, and other project elements as far back from road, trail, and river crossings (linear KOPs) as possible, and, where feasible, employ terrain and vegetation to screen views from crossings.*

Effectiveness: This mitigation would substantially reduce visual contrasts by decreasing the apparent size and extent of structures.

***VR-4**: In areas with no existing transmission lines move the transmission line (reference line) away from the immediate foreground of stationary (non-linear) KOPs to a distance of 0.5 miles or more. Where feasible, approach and cross linear KOPs such as roads and trails at right angles.*

Effectiveness: This mitigation would reduce visual contrasts from strong to moderate and moderate to weak.

***VR-5**: Materials and surface treatments of structures and land disturbances should repeat and/or blend with the existing form, line, color, and texture of the landscape and have little or no reflectivity (non-specular).*

Effectiveness: This mitigation would substantially reduce visual contrasts.

***VR-6**: Where paralleling an existing transmission line, where possible, place the structures to match the locations of structures in the existing line.*

Effectiveness: This mitigation would reduce line and form structure contrasts by blending structures with existing structures.

***VR-7**: Where possible, position roads at the toe of a slope, at the edge of vegetation openings, and perpendicular with the line of sight.*

Effectiveness: This mitigation would substantially reduce visual contrasts by blending roads and associated grading into the landscape.

***VR-8**: Minimize lighting at terminal and construction facilities to the extent permitted by OSHA and down-shield lights to reduce night glare and light pollution.*

Effectiveness: This mitigation would substantially reduce night-time visual contrasts by diminishing the effects of lighting on the night landscape.

***VR-9**: Where possible in tree-covered moderate to steep terrain, perform construction operations for towers and conductors with helicopters to reduce the need for access roads and laydown clearings.*

Effectiveness: This mitigation would substantially reduce visual contrasts by eliminating the need for terrain modification, grading and drainage disturbances and tree removal.

Implementation of mitigation **VR-1**, selective clearing of pinyon-juniper vegetation in the 250-foot-wide ROW would substantially reduce impacts in the immediate foreground, foreground-middleground, and background viewing situations. **Figures 3.12-8**, **3.12-9**, and **3.12-10** show a representative existing condition, simulated condition with full ROW clearing, and simulated mitigation with selective clearing in the zone of construction for structures, respectively. This example is located in Utah near the Mountain Meadows National Historic Landmark and Site, along Alternative III-A, Segment 501, Milepost 7.

Operation Impacts

Visual resources would be impacted during the operation of the Project due to contrasts from guyed steel lattice and/or self-supporting steel lattice structures, two electrical conductor phases with three wires per phase, terminal facilities, ground electrode facilities, and disturbance by cleared ROWs, permanent access roads and other areas of ground or vegetation disturbance.

Direct impacts to viewsheds similar to those discussed for the construction phase would be expected.

Figure 3.12-8 **Existing Condition for the Mountain Meadows National Historic Landmark and Site KOP Showing One Steel Lattice Transmission Line, Two H-frame Transmission Lines, and One Pipeline ROW Clearing**

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.12-9 **Simulated Condition for the Mountain Meadows National Historic Landmark and Site showing the TWE Guyed Transmission Line Structures and the Cleared 250-foot ROW**

TRANSWEST EXPRESS TRANSMISSION PROJECT

Western AREA POWER ADMINISTRATION

Figure 3.12-10 **Simulated Mitigation Condition for the Mountain Meadows National Historic Landmark and Site KOP showing the TWE Guyed Transmission Line Structures and the Selectively-cleared 250-foot ROW**

TRANSWEST EXPRESS TRANSMISSION PROJECT

Western AREA POWER ADMINISTRATION

Direct impacts to people and scenery would be expected to be moderate to high and contrasts would comply with BLM VRM Class IV management objectives, and be consistent with USFS Low and Very Low Scenic Integrity Objectives and USFS Modification and Maximum Modification Visual Quality Objectives. Project construction activities, as discussed in the plan of development, that are located within 0.5 mile of high or moderate sensitivity viewers and have strong or moderate contrasts, would not be expected to comply with BLM VRM Classes II or III, or be consistent with USFS SIO High, or Medium, and USFS VQO Retention, or Partial Retention management objectives. Mitigations involving distances greater than 0.5 mile typically would reduce visual contrasts to moderate and, therefore, result in compliance with VRM Class III, and consistency with SIO Medium, and VQO Partial Retention management objectives.

Indirect viewshed impacts would result from disturbance by human recreational activities, artifacts of activities, and vehicles with access to scenic landscapes by the Project's permanent access roads. Indirect impacts during operation would be expected to comply with agency management objectives in BLM VRM Class III and IV areas and be consistent with USFS SIO Medium and Low or USFS VQO Partial Retention, Modification, or Maximum Modification management objectives. Due to effects in landscapes without existing cultural modifications or with intact scenic integrity, indirect impacts in the immediate foreground 0.5 mile from sensitive viewers may not comply with BLM VRM Class II management objectives or be consistent with USFS SIO High or USFS VQO Retention management objectives. It is expected these impacts would be mitigated as much as possible on a case-by-case basis.

Design Option 2

Design Option 2 would consist of a 600-kV DC tubular pole transmission line from the Northern Terminal near Rawlins, WY to a new AC/DC converter station near the existing IPP substation near Delta, Utah. From the new converter station, a 500-kV AC transmission line would be constructed to connect with one of the existing substations in the Eldorado Valley, south of Boulder City, Nevada (Marketplace Hub). Design Option 2 would consist of the following elements that are different from the Project, that would cause effects to visual resources, scenery, and people: 1) 100 to 150-foot tall tubular pole structures with three conductors, and two static/communication wires (**Figures 3.12-6** and **3.12-7** show the character of these structures at distances of 0.25, 0.5, 1.0, and 2.0 miles with sky as background and landforms as background, respectively); 2) 345-kV AC transmission line of less than five miles between the new converter station and the existing IPP 345-kV AC substation; a series compensation station (similar to a small 500-kV substation) near the halfway point in the 500-kV line between IPP and Marketplace Hub.

The effects of Design Option 2 ROW clearing and access roads would be the same as for the Project. The tubular pole structures would cause decreased effects in the immediate foreground with sky as background (all road, river, and trail crossings) as compared with the guyed and self-supporting lattice structures (**Figure 3.12-6**). The tubular pole structures would cause increased effects beyond the immediate foreground with landforms as background, as compared with the guyed and self-supporting lattice structures (**Figure 3.12-7**). Non-specular (dulled surfaces) structure mitigations would decrease visual impacts in all cases as compared with specular (reflective) structures. However, the tubular pole structures would still have increased effects beyond the immediate foreground, as compared with guyed and self-supporting lattice structures. The additional (3rd) conductor, as compared with the Project's two conductors with three phases (wires), would have minimal increased effects on visual resources and not be consequential to the casual observer. The existing character of the IPP area is dominated by utility structures, roads, and buildings. As such, the addition of the new AC/DC converter station and transmission line would have minimal increased effects as compared to the existing conditions.

Design Option 3

Design Option 3 would consist of a "phased-buildout" of the Project and have similar effects to visual resources.

Decommissioning Impacts

Impacts to visual resources during the decommissioning phase of the Project would be similar to construction impacts.

3.12.6.4 Region I

Impact parameters that relate to the impact discussion in Section 3.12.6.3, Impacts Common to all Alternative Routes and Associated Components, and differences by alternative are presented in this section. The segment-specific table information for high and moderate sensitivity viewers distance zones, scenic quality, visual resource inventory classifications, agency management classifications, residual impacts, compliance or consistency with BLM VRM, USFS SIO or VQO, and intersection of the Project reference line with utility corridors or utility windows are summarized in **Table 3.12-9**. Segment- and milepost-specific Region I inventory data and impact results for these topics are shown in the corresponding tables in **Appendix I**. The KOP figures in **Appendix I** indicate the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation.

The application of substantive mitigation measures would reduce visual impacts from high to moderate, or moderate to low. These reductions are applicable to viewing situations involving stationery (non-linear) viewers and to landscapes where tree cover and moderate to steep landforms contribute strongly to visual impacts. Residual impacts by Alternative and Segment are listed for landscape scenery, high viewer sensitivity and moderate viewer sensitivity in **Table 3.12-9**. Residual impacts by Region, Alternative, Segment, and mileposts (as if, “walking the line”) are listed in the corresponding tables in **Appendix I**.

Compliance or Consistency with Agency Management Objectives

Maps showing locations where agency management objectives would be met and would not be met are shown in **Appendix I**, **Figure I-12**. Photographic simulations of the Project, for those KOP locations where agency management objectives would not be met, are shown in the KOP figures in **Appendix I**, following the applicable KOP analysis sheet. Maps showing locations where applications of mitigation **VR-4** to the reference line would reduce impacts to levels compliant or consistent with agency management objectives are shown in **Appendix I**, **Figure I-13**. Maps showing locations where agency management objectives would be met with mitigation and where agency management objectives are not applicable are shown in **Appendix I**, **Figure I-14**. Mitigation **VR-4** would be applicable to, and subject to routing engineering study for reference lines within 0.5 mile of linear KOPs, except for those reference lines crossing roads. Designated utility corridors considered in the analysis are shown in **Appendix I**, **Figure I-15**.

Scenic Quality

Existing scenic quality may be lowered by the Project, depending on the context. This is determined based on analysis of existing scenic quality rating/scores, existing landscape character, presence or absence of existing industrial development (transmission lines, pipelines, land disturbances, etc.), and the effect of introducing the Project into the landscape as either a new or additional cultural modification. Those segments where the existing scenic quality would be lowered by the Project to a lower class (Class A to Class B or Class B to Class C) are shown in **Table 3.12-10**. Segment- and milepost-specific data for change in scenic quality is shown in **Appendix I**, **Table I-12**.

Table 3.12-9 Region I Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Alternative I-A																																				
Alternative I-A Totals	**155**	**13**	**74**	**48**	**20**	**10**	**53**	**45**	**47**	**<1**	**61**	**93**	**29**	**41**	**85**	**--**	**72**	**43**	**--**	**--**	**--**	**58**	**53**	**44**	**7**	**97**	**51**	**8**	**38**	**109**	**110**	**5**	**40**	**110**	**5**	**40**	**5**
20	<1	<1	--	--	--	--	<1	--	--	--	--	<1	--	--	<1	--	--	--	--	--	--	--	<1	--	<1	--	--	--	<1	--	--	--	<1	--	--	<1	--
30	32	7	17	8	--	5	15	12	--	--	15	17	19	1	13	--	--	16	--	--	--	13	10	9	3	29	1	4	10	18	16	--	17	16	--	17	--
40	10	1	2	6	1	1	2	6	1	--	--	10	--	--	10	--	--	5	--	--	--	--	--	10	--	1	9	--	1	9	5	--	5	5	--	5	<1
100	19	<1	14	5	--	<1	19	--	--	--	4	15	--	--	19	--	13	--	--	--	--	3	10	6	<1	13	6	--	14	5	13	--	6	13	--	6	2
110	15	1	10	5	--	--	3	6	6	--	--	15	--	6	9	--	2	6	--	--	--	--	--	15	--	1	14	--	--	15	8	--	7	8	--	7	--
110.05	4	--	2	2	--	--	--	2	2	--	--	4	--	2	2	--	--	2	--	--	--	--	--	4	--	2	2	--	--	4	2	--	2	2	--	2	--
120	23	--	6	11	6	1	5	3	14	--	9	14	1	12	10	--	12	11	--	--	--	9	14	--	--	17	6	1	5	17	20	2	<1	20	2	<1	--
180	2	2	<1	--	--	--	2	--	--	--	2	--	2	--	--	--	2	--	--	--	--	2	--	--	2	<1	--	--	2	--	<1	2	--	<1	2	--	<1
180.05	14	--	9	3	1	--	1	8	5	--	4	10	3	--	11	--	13	1	--	--	--	4	10	--	--	12	1	--	1	13	14	--	--	14	--	--	1
180.2	35	2	13	8	12	3	5	8	19	--	26	9	4	20	11	--	30	2	--	--	--	26	9	--	2	21	12	3	5	27	31	1	3	13	1	3	1
Alternative I-B																																				
Alternative I-B Totals	**159**	**13**	**64**	**57**	**25**	**15**	**54**	**51**	**39**	**1**	**60**	**98**	**40**	**22**	**97**	**--**	**88**	**25**	**--**	**--**	**--**	**57**	**51**	**51**	**7**	**92**	**60**	**12**	**38**	**109**	**105**	**8**	**46**	**105**	**8**	**46**	**18**
20	<1	<1	--	--	--	--	<1	--	--	--	--	<1	--	--	<1	--	--	--	--	--	--	--	<1	--	<1	--	--	--	<1	--	--	--	<1	--	--	<1	--
30	32	7	17	8	--	5	15	12	--	--	15	17	19	1	13	--	--	16	--	--	--	13	10	9	3	29	1	4	10	18	16	--	17	16	--	17	--
40	10	1	2	6	1	1	2	6	1	--	--	10	--	--	10	--	--	5	--	--	--	--	--	10	--	1	9	--	1	9	5	--	5	5	--	5	<1
50	5	--	5	--	5	--	--	5	--	--	--	5	--	--	5	--	1	<1	--	--	--	--	--	5	--	--	5	--	--	5	1	--	4	1	--	4	--
60	19	1	4	12	2	1	4	7	7	--	--	19	--	2	17	--	12	<1	--	--	--	--	--	19	--	5	15	--	1	18	12	<1	7	12	<1	7	9
70	22	--	2	3	18	1	3	3	15	--	11	11	11	5	6	--	19	3	--	--	--	11	11	--	--	5	18	1	3	17	20	2	--	20	2	--	2
100	19	<1	14	5	--	<1	19	--	--	--	4	15	--	--	19	--	13	--	--	--	--	3	10	6	<1	13	6	--	14	5	13	--	6	13	--	6	2

Table 3.12-9 Region I Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
180	2	2	<1	--	--	--	2	--	--	--	2	--	2	--	--	--	2	--	--	--	--	2	--	--	2	<1	-	--	2	--	<1	2	--	<1	2	--	<1
180.05	14	--	9	3	1	<1	1	8	5	--	4	10	3	--	11	--	13	1	--	--	--	4	10	--	--	12	1	--	1	13	14	--	--	14	--	--	1
186	34	2	16	12	4	7	6	10	11	1	23	10	5	14	14	--	27	<1	--	--	--	24	10	--	2	28	4	7	6	21	24	4	6	23	4	6	3
190.05	1	--	--	1	--	--	1	--	--	--	--	1	--	--	1	--	1	--	--	--	--	--	--	1	--	--	1	--	--	1	1	--	<1	1	--	<1	--
Alternative I-C																																					
Alternative I-C Totals	**186**	**73**	**88**	**24**	**1**	**67**	**96**	**23**	**--**	**<1**	**94**	**91**	**29**	**60**	**97**	**--**	**38**	**45**	**--**	**--**	**--**	**52**	**59**	**75**	**28**	**117**	**41**	**31**	**81**	**74**	**82**	**<1**	**104**	**82**	**<1**	**104**	**42**
20	<1	<1	--	--	--	--	<1	--	--	--	--	<1	--	--	<1	--	--	--	--	--	--	--	<1	--	<1	--	--	--	<1	--	--	--	<1	--	--	<1	--
30	32	7	17	8	--	5	15	12	--	--	15	17	19	1	13	--	--	16	--	--	--	13	10	9	3	29	1	4	10	18	16	--	17	16	--	17	--
100	19	<1	14	5	--	<1	19	--	--	--	4	15	--	--	19	--	13	--	--	--	--	3	10	6	<1	13	6	--	14	5	13	--	6	13	--	6	2
130	22	18	4	--	--	19	3	--	--	--	6	16	3	8	10	--	--	12	--	--	--	6	<1	16	6	12	14	6	12	3	12	--	10	12	--	10	9
140	16	16	1	--	--	11	5	--	--	--	14	3	4	8	5	--	--	14	--	--	--	--	14	3	--	16	--	--	11	5	14	--	2	14	--	2	9
140.05	2	2	1	--	--	1	1	--	--	--	<1	2	--	2	--	--	--	<1	--	--	--	<1	2	--	2	1	--	1	1	--	<1	--	2	<1	--	2	<1
190	93	30	52	10	1	31	51	11	--	<1	54	38	3	42	48	--	24	2	--	--	--	30	23	41	17	46	30	19	33	40	<1	--	67	25	<1	67	22
190.05	1	--	--	1	--	--	1	--	--	--	--	1	--	--	1	--	1	--	--	--	--	--	--	1	--	--	1	--	--	1	1	--	<1	1	--	<1	--
Alternative I-D																																					
Alternative I-D Totals	**171**	**20**	**105**	**41**	**6**	**13**	**67**	**62**	**29**	**1**	**76**	**94**	**32**	**39**	**100**	**--**	**85**	**44**	**--**	**--**	**--**	**59**	**61**	**51**	**10**	**119**	**42**	**11**	**38**	**121**	**114**	**14**	**43**	**114**	**14**	**43**	**7**
20	<1	<1	--	--	--	--	<1	--	--	--	--	<1	--	--	<1	--	--	--	--	--	--	--	<1	--	<1	--	--	--	<1	--	--	--	<1	--	--	<1	--
30	32	7	17	8	--	5	15	12	--	--	15	17	19	1	13	--	--	16	--	--	--	13	10	9	3	29	1	4	10	18	16	--	17	16	--	17	--
40	10	1	2	6	1	1	2	6	1	--	--	10	--	--	10	--	--	5	--	--	--	--	--	10	--	1	9	--	1	9	5	--	5	5	--	5	<1
100	19	<1	14	5	--	<1	19	--	--	--	4	15	--	--	19	--	13	--	--	--	--	3	10	6	<1	13	6	--	14	5	13	--	6	13	--	6	2

Table 3.12-9 Region I Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
110	15	1	10	5	--	--	3	6	6	--	--	15	--	6	9	--	2	6	--	--	--	--	--	15	--	1	14	--	--	15	8	--	7	8	--	7	--
115	7	1	6	<1	--	--	2	5	--	--	--	7	--	3	4	--	--	5	--	--	--	--	--	7	--	1	6	--	--	7	5	--	2	5	--	2	--
115.05	18	3	14	--	--	--	11	7	--	--	15	3	--	4	13	--	7	10	--	--	--	--	15	3	--	18	--	--	--	18	16	2	<1	16	2	<1	--
115.07	18	5	14	--	--	<1	5	7	5	--	12	7	2	11	5	--	18	--	--	--	--	12	7	--	5	14	--	<1	5	13	10	8	<1	10	8	<1	--
115.1	3	--	3	--	--	--	1	2	--	--	3	--	3	--	--	--	3	--	--	--	--	3	--	--	--	3	--	<1	1	2	3	--	--	3	--	--	<1
180.05	14	--	9	3	1	--	1	8	5	--	4	10	3	--	11	--	13	1	--	--	--	4	10	--	--	12	1	--	1	13	14	--	--	14	--	--	1
186	34	2	16	2	4	7	6	10	11	1	23	10	5	14	14	--	27	<1	--	--	--	24	10	--	2	28	4	7	6	21	23	4	6	23	4	6	3
190.05	1	--	--	1	--	--	1	--	--	--	--	1	--	--	1	--	1	--	--	--	--	--	--	1	--	--	1	--	--	1	1	--	<1	1	--	<1	--
Mexican Flats Connector																																					
Mexican Flat Connector Totals	**10**	**2**	**2**	**4**	**2**	**1**	**2**	**3**	**4**	**--**	**<1**	**10**	**--**	**<1**	**10**	**--**	**--**	**9**	**--**	**--**	**--**	**<1**	**2**	**8**	**2**	**2**	**6**	**1**	**1**	**8**	**9**	**<1**	**1**	**9**	**<1**	**1**	**1**
150	4	--	2	2	--	--	1	3	<1	--	--	4	--	--	4	--	--	3	--	--	--	--	--	4	--	2	2	--	--	4	3	--	<1	3	--	<1	--
150.05	2	2	<1	--	--	1	1	--	--	--	<1	2	--	<1	2	--	--	2	--	--	--	<1	2	--	2	<1	--	1	1	2	2	--	<1	2	--	<1	1
160	4	--	--	2	2	--	--	--	4	--	--	4	--	--	4	--	--	4	--	--	--	--	--	4	--	--	4	--	--	4	4	--	<1	4	--	<1	--
Baggs Connector																																					
Baggs Connector Totals	**22**	**2**	**19**	**1**	**--**	**1**	**10**	**11**	**--**	**--**	**20**	**2**	**8**	**12**	**2**	**--**	**18**	**<1**	**--**	**--**	**--**	**20**	**2**	**--**	**2**	**20**	**--**	**1**	**10**	**11**	**13**	**5**	**4**	**13**	**5**	**4**	**<1**
170	3	1	2	--	--	1	2	--	--	--	2	1	--	2	1	--	2	<1	--	--	--	2	1	--	1	2	--	1	2	--	2	<1	1	2	<1	1	<1
170.05	17	--	16	1	--	--	7	10	--	--	17	1	6	10	1	--	14	--	--	--	--	17	1	--	--	17	--	--	7	10	11	3	3	11	3	3	--
170.1	2	1	1	--	--	--	1	1	--	--	2	--	2	--	--	--	2	--	--	--	--	2	--	--	1	1	--	--	1	1	1	1	--	1	1	--	--

Table 3.12-9 Region I Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Fivemile Point North Connector																																					
116 (Total)	3	2	1	--	--	1	2	--	--	--	3	<1	--	3	--	--	2	<1	--	--	--	3	<1	--	2	1	--	1	2	--	<1	2	<1	1	2	<1	1
Fivemile Point South Connector																																					
117 (Total)	2	--	2	--	--	--	2	--	--	--	2	--	--	2	1	--	2	--	--	--	--	2	<1	--	--	2	--	--	2	--	1	<1	<1	1	<1	<1	--

[1] High Sensitivity and Moderate Sensitivity Viewers' analysis and mapping for the Project encompass public and private viewers' concern for landscape scenery (**Appendix I, Tables I-3** and **I-4**; **Appendix I**, **Figure I-4**). The distance and visibility factors are based on the characteristics of TWE facilities, divided into four zones(**Appendix I**, **Tables I-3** and **I-4**; **Appendix I**, **Figures I-4**, **I-5**, and **I-6**).

[2] Scenic Quality or scenic attractiveness is rated Class A, Class B, or Class C for highest to lowest quality or attractiveness (**Appendix I, Table I-1**; **Appendix I, Figures I-2** and **I-3**).

[3] BLM VRI classifications represent this relative value of visual resources and provide the basis for considering visual values in the resource management planning process. VRI Class II, III, and IV (high to low) are determined based on the combination of scenic quality, sensitivity levels, and distance zones. VRI Class I is assigned to special management areas (**Appendix I, Table I-5**; **Appendix I, Figure I-7**).

[4] BLM VRM classifications result from the RMP land use planning process for all BLM-administered lands (**Table 3.12-1**) (**Appendix I, Table I-7**; **Appendix I**, **Figure I-8**).

[5] USFS SIO or VQO Classifications result from the national forest planning process for all USFS-administered lands (**Table 3.12-2**) (**Appendix I, Table I-7**; **Appendix I**, **Figure I-8**).

[6] Residual Impacts for Landscape Scenery (**Table 3.12-7**) involves the comparison of contrasts after mitigation with the scenic quality inventory of the affected environment (**Table 3.12-4**).

[7] Residual Impacts for High Sensitivity and Moderate Sensitivity Viewers (**Table 3.12-5**) involves comparison of contrasts after mitigation with distance zones (**Table 3.12-6**) and viewers' concern levels (**Table 3.12-5**).

[8] BLM VRM, USFS SIO, or USFS VQO Compliance or Consistency (**Table 3.12-8**) involves comparisons of agency management objectives with contrast ratings from 309 KOPs (**KOP Figures** in **Appendix I**).

[9] Calculations associated with Utility Corridors and Utility Windows involve the intersection of the Project reference line with the areas/polygons of the corridors or windows. These corridors or windows take precedence over the compliance and consistency determinations and as such negate the need for updates of the land use plans.

Note: Discrepancies in totals due to rounding. Segment numbers depicted in **Figure 2-21**.

Table 3.12-10 Region I Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
Alternative I-A				
20	<1	--	--	<1
30	32	--	--	32
40	10	--	--	10
100	19	--	--	19
110	15	--	--	15
110.05	4	--	--	4
120	23	--	2	21
180	2	--	2	--
180.05	14	--	4	10
180.2	35	--	26	9
Alternative I-B				
20	<1	--	--	<1
30	32	--	--	32
40	10	--	--	10
50	5	--	--	5
60	19	--	--	19
70	22	--	1	21
100	19	--	--	19
180	2	--	2	--
180.05	14	--	4	10
186	34	--	22	12
190.05	1	--	--	1
Alternative I-C				
20	<1	--	--	<1
30	32	--	--	32
100	19	--	--	19
130	22	--	6	16
140	17	--	14	3
140.05	2	--	<1	2
190	93	<1	11	81
190.05	1	--	--	1
Alternative I-D				
20	<1	--	--	<1
30	32	--	--	32
40	10	--	--	10

Table 3.12-10 Region I Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
100	19	--	--	19
110	15	--	--	15
115	7	--	--	7
115.05	18	--	15	3
115.07	19	--	12	7
115.1	3	--	3	--
180.05	14	--	4	10
186	34	--	22	12
190.05	1	--	--	1
Mexican Flats Connector				
150	4	--	--	4
150.05	2	--	<1	2
160	4	--	--	4
Baggs Connector				
170	3	--	2	1
170.05	17	--	16	1
170.1	2	--	2	--
Fivemile Point North Connector				
116	3	--	3	<1
Fivemile Point South Connector				
117	2	--	2	<1

Segment numbers depicted in **Figure 2-21**.

Public Viewers and Visibility of the Project

Immediate foreground (0 to 0.5-mile) visibility of the Project is influential in the experiences of viewers and indicative of the level of impacts to people. The following **Table 3.12-11** indicates visibility by alternative and segment for those immediate foreground public places, designated special management areas, lakes and reservoirs, rivers, roads, scenic byways and backways, and historic trails where visual resources are important to recreational and viewer experiences. Viewing situations in these locations are both stationary and mobile.

Table 3.12-11 Region I Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
I-A	30	Coal Creek, Continental Divide National Scenic Trail, Continental Divide Trail, Hay Gulch, Rawlins to Baggs Rd, Rawlins to Baggs Stage Rd, Red Rim-Daley, SR 71, Twentymile Rd 3 Residences
I-A	40	SR 789, The Outlaw Trail Scenic Loop 0 Residences
I-A	100	Lower Wolf Creek Reservoir Number 2, Tuttle Ranch, Winter Valley 0 Residences

Table 3.12-11 Region I Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
I-A	110	8 Mile Lake Rd, Coal Bank Wash, Echo Springs Draw, Eightmile Lake, Fivemile Lake, Wamsutter Rd 0 Residences
I-A	110.05	Coal Gulch, North Barrel Springs Draw 0 Residences
I-A	120	Cedar Breaks Draw, StandaRd Rd, W Hangout Rd, West Flat Top Mountain 0 Residences
I-A	180.05	CR 4, CR 66 0 Residences
I-A	180.2	Camping Unit - North, Camping Unit - South, CR 10, CR 21, CR 21s, CR 66, CR 66b, CR 66n, CR 66w, CR 75, CR 75e, CR 75s, CR 85, East Cross Mtn. River Access, HWY 318, Raftopolis Hunting Lease WMA, Raftopolis Ranch SWA, Sevenmile Ridge, US 40 1 Residence
I-B	30	Coal Creek, Continental Divide National Scenic Trail, Continental Divide Trail, Hay Gulch, Rawlins to Baggs Rd, Rawlins to Baggs Stage Rd, Red Rim-Daley, SR 71, Twentymile Rd 3 Residences
I-B	40	SR 789, The Outlaw Trail Scenic Loop 0 Residences
I-B	50	Wamsutter Crooks Gap Rd 0 Residences
I-B	60	Barrel Springs Rd, Eureka Headquarters Rd 0 Residences
I-B	70	4wd Rd, Adobe Town Dispersed Recreation Use Area, Cherokee Trail, Cherokee Trail Rd, Church Butte, Lower Willow Creek Spring, Reader Cabin Draw, Shell Creek Stock Trl, Windmill Draw Rd 0 Residences
I-B	100	Lower Wolf Creek Reservoir Number 2, Tuttle Ranch, Winter Valley 0 Residences
I-B	180.05	CR 4, CR 66 0 Residences
I-B	186	Cedar Springs Draw, CR 10, CR 21, CR 26, CR 66, CR 66n, CR 85, HWY 318, Lone Tree Gulch, Reservoir Spring, South Cross Mtn. Trailhead, Spence Gulch, US 40 0 Residences
I-C	30	Coal Creek, Continental Divide National Scenic Trail, Continental Divide Trail, Hay Gulch, Rawlins to Baggs Rd, Rawlins to Baggs Stage Rd, Red Rim-Daley, SR 71, Twentymile Rd 3 Residences
I-C	100	Lower Wolf Creek Reservoir Number 2, Tuttle Ranch, Winter Valley 0 Residences
I-C	130	Coal Bank Spring, Overland Trail, Pine Butte, Upper Muddy Creek/Grizzly ACEC 1 Residence
I-C	140	Blue Gap Draw, Cherokee Creek, Little Robbers Gulch, Pines Draw, Rawlins to Baggs Stage Rd, Robbers Gulch, Wild Cow Rd, Wild Horse Draw 0 Residences
I-C	140.05	Deep Creek, White Rock Draw 0 Residences

Table 3.12-11 Region I Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
I-C	190	4wd Rd, 5th Ave, Access Rd, Aiken St, Battle Scenic Highway, Bitter Brush SWA, Blue Gravel Creek, Bogenschutz Creek, Burbank Draw, Cc Rd 601, Cc Rd 702, Cottonwood Creek, CR 100, CR 101, CR 103, CR 107, CR 11, CR 110, CR 117, CR 120, CR 13, CR 139, CR 143, CR 17, CR 173, CR 18, CR 2, CR 213, CR 23, CR 27, CR 30, CR 33, CR 35, CR 38, CR 40, CR 53, CR 57, CR 59, CR 70, CR 73, CR 74, CR 78, CR 86, CR 90, Craig Raw Water Reservoir, Culverwell Reservoir, Dry Cottonwood Creek, East Juniper Mtn. Trailhead, Hicox Draw, Johnson Gulch, Juniper Mountain SRMA, Little Cottonwood Creek, Mesa Ave, Mexican Creek, Rangely Way, Roberts Rd, Saddorus Rd, Sheehan Lane Rd, South Beach Trail Area, SR 13, SR 394, SR 70, Thompson Way, Union St, US 40, W Mesa Rd, Wheatridge Dr, Willow Creek, Wilson St, Yampa River 114 Residences
I-D	30	Coal Creek, Continental Divide National Scenic Trail, Continental Divide Trail, Hay Gulch, Rawlins to Baggs Rd, Rawlins to Baggs Stage Rd, Red Rim-Daley, SR 71, Twentymile Rd 3 Residences
I-D	40	SR 789, The Outlaw Trail Scenic Loop 0 Residences
I-D	100	Lower Wolf Creek Reservoir Number 2, Tuttle Ranch, Winter Valley 0 Residences
I-D	110	8 Mile Lake Rd, Coal Bank Wash, Echo Springs Draw, Eightmile Lake, Fivemile Lake, Wamsutter Rd 0 Residences
I-D	115	Duck Lake, Duck Lake Rd, Little Coal Gulch 0 Residences
I-D	115.05	Hangout Rd, Little Robbers Rd, North Fork Cottonwood Creek, Straten Rd, Streckfus Draw 0 Residences
I-D	115.07	Cottonwood Draw Rd, Government Rd, Hangout Wash, North Prong Red Creek 0 Residences
I-D	115.1	Cherokee Draw 0 Residences
I-D	180.05	CR 4, CR 66 0 Residences
I-D	186	Cedar Springs Draw, CR 10, CR 21, CR 26, CR 66, CR 66n, CR 85, HWY 318, Lone Tree Gulch, Reservoir Spring, South Cross Mtn. Trailhead, Spence Gulch, US 40 0 Residences
Mexican Flats Alternative Connector	150.05	SR 789, Wamsutter Rd 0 Residences
Baggs Alternative Connector	170.05	4wd Rd, Cherokee Rim, CR 144, Devils Canyon, Poison Buttes, Red Creek
Fivemile Point North Alternative Connector	116	Cottonwood Creek, Cottonwood Draw, Rawlins to Baggs Stage Rd, The Bluffs 0 Residences
Fivemile Point South Alternative Connector	117	4wd Rd. 0 Residences

Segment numbers depicted in **Figure 2-21**.

Vegetation Treatments

Scenarios for vegetation treatments are listed in the PDTR (**Appendix D**). Clearing of plants above 4 feet in height would occur in the 250-foot-wide ROW unless otherwise specified in the PDTR. Only the 90-foot-wide “wire zone” and 250-foot-square structure construction area would be cleared in corridors classified as VRM Class II, SIO High, and VQO Retention. Key factors in the determination of impacts to the visual resource include viewing distances, presence or absence of tree cover, and steepness of topographic slopes. Application of **VR-1** would preserve pinyon-juniper trees, except for those impeding

tower and access road construction. The edges between clearings and forest would be feathered in all species. The presence of moderate to steep slopes increases visibility of vegetation treatments for ROWs and for access roads, as compared to flat slopes. These factors are included in the analysis of impacts to scenery and to sensitive viewers. Reclamation recovery time analyses, specific to views from the 294 KOPs and involving topographic slope, topographic aspect and vegetation type, are shown in **Appendix I**, **Table I-10**. The results are central components in **Table 3.12-9**.

The geographic context, distances, and spatial relationship between visual resources and the Project reference lines by segment and milepost for Region I are portrayed by tables and maps of scenic quality classes (**Appendix I**, **Table I-1** and **Figure I-2**), sensitivity levels (**Appendix I**, **Table I-2** and **Figure I-4**), visual resource inventory classes (**Appendix I**, **Table I-5** and **Figure I-7**), and visual resource management classes (**Appendix I**, **Table I-6** and **Figure I-8**). All BLM VRI distance zones were inventoried as foreground-middleground for the Project study area and are therefore not shown with map figures. Project-specific distance zones are included in the analyses for impacts to landscape scenery, sensitive viewers, and compliance or consistency with BLM or USFS management objectives, respectively.

There were 41 KOPs selected, photographed, and analyzed in Region I. The KOP figures in **Appendix I** portray the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation. Thirty-one photographic simulations of the Project in Region I, for those KOP locations where agency management objectives would not be met, are shown in the KOP figures in **Appendix I** and shown in a photographic figure following each applicable KOP in the KOP figures in **Appendix I**.

Estimates of impacts to scenery and impacts to humans are based on comparisons of the Project's visual characteristics with characteristics of the landscape and locations and visual sensitivities of people. Compliance or consistency with agency management objectives is based on the agencies' planned limits of acceptable alteration or changes to the landscape. The Project's visual characteristics, affected environment, and analysis of environmental effects are documented in this report and in **Appendix I**.

Alternative I-A (Applicant Proposed)

Alternative I-A would cross 155 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). It would cross the Continental Divide Trail, Outlaw Scenic Highway, Overland Trail, Old Cherokee Trail-South, Little Snake River, Yampa River, and U.S. 40, in addition to several recreational roads and trails (**Table 3.12-11**), and would be "sky-lined" (increased impact) in those areas. Recreationally important landscapes include the Cedar Breaks Draw, Sand Wash Basin, Little Snake River, and Yampa River Valley/Cross Mountain areas, where the Project's guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen with existing transmission line structures or oil and gas facilities. Landscape photography and project simulations are located in **Appendix I**, in the Rawlins and Little Snake FO sections. Alternative I-A would be visible in the immediate foreground from four residences. Thirty-seven percent of Alternative I-A would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Five percent of Alternative I-A would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5 miles) viewing situations (**Table 3.12-11**). Three percent of Alternative I-A would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view. Alternative I-A is comparable to Alternative I-B and Alternative I-D, except where it would cross the Cedar Breaks Draw area which would cause increased impacts over Alternative I-B. Alternative I-A has decreased impacts as compared with Alternative I-C. Three percent of the Alternative I-A reference line would be located within a

utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

The Tuttle Easement micro-siting options could be utilized with outcomes similar to those discussed under Alternative I-D.

Alternative I-B

Alternative I-B would cross 159 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). It would cross the Continental Divide Trail, Outlaw Scenic Highway, Overland Trail, Old Cherokee Trail-South, Little Snake River, Yampa River, and U.S. 40, in addition to several recreational roads and trails (**Table 3.12-11**), and would be "sky-lined" (increased impact) in those areas. Segment 70 blends visually with an existing cleared pipeline ROW. Recreationally important landscapes include the Cedar Breaks Draw, Sand Wash Basin, Little Snake River, and Yampa River Valley/Cross Mountain areas, where the Project's guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen with existing transmission line structures or oil and gas facilities. Landscape photography and project simulations are located in **Appendix I**, in the Rawlins and Little Snake FO sections. Alternative I-B would be visible in the immediate foreground from three residences. Thirty-six percent of Alternative I-B would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Four percent of Alternative I-B would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5 miles) viewing situations (**Table 3.12-11**). Five percent of Alternative I-B would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view. Alternative I-B is comparable to Alternative I-A and Alternative I-D, except where it would parallel the existing cleared pipeline ROW which would cause decreased impacts over Alternative I-A and Alternative I-D. Alternative I-B has decreased impacts as compared with Alternative I-C. Eleven percent of the Alternative I-B reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

The Tuttle Easement micro-siting options could be utilized with outcomes similar to those discussed under Alternative I-D.

Alternative I-C

Alternative I-C would cross 186 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). It would closely parallel the Outlaw Scenic Highway in Wyoming and Colorado State Highway 13 in Colorado. It would cross the Continental Divide Trail, Outlaw Scenic Highway, Overland Trail, Old Cherokee Trail-South, Little Snake River east of Baggs, Yampa River east of Craig, and U.S. 40, in addition to several recreational roads and trails (**Table 3.12-11**), and would be "sky-lined" (increased impact) in those areas. Recreationally important landscapes include the Little Snake River and Yampa River Valley areas, where the Project's guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen with existing transmission line structures or oil and gas facilities. It would closely parallel the Yampa River in the Juniper Mountain area west of Craig, however it is co-located with an existing 345-kV steel lattice and wooden H-frame transmission lines. Landscape photography and project simulations are located in **Appendix I**, in the Rawlins and Little Snake FO sections. Alternative I-C would be visible in the immediate foreground from 118 residences. Twenty-eight percent of Alternative I-C would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Fifteen percent of Alternative I-C would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Less than 1 percent of Alternative I-C would not comply with

agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view. Alternative I-C has increased impacts as compared with Alternative I-A, I-B, and I-D. Twenty-three percent of the Alternative I-C reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

The Tuttle Easement micro-siting options could be utilized with outcomes similar to those discussed under Alternative I-D.

Alternative I-D (Agency Preferred)

Alternative I-D would cross 171 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). It would cross the Continental Divide Trail, Outlaw Scenic Highway, Overland Trail, Old Cherokee Trail-South, Little Snake River, Yampa River, and U.S. 40, in addition to several recreational roads and trails (**Table 3.12-11**) and would be "sky-lined" (increased impact) in those areas. Recreationally important landscapes include the Cedar Breaks Draw, Sand Wash Basin, Little Snake River, and Yampa River Valley/Cross Mountain areas, where the Project's guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen with existing transmission line structures or oil and gas facilities. Landscape photography and project simulations are located in **Appendix I**, in the Rawlins and Little Snake FO sections. Alternative I-D would be visible in the immediate foreground from three residences. Thirty-four percent of Alternative I-D would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Six percent of Alternative I-D would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Eight percent of Alternative I-D would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view. Alternative I-D is comparable to Alternative I-A and Alternative I-B, except where it would cross the Cedar Breaks Draw area which would cause increased impacts over Alternative I-B. Alternative I-D has decreased impacts as compared with Alternative I-C. Four percent of the Alternative I-D reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Tuttle Easement Micro-siting Option 1

The Tuttle Easement Option 1 would cross landscapes in the Wyoming Basin Province (Section 3.12.5.1) and Uintah Basin Section of the Colorado Plateaus Province (Section 3.12.5.2). It would closely parallel and is located on the far side of two existing transmission lines in the area near U.S. 40 and Deer Lodge Road, an entry road to Dinosaur National Monument. These circumstances would result in lower visual contrasts than Tuttle Easement Option 2 or Tuttle Easement Option 3. The Tuttle Easement Option 1 would have decreased impacts as compared to Tuttle Easement Option 2 and Tuttle Easement Option 3. Thirty percent of the Tuttle Easement Micro-siting Option 1 reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor. Field photography and preparation of visual contrast rating worksheets for this option will be completed for the Final EIS.

Tuttle Easement Micro-siting Option 2

The Tuttle Easement Option 2 would cross landscapes in the Wyoming Basin Province (Section 3.12.5.1) and Uintah Basin Section of the Colorado Plateaus Province (Section 3.12.5.2). It would cross U.S. 40, a turnout/parking area, and the intersection with Deer Lodge Road, an entry road to Dinosaur National

Monument, and would closely parallel U.S. 40. It would cross these locations with the more visually dominant self-supporting structures at acute angles in two places. It would be "sky-lined" (increased impact) in those areas and have higher contrasts than Tuttle Easement Option 1 or Tuttle Easement Option 3. The Tuttle Easement Option 2 would cause high impacts to high sensitivity recreational viewers in immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Tuttle Easement Option 2 would cross VRM Class III landscapes in the same location as Tuttle Easement Option 3, where changes may attract attention, but should not dominate the view of the casual observer. Tuttle Easement Option 2 would have increased impacts as compared to Tuttle Easement Option 1 and Tuttle Easement Option 3. Seventeen percent of the Tuttle Easement Micro-siting Option 2 reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor. Field photography, preparation of visual contrast rating worksheets, and visual simulations for this option will be completed for the Final EIS.

Tuttle Easement Micro-siting Option 3

The Tuttle Easement Option 3 would cross landscapes in the Wyoming Basin Province (Section 3.12.5.1) and Uintah Basin Section of the Colorado Plateaus Province (Section 3.12.5.2). It would cross Deer Lodge Road, an entry road to Dinosaur National Monument, and would be "sky-lined" (increased impact) in this area. The Tuttle Easement Option 3 would cause high impacts to high sensitivity recreational and residential viewers at the Deer Lodge Road crossing. This location is associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Tuttle Easement Option 3 would cross VRM Class III landscapes in the same location as Tuttle Easement Option 2, where changes may attract attention, but should not dominate the view of the casual observer. The Tuttle Easement Option 3 would have increased impacts as compared Tuttle Easement Option 1 and decreased impacts as compared to Tuttle Easement Option 2. Seventeen percent of the Tuttle Easement Micro-siting Option 3 reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor. Field photography, preparation of visual contrast rating worksheets, and visual simulations for this option will be completed for the Final EIS.

Alternative Connectors in Region I

Mexican Flat Connector

The Mexican Flat Connector cross 10 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). It would cross the Outlaw Scenic Highway and would be "sky-lined" (increased impact) in that area, and also cross several minor service roads. The Mexican Flat Connector would be seen in the immediate foreground from zero residences. Less than 1 percent of the Mexican Flat Connector cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Twenty percent of the Mexican Flat Connector cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Less than 1 percent of the Mexican Flat Connector would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. The Mexican Flat Connector would exclude the need for Alternatives I-A, I-C, and I-D segments southward and take advantage of the decreased impacts of Alternative I-B and its existing cleared pipeline ROW. Ten percent of the Mexican Flat Connector reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Fivemile Point North Connector

The Fivemile Point North Connector would cross 3 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). It is located in the footprint of the Stock Trail Road (a major recreational road) for 2.5 miles and would cross the Outlaw Scenic Highway. It would be "sky-lined" (increased impact) in those

areas. The Fivemile Point North Connector is in the immediate foreground from zero residences. One hundred percent of the Fivemile Point North Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Sixty-seven percent of the Fivemile Point North Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Sixty-seven percent of the Fivemile Point North Connector would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. The Fivemile Point North Connector would exclude the need for Alternative I-C segments southward. The Fivemile Point North Connector has greatly increased impacts over all other alternatives for its 2.5-mile reach. Thirty-three percent of the Fivemile Point North Connector reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Fivemile Point South Connector

The Fivemile Point South Connector would cross 2 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). It would cross the Stock Trail Road (a major recreational road) and would be “sky-lined” (increased impact) in that area. The Fivemile Point South Connector is in the immediate foreground from zero residences. One hundred percent of the Fivemile Point South Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). None of the Fivemile Point South Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Less than 1 percent of the Fivemile Point South Connector would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. The Fivemile Point South Connector would have decreased impacts over its reach, but would involve the increased impacts of the Baggs Connector and, possibly, Alternative I-C, which has increased impacts over Alternatives I-A, I-B, and I-D. None of the Fivemile Point South Connector reference line would be located within a utility corridor or utility window.

Baggs Connectors

The Baggs Connectors cross 22 miles of landscapes in the Wyoming Basin Province (Section 3.12.5.1). They cross the Outlaw Scenic Highway, Old Cherokee Trail-South, in addition to several recreational roads and trails (**Table 3.12-11**), and would be “sky-lined” (increased impact) in those areas. Recreationally important landscapes include the Fivemile Point, Tincan Hill, Poison Buttes, Snake River Valley, Cherokee Rim, and Cherokee Draw areas, where the Project’s guyed and, substantially more dominant self-supported structures would stand out visually more than they would if seen with existing transmission line structures or oil and gas facilities. The Baggs Connectors would be seen in the immediate foreground from zero residences. Ninety-one percent of the Baggs Connectors cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Nine percent of the Baggs Connectors cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-11**). Twenty-three percent of the Baggs Connectors would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. The Baggs Connectors have increased impacts as compared with the Mexican Flats Connectors. The Baggs Connectors would exclude the need for I-C segments (increased impacts) southward. Less than 1 percent of the Baggs Connector reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

3.12.6.5 Region II

Impact parameters relate to the impact discussion in Section 3.12.6.3, Impacts Common to all Alternative Routes and Associated Components, and differences by alternative are presented below. The segment-specific table information for high and moderate sensitivity viewers distance zones, scenic quality, visual resource inventory classifications, agency management classifications, residual Impacts, compliance or consistency with BLM VRM, USFS SIO or VQO, and intersection of the Project reference line with utility corridors or utility windows are summarized in **Table 3.12-12**.

Segment- and milepost-specific Region I inventory data and impact results for these topics are shown in the corresponding tables in **Appendix I**. The KOP figures in **Appendix I** indicate the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation.

Residual Impacts

The application of substantive mitigation measures would reduce visual impacts from high to moderate, or moderate to low. These reductions are applicable to viewing situations involving stationery (non-linear) viewers and to landscapes where tree cover and moderate to steep landforms contribute strongly to visual impacts. Residual impacts by Alternative and Segment are listed for landscape scenery, high viewer sensitivity and moderate viewer sensitivity in **Table 3.12-12**. Residual impacts by Region, Alternative, Segment, and mileposts (as if, “walking the line”) are listed in the corresponding tables in **Appendix I**.

Compliance or Consistency with Agency Management Objectives

Maps showing locations where agency management objectives would be met and would not be met are shown in **Appendix I**, **Figure I-12**. Photographic simulations of the Project, for those KOP locations where agency management objectives would not be met, are shown in the KOP figures in **Appendix I** following the applicable KOP analysis sheet. Maps showing locations where applications of mitigation **VR-4** to the reference line would reduce impacts to levels compliant or consistent with agency management objectives are shown in **Appendix I**, **Figure I-13**. Maps showing locations where agency management objectives would be met with mitigation and where agency management objectives are not applicable are shown in **Appendix I**, **Figure I-14**. Mitigation **VR-4** would be applicable to, and subject to routing engineering study for, reference lines within 0.5 mile of linear KOPs, except for those reference lines crossing roads. Designated utility corridors considered in the analysis are shown in **Appendix I**, **Figure I-15**.

Scenic Quality

Existing scenic quality may be lowered by the Project, depending on the context. This is determined based on analysis of existing scenic quality rating/scores, existing landscape character, presence or absence of existing industrial development (transmission lines, pipelines, land disturbances, etc.), and the effect of introducing the Project into the landscape as either a new or additional cultural modification. Those segments where the existing scenic quality would be lowered by the Project to a lower class (Class A to Class B or Class B to Class C) are shown in **Table 3.12-13**. Segment- and milepost-specific data for change in scenic quality is shown in **Appendix I**, **Table I-12**.

Public Viewers and Visibility of the Project

Immediate foreground (0 to 0.5-mile) visibility of the Project is influential in the experiences of viewers and indicative of the level of impacts to people. The following **Table 3.12-14** indicates visibility by alternative and segment for those immediate foreground public places, designated special management areas, lakes and reservoirs, rivers, roads, scenic byways and backways, and historic trails where visual resources are important to recreational and viewer experiences. Viewing situations in these locations are both stationary and mobile.

Table 3.12-12 Region II Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Alternative II-A																																				
Alternative II-A Total	**257**	**78**	**127**	**35**	**17**	**72**	**132**	**44**	**9**	**<1**	**139**	**118**	**9**	**33**	**111**	**--**	**48**	**51**	**<1**	**21**	**--**	**97**	**78**	**82**	**61**	**116**	**80**	**55**	**93**	**109**	**116**	**4**	**137**	**117**	**3**	**137**	**29**
210	26	2	23	1	--	8	18	--	--	--	--	26	--	--	26	--	19	--	--	--	--	--	15	11	2	13	11	2	18	5	19	--	6	19	--	6	10
211	8	--	2	6	--	--	1	3	5	--	8	<1	--	--	8	--	8	1	--	--	--	8	<1	--	--	8	--	--	1	8	8	--	<1	8	--	<1	1
212	13	--	4	7	2	2	6	3	2	--	13	--	--	--	13	--	3	10	--	--	--	--	--	13	--	--	13	--	2	11	13	--	--	13	--	--	5
213	13	2	11	1	--	1	4	7	2	<1	3	10	--	--	13	--	4	8	--	--	--	--	<1	13	--	2	12	--	1	13	11	--	2	11	--	2	11
320.05	24	12	11	--	--	6	11	8	--	--	15	8	--	--	5	--	1	3	--	--	--	8	4	11	10	4	10	4	4	16	4	--	20	4	--	20	--
320.1	74	36	37	1	--	21	49	4	--	--	55	19	1	--	--	--	--	--	--	18	--	37	15	22	27	33	14	19	23	32	16	2	56	16	2	56	1
320.15	28	12	15	--	--	8	13	7	--	--	26	2	7	--	8	--	--	--	<1	3	--	26	2	--	12	15	--	8	13	7	3	0	25	3	0	25	--
320.2	7	3	4	--	--	3	3	1	--	--	5	2	--	1	6	--	1	1	--	--	--	5	2	--	3	4	--	3	3	1	2	<1	5	2	--	5	--
340	20	8	12	--	--	12	7	1	--	--	8	12	--	15	5	--	1	2	--	--	--	8	2	10	4	11	6	7	8	5	3	--	17	3	--	17	--
360	26	<1	2	9	14	10	11	4	--	--	5	21	--	14	12	--	12	10	--	--	--	5	21	--	<1	12	14	10	11	4	20	2	4	21	1	4	1
430	18	3	5	9	1	2	9	7	--	--	--	18	--	3	15	--	--	16	--	--	--	--	18	--	3	14	1	2	9	7	16	--	2	16	--	2	--
Alternative II-B																																				
Alternative II-B Total	**345**	**95**	**197**	**38**	**15**	**170**	**146**	**29**	**--**	**1**	**131**	**213**	**19**	**49**	**243**	**5**	**135**	**66**	**3**	**18**	**--**	**96**	**134**	**115**	**43**	**236**	**66**	**83**	**183**	**79**	**176**	**51**	**118**	**214**	**13**	**118**	**142**
220.1	181	63	93	12	10	112	59	7	--	1	66	115	14	25	142	5	115	32	--	--	--	48	61	71	22	123	33	53	94	31	109	43	29	144	9	29	111
222.05	41	9	26	6	--	17	19	5	--	--	17	24	--	10	31	--	13	18	--	--	--	6	26	10	3	38	--	6	21	15	27	4	10	31	--	10	19
222.3	15	1	6	8	--	2	8	5	--	--	1	14	5	<1	9	--	1	<1	--	--	--	--	--	15	--	1	13	--	2	13	2	--	13	2	--	13	<1
310	49	16	31	2	--	15	25	9	--	--	28	21	--	1	23	--	5	--	--	18	--	27	17	6	13	34	2	12	25	12	21	1	27	21	1	27	2
350	15	4	11	--	--	6	8	--	--	--	9	6	--	12	3	--	--	3	--	--	--	9	6	--	4	11	--	6	8	--	3	--	12	3	--	12	1
370	14	<1	4	5	4	1	11	3	--	--	8	6	--	--	13	--	--	7	1	<1	--	4	6	4	--	8	7	1	5	8	7	1	6	7	1	6	5
380	13	<1	12	--	--	4	9	--	--	--	2	10	--	--	10	--	<1	<1	2	<1	--	2	10	--	<1	12	--	4	9	--	<1	2	10	<1	2	10	3
420	8	--	3	5	--	2	6	--	--	--	--	8	--	--	8	--	1	4	--	--	--	--	7	1	--	7	1	<1	8	--	5	--	3	5	--	3	--
440	9	--	9	--	--	9	--	--	--	--	--	8	--	1	4	--	--	1	--	--	--	--	--	8	--	--	9	--	9	--	1	--	8	1	--	8	--
Alternative II-C																																				
Alternative II-C Total	**364**	**91**	**215**	**48**	**10**	**207**	**142**	**15**	**--**	**3**	**124**	**237**	**22**	**64**	**242**	**5**	**159**	**55**	**9**	**20**	**--**	**84**	**143**	**137**	**33**	**247**	**81**	**111**	**184**	**69**	**181**	**66**	**117**	**217**	**31**	**117**	**141**
220.1	181	63	93	12	10	112	59	7	--	1	66	115	14	25	142	5	115	32	--	--	--	48	61	71	22	123	33	53	94	31	109	43	29	144	9	29	111
225.2	38	6	24	8	--	26	12	--	--	--	15	23	8	23	7	--	22	--	--	--	--	12	16	11	3	27	8	20	13	5	12	10	16	12	10	16	10
330.1	99	19	61	19	--	44	48	7	--	2	43	55	--	14	58	--	14	16	7	16	--	23	30	47	6	62	31	23	44	32	43	10	46	43	3	18	13
410	37	2	26	9	--	15	22	<1	--	--	1	36	--	--	31	--	7	7	2	4	--	1	36	--	2	35	--	15	22	<1	17	3	18	17	3	18	6
440	9	--	9	--	--	9	--	--	--	--	--	8	--	1	4	--	--	1	--	--	--	--	--	8	--	--	9	--	9	--	1	--	8	1	--	8	--

Table 3.12-12 Region II Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Alternative II-D																																				
Alternative II-D Total	**262**	**51**	**116**	**50**	**45**	**72**	**104**	**47**	**39**	**25**	**98**	**139**	**40**	**62**	**138**	**2**	**50**	**94**	**<1**	**8**	**--**	**103**	**98**	**61**	**47**	**142**	**73**	**50**	**101**	**111**	**143**	**11**	**108**	**146**	**8**	**108**	**82**
210	26	2	23	1	--	8	18	--	--	--	--	26	--	--	26	--	19	--	--	--	--	--	15	11	2	13	11	2	18	5	19	--	6	19	--	6	10
214	10	--	5	5	--	--	1	3	6	--	9	1	--	--	10	--	6	1	--	--	--	9	1	--	--	10	--	--	1	9	6	--	4	6	--	4	7
215	8	1	3	3	2	1	2	3	2	--	1	7	--	--	8	--	--	8	--	--	--	--	--	8	--	1	7	--	1	7	8	--	--	8	--	--	8
217.01	79	15	23	13	28	19	21	14	25	11	29	38	22	9	42	2	6	55	--	--	--	27	15	37	15	27	37	11	15	53	57	5	16	57	5	16	51
217.02	16	1	15	--	--	--	1	10	6	13	1	1	16	--	--	--	2	--	--	--	--	15	1	--	1	15	--	--	1	15	2	--	14	2	--	14	--
217.1	21	9	6	6	1	11	8	2	--	--	12	9	2	14	5	--	2	1	--	--	--	7	10	4	6	13	2	5	12	4	2	<1	19	2	<1	19	2
217.15	36	13	18	5	--	10	22	4	--	--	26	10	--	9	11	--	3	--	<1	8	--	26	9	1	13	22	1	10	21	5	7	4	25	9	2	25	3
320.2	7	3	4	--	--	3	3	1	--	--	5	2	--	1	6	--	1	1	--	--	--	5	2	--	3	4	--	3	3	1	2	--	5	2	<1	5	--
350	15	4	11	--	--	6	8	--	--	--	9	6	--	12	3	--	--	3	--	--	--	9	6	--	4	11	--	6	8	--	3	--	12	3	--	12	1
360	26	<1	2	9	14	10	11	4	--	--	5	21	--	14	12	--	12	10	--	--	--	5	21	--	<1	12	14	10	11	4	20	2	4	21	1	4	1
430	18	3	5	9	1	2	9	7	--	--	--	18	--	3	15	--	--	16	--	--	--	--	18	--	3	14	1	2	9	7	16	--	2	16	--	2	--
Alternative II-E																																				
Alternative II-E Total	**266**	**84**	**125**	**35**	**22**	**71**	**118**	**50**	**27**	**10**	**135**	**121**	**31**	**45**	**113**	**--**	**44**	**56**	**<1**	**23**	**--**	**109**	**98**	**59**	**67**	**137**	**62**	**49**	**100**	**117**	**121**	**2**	**143**	**121**	**1**	**143**	**71**
210	26	2	23	1	--	8	18	--	--	--	--	26	--	--	26	--	19	--	--	--	--	--	15	11	2	13	11	2	18	5	19	--	6	19	--	6	10
213	13	2	11	1	--	1	4	7	2	<1	3	10	--	--	13	--	4	8	--	--	--	--	<1	13	--	2	12	--	1	13	11	--	2	11	--	2	11
214	10	--	5	5	--	--	1	3	6	--	9	1	--	--	10	--	6	1	--	--	--	9	1	--	--	10	--	--	1	9	6	--	4	6	--	4	7
215	8	1	3	3	2	1	2	3	2	--	1	7	--	--	8	--	--	8	--	--	--	--	--	8	--	1	7	--	1	7	8	--	--	8	--	--	8
215.05	7	--	--	2	5	<1	7	--	--	--	6	<1	--	--	7	--	1	6	--	--	--	--	--	7	--	--	7	--	<1	7	7	--	--	7	--	--	7
217.051	21	6	13	2	--	10	11	--	--	<1	12	9	9	12	--	--	<1	--	--	--	--	9	7	5	2	19	--	3	17	1	<1	--	21	<1	--	21	<1
217.052	16	13	3	--	--	12	5	--	--	1	12	3	8	--	--	--	--	--	<1	9	--	13	3	<1	12	5	--	11	6	--	9	<1	8	9	<1	8	7
320.05	24	12	11	--	--	6	11	8	--	--	15	8	--	--	5	--	1	3	--	--	--	8	4	11	10	4	10	4	4	16	4	--	20	4	--	20	--
320.15	28	12	15	--	--	8	13	7	--	--	26	2	7	--	8	--	--	--	<1	3	--	26	2	--	12	15	--	8	13	7	3	<1	25	25	3	<1	--
320.2	7	3	4	--	--	3	3	1	--	--	5	2	--	1	6	--	1	1	--	--	--	5	2	--	3	4	--	3	3	1	2	--	5	2	<1	5	--
325.1	43	26	13	4	--	3	14	8	17	6	29	8	5	--	--	--	--	--	--	12	--	21	19	3	18	25	<1	--	5	38	12	--	31	12	--	31	15
325.2	4	1	3	--	--	--	2	2	--	3	1	--	1	3	--	--	<1	--	--	--	--	4	--	--	1	3	--	--	2	2	<1	--	4	<1	--	4	4
350	15	4	11	--	--	6	8	--	--	--	9	6	--	12	3	--	--	3	--	--	--	9	6	--	4	11	--	6	8	--	3	--	12	3	--	12	1
360	26	<1	2	9	14	10	11	4	--	--	5	21	--	14	12	--	12	10	--	--	--	5	21	--	<1	12	14	10	11	4	20	2	4	21	1	4	1
430	18	3	5	9	1	2	9	7	--	--	--	18	--	3	15	--	--	16	--	--	--	--	18	--	3	14	1	2	9	7	16	--	2	16	--	2	--

Table 3.12-12 Region II Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Alternative II-F																																				
Alternative II-F Total	**267**	**74**	**128**	**31**	**34**	**88**	**104**	**33**	**42**	**45**	**102**	**120**	**66**	**23**	**138**	**2**	**39**	**83**	**4**	**14**	**--**	**128**	**69**	**70**	**71**	**123**	**73**	**61**	**105**	**101**	**130**	**12**	**125**	**133**	**8**	**126**	**93**
210	26	2	23	1	--	8	18	--	--	--	--	26	--	--	26	--	19	--	--	--	--	--	15	11	2	13	11	2	18	5	19	--	6	19	--	6	10
214	10	--	5	5	--	--	1	3	6	--	9	1	--	--	10	--	6	1	--	--	--	9	1	--	--	10	--	--	1	9	6	--	4	6	--	4	7
215	8	1	3	3	2	1	2	3	2	--	1	7	--	--	8	--	--	8	--	--	--	--	--	8	--	1	7	--	1	7	8	--	--	8	--	--	8
217.01	78	15	23	13	28	19	21	14	25	11	29	38	22	9	42	2	6	55	--	--	--	27	15	37	15	27	37	11	15	53	57	5	16	57	5	16	51
217.052	16	13	3	--	--	12	5	--		1	12	3	8	--	--	--	--	--	<1	9	--	13	3	<1	12	5	1	11	6	--	9	<1	8	9	<1	8	7
218	12	3	8	<1	--	--	<1	3	9	12	--	--	12	--	--	--	3	--	--	--	--	12	--	--	3	9	--	--	<1	12	3	--	9	3	--	9	1
219.1	1	1	--	--	--	--	1	--	--	1	--	--	1	--	--	--	--	--	--	--	--	1	--	--	1	--	--	--	1	--	--	--	1	--	--	1	<1
219.2	20	18	2	--	--	13	6	--	--	20	--	<1	14	--	--	--	--	--	--	--	--	20	<1	--	18	2	--	13	6	--	5	4	11	9	--	11	--
219.3	2	2	--	--	--	2	--	--	--	--	--	2	2	--	--	--	--	--	--	--	--	--	2	--	2	--	--	2	--	--	--	--	2	--	--	2	--
320.15	28	12	15	--	--	8	13	7	--	--	26	2	7	--	8	--	--	--	<1	3	--	26	2	--	12	15	--	8	13	7	3	<1	25	3	<1	25	--
320.2	7	3	4	--	--	3	3	1	--	--	5	2	--	1	6	--	1	1	--	--	--	5	2	--	3	4	--	3	3	1	2	--	5	2	--	5	--
350	15	4	11	--	--	6	8	--	--	--	9	6	--	12	3	--	--	3	--	--	--	9	6	--	4	11	--	6	8	--	3	--	12	3	--	12	1
370	14	<1	4	5	4	1	11	3	--	--	8	6	--	--	13	--	--	7	1	<1	--	4	6	4	--	8	7	1	5	8	7	1	6	7	1	6	5
380	13	<1	12	--	--	4	9	--	--	--	2	10	--	--	10	--	<1	<1	2	<1	--	2	10	--	<1	12	--	4	9	--	<1	2	10	<1	2	10	3
420	8	--	3	5	--	2	6	--	--	--	--	8	--	--	8	--	1	4	--	--	--	--	7	1	--	7	1	<1	8	--	5	--	3	5	--	3	--
440	9	--	9	--	--	9	--	--	--	--	--	8	--	1	4	--	--	1	--	--	--	--	--	8	--	--	9	--	9	--	1	--	8	1	--	8	--
Emma Park Variation																																					
Emma Park Variation	35	4	31	--	--	<1	19	10	6	31	2	2	33	1	--	--	5	--	--	--	--	34	1	--	4	31	--	<1	20	15	5	--	30	5	--	30	<1
217.02	16	1	15	--	--	--	1	10	6	13	1	1	16	--	--	--	2	--	--	--	--	15	1	--	1	15	--	--	1	15	2	--	14	2	--	14	--
219.4	3	2	1	--	--	--	3	--	--	1	1	--	1	1	--	--	--	--	--	--	--	3	--	--	2	1	--	--	3	--	--	--	3	--	--	3	<1
219.5	16	1	16	--	--	<1	16	--	--	16	--	<1	16	--	--	--	3	--	--	--	--	16	<1	--	1	15	--	<1	16	--	3	--	13	3	--	13	--
Emma Park Variation Comparison																																					
Emma Park Variation Comparison	32	21	10	<1	--	13	7	3	9	32	--	<1	27	--	--	--	6	3	<1	2	--	32	<1	--	21	11	--	13	7	12	8	4	20	12	--	20	1
218	12	3	8	<1	--	--	<1	3	9	12	--	--	12	--	--	--	3	--	--	--	--	12	--	--	3	9	--	--	<1	12	3	--	9	3	--	9	1
219.1	1	1	--	--	--	--	1	--	--	1	--	--	1	--	--	--	--	--	--	--	--	1	--	--	1	--	--	--	1	--	--	--	1	--	--	1	<1
219.2	19	17	2	--	--	13	6	--	--	19	--	<1	14	--	--	--	3	3	<1	2	--	19	<1	--	17	2	--	13	6	--	5	4	10	9	--	10	--
Highway 191 Connector																																					
Highway 191 Connector	5	3	2	--	--	--	4	1	--	5	--	--	4	1	--	--	--	--	--	--	--	5	--	--	3	2	--	--	4	1	--	--	5	--	--	5	--
219.6	5	--	--	--	--	--	4	1	--	5	--	--	--	--	--	--	--	--	--	--	--	5	--	--	--	--	--	--	4	1	--	--	--	--	--	--	--

Table 3.12-12 Region II Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)[1]				Moderate Sensitivity Viewers (miles)[1]				Scenic Quality (miles)[2]			BLM VRI Classifications (miles)[3]			BLM VRM Classifications (miles)[4]			USFS SIO/VQO Classifications (miles)[5]			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)[8]						Utility Corridor or Utility Window[9]
																						Landscape Scenery[6]			High Sensitivity Viewers[7]			Moderate Sensitivity Viewers[7]			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
CastleDale Connector																																				
270	11	1	10	--	--	3	6	2	--	--	5	6	4	2	4	--	2	<1	--	--	--	3	1	6	1	4	6	1	4	6	2	<1	8	2	<1	8	2
Price Connector																																				
223	18	--	4	14	--	6	10	3	--	--	4	14	<1	7	12	--	4	<1	--	--	--	4	3	12	--	6	12	4	5	10	4	--	14	4	--	14	4
Lynndyl Connector																																				
400	24	3	21	--	--	7	10	7	--	--	9	15	--	18	6	--	<1	9	<1	--	--	9	15	--	3	21	--	7	10	7	9	<1	15	9	<1	15	1
IPP East Connector																																				
390	3	--	2	1	--	--	2	1	--	--	--	3	--	<1	2	--	2	1	--	--	--	--	3	--	--	3	--	--	2	1	3	--	--	3	--	--	--

1 High Sensitivity and Moderate Sensitivity Viewers' analysis and mapping for the Project encompass public and private viewers' concern for landscape scenery (**Appendix I, Tables I-3** and **I-4**; **Appendix I**, **Figure I-4**). The distance and visibility factors are based on the characteristics of TWE facilities, divided into four zones(**Appendix I**, **Tables I-3** and **I-4**; **Appendix I**, **Figures I-4**, **I-5**, and **I-6**).

2 Scenic Quality or scenic attractiveness is rated Class A, Class B, or Class C for highest to lowest quality or attractiveness (**Appendix I**, **Table I-1**; **Appendix I**, **Figures I-2** and **I-3**).

3 BLM VRI classifications represent this relative value of visual resources and provide the basis for considering visual values in the resource management planning process. VRI Class II, III, and IV (high to low) are determined based on the combination of scenic quality, sensitivity levels, and distance zones. VRI Class I is assigned to special management areas (**Appendix I**, **Table I-5**; **Appendix I**, **Figure I-7**).

4 BLM VRM classifications result from the RMP land use planning process for all BLM-administered lands (**Table 3.12-1**) (**Appendix I**, **Table I-7**; **Appendix I**, **Figure I-8**).

5 USFS SIO or VQO Classifications result from the national forest planning process for all USFS-administered lands (**Table 3.12-2**) (**Appendix I, Table I-7**; **Appendix I**, **Figure I-8**).

6 Residual Impacts for Landscape Scenery (**Table 3.12-7**) involves the comparison of contrasts after mitigation with the scenic quality inventory of the affected environment (**Table 3.12-4**).

7 Residual Impacts for High Sensitivity and Moderate Sensitivity Viewers (**Table 3.12-5**) involves comparison of contrasts after mitigation with distance zones (**Table 3.12-6**) and viewers' concern levels (**Table 3.12-5**).

8 BLM VRM, USFS SIO, or USFS VQO Compliance or Consistency (**Table 3.12-8**) involves comparisons of agency management objectives with contrast ratings from 309 KOPs (**KOP Figures in Appendix I**).

9 Calculations associated with Utility Corridors and Utility Windows involve the intersection of the Project reference line with the areas/polygons of the corridors or windows. These corridors or windows take precedence over the compliance and consistency determinations and as such negate the need for updates of the land use plans.

Note: Discrepancies in totals due to rounding. Segment numbers depicted in **Figure 2-22**.

Table 3.12-13 Region II Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
Alternative II-B				
210	26	--	--	26
211	8	--	--	8
212	13	--	--	13
213	13	--	--	13
320.05	24	--	--	24
320.1	74	--	--	74
320.15	28	--	--	28
320.2	7	--	--	7
340	20	--	--	20
360	26	--	--	26
430	18	--	--	18
Alternative II-B				
220.1	181	--	29	152
222.05	41	--	8	33
222.3	15	--	--	15
310	49	--	--	49
350	15	--	--	15
370	14	--	--	14
380	13	--	--	13
420	8	--	--	8
440	8	--	--	8
Alternative II-C				
220.1	181	--	29	152
225.2	38	--	2	36
330.1	99	--	--	99
410	37	--	--	37
440	8	--	--	8
Alternative II-D				
210	26	--	--	26
214	10	--	--	10
215	8	--	--	8
217.01	79	11	<1	67
217.02	16	13	--	3
217.1	21	--	1	20
217.15	36	--	--	36

Table 3.12-13 Region II Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
320.2	7	--	--	7
350	15	--	--	15
360	26	--	--	26
430	18	--	--	18
Alternative II-E				
210	26	--	--	26
213	13	--	--	13
214	10	--	--	10
215	8	--	--	8
217.05	7	--	--	7
215.051	21	--	--	21
217.052	16	--	--	16
320.05	24	--	--	24
320.15	28	--	--	28
320.2	7	--	--	7
325.1	43	5	--	38
325.2	4	3	--	1
350	15	--	--	15
360	26	--	--	26
430	18	--	--	18
Alternative II-F				
210	26	--	--	26
214	10	--	--	10
215	8	--	--	8
217.01	79	11	<1	67
217.052	17	1	--	16
218	12	12	--	--
219.1	1	1	--	--
219.2	20	20	--	<1
219.3	2	--	--	2
320.15	28	--	--	28
320.2	7	--	--	7
350	15	--	--	15
370	14	--	--	14
380	13	--	--	13
420	8	--	--	8

Table 3.12-13 Region II Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
440	8	--	--	8
Emma Park Variation				
217.02	16	13	--	3
219.4	2	1	--	1
219.5	17	17	--	<1
Emma Park Variation Comparison				
218	12	12	--	--
219.1	1	1	--	--
219.2	20	20	--	<1
Highway 191 Connector				
219.6	5	--	--	5
Castle Dale Connector				
270	11	--	--	11
Price Connector				
223	18	--	1	17
Lynndyl Connector				
400	24	--	<1	24
IPP East Connector				
390	3	--	--	3

Segment numbers depicted in **Figure 2-22**.

Table 3.12-14 Region II Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
II-A	210	Blue Mountain Ave, Box Elder Creek, Box Elder Reservoir, Box Elder Reservoir Number 2, CR 1, CR 134, CR 61, CR 95c, CR 96, CR 98, Dinosaur Diamond Prehistoric Byway, East Twin Wash, Miller Creek, Skull Creek, Spencer Draw, SR 64, West Twin Wash, Willow Creek 0 Residences
II-A	211	4wd Rd, Old Bonanza Hwy, Snake John Reef Cutoff Rd 0 Residences
II-A	212	Redwash Hwy, SR 45 0 Residences
II-A	213	Baeser Rd, Brennan Btm Rd, SR 88, Stirrup Rd, Wyasket Bottom Rd 0 Residences
II-A	320.05	1000w Rd, 1780w Rd, 2000 Rd, 2200 Rd, 2250 Rd, 2500 Rd, 2750 Rd, 3000s Rd, 3000w Rd, 3390 Rd, 3390s Rd, 3760s Rd, 4000s Rd, 4000w Rd, 4235s Rd, 4wd Rd, 5000 Rd, 6000w Rd, Cobble Hollow, Fort Duchesne Rd, Gusher Randlett Rd, Hilltop Rd, N 2100 Rd, S 1100 Rd, S 7000 Rd, S State St, US 40 150 Residences

Table 3.12-14 Region II Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
II-A	320.1	13000 Rd, 3450s Rd, 36730 Rd, 418008 Uinta National Forest Roadless Area, 418015 Uinta National Forest Roadless Area, 418016 Uinta National Forest Roadless Area, 45000w Rd, 46000w Rd, 4wd Rd, 5000s Rd, Aspen Cove Campground, Burgess Blvd, Center St, Coke Rd, Coleman Dr, Colman Rd, Currant Creek Wildlife Management Area, Currant Creek WMA, Current Creek Rd, Deep Creek, Deep Creek Canyon, Double R Ranch, Forest Rd, Granite Blvd, Knoll Hollow, Little Baldy Mountain, Northwest Manti WMA, Rabbit Gulch Wildlife Management Area, Rays Valley Rd, Rd A, Sand Wash/Sink Draw, Sheep Creek Rd, Sink Draw, SR 208, SR 35, SR 87, Starvation State Park, Strawberry River Day Use Area, Strawberry River Day Use Area, Strawberry River WMA, Tabby Mountain WMA, Tank Hollow, US 40, US 6, Utahan Rd, White River/Strawberry Rd Scenic Backway, Wildcat Wildlife Management Area, Willow Creek 116 Residences
II-A	320.15	418028 Uinta National Forest Roadless Area, Cedar Knoll Manti-La Sal Roadless Area, Coal Hollow Manti-La Sal Roadless Area, Dispersed Camping Access Route, Dry Creek, Dry Hollow, Lake Fork & Dairy Fork Camping, Left Fork Spencer Canyon, North Nebo WMA, Northwest Manti WMA, Right Fork Spencer Canyon, Spencer Fork Wildlife Management Area, Spencer Fork--Lasson, Unnamed Campsite, US 89 15 Residences
II-A	320.2	Big Mountain Campground, Big Mountain Campground, Bradley Canyon, Hop Creek, Mud Spring Hollow, Nebo Loop Rd, Nebo Loop Scenic Byway, Water Hollow 0 Residences
II-A	340	1450 North St Rd, 740 North St, Andrews Spring Canyon, Canyon Hills Golf Course, Cazier Canyon, Cr Rd, E 1250 Rd, E 1450 Rd, E 700 Rd, E 770 Rd, Exit 228, Footes Canyon, Frontage Rd, Gardner Creek, Government Canyon, I-15, N 550 Rd, N 600 Rd, N 650 Rd, N 800 Rd, N 900 Rd, Nephi WMA, Quaking Asp Canyon, Ramp, Red Canyon, Salt Creek, Salt Spring Canyon, South Nebo WMA, SR 132, SR 41, SR 91, Sugarloaf, West Creek 99 Residences
II-A	360	Jericho Callao Rd, Little Sahara Recreation Area, RT 1812, SR 132, Tanner Creek, US 6 0 Residences
II-A	430	Desert Mountain Rd, N 6000 West St, SR 174 0 Residences
II-B	220.1	1 8/10 Rd, 2 8/10 Rd, 4th Rd, 4wd Rd, 5/10 Rd, 60th Rd, Atchee Ridge Rd, Badger Wash ACEC, Bitter Creek, Blaze Canyon, Bobcat Reservoir, Bryson Wash, Buttermilk Canyon, Cactus Reservoir, Coal Rd, CR 100, CR 104, CR 107, CR 108, CR 109, CR 112, CR 113, CR 114, CR 138, CR 201, CR 23, CR 25, CR 268, CR 65, CR 73, CR 78, Cr Rd, Crystal Geyser Overlook, Demaree Wildlife Study Area, Desolation Canyon WCR, Displacement Point, Exit 212, Exit 220, Flint Trl, Floy Wash Rd, Frontage Rd, Gillam Draw, Green River Overlook, I-70, Iron Wash Kiosk Site, Labyrinth Canyon SRMA, Labyrinth Rims/Gemini Bridges SRMA, Little Gillam Draw, Little Valley Rd, Lost Spring Wash, McInnis Canyons NCA, Mitchell Rd, Oil Spring Mountain ACEC, Oil Spring Mountain Wildlife Study Area, Old Hwy, Old Hwy Hanksville, Old Railroad Rd, Old Spanish Historic Trail, Park Canyon, Prairie Canyon, Railroad Rd, Ramp, Red Wash, San Arroyo Wash, Scullion Gulch, Sego Canyon Rd, Shale Dr, Side Canyon, South Canyon, Spring Canyon, Spring Creek, SR 128, SR 139, SR 64, SR 94, Thompson Canyon, US 6, Utah Rims SRMA, Villaroad Flats Reservoir, VRM Class 2 Scenic Corridor, Wagon Canyon, West Canyon, White River Riparian ACEC, Windy Mesa Rd 33 Residences
II-B	222.05	Cleveland Rd, Drop Wash, Farnham Rd, Marsh Flat Wash, Mathis Wash, Midway Reservoir, Mounds Rd, Mounds Reservoir, Mud Spring Rd, Never Sweat Wash WCR, Noviatt Ln, Price River WCR, SR 10, Upper Miller Creek Rd, Well Rd 2 Residences
II-B	222.3	Brockbank Hollow, Burma Rd, SR 122, SR 31, The Energy Loop: Huntington/Eccles Canyo, W 400 Rd 0 Residences

Table 3.12-14 Region II Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
II-B	310	200 Rd, Arapeen OHV Area, Arapeen OHV Area, Arapeen OHV Area, Bear Mountain, Big Hollow Rd, Black Knob, Blue Slide Fork, Booths Canyon, Boulger - Black Canyon Manti-La Sal Rdl, Coal Fork, Cottonwood Camping, Cottonwood Creek Rd, Cottonwood Rd, Cove Creek Rd, Devils Peak, Dispersed Camping Access Route, Dublin Wash, East Mountain Manti-La Sal Roadless Area, Elk Canyon, Flat Canyon, Indian Creek Campground, Indian Creek GuaRd Station, Indian Creek Rd, Little North Creek, "Lower Millers Flat & Lowry Camping," Marinus Canyon, Meetinghouse Canyon, Miller Flat Rd, Moroni or Morris Cook, Mountainville Hwy, Mountainville Rd, Mule Creek, N 570 Rd, North Canyon, North Creek, North Fork Pleasant Creek, North Nebo WMA, Parley Ln, Pollys Peak, Potters Canyon, Potters Canyon Rd, "Potters Pond Campground", Rocky Ridge, Round Hills, Sanpitch Manti-La Sal Roadless Area, Skyline Dr, Skyline Drive Scenic Backway, Straight Fork, Unnamed Campsite, US 89, W 1780 Rd, Whetstone Creek 24 Residences
II-B	350	4wd Rd, Airport Rd, Broad Canyon, I-15, Old Pinery Canyon, Ramp, Sheep Dr, Sheep Ln, Spring Canyon, SR 28, Triangle Ranch Wildlife Management Area 1 Residence
II-B	370	Little Sage Valley, West Fork Reservoir 0 Residences
II-B	380	E 600 Rd, Railroad Ave, S 150 Rd, S Main St, SR 125, Taylors Flat Rd, W 400 Rd, W 600 Rd 0 Residences
II-B	440	Jones Rd, N 4000 Rd, N 8000 West St, W 8500 North St 0 Residences
II-C	220.1	1 8/10 Rd, 2 8/10 Rd, 4th Rd, 4wd Rd, 5/10 Rd, 60th Rd, Atchee Ridge Rd, Badger Wash ACEC, Bitter Creek, Blaze Canyon, Bobcat Reservoir, Bryson Wash, Buttermilk Canyon, Cactus Reservoir, Coal Rd, CR 100, CR 104, CR 107, CR 108, CR 109, CR 112, CR 113, CR 114, CR 138, CR 201, CR 23, CR 25, CR 268, CR 65, CR 73, CR 78, Cr Rd, Crystal Geyser Overlook, Demaree Wildlife Study Area, Desolation Canyon WCR, Displacement Point, Exit 212, Exit 220, Flint Trl, Floy Wash Rd, Frontage Rd, Gillam Draw, Green River Overlook, I-70, Iron Wash Kiosk Site, Labyrinth Canyon SRMA, Labyrinth Rims/Gemini Bridges SRMA, Little Gillam Draw, Little Valley Rd, Lost Spring Wash, McInnis Canyons NCA, Mitchell Rd, Oil Spring Mountain ACEC, Oil Spring Mountain Wildlife Study Area, Old Hwy, Old Hwy Hanksville, Old Railroad Rd, Old Spanish Historic Trail, Park Canyon, Prairie Canyon, Railroad Rd, Ramp, Red Wash, San Arroyo Wash, Scullion Gulch, Sego Canyon Rd, Shale Dr, Side Canyon, South Canyon, Spring Canyon, Spring Creek, SR 128, SR 139, SR 64, SR 94, Thompson Canyon, US 6, Utah Rims SRMA, Villaroad Flats Reservoir, VRM Class 2 Scenic Corridor, Wagon Canyon, West Canyon, White River Riparian ACEC, Windy Mesa Rd 33 Residences
II-C	225.2	Chimney Rock Flat, Dry Mesa, Job Corps Pond, Lost Spring Wash WCR, Lynns Pond, Old Spanish Historic Trail, Red Seep Wash, Saleratus Reservoir, San Rafael Canyon ACEC, Smith Pond, Summerville Point 0 Residences
II-C	330.1	3550 Rd, 4wd Rd, Aspen Hollow, Bar J Ranch, Browns Hole, Castle Valley Outdooors, Catamount Canyon, CR 801, CR 803, CR 805, CR 903, CR 906, CR 909, CR 912, CR 913, CR 916, Creepy Spring Rd, Crooked Canyon, Cutler Canyon, Dutch Flat Reservoir, Dutchmans Wash, E 11000 North St, E 1600 North St, E 2600 North St, E 300 Rd, E 3300 North St, E 3700 North St, E 400 Rd, E 4000 North St, E 5400 North St, F S 290, FS Rd, FS 037, FS 038, FS 047, FS 048, Goosberry Rd, Gooseberry/Fremont Rd Scenic Backway, I-70, Johnson Mountain Ranch, Klondike Canyon, Link Canyon Wash, Long Knoll, Lost Creek Rd, Molen Cutoff, Molen Seep Wash, N 8800 East St, N 9200 East St, N 9400 East St, Noon Rock Canyon, North Pavant Lake, Old Spanish Historic Trail, Old Woman Plateau, Paradise Ln, Pharo Canyon, Pharo Creek, Ranch Rd, Raspberry Canyon, Rock Art ACEC, Rocky Ford Canal Rd, Round Valley, Round Valley, S 100 Rd, S 200 Rd, S 300 Rd, S Old Hwy 89, Saddlehorse Canyon, Sage Flat Rd, San Rafael Swell SRMA, Santa Fe Creek, Sawmill Canyon, Shearing Corral Draw, South Wash, SR 10, SR 322, Telephone Hollow, The Breaks, US 50, US 89, Water Hollow, Wedge Overlook/Buckhorn Drive Scenic Bckwy 44 Residences

Table 3.12-14 Region II Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
II-C	410	4wd Rd, Connecting Rd, DMAD Reservoir, DMAD Reservoir, E 4500 South St, East Fork Eightmile Creek, Exit 184, Frontage Rd, Graball Canyon, I-15, Long Canyon, N 400 West St, Ramp, Scipio Pioneer Trl, SR 100, SR 125, US 50, West Fork Eightmile Creek, Whisky Creek 1 Residence
II-C	440	Jones Rd, N 4000 Rd, N 8000 West St, W 8500 North St 0 Residences
II-D	210	Blue Mountain Ave, Box Elder Creek, Box Elder Reservoir, Box Elder Reservoir Number 2, CR 1, CR 134, CR 61, CR 95c, CR 96, CR 98, Dinosaur Diamond Prehistoric Byway, East Twin Wash, Miller Creek, Skull Creek, Spencer Draw, SR 64, West Twin Wash, Willow Creek 0 Residences
II-D	214	4wd Rd 0 Residences
II-D	215	Glen Bench Rd, SR 45 0 Residences
II-D	217.01	0401009 Ashley National Forest Roadless Ar, 4wd Rd, 9 Mile Canyon Rd, 9 Mile Rd, Argyle Canyon Rd, Camping Unit, Enron Middle Campsite, Enron North Campsite, Enron South Campsite, Glen Bench Rd, Lears Canyon ACEC, Lower Green River ACED, Lower Green River WSR (VFO) Wildlife Stu, Mountain Fuel Bridge, Nine Mile Canyon Scenic Backway, Nine Mile SRMA, Ninemile ACEC, Seep Ridge Rd, The Squeeze, Turkey Trl, Watson Rd, White River Raft Access 0 Residences
II-D	217.02	2 Industrial Buildings, 4wd Rd, 7 Outbuildings, Badger Canyon, Big Sulphur Canyon Rd, Butchers Rd, Camp Site, Dry Fork, Lion Canyon, Minnie Maud Creek Rd, Minnie Maud Ridge, Pasture Canyon, Pole Canyon, Sams Canyon Rd, Sky-high Pond, Wash Canyon, Whitmore Park Rd 16 Residences
II-D	217.1	1 Industrial Building, 5th Rd, 9th Rd, Arriotti Rd, Castle Gate Dr, Castle Gate Rd, Cedar Bench Rd, Deep Canyon, Dinosaur Diamond Prehistoric Byway, Dry Canyon, Dry Canyon Rd, Dump Rd, Frontage Rd, Gentile Wash, Gordon Creek WMA, Gun Club Rd, Gun Range Rd, Hardscrabble Canyon, Hardscrabble Canyon Rd, Hardscrabble Rd, Helper Dr, Jack Canyon, Ketchum Rd, Mathis Canyon, Mathis Canyon Rd, Minnie Maud Ridge, Mountain Rd, N Lincoln Rd, N Main St, N Martin Rd, Orchard St, Panther Canyon, Panther Canyon Rd, Pipeline Bench, Pit Rd, Power Plant Rd, Price Canyon, Red Diamond Rd, Rock Rd, Royal St, Royal Way, S 4th Ave, S 5th Ave, Shooters Aly Rd, Spring Canyon Cir, Spring Canyon Rd, SR 139, The Flats, Trestle Rd, Upper Fish Rd, US 191, US 6, W 100 Rd, W 1000 Rd, W 200 Rd, W 300 Rd, W 400 Rd, W 500 Rd, W 600 Rd, W 700 Rd, W 800 Rd, W 900 Rd, Waldo Rd, Whitmore Park Rd 0 Residences
II-D	217.15	Barn Canyon, Benches Rd, Blind Fork, Boarding House Canyon Rd, Boardinghouse Canyon, Boneyaroad Canyon, Broads Canyon Rd, Burnt Fork, Castle Valley Ridge Rd, Dispersed Camping Access Route, Dry Creek, Finn Canyon, Finn Canyon Rd, Hill Top Rd, Hys Fork, Lone Rock Ravine, Magazine Canyon, Maple Fork, Milburn Rd, Narrows Tunnel, North Fork Swens Canyon, North Skyline Winter Staging, Northwest Manti WMA, Oak Creek Manti-La Sal Roadless Area, Peterson Ln, S Fork Eccles Creek Rd, Skyline Dr, SR 264, SR 31, SR 96, Swens Canyon, The Elbow, Tough Springs Rd, Trail Canyon Rd, Unnamed Campsite, US 89, Wasatch Academy SUP School, White Pine Fork 0 Residences
II-D	320.2	Big Mountain Campground, Big Mountain Campground, Bradley Canyon, Hop Creek, Mud Spring Hollow, Nebo Loop Rd, Nebo Loop Scenic Byway, Water Hollow 0 Residences
II-D	350	4wd Rd, Airport Rd, Broad Canyon, I-15, Old Pinery Canyon, Ramp, Sheep Dr, Sheep Ln, Spring Canyon, SR 28, Triangle Ranch Wildlife Management Area 1 Residence
II-D	360	Jericho Callao Rd, Little Sahara Recreation Area, RT 1812, SR 132, Tanner Creek, US 6 0 Residences

Table 3.12-14 Region II Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
II-D	430	Desert Mountain Rd, N 6000 West St, SR 174 0 Residences
II-E	210	Blue Mountain Ave, Box Elder Creek, Box Elder Reservoir, Box Elder Reservoir Number 2, CR 1, CR 134, CR 61, CR 95c, CR 96, CR 98, Dinosaur Diamond Prehistoric Byway, East Twin Wash, Miller Creek, Skull Creek, Spencer Draw, SR 64, West Twin Wash, Willow Creek 0 Residences
II-E	213	Baeser Rd, Brennan Btm Rd, SR 88, Stirrup Rd, Wyasket Bottom Rd 0 Residences
II-E	214	4wd Rd 0 Residences
II-E	215	Glen Bench Rd, SR 45 0 Residences
II-E	215.05	Siddoways Reservoir 0 Residences
II-E	217.051	1 Gas Station, 3 Industrial Buildings, 5 Dispersed Camping, 5 Outbuildings, Emma Park, Horse Creek Rd, Indian Canyon Scenic Byway, Jack Canyon Rd, Kyune Creek, Quarry Rd, Scofield Canyons, Soldier Summit, Spring Canyon, SR 96, Tabbyune Canyon, Tabbyune Creek, US 191, US 6, White River, Woods Canyon 8 Residences
II-E	217.052	19 Dispersed Camping, Center St, Cleary St, Cottonwood Canyon, Davidson Canyon, Garner Canyon, Garner Hollow, Great Western South, Heslington Canyon, Hicks Canyon, Indian Creek, Northwest Manti WMA, Oak St, Pine St, Private Picnic Site, Sheep Creek, Sheep Creek (Snowmobile), Spring Canyon, Tie Fork, Viaduct St 7 Residences
II-E	320.05	1000w Rd, 1780w Rd, 2000 Rd, 2200 Rd, 2250 Rd, 2500 Rd, 2750 Rd, 3000s Rd, 3000w Rd, 3390 Rd, 3390s Rd, 3760s Rd, 4000s Rd, 4000w Rd, 4235s Rd, 4wd Rd, 5000 Rd, 6000w Rd, Cobble Hollow, Fort Duchesne Rd, Gusher Randlett Rd, Hilltop Rd, N 2100 Rd, S 1100 Rd, S 7000 Rd, S State St, US 40 150 Residences
II-E	320.15	418028 Uinta National Forest Roadless Area, Cedar Knoll Manti-La Sal Roadless Area, Coal Hollow Manti-La Sal Roadless Area, Dispersed Camping Access Route, Dry Creek, Dry Hollow, Lake Fork & Dairy Fork Camping, Left Fork Spencer Canyon, North Nebo WMA, Northwest Manti WMA, Right Fork Spencer Canyon, Spencer Fork Wildlife Management Area, Spencer Fork--Lasson, Unnamed Campsite, US 89 15 Residences
II-E	320.2	Big Mountain Campground, Big Mountain Campground, Bradley Canyon, Hop Creek, Mud Spring Hollow, Nebo Loop Rd, Nebo Loop Scenic Byway, Water Hollow 0 Residences
II-E	325.1	0401010 Ashley National Forest Roadless Ar, 0401011 Ashley National Forest Roadless Area, 10000w Rd, 101060w Rd, 11000w Rd, 11490w Rd, 4 Outbuildings, 4000 Rd, 4725 Rd, 4725s Rd, 4730s Rd, 6000 Rd, 6000s Rd, 6450s Rd, 7 Dispersed Camping, 8000 Rd, 9000 Rd, 9000s Rd, 9000w Rd, 9500w Rd, Antelope Canyon Rd, Antelope Creek, Broad Hollow, Clem Hollow, Corral Hollow, Deathtrap Canyon, E River Rd, Indian Canyon WMA, Jolie Hollow, Lance Canyon, Mine Hollow, North Lost Hollow, North Twin Hollow, Quitchampau Canyon, Rd Hollow, South Lost Hollow, South Twin Hollow, Sowers Canyon Rd, Spring Hollow, SR 87, Tabby Canyon, Trail Hollow, Trapper Canyon, US 40, Walkway, Wire Fence Canyon, Y Canyon 63 Residences
II-E	325.2	3 Dispersed Camping, Timberlane Camp, Timberlane Camp Rd 1 Residence
II-E	350	4wd Rd, Airport Rd, Broad Canyon, I-15, Old Pinery Canyon, Ramp, Sheep Dr, Sheep Ln, Spring Canyon, SR 28, Triangle Ranch Wildlife Management Area 1 Residence

Table 3.12-14 Region II Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
II-E	360	Jericho Callao Rd, Little Sahara Recreation Area, RT 1812, SR 132, Tanner Creek, US 6 0 Residences
II-E	430	Desert Mountain Rd, N 6000 West St, SR 174 0 Residences
II-F	210	Blue Mountain Ave, Box Elder Creek, Box Elder Reservoir, Box Elder Reservoir Number 2, CR 1, CR 134, CR 61, CR 95c, CR 96, CR 98, Dinosaur Diamond Prehistoric Byway, East Twin Wash, Miller Creek, Skull Creek, Spencer Draw, SR 64, West Twin Wash, Willow Creek 0 Residences
II-F	214	4wd Rd 0 Residences
II-F	215	Glen Bench Rd, SR 45 0 Residences
II-F	217.01	0401009 Ashley National Forest Roadless Area, 4wd Rd, 9 Mile Canyon Rd, 9 Mile Rd, Argyle Canyon Rd, Camping Unit, Enron Middle Campsite, Enron North Campsite, Enron South Campsite, Glen Bench Rd, Lears Canyon ACEC, Lower Green River ACED, Lower Green River WSR (VFO) Wildlife Stu, Mountain Fuel Bridge, Nine Mile Canyon Scenic Backway, Nine Mile SRMA, Ninemile ACEC, Seep Ridge Rd, The Squeeze, Turkey Trl, Watson Rd, White River Raft Access 0 Residences
II-F	217.052	19 Dispersed Camping, Center St, Cleary St, Cottonwood Canyon, Davidson Canyon, Garner Canyon, Garner Hollow, Great Western South, Heslington Canyon, Hicks Canyon, Indian Creek, Northwest Manti WMA, Oak St, Pine St, Private Picnic Site, Sheep Creek, Sheep Creek (Snowmobile), Spring Canyon, Tie Fork, Viaduct St 7 Residences
II-F	218	2 Outbuildings, 4 Dispersed Camping, Argyle Ridge 14 Residences
II-F	219.2	0401012 Ashley National Forest Roadless Area, 0401013 Ashley National Forest Roadless Area, 2 Outbuildings, 26 Dispersed Camping, 418019 Uinta National Forest Roadless Area, 4wd Rd, Amphitheatre, Argyle Canyon Rd, Avintaquin Family Campground, Cat Peak, Dock, Horse Rd, Indian Head, Res Ridge Rd, Reservation Ridge, Reservation Ridge Scenic Backway 49 Residences
II-F	219.3	1 Utility Structure, 1 Gas Station, East St, Left Fork White River, Right Fork White River, Soldier Summit (Snowmobile), Timber Canyon Rd 4 Residences
II-F	320.15	418028 Uinta National Forest Roadless Area, Cedar Knoll Manti-La Sal Roadless Area, Coal Hollow Manti-La Sal Roadless Area, Dispersed Camping Access Route, Dry Creek, Dry Hollow, Lake Fork & Dairy Fork Camping, Left Fork Spencer Canyon, North Nebo WMA, Northwest Manti WMA, Right Fork Spencer Canyon, Spencer Fork Wildlife Management Area, Spencer Fork--Lasson, Unnamed Campsite, US 89 15 Residences
II-F	320.2	Big Mountain Campground, Big Mountain Campground, Bradley Canyon, Hop Creek, Mud Spring Hollow, Nebo Loop Rd, Nebo Loop Scenic Byway, Water Hollow 0 Residences
II-F	350	4wd Rd, Airport Rd, Broad Canyon, I-15, Old Pinery Canyon, Ramp, Sheep Dr, Sheep Ln, Spring Canyon, SR 28, Triangle Ranch Wildlife Management Area 1 Residence
II-F	370	Little Sage Valley, West Fork Reservoir 0 Residences
II-F	380	E 600 Rd, Railroad Ave, S 150 Rd, S Main St, SR 125, Taylors Flat Rd, W 400 Rd, W 600 Rd
II-F	440	Jones Rd, N 4000 Rd, N 8000 West St, W 8500 North St 0 Residences

Table 3.12-14 Region II Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
Emma Park Alternative Variation	217.02	2 Industrial Buildings, 4wd Rd, 7 Outbuildings, Badger Canyon, Big Sulphur Canyon Rd, Butchers Rd, Camp Site, Dry Fork, Lion Canyon, Minnie Maud Creek Rd, Minnie Maud Ridge, Pasture Canyon, Pole Canyon, Sams Canyon Rd, Sky-high Pond, Wash Canyon, Whitmore Park Rd 16 Residences
Emma Park Alternative Variation	219.4	West Fork Willow Creek 0 Residences
Emma Park Alternative Variation	219.5	2 Dispersed Camping, Anderson Hollow, Logge Canyon, Right Fork Kyune Creek 0 Residences
Emma Park Alternative Variation Comparison	218	2 Outbuildings, 4 Dispersed Camping, Argyle Ridge 14 Residences
Emma Park Alternative Variation Comparison	219.2	0401012 Ashley National Forest Roadless Ar, 0401013 Ashley National Forest Roadless Area, 2 Outbuildings, 26 Dispersed Camping, 418019 Uinta National Forest Roadless Area, 4wd Rd, Amphitheatre, Argyle Canyon Rd, Avintaquin Family Campground, Cat Peak, Dock, Horse Rd, Indian Head, Res Ridge Rd, Reservation Ridge, Reservation Ridge Scenic Backway 49 Residences
Highway 191 Alternative Connector	219.6	Jones Hollow 0 Residences
Castle Dale Alternative Connector	270	4wd Rd, Lawrence County Rd, SR 10 0 Residences
Price Alternative Connector	223	Benches Rd, Bob Wright Canyon, Hiawatha, Horse Bench, Long Bench Rd, Mine Property Line, Mud Water Canyon, N Spring Canyon Rd, N Spring Rd, Telephone Bench Rd, The Knoll, Wattis Hwy, Wattis Rd, Wiregrass Bench Rd 0 Residences
Lynndyl Alternative Connector	400	4wd Rd, Frontage Rd, Hard Scrabble Canyon Rd, I-15, Leamington Pass Rd, Little Oak Creek Rd, Middle Canyon, Murrays Canyon, Oak Creek Canyon Rd, Spring Canyon 0 Residences

Segment numbers depicted in **Figure 2-22**.

Vegetation Treatments

Scenarios for vegetation treatments are listed in the PDTR (**Appendix D**). Clearing of plants above 4 feet in height would occur in the 250-foot-wide ROW unless otherwise specified in the PDTR. Only the 90-foot-wide "wire zone" and 250-foot-square structure construction area would be cleared in corridors classified as VRM Class II, SIO High, and VQO Retention. Key factors in the determination of impacts to the visual resource include viewing distances, presence or absence of tree cover, and steepness of topographic slopes. Application of **VR-1** would preserve pinyon-juniper trees, except for those impeding tower and access road construction. The edges between clearings and forest would be feathered in all species. The presence of moderate to steep slopes increases visibility of vegetation treatments for ROWs and for access roads, as compared to flat slopes. These factors are included in the analysis of impacts to scenery and to sensitive viewers. Reclamation recovery time analyses, specific to views from the 309 KOPs and involving topographic slope, topographic aspect and vegetation type, are shown in **Appendix I**, **Table I-10**. The results are central components in **Table 3.12-14**.

The geographic context, distances, and spatial relationship between visual resources and the Project reference lines by segment and milepost for Region II are portrayed by tables and maps of scenic quality classes (**Appendix I**, **Table I-1** and **Figure I-2**), sensitivity levels (**Appendix I**, **Table I-2** and **Figure I-4**), visual resource inventory classes (**Appendix I**, **Table I-5** and **Figure I-7**), and visual resource management classes (**Appendix I**, **Table I-6** and **Figure I-8**). All BLM VRI distance zones were inventoried as foreground-middleground for the Project study area and are therefore not shown with map figures. Project-specific distance zones are included in the analyses for impacts to landscape scenery,

sensitive viewers, and compliance or consistency with BLM or USFS management objectives, respectively.

There were 176 KOPs selected, photographed, and analyzed in Region II. The KOP figures in **Appendix I** portray the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation. Twenty-three photographic simulations of the Project in Region II, for those KOP locations where agency management objectives would not be met, are shown in the tables in **Appendix I** and shown in a photographic figure following each applicable KOP in the KOP figures **Appendix I**.

Alternative II-A (Applicant Proposed)

Alternative II-A would cross 257 miles of landscapes in the Uinta Basin Section of the Colorado Plateaus Province (Section 3.12.5.2), Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3), Middle Rocky Mountains Province (3.12.5.4), High Plateaus of Utah Section of the Colorado Plateaus Province (3.12.5.5), and Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross, along with one or more existing transmission lines (reduced contrasts), in the view from the visitor center of Dinosaur National Monument, CO State Highway 64 just south of Dinosaur, the Green River just south of The Stirrup, U.S. 40 southwest of Roosevelt and again in Deer Creek Canyon, Utah State Highway 87, Strawberry Road Scenic Backway, U.S. 6, U.S. 89, Utah State Highway 132 east of Nephi, in addition to several recreational roads and trails (**Table 3.12-14**). It would cross Utah State Highway 132 west of Nephi, U.S. 6 adjacent to Little Sahara Recreation Area, and Utah State Highway 174 in areas where the Project's guyed and, substantially more dominant, self-supported structures would stand out visually (higher contrasts) more than they would if seen with existing transmission line structures.

Recreationally important landscapes include Dinosaur National Monument, Bottle Hollow Reservoir, Starvation Reservoir, Strawberry Reservoir, Aspen Cove Campground, Strawberry River Day Use Area, and Strawberry Road Scenic Backway and camping areas, where the Project's structures would be seen with existing transmission line structures or oil and gas facilities. The Project would be visible from the Little Sahara Recreation Area and associated sand dunes areas where guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen with existing transmission line structures. Landscape photography and project simulations are located in **Appendix I**, in the Dinosaur NM, White River, Vernal, Uinta, Salt Lake, Richfield, and Fillmore FO sections.

Alternative II-A would be visible in the immediate foreground from 380 residences. Thirty-eight percent of Alternative II-A would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Twenty-four percent of Alternative II-A would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). One percent of Alternative II-A would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view. Alternative II-A has increased impacts as compared with Alternative II-E. Alternative II-A has decreased impacts as compared with Alternative II-B, Alternative II-C, Alternative II-D, and Alternative II-F. Eleven percent of the Alternative II-A reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

The Cedar Knoll IRA Micro-siting Options could be utilized with similar results as those discussed under Alternative II-F.

Strawberry IRA Micro-siting Option 1

This option is similar to Alternative II-A, except that it would cross the Strawberry Road Scenic Backway immediate foreground viewshed nearer to the existing transmission line. Thus, it has decreased impacts as compared with Alternative II-A. Four percent of the Strawberry IRA Micro-siting Option 1 reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Strawberry IRA Micro-siting Option 2

This option is similar to Alternative II-A, except that it would cross the Strawberry Road Scenic Backway immediate foreground viewshed nearer to the existing transmission line. However, it has two additional, substantially more dominant, self-supported structures at the road crossing near Little Baldy Mountain. These features would stand out visually and have increased visual impacts. Thus, it has increased impacts as compared with Alternative II-A. Four percent of the Strawberry IRA Micro-siting Option 2 reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Strawberry IRA Micro-siting Option 3

This option is similar to Alternative II-A, except that it would cross over or under the existing transmission line in the Strawberry Road Scenic Backway immediate foreground viewshed and has at least four additional, substantially more dominant, self-supported structures at the road crossings near Little Baldy Mountain and Buffalo Canyon. These features would stand out visually and have increased visual impacts. Thus, this option has increased impacts as compared with Alternative II-A. Four percent of the Strawberry IRA Micro-siting Option 3 reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative II-B

Alternative II-B would cross 345 miles of landscapes in the Uinta Basin Section of the Colorado Plateaus Province (Section 3.12.5.2), Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3), Middle Rocky Mountains Province (Section 3.12.5.4), High Plateaus of Utah Section of the Colorado Plateaus Province (3.12.5.5), and Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross, along with one or more existing transmission lines (reduced contrasts), in the view from CO State Highway 64 east of Rangely, CO State Highway 139 south of Rangely, the Crystal Geyser Road and Green River south of the town of Green River, I-70 west of Green River, would closely parallel U.S. 6 from I-70 to near the Carbon County/Emery County line, the Upper Joe's Valley Road, Skyline Road Backway, U.S. 89, Utah State Highway 132, U.S. 6 near Lynndyl, and Utah State Highway 174, in addition to several recreational roads and trails (**Table 3.12-14**). It does not parallel existing transmission lines as it would cross the Old Spanish Trail and I-70 west of the Green River to the Colorado/Utah border, and would cross and would closely parallel the winding Baxter Pass Road from near the Garfield County/Mesa County border over Baxter Pass to the White Face Butte area where the Project's predominantly self-supported structures would be "sky-lined" for the majority of the distance. It also would cross Rangely Dragon Road, Texas Creek recreational roads and trails, Utah State Highway 10, Utah State Highway 31, and I-15 in areas where the Project's guyed and, substantially more dominant, self-supported structures would stand out visually (higher contrasts) more than they would if seen with existing transmission line structures and oil and gas structures.

Recreationally important landscapes include the Texas Creek area, Baxter Pass area, Cisco Desert area, Green River area, Cedar Mountain area, and Joe's Valley area, where guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen with existing transmission line structures. Landscape photography and project simulations are located in **Appendix I**, in the Dinosaur NM, White River, Grand Junction, Moab, Price, Richfield, and Fillmore FO sections.

Alternative II-B would be visible in the immediate foreground from 60 residences. Twenty-eight percent of Alternative II-B would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Twelve percent of Alternative II-B would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**).

Four percent of Alternative II-B would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative II-B has decreased impacts as compared with Alternative II-C and Alternative II-F, and all the alternatives have increased impacts as compared with Alternative II-A, Alternative II-D, and Alternative II-E. Forty-one percent of the Alternative II-B reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative II-C

Alternative II-C would cross 364 miles of landscapes in the Uinta Basin Section of the Colorado Plateaus Province (Section 3.12.5.2), Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3), Middle Rocky Mountains Province (3.12.5.4), High Plateaus of Utah Section of the Colorado Plateaus Province (3.12.5.5), and Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross along with one or more existing transmission lines (reduced contrasts) in the view from CO State Highway 64 east of Rangely, CO State Highway 139 south of Rangely, the Crystal Geyser Road and Green River south of the town of Green River, I-70 west of Green River, would closely parallel U.S. 6 from I-70 to the intersection with the Green River Cutoff Road, Wedge Overlook Road, Utah State Highway 10, I-70, Gooseberry Road, U.S. 70, U.S. 50, I-15, would closely parallel U.S.50, and would cross U.S. 6. At the intersection of the Green River Cutoff Road it aligns west through complex and highly scenic surface geology where it would predominantly consist of self-supported structures that would be "sky-lined" along the roadway to the Cedar Mountain area, in addition to several local recreational roads and trails (**Table 3.12-14**). It does not parallel existing transmission lines as it would cross and would closely parallel the Rangely Dragon Road, Texas Creek recreational roads and trails, the winding Baxter Pass Road (where predominantly self-supporting structures would be required) from near the White Face Butte area over Baxter Pass to the Garfield County/Mesa County and would parallel the Old Spanish Trail and I-70 from the Colorado/Utah Border to the crossings just east of Green River. All of these locations would be subject to "sky-lining" of the Project's guyed and self-supported structures.

Recreationally important landscapes include the Texas Creek area, Baxter Pass area, Cisco Desert area, and U.S. 6 to Cedar Mountain area, Wedge Overlook area, Saleratus Benches area, Gooseberry Road area, Maple Grove Campground area, Scipio Lake area, and Canyon Mountains area, where guyed and self-supported structures would stand out visually more than they would if seen with existing transmission line structures. Landscape photography and project simulations are located in **Appendix I**, in the Dinosaur NM, White River, Grand Junction, Moab, Price, Richfield, Fishlake and Fillmore FO sections.

Alternative II-C would be visible in the immediate foreground from 78 residences. Twenty-three percent of Alternative II-C would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Less than 1 percent of Alternative II-C would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). Less than 1 percent of Alternative II-C would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but

should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is “sky-lined” and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative II-C has increased impacts as compared with Alternative II-A, Alternative II-B, Alternative II-D, and Alternative II-E. Alternative II-C has decreased impacts as compared with Alternative II-F. Thirty-nine percent of the Alternative II-C reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative II-D

Alternative II-D would cross 262 miles of landscapes in the Uinta Basin Section of the Colorado Plateaus Province (Section 3.12.5.2), Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3), Middle Rocky Mountains Province (Section 3.12.5.4), High Plateaus of Utah Section of the Colorado Plateaus Province (Section 3.12.5.5), and Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross, along with one or more existing transmission lines (reduced contrasts), in the view from the visitor center of Dinosaur National Monument, Colorado State Highway 64 just south of Dinosaur, the Chapita Wells Gas Field area, and U.S. 6. It would cross with higher contrasts the White River near the Enron Boat Takeout spot, the Uintah and Ouray Indian Reservation, the Green River, Sand Wash Road, Nine Mile Canyon Scenic Backway, Argyle Canyon Road, would closely parallel U.S. 191, Energy Loop Scenic Byway north of Clear Creek, again near Fairview Lakes, and again east of Fairview, U.S. 89 north of Fairview, Utah State Highway 132 east and west of Nephi, U.S. 6 adjacent to Little Sahara Recreation Area, and Utah State Highway 174, in addition to numerous recreational roads and trails (**Table 3.12-14**).

Recreationally important landscapes include Dinosaur National Monument, Fantasy Canyon, White River, Green River, Electric Lake, Fairview Lakes and the Little Sahara Recreation Area and associated sand dunes areas where guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen with existing transmission line structures. Landscape photography and project simulations are located in **Appendix I**, in the Dinosaur National Monument, White River, Vernal, Manti La Sal, Richfield, and Fillmore FO sections.

Alternative II-D would be visible in the immediate foreground from 17 residences. Thirty-nine percent of Alternative II-D would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Eighteen percent of Alternative II-D would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). Three percent of Alternative II-D would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is “sky-lined” and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative II-D has increased impacts as compared with Alternative II-A and Alternative II-E due to the (Alternative II-D) crossings of Electric Lake and Fairview Lakes areas. Alternative II-D has decreased impacts as compared with Alternative II-B, Alternative II-C, and Alternative II-F. Thirty-one percent of the Alternative II-D reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative II-E

Alternative II-E would cross 266 miles of landscapes in the Uinta Basin Section of the Colorado Plateaus Province (Section 3.12.5.2), Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3), Middle Rocky Mountains Province (3.12.5.4), High Plateaus of Utah Section of the

Colorado Plateaus Province (Section 3.12.5.5), and Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross, along with one or more existing transmission lines (reduced contrasts), in the view from the visitor center of Dinosaur National Monument, CO State Highway 64 just south of Dinosaur, the Green River just south of The Stirrup, U.S. 40 southwest of Roosevelt, Sowers Canyon Road, Argyle Canyon Road, the LDS Camp Timberlane, U.S. 6 in Soldier Canyon, Utah State Highway 87, Strawberry Road Scenic Backway, U.S. 6, U.S. 89, Utah State Highway 132 east of Nephi, in addition to several recreational roads and trails (**Table 3.12-14**). It would cross Utah State Highway 132 west of Nephi, U.S. 6 adjacent to Little Sahara Recreation Area, and Utah State Highway 174 in areas where the Project's guyed and, substantially more dominant, self-supported structures would stand out visually (higher contrasts) more than they would if seen with existing transmission line structures.

Recreationally important landscapes include Dinosaur National Monument, Bottle Hollow Reservoir, Sowers Canyon, Argyle Canyon, and the LDS Camp Timberland, where the Project's structures would be seen with existing transmission line structures. The Project would be visible from the Little Sahara Recreation Area and associated sand dunes areas where guyed and self-supported structures would stand out visually more than they would if seen with existing transmission line structures. Landscape photography and project simulations are located in **Appendix I**, in the Dinosaur National Monument, White River, Vernal, Ashley, Uinta, Salt Lake, Richfield, and Fillmore FO sections.

Alternative II-E would be visible in the immediate foreground from 245 residences. Forty percent of Alternative II-E would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Twenty-five percent of Alternative II-E would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). Less than 1 percent of Alternative II-E would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative II-E has decreased impacts as compared with Alternative II-A, Alternative II-B, Alternative II-C, Alternative II-D, and Alternative II-F. Twenty-seven percent of the Alternative II-E reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

The Cedar Knoll IRA Micro-siting Options could be utilized with similar results as those discussed under Alternative II-F.

Alternative II-F (Agency Preferred)

Alternative II-F would cross 267 miles of landscapes in the Uinta Basin Section of the Colorado Plateaus Province (Section 3.12.5.2), Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3), Middle Rocky Mountains Province (Section 3.12.5.4), High Plateaus of Utah Section of the Colorado Plateaus Province (Section 3.12.5.5), and Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross, along with one or more existing transmission lines (reduced contrasts), in the view from the visitor center of Dinosaur National Monument, Colorado State Highway 64 just south of Dinosaur, the Chapita Wells Gas Field area, and U.S. 6. It would cross with higher contrasts the White River near the Enron Boat Takeout spot, the Uintah and Ouray Indian Reservation, the Green River, Sand Wash Road, Nine Mile Canyon Scenic Backway, Argyle Canyon Road, access road to the LDS Camp Timberlane, U.S. 191, (parallel and cross) the Reservation Ridge Scenic Backway, U.S. 6, Utah State Highway 132 east and west of Nephi, U.S. 6 adjacent to Little Sahara Recreation Area, and Utah State Highway 174, in addition to numerous recreational roads and trails (**Table 3.12-14**).

Recreationally important landscapes include Dinosaur National Monument, Fantasy Canyon, White River, Green River, the LDS Camp Timberlane, Reservation Ridge Scenic Backway, USFS Avintaquin Campground, and the Little Sahara Recreation Area and associated sand dunes areas where guyed and self-supported structures would stand out visually more than they would if seen with existing transmission line structures. Landscape photography and project simulations are located in **Appendix I**, in the Dinosaur National Monument, White River, Vernal, Manti La Sal, Richfield, and Fillmore FO sections.

Alternative II-F would be visible in the immediate foreground from 90 residences. Forty-eight percent of Alternative II-F would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Twenty-seven percent of Alternative II-F would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). Three percent of Alternative II-F would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is “sky-lined” and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative II-F has substantially increased impacts as compared with Alternative II-A, Alternative II-B, Alternative II-C, Alternative II-D, and Alternative II-E. The Argyle Ridge and Reservation Ridge locations cause the highest impacts to landscape scenery and to high sensitivity viewers of all Project alternatives (Region I, Region II, Region III, and Region IV). Field photography, preparation of visual contrast worksheets, and visual simulations will be completed for the Final EIS. Thirty-five percent of the Alternative II-F reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Cedar Knoll IRA Micro-siting Option 1

The Cedar Knoll IRA Micro-siting Option 1 would cross 28 miles of landscapes along the boundaries of the Middle Rocky Mountains Province (Section 3.12.5.4), Great Basin Section of the Basin and Range Province (Section 3.12.5.6), and High Plateaus of Utah Section of the Colorado Plateaus Province (Section 3.12.5.5). It would cross U.S. 89 along with an existing transmission line and would be “sky-lined” (increased impact) in that area. The community of Birdseye and historic town of Thistle would have visibility of the Project in their vicinities. The Cedar Knoll IRA Micro-siting Option 1 would be visible in the immediate foreground from zero residences.

Ninety-three percent of the Cedar Knoll IRA Micro-siting Option 1 would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Thirty-nine percent of the Cedar Knoll IRA Micro-siting Option 1 would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). Less than 1 percent of the Cedar Knoll IRA Micro-siting Option 1 would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The Cedar Knoll IRA Micro-siting Option 1 would have impacts over its reach comparable to Alternative II-A. None of the Cedar Knoll IRA Micro-siting Option 1 reference line would be located within a utility corridor or utility window.

Cedar Knoll IRA Micro-siting Option 2

The Cedar Knoll IRA Micro-siting Option 2 would cross 28 miles of landscapes along the boundaries of the Middle Rocky Mountains Province (Section 3.12.5.4), Great Basin Section of the Basin and Range Province (Section 3.12.5.6), and High Plateaus of Utah Section of the Colorado Plateaus Province

(Section 3.12.5.5). It would cross U.S. 89 along with an existing transmission line and would be "sky-lined" (increased impact) in that area. The community of Birdseye and historic town of Thistle would have visibility of the Project in their vicinities. It would require near U.S. 89 at least five additional, substantially more dominant, self-supported structures as compared with other alternatives in this viewshed. The Cedar Knoll IRA Micro-siting Option 2 would be visible in the immediate foreground from zero residences.

Ninety-three percent of the Cedar Knoll IRA Micro-siting Option 2 would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Forty-three percent of the Cedar Knoll IRA Micro-siting Option 2 would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). Less than 1 percent of the Cedar Knoll IRA Micro-siting Option 2 would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The Cedar Knoll IRA Micro-siting Option 2 would have increased impacts over its reach as compared with Alternative II-A and Cedar Knoll IRA Micro-siting Option 2. None of the Cedar Knoll IRA Micro-siting Option 2 reference line would be located within a utility corridor or utility window.

Alternative Variation in Region II

Emma Park Alternative Variation

The Emma Park Alternative Variation would cross 35 miles of landscapes in the Uintah Basin Section of the Colorado Plateaus Province (Section 3.12.5.2) and the High Plateaus of Utah Section of the Colorado Plateaus Province (Section 3.12.5.5). It would cross U.S. Highway 191 and three places along the access road to a camp, and would be "sky-lined" (increased impact) in those areas. The Emma Park Alternative Variation would be visible in the immediate foreground from 79 residences. Ninety-seven percent of the Emma Park Alternative Variation would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Eleven percent of the Emma Park Alternative Variation would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). All of the Emma Park Alternative Variation would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The Emma Park Alternative Variation would have increased impacts as compared to Alternative II-E and substantially decreased impacts as compared to Alternative II-F. Field photography, preparation of visual contrast rating worksheets, and visual simulations will be completed for the Final EIS. Less than 1 percent of the Emma Park Variation reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative Connectors in Region II

Highway 191 Alternative Connector

The Highway 191 Alternative Connector would cross 5 miles of landscapes in the Uintah Basin Section of the Colorado Plateaus Province (Section 3.12.5.2) and the High Plateaus of Utah Section of the Colorado Plateaus Province (Section 3.12.5.5). It would cross U.S. and would be "sky-lined" (increased impact) in that area. The Highway 191 Alternative Connector would be visible in the immediate foreground from zero residences. One hundred percent of the Highway 191 Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Sixty percent of the Highway 191 Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations

(**Table 3.12-14**). All of the Highway 191 Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The Highway 191 Alternative Connector would have increased impacts as compared to Alternative II-E and substantially decreased impacts as compared to Alternative II-F. Field photography, preparation of visual contrast rating worksheets, and visual simulations will be completed for the Final EIS. None of the Highway 191 Connector reference line would be located within a utility corridor or utility window.

Price Alternative Connector

The Price Connector would cross 18 miles of landscapes in the Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3) and the High Plateaus of Utah Section of the Colorado Plateaus Province (Section 3.12.5.5). It would cross the Wattis Road along with a pair of existing transmission lines and would be "sky-lined" (increased impact) in that area. It would closely parallel these steel lattice transmission lines for the majority of the route. The Price Connector would be visible in the immediate foreground from zero residences. Twenty-two percent of the Price Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). None of the Price Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). All of the Price Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The Price Connector would have decreased impacts over its reach, but would involve the increased impacts of Alternative II-B. Twenty-two percent of the Price Connector reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Castle Dale Alternative Connector

The Castle Dale Alternative Connector would cross 11 miles of landscapes in the Northern Canyonlands Section of the Colorado Plateaus Province (Section 3.12.5.3) and the High Plateaus of Utah Section of the Colorado Plateaus Province (Section 3.12.5.5). It would cross Utah State Highway 10 in an area with existing transmission lines and would be "sky-lined" in that area. It would cross in front of Red Point, a major visual landmark in the Huntington area. The Castle Dale Alternative Connector would be visible in the immediate foreground from zero residences. Twenty-seven percent of the Castle Dale Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Nine percent of the Castle Dale Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). Less than 1 percent of the Castle Dale Alternative Connector would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The Castle Dale Alternative Connector would have decreased impacts over its reach, but would involve the increased impacts of Alternatives II-B and II-C. Eighteen percent of the Castle Dale Connector reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Lynndyl Alternative Connector

The Lynndyl Alternative Connector would cross 24 miles of landscapes in the Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross numerous recreational roads and trails (**Table 3.12-14**) and would be "sky-lined" (increased impact) in those areas with no other transmission

lines present. The Lynndyl Alternative Connector would be visible in the immediate foreground from one residence. Thirty-eight percent of the Lynndyl Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Thirteen percent of the Lynndyl Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). All of the Lynndyl Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The Lynndyl Alternative Connector would have increased impacts over its reach. Four percent of the Lynndyl Connector reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

IPP Alternative Connector

The IPP Alternative Connector would cross 3 miles of landscapes in the Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross no roads or trails. The IPP Alternative Connector would be visible in the immediate foreground from zero residences. None of the IPP Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). None of the IPP Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-14**). All of the IPP Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

The IPP Alternative Connector would have minimal impacts over its reach. None of the IPP East Connector reference line would be located within a utility corridor or utility window.

3.12.6.6 Region III

Impact parameters relate to the impact discussion in Section 3.12.6.3, Impacts Common to all Alternative Routes and Associated Components, and specific differences by alternative are presented below. The segment-specific table information for high and moderate sensitivity viewers distance zones, scenic quality, visual resource inventory classifications, agency management classifications, residual Impacts, compliance or consistency with BLM VRM, USFS SIO or VQO, and intersection of the Project reference line with utility corridors or utility windows are summarized in **Table 3.12-15**. Segment- and milepost-specific Region I inventory data and impact results for these topics are shown in the corresponding tables in **Appendix I**.

The KOP figures in **Appendix I** indicate the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation.

Residual Impacts

The application of substantive mitigation measures would reduce visual impacts from high to moderate, or moderate to low. These reductions are applicable to viewing situations involving stationery (non-linear) viewers and to landscapes where tree cover and moderate to steep landforms contribute strongly to visual impacts. Residual impacts by Alternative and Segment are listed for landscape scenery, high viewer sensitivity and moderate viewer sensitivity in **Table 3.12-15**. Residual impacts by Region, Alternative, Segment, and mileposts (as if, “walking the line”) are listed in the corresponding tables in **Appendix I**.

Table 3.12-15 Region III Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)				Moderate Sensitivity Viewers (miles)				Scenic Quality (miles)			BLM VRI Classifications (miles)			BLM VRM Classifications (miles)			USFS SIO/VQO Classifications (miles)			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)						Utility Corridor or Utility Window[9]
																						Landscape Scenery			High Sensitivity Viewers			Moderate Sensitivity Viewers			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	III-A	III-B	III-C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Alternative III-A																																				
Alternative III-A Total	**276**	**32**	**82**	**69**	**93**	**52**	**93**	**72**	**59**	**1**	**101**	**174**	**17**	**90**	**150**	**3**	**73**	**132**	**1**	**16**	**--**	**60**	**60**	**156**	**23**	**70**	**182**	**25**	**73**	**178**	**219**	**7**	**50**	**220**	**6**	**50**	**68**
450	11	--	4	6	2	2	7	2	--	--	--	11	--	10	1	--	--	11	--	--	--	--	2	9	--	<1	11	1	3	8	11	--	<1	11	--	<1	--
470	34	1	4	5	24	1	5	11	16	--	13	21	--	3	31	--	--	31	--	--	--	13	21	--	1	9	24	1	5	27	31	--	3	31	--	3	2
480	65	2	14	28	21	21	19	25	--	--	15	50	--	9	56	--	--	53	--	--	--	1	9	56	--	6	59	8	15	42	53	--	12	53	--	12	--
500	19	--	--	2	17	1	8	7	3	--	--	19	--	--	19	--	--	12	--	--	--	--	--	19	--	--	19	--	1	18	12	--	8	12	--	8	1
500.02	18	<1	11	3	4	10	6	2	--	--	2	16	--	3	15	--	--	2	--	--	--	--	--	18	--	<1	17	--	10	8	2	--	15	2	--	15	--
500.05	10	7	3	--	--	2	3	5	--	--	8	2	--	3	5	--	--	3	--	1	--	6	<1	3	5	3	2	2	1	6	5	--	5	5	--	5	2
501.1	14	13	1	--	--	5	8	1	--	--	12	2	--	--	1	--	--	--	1	11	--	9	4	1	10	4	<1	5	6	4	8	4	1	9	3	1	13
501.15	1	1	--	--	--	--	1	--	--	--	1	--	--	--	--	--	--	--	--	1	--	--	1	--	--	1	--	--	--	1	1	--	--	1	--	--	1
502.05	43	3	11	9	19	1	5	6	30	--	25	18	2	22	16	--	25	12	--	2	--	9	1	33	3	7	33	1	4	38	39	--	4	39	--	4	36
530	9	--	--	3	5	--	--	--	9	--	2	6	2	5	1	2	--	6	--	--	--	--	--	9	--	--	9	--	--	9	9	--	--	9	--	--	6
550	35	2	22	12	--	6	22	6	1	--	23	12	12	18	4	1	31	2	--	--	--	21	12	3	2	31	3	6	22	7	34	--	1	34	--	1	2
560	11	3	9	--	--	1	5	5	--	--	<1	11	<1	11	--	--	11	--	--	--	--	<1	11	--	3	9	--	1	5	5	9	2	--	9	2	--	--
600	6	<1	4	1	--	--	3	2	--	--	--	6	--	6	--	--	6	--	--	--	--	--	--	6	--	<1	5	--	--	6	6	--	--	6	--	--	6
Alternative III-B																																					
Alternative III-B Total	**285**	**22**	**99**	**106**	**58**	**84**	**92**	**48**	**61**	**13**	**85**	**187**	**26**	**75**	**169**	**3**	**64**	**144**	**--**	**--**	**--**	**59**	**100**	**126**	**14**	**117**	**154**	**55**	**67**	**163**	**211**	**1**	**73**	**211**	**1**	**73**	**79**
450	11	--	4	6	2	2	7	2	--	--	--	11	--	10	1	--	--	11	--	--	--	--	2	9	--	<1	11	1	3	8	11	--	<1	11	--	<1	--
470	34	1	4	5	24	1	5	11	16	--	13	21	--	3	31	--	--	31	--	--	--	13	21	--	1	9	24	1	5	27	31	--	3	31	--	3	2
480	65	2	14	28	21	21	19	25	--	--	15	50	--	9	56	--	--	53	--	--	--	1	9	56	--	6	59	8	15	42	53	--	12	53	--	12	--
490	14	--	2	12	--	1	12	--	--	--	--	14	--	--	14	--	--	5	--	--	--	--	14	--	--	14	--	1	12	--	5	--	9	5	--	9	--
490.05	42	7	29	7	--	37	5	--	--	--	1	42	--	1	42	--	2	8	--	--	--	1	42	--	7	35	--	37	5	--	10	<1	33	10	<1	33	--

Table 3.12-15 Region III Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)				Moderate Sensitivity Viewers (miles)				Scenic Quality (miles)			BLM VRI Classifications (miles)			BLM VRM Classifications (miles)			USFS SIO/VQO Classifications (miles)			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)						Utility Corridor or Utility Window[9]
																						Landscape Scenery			High Sensitivity Viewers			Moderate Sensitivity Viewers			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	III-A	III-B	III-C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
510	57	6	23	24	4	7	11	3	36	13	32	12	13	25	19	--	27	28	--	--	--	44	12	--	6	47	4	7	11	38	55	1	1	55	1	1	26
530	9	--	--	3	5	--	--	--	9	--	2	6	2	5	1	2	--	6	--	--	--	--	--	9	--	--	9	--	--	9	9	--	--	9	--	--	6
540	40	4	14	19	2	13	21	5	1	--	22	18	11	9	5	1	22	2	--	--	--	--	--	40	--	4	36	--	13	27	25	--	14	25	--	14	34
590	7	1	6	<1	--	1	6	--	--	--	--	7	--	7	<1	--	7	--	--	--	--	--	--	7	--	1	6	--	1	6	7	--	--	7	--	--	4
600	6	<1	4	1	--	--	3	2	--	--	--	6	--	6	--	--	6	--	--	--	--	--	--	6	--	<1	5	--	--	6	6	--	--	6	--	--	6
Alternative III-C																																					
Alternative III-C Total	**308**	**51**	**106**	**83**	**68**	**109**	**81**	**72**	**46**	**11**	**96**	**201**	**28**	**66**	**209**	**--**	**92**	**146**	**--**	**--**	**--**	**82**	**111**	**115**	**42**	**131**	**135**	**89**	**64**	**155**	**229**	**8**	**71**	**229**	**8**	**71**	**42**
450	11	--	4	6	2	2	7	2	--	--	--	11	--	10	1	--	--	11	--	--	--	--	2	9	--	<1	11	1	3	8	11	--	<1	11	--	<1	--
460	32	--	--	8	24	1	5	15	10	--	6	25	--	3	28	--	--	30	--	--	--	--	--	32	--	--	32	--	1	30	30	--	2	30	--	2	12
480	65	2	14	28	21	21	19	25	--	--	15	50	--	9	56	--	--	53	--	--	--	1	9	56	--	6	59	8	15	42	53	--	12	53	--	12	--
490	14	--	2	12	--	1	12	--	--	--	--	14	--	--	14	--	--	5	--	--	--	--	14	--	--	14	--	1	12	--	5	--	9	5	--	9	--
490.05	42	7	29	7	--	37	5	--	--	--	1	42	--	1	42	--	2	8	--	--	--	1	42	--	7	35	--	37	5	--	10	<1	33	10	<1	33	--
520	125	35	51	18	21	43	23	24	35	11	70	44	28	39	54	--	79	33	--	--	--	80	44	--	35	69	21	43	23	59	104	8	13	104	8	13	27
610	19	8	7	5	--	4	9	6	--	--	4	15	--	4	14	--	12	6	--	--	--	--	--	19	--	8	12	--	4	15	18	--	2	18	--	2	13
Ox Valley East Variation																																					
Ox Valley East Variation Total	**16**	**14**	**2**	**--**	**--**	**2**	**7**	**8**	**--**	**--**	**16**	**--**	**--**	**<1**	**<1**	**--**	**--**	**--**	**15**	**1**	**--**	**16**	**--**	**--**	**14**	**2**	**--**	**2**	**7**	**8**	**1**	**15**	**<1**	**1**	**15**	**1**	**2**
503	7	5	2	--	--	2	5	1	--	--	7	--	--	--	<1	--	--	--	7	<1	--	7	--	--	5	2	--	2	5	1	<1	7	--	<1	7	<1	<1
505	9	9	--	--	--	--	2	7	--	--	9	--	--	<1	<1	--	--	--	8	1	--	9	--	--	9	--	--	--	2	7	1	8	<1	1	8	<1	1

Table 3.12-15 Region III Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)				Moderate Sensitivity Viewers (miles)				Scenic Quality (miles)			BLM VRI Classifications (miles)			BLM VRM Classifications (miles)			USFS SIO/VQO Classifications (miles)			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)						Utility Corridor or Utility Window[9]
																						Landscape Scenery			High Sensitivity Viewers			Moderate Sensitivity Viewers			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	III-A	III-B	III-C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Ox Valley East Variation Comparison																																				
Ox Valley East Variation Comparison Total	**15**	**14**	**1**	**--**	**--**	**5**	**9**	**1**	**--**	**--**	**13**	**2**	**--**	**--**	**1**	**--**	**--**	**--**	**1**	**12**	**--**	**9**	**5**	**1**	**10**	**5**	**<1**	**5**	**6**	**5**	**9**	**4**	**1**	**10**	**3**	**1**	**14**
501.1	14	13	1	--	--	5	8	1	--	--	12	2	--	--	1	--	--	--	1	11	--	9	4	1	10	4	<1	5	6	4	8	4	1	9	3	1	13
501.15	1	1	--	--	--	--	1	--	--	--	1	--	--	--	--	--	--	--	--	1	--	--	1	--	--	1	--	--	--	1	--	--	1	--	--	1
Ox Valley West Variation																																				
Ox Valley West Variation Total	**17**	**14**	**2**	**--**	**--**	**1**	**8**	**7**	**--**	**--**	**16**	**<1**	**--**	**<1**	**1**	**--**	**--**	**<1**	**15**	**1**	**--**	**16**	**<1**	**--**	**14**	**2**	**--**	**1**	**8**	**7**	**1**	**15**	**1**	**1**	**15**	**<1**	**2**
504	7	5	2	--	--	1	6	<1	--	--	7	<1	--	--	1	--	--	<1	6	<1	--	7	<1	--	5	2	--	1	6	<1	1	6	<1	1	6	0	<1
505	9	9	--	--	--	--	2	7	--	--	9	--	--	<1	<1	--	--	--	8	1	--	9	--	--	9	--	--	--	2	7	1	8	<1	1	8	<1	1
Ox Valley West Variation Comparison																																				
Ox Valley West Variation Comparison Total	**15**	**14**	**1**	**--**	**--**	**5**	**9**	**1**	**--**	**--**	**13**	**2**	**--**	**--**	**1**	**--**	**--**	**--**	**1**	**12**	**--**	**9**	**5**	**1**	**10**	**5**	**<1**	**5**	**6**	**5**	**9**	**4**	**1**	**10**	**3**	**1**	**14**
501.1	14	13	1	--	--	5	8	1	--	--	12	2	--	--	1	--	--	--	1	11	--	9	4	1	10	4	<1	5	6	4	8	4	1	9	3	1	13
501.15	1	1	--	--	--	--	1	--	--	--	1	--	--	--	--	--	--	--	--	1	--	--	1	--	--	1	--	--	--	1	--	--	1	--	--	1
Pinto Variation																																				
506	29	18	10	--	--	17	12	--	--	--	24	5	--	5	3	--	2	4	20	1	--	24	5	--	18	10	--	17	12	--	6	21	1	6	21	1	2
Pinto Variation Comparison																																				
Pinto Variation Comparison Total	**24**	**20**	**4**	**--**	**--**	**7**	**11**	**6**	**--**	**--**	**20**	**4**	**--**	**3**	**7**	**--**	**--**	**3**	**1**	**13**	**--**	**15**	**5**	**4**	**15**	**7**	**2**	**7**	**7**	**10**	**13**	**4**	**6**	**14**	**3**	**6**	**15**
500.05	10	7	3	--	--	2	3	5	--	--	8	2	--	3	5	--	--	3	--	1	--	6	<1	3	5	3	2	2	1	6	5	--	5	5	--	5	2
501.1	14	13	1	--	--	5	8	1	--	--	12	2	--	--	1	--	--	--	1	11	--	9	4	1	10	4	<1	5	6	4	8	4	1	9	3	1	13

Table 3.12-15 Region III Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)				Moderate Sensitivity Viewers (miles)				Scenic Quality (miles)			BLM VRI Classifications (miles)			BLM VRM Classifications (miles)			USFS SIO/VQO Classifications (miles)			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)						Utility Corridor or Utility Window[9]
																						Landscape Scenery			High Sensitivity Viewers			Moderate Sensitivity Viewers			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	III-A	III-B	III-C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Avon Connector																																				
495	8	--	1	3	4	8	--	--	--	--	--	8	--	--	8	--	--	3	--	--	--	--	8	--	--	4	4	8	--	--	3	--	5	3	--	5	--
Moapa Connector																																				
Moapa Connector	13	3	9	1	--	3	9	--	--	--	<1	13	<1	9	3	--	11	2	--	--	--	<1	9	3	3	7	3	3	6	3	12	1	--	12	1	--	2
570	10	3	6	1	--	3	6	--	--	--	<1	9	<1	9	<1	--	10	--	--	--	--	<1	9	--	3	7	--	3	6	--	8	1	--	8	1	--	<1
580	3	--	3	<1	--	--	3	--	--	--	--	3	--	--	3	--	1	2	--	--	--	--	--	3	--	--	3	--	--	3	3	--	--	3	--	--	1

[1] High Sensitivity and Moderate Sensitivity Viewers' analysis and mapping for the Project encompass public and private viewers' concern for landscape scenery (**Appendix I, Tables I-3** and **I-4**; **Appendix I**, **Figure I-4**). The distance and visibility factors are based on the characteristics of TWE facilities, divided into four zones(**Appendix I**, **Tables I-3** and **I-4**; **Appendix I**, **Figures I-4**, **I-5**, and **I-6**).

[2] Scenic Quality or scenic attractiveness is rated Class A, Class B, or Class C for highest to lowest quality or attractiveness (**Appendix I, Table I-1**; **Appendix I, Figures I-2** and **I-3**).

[3] BLM VRI classifications represent this relative value of visual resources and provide the basis for considering visual values in the resource management planning process. VRI Class II, III, and IV (high to low) are determined based on the combination of scenic quality, sensitivity levels, and distance zones. VRI Class I is assigned to special management areas (**Appendix I, Table I-5**; **Appendix I, Figure I-7**).

[4] BLM VRM classifications result from the RMP land use planning process for all BLM-administered lands (**Table 3.12-1**) (**Appendix I, Table I-7**; **Appendix I**, **Figure I-8**).

[5] USFS SIO or VQO Classifications result from the national forest planning process for all USFS-administered lands (**Table 3.12-2**) (**Appendix I, Table I-7**; **Appendix I**, **Figure I-8**).

[6] Residual Impacts for Landscape Scenery (**Table 3.12-7**) involves the comparison of contrasts after mitigation with the scenic quality inventory of the affected environment (**Table 3.12-4**).

[7] Residual Impacts for High Sensitivity and Moderate Sensitivity Viewers (**Table 3.12-5**) involves comparison of contrasts after mitigation with distance zones (**Table 3.12-6**) and viewers' concern levels (**Table 3.12-5**).

[8] BLM VRM, USFS SIO, or USFS VQO Compliance or Consistency (**Table 3.12-8**) involves comparisons of agency management objectives with contrast ratings from 309 KOPs (**KOP Figures** in **Appendix I**).

[9] Calculations associated with Utility Corridors and Utility Windows involve the intersection of the Project reference line with the areas/polygons of the corridors or windows. These corridors or windows take precedence over the compliance and consistency determinations and as such negate the need for updates of the land use plans.

Note: Discrepancies in totals due to rounding. Segment numbers depicted in **Figure 2-23**.

Compliance or Consistency with Agency Management Objectives

Maps showing locations where agency management objectives would be met and would not be met are shown in **Appendix I**, **Figure I-12**. Photographic simulations of the Project, for those KOP locations where agency management objectives would not be met, are shown in the KOP figures in **Appendix I** following the applicable KOP analysis sheet. Maps showing locations where applications of mitigation **VR-4** to the reference line would reduce impacts to levels compliant or consistent with agency management objectives are shown in **Appendix I**, **Figure I-13**. Maps showing locations where agency management objectives would be met with mitigation and where agency management objectives are not applicable are shown in **Appendix I**, **Figure I-14**. Mitigation **VR-4** would be applicable to, and subject to the standard routing engineering study for reference lines within a half-mile of linear KOPs, except for those reference lines crossing roads. Designated utility corridors considered in the analysis are shown in **Appendix I**, **Figure I-15**.

Scenic Quality

Existing scenic quality may be lowered by the Project, depending on the context. This is determined based on analysis of existing scenic quality rating/scores, existing landscape character, presence or absence of existing industrial development (transmission lines, pipelines, land disturbances, etc.), and the effect of introducing the Project into the landscape as either a new or additional cultural modification. Those segments where the existing scenic quality would be lowered by the Project to a lower class (Class A to Class B or Class B to Class C) are shown in **Table 3.12-16**. Segment- and milepost-specific data for change in scenic quality is shown in **Appendix I**, **Table I-12**.

Table 3.12-16 Region III Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
Alternative III-A				
450	11	--	--	11
470	34	--	--	34
480	65	--	--	65
500	19	--	--	19
500.02	18	--	--	18
500.05	10	--	--	10
501.1	14	--	--	14
501.15	1	--	--	1
502.05	43	1	--	42
530	9	--	--	9
550	35	--	--	35
560	11	--	--	11
600	6	--	--	6

Table 3.12-16 Region III Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
Alternative III-B				
450	11	--	--	11
460	34	--	--	34
480	65	--	--	65
490	14	--	--	14
490.05	43	--	1	42
510	57	--	14	43
530	9	--	--	9
540	40	--	--	40
590	7	--	--	7
600	6	--	--	6
Alternative III-C				
450	11	--	--	11
460	32	--	--	32
480	65	--	--	65
490	14	--	--	14
490.05	43	--	1	42
520	124	9	--	115
610	19	--	--	19
Ox Valley East Variation				
503	7	--	--	7
505	9	--	--	9
Ox Valley East Variation Comparison				
501.1	14	--	--	14
501.15	1	--	--	1
Ox Valley West Variation				
504	7	--	--	7
505	9	--	--	9
Ox Valley West Variation Comparison				
501.1	14	--	--	14
501.15	1	--	--	1

Table 3.12-16 Region III Scenic Quality Class Changes by Alternative and Segment

Alternative/Segment	Total Miles	Class A to B	Class B to C	No Change
Pinto Variation				
506	29	--	--	29
Pinto Variation Comparison				
500.05	10	--	--	10
501.1	14	--	--	14
Avon Connector				
495	8	--	--	8
Moapa Connector				
570	10	--	--	10
580	3	--	--	3

Segment numbers depicted in **Figure 2-23**.

Public Viewers and Visibility of the Project

Immediate foreground (0 to 0.5-mile) visibility of the Project is influential in the experiences of viewers and indicative of the level of impacts to people. The following **Table 3.12-17** indicates visibility by alternative and segment for those immediate foreground public places, designated special management areas, lakes and reservoirs, rivers, roads, scenic byways and backways, and historic trails where visual resources are important to recreational and viewer experiences. Viewing situations in these locations are both stationary and mobile.

Table 3.12-17 Region III Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
III-A	450	Smelter Knolls Reservoir 0 Residences
III-A	470	4wd Rd, Old 6 And 50, US 6 0 Residences
III-A	480	4wd Rd, Beryl Milford Rd, Cat Canyon, Cat Canyon Reservoir, Chrystal Peak Rd, Cricket Mountains ATV Area, Cricket Mountains ATV Area, Jockey Rd, Long Lick Canyon, Lower Big Wash Reservoir, Mollies Nipple, Moscow Reservoir, Moscow Wash, Red Rock Number 1 Reservoir, S 24300 West St, SR 21, The Big Wash, Twelvemile Knoll 0 Residences
III-A	500	16000 Rd, 18200 Rd, 21600 Rd, Blue Knoll, E 18200 Rd, E 20600 Rd, Iron Springs Creek, Lund Hwy, Schoppmann Rd 0 Residences
III-A	500.02	10400 Rd, 1600 Rd, 8000 Rd, Bullion Canyon, Chloride Canyon, Sand Spring Canyon, Sand Spring Rd, Urie Hollow, W Antelope Rd 0 Residences

Table 3.12-17 Region III Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
III-A	500.05	2600 Rd, 3200 Rd, 700 Rd, Bench Rd, E 300 Rd, Jefferson Hunt Monument, Old Spanish Historic Trail, SR 56, W Pinto Rd 13 Residences
III-A	501.1	Atchinson Dixie National Forest Roadless A, Big Canyon, California Hollow, Carson Cir, Cave Cir, Dodge City Trl, E Christie Ln, E Forest Dr, E Rye Dr, E Sumac Dr, Hardin Trl, Hole N Rock Cir, Launa Ln, Lodge Rd, Meadow Valley Creek, N Butch Cassidy Trl, N Cedar Dr, N Doc Holiday Ln, N Lodge Rd, N Matt Dillon Trl, N Pinion Cir, N Sundance Kid Trl, Old State Hwy 144, Orchard Dr, Pine Valley Hwy, Red Butte, Rex Layne Dr, Spring Creek, W Butch Cassidy Cir, W Frontier Rd, Younger Cir 131 Residences
III-A	501.15	Rancho Veyo Rd 0 Residences
III-A	502.05	Beaver Dam Slope ACEC, Beaver Dam Wash NCA, Biglow Ranch Rd, Burgess Wash, Grapevine Wash, Jackson Reservoir, Moody Wash Dixie National Forest Roadless, Mormon Mesa ACEC - Ely, Snow Spring Wash, Snow Spring Wash, Veyo Shoal Creek Rd 0 Residences
III-A	550	Carp Elgin Rd, Carpelgin Rd, Frontage Rd, I-15, Mormon Mesa ACEC, Muddy River Wildlife Study Area, Ramp, SR 12, Waterline Rd, Weiser Wash 0 Residences
III-A	560	Bitter Springs Backcountry Byway, Muddy Mountains SRMA, Old Spanish Historic Trail, RT 167, RT 169, SR 40 0 Residences
III-A	600	Old Spanish Historic Trail, Old Spanish Historic Trail 0 Residences
III-B	450	Smelter Knolls Reservoir 0 Residences
III-B	470	4wd Rd, Old 6 And 50, US 6 0 Residences
III-B	480	4wd Rd, Beryl Milford Rd, Cat Canyon, Cat Canyon Reservoir, Chrystal Peak Rd, Cricket Mountains ATV Area, Cricket Mountains ATV Area, Jockey Rd, Long Lick Canyon, Lower Big Wash Reservoir, Mollies Nipple, Moscow Reservoir, Moscow Wash, Red Rock Number 1 Reservoir, S 24300 West St, SR 21, The Big Wash, Twelvemile Knoll 0 Residences
III-B	490	13300 Rd, 9300 Rd, E 14900 Rd, E 18200 Rd, E 20600 Rd, E 23200 Rd, E 24000 Rd, Lund Hwy, N 10100 Rd, N 10900 Rd, N 12500 Rd 0 Residences
III-B	490.05	4wd Rd, 50 Rd, 5600 Rd, Beryl Milford Rd, Beryl Rd, Center St, Cow Trl, Deer Rd, Dick Palmer Wash, E 12000 Rd, Gold Springs Rd, Hamblin Valley Rd, Modena Reservoir, N 10000 Rd, N 10100 Rd, N 10200 Rd, N 10300 Rd, N 1600 Rd, N 3000 Rd, N 4000 Rd, N 7200 Rd, N 800 Rd, N 8000 Rd, N 8800 Rd, Sheep Spring Draw, SR 319, SR 56, Uvada Reservoir, W 6600 Rd, W Center St, Zane, Zane Rd 21 Residences

Table 3.12-17 Region III Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
III-B	510	Abe Spring, Bally Knolls, Clover Mountains Wilderness, Jumbled Mountain, Lafes Reservoir, Mud Springs, Shoemake Spring, Summit Spring, The Ribbons, Topah Spring, Tule Spring 3 Residences
III-B	540	31 Residences, Barlow Ave, Casaby Ave, Dry Gulch Trl, Embry St, Henry Dr, Livingston Number Two Spring, Meadow Valley Wash Wildlife Study Area, Moapa Recreation Center Park, N Lawson Dr, Patriots Way, Pulsipher Ave, Rest Area, S Lawson Dr, S Sandy St, SR 168, SR 78, Vivian Pl 0 Residences
III-B	590	SR 40 0 Residences
III-B	600	Old Spanish Historic Trail, Old Spanish Historic Trail 0 Residences
III-C	450	Smelter Knolls Reservoir 0 Residences
III-C	460	North Clay Knoll Reservoir, Old Channel Sevier River, Rocky Knoll, S 18000 Rd, Soap Wash, Squire Ln, W 13000 Rd, W 2500 South St, West Clay Knoll Reservoir, West Marshall Tract Reservoir 0 Residences
III-C	480	4wd Rd, Beryl Milford Rd, Cat Canyon, Cat Canyon Reservoir, Chrystal Peak Rd, Cricket Mountains ATV Area, Cricket Mountains ATV Area, Jockey Rd, Long Lick Canyon, Lower Big Wash Reservoir, Mollies Nipple, Moscow Reservoir, Moscow Wash, Red Rock Number 1 Reservoir, S 24300 West St, SR 21, The Big Wash, Twelvemile Knoll 0 Residences
III-C	490	13300 Rd, 9300 Rd, E 14900 Rd, E 18200 Rd, E 20600 Rd, E 23200 Rd, E 24000 Rd, Lund Hwy, N 10100 Rd, N 10900 Rd, N 12500 Rd 0 Residences
III-C	490.05	4wd Rd, 50 Rd, 5600 Rd, Beryl Milford Rd, Beryl Rd, Center St, Cow Trl, Deer Rd, Dick Palmer Wash, E 12000 Rd, Gold Springs Rd, Hamblin Valley Rd, Modena Reservoir, N 10000 Rd, N 10100 Rd, N 10200 Rd, N 10300 Rd, N 1600 Rd, N 3000 Rd, N 4000 Rd, N 7200 Rd, N 800 Rd, N 8000 Rd, N 8800 Rd, Sheep Spring Draw, SR 319, SR 56, Uvada Reservoir, W 6600 Rd, W Center St, Zane, Zane Rd 21 Residences
III-C	520	Access Route, Antelope Canyon Rd, Buckboard Spring, Cedar Wash, Chief Mountain SRMA, Chokecherry Spring, Cobalt Canyon, Cobalt Canyon, Coyote Springs Valley ACEC, Delamar Mountains Wilderness, Delamar Valley, Desert National Wildlife Range, Fish and Wildlife #1, Fish and Wildlife #2, Fish and Wildlife #3, Gunsight Mountain Trl, Highway 93, Kane Springs ACEC, Kane Springs Wash, Keel Spring, Lien Draw, Miller Spring, Miser Gulch, Nelson Spring, Old Hwy 93, Old State Boundary Historical Marker, Perkins Number Two Reservoir, Powerline Reservoir, Pwr Line Maintenance Rd, Rainbow Canyon Backcountry Byway, Sawmill Rd, Silver State OHV Area, Silver State OHV Area, Silver State OHV Area Access Route, Silver State OHV Trail, Southeast Reservoirs, SR 168, SR 75, Unit 3/Sheep Range, US 93, Wamp Springs Trl 4 Residences

Table 3.12-17 Region III Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
III-C	610	Apex Rd, I-15, Nellis Dunes SRMA, Old Spanish Historic Trail, Power Line Rd, Salt Lake Hwy, Service Rd, US 93 0 Residences
Ox Valley East Alternative Variation	503	Gum Hill, Gum Hill Dixie National Forest Roadless Ar, Meadow Canyon Rd, Mogotsu Dixie National Forest Roadless Are, Natl Forest Rd, Shinbone Creek, SR 18 0 Residences
Ox Valley East Alternative Variation	505	Bullrush Creek, Hardscrabble Hollow, Natl Forest Rd, Red Hardscrabble Trail, Valley Canyon 0 Residences
Ox Valley East Alternative Variation Comparison	501.1	Atchinson Dixie National Forest Roadless A, Big Canyon, California Hollow, Carson Cir, Cave Cir, Dodge City Trl, E Christie Ln, E Forest Dr, E Rye Dr, E Sumac Dr, Hardin Trl, Hole N Rock Cir, Launa Ln, Lodge Rd, Meadow Valley Creek, N Butch Cassidy Trl, N Cedar Dr, N Doc Holiday Ln, N Lodge Rd, N Matt Dillon Trl, N Pinion Cir, N Sundance Kid Trl, Old State Hwy 144, Orchard Dr, Pine Valley Hwy, Red Butte, Rex Layne Dr, Spring Creek, W Butch Cassidy Cir, W Frontier Rd, Younger Cir 131 Residences
Ox Valley East Alternative Variation Comparison	501.15	Rancho Veyo Rd 0 Residences
Ox Valley West Alternative Variation	504	Natl Forest Rd, S 1200th St 0 Residences
Ox Valley West Alternative Variation	505	Bullrush Creek, Hardscrabble Hollow, Natl Forest Rd, Red Hardscrabble Trail, Valley Canyon 0 Residences
Ox Valley West Alternative Variation Comparison	501.1	Atchinson Dixie National Forest Roadless A, Big Canyon, California Hollow, Carson Cir, Cave Cir, Dodge City Trl, E Christie Ln, E Forest Dr, E Rye Dr, E Sumac Dr, Hardin Trl, Hole N Rock Cir, Launa Ln, Lodge Rd, Meadow Valley Creek, N Butch Cassidy Trl, N Cedar Dr, N Doc Holiday Ln, N Lodge Rd, N Matt Dillon Trl, N Pinion Cir, N Sundance Kid Trl, Old State Hwy 144, Orchard Dr, Pine Valley Hwy, Red Butte, Rex Layne Dr, Spring Creek, W Butch Cassidy Cir, W Frontier Rd, Younger Cir 131 Residences
Ox Valley West Alternative Variation Comparison	501.15	Rancho Veyo Rd 0 Residences
Pinto Alternative Variation	506	Cove Hollow, Cove Mountain Dixie National Forest Rdle, Earl Canyon, Forest Rd, Grassy Flat Canyon, Kane Mountain Dixie National Forest Rdle, Kane Spring Draw, N Baker Rd, Natl Forest Rd, Newcastle Reservoir, Old State Hwy 144, Santa Clara River Fishing Access, South Fork Pinto Creek, SR 18, W Pine Valley Rd, W Pinto Rd, Wheat Grass Canyon 3 Residences
Pinto Alternative Variation Comparison	500.05	2600 Rd, 3200 Rd, 700 Rd, Bench Rd, E 300 Rd, Jefferson Hunt Monument, Old Spanish Historic Trail, SR 56, W Pinto Rd 13 Residences

Table 3.12-17 Region III Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
Pinto Alternative Variation Comparison	501.1	Atchinson Dixie National Forest Roadless A, Big Canyon, California Hollow, Carson Cir, Cave Cir, Dodge City Trl, E Christie Ln, E Forest Dr, E Rye Dr, E Sumac Dr, Hardin Trl, Hole N Rock Cir, Launa Ln, Lodge Rd, Meadow Valley Creek, N Butch Cassidy Trl, N Cedar Dr, N Doc Holiday Ln, N Lodge Rd, N Matt Dillon Trl, N Pinion Cir, N Sundance Kid Trl, Old State Hwy 144, Orchard Dr, Pine Valley Hwy, Red Butte, Rex Layne Dr, Spring Creek, W Butch Cassidy Cir, W Frontier Rd, Younger Cir 131 Residences
Avon Alternative Connector	495	15200 Rd 0 Residences
Moapa Alternative Connector	570	Old Spanish Historic Trail, SR 40 0 Residences

Segment numbers depicted in **Figure 2-23**.

Vegetation Treatments

Scenarios for vegetation treatments are listed in the PDTR (**Appendix D**). Clearing of plants above 4 feet in height would occur in the 250-foot-wide ROW unless otherwise specified in the PDTR. Only the 90-foot-wide "wire zone" and 250-foot-square structure construction area would be cleared in corridors classified as VRM Class II, SIO High, and VQO Retention. Key factors in the determination of impacts to the visual resource include viewing distances, presence or absence of tree cover, and steepness of topographic slopes. Application of **VR-1** would preserve pinyon-juniper trees, except for those impeding tower and access road construction. The edges between clearings and forest would be feathered in all species. The presence of moderate to steep slopes increases visibility of vegetation treatments for ROWs and for access roads, as compared to flat slopes. These factors are included in the analysis of impacts to scenery and to sensitive viewers. Reclamation recovery time analyses, specific to views from the 309 KOPs and involving topographic slope, topographic aspect and vegetation type, are shown in **Appendix I**, **Table I-12**. The results are central components in **Table 3.12-17**.

The geographic context, distances, and spatial relationship between visual resources and the Project reference lines by segment and milepost for Region III are portrayed by tables and maps of scenic quality classes (tables in **Appendix I** and **Figure I-2**), sensitivity levels (tables in **Appendix I** and **Figure I-4**), visual resource inventory classes (tables in **Appendix I** and **Figure I-7**), and visual resource management classes (tables in **Appendix I** and **Figure I-8**). All BLM VRI distance zones were inventoried as foreground-middleground for the Project study area and are therefore not shown with map figures. Project-specific distance zones are included in the analyses for impacts to landscape scenery, sensitive viewers, and compliance or consistency with BLM or USFS management objectives, respectively.

There were 62 KOPs selected, photographed, and analyzed in Region III. The KOP figures in **Appendix I**, portray the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation. Sixteen photographic simulations of the Project in Region III, for those KOP locations where agency management objectives would not be met, are shown in the tables in **Appendix I** and shown in a photographic figure following each applicable KOP in the KOP figures in **Appendix I**.

Alternative III-A (Applicant Proposed)

Alternative III-A would cross 276 miles of landscapes in the Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross U.S. 50, where the Project's guyed structures would stand out

visually more (increased impact) than they would if seen with existing transmission line structures. At the eastern edge of the Cricket Mountains' crossing, the Project would join and parallel existing transmission lines southward to the Region III, Alternative III-A terminus just north of Las Vegas. The Project would cross and or parallel numerous highways (Utah State Highways 257, 21, 56, and 18, and I-15), recreational roads, and trails (**Table 3.12-17**), and in all cases it would parallel existing transmission lines (reduced impacts).

Recreationally important landscapes include the Sevier River plain and Cricket Mountains, where the Project's guyed and, substantially more dominant, self-supported structures are sky-lined (increased impact) in the landscape. All other recreationally important landscapes have existing transmission lines in the Projects' immediate viewshed. Of particular note is the Mountain Meadows National Historic Landmark Site viewshed where the Project would be placed on the far side of three existing transmission lines and two pipeline ROWs. This results in decreased impacts to viewers and landscape scenery. Landscape photography and project simulations are located in **Appendix I**, in the Fillmore, Cedar City, St. George and Southern Nevada FO sections.

Alternative III-A would be visible in the immediate foreground from 144 residences. Twenty-two percent of Alternative III-A would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Eight percent of Alternative III-A would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-17**). Two percent of Alternative III-A would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative III-A has decreased impacts as compared with Alternative III-B, Alternative III-C, and Alternative III-D. Twenty-five percent of the Alternative III-A reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative III-B (Agency Preferred)

Alternative III-B would cross 285 miles of landscapes in the Great Basin Section of the Basin and Range Province (Section 3.12.5.6). In areas with no existing transmission lines, it would cross U.S. 50 and closely parallel and would cross Utah State Highway 56, and would cross the Rainbow Backcountry Byway in two locations. The Project would cross several recreational roads and trails (**Table 3.12-17**) and recreationally important landscapes in the Sevier River Sand Dunes, Sevier River, Cricket Mountain, Red Pass, and landscapes east, north, west, and south of Caliente, including the Matthews Canyon Reservoir area, where there are no existing transmission lines (higher impacts). Landscape photography and project simulations are located in **Appendix I**, in the Fillmore, Cedar City, Ely, and Las Vegas FO sections.

Alternative III-B would be visible in the immediate foreground from 24 residences. Twenty-one percent of Alternative III-B would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Five percent of Alternative III-B would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-17**). Less than 1 percent of Alternative III-B would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative III-B has increased impacts as compared with Alternative III-A. Alternative III-B is comparable to Alternative III-C. Twenty-eight percent of the Alternative III-B reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative III-C

Alternative III-C would cross 308 miles of landscapes in the Great Basin Section of the Basin and Range Province (Section 3.12.5.6). Adjacent to one or more existing transmission lines (reduced contrasts), it would cross U.S. 50, parallel Utah State Highway 257, would cross Utah State Highways 21 and parallel U.S. 93 in the Pahranagat and Coyote Spring Valleys. In areas with no existing transmission lines, it would closely parallel and would cross Utah State Highway 56, would cross U.S. 93 north and west of Caliente, and would cross the Silver State Trail in two locations. The Project would cross several recreational roads and trails (**Table 3.12-17**) and recreationally important landscapes east, north, and west of Caliente, where there are no existing transmission lines (higher impacts). All other recreationally important landscapes have existing transmission lines in the Projects' immediate viewshed. Landscape photography and project simulations are located in **Appendix I**, in the Fillmore, Cedar City, Ely, and Las Vegas FO sections.

Alternative III-C would be visible in the immediate foreground from 25 residences. Twenty-seven percent of Alternative III-C would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Fourteen percent of Alternative III-C would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-17**). Three percent of Alternative III-C would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads, trails, and rivers, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative III-C has increased impacts as compared with Alternative III-A. Alternative III-C is comparable to Alternative III-B. Fourteen percent of the Alternative III-C reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Avon Alternative Connector

The Avon Alternative Connector would cross 8 miles of landscape in the Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would closely parallel the Union Pacific Railroad. The Avon Alternative Connector would be visible in the immediate foreground from zero residences. None of the Avon Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**).

None of the Avon Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-17**). All of the Avon Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. The Avon Alternative Connector would have minimal impacts over its reach, and would provide connection with Alternative II-A (decreased impacts). None of the Avon Connector reference line would be located within a utility corridor or utility window.

Moapa Alternative Connector

The Moapa Alternative Connector would cross 13 miles of landscape in the Great Basin Section of the Basin and Range Province (Section 3.12.5.6). It would cross I-15 in an area with several existing steel

lattice transmission lines in the view to the west (toward Alternative III-C) and no existing transmission lines to the east (toward Alternative III-A). It would be "sky-lined" (increased impact) in the immediate foreground of I-15. The Moapa Alternative Connector would cause high impacts to moderate sensitivity I-15 viewers in this immediate foreground (0 to 0.5-mile) viewing situation (**Table 3.12-17**). Moapa Alternative Connector would cross VRM Class III landscapes, where changes may attract attention, but should not dominate the view of the casual observer.

The Moapa Alternative Connector would have increased impacts as compared to Alternative III-A or Alternative III-C, in part due to the need for heavier self-supporting transmission line structures at the points-of-intersection with the alternatives. Fifteen percent of the Moapa Connector reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

3.12.6.7 Region IV

Impact parameters relate to the impact discussion in Section 3.12.6.3, Impacts Common to all Alternative Routes and Associated Components, and specific differences by alternative are presented below. The segment-specific table information for high and moderate sensitivity viewers distance zones, scenic quality, visual resource inventory classifications, agency management classifications, residual Impacts, compliance or consistency with BLM VRM, USFS SIO or VQO, and intersection of the Project reference line with utility corridors or utility windows are summarized in **Table 3.12-18**. Segment- and milepost-specific Region I inventory data and impact results for these topics are shown in the corresponding tables in **Appendix I**.

The KOP figures in **Appendix I** indicate the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation.

Residual Impacts

The application of substantive mitigation measures would reduce visual impacts from high to moderate, or moderate to low. These reductions are applicable to viewing situations involving stationery (non-linear) viewers and to landscapes where tree cover and moderate to steep landforms contribute strongly to visual impacts. Residual impacts by Alternative and Segment are listed for landscape scenery, high viewer sensitivity and moderate viewer sensitivity in **Table 3.12-18**. Residual impacts by Region, Alternative, Segment, and mileposts (as if, "walking the line") are listed in the corresponding tables in **Appendix I**.

Compliance or Consistency with Agency Management Objectives

Maps showing locations where agency management objectives would be met and would not be met are shown in **Appendix I**, **Figure I-12**. Photographic simulations of the Project, for those KOP locations where agency management objectives would not be met, are shown in the KOP figures in **Appendix I** following the applicable KOP analysis sheet. Maps showing locations where applications of mitigation **VR-4** to the reference line would reduce impacts to levels compliant or consistent with agency management objectives are shown in **Appendix I**, **Figure I-13**. Maps showing locations where agency management objectives would be met with mitigation and where agency management objectives are not applicable are shown in **Appendix I**, **Figure I-14**. Mitigation **VR-4** would be applicable to, and subject to routing engineering study for, reference lines within a half-mile of linear KOPs, except for those reference lines crossing roads. Designated utility corridors considered in the analysis are shown in **Appendix I**, **Figure I-15**.

Table 3.12-18 Region IV Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)				Moderate Sensitivity Viewers (miles)				Scenic Quality (miles)			BLM VRI Classifications (miles)			BLM VRM Classifications (miles)			USFS SIO/VQO Classifications (miles)			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)						Utility Corridor or Utility Window[9]
																						Landscape Scenery			High Sensitivity Viewers			Moderate Sensitivity Viewers			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Alternative IV-A																																				
Alternative IV-A Total	**37**	**22**	**8**	**7**	**--**	**6**	**23**	**8**	**--**	**3**	**17**	**17**	**14**	**8**	**4**	**--**	**22**	**3**	**--**	**--**	**--**	**6**	**3**	**28**	**6**	**16**	**15**	**--**	**12**	**25**	**20**	**5**	**12**	**20**	**5**	**12**	**6**
620	6	2	2	2	--	2	4	--	--	--	--	6	--	6	--	--	6	--	--	--	--	--	--	6	--	2	4	--	2	4	6	--	<1	6	--	<1	5
630	4	4	--	--	--	1	3	--	--	--	4	1	4	<1	--	--	4	--	--	--	--	--	--	4	--	4	--	--	1	3	3	1	<1	3	1	<1	<1
660	8	8	<1	--	--	1	7	<1	--	2	6	1	6	--	<1	--	6	--	--	--	--	6	1	1	6	2	--	--	7	1	2	4	2	2	4	2	--
700	2	1	<1	--	--	1	1	--	--	1	--	<1	--	--	--	--	--	--	--	--	--	--	1	<1	--	1	<1	--	1	1	--	--	2	--	--	2	--
720	1	1	--	--	--	<1	1	--	--	<1	1	<1	1	--	--	--	1	--	--	--	--	--	<1	1	--	1	--	--	<1	1	1	--	1	1	--	1	--
740	4	4	--	--	--	<1	4	--	--	--	2	2	2	--	--	--	2	--	--	--	--	--	--	4	--	4	--	--	<1	4	2	--	2	2	--	2	--
790	12	2	6	5	--	1	3	8	--	<1	4	8	1	2	3	--	4	3	--	--	--	--	1	12	--	2	10	--	1	11	6	--	6	6	--	6	1
Alternative IV-B																																				
Alternative IV-B Total	**39**	**17**	**15**	**7**	**--**	**20**	**17**	**2**	**--**	**7**	**2**	**30**	**2**	**6**	**--**	**--**	**8**	**--**	**--**	**--**	**--**	**6**	**9**	**24**	**8**	**13**	**18**	**7**	**18**	**14**	**8**	**--**	**31**	**8**	**--**	**31**	**5**
620	6	2	2	2	--	2	4	--	--	--	--	6	--	6	--	--	6	--	--	--	--	--	--	6	--	2	4	--	2	4	6	--	<1	6	--	<1	5
640	4	4	--	--	--	--	4	--	--	--	2	2	2	<1	--	--	2	--	--	--	--	2	1	1	3	1	--	--	3	1	2	--	2	2	--	2	<1
670	4	2	2	--	--	3	1	--	--	3	<1	1	<1	--	--	--	<1	--	--	--	--	3	1	--	2	2	--	3	1		<1	--	4	<1	--	4	--
710	8	5	3	--	--	7	1	--	--	3	--	5	--	--	--	--	--	--	--	--	--	1	6	2	3	5	1	4	4	<1	--	--	8	--	--	8	--
750	<1	--	<1	--	--	<1	--	--	--	<1	--	--	--	--	--	--	--	--	--	--	--	--	<1	--	--	--	<1	--	<1		--	--	<1	--	--	<1	--
760	8	4	4	--	--	4	3	--	--	1	--	7	--	--	--	--	--	--	--	--	--	--	1	7	--	4	4	--	4	3	--	--	8	--	--	8	--
800	2	--	2	--	--	2	--	--	--	--	--	2	--	--	--	--	--	--	--	--	--	--	--	2	--	--	2	--	2		--	--	2	--	--	2	--
820	7	--	2	5	--	1	4	2	--	--	--	7	--	--	--	--	--	--	--	--	--	--	--	7	--	--	7	--	1	6	--	--	7	--	--	7	--
Alternative IV-C																																				
Alternative IV-C Total	**44**	**14**	**17**	**8**	**5**	**15**	**26**	**3**	**--**	**8**	**2**	**34**	**2**	**6**	**--**	**--**	**8**	**--**	**--**	**--**	**--**	**6**	**10**	**28**	**8**	**10**	**26**	**7**	**13**	**24**	**8**	**--**	**36**	**8**	**--**	**36**	**5**
620	6	2	2	2	--	2	4	--	--	--	--	6	--	6	--	--	6	--	--	--	--	--	--	6	--	2	4	--	2	4	6	--	<1	6	--	<1	5
640	4	4	--	--	--	--	4	--	--	--	2	2	2	<1	--	--	2	--	--	--	--	2	1	1	3	1	--	--	3	1	2	--	2	2	--	2	<1
670	4	2	2	--	--	3	1	--	--	3	<1	1	<1	--	--	--	<1	--	--	--	--	3	1	--	2	2	--	3	1	--	<1	--	4	<1	--	4	--
710	8	5	3	--	--	7	1	--	--	3	--	5	--	--	--	--	--	--	--	--	--	1	6	2	3	5	1	4	4	<1	--	--	8	--	--	8	--
750	<1	--	<1	--	--	<1	--	--	--	<1	--	--	--	--	--	--	--	--	--	--	--	--	<1	--	--	--	<1	--	<1	--	--	--	<1	--	--	<1	--
771	22	1	10	6	5	3	16	3	--	2	--	20	--	--	--	--	--	--	--	--	--	--	2	20	--	1	21	--	3	19	--	--	22	--	--	22	--
Marketplace Variation																																				
810	8	--	3	4	--	1	4	3	--	--	--	8	--	1	2	--	3	--	--	--	--	--	3	5	--	3	5	--	3	5	3	--	5	3	--	5	<1
Marketplace Variation Comparison																																				
820	7	--	2	5	--	1	4	2	--	--	--	7	--	--	--	--	--	--	--	--	--	--	--	7	--	--	7	--	1	6	--	--	7	--	--	7	--

Table 3.12-18 Region IV Route Comparison by Alternative and Segment

Alternative/Segment	Total Miles	High Sensitivity Viewers (miles)				Moderate Sensitivity Viewers (miles)				Scenic Quality (miles)			BLM VRI Classifications (miles)			BLM VRM Classifications (miles)			USFS SIO/VQO Classifications (miles)			Residual Impacts (miles)									BLM VRM USFS SIO/VQO Compliance/Consistency (miles)						Utility Corridor or Utility Window[9]
																						Landscape Scenery			High Sensitivity Viewers			Moderate Sensitivity Viewers			Before Mitigation			After Mitigation			
		0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	0–0.5 miles	0.5–2.5 miles	2.5–5 miles	>5 miles	A	B	C	Class II	Class III	Class IV	Class II	Class III	Class IV	High Retention	Moderate Partial Retention	Low Modification	High	Moderate	Low	High	Moderate	Low	High	Moderate	Low	Compliant	Non-compliant	NA	Compliant	Non-compliant	NA	
Sunrise Mountain Connector																																				
650	3	3	--	--	--	1	2	--	--	--	3	--	3	--	--	--	3	--	--	--	--	2	--	1	2	1	--	1	1	<1	2	1	--	2	1	--	--
Lake Las Vegas Connector																																				
680	4	3	1	--	--	4	--	--	--	2	--	1	--	--	--	--	--	--	--	--	--	2	1	--	3	1	--	4	--	--	--	--	4	--	--	4	--
Three Kids Mine Connector																																				
690	5	5	1	--	--	1	5	--	--	1	1	4	1	--	--	--	1	--	--	--	--	2	4	--	5	1	--	1	5	--	1	--	5	1	--	5	--
River Mountain Connector																																				
730	7	3	4	--	--	<1	5	2	--	<1	2	5	2	--	--	--	2	1	--	--	--	2	3	2	3	2	2	--	4	3	2	--	5	2	--	5	--
Railroad Pass Connector																																				
780	3	1	2	--	--	3	--	--	--	--	--	3	--	--	--	--	--	--	--	--	--	--	--	3	--	1	2	--	3	--	--	--	3	--	--	3	--

[1] High Sensitivity and Moderate Sensitivity Viewers' analysis and mapping for the Project encompass public and private viewers' concern for landscape scenery (**Appendix I, Tables I-3** and **I-4**; **Appendix I**, **Figure I-4**). The distance and visibility factors are based on the characteristics of TWE facilities, divided into four zones(**Appendix I**, **Tables I-3** and **I-4**; **Appendix I**, **Figures I-4**, **I-5**, and **I-6**).

[2] Scenic Quality or scenic attractiveness is rated Class A, Class B, or Class C for highest to lowest quality or attractiveness (**Appendix I, Table I-1**; **Appendix I, Figures I-2** and **I-3**).

[3] BLM VRI classifications represent this relative value of visual resources and provide the basis for considering visual values in the resource management planning process. VRI Class II, III, and IV (high to low) are determined based on the combination of scenic quality, sensitivity levels, and distance zones. VRI Class I is assigned to special management areas (**Appendix I, Table I-5**; **Appendix I, Figure I-7**).

[4] BLM VRM classifications result from the RMP land use planning process for all BLM-administered lands (**Table 3.12-1**) (**Appendix I, Table I-7**; **Appendix I**, **Figure I-8**).

[5] USFS SIO or VQO Classifications result from the national forest planning process for all USFS-administered lands (**Table 3.12-2**) (**Appendix I, Table I-7**; **Appendix I**, **Figure I-8**).

[6] Residual Impacts for Landscape Scenery (**Table 3.12-7**) involves the comparison of contrasts after mitigation with the scenic quality inventory of the affected environment (**Table 3.12-4**).

[7] Residual Impacts for High Sensitivity and Moderate Sensitivity Viewers (**Table 3.12-5**) involves comparison of contrasts after mitigation with distance zones (**Table 3.12-6**) and viewers' concern levels (**Table 3.12-5**).

[8] BLM VRM, USFS SIO, or USFS VQO Compliance or Consistency (**Table 3.12-8**) involves comparisons of agency management objectives with contrast ratings from 309 KOPs (**KOP Figures** in **Appendix I**).

[9] Calculations associated with Utility Corridors and Utility Windows involve the intersection of the Project reference line with the areas/polygons of the corridors or windows. These corridors or windows take precedence over the compliance and consistency determinations and as such negate the need for updates of the land use plans.

Note: Discrepancies in totals due to rounding. Segment numbers depicted in **Figure 2-24**.

Scenic Quality

Existing scenic quality may be lowered by the Project, depending on the context. This is determined based on analysis of existing scenic quality rating/scores, existing landscape character, presence or absence of existing industrial development (transmission lines, pipelines, land disturbances, etc.), and the effect of introducing the Project into the landscape as either a new or additional cultural modification. Those segments where the existing scenic quality would be lowered by the Project to a lower class (Class A to Class B or Class B to Class C) are shown in **Table 3.12-19**. Segment- and milepost-specific data for change in scenic quality is shown in **Appendix I**, **Table I-12**.

Table 3.12-19 Region IV Scenic Quality Class Changes by Alternative and Segment

Alternative	Total Miles	Class A to B	Class B to C	No Change
Alternative IV-A				
620	6	--	--	6
630	4	--	--	4
660	8	--	--	8
700	2	--	--	2
720	1	--	--	1
740	4	--	--	4
790	12	--	--	12
Alternative IV-B				
620	6	--	--	6
640	4	--	--	4
670	4	--	--	4
710	8	--	--	8
750	<1	--	--	<1
760	8	--	---	8
800	2	--	--	2
820	7	--	--	7
Alternative IV-C				
620	6	--	--	6
640	4	--	--	4
670	4	--	--	4
710	8	--	--	8
750	<1	--	--	<1
771	22	--	--	22
Marketplace Variation				
810	8	--	--	8
Marketplace Variation Comparison				
820	7	--	--	7

Table 3.12-19 Region IV Scenic Quality Class Changes by Alternative and Segment

Alternative	Total Miles	Class A to B	Class B to C	No Change
Sunrise Mountain Connector				
650	3	--	--	3
Lake Las Vegas Connector				
680	4	--	--	4
Three Kids Mine Connector				
690	5	--	--	5
River Mountain Connector				
730	7	--	--	7
Railroad Pass Connector				
780	3	--	--	3

Segment numbers depicted in **Figure 2-24**.

Public Viewers and Visibility of the Project

Immediate foreground (0 to 0.5-mile) visibility of the Project is influential in the experiences of viewers and indicative of the level of impacts to people. The following **Table 3.12-20** indicates visibility by alternative and segment for those immediate foreground public places, designated special management areas, lakes and reservoirs, rivers, roads, scenic byways and backways, and historic trails where visual resources are important to recreational and viewer experiences. Viewing situations in these locations are both stationary and mobile.

Table 3.12-20 Region IV Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
IV-A	620	Apex Rd, Rainbow Gardens ACEC, Sunrise Mountain SRMA 0 Residences
IV-A	630	Gypsum Rd, Gypsum Spring, SR 147, Sunrise Mountain Instant Study Area (ISA) 0 Residences
IV-A	660	4wd Rd, Argonaunt, Armillaria St, Bee Balm Ct, Big Bird Ct, Black Lava Ct, Boletus Dr, Broken Hills Dr, Brown Hill Ct, Calico Ridge Dr, Camelia Dr, Candy Tuft Dr, Chanterelle Dr, Charlene Ct, Chrysanthemum Rd, Clark County Wetlands Park, Companion Way, Cutter St, Feather Haven Ct, Feather Point Ct, Geranium Dr, Golda Way, Hyperion Dr, Iolite Ct, Luca Ln, Majesty Ct, Malachite Ct, Marigold Ct, Morning Melody Ct, Norellat Rd, Old Spanish Historic Trail, Pabco Rd, Primrose Ct, Primrose Ln, Pyrite Ave, Rainbow Gardens, Rhyolite Ter, Roy Way, Rubellite St, Skysail Dr, SR 146, Verdite Ave, Weatherboard St, Whistle Ct, White Hill Cir 550 Residences
IV-A	700	4wd Rd, Essex Ave, Foothill Dr, Ithaca Ave 0 Residences
IV-A	740	Las Vegas Valley SRMA, River Mountains ACEC 8 Residences
IV-A	790	4wd Rd, Black Hill, Car Country Blvd, E Horizon Ridge Pky, Nelson/ Eldorado SRMA, Sloan Canyon NCA, Trail, US 93 0 Residences
IV-B	620	Apex Rd, Rainbow Gardens ACEC, Sunrise Mountain SRMA 0 Residences

Table 3.12-20 Region IV Immediate Foreground Viewing Situations by Alternative and Segment

Alternative	Segment	Human Environment
IV-B	640	Gypsum Rd, Pabco Rd 0 Residences
IV-B	670	Las Vegas Wash, Lava Butte Wash, SR 146, SR 167 0 Residences
IV-B	710	Boulder Beach Cmpgrnd, Boulder Canyon Project Federal Reservation, Lake Mead National Recreation Area, Lake Mead Rd, Ramp, SR 166 16 Residences
IV-B	750	Las Vegas Bay Rd, Ramp, SR 166 0 Residences
IV-B	760	Aaron Way, Black Canyon Cove Rd, Bootleg Canyon, Bootleg Canyon, Bootleg Wash, Calumet Ln, Cascata Golf Course, Connecting Rd, Genni Pl, Golf Course, Greenbriar Pl, Hemenway Cove, Hidden Cove, Isabel Ln, Island Cove, Jani Pl, Judi Pl, Kati Pl, Katzenbach Dr, Kendall Ln, Keys Dr, Kingman Cove, Lake Erie Ln, Lake Havasu Ln, Lake Huron Ln, Lake Merritt Ln, Lake Michigan Ln, Lake Mountain Dr, Lake Ontario Ln, Lake Superior Ln, Lake Tahoe Ln, Lake Terrace Dr, Lake Winnebago Ln, Lakes Dr, Lido Dr, Marina Cove, Marina Dr, Mount Antero Way, Mount Bear Way, Mount Blackburn Ln, Mount Bona Way, Mount Elbert Way, Mt Hunter Way, Mount Tamalpais Way, Mount Williamson Way, Mt Ranier Way, Old Spanish Historic Trail, Pacifica Way, Patti Pl, Robinson Ln, Robinson Way, Swallow Cove, Tara Ct, US 93, Veterans Dr, Veterans Memorial Dr, Ville Dr, Woodacre Dr, Woodcrest Dr, Yates Ln, Yucca St 516 Residences
IV-B	820	Lake Mead National Recreation Area 0 Residences
IV-C	620	Apex Rd, Rainbow Gardens ACEC, Sunrise Mountain SRMA 0 Residences
IV-C	640	Gypsum Rd, Pabco Rd 0 Residences
IV-C	670	Las Vegas Wash, Lava Butte Wash, SR 146, SR 167 0 Residences
IV-C	710	Boulder Beach Campground, Boulder Canyon Project Federal Reservation, Lake Mead National Recreation Area, Lake Mead Rd, Ramp, SR 166 16 Residences
IV-C	750	Las Vegas Bay Rd, Ramp, SR 166 0 Residences
IV-C	771	Adams Blvd, Alaska Ave, Bronco Rd, Chestnut Ln, Del Prado Dr, El Canto Way, Lake Mead National Recreation Area, Olmo Way, Otono Dr, Ramp, Rawhide Rd, Rest Area, Smoke Ranch Rd, Sorrel Rd, SR 166, US 93, US 95 94 Residences
Marketplace Alternative Variation	820	Lake Mead National Recreation Area 0 Residences
Lake Las Vegas Alternative Connector	680	Lake Las Vegas Pky, Lake Mead NRA, Old Spanish Historic Trail, Pyrenees Ct, Ramp, Rest Area, SR 146 0 Residences
River Mountain Alternative Connector	730	River Mountains 0 Residences

Segment numbers depicted in **Figure 2-24**.

Vegetation Treatments

Scenarios for vegetation treatments are listed in the PDTR (**Appendix D**). Clearing of plants above four-feet in height would occur in the 250-foot corridor unless otherwise specified in the PDTR. Only the 90-foot-wide "wire zone" and 250-foot-square structure construction area would be cleared in corridors classified as VRM

Class II, SIO High, and VQO Retention. Key factors in the determination of impacts to the visual resource include viewing distances, presence or absence of tree cover, and steepness of topographic slopes. Application of **VR-1** would preserve pinyon-juniper trees, except for those impeding tower and access road construction. The edges between clearings and forest would be feathered in all species. The presence of moderate to steep slopes increases visibility of vegetation treatments for ROWs and for access roads, as compared to flat slopes. These factors are included in the analysis of impacts to scenery and to sensitive viewers. Reclamation recovery time analyses, specific to views from the 309 KOPs and involving topographic slope, topographic aspect and vegetation type, are shown in **Appendix I**, **Table I-12**. The results are central components in **Table 3.12-20**.

The geographic context, distances, and spatial relationship between visual resources and the Project reference lines by segment and milepost for Region IV are portrayed by tables and maps of scenic quality classes (tables in **Appendix I** and **Figure I-2**), sensitivity levels (tables in **Appendix I** and **Figure I-4**), visual resource inventory classes (tables in **Appendix I** and **Figure I-7**), and visual resource management classes (tables in **Appendix I** and **Figure I-8**). All BLM VRI distance zones were inventoried as foreground-middleground for the Project study area and are therefore not shown with map figures. Project-specific distance zones are included in the analyses for impacts to landscape scenery, sensitive viewers, and compliance or consistency with BLM or USFS management objectives, respectively.

There were 15 KOPs selected, photographed, and analyzed in Region IV. The KOP figures in **Appendix I** portray the location information for each KOP, photograph of the existing condition for each KOP, estimated structure locations, Google Earth 3D locations and heights of Project structures, associated visual contrast rating form analysis, compliance with agency management objectives, and recommended mitigation, Three photographic simulations of the Project in Region IV, for those KOP locations where agency management objectives would not be met, are shown in the tables in **Appendix I** and shown in a photographic figure following each applicable KOP in the KOP figures in **Appendix I**.

Alternative IV-A (Agency Preferred and Applicant Proposed)

Alternative IV-A would cross 37 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would cross the Sunrise Mountain ISA, a VRM Class I landscape. It would cross the Old Spanish Trail, Lake Mead Boulevard (the accessway to Lake Mead NRA), I-15, and U.S. 93-95, in addition to several recreational roads and trails (**Table 3.12-20**), and would be “sky-lined” (increased impact) in those areas. Recreationally important landscapes include the Clark County Wetlands Park, Sunrise Mountain ISA, Rainbow Gardens ACEC, and the Las Vegas Wash area, where the Project’s guyed and, substantially more dominant, self-supported structures would stand out visually more than they would if seen in the same viewshed with existing transmission line structures. The majority of Alternative IV-A would parallel existing transmission lines in valley situations, but sometimes is distanced enough to be on the opposite side of ridgelines. Landscape photography and project simulations are located in **Appendix I**, in the Lake Mead NRA and Las Vegas FO sections.

Alternative IV-A would be visible in the immediate foreground from 558 residences. Sixteen percent of Alternative IV-A would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Sixteen percent of Alternative IV-A would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). Alternative IV-A would cross 1.1 miles of the Sunrise Mountain ISA VRM Class I landscape where changes may be ecological or from very limited management activities. However, in this area, it would closely parallel four existing transmission lines. Fourteen percent of Alternative IV-A would not comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads and trails, where the Project is “sky-lined” and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative IV-A has decreased impacts compared with Alternative IV-B and Alternative IV-C, except where it would cross the Rainbow Gardens ACEC area which is undeveloped and would cause localized increased impacts over Alternative IV-B and Alternative IV-C. Eighty-six percent of the Alternative IV-A reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative IV-B

Alternative IV-B would cross 39 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would cross the Old Spanish Trail, Lakeshore Road through Lake Mead NRA, I-15, and U.S. 93-95, in addition to several recreational roads and trails (**Table 3.12-20**), and would be "sky-lined" (increased impact) in those areas. Recreationally important landscapes include the Lake Mead NRA, the Las Vegas Bay boat launch area, Lake Mead Marina, and Boulder Harbor, where the Project's guyed and, substantially more dominant, self-supported structures would be seen with existing transmission line structures. The majority of Alternative IV-B would parallel existing transmission lines in valley situations, but sometimes is distanced enough to be on the opposite side of ridgelines. Landscape photography and project simulations are located in **Appendix I**, in the Lake Mead NRA and Las Vegas FO sections.

Alternative IV-B would be visible in the immediate foreground from 532 residences. Fifteen percent of Alternative IV-B would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Twenty-one percent of Alternative IV-B would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). All of Alternative IV-B would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads and trails, where the Project is "sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative IV-B has increased impacts compared with Alternative IV-A, and has comparable impacts to Alternative IV-C. Thirteen percent of the Alternative IV-B reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Alternative IV-C

Alternative IV-C would cross 44 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would cross the Old Spanish Trail, Lakeshore Road through Lake Mead NRA, I-15, and U.S. 93-95, in addition to several recreational roads and trails (**Table 3.12-20**), and would be "sky-lined" (increased impact) in those areas. Recreationally important landscapes include the Lake Mead NRA, the Las Vegas Bay boat launch area, Lake Mead Marina, Boulder Harbor, and the south entry to Lake Mead NRA, where the Project's guyed and, substantially more dominant, self-supported structures would be seen with existing transmission line structures. The majority of Alternative IV-C would parallel existing transmission lines in valley situations, but sometimes is distanced enough to be on the opposite side of ridgelines. Landscape photography and project simulations are located in **Appendix I**, in the Lake Mead NRA and Las Vegas FO sections.

Alternative IV-C would be visible in the immediate foreground from 110 residences. Thirteen percent of Alternative IV-C would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Eighteen percent of Alternative IV-C would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). All of Alternative IV-C would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer. These locations are primarily associated with crossings of roads and trails, where the Project is

"sky-lined" and cannot be moved out of view, where there are no existing transmission lines, and where the Project dominates the view.

Alternative IV-C has increased impacts compared with Alternative IV-A, and has comparable impacts to Alternative IV-B. Eleven percent of the Alternative IV-C reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

Sunrise Mountain Alternative Connector

The Sunrise Mountain Alternative Connector would cross 3 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would cross Lake Mead Boulevard in an area with an existing transmission line and would cross four additional transmission lines near its terminus with Alternative IV-A. The Sunrise Mountain Alternative Connector would cross the Sunrise Mountain ISA, a VRM Class I landscape. The Sunrise Mountain Alternative Connector would be visible in the immediate foreground from zero residences. Sixty-seven percent of the Sunrise Mountain Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Sixty-seven percent of The Sunrise Mountain Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). Thirty-four percent of the Sunrise Mountain Alternative Connector would not comply with agency management objectives after mitigations (Section 3.12.6.3).

Due to its location in developed landscape, the Sunrise Mountain Alternative Connector has comparable impacts to the Lake Las Vegas Alternative Connector and River Mountain Alternative Connector. It has decreased impacts over the Railroad Pass Alternative Connector. The Sunrise Mountain Alternative Connector has increased impacts over the Three Kids Mine Alternative Connector. None of the Sunrise Mountain Connector reference line would be located within a utility corridor or utility window.

Lake Las Vegas Alternative Connector

The Lake Las Vegas Alternative Connector would cross 4 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would parallel Lake Mead Drive in an area with an existing transmission line. The Lake Las Vegas Alternative Connector would be visible in the immediate foreground from zero residences. Fifty percent of the Lake Las Vegas Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Seventy-five percent of The Lake Las Vegas Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). All of the Lake Las Vegas Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

Due to its location in developed landscape, the Lake Las Vegas Alternative Connector has comparable impacts to the Sunrise Mine Alternative Connector and River Mountain Alternative Connector. It has decreased impacts over the Railroad Pass Alternative Connector. The Lake Las Vegas Alternative Connector has increased impacts over the Three Kids Mine Alternative Connector. None of the Lake Las Vegas Connector reference line would be located within a utility corridor or utility window.

Three Kids Mine Alternative Connector

The Three Kids Mine Alternative Connector would cross 5 miles of undeveloped landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would be visible in the immediate foreground from zero residences. Forty percent of the Three Kids Mine Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or

moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). One hundred percent of The Three Kids Mine Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). All of the Three Kids Mine Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

Due to its location in undeveloped landscape, the Three Kids Mine Alternative Connector has increased impacts over the Sunrise Mine Alternative Connector, Railroad Pass Alternative Connector, and River Mountain Alternative Connector. None of the Three Kids Mine Connector reference line would be located within a utility corridor or utility window.

River Mountain Alternative Connector

The River Mountain Alternative Connector would cross 7 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would parallel an existing transmission line. The River Mountain Alternative Connector would be visible in the immediate foreground from zero residences. Twenty-nine percent of the River Mountain Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). Forty-three percent of the River Mountain Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). All of the River Mountain Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

Due to its location in developed landscape, the River Mountain Alternative Connector has comparable impacts with the Sunrise Mine Alternative Connector, Railroad Pass Alternative Connector, and River Mountain Alternative Connector. It has increased impacts over the Three Kids Mine Alternative Connector. None of the River Mountain Connector reference line would be located within a utility corridor or utility window.

Railroad Pass Alternative Connector

The Railroad Pass Alternative Connector would cross 3 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would parallel an existing transmission line. The Railroad Pass Alternative Connector would be visible in the immediate foreground from zero residences. None of the Railroad Pass Alternative Connector would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). None of The Railroad Pass Alternative Connector would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). All of the Railroad Pass Alternative Connector would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

Due to its location in developed landscape, the Railroad Pass Alternative Connector has comparable impacts with the Sunrise Mine Alternative Connector, Railroad Pass Alternative Connector, and River Mountain Alternative Connector. It has decreased impacts over the Three Kids Mine Alternative Connector. None of the Railroad Pass Connector reference line would be located within a utility corridor or utility window.

Marketplace Variation

The Marketplace Variation would cross 8 miles of landscapes in the Sonoran Desert Section of the Basin and Range Province (Section 3.12.5.7). It would cross U.S. 95 and would be “sky-lined” (increased impact)

in that area. The Marketplace Variation would be visible in the immediate foreground from zero residences. None of the Marketplace Variation would cause high impacts to landscape scenery. These locations are associated with Class A scenery with high or moderate contrasts or Class B scenery with high contrasts (**Table 3.12-4**). None of The Marketplace Variation would cause high impacts to high sensitivity recreational and residential viewers. These locations are associated with immediate foreground (0 to 0.5-mile) viewing situations (**Table 3.12-20**). All of the Marketplace Variation would comply with agency management objectives after mitigations (Section 3.12.6.3), where changes may attract attention, but should not dominate the view of the casual observer.

Due to its location in undeveloped landscape, the Marketplace Variation has increased impacts over Alternative IV-B (which would parallel multiple transmission lines). Less than 1 percent of the Marketplace Variation reference line would be located within a utility corridor or utility window, where compliance or consistency with agency visual management objectives would be preempted by the utility corridor.

3.12.6.8 Residual Impacts

All of the action alternatives would result in residual impacts to people and scenery. Topographic modifications on moderate to steep slopes, vegetation management, and sky-lined structures situated in the immediate foreground would impact sensitive viewers and Class A and Class B scenery.

The application of substantive mitigation measures would reduce visual impacts from high to moderate, or moderate to low. These reductions are applicable to viewing situations involving stationery (non-linear) viewers and to landscapes where tree cover and moderate to steep landforms contribute strongly to visual impacts. Residual impacts (what would remain after mitigation) for landscape scenery, high viewer sensitivity and moderate viewer sensitivity by alternative and segment are listed in regional impacts sections. Residual impacts to landscape scenery, high viewer sensitivity and moderate viewer sensitivity by region, alternative, segment, and mileposts (as if, “walking the line”) are listed in **Appendix I**, **Tables I-11** through **I-14**, respectively.

3.12.6.9 Impacts from the No Action Alternative

Current management across the study area would be maintained under the No Action alternative. Under this alternative, there would be no project construction or operation to impact visual resources.

3.12.6.10 Irreversible and Irretrievable Commitment of Resources

Irretrievable impacts to visual resources are anticipated where pinyon-pine, ponderosa, spruce-fir, cottonwood and aspen are involved in ROW management, since trees would not be replanted, or would be replanted and result in age disparities, and the effects would be noticeable to the casual observer.

Vegetation management effects in these ROWs would be irretrievable in the long term (50 to 100 years), or until wildfires or large scale vegetation management actions clear vegetation in patterns informed by the topography. The impacts are noted in the tables in the impacts sections for Regions I, II, and III. No irreversible impacts would occur assuming long-term time frames and complete restoration after decommissioning.

3.12.6.11 Relationship Between Local Short-term Uses and Long-term Productivity

Short-term vegetation management may impair long-term visual resources.