Western
AREA POWER
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FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE

Final Environmental Assessment for the Glen Canyon to Pinnacle Peak 345 kV Transmission Lines Vegetation Management Project within the Coconino National Forest

DOE/EA-1863

July 2012

Approved October 2012

Lead Agency:
United States Department of Energy,
Western Area Power Administration

Cooperating Agency:
United States Forest Service
Coconino National Forest

FINAL
ENVIRONMENTAL ASSESSMENT

DOE/EA-1863

Glen Canyon – Pinnacle Peak 345 kV Transmission Lines Vegetation Management Project

Coconino and Yavapai Counties, Arizona

U.S. Department of Energy
Western Area Power Administration
Desert Southwest Customer Service Region
615 South 43rd Avenue
Phoenix, Arizona 85009

U.S. Department of Agriculture
US Forest Service
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LIST OF ABBREVIATIONS AND ACRONYMS

A.R.S.	Arizona Revised Statues
AAQS	Ambient Air Quality Standards
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AGL	above ground level
APLIC	Avian Powerline Interaction Committee
AZGFD	Arizona Game and Fish Department
AZPDES	Arizona Pollutant Discharge Elimination System
BA	biological assessment
BLM	Bureau of Land Management
BMP	best management practice
BO	biological opinion
BOR	Bureau of Reclamation
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CNF	Coconino National Forest
CO	carbon monoxide
dBA	A-weighted decibel scale
DOE	Department of Energy
DSW	Western's Desert Southwest Region
EA	environmental assessment
EIS	environmental impact statement
EMF	electric and magnetic field
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FH	Forest Highway
FMU	fire management unit
FONSI	Finding of No Significant Impacts
FR	Forest Road
GIS	geographic information system
GRIP	Guidelines, Requirements, Inspections, and Procedures
HAP	hazardous air pollutants
IVM	Integrated Vegetation Management
kV	kilovolt
L_{dn}	24-hour, time-averaged, A-weighted sound level (day-night)
LIDAR	light detection and ranging
LR2000	Legacy Rehost 2000 System

LRMP	Land/Resource Management Plan
MIS	Management Indicator Species
MOU	memorandum of understanding
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NFMA	National Forest Management Act
NHPA	National Historic Preservation Act
NMRPTC	New Mexico Rare Plant Technical Council
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NO_x	nitrogen oxide
NWP	nationwide permits
O	Western order
OHV	off-highway vehicle
OSHA	Occupational Safety and Health Administration
PA	programmatic agreement
PAC	protected activity centers
PCM	project conservation measures
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PNVT	potential natural vegetation types
PFA	post-fledging area (PFA)
Project	Glen Canyon to Pinnacle Peak 345 kV vegetation management and right-of-way maintenance project
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
RMP	resource management plan
ROG	reactive and volatile organic compounds and gasses
ROS	recreation opportunity spectrum
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Officer
SIO	scenic integrity objective
SMS	Scenery Management System
SO_2	sulfur dioxide
SOP	standard operating procedure
SR	State Route
SWPPP	Storm Water Pollution Prevention Plan
TAC	toxic air contaminant
TEU	Terrestrial Ecosystem Units
TMR	Travel Management Rule
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

SECTION 1 – PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION AND BACKGROUND

The Western Area Power Administration, Desert Southwest Region (Western) markets and delivers federal hydroelectric power to nearly 70 municipalities, cooperatives, federal and state agencies, and irrigation districts. Most power sold by Western is generated from power plants operated at Hoover, Parker, and Davis dams; as well as from hydroelectric projects in the Bureau of Reclamation's (BOR) Upper Colorado Region and the federal portion of power generated at the Navajo Generating Station near Page, Arizona. Western's Desert Southwest Region operates and maintains more than 40 substations and 3,100 miles (4,950 kilometers) of transmission line to ensure system reliability. Within this region, Western owns, operates, and maintains 69-kilovolt (kV), 115 kV, 230 kV, 345 kV, and 500 kV, transmission lines in eleven counties in Arizona; San Bernardino, Riverside, and Imperial counties in California; San Juan County in New Mexico; and Clark County in Nevada. These transmission lines include the Glen Canyon-Flagstaff and Flagstaff-Pinnacle Peak transmission lines. Collectively, the portions of these 345 kV transmission lines and associated access roads from Glen Canyon Dam to Pinnacle Peak that traverse the Coconino National Forest (CNF) compose the Project area (Figure 1-1). Currently, these transmission lines pass through rugged, and in some cases densely vegetated areas in northern and central Arizona, which are in need of proactive vegetation management and right-of-way maintenance. Western's Integrated Vegetation Management (IVM) Guide and Transmission Vegetation Management Program (Western 2011) employs an adaptive management approach that follows environmentally protective vegetation-control principles for potentially hazardous vegetation, including natural, physical, and mechanical control. Section 2 – Proposed Action and Alternatives, provides additional details on these vegetation control methods.

There are numerous electrical transmission and distribution lines owned and operated by private and federal utility entities (e.g., Arizona Public Service, Salt River Project, Navopache Electric Co-op Inc., Garkane Energy, Qwest, Western, etc.) crossing U.S. Forest Service (USFS) lands in Arizona. Nearly all of these transmission and distribution lines require vegetation management as a part of routine operation and maintenance activities for their respective rights-of-way. Pursuant to Section 7 of the federal Endangered Species Act (ESA), a biological assessment (BA) and biological opinion (BO) were completed in 2008 by the USFS and U.S. Fish and Wildlife Service (USFWS), for operation and maintenance activities on all existing transmission and distribution line rights-of-way (including Western's Glen Canyon-Pinnacle Peak 345 kV transmission lines) within the Coconino, Apache-Sitgreaves, Kaibab, Prescott, and Tonto National Forests in Arizona. Western also has a current programmatic agreement (PA) with the Arizona State Historic Preservation Officer (SHPO), pursuant to Section 106 of the National Historic Preservation Act (NHPA), for existing operation and maintenance activities.

The Glen Canyon-Pinnacle Peak 345 kV vegetation management and right-of-way maintenance project serves to update the existing operation and maintenance program to include all transmission facilities and access roads into one comprehensive and proactive vegetation management and right-of-way maintenance project (Project). This environmental assessment (EA) analyzes the potential environmental consequences of the proposed Project, as required under the National Environmental Policy Act (NEPA) and other relevant federal regulations.

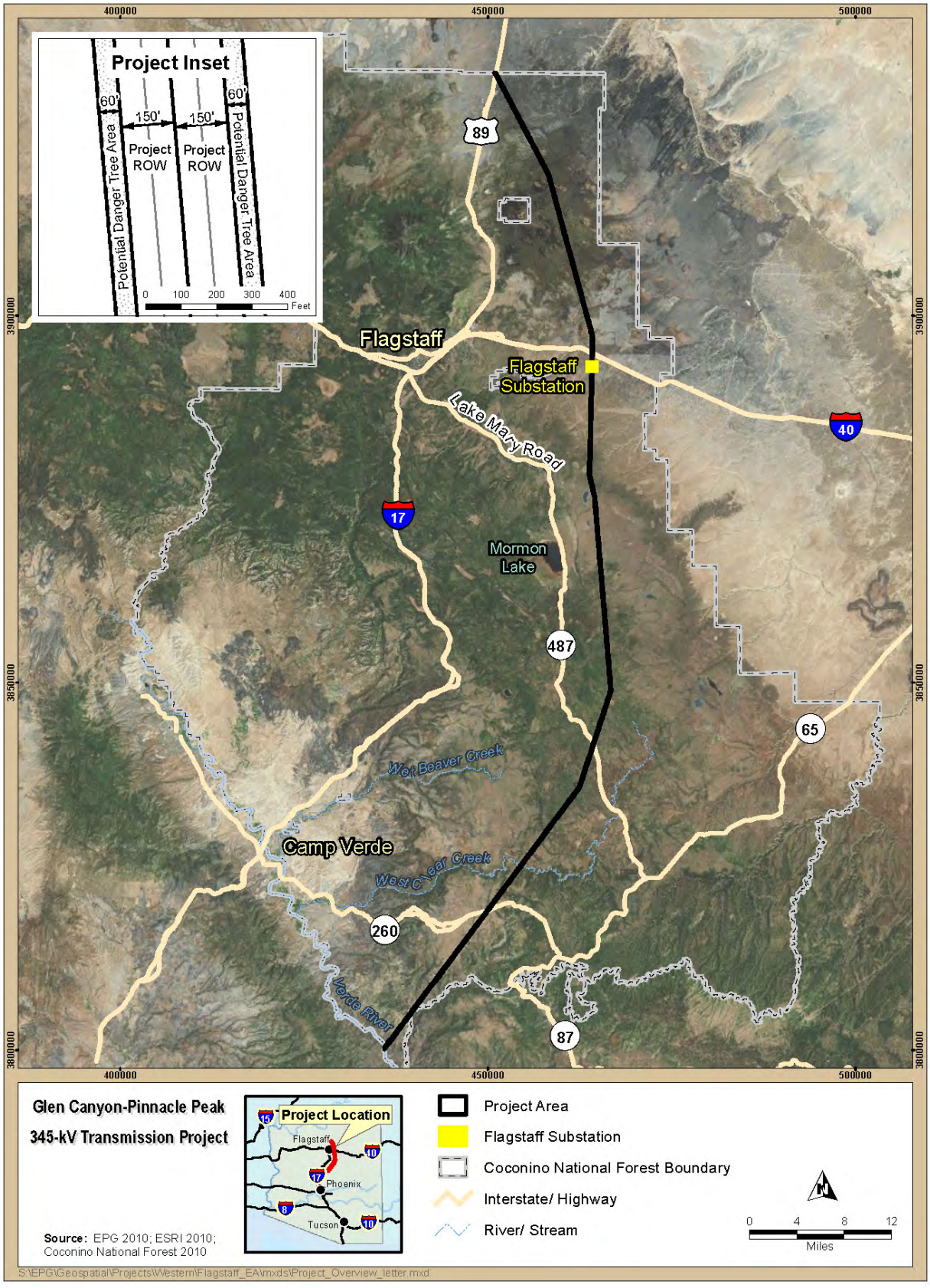

Figure 1-1. Project Area Overview

1.2 LOCATION AND PROJECT AREA DESCRIPTION

The Glen Canyon-Pinnacle Peak 345 kV transmission lines were constructed in 1966 on self-supporting lattice steel structures; the transmission lines are located predominantly in Coconino and Yavapai counties, Arizona, east of I-17. The Glen Canyon-Flagstaff and Flagstaff-Pinnacle Peak projects have two adjacent and parallel transmission facilities within their cumulative right-of-way. Each individual transmission facility has an existing right-of-way of 150 feet, for a cumulative right-of-way width of 300 feet. When the transmission lines were initially constructed in 1966, all vegetation within the 300-foot right-of-way area was removed and/or altered from its natural state. Since that time, successional vegetation growth has been allowed to occur, resulting in large woody species (e.g., ponderosa pine, Gambel oak, piñon pine, juniper, and other trees) to reinhabit the right-of-way. In addition, trees that pose an immediate hazard to the safe and reliable operation of the Project outside of the right-of-way are also considered to be part of the Project area. Potential danger trees, defined as trees located within or adjacent to the right-of-way that present a hazard to employees, the public, or power system facilities, may be identified as far as 60 feet outside the edge of the right-of-way (USFS 2008). To account for potential danger trees, the Project area includes an additional 60 feet beyond both right-of-way edges, for a total Project area width of 420 feet (Figure 1-2).

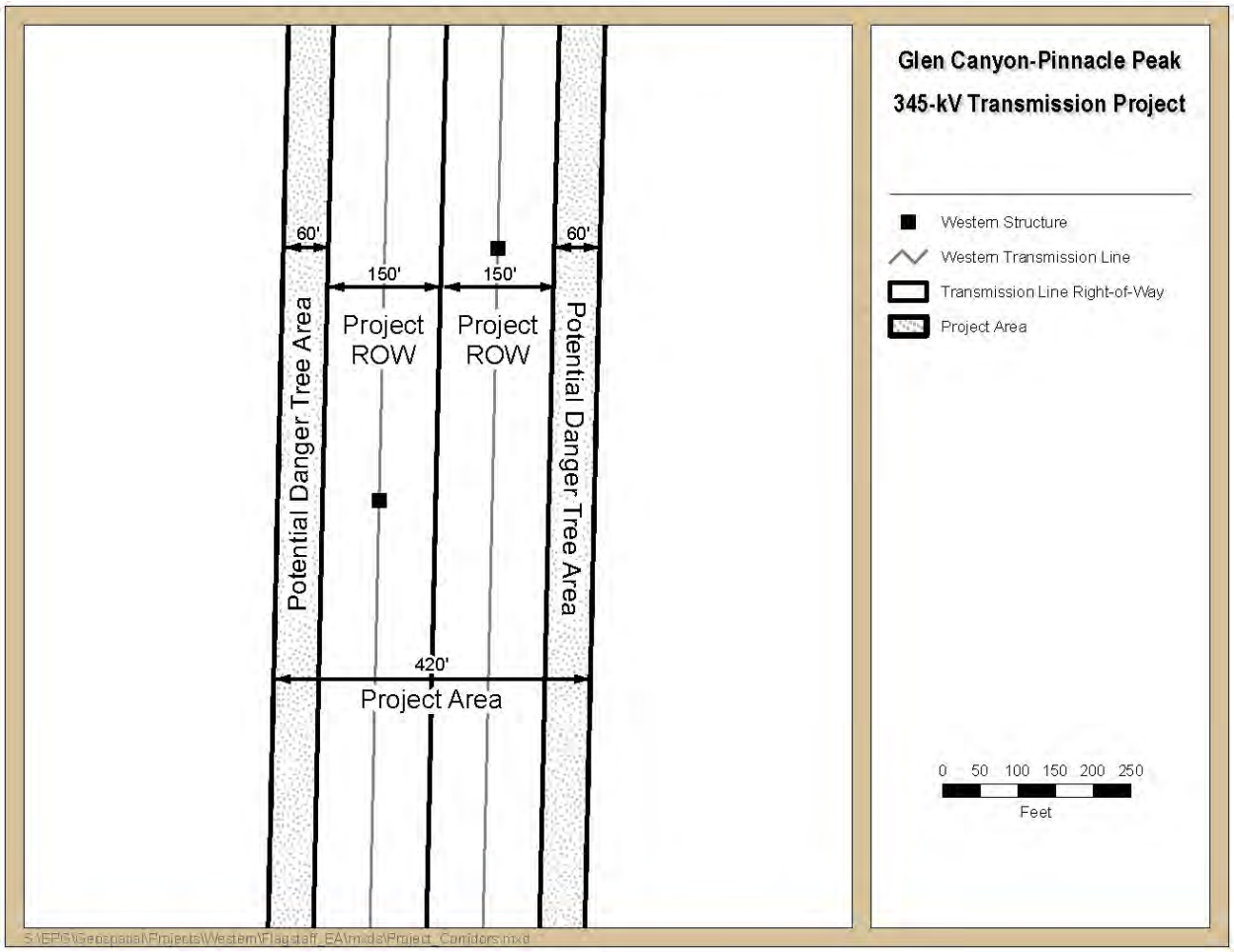

Figure 1-2. Project Area Dimensions

This EA is intended to cover the portions of the transmission line rights-of-way and potential danger tree areas that are within the jurisdictional boundaries of the CNF. The Glen Canyon-Flagstaff transmission lines traverse approximately 26 miles of the CNF, starting at the Flagstaff Substation (south of I-40) and proceeding northwest to the northern boundary of the CNF where the transmission lines cross U.S. Highway 89. Similarly, the Flagstaff-Pinnacle Peak transmission lines traverse approximately 64 miles of the CNF, starting at the Flagstaff Substation and proceeding south-southwest to the southern boundary of the CNF where the transmission lines cross the Verde River (approximately 18 miles southeast of Camp Verde). The total length of Western transmission lines on CNF land is approximately 90 miles.

1.3 PURPOSE AND NEED FOR ACTION

Western's policy on Transmission Vegetation Management Program Western Order (O) 450.3A specifies that *"Western's desired condition beneath and adjacent to its transmission line facilities is characterized by stable, low growth plant communities free from noxious or invasive plants. These communities will typically be comprised of herbaceous plants and low growing shrubs which ideally are native to the local area. Vegetation on the bordering areas of transmission line rights-of-way can be managed so that increased tree height is allowed in relation to an increasing distance from the transmission line. Accumulations of vegetation debris from intensive or repetitive vegetation treatments may require mitigation to reduce risks from wildfire and enhance the fire survivability of the transmission facilities."*

The purpose of the Project is to maintain Western's existing transmission line and access road rights-of-way in a manner that: (1) is consistent with applicable laws, orders, standards, practices, and guidance, and (2) protects environmental resources to the extent practicable, while improving the efficiency and effectiveness of vegetation management and right-of-way maintenance activities. Western has designed this Project to balance environmental protection with system reliability and compliance with the National Electric Safety Code; Western Electricity Coordinating Council requirements; North American Electric Reliability Corporation (NERC) reliability standards; Institute of Electrical and Electronics Engineers standards; and Western's Guidelines, Requirements, Inspections, and Procedures (GRIP), Western O 450.3A, and directives for maintaining system reliability and protection of human safety.

Since completion of construction for the transmission facilities in 1966, vegetation within and adjacent to the Project rights-of-way has primarily been managed on a reactive basis, where only immediate vegetative hazards have been treated. This has resulted in dense stands of vegetation within and adjacent to the Project rights-of-way that pose a potential hazard to Project facilities and is not consistent with Western's purpose (Western O 450.3A, Section 7). When vegetation reaches a hazardous condition for continued operation of the transmission facilities (see Section 2.1.1), Western may identify this as an emergency situation. When emergency situations for the transmission facilities are identified, Western is required to resolve the emergency immediately, which may preclude the implementation of conservation measures that would otherwise govern vegetation management activities.

Because of the potential for service outages from trees growing into the line, falling into the line, or creating a fire hazard to the transmission lines and structures, and because standards regarding vegetation along transmission lines have recently become more strict, a comprehensive

vegetation management and right-of-way maintenance project is needed. Failure to address vegetation clearance and fuel hazards could result in wildfires, major power outages, and injury to life or property. The need for the Proposed Action includes:

- Providing safe and efficient transmission of power along existing lines.
- Eliminating vegetation that interferes with the safe and reliable operation of the transmission lines and towers. Vegetation near transmission lines may pose a threat to public safety and the environment because of the risk of:
    - Wildfire resulting from arcing (a luminous discharge of current that is formed when a strong current jumps a gap in a circuit or between two electrodes). In the case of the Project, the current jumps the gap from energized conductor to the ground or tree.
    - Trees falling, growing, or bending into the transmission lines and/or structures.
- Complying with NERC reliability standards (FAC-003-1 [NERC 2006] and FAC-003-2 [NERC 2011]) that deal with vegetation inspections and treatment, to maintain transmission lines in safe and reliable operating conditions as well as various aspects of the planning and operation of the power system.
- Performing operation and maintenance activities in a manner that benefits the public by virtue of uninterrupted service, and minimizes Western's potential for costly fines for NERC noncompliance.
- Maintaining the transmission line rights-of-way and access roads to ensure that Western's maintenance crews have safe access to right-of-way facilities.

1.4 EXISTING OPERATION AND MAINTENANCE ACTIVITIES

Western currently uses aerial and ground patrols, and light detection and ranging (LIDAR) surveys to identify hazard vegetation for removal. Once hazard vegetation is identified, a crew of linemen enters the area and removes the hazard vegetation. Because the nature of hazard vegetation is "imminent," work to address hazards is conducted as quickly as possible.

1.4.1 Aerial Patrols

Western currently conducts aerial surveys for line maintenance and vegetation management, using a Bell Long Ranger passenger helicopter. The flights patrol each transmission line once per quarter, but do not follow a routine schedule. Flights could occur during any combination of months, three months apart out of a year, for multiple days at a time. Aerial patrols typically occur from 7:30 a.m. to 4:30 p.m. and typically take 2 days to complete. The low-level flights are intended to get a close look at the transmission line, structures, and associated equipment to identify areas that may require repair. Any problem areas identified during these patrols are recorded and scheduled for ground treatment and/or repair.

During aerial patrols, the helicopter flies close enough to Project facilities to ensure a detailed look at the transmission line structures, hardware, and the vegetation within and adjacent to the right-of-way. This generally ranges from 50 to 150 feet above ground level (AGL), varying with the height of the structures and the surrounding terrain. The speed of the helicopter during aerial patrols is approximately 60 to 80 miles per hour. The helicopter may hover or circle the rights-of-way to get a detailed look at damaged facilities or hazard vegetation. Western estimates that

the helicopter may hover or circle up to six times per transmission line during a given aerial patrol. When necessary, the helicopter may land near the transmission line so that the aerial patrolman can get a closer look at the hardware that appears to have structural damage, and/or to get a closer look at hazard vegetation that might pose an immediate risk to the safe and reliable operation of the facility. The helicopter may land within or outside of the right-of-way, based on the nearest safe landing area. Landing near the transmission line during aerial patrols typically occurs once or twice per patrol.

1.4.2 Ground Patrols

Western currently conducts routine ground and line maintenance patrols to follow up with problem areas identified during aerial patrols, as well as to identify hazard vegetation, plan for routine vegetation maintenance, and assess overall condition of the rights-of-way. Routine ground patrols typically focus on assessing the condition of Project access, while routine line maintenance patrols are intended to inspect and maintain Project structures and associated hardware. Routine ground and line maintenance patrols are conducted during the same patrol effort. These patrols are conducted from April to September by two linemen driving a pickup truck. Three or four crews may be staggered along the transmission line to facilitate timely completion of the patrol. Ground patrol vehicles typically drive on existing access roads and/or trails; however, within the Project rights-of-way and where access is clear (i.e., no environmental obstructions or limiting slope conditions), ground patrol vehicles may at times drive off of designated access roads to access Project facilities or connecting access roads. Ground patrols occur from 6:00 a.m. to 4:30 p.m.

Currently, routine transmission line maintenance and vegetation management ground patrols occur every 3 years for this Project. During ground patrols, the linemen may plan for a routine vegetation management project or identify and document hazard vegetation. For hazard vegetation, the linemen document the location, size, species, date, quantity, and method of anticipated removal for all hazard vegetation. The information gathered during this patrol is summarized and given to the work crews. Hazard vegetation is removed as quickly as possible at any time of the year.

Additional ground patrols may be conducted by two linemen to follow up after aerial patrols, to gather site-specific information on hazard vegetation identified during the aerial patrol. The linemen only inspect the particular area where hazard vegetation was located, but additional hazard vegetation may be identified during this ground inspection. The required information is documented for all hazard vegetation, and removal work is conducted as quickly as possible. Any additional consecutive days of removal work, if necessary, is also conducted at this time. Additional ground patrols for hazard vegetation identified during aerial patrols may occur at any time of year.

1.5 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

This EA presents and evaluates the potential environmental consequences resulting from implementation of the Proposed Action and No Action alternative, including the methods and management approaches that compose the Proposed Action and No Action alternative; a detailed description of the affected environment and a comprehensive analysis of environmental

consequences for the Proposed Action and No Action alternative for 16 environmental issue areas (e.g., air quality, biological resources, cultural resources, etc.); and a discussion of the cumulative effects with regard to the Proposed Action and No Action alternative. Section 2.3 also presents those alternatives considered but eliminated from full EA evaluation.

Western has proposed project conservation measures (PCM) to prevent and/or minimize effects to sensitive resources in the right-of-way during Project activities. Western developed these proposed conservation measures to proactively mitigate sensitive resources in the Project area. Proposed PCMs are specific to each resource and Project activity and are provided in Section 2.

Assessment of the affected environment and environmental consequences relied on a combination of existing data (including biological data collected during the BA and BO that were completed for the Project area) and data collected during cultural resource field surveys. Surveys were conducted throughout the Project area between the northern boundary of the CNF, where the transmission lines cross U.S. Highway 89, and the southern CNF boundary, where the transmission lines cross Fossil Creek (approximately 18 miles southeast of Camp Verde). Western conducted cultural resource investigations to prepare a complete inventory of archaeological sites, and historic buildings and structures, located within or near the Project rights-of-way and access roads. The inventory efforts included a comprehensive literature search to identify and evaluate previous survey and site recording efforts, as well as an intensive pedestrian field survey of the Project rights-of-way and access roads.

1.6 COOPERATING AGENCIES

The Project traverses lands managed by the CNF. Under NEPA regulations, the CNF accepted Western's invitation to become a cooperating agency in preparing this EA for the Project. Western has proactively met with the CNF and has requested input into the scope, alternatives, and environmental analysis. See Section 4.0 for a detailed description of agency coordination for this Project.

1.7 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

This section presents the federal, state, and local laws, ordinances, and regulations applicable to the Proposed Action.

1.7.1 Federal

1.7.1.1 National Environmental Policy Act (NEPA)

This act requires federal agencies to consider the impacts to the human and natural environment from their actions. The Council on Environmental Quality has published implementing regulations (40 CFR parts 1500-1508) and the Department of Energy (DOE) has published implementing procedures (10 CFR part 1021) that govern Western's compliance with NEPA.

1.7.1.2 Comprehensive Environmental Response, Compensation and Liability Act

The CERCLA regulates methods of cleaning up recent and past spills of hazardous substances, as well as defines periods within which the EPA and other agencies must be notified of current spills. Federal and state agencies are notified based on the reportable quantities of the hazardous substances.

Along with the National Contingency Plan, the CERCLA specifies federal natural resource trustees. The DOE is a designated trustee for natural resources that are on, over, or under land within its jurisdiction and not specifically the responsibility of some other resource management agency. Federal facilities that have released hazardous substances, therefore, should clearly be concerned about natural resource damage liabilities. The DOE may have a dual role here, however, because its own activities have resulted in hazardous substance releases. As the CERCLA's lead response agency, the DOE may be subject to natural resource liabilities to other trustees.

1.7.1.3 Occupational Health and Safety Act and Hazard Communication Standard

The Occupational Health and Safety Act (OSHA) protects worker health and safety. The OSHA Hazard Communication Standard requires workers to be provided with a material safety data sheet for all hazardous materials, and requires that workers be trained regarding the hazards of any materials that are handled. Information is provided to workers on how best to protect themselves in the workplace, as well as on what to do during emergencies such as spills and fires.

1.7.1.4 49 CFR, Subchapter C – Hazardous Materials Regulations

49 CFR, Subchapter C – Hazardous Materials Regulations requires placards and shipping papers for shipping certain quantities of hazardous materials, and requires the reporting of any accidents that may occur in transit.

State OSHA, EPA, agricultural agencies, and local health and weed control agencies may also have specific regulations that deal with pesticide use, spills, transportation, and disposal of hazardous materials.

1.7.1.5 Federal Noxious Weed Act of 1974

The Federal Noxious Weed Act of 1974 defines a noxious weed as any living stage of a plant that can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture, including irrigation, navigation, the fish and wildlife resources of the United States, or the public health. It requires federal agencies to work with state and local agencies to develop and implement noxious weed management programs on federal lands.

This act regulates the sale, purchase, and transportation of noxious weeds into or through the United States, as well as the inspection and the quarantine of areas suspected of infestation. It provides for the disposal or destruction of infested products, articles, means of conveyance, or noxious weeds. Persons who violate these regulations are subject to fines of up to $5,000 and/or imprisonment up to 1 year.

1.7.1.6 Endangered Species Act

The ESA protects listed plants and animals that are threatened by habitat destruction, pollution, overharvesting, disease, predation, or other natural or man-made factors. It stipulates that listed species cannot be taken without a special permit (take, as defined under the ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct"). All federal agencies must ensure that their activities do not jeopardize a listed species or its critical habitat.

1.7.1.7 Fish and Wildlife Coordination Act

This Fish and Wildlife Coordination Act requires all federal agencies to consult with state and federal wildlife management agencies prior to approving any federal action that may affect a stream or other body of water.

1.7.1.8 Migratory Bird Treaty Act of 1918, as Amended

The Migratory Bird Treaty Act protects migratory birds by making it unlawful to pursue, take, attempt to take, capture, possess, or kill any migratory bird, or any part, nest, or egg of any such bird, unless and except as permitted by regulation. The act is intended to protect birds that have common migratory patterns within the United States, Canada, Mexico, Japan, and Russia.

1.7.1.9 Bald Eagle Protection Act of 1940

This act makes it unlawful to capture, kill, destroy, molest, or disturb bald eagles, their nests, or their eggs anywhere in the United States. The act also protects Golden Eagles because they are similar in appearance. A permit must be obtained from the U.S. Department of Interior to relocate a nest that interferes with resource development or recovery operations. The act imposes criminal and civil penalties on anyone (including associations, partnerships, and corporations) in the United States or within its jurisdiction who, unless excepted, takes, possesses, sells, purchases, barters, offers to sell or purchase or barter, transports, exports or imports at any time or in any manner a Bald or Golden Eagle, alive or dead; or any part, nest or egg of these eagles; or violates any permit or regulations issued under the act.

If compatible with the preservation of Bald and Golden Eagles, the Secretary of the Interior may issue regulations authorizing the taking, possessing, and transporting of these eagles for scientific or exhibition purposes, for religious purposes of Indian tribes, or for the protection of wildlife, agricultural, or other interests.

1.7.1.10 National Historic Preservation Act

The NHPA directs that government agencies must locate and inventory historic properties and cultural resources eligible for the National Register prior to taking an action that might harm them, with the intent of minimizing such harm through appropriate avoidance measures. Agencies must consider the effects of their actions on identified historic properties prior to implementing the action.

1.7.1.11 American Indian Religious Freedom Act

The American Indian Religious Freedom Act establishes that it is the policy of the United States to protect and preserve for Native Americans their inherent right of freedom to believe, express, and exercise their traditional religions. This includes access to sites, use and possession of sacred objects, and the freedom to worship through ceremonies and traditional rites.

1.7.1.12 Executive Order 13007, Indian Sacred Sites

This Executive Order (EO) directs federal agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of those sacred sites. This includes providing reasonable notice of proposed actions or land-management policies that may restrict access or affect the physical integrity of sacred sites. It also directs agencies to keep confidential information pertaining to such sites.

1.7.1.13 Archaeological Resources Protection Act of 1979

The Archaeological Resources Protection Act secures the protection of archaeological resources and sites on both public and Indian lands. The act includes stiffer penalties and fines for a detailed list of prohibited acts, and sets forth uniform regulations for excavation, removal, disposition, exchange, and information disclosure of archaeological resources.

1.7.1.14 Clean Air Act

The Clean Air Act (CAA) of 1970, and the CAA Amendments of 1990, as amended, establish air quality standards for protection of public health and the environment. The ambient air quality in an area is characterized in terms of whether or not it complies with the primary and secondary NAAQS. The CAA, as amended, requires the EPA to set NAAQS for pollutants considered harmful to public health and the environment. NAAQS are provided for six principal pollutants, called "criteria pollutants" (as listed under Section 108 of the CAA): CO, lead, NO_x, SO_2, ozone, and PM, divided into two size classes (aerodynamic size less than or equal to 10 micrometers [PM_{10}] and aerodynamic size less than or equal to 2.5 micrometers [$PM_{2.5}$]).

Title III of the CAA, as amended, provides for regulation of 187 specifically listed hazardous air pollutants (HAP). Emission standards have been developed for sources that emit HAPs, but no NAAQS have been developed. The Title V Operating Permit Program under 40 CFR Part 70 requires sources that meet the definition of a "major source" of criteria pollutants or HAPs to apply for and obtain a Title V operating permit. A major source of HAPs has the potential to emit more than 10 tons per year of any individual HAP or 25 tons per year of any combination of HAPs. The definition of a major source for criteria pollutants is dependent upon the air quality attainment status of the region in which the source is located.

1.7.1.15 Presidential Memorandum Dated April 26, 1994, for the Heads of Executive Departments and Agencies and Guidance for this Memorandum from the Office of the Federal Environmental Executive (60 FR 40837; August 10, 1995)

In this memo and the accompanying guidance, agencies are directed to:

- Use regionally native plants for landscaping
- Design, use, or promote construction practices that minimize adverse effects on natural habitat
- Implement water-efficient practices, such as use of mulches, efficient irrigation systems, audits to determine water-use needs, and siting of plants in a manner that conserves water and controls soil erosion
- Plant regionally native shade trees to reduce air conditioning demands
- Create outdoor demonstrations incorporating native plants, as well as pollution-prevention and water-conservation techniques

1.7.1.16 Paleontological Resources Preservation Act of 2009

The Paleontological Resources Preservation Act is part of the Omnibus Public Land Management Act of 2009 (Public Law 111-011 Subtitle D). This act directs the Secretary of the Interior or the Secretary of Agriculture to manage and protect paleontological resources on federal land, and develop plans for the inventory, monitoring, and deriving of the scientific and educational use of such resources. It prohibits the removal of paleontological resources from federal land without a permit issued under this act, establishes penalties for violation of this act, and establishes a program to increase public awareness about such resources.

1.7.1.17 Other Applicable Federal Regulations, Guidance, and Executive Orders

The following identifies other federal requirements potentially applicable to the Proposed Action:

Pollution Prevention Act of 1990. The Pollution Prevention Act recognizes that "pollution should be prevented or reduced at the source whenever feasible; pollution that cannot be prevented should be recycled in an environmentally sound manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally sound manner whenever feasible; and disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner."

Resource Conservation and Recovery Act of 1976. The Resource Conservation and Recovery Act (RCRA) establishes a system for managing nonhazardous and hazardous solid wastes in an environmentally sound manner. Specifically, it provides for the management of hazardous wastes from the point of origin to the point of final disposal (i.e., "cradle to grave"). The RCRA also promotes resource recovery and waste minimization.

Safe Drinking Water Act of 1974. The Safe Drinking Water Act (SDWA) manages potential contamination threats to groundwater. It instructs the EPA to establish a national program to prevent underground injections of contaminated fluids that would endanger drinking water sources. Drinking water standards established under the SDWA are used to determine groundwater protection regulations under a number of other statutes (e.g., RCRA). Therefore, many of the SDWA requirements apply to DOE activities, especially cleanup of contaminated sites and storage and disposal of materials containing inorganic chemicals, organic chemicals, and hazardous wastes.

Toxic Substances Control Act of 1976. The Toxic Substances Control Act authorizes the EPA to secure information on all new and existing chemical substances and to control any of these substances that could cause an unreasonable risk to public health or the environment, including lead, asbestos, radon, and polychlorinated biphenyls.

EO 13175, Consultation and Coordination with Indian Tribal Governments. This EO requires federal agencies to establish regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications.

EO 13112, Invasive Species. This EO requires federal agencies to:

- *prevent the introduction of invasive species*
- *detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner*
- *monitor invasive species populations accurately and reliably, provide for restoration of native species and habitat conditions in ecosystems that have been invaded*
- *conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species*
- *promote public education on invasive species and the means to address them*

National Aquatic Invasive Species Act of 1996. The National Aquatic Invasive Species Act prescribes actions to combat invasive aquatic species.

Native American Graves Protection and Repatriation Act. The Native American Graves Protection and Repatriation Act and its implementing regulations (43 CFR Part 10) protect Native American human remains, burials, and associated burial goods.

Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990. The Non-indigenous Aquatic Nuisance Prevention and Control Act establishes a program to prevent the introduction of, and to control the spread of, introduced aquatic nuisance species.

EO 11988, Floodplain Management. This EO requires federal agencies to assess the effects that their actions may have on floodplains and to consider alternatives to avoid adverse effects and incompatible development on floodplains.

EO 11990, Protection of Wetlands. This EO requires federal agencies to take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the beneficial values of wetlands.

Soil Conservation and Domestic Allotment Act. The Soil Conservation and Domestic Allotment Act provides for soil conservation practices on federal land.

EO 12898 (1998). This EO requires federal agencies to address high and disproportionate environmental impacts on minority and low-income populations. Should potentially significant and adverse impacts attributable to a proposed project fall disproportionately on minority or low-income populations, environmental justice impacts would result and would therefore need to be mitigated or avoided.

1.7.1.18 U.S. Department of Energy Policies, Orders, and Memoranda

DOE Policy 141.1. DOE Management of Cultural Resources, dated May 2, 2011, establishes cultural resource management as a necessary part of DOE program implementation and establishes program responsibilities, requirements, and authorities.

DOE Policy 450.2A. Identifying, Implementing, and Complying with Environment, Safety and Health Requirements, dated May 15, 1996, sets forth the framework for identifying, implementing, and complying with environment, safety, and health requirements so work is performed in a manner that ensures adequate protection of workers, the public, and the environment.

DOE Policy 450.4. Safety Management System Policy, dated October 15, 1996, provides a formal, organized process whereby people plan, perform, assess, and improve environmental processes.

DOE Order 5400.1. General Environmental Protection Program, dated November 9, 1988, establishes environmental protection program requirements, authorities, and responsibilities for DOE operations to ensure compliance with federal, state, and local environmental laws, regulations, EOs, and internal policies.

DOE Order 5480.4. Environmental Protection, Safety, and Health Protection Standards, dated May 15, 1984, specifies requirements for the application of mandatory environmental protection standards. A DOE memorandum dated November 3, 1997, issued from the DOE Office of NEPA Policy and Assistance, emphasizes the need to consider environmentally and economically beneficial landscape practices, in addition to the above guidance, when developing NEPA documents.

Western Area Power Administration Order 430.1. Right-of-Way Management Guidance for Vegetation, Encroachments, and Access Routes, dated March 18, 2008, delegates and clarifies responsibilities to maintenance managers and establishes guidance and organizational support for maintenance and safe operation of Western rights-of-way.

Western Area Power Administration Order 450.1A. Environmental Considerations in the Planning, Design, Construction, and Maintenance of Power Facilities and Activities, dated November 21, 2001, describes environmental requirements that may be necessary to support maintenance activities.

Western Area Power Administration Order 450.3A. Transmission Vegetation Management Program, dated March 13, 2008, dictates Western's approach to transmission vegetation management.

Western Area Power Administration Order 6400.1. Establishment of Engineering Manual Series, dated February 5, 1980, describes standards for documents developed for guidance of Western's field activities.

Western Area Power Administration Power System Maintenance Manual, Chapter 11. Trimming and Felling of Trees and Brush Near Powerlines, November 2000 GRIP No.16, Transmission Line Right-of-Way Management, February 2001. This guide sets forth the

procedures and practices for management of the transmission line rights-of-way, including easements and fee land owned by Western's Desert Southwest Region (DSW).

GRIP No. 19. Major Power System Component and Maintenance Program, May 2002. This guide outlines Western's DSW maintenance program for major power system components, including both scheduled maintenance practices and trigger-based maintenance practices, to ensure power system reliability, safety of employees, and cost effectiveness. The program is designed to meet the requirements of the customers, public safety, environmental sensitivities, and various power system organizations.

1.7.1.19 Federal Water Quality Regulations and Programs

Section 401 of the Clean Water Act. Activities covered by the U.S. Army Corps of Engineers' jurisdiction over wetlands (Clean Water Act Section 404 Department of Army permits) require Section 401 water-quality certifications from the State Water Resources Control Board. The water quality certification program requires that states certify compliance of federal permits and licenses with state water quality standards.

Section 404 of the Clean Water Act. Authorization from the U.S. Army Corps of Engineers is required in accordance with the provisions of Section 404 when dredged or fill material is discharged into waters of the United States, including wetlands. This includes excavation activities that result in the discharge of dredged material that could destroy or degrade waters of the United States. The repair and upgrade of access roads could impact waters of the United States.

Nationwide Permits. Nationwide permits (NWP) are a type of general permit issued by the U.S. Army Corps of Engineers that are designed to regulate with little delay or paperwork certain activities having minimal impacts. Western would perform right-of-way maintenance work under the NWPs listed in Table 1-1. The NWPs can be periodically proposed, issued, modified, reissued (extended), and revoked after an opportunity for public notice and comment. NWPs expire after 5 years. Western would perform operation and maintenance activities under the most up to date permit and comply with any modifications. All actions are performed on a limited basis, because of the limited resources available and because actions are intended to be performed over a period of at least 10 years. Thresholds of effect are incorporated into these NWPs, and Western would adhere to the thresholds as specified.

Table 1-1. Summary of Applicable Nationwide Permits

Permit and Title	Description	Thresholds	Notification Requirements
Nationwide Permit 3 – Maintenance	Activities related to: (i) the repair, rehabilitation, or replacement of any previously authorized, currently serviceable, structure, or fill; (ii) discharges of dredged or fill material, including excavation, into all waters of the U.S. to remove accumulated sediments and debris in the	Under (ii), the removal of sediment is limited to the minimum necessary to restore the waterway in the immediate vicinity of the structure to the approximate dimensions that existed when the structure was built, but cannot extend farther	Under (iii), the permittee must notify the district engineer within 12 months of the date of the damage.

Table 1-1. Summary of Applicable Nationwide Permits			
Permit and Title	**Description**	**Thresholds**	**Notification Requirements**
	vicinity of, and within, existing structures and the placement of rip-rap; and (iii) discharges of dredged or fill material, including excavation, into all waters of the U.S. for activities associated with the restoration of upland areas damaged by a storm, flood, or other discrete event, including the construction, placement, or installation of upland protection structures and minor dredging to remove obstructions in a water of the U.S.	than 200 ft in any direction from the structure. Under (iii), minor dredging to remove obstructions from the adjacent waterbody is limited to 50 cubic yards below the plane of ordinary highwater mark.	
Nationwide Permit 12 – Utility Line Activities	Activities required for the construction, maintenance, and repair of utility lines and associated facilities in waters of the U.S. as follows: (i) utility lines: The construction, maintenance, or repair of utility lines, including outfall and intake structures and the associated excavation, backfill, or bedding for the utility lines, in all waters of the U.S., provided there is no change in preconstruction, maintenance, or expansion of a substation facility associated with a power line or utility line in non-tidal waters of the U.S., excluding non-tidal wetlands adjacent to tidal waters. (iii) foundations for overhead utility line towers, poles, and anchors: The construction or maintenance of foundations for overhead utility line towers, poles, and anchors in all waters of the U.S. (iv) access roads: The construction of access roads for the construction and maintenance of utility lines, including overhead power lines and utility line substations, in non-tidal waters of the U.S., excluding non tidal wetlands adjacent to tidal waters.	Activities may not exceed a total of 0.5-acre loss of waters of the U.S.	The permittee must notify the district engineer if any of the following criteria are met: (a) mechanized land clearing in a forested wetland for the utility line right-of-way; (b) a Section 10 permit is required; (c) the utility line in waters of the U.S., excluding overhead lines, exceeds 500 ft; (d) the utility line is placed within a jurisdictional area(i.e., water of the U.S.), and it runs parallel to a stream bed that is within that jurisdictional area; (e) discharges associated with the construction of utility line substations that result in the loss of more the 0.1 acre of waters of the U.S.; (f) permanent access roads constructed above grade in waters of the U.S. for a distance of more the 500 ft.; or (g) permanent access roads constructed in waters of the U.S. with impervious materials. (Sections 10 and404).
Nationwide Permit 13 – Bank Stabilization	Bank stabilization activities necessary for erosion prevention.	The bank stabilization activity must be less than 500 ft in length.	Bank stabilization activities in excess of 500 ft in length or more than an average of one cubic yard per running foot

Table 1-1. Summary of Applicable Nationwide Permits			
Permit and Title	**Description**	**Thresholds**	**Notification Requirements**
			may be authorized if the permittee notifies the district engineer.
Nationwide Permit 14 – Linear Transportation Projects	Activities required for the construction, expansion, modification, or improvement of linear transportation crossings (e.g., highways, railways, trails, airport runways, and taxiways) in waters of the U.S., including wetlands.	For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of more than 0.5 acre of waters of the U.S.; for linear transportation projects in tidal waters, the discharge cannot cause the loss of more than 0.33 acre of waters of the U.S.	The permittee must notify the district engineer if any of the following criteria are met: (1) the discharge causes the loss more than 0.1 acre of waters on the U.S.; or (2) there is a discharge in a special aquatic site, including wetlands
Nationwide Permit 41 – Reshaping Existing Drainage Ditches	Discharges of dredged or fill material into non-tidal waters of the U.S., excluding non-tidal wetlands adjacent to tidal waters, to modify the cross-sectional configuration of currently serviceable drainage ditches constructed in waters of the U.S.	The reshaping of the ditch cannot increase drainage capacity beyond the original design capacity, nor can it expand the area drained by the ditch as originally designed.	The permittee must notify the district engineer if more than 500 linear ft of drain age ditch will be reshaped.

1.7.2 State

1.7.2.1 Stormwater and Discharge Regulations.

The federal Clean Water Act and ADEQ regulate state water and stormwater quality. State permits, which could apply to the Proposed Action, include the Construction General Permit and the Arizona Pollution Discharge Elimination System (AZPDES). Staging areas, whether temporary or permanent, may also be subject to the AZPDES Permit.

1.7.3 Local

1.7.3.1 Coconino National Forest Land and Resource Management Plan (1987, with amendments) – Best Management Practices and Direction

Forest Goals

Outdoor Recreation

Manage the recreation resource to increase opportunities for a wide variety of developed and dispersed experiences.

Maintain and enhance visual resource values by including visual quality objectives in resource planning and management activities.

Maintain a variety of Forest trails that include foot, horse, bicycle, and motorized trails, and challenge and adventure opportunities, as well as opportunities for the handicapped.

Continue to integrate the Recreation Opportunity Spectrum (ROS) system into the Forest planning process to quantify recreation opportunities changes, guide management, and coordinate recreation with other resources.

Manage off-road driving to provide opportunities while protecting resources and minimizing conflicts with other users.

Inventory, evaluate, nominate, protect, study, interpret, and enhance cultural resources in accordance with the management prescriptions.

Wilderness

Provide a wilderness management program that achieves high quality wilderness values while providing for quality wilderness recreation experiences. Allow wildfire to play a more natural role. Treat wildernesses in the same manner as Class I Airsheds.

Develop wilderness management direction that establishes Limits of Acceptable Change (LAC).

Wildlife and Fish

Manage habitat to maintain viable populations of wildlife and fish species and improve habitat for selected species.

Improve habitat for listed threatened, endangered, or sensitive species of plants and animals and other species as they become threatened or endangered. Work toward recovery and delisting threatened and endangered species.

Identify and protect areas that contain threatened, endangered, and sensitive species of plants and animals.

Increase opportunities for wildlife and fish oriented recreation activities.

Noxious and Invasive Weeds

Prevent any new noxious or invasive weed species from becoming established, contain or control the spread of known weed species, and eradicate species that are the most invasive and pose the greatest threat to the biological diversity and watershed condition.

Timber

Manage the timber resource to provide a sustained-yield of forest products through integrated stand management. On forested lands identified as suitable for commercial timber production, design timber management activities to integrate considerations for economics, water quality, soils, wildlife habitat, recreation opportunities, visual quality, and other values. Develop and implement a sustained-yield program for firewood and other miscellaneous forest products including posts, poles, Christmas trees, and wildings. Emphasize uneven-aged management for timber cutting areas.

Soil, Water, and Air Quality

Maintain or, where needed, enhance soil productivity and watershed condition. Identify and protect wetlands and floodplains.

Minerals

Administer the mineral laws and regulations to minimize adverse surface resource impacts.

Lands

Administer special uses to best meet public needs.

Minimize the number of electronic sites and utility corridors consistent with appropriate public services that can only be met on Forest lands.

Transportation and Administrative Facilities

Provide and manage a serviceable road transportation system that meets needs for public access, land management, resource protection, and user safety. Provisions are made for construction/ reconstruction, maintenance, seasonal and special closures, and obliterating unnecessary roads.

Protection

Use fire as a resource management tool where it can effectively accomplish resource management objectives. Use fire prevention and control to protect life, property, and resources.

Public Affairs

Provide and promote public participation in and information about Forest management to both internal and external publics. Appropriately involve the public in the decision making process. Seek advice and counsel from people who are affected by Forest management.

Forest-Wide Management Direction

Recreation

Review the ROS inventory as a part of project planning and make necessary corrections/ refinements following field checking. Use the ROS inventory to analyze impacts to ROS classes due to management activities such as timber sales, range projects, and firewood sales.

Cultural Resources

Consult with Native Americans when projects and activities are planned in sites or areas of known religious or cultural importance.

The Forest complies with the National Historic Preservation Act (NHPA) in decisions involving interactions between cultural and other resources. Cultural resources are managed in coordination with the State Historic Preservation Plan. Until evaluated, the minimal level of management for all sites is avoidance and protection.

Project undertakings are inventoried for cultural resources and areas of Native American religious use. Generally, inventory standards are:

- One hundred percent survey of all projects causing complete surface disturbance
- When less than 100 percent survey is deemed appropriate, the specific sample fraction surveyed is determined in consultation with the State Historic Preservation Office (SHPO) and is generally greater than 10 percent. Factors determining when sampling is appropriate include projects with dispersed or minimal impacts, low expected archaeological site density, ground cover, and types of archaeological sites present in the area
- Consultation with appropriate Native American groups
- Consultation with the SHPO, and if necessary, the Advisory Council on Historic Preservation (ACHP), before project implementation.

Significant, or potentially significant, inventoried sites are managed to achieve a "No Effect" determination, in consultation with the SHPO and ACHP (36 CFR 800).

Monitoring during and after project implementation is done to document site protection and condition.

Management strives to achieve a "No Effect" determination.

Identified sites are evaluated for their National Register eligibility when they are severely damaged, when they will be impacted by an undertaking, or information about the uniqueness, commonness, and characteristics of their site class are sufficiently known to make an informed decision. Sites for which determinations of eligibility have not been made are managed as if they are eligible, unless consultation with the SHPO indicates otherwise.

Maintain a form for tracking compliance of each undertaking with the requirements of the NHPA.

Stabilize or repair damaged National Register sites or other sites funded by Regional priority.

General Crook National Historic Trail

Manage the 138-mile trail corridor on National Forest Land from Fort Whipple to Fort Apache and associated historic sites and side trails for potential Congressional designation as a National Historic Trail. Management requirements for the currently designated National Recreation trail are integrated and expanded by the Historic Trail designation.

Use of motorized vehicles, except vehicles designed to travel over-the-snow, such as snowmobiles, on any portion of the route not already designated and designed for general vehicle travel is prohibited.

Manage resource activities to meet Visual Quality Objective (VQO) of foreground Retention, considering the historic qualities of the characteristic landscape.

Clear Creek Campground to the Long Valley Ranger District Boundary – Manage 200-foot corridor to preserve evidences of historic roadway and Landscape character, including related historic markers, trees, and water holes.

Off-Road Driving Management

Areas are closed to off-road driving when adverse resource impacts occur, when conflicts with the minimum management requirements occur, or if areas are too sensitive to withstand driving. The following criteria are used to evaluate the need for future closures or restrictions:

- Soils that are receiving, or are expected to receive, damage to the extent that soil productivity will be significantly impaired.
- Slopes exceeding 40 percent where high probability for damage exists
- Riparian areas being threatened or damaged
- Meadows likely to be or being damaged
- Areas adjacent to stream courses where potential for sedimentation is high
- Areas within water courses or wetlands (permanently or intermittently wet)
- Where the Visual Quality Objectives (VQO) of Preservation, Retention, or Partial Retention are jeopardized
- Areas of important cultural resource sites vulnerable to damage that are being threatened or damaged
- Tree plantations less than 10 years old that are likely to be damaged
- Habitat for threatened, endangered, or sensitive species that is threatened
- Key wildlife areas being threatened or damaged
- Areas important to wildlife reproduction, such as, fawning or nesting areas, where disturbance is causing, or likely to cause, significant stress and reduction of reproductive success
- Restrictions or closures needed to meet road management objectives
- Areas within municipal watersheds
- Areas where user conflict must be resolved to ensure public safety
- Areas considered to be dangerous for winter off-road driving activities
- Dispersed recreation areas where conflicts exist.

Other areas may be seasonally closed to provide opportunities for recreation in a setting without vehicular disturbance such as temporarily changing the Recreation Opportunity Spectrum (ROS) class social and managerial settings toward the primitive end of the spectrum. Motor vehicle use will be seasonally restricted in designated cross-country ski areas and in big game winter range where there is a conflict.

Visual Resources

Allow only one classification movement downward unless a larger movement is justified after doing an environmental analysis for emergency situations such as removal of fire damaged timber or I&DC control needs.

Wildlife and Fish Operations and Maintenance

Habitat management for Federally listed species will take precedence over unlisted species. Habitat management for endangered species will take precedence over threatened species.

Habitat management for sensitive species will take precedence over non-sensitive species. Follow approved recovery plans.

Evaluate potential resource impacts on T&E and sensitive species habitat by projects and activities through a biological assessment (FSM 2670) and conduct appropriate consultation (FSM 2670) when necessary. Provide appropriate protection or enhancement.

Activities determined to cause disturbance, including public use, are prohibited in the vicinity of occupied peregrine falcon nesting habitat between March 1 and August 15. This seasonal restriction applies to occupied nesting habitat unless the site is determined to be unoccupied

Identify areas where spotted owls occur and protect occupied nesting territory.

Mexican Spotted Owl

Provide three levels of habitat management—protected, restricted, and other forest and woodland types—to achieve a diversity of habitat conditions across the landscape.

Allow no timber harvest except for fuelwood and fire risk abatement in established protected activity centers (PAC). For PACs destroyed by fire, windstorm, or other natural disaster, salvage timber harvest or declassification may be allowed after evaluation on a case-by-case basis in consultation with USFWS.

Allow no timber harvest except for fire risk abatement in mixed conifer and pine-oak forests on slopes greater than 40% where timber harvest has not occurred in the last 20 years.

Limit human activity in PACs during the breeding season.

Monitor changes in owl populations and habitat needed for delisting.

In PACs, harvest fuelwood when it can be done in such a way that effects on the owl are minimized. Manage within the following limitations to minimize effects on the owl.

- retain key forest species such as oak
- retain key habitat components such as snags and large downed logs
- harvest conifers less than 9 inches in diameter only within those protected activity centers treated to abate fire risk
- treat fuel accumulations to abate fire risk

In restricted areas:

- manage to ensure a sustained level of owl nest/roost habitat well distributed across the landscape
- attempt to mimic natural disturbance patterns by incorporating natural variation, such as irregular tree spacing and various patch sizes, into management prescriptions
- maintain all species of native trees in the landscape including early seral species
- allow natural canopy gap processes to occur, thus producing horizontal variation in stand structure
- emphasize uneven-aged management systems
- save all trees greater than 24 inches dbh

- in pine-oak forests, retain existing large oaks and promote growth of additional large oaks
- encourage prescribed and prescribed natural fire to reduce hazardous fuel accumulation (thinning from below may be desirable or necessary before burning to reduce ladder fuels and the risk of crown fire)
- retain substantive amounts of key habitat components: snags 18 inches in diameter and larger, down logs over 12 inches midpoint diameter, and hardwoods for retention, recruitment, and replacement of large hardwoods

Northern Goshawk

Manage for uneven-age stand conditions for live trees and retain live reserve trees, snags, downed logs, and woody debris levels throughout woodland, ponderosa pine, mixed conifer and spruce-fir forest cover types. Manage for old age trees such that as much old forest structure as possible is sustained over time across the landscape. Sustain a mosaic of vegetation densities (overstory and understory), age classes and species composition across the landscape. Provide foods and cover for goshawk prey.

Limit human activity in nesting areas during the breeding season.

Manage the ground surface layer to maintain satisfactory soil conditions i.e. to minimize soil compaction; and to maintain hydrologic and nutrient cycles.

Outside of Post-fledging Family Areas, the order of preferred treatment for woody debris is: 1) prescribed burning, 2) lopping and scattering, 3) hand piling or machine grapple piling, 4) dozer piling.

Within Post-fledging Family Areas, provide for a healthy sustainable forest environment for the post-fledging family needs of goshawks. The principle difference between within the post-fledging family area and outside the post-fledging family area is the higher canopy cover within the post-fledging family area and smaller opening size within the post-fledging family area. Provide unique nesting habitat conditions for goshawks. Important features include trees of mature to old age with high canopy cover.

Preferred treatments to maintain the desired structure are to thin from below with non-uniform spacing and use of handtools and fire to reduce fuel loads. Lopping and scattering of thinning debris is preferred if prescribed fire cannot be used. Piling of debris should be limited. When necessary, hand piling should be used to minimize compaction within piles and to minimize displacement and destruction of the forest floor and the herbaceous layer. Do not grapple or Dozer pile debris. Manage road densities at the lowest level possible to minimize disturbance in the nest area. Use small, permanent skid trails in lieu of roads for timber harvesting.

Limit human activities in or near nest sites and post-fledging family area's during the breeding season so that goshawk reproductive success is not affected by human activities. The breeding season extends from March 1 through September 30.

Piling of debris should be limited. When necessary, hand or grapple piling should be used to minimize soil compaction within piles and to minimize forest floor and herbaceous layer displacement and destruction. Limit dozer use for piling or scattering of logging debris so that the forest floor and herbaceous layer is not displaced or destroyed.

Noxious and Invasive Weeds

Incorporate measures to control invasive weeds into project planning, implementation, and monitoring.

Old Growth

Strive to create or sustain as much old-growth compositional, structural, and functional flow as possible over time at multiple-area scales. Seek to develop or retain old-growth function on at least 20 percent of the naturally forested area by forest type in any landscape.

Consider the effects of spatial arrangement on old-growth function, from groups to landscapes, including de facto allocations to old-growth such as goshawk nest sites, Mexican spotted owl PACs, sites protected for species behavior associated with old-growth, wilderness, research natural areas, and other forest structures managed for old-growth function.

Water Resources

Ensure compliance with PL 92-500 "Federal Water Pollution Control Act" and Arizona Water Quality Standards through the implementation of Best Management Practices (BMP) to prevent water quality degradation.

Plan for appropriate filter strips adjacent to streamcourses and/or riparian areas, as determined through the integrated resource management process. A filter strip is an area of vegetation and forest litter located adjacent to streamcourse and/or riparian areas for the purpose of filtering sediment, providing bank stability, and in tree/shrub ecosystems providing shade for fisheries habitat. The ability of the strip to trap and filter sediments is a function of the amount and type of material on the ground, and width and slope of the strip. The ability of the strip to provide shade over perennial streams is dependent on the height of the vegetation and orientation of the stream with respect to the sun. Filter strip widths provided below are for average ground cover conditions. Significant topographic changes, such as abrupt canyon edges may be used as boundaries for filter strips, as long as ground disturbing activities beyond the canyon walls do not influence water quality.

Maintain at least 80 percent of the potential crown cover in the riparian area.

Road Maintenance and Management

Roads are to be operated and maintained in accordance with objectives, as specified in road prescriptions. Roads not needed for industry, public, and/or administrative use are closed and put to bed or returned to resource production through obliteration. Obliteration includes restoring the original land contour to the degree practical, scarifying, providing proper drainage, and revegetating with appropriate species.

Access roads are to be maintained at the lowest standard necessary for two-wheel drive pickups for removal of green firewood. Temporary closures using gates or barriers are implemented on roads that are unsafe for traffic, until the hazard is corrected. Roads will be closed seasonally using gates or barriers, as necessary for resource protection or public safety according to the Coconino National Forest Wet Weather Roads Policy. New timber sale roads designated for closure have gates, barriers, and signs planned as a cost of the project.

Miscellaneous Forest Direction

Underneath transmission lines there may be a potential for Christmas tree production, firewood, wildings, pulpwood, and/or other miscellaneous forest products. The land is managed to attain products whenever possible. The choice of silvicultural objectives depends on the profile of the transmission line and the multiple-use objectives.

Requests for transmission corridors will be evaluated based on public need, economics, and environmental impacts of the alternatives. Existing corridors will be used to capacity with compatible utilities, where additions are environmentally and visually acceptable before evaluating new routes. Limit Road maintenance and road improvement activities will be limited in order to conserve Semi-primitive Motorized ROS characteristics, and road maintenance consistent with management area emphasis/ROS objectives will be provided.

1.7.3.2 Coconino County Comprehensive Plan (2003)

Utility Policies

Utilities infrastructure shall be located in a manner sensitive to environmental and scenic resources. Coconino County encourages placing utility distribution lines underground whenever possible; where above-ground utility infrastructure and facilities are installed, all efforts should be made to minimize environmental, visual, and aesthetic impacts. The County encourages cooperation between developers and the owners of utility corridors to use such corridors for trails, open space, and greenway features.

Conservation Guidelines

Assess impacts of local decisions in a landscape context. Although land use planning occurs at the landscape level, decisions are often made at the site level. However, because ecosystems and habitats are dynamic and interactive, land use changes often have effects beyond the boundaries of a site. Using the best available scientific information in making land use decisions will help ensure that the cumulative effects of human use do not compromise the landscape.

Make land use decisions that are compatible with the natural potential of the site and the landscape. Land uses should consider the physical, biological, cultural, aesthetic, and economic constraints of the site and the landscape. Uses that are compatible with the site's "natural potential" (its water, vegetation, and soil resources) are usually cost-effective in the long term. Incompatible uses, on the other hand, often destroy habitat or degrade resources, ultimately resulting in higher costs.

Avoid or mitigate for the effects of human use and development on ecological processes and the landscape. Avoid, minimize, or mitigate the negative impacts of a project by applying good planning and design principles at the appropriate scale. At a local scale, siting a structure without considering ecological processes may disrupt wildlife movement corridors or destroy a particular habitat. Regional impacts include changes to watershed processes caused by altering drainage patterns as part of a project.

Identify and preserve rare or critical ecosystems, habitats, and associated species. Rare or critical ecosystems support environmentally sensitive habitats and ecological processes that are key to the overall health and biological diversity of these ecosystems. To understand the factors that affect them, an inventory of critical components (vegetation and soil types, landforms, wildlife, and hydrologic and geologic features, among others) must be conducted. This information is required to make science-based land use decisions.

Minimize the fragmentation of large contiguous areas of habitat and maintain or restore connectivity among habitats. Many ecosystem processes require large areas of unfragmented habitat. If this habitat is fragmented into smaller pieces or disconnected from the larger landscape, it can become threatened, jeopardizing the survival of species. Because some species require different habitats during different seasons, maintaining connectivity is important between different habitat types. In addition, because land management and political boundaries do not define habitats and ecosystems, coordination between planners and resource managers is critical.

Minimize the introduction and spread of non-native species and use native plant species in restoration and landscaping. Non-native organisms often have negative effects on native species, as well as on the structure and functioning of ecological systems. The cost of preventing their introduction and spread can be far less than the cost of restoring the long-term damage they can cause to aquatic and terrestrial ecosystems. Likewise, it can also be less than the cost of controlling non-native species after they become established.

Conserve use of non-renewable and critical resources. To preserve the long-term health of our communities and economies, it is important to conserve critically important resources such as water, and to reduce our reliance on nonrenewable resources such as oil and gas.

Avoid land uses that deplete natural resources. Reducing or depleting resources such as water, soil, wildlife, or natural vegetation alters ecosystems in significant and fundamental ways. Depleting these resources disrupts natural processes in ways that are often irreversible.

Avoid polluting our communities and environment. Vibrant communities and ecosystems are either free of pollutants or they contain them at levels that are too low to disrupt natural processes. Land use decisions should limit the levels of pollution entering our landscapes.

Consider land use decisions over time horizons that encapsulate the natural variability of ecosystems. Because the factors affecting ecosystems vary, planning must consider the extreme and catastrophic events that occur over long periods. In the case of climate, such events would include floods, drought, and exceptionally high or low temperatures. For example, drought and flood cycles can differ in magnitude and time scale—El Niño/La Niña cycles occur every 7 to 10 years, Pacific Decadal Oscillations occur every 30 to 50 years, tropical storms occur very erratically and infrequently, and long-term climate changes occur over hundreds to thousands of years. The recent return to drier conditions illustrates the importance of not over-committing an important natural resource (such as water), which all organisms need to survive.

Evaluate the effects of land use decisions cumulatively and over time. Long-term changes caused by land use decisions can be delayed and cumulative. Impacts may not be apparent for years or decades; and in some cases, may not be recognizable until they reach a threshold when impacts are dramatic. A series of seemingly innocuous, site-specific changes in land use can

combine to produce cumulative effects that cannot be attributed to a single, landscape-scale event.

1.8 PUBLIC INVOLVEMENT

Two public scoping meetings were held on February 8th and February 9th, 2011 in Flagstaff and Camp Verde, Arizona, respectively. Prior to these meetings, on January 21, 2011, approximately 940 scoping notification postcard mailers for these meetings were sent to various agencies, Indian tribes, organizations, businesses, and members of the public. Some of the recipients included members and representatives from Sierra Club AZGFD, USFWS, Arizona State Parks, ADEQ, Arizona Wildlife Conservation, Ft. McDowell Apache Tribe, Hopi Tribe, Navajo Nation, Yavapai Tribe, Havasupai Tribe, Tonto Apache Tribe, White Mountain Apache Tribe, Yavapai-Apache Nation and Yavapai-Prescott Tribe. Newspaper notifications were placed in the Arizona Daily Sun (January 25th, 26th, and February 5th) and Camp Verde Bugle-Verde (January 26th and February 6th) newspapers prior to the meetings. Website notification was posted on the CNF Schedule of Proposed Actions website two weeks prior to the public meetings. The official start of the scoping period began on January 27th, 2011 and concluded on March 10th, 2011.

A total of two comments were received during the scoping period, one from a member of the public and another from Arizona Game and Fish Department. Both comments were concerned with wildlife and habitat conditions in the CNF as a result of this Project. Copies of these comments are included in the Project record.

The letter received from Arizona Game and Fish Department offered recommendations to prevent and minimize negative impacts to wildlife. Treatment methods that allow for the regeneration of grasslands and piñon-juniper, such as the practice of lopping and scattering tree remains were suggested, noting that grasslands serve as habitat for pronghorn, prairie dog (no populations occur in the Project area), burrowing owl (no populations occur in the Project area), raptors, and other species across the CNF. Additional measures for ponderosa pine, mixed conifer, and wetlands areas were also identified. Some of the species of concern in these areas included Mexican spotted owls, northern goshawk, wild turkey, and northern leopard frogs.

The Draft EA was made available for public comment on November 20, 2011, and closed on December 20, 2011. A legal notice (Legal No. 15053) announcing the release of the EA for public comment was made in the Arizona Daily Sun newspaper on November 20, 2011. The notice informed the public that the EA could be viewed digitally on the DOE and CNF websites or obtained in compact disc or hard copy format from Western. A copy of this notice and all other public notices for the Project can be found in the Project record. During the public comment period for the Draft EA, one comment was received from the Center for Biological Diversity; a copy of this comment along with Western's response is included in the Project record.

1.9 DECISIONS TO BE MADE

This EA is a concise public document that serves to:

- provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement (EIS) or a finding of no significant impact (FONSI)

- aid Western's compliance with NEPA when no EIS is necessary
- facilitate preparation of an EIS if one is necessary (40 CFR § 1508.9)

Based on the findings contained in this EA, Western will determine whether to implement the Proposed Action or No Action alternative. In addition, the findings contained within this EA will support Western's determination of whether the proposed Project requires an EIS or if a FONSI should be prepared. If Western decides to prepare a FONSI, the document will present supporting rationale for that decision.

SECTION 2 – PROPOSED ACTION AND ALTERNATIVES

The Proposed Action and the No Action alternative are analyzed in this EA. Section 2.1 provides a detailed description of the Proposed Action, while Section 2.2 describes the vegetation management and right-of-way maintenance activities under the No Action alternative. Section 2.3 describes the alternatives considered but eliminated from full evaluation in the EA.

2.1 DESCRIPTION OF PROPOSED ACTION

Western proposes to develop and implement the vegetation management and right-of-way maintenance project on the CNF as described in Section 2.1.1 and 2.1.2. Consistent with the BA prepared for maintenance in utility corridors on Arizona forests (USFS 2008) and corresponding BO, Western's transmission lines require extensive vegetation removal within, and in some cases adjacent to, the Project rights-of-way. The Proposed Action consists of two primary components: (1) initial vegetation removal within and adjacent to the rights-of-way, and (2) vegetation management and right-of-way maintenance for Western's desired right-of-way condition. Initial vegetation removal and vegetation management and right-of-way maintenance are covered in detail in sections 2.1.1 and 2.1.2, respectively.

Based on a total length of approximately 90 miles and a Project area width of 420 feet, the Project area is estimated at approximately 4,580 acres, assuming flat ground; however, this may be an overestimate of the actual Project area that would require vegetation removal and management by Western. This Project crosses canyons, areas of steep slope, drainages, and washes. Project facilities span many of these areas at such a height that vegetation within these areas will not interfere with safe and reliable transmission line operation. In such areas, this vegetation may not need to be removed or maintained by Western. In addition, the Project area has a lower density of tall growing vegetation than surrounding habitat because the right-of-way was cleared of all vegetation during construction and has since been maintained by removing hazard vegetation.

Western's intent is to establish and maintain rights-of-way that minimize vegetative threats to the safe and reliable operation of the transmission system, and ultimately require infrequent (i.e., once every 5 years) treatments for vegetation management. Achieving Western's desired right-of-way condition (see Section 1.2) is an evolutionary process that may take several iterations of vegetation removal over an extended period of time. Once achieved, the desired condition will be proactively maintained through ongoing corridor vegetation management.

2.1.1 Initial Vegetation Removal

Vegetation typical to the vegetation communities within the Project rights-of-way (see Section 3.3.2) is incompatible with Western's purpose and need. Furthermore, vegetation has not been substantially removed from the Project rights-of-way (except for individual hazard trees) since approximately 1966. As such, Western must remove nearly all vegetation (except grasses, forbs, and some small shrubs) within the rights-of-way to satisfy their purpose and need for safely and reliably operating their transmission facilities while improving the efficiency and effectiveness of vegetation management. Where terrain conditions (i.e., certain canyon, wash, steep slope,

and/or drainage crossings) provide for higher conductor clearances, typically a minimum of 50 to 100 feet AGL, vegetation may not conflict with the safe and reliable operation of the transmission lines, and thus would not necessitate removal. These areas would be evaluated on a case-by-case basis and identified by Western as preserve-in-place areas where vegetation would not be removed.

In addition to vegetation removal within the limits of the right-of-way, danger trees outside of the right-of-way would also be removed. These danger trees are defined as trees located within or adjacent to the right-of-way that present a hazard to employees, the public, or power system facilities. Characteristics used in identifying a danger tree include but are not limited to the following:

- encroachment within the safe distance to the conductor as a result of the tree bending, growing, swinging, or falling toward the conductor (Figure 2-1 through 2-4)
- deterioration or physical damage to the root system, trunk, stem or limbs, and/or the direction and lean of the tree
- vertical or horizontal conductor movement and increased sag as a result of thermal, wind, and ice loading
- potential for arcing with Project facilities in the event of wildfire, or providing wildfire fuel within the right-of-way

The BA prepared for maintenance in utility corridors on Arizona forests (USFS 2008) identified the greatest height of a tree that could be considered a hazard tree outside of the rights-of-way to be 110 feet. The BA also identified 105.8 feet as the maximum distance a tree can be located away from the transmission conductors before striking a conductor (based on a 30-foot AGL conductor clearance [i.e., lowest conductor sag point] and a 110-foot tall tree). Based on these maximum heights and distances, the BA identified the striking distance of edge trees in relation to the right-of-way width of a 345 kV transmission facility in accordance with Table 2-1 and formula below.

Table 2-1. Striking Distance of Edge Trees to the Project Right-of-Way

Line Voltage	Tree Height (Feet)	Conductor Height (Feet, AGL)	Distance to Strike a Conductor (Feet)	Average Width Between Conductors (Feet)	Right-of-Way Width (Feet)	Distance Beyond Right-of-Way to Strike Conductor (Feet)
345 kV	110	30	105.8	56	150	58.8

Distance beyond right-of-way was calculated using: $105.8 - [(\frac{ROWwidth}{2}) - (\frac{ConductorWidth}{2})]$

Per the BA, trees within 60 feet of the Project rights-of-way that meet any of the criteria identified above may present a danger to the transmission lines due to wind, leaning, decay, other causes of instability, or fire. According to Western's IVM Guidance Manual, these danger trees must be removed. Four common hazardous vegetation scenarios are shown and described below.

- Bend-in trees (Figure 2-1) are located outside and adjacent to the right-of-way; they have tops or branches that bend down or could bend down into the minimum clearance distance to the transmission line conductor.

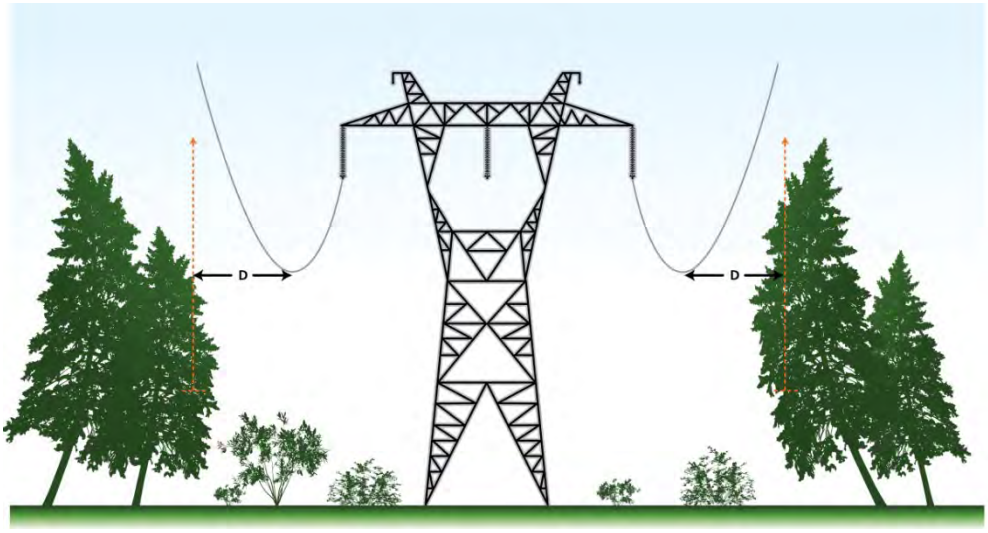

Figure 2-1. Bend-in Trees

- Grow-in trees (Figure 2-2) are located within and/or adjacent to the right-of-way; they have grown, or will grow, horizontally and vertically into the minimum clearance distance to the conductor within the routine vegetation management cycle (see Section 2.1.2.1).

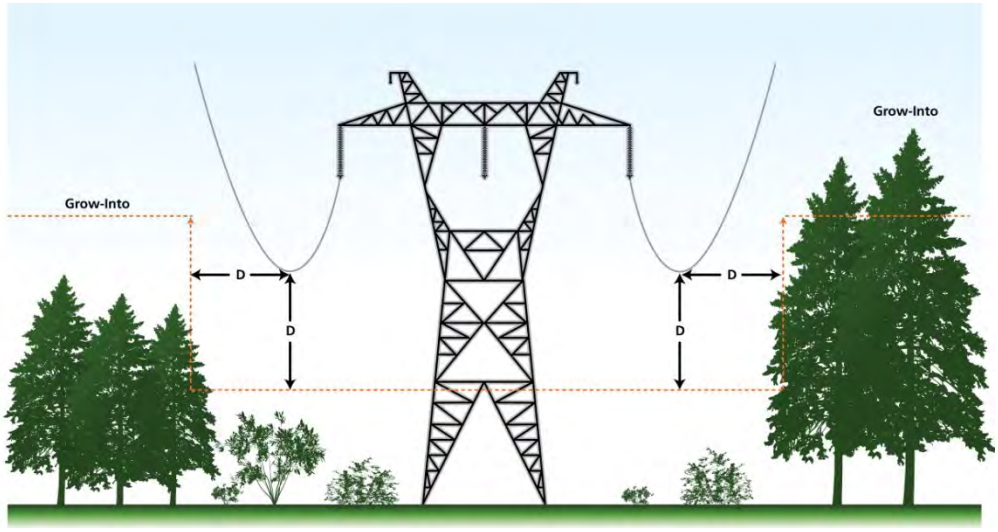

Figure 2-2. Grow-in Trees

- Swing-in trees (Figure 2-3) are located off and adjacent to the right-of-way, and whose branches would, or could, violate the minimum clearance distance to the conductor as a result of the conductor being blown toward the tree.

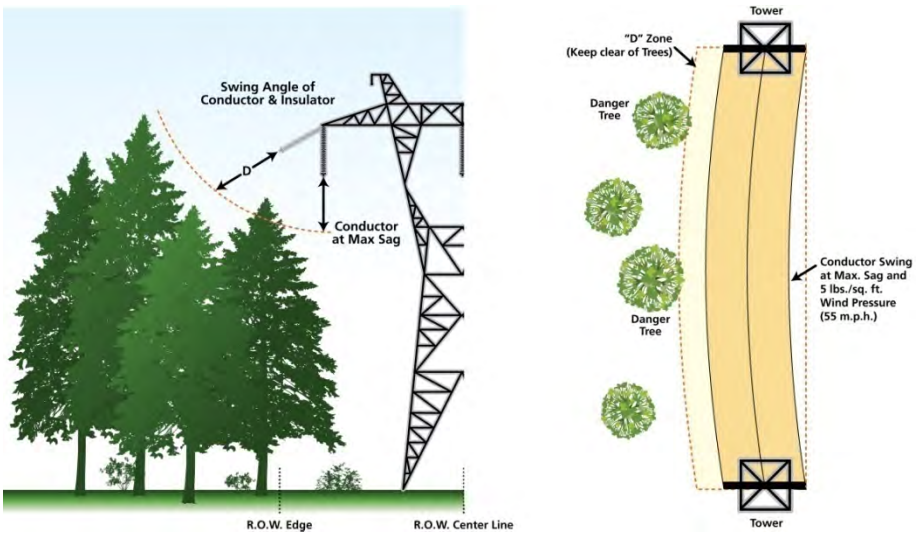

Figure 2-3. Swing-in Trees

- Fall-in trees (Figure 2-4) are any trees that, if they were to fall toward the transmission line, would extend into the minimum clearance distance to the conductor.

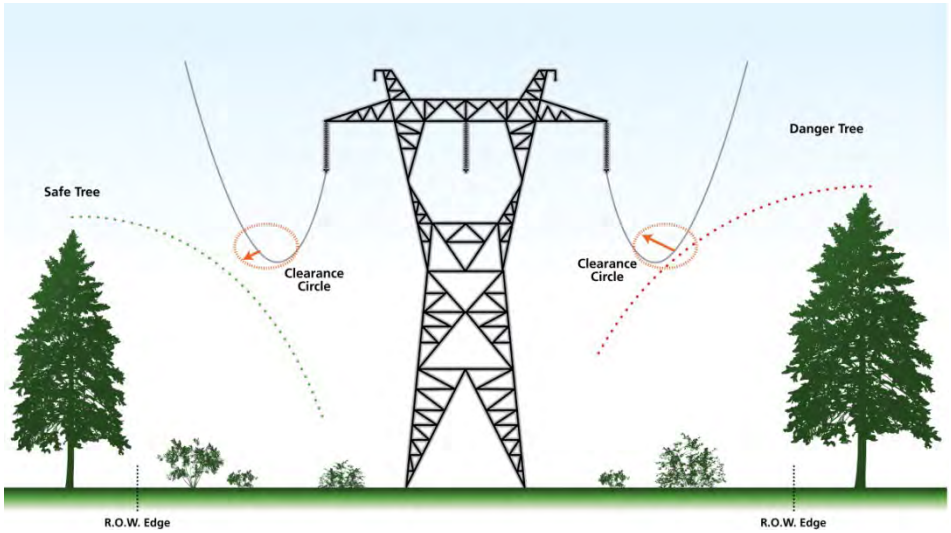

Figure 2-4. Fall-in Trees

2.1.1.1 Vegetation Removal Methods

Methods for vegetation removal consist of mechanical and manual methods. Vegetation within the rights-of-way would be removed predominantly through mechanical methods. Where access, terrain conditions, or resource sensitivity precludes the use of mechanical methods, manual vegetation removal methods (i.e., hand crews) would be employed. Descriptions of mechanical and manual vegetation removal methods are provided below.

Mechanical Vegetation Removal

Mechanical methods of vegetation removal occur within the Project rights-of-way. These methods include grinders, masticators, or mowers on wheeled or tracked equipment to remove target vegetation. Mechanical methods are less selective in that all vegetation within the area treated is affected. The majority of the Project area would be treated using mowers and/or masticators; however, areas where the masticator cannot access the rights-of-way, or where sensitive resources occur, manual vegetation removal methods (i.e., hand crews) would be utilized. Tracked equipment would be used, where needed, to minimize impacts to erodible or compressible soils.

One example of a typical Western mechanical method includes the use of a machine called a Cut-Shredder. A Cut-Shredder has a large drum with teeth that spins at high speeds and is mounted on a rubber-tired front end loader. The spinning teeth mulch and scatter tree and branch material across the right-of-way. The Cut-Shredder requires two people for operation, one to guide the machine and one to operate it. In addition, a follow-up crew with chainsaws to clean up after the machine and to manually cut trees or vegetation that was missed is typically required. Figure 2-5 represent examples of typical mowers that will be used to remove vegetation.

Figure 2-5. Examples of Tractor Mounted Mowers with Rubber Tires or Tracks

Manual Vegetation Removal

Western would also use manual vegetation removal methods (hand crews) to remove hazard vegetation (danger trees) outside of the right-of-way, and for some vegetation removal in areas not recommended for mechanical treatment within the right-of-way. Hand crews would consist of Western linemen or outside contractors certified as line clearance tree workers. Manual vegetation removal would include the use of hand tools (chain saws, hand saws, rope) to cut

branches and trunks of vegetation (Figure 2-6). Each hand crew would consist of six to eight men driving three to four pickup or bucket trucks. Crews would either walk to the right-of-way and vegetation treatment area from the nearest access point, or drive to and/or within the right-of-way where access to the vegetation treatment area is available. Western may mobilize multiple hand crews at a time. Hand crews may operate at any time of year, but would implement all applicable conservation measures for operation and maintenance activities. Hand crews operate from 6:00 a.m. to 4:30 p.m. Work would typically involve anywhere from 3 to 24 tree workers.

Figure 2-6. Hand Crew Worker Using Chain Saw

2.1.1.2 Vegetation Disposal

Once vegetation is removed within and adjacent to the right-of-way, various disposal methods would be used to disperse the vegetation debris. The objective of vegetation disposal is to dispose and/or distribute the leftover debris (i.e., chips, slash, and logs) from vegetation management activities in a cost effective and efficient manner that minimizes potential impacts to environmental resources on CNF land, while mitigating fire risk beneath and surrounding the transmission lines and structures.

Below is a list of methods of disposal that may be used for the Proposed Action. When determining the appropriate method, land uses, terrain, aesthetics, fire concerns, and sensitive environmental resource concerns are considered. The disposal methods list may not include all possible methods, but provides general methods for the purposes of analysis of effects to environmental resources.

Mechanical Removal Vegetation Disposal

When a mower is used for vegetation removal, the mower masticates the tree or vegetation into small chips. The chips are broadcast across the right-of-way at a thickness no greater than 4 inches. Trees or vegetation that mowers are unable to access are treated using manual methods. Disposal of vegetation removed by manual methods is described below.

Manual Removal Vegetation Disposal

Where manual methods are needed for vegetation removal, the following procedures and measures would be adhered to when disposing of vegetation.

- Limbs would be lopped and scattered throughout the immediate area (within and adjacent to the right-of-way, depending on the location of the removed tree) in a manner such that debris lies within 18 to 24 inches of the ground. Typically logs are cut to manageable lengths of 8 feet or less, and left within or adjacent to the right-of-way off of access routes. In some areas (e.g., Northern Goshawk habitat, inaccessible portions of the rights-of-way, etc.), logs may be left longer than 8 feet as a benefit to local wildlife.
- Stumps from tree removal are cut flush with the ground or cut within 4 to 12 inches of the ground when removal is not possible.
- No slash or logs are placed within 25 feet of the high water mark of streams or other bodies of water.
- All areas with the potential for flowing water (culverts, ditches, washes, etc.) are kept free of slash, logs, and debris from tree removal operations.
- Western would coordinate with the CNF regarding placement of slash for potential future burning per CNF standards and requirements.

2.1.2 Vegetation Management and Right-of-Way Maintenance (Project Access Routes)

Once the rights-of-way have been sufficiently cleared of vegetation, Western would manage the Project to achieve their desired condition within their rights-of-way (Section 1.2).

2.1.2.1 Vegetation Management

Western's proposed vegetation management project is developed to ensure: (1) reliable, uninterrupted service to customers; (2) safe transmission and distribution of power along existing transmission lines; and (3) protection against wildfires that could result from vegetation coming into contact with or arcing to the transmission lines. Western's proposed vegetation management project includes routine vegetation maintenance and danger tree removal. Failure to address vegetation clearance and fuels hazards could result in wildfires from transmission line flash-overs and/or arcing, major power outages, and/or injury to life or property. Proper management of vegetation within the Project rights-of-way can minimize the chance of fire ignition by reducing available wildfire fuel sources.

New federal energy standards require vegetation inspections and treatment to maintain transmission lines in safe and reliable operating conditions (NERC Reliability Standard FAC-003-1 and FAC-003-2). Vegetation-to-conductor clearance standards are established through an agreement between the CNF and Western in an operating plan or corridor management plan required for the Project, the process of which is described by the Utility Vegetation Management (UVM) Guidelines (USFS 2006) that was signed by Western in 2006.

Vegetation clearance distances required by NERC FAC-003-1 and FAC-003-2 are provided in Western Order 430.1A, Right-of-Way Management Guidance for Vegetation, Encroachments, and Access Routes. Specifically, Western requires a minimum of 26 feet between conductors and

vegetation; however, it is Western's general practice to manage for clearances greater than the established minimum to further reduce the potential for wildfire ignition.

Vegetation management includes routine vegetation maintenance and removal of danger trees as described in the sections below. As the rights-of-way are managed to achieve Western's desired condition and clearance standards, it is anticipated that low-growing vegetation (e.g., grasses and forbs, some small shrubs) would become the predominant condition within the rights-of-way and the occurrence of danger trees and other tall-growing vegetation within and adjacent to the rights-of-way would decline over time, thus reducing the need for additional vegetation removal.

Routine Vegetation Maintenance

After Western has sufficiently removed vegetation within and adjacent to their rights-of-way from which they could manage vegetation for their desired condition, Western would implement routine vegetation maintenance. Routine vegetation maintenance would occur within the rights-of-way and is intended to enable Western to continue providing safe, efficient, and reliable electricity delivered through their transmission facilities to their customers.

Western would conduct routine vegetation maintenance for the Project rights-of-way according to a 5-year vegetation maintenance cycle. Routine vegetation maintenance would involve the identification and removal of vegetation within or adjacent to the rights-of-way that are incompatible with Western's desired condition. Western would use aerial patrols, ground patrols, and/or LIDAR surveys to identify routine vegetation maintenance needs, as described in sections 1.4.1 and 1.4.2. Routine vegetation management activities would be conducted in accordance with any seasonal restriction PCMs identified in Table 2-2. Growth cycles specific to target species for the Project would be considered according to the 5-year maintenance cycle. Any vegetation that would conflict with Western's desired condition within the 5-year routine maintenance cycle would be removed. All work would be conducted using predominantly mechanical mowers, with hand crews used only in areas where the mowers cannot access or where PCMs require (e.g., cultural resource sites, etc.). Work would be conducted any time during the day from 6:00 a.m. to 4:30 p.m., Monday to Friday, and in accordance with any seasonal restriction PCMs identified in Table 2-2.

Western's vegetation management manual (2011) requires that a minimum of 40 feet around concrete footers of transmission structures be maintained free of shrubs, trees, or other such vegetation (grasses and/or forbs in this area would be acceptable) that could pose a potential fire threat to transmission structures or associated hardware. This 40-foot clearance area is intended to provide a fire break, to minimize arcing of electricity or burning of structures during a fire under or near the transmission lines. Clearing around the footers of the Project transmission structures may also be necessary to provide access for Project maintenance vehicles. This clearance area would also maintain the integrity of the transmission structures by minimizing the potential for trees or vegetation falling on the structures. This work would occur within the permitted rights-of-way.

All vegetation removal during routine vegetation maintenance activities would be done using either mechanical or manual removal methods, as described in Section 2.1.1.1. As with initial vegetation removal, where routine vegetation maintenance identifies areas of the Project requiring vegetation treatment, mechanical methods would be the preferred and predominant

method to be used within the rights-of-way. Similarly, disposal of vegetation removed during routine vegetation maintenance would also be done in accordance with the procedures identified in Section 2.1.1.2, dependent upon the method of removal applied at a given location.

Danger Tree Removal

Danger trees (see Section 2.1.1) can be located within or outside of the Project rights-of-way. In the BA, CNF identified locations within the Project area which have the highest risk for hazard vegetation based on factors such as topography, vegetation type, previous vegetation management projects, drought, and disease. The Project rights-of-way were rated by the CNF as the highest risk with "*Extreme high potential for hazard vegetation. Need for hazard removal is certain. Power line is likely to have the highest concentrations of hazard vegetation"* (USFS 2008).

Initial vegetation removal is intended to identify and remove danger trees within and adjacent to the Project rights-of-way. However, as vegetation continues to grow on the periphery of the rights-of-way or beyond its boundaries, new or existing trees may become danger trees. As environmental conditions continually change, trees adjacent to the transmission lines and Project rights-of-way may present a danger of falling into the lines due to wind, leaning, decay, or other causes of instability. In accordance with Western's IVM Guidance Manual, danger trees must be removed. Western would use aerial surveys and ground patrols to identify danger trees for removal. Once danger trees are identified, a crew of linemen would be mobilized to remove the hazard. Danger trees within the right-of-way would be treated using either mechanical or manual removal methods, while danger trees outside of the right-of-way would only be treated using manual removal methods. Because the conflict of danger trees with required vegetation clearances is imminent, work to address danger trees would be conducted as soon as possible and conservation measures to minimize effects may not be applicable (see Section 1.3). After removal, danger trees would be disposed of as described in Section 2.1.1.2.

2.1.2.2 Project Access Routes

Adequate access routes are required and must be maintained to provide for safe, efficient, and cost effective Project operation and maintenance activities. It is Western's intent to use existing forest service roads wherever possible to access the rights-of-way. In most cases, the Project transmission lines have roads that approach and/or follow the transmission facilities within the rights-of-way. Roads authorized for use are identified in Western's Memorandum of Understanding with the CNF (USFS 1962). To conduct vegetation management activities, Western would use established roads and access routes to approach the right-of-way and would remain within the right-of-way while conducting vegetation management (except for the removal of danger trees outside the right-of-way, as necessary). Western would not create any new roads or access routes to enter Project rights-of-way. If Project rights-of-way are not accessible by existing roads, Western would drive to the nearest location and crews would walk in with the necessary equipment to properly maintain vegetation.

Utility vehicles may travel on or off-road within Project rights-of-way, but do not typically travel off-road outside of the rights-of-way. Where off-road travel would be necessary outside the Project rights-of-way, only rubber tired vehicles would travel off-road, with no off-road travel through wetlands or running streams (Table 2-2, PCM 32).

Table 2-2. Project Conservation Measures for the Proposed Action (By Resource)		
PCM #	**Description**	**Responsible Party**
Multiple Resources		
1	All vehicle movement outside the right-of-way would normally be restricted to pre-designated access or existing system roads.	Western/Contractor
2	The boundary of vegetation management and danger tree removal activities would normally be predetermined, with activity restricted to and confined within those limits. No paint or permanent discoloring agents would be applied to rocks, or any vegetation that is to remain in place, to indicate survey or construction activity limits.	Western/Contractor
3	To limit new disturbance, existing access roads in the Project area would be used to the extent practicable, provided that doing so does not additionally impact resource values.	Western/Contractor
4	Ensure all crews entering construction site have been provided training to recognize and respond to occurrences of cultural and natural resources and optimally protect the environment.	Western
5	Fences and gates would be repaired or replaced to their original pre-disturbed condition as required by the landowner or the CNF Authorized Officer if they are damaged or destroyed by vegetation management and right-of-way maintenance activities. New temporary and/or permanent gates will be installed only with the permission of the landowner or CNF.	Western/Contractor
6	During vegetation management and right-of-way maintenance activities for the transmission line(s), the right-of-way would be maintained free of non-biodegradable debris. Slash will be left in place or disposed of in accordance with requirements of the Biological Assessment (BA) prepared for maintenance in utility corridors on the CNF.	Western/Contractor
7	All existing roads will be left in a condition equal to their condition prior to vegetation management and right-of-way maintenance activities along the transmission line.	Western/Contractor
8	There will be no open burning of trash generated by vegetation management and right-of-way maintenance crews.	Western/Contractor
9	Caves, mine tunnels, and rock outcrops will not be entered, climbed upon, or otherwise disturbed.	Western/Contractor
10	Vehicles will be inspected daily for fluid leaks before entering the CNF.	Western/Contractor
11	At canyon, wash, river, stream crossings where appropriate conductor-vegetation clearances can be maintained, vegetation will be left in place to the extent feasible to allow for safe and reliable operation of the project facilities.	Western/Contractor
12	Western and its contractors will comply with all applicable federal and state regulations regarding fire suppression, including but not limited to having vehicles be equipped with a shovel and fire extinguisher, and the use of spark arrestors on combustion engines. Verification of daily fire levels during fire season will occur, and in some cases temporary work stoppage may be required due to high fire levels.	Western/Contractor

Table 2-2. Project Conservation Measures for the Proposed Action (By Resource)		
PCM #	**Description**	**Responsible Party**
13	Helicopter refueling away from existing airports would be accomplished by landing the helicopter in a parking lot or other open, previously disturbed area near a well established road. A tanker truck would travel on the well established road to meet the helicopter for refueling. Helicopter refueling would not be conducted within 0.25 mile of any: • Mexican spotted owl PAC • stream or pond occupied with threatened or endangered fish and/or amphibians • yellow-billed cuckoo occupied habitat during this species' breeding season	Western/Contractor
Biology Resources		
14	All vegetation management and right-of-way maintenance activities shall be conducted in a manner that will minimize disturbance to drainage channels, and intermittent and perennial streambanks to the extent practicable.	Western/Contractor
15	In areas where mechanical vegetation removal is not permitted or feasible (e.g., sensitive resource areas, terrain constraints, etc.), vegetation would be left in place wherever possible, and original contour would be maintained to avoid excessive root damage.	Western/Contractor
16	Monitoring of vegetation management and right-of-way maintenance activities may be required in some areas to ensure that species listed under the ESA or as specified by the CNF and state or county authority as sensitive or of concern are avoided. Additionally, if Bald or Golden Eagle nests are identified in the project area, seasonal restrictions on vegetation management and right-of-way maintenance in affected areas would be implemented where applicable according to current USFWS protocol to comply with the Bald and Golden Eagle Protection Act.	Western/Contractor
17	Measures to control noxious weeds will be incorporated into project planning, implementation, and monitoring. Western will clean seeds from ground-disturbing equipment before entering or moving between project areas. In areas of known occurrences of state-listed noxious weeds, a Western-approved botanist would identify and flag noxious weeds to be avoided. Methods of vegetation removal may be altered as appropriate to avoid the spread of noxious weeds.	Western/Contractor
18	The appropriate USFS Ranger District should notify Western of new or existing noxious weed hotspots.	CNF
19	In areas of known occurrences of, or suitable habitat for special-status plant species, a Western-approved botanist would identify and flag special-status plants to be avoided. Methods of vegetation removal would be altered as appropriate to avoid impacts to special-status plant species.	Western/Contractor
20	Field monitoring personnel (i.e., archaeological and biological monitors) will have access to the operations and maintenance GIS database in the field to be able to identify sensitive resources and associated PCMs.	Western/Contractor

Table 2-2. Project Conservation Measures for the Proposed Action (By Resource)		
PCM #	**Description**	**Responsible Party**
21	To minimize impacts to Chiricahua and northern leopard frogs, wet areas will be avoided to the extent practicable and all activity will be minimized during winter and other wet periods. This would minimize the potential for the spread of the pathogenic chytrid fungus (*Batrachochytrium dendrobatidis*), which can be fatal to frogs. If wet areas cannot be avoided, mud and debris will be removed from vehicles and decontaminated with quaternary ammonia or other USFS approved decontaminants to kill the fungus prior to moving to new areas.	Western/Contractor
22	To minimize disturbance to northern goshawk during breeding, nesting, and fledging seasons, avoid work between March 1 and September 30 within post-fledging areas (PFA). This includes the use of loud machinery within 0.25 mile of the PFA.	Western/Contractor
23	Coordinate disposal methods with the Forest Service District and, if appropriate/feasible, leave large (>8 inches) logs at edge of right-of-way in or adjacent to northern goshawk PFAs.	Western/Contractor/CNF
24	To minimize impacts to riparian habitat and migratory birds, areas within 250 feet of the Fossil Creek and Verde River crossings will be treated using manual methods of vegetation removal and only danger trees will be removed. Dense vegetation will be thinned as necessary to minimize fire hazards within the rights-of-way. Additionally, this work will be done outside of the breeding season (April 1 through August 15) for migratory birds such as yellow-breasted chat.	Western/Contractor
25	To protect nesting birds (birds not specifically protected by PCMs but protected by the Migratory Bird Treaty Act), whose nests could occur within the right-of-way, Western and its subcontractors will perform vegetation management and right-of-way maintenance activities outside the nesting season, which runs from April 1 through August 15 in the CNF. Alternatively, a qualified biologist will conduct nesting-bird surveys prior to project activities. For special-status birds, see PCM 16 and Mexican Spotted Owl PCMs. • An additional survey may be required if gaps between the survey and the project activity exceed three weeks. • Should an active nest be discovered, the qualified biologist will establish an appropriate buffer zone (in which operations and maintenance activity is not allowed) to avoid disturbance in the vicinity of the nest. Maintenance activities will not take place until the biologist has determined that the nestlings have fledged or that maintenance activities will not adversely affect adults or newly fledged young. • Alternatively, the qualified biologist will develop a monitoring/mitigation plan that permits the maintenance activity to continue in the vicinity of the nest while monitoring nesting activities to ensure that the nesting birds are not disturbed. Biological monitors would have the authority to modify or halt activities if deemed necessary based on behavior of nesting birds.	Western/Contractor
Mexican Spotted Owl		
26	Monitor and report proposed utility actions annually. This would include tree species, location, condition and size class, information as outlined in Appendix D of the Biological Assessment.	Western/Contractor

Table 2-2. Project Conservation Measures for the Proposed Action (By Resource)		
PCM #	**Description**	**Responsible Party**
27	Avoid ground work (use of equipment) within PACs between March 1 and August 31.	Western/Contractor
28	Avoid use of loud machinery within 0.25 mile of PACs between March 1 and August 31, with goal to limit noise levels at PAC boundary to < 56 decibels (dbA).	Western/Contractor
29	Avoid landing of helicopters in PACs or within 0.25 mile of PACs between March 1 and August 31.	Western/Contractor
30	For hazard line maintenance and/or vegetation hazard treatment in a Mexican Spotted Owl PAC during the breeding season, coordinate the timing of the hazard treatments such that work is consolidated into the least number of days and least number of trips in and out of the PAC to minimize the duration and frequency of disturbance to the Mexican Spotted Owl as much as possible.	Western/Contractor
31	Coordinate disposal methods with the Forest Service District and, if appropriate/feasible, leave large (>12 inches) logs at edge of right-of-way in or adjacent to PACs.	Western/Contractor/CNF
32	When feasible, schedule hazard line maintenance and vegetation treatments after breeding season (i.e., defer activity to later date when low priority or when not an imminent threat to safe operation of lines/structures).	Western/Contractor
33	It is recommended that trees > 24 inches diameter at breast height within PACs be retained unless over-riding management situations require their removal to protect human safety and/or property (for example, the removal of danger trees along power lines).	Western/Contractor
34	Retention of hardwood, large downed logs, large trees, and snags is recommended in PACs and Mexican Spotted Owl habitat to an extent that it does not significantly impede the overriding objective of reducing the risk of high-severity fire in Mexican Spotted Owl habitat.	Western/Contractor
Water Resources		
35	Watering facilities (e.g., tanks, developed springs, water lines, wells, etc.) would be repaired or replaced if they are damaged or destroyed by vegetation management and right-of-way maintenance activities to their predisturbed condition as required by the landowner or CNF.	Western/Contractor
36	Run-off control structures, diversion ditches, erosion-control structures, and energy dissipaters will be cleaned, maintained, repaired, and replaced to meet the standards set by applicable permits and the Storm Water Pollution Prevention Plan (SWPPP), or where such a plan is inapplicable, similar standards set by Western or the applicable federal land manager.	Western/Contractor
37	Sediment-control devices (e.g., placement of native rock, etc.) will be used at all dry wash crossings as determined in the SWPPP for the Project.	Western/Contractor

Table 2-2. Project Conservation Measures for the Proposed Action (By Resource)		
PCM #	**Description**	**Responsible Party**
38	Wet areas will be avoided to the extent practicable and all activity will be minimized during winter and other wet periods to prevent damage (e.g., rutting, erosion, soil compaction). If wet areas cannot be avoided (e.g., emergency situations, etc.), Western will use wide-track or balloon tire vehicles and equipment or timber mats and install sediment control devices where necessary.	Western/Contractor
39	To minimize impacts to soils and wetlands, mechanical clearing of vegetation will be prohibited within 100 feet of a wetland during the wet season (July 1 to September 30 and December 1 to March 31).	Western/Contractor
40	All equipment will be stored, fueled, and maintained a minimum of 300 feet from a stream or wetland. If equipment is fueled and/or maintained within CNF boundaries, a spill kit with a minimum capacity of 40 gallons will be required on-site where refueling/equipment maintenance activities occur.	Western/Contractor
Visual Resources		
41	Material storage and staging areas will be selected to minimize views from public roads, trails, and nearby residences, to the extent feasible. During vegetation management and right-of-way maintenance activities, the work site will be kept clean of debris and management and maintenance waste. For areas where slash and vegetation debris will be visible from sensitive viewing locations, materials will be disposed of in a manner that is not visually evident, in coordination with CNF, and in compliance with the BA.	Western/Contractor/CNF
42	Vegetation management and right-of-way maintenance activities will be conducted in a manner that limits unnecessary scarring or defacing of the natural surroundings to preserve the natural landscape to the extent possible. To preserve vegetation screening from public areas, understory vegetation clearing will be minimized to the extent practicable along state highways and near recreation sites, and wherever possible along scenic roadways.	Western/Contractor
43	To minimize visual impacts, only danger trees would be removed within and adjacent to the rights-of-way where the Project crosses Class A landscapes, Concern Level 1 routes/areas, and/or Moderate Scenic Integrity Objective designations, and where removal of vegetation would result in moderate to high landscape contrast.	Western/Contractor
Cultural Resources		
44	Prior to conducting planned vegetation clearing within the boundaries of a known cultural site, Western would prepare a Monitoring Plan detailing procedures for cultural resource training, monitoring, reporting, and procedures for addressing unanticipated discoveries. This plan would be submitted to CNF, SHPO, and interested Tribes for review and concurrence.	Western/Contractor/CNF/SHPO
45	Vehicles and equipment will be staged outside of cultural resource sites.	Western/Contractor
46	Only the following activities are allowed in cultural sites: vehicular travel will only take place on existing roads, manual cutting of vegetation, and disposal of cut vegetation consistent with Western and CNF management guidelines.	Western/Contractor

Table 2-2. Project Conservation Measures for the Proposed Action (By Resource)		
PCM #	**Description**	**Responsible Party**
47	No slash will be placed within fire sensitive sites such as historic building remains, other wood artifacts, adjacent to rockshelters or caves where fire sensitive artifacts may exist, or adjacent to rock art panels.	Western/Contractor
48	No ground disturbing activities will occur within the boundaries of cultural sites.	Western/Contractor
49	A Western- and CNF-approved archeological monitor will be present when vegetation removal occurs within the boundaries of sensitive cultural sites, including those containing petroglyphs or standing historic or prehistoric architecture, or other sites designated as sensitive by the CNF.	Western/CNF
50	If a danger tree is identified as a potential historic feature (blazed tree, phoneline insulator tree, dendroglyph tree, etc.) Western will coordinate with the CNF to determine the appropriate mitigation, should any measures be required.	Western/Contractor/CNF
51	Where danger trees are removed outside of the right-of-way, trees will be felled to avoid any identified cultural resource sites. If a danger tree cannot be felled to avoid an identified cultural site, felled trees must be lopped and left in place as slash in accordance with the requirements of the BA and BO (2008).	Western/Contractor
Geology & Soils		
52	Upon completing ground-disturbing work, all work areas will be left in a condition that facilitates proper drainage, and minimizes erosion.	Western/Contractor
53	All operations and maintenance activities will be in conformance with Western's Integrated Vegetation Management Environmental Guidance Manual	Western/Contractor
54	Where soil has been severely disturbed and the establishment of vegetation will be needed to minimize erosion, appropriate measures, as approved by the CNF, will be implemented to establish an adequate cover of native grass or other native vegetation as needed. Perennial vegetation is preferred to annual vegetation. All mulch and seed will be certified free of noxious weeds.	Western/Contractor/CNF
55	Disturbance and removal of soils and vegetation will be limited to the minimum area necessary for vegetation management and right-of-way maintenance activities.	Western/Contractor
Air Quality		
56	All requirements of those entities having jurisdiction over air quality matters will be adhered to, any necessary dust control plans will be developed.	Western/Contractor
57	Machinery and vehicles will be kept in good operating condition and older equipment will be replaced with equipment meeting Arizona emission standards; appropriate emissions-control equipment will be maintained for vehicles and equipment, per EPA, and Western air-emission requirements. Trucks transporting loose material will be covered or maintain at least 2 feet of freeboard and will not create any visible dust emissions.	Western/Contractor
58	Idle equipment will be shut down when not in active use.	Western/Contractor

Table 2-2. Project Conservation Measures for the Proposed Action (By Resource)		
PCM #	**Description**	**Responsible Party**
59	Fugitive dust will be minimized during vegetation management and right-of-way maintenance activities by adhering to speed limits and minimizing blading activities to the extent practicable.)	Western/Contractor
Land Use		
60	Western will coordinate with CNF and post proper signage in areas requiring temporary closure or limited access due to vegetation management and right-of-way maintenance activities.	Western/Contractor/CNF
61	No mechanical vegetation removal methods will occur within wilderness areas. In addition, vegetation removal, management, and/or right-of-way maintenance activities necessary within wilderness areas will not be conducted during weekends or federal holidays.	Western/Contractor
Noise		
62	All vehicles and equipment will be equipped with required exhaust-noise-abatement devices.	Western/Contractor
Recreation		
63	Western will direct members of the public to alternate trails or recreation areas if blocked by machinery or for safety purposes.	Western/Contractor
64	Closure of recreation areas will be minimized to the extent practicable during weekends and Federal holidays between Memorial Day and Labor Day.	Western/Contractor/CNF
65	No motorized or mechanized tools will be used to clear vegetation in wilderness (including motor vehicles). Crews will walk in or use primitive means to transport needed hand tools and will remove vegetation using non-motorized tools. A Minimum Requirement Decision Guide will be completed and receive Forest Service review and approval if any other vegetation removal methods are proposed.	Western/Contractor/CNF
66	Minimize use of overhead flights over designated Wilderness.	Western
Public Health & Safety		
67	Signs and/or flags will be erected in areas of public access to indicate vegetation management and right-of-way maintenance activities are taking place; workers will be conspicuous by wearing high-visibility vests and hardhats.	Western/Contractor

Table 2-2. Project Conservation Measures for the Proposed Action (By Resource)		
PCM #	**Description**	**Responsible Party**
68	With regard to hazardous materials: • Hazardous materials will not be drained onto the ground, into streams, or into drainage areas. • Any release, threat of release, or discharge of hazardous materials within the project area in connection with project activities will be cleaned up and/or remediated, in accordance with applicable federal, state, and local regulations. • All construction waste, including trash and litter, other solid waste, petroleum products, and other potentially hazardous material will be removed in accordance with applicable federal, state, and local regulations. • Discovery of, or the accidental discharge of, a significant amount of hazardous materials will be immediately reported to Western's dispatch center. • There will be no storage of hazardous materials in the project area without approval from the Western authorized officer. • Upon termination of the permit, a report will be submitted to determine whether there had been site contamination and if so, that the remediation met compliance with applicable laws.	Western/Contractor
69	Hazardous materials standard operating procedures and applicable PCMs will be written into the contract for vegetation management and right-of-way maintenance work, and contractors will be held responsible for compliance.	Western/Contractor
70	Contractors must submit a spill response plan that is approved by Western. Clean-up actions and costs resulting from contractor misconduct will be the responsibility of the contractor.	Western/Contractor
Transportation		
71	All lane closures or obstructions on major roadways associated with maintenance activities will be restricted to off-peak periods to minimize traffic congestion and delays, and will be coordinated with Arizona Department of Transportation (ADOT).	Western/Contractor

2.2 NO ACTION ALTERNATIVE

Under the No Action alternative, Western would continue its need-driven management approach using current methods for vegetation management and right-of-way maintenance. Under a need-driven management approach, Western would mow, clear, remove, and dispose of vegetation within and along right-of-way segments as control needs are identified through periodic line patrols. Western would perform vegetation management using the current mix of manual and mechanical methods to control vegetation on transmission line and access road rights-of-way. Access road repairs would be performed as needed. Transmission system maintenance activities would consist of regular aerial and ground patrols to locate problems, repairs to correct problems, and preventative maintenance. These are all consistent with the USFWS 2008 programmatic BO and the PA with the SHPO.

The No Action alternative does not adequately satisfy the applicable standards, orders and guidance for operation and maintenance of transmission facilities, resulting in reliability and

safety concerns for Western's rights-of-way. Furthermore, the No Action alternative perpetuates a reactive approach to vegetation management, exacerbating hazardous vegetation conditions within the rights-of-way. This alternative would fail to achieve the purpose and need for the Project.

2.3 ALTERNATIVES ELIMINATED FROM FULL ENVIRONMENTAL ASSESSMENT EVALUATION

Alternatives were assessed on their ability to reasonably respond to the purpose and need for action. This section provides the rationale for each alternative identified and eliminated from full EA evaluation.

2.3.1 Removal of Vegetation that Conflicts, or has the Potential to Conflict, with Western Conductor-to-Vegetation Clearance Requirements Only Alternative

Under this alternative, currently approved vegetation removal practices and methods would be used to remove vegetation throughout the Project area that either conflicts, or has the potential to conflict, with Western's required conductor clearances (i.e., 26-foot minimum). In addition, dense stands of vegetation within the right-of-way that do not encroach within the minimum conductor clearance requirements, but present a hazard to the facility due to potential arcing that could occur from smoke plumes in the event of a wildfire, would be removed. In contrast to the Proposed Action, vegetation that would not conflict with these minimum clearance requirements, and that do not pose an immediate wildfire threat to the transmission facilities, would remain in place throughout the Project area.

This alternative would result in more frequent vegetation management and facility maintenance activities. These frequent vegetation management and facility maintenance trips would increase potential for ground disturbance, overall emissions, hazardous material and petroleum spills, long-term intermittent noise levels, and the potential for disturbance to biological resources. In addition, this alternative could increase the potential for service interruption from wildfire within the Project area, as a result of added biomass and wildfire fuels within the Project area. As a result, this alternative was eliminated from further consideration in this EA.

2.3.2 Establishment and Management of a Wire Zone and Border Zone Alternative

Under this alternative, a process of vegetation community conversion would be implemented within the Project rights-of-way. In general, Western would remove vegetation within the existing rights-of-way to establish a wire zone and border zone for vegetation management activities. The wire zone would be defined as the portion of the right-of-way directly beneath the conductors and 10 feet beyond the outside edge of the conductors. The border zone ranges from 10 feet outside the outer phases to the edge of the right-of-way. The wire zone would be managed to promote a low-growing plant community dominated by grasses, herbs, and small shrubs (typically under 3 feet in height at maturity), while the border zone would be managed to preserve or establish small trees and tall shrubs (typically under 25 feet in height at maturity).

Within the wire zone, nearly all existing woody vegetation and shrubs would be removed. Within the border zone, small trees, tall shrubs, and other vegetation up to 25 feet in height at maturity

may remain in place, provided the minimum conductor clearances could still be met. This process would continue within the two designated zones until vegetation cover types have been converted to low-growing grasses and forbs in the wire zone, and small trees and tall shrubs in the border zone.

Within the wire zone, this alternative could facilitate Western's purpose to safely and reliably operate the transmission facilities in comparison to the No Action alternative; however, the border zone associated with this alternative would preclude Western from achieving the purpose and need for this Project. The Proposed Action for the rights-of-way creates a fuel break in the event of a wildfire, which minimizes wildfire intensity in the vicinity of Project facilities. Under the wire zone/border zone alternative, the presence of tall shrubs and small trees within portions of the rights-of-way (i.e., border zone) would not be compatible with Western's objective to reduce fuel loads within the rights-of-way. The reduction of fuel loads within the rights-of-way protects Project facilities from the effects of wildfire (i.e., damage to transmission hardware, arcing from nearby vegetation into conductors, etc.) and minimizes service interruption to Western's delivery base. In addition, new NERC standards (NERC Reliability Standard FAC-003-1 AND FAC-003-2) impose costly penalties on utilities where it is demonstrated that outages on transmission facilities is the result of improperly managed vegetation within their rights-of-way. Because of these risks, this alternative was eliminated from analysis in this EA.

SECTION 3 – AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND CUMULATIVE EFFECTS

3.1 INTRODUCTION

This section provides discussion and disclosure of the potential environmental impacts of the Proposed Action and No Action alternative. The potential environmental impacts are examined as they relate to the following 14 issue areas:

- Biological Resources
- Cultural Resources
- Land Use
- Recreation
- Wildland Fire
- Visual Resources
- Water Resources
- Geology and Soils
- Public Health and Safety
- Air Quality
- Noise
- Transportation
- Socioeconomics
- Environmental Justice

3.2 ENVIRONMENTAL ASSESSMENT METHODOLOGY

Within each resource identified above, a description of the existing affected environment is provided. Potential environmental effects were assessed based on a comparison of potential changes to the affected environment resulting from the implementation of the Proposed Action and No Action alternatives for each resource evaluated for the Project. The impact analysis assumes that all PCMs (Table 2-2) would be implemented as committed to by Western. The description of the environmental consequences for each section takes into account both of the primary components of the Proposed Action; namely, the initial vegetation removal activities and the vegetation management and right-of-way maintenance activities.

The end of each resource section also presents the analysis of the potential cumulative effects of the Proposed Action. Cumulative effects are defined as the total impact on the environment that occurs when impacts of a particular action are combined with those of other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR § 1508.7). Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Because transmission rights-of-way are linear in nature, relatively narrow, and spread out over a large geographical area, this vegetation management and right-of-way maintenance project is not expected to contribute cumulatively considerable or significant impacts when considered together with other actions in a project area. While vegetation management or right-of-way maintenance activities at a single location could involve ground disturbance, noise, or alteration

of vegetation or habitat, these activities would be localized and of short duration, with their environmental effects avoided and/or minimized through PCMs. Furthermore, impacts are expected to be minor because the Proposed Action is focused along existing transmission lines.

Table 3-1 includes past, present, and reasonably foreseeable future actions that may take place in the Project area.

Table 3-1. Past, Present, and Reasonably Foreseeable Future Actions that Occur in the Project Area

Project Name	Project Purpose	Expected Implementation	Action Type	Distance/ Proximity
APS 230 kV transmission line from Leupp Substation to Coconino Substation	Electricity transmission, reissuance of special use permits by Coconino National Forest (CNF)	—	Past, Present and Reasonably Foreseeable Future	Parallels Glen Canyon to Flagstaff lines for approximately 5 miles, beginning near County Road 505, and then heads south across I-40
Description	This APS line heads east from the city of Flagstaff and crosses the Flagstaff to Glen Canyon line (Proposed Action) just south of where it is crossed by County Road 505.			
APS 69 kV Sandvig-Youngs Powerline	Expansion of existing power line corridor for new 69 kV line	EA Approved 7/2011	Reasonably Foreseeable Future	Directly crosses Glen Canyon to Flagstaff transmission lines
Description	Construction of a new power line along existing transmission corridor from Sandvig Substation (existing) to the new Youngs Canyon Substation, east of Flagstaff (south of I-40 and just northwest of the Flagstaff Substation).			
APS 69 kV transmission line from Tap Substation to the Coconino Substation	Electricity transmission, reissuance of special use permits by CNF	—	Past, Present and Reasonably Foreseeable Future	Directly crosses Glen Canyon to Flagstaff transmission lines
Description	Existing APS line heads east from in the city of Flagstaff and crosses the Proposed Action south of I-40 and just north of the Western Flagstaff Substation, and then heads southeast.			
Rock Pit Development: 6 pits located within proximity of line	The Coconino and Kaibab National Forests propose to develop, expand and operate up to 39 (25 existing and 14 new) material pits to provide cinders, gravel, and other aggregate materials for surfacing of unpaved roads for maintenance purposes	Over the next 20 years	Past, Present, and Reasonably Foreseeable Future	Within approximately 3 miles of the Project Area

Table 3-1. Past, Present, and Reasonably Foreseeable Future Actions that Occur in the Project Area				
Project Name	**Project Purpose**	**Expected Implementation**	**Action Type**	**Distance/ Proximity**
Description	Six pits are located within proximity to the lines: Pine Hill Cinders, Youngs Canyon, and Salmon Lake are within approximately 1 mile; Buck Butte, Yellowjacket, and Perry Lake are within approximately 3 miles; the Salmon Lake and Youngs Canyon rock pits would be newly constructed pits, totaling approximately 9.9 and 11.0 acres, respectively. The expansions of Pine Hill Cinders and Buck Butte rock pits would total 10.4 acres. Perry Lake rock pit would not be expanded, but would continue its current operations. A total of 0.16 mile of road would be developed for Pine Hill Cinders (0.01), Salmon Lake (0.08) and Youngs Canyon (0.07). No expansion or new construction is proposed for Yellowjacket, but operations would continue. Initially, rock pit development and expansion would involve the disturbance of surface conditions and removal of existing vegetation; heavy equipment such as bulldozers and backhoes would be used to move soil; for soils stored onsite, seeding would be used to prevent erosion and air quality impacts caused by winds.			
Coconino National Forest Motorized Travel Management Plan EIS	Compliance with National Forest Travel Management Rule (2005)	5/2012	Reasonably Foreseeable Future	Entire CNF
Description	Make changes to the designated system of roads, trails, and areas for motorized use on the CNF; changes include restrictions to off-road motor vehicle use. This plan is expected to limit off-road travel across thousands of miles of CNF roads and is expected to concentrate usage on designated roads and camping corridors. The concentration of these activities will likely result in loss of vegetation and potential scenic impacts in these areas.			
Year-round Recreation Site Access Points, Mogollon Rim Ranger District	Provide new areas within Mogollon Rim Ranger District for year-round recreation opportunities	3/2012	Reasonably Foreseeable Future	Mogollon Rim Ranger District
Description	New public access, parking areas, and facilities (including toilets, trash receptacles, kiosks, and picnic tables). Two sites are located near the Proposed Action, including a location just across from the Happy Jack Ranger Station and along Stoneman Lake Road;both projects are listed as short-term needs for the CNF.			
Grapevine Interconnect (Grapevine Canyon Wind Project)	Renewable Energy Project Development	6/2012	Reasonably Foreseeable Future	West of Mormon Lake within Proposed Action right-of-way
Description	Approximately 9 miles of new 345 kV electric transmission line connecting a new wind park located on Flying M Ranch private property to the existing Western 345 kV line. Western is the NEPA lead. The Proposed Action will follow FS Road 125 and tie into the Flagstaff to Pinnacle Peak lines just east of Mormon Lake.			
Fossil Creek Wild and Scenic River Comprehensive River Management Plan	Compliance with Wild and Scenic Rivers Act (2009)	11/2012	Reasonably Foreseeable Future	Southern boundary of CNF

Table 3-1. Past, Present, and Reasonably Foreseeable Future Actions that Occur in the Project Area				
Project Name	**Project Purpose**	**Expected Implementation**	**Action Type**	**Distance/ Proximity**
Description	The development of a comprehensive river management plan to protect and attempt to enhance the free-flow condition, the water quality, values, and allow other uses that do not substantially interfere with public use; the project will likely reduce the number of people and cars near Fossil Creek during the summer, and could involve the development of several recreation facilities, which could result in some loss of wildlife habitat in upland areas and short-term sedimentation.			
Four Forest Restoration Initiative EIS: South Kaibab and Coconino	Forest products, vegetation management, (other than forest products), fuels management, watershed management, road management	4/2013	Reasonably Foreseeable Future	Entire CNF
Description	Create landscape-scale restoration approaches that will provide for fuel reduction, forest health, and wildlife and plant diversity; businesses will play a role in this effort by harvesting, processing, and selling wood products grown in the CNF.			
Source: USFS 2011a; Forest Service Schedule of Proposed Actions for the Coconino National Forest				

3.3 BIOLOGICAL RESOURCES

3.3.1 Introduction

This section provides discussion and disclosure of the potential effects of the Proposed Action and No Action alternative. The potential adverse effects are examined as they relate to plant communities, special-status plants, wildlife, and special-status wildlife species.

3.3.2 Plant Communities

3.3.2.1 Affected Environment

A variety of vegetation and wetland types occur within the Project area. The vegetation communities were categorized using results from the Forest Service Southwestern Region Terrestrial Ecosystem Surveys. Shapefiles of these data were provided by the CNF. These vegetation communities are considered to be potential natural vegetation types (PNVT), which "represent the vegetation type and characteristics that would occur when natural disturbance regimes and biological processes prevail" (USFS 2008). These community types were utilized in the development of the BA for Phase II Maintenance in Utility Corridors on Arizona Forests (see Section 1.1). As this BA is applicable to the Proposed Action, these community types will be used in this analysis.

Ten plant communities are located within the Project area (Figure 3-1). Table 3-2 provides the approximate acreage within the Project area occupied by each community type. A brief description of each community is provided below.

Table 3-2. Plant Communities within the Project Area

Plant Community	Acres
Mixed Broadleaf Deciduous Riparian Forest	1
Mixed Conifer with Aspen	8
Cottonwood Willow Riparian Forest	10
Wetland/Cienega	25
Montane/Subalpine Grassland	35
Semi-desert Grasslands	175
Great Basin Grassland	470
Piñon-Juniper Evergreen Shrub	810
Piñon-Juniper Woodland	1,280
Ponderosa Pine	1,770
TOTAL	**4,584**
Source: LIDAR Survey, October 2010; USFS PNVT, May 2010	

Mixed Broadleaf Deciduous Riparian Forest

Mixed broadleaf deciduous riparian forests are found along rivers and streams at elevations ranging from 4,000 to 9,000 feet. The vegetation is a mix of riparian woodlands and shrublands with a variety of vegetation associations. Within the Project area, this PNVT is only located along Clover Creek in a canyon approximately 550 feet below the existing transmission lines.

Mixed Conifer with Aspen

Mixed conifer with aspen is found at elevations between 5,000 and 10,000 feet and may be situated between ponderosa pine, pine-oak, or piñon-juniper woodlands. In the vicinity of the Project area, this PNVT is completely surrounded by ponderosa pine forest and piñon-juniper woodlands. Dominant and codominant vegetation varies with elevation and moisture availability. In the lower and drier elevations, Gambel oak (*Quercus gambelii*) and ponderosa pine (*Pinus ponderosa*) may codominate. In higher, more mesic areas, ponderosa pine may codominate with Douglas-fir (*Pseudotsugo mensiesii*) and white fir (*Abies concolor*). Within the Project area, this PNVT is only located on the southeast side of Hutch Mountain near Boondock Tank.

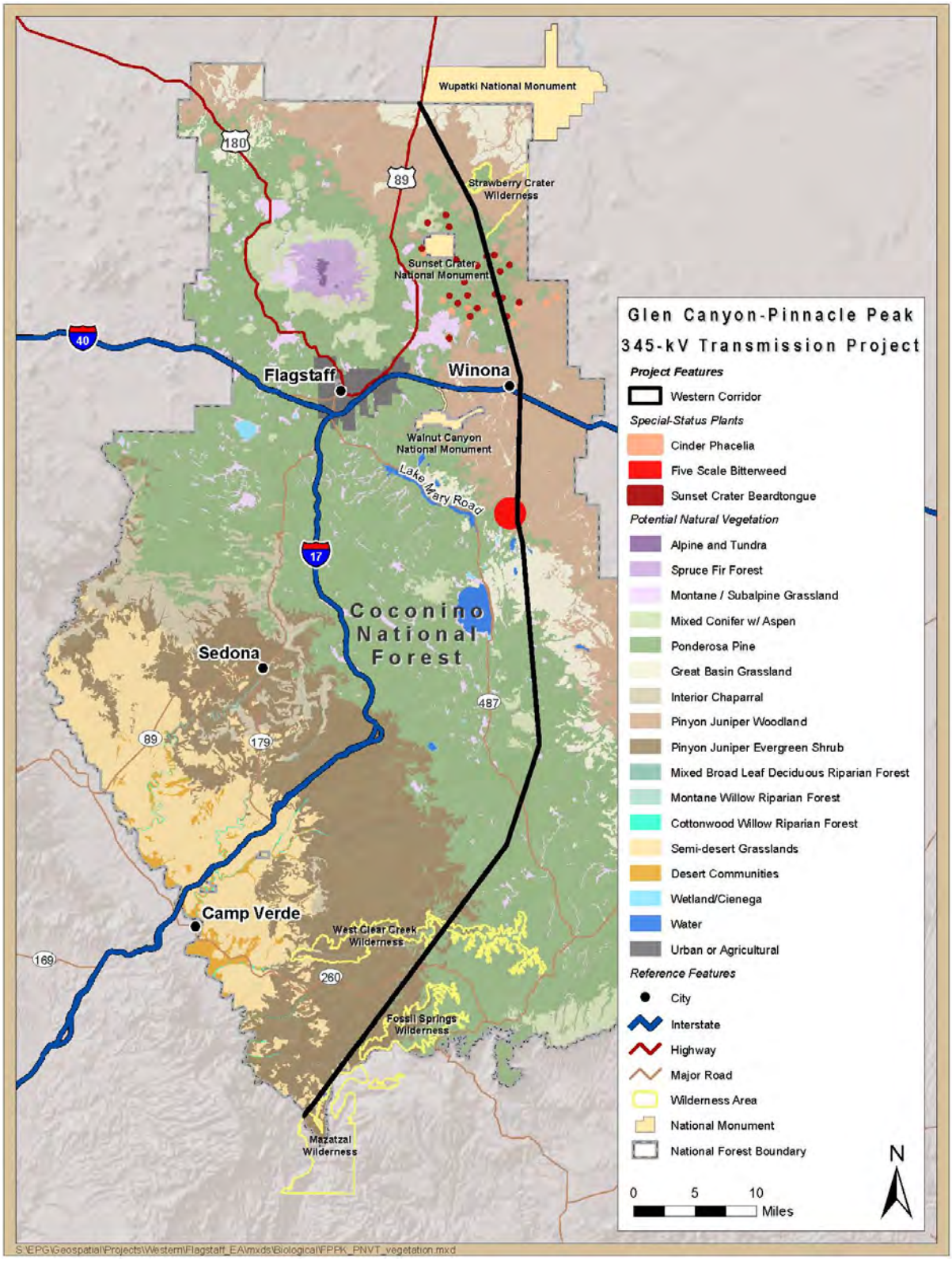

Figure 3-1. Potential Natural Vegetation Types within the Project Area

Cottonwood Willow Riparian Forest

Cottonwood willow riparian forests are typically found at lower elevations along rivers and streams in unconstrained valley bottoms. Dominant wood species include cottonwood species (*Populus* spp.), willow species (*Salix* spp.), and mesquite species (*Prosopis* spp.). This PNVT is frequently subjected to heavy grazing, resulting in degradation. Additionally, invasive species such as salt cedars (*Tamarix* spp.) and Russian olive (*Elaeagnus angustifolia*) can be found in these areas and may result in depletion of the water table. The vegetation within cottonwood willow riparian forests is dependent upon seasonal flooding and high water tables for germination, growth, and survivorship of the woody dominants. This PNVT is only found where the alignments cross Fossil Creek, near the southern end of the Project area.

Wetland/Cienega

This PNVT is associated with perennial springs or headwater streams where groundwater intersects the surface to create pools of standing water. Soils in these areas may be highly saline. Species of vegetation varies based on soil saturation and salinity. Some species may include salt grass (*Distichlis spicata*), yerba mansa (*Anemopsis californica*), and sacaton (*Sporobolus airoides*). Highly saturated areas may support vegetation such as rushes and sedges, and deep pools may support aquatic species. This PNVT may occur over elevations ranging from 3,500 to 11,000 feet. The Project area crosses three wetland/cienegas. Two are located along Forest Road (FR) 124H north of Hutch Mountain. The other is located south of FR 125 and is designated as Camillo Tank.

Montane/Subalpine Grassland

This PNVT occurs at elevations ranging from 8,000 to 11,000 feet. Montane/subalpine grasslands may contain several plant associations with varying dominant grasses and herbaceous species. Dominant species may include Parry's oatgrass (*Danthonia parryi*), Arizona fescue (*Festuca arizonica*), Thurber's fescue (*Festuca thurberi*), pine dropseed (*Blepharoneuron tricholepis*), Kentucky bluegrass (*Poa pratensis*), Rocky Mountain iris (*Iris missouriensis*), Parry's bellflower (*Campanula parryi*), and bulrush species (*Scipus* and/or *Schoenoplectus* species). Some shrubs may also be present. These grasslands may be seasonally wet as a result of snowmelt, but rarely experience flooding events. The Project area crosses several small patches of montane/subalpine grassland.

Semi-desert Grasslands

Semi-desert grasslands are dominated by grassland associations/types such as black grama (*Bouteloua eriopoda*) grassland, blue grama (*Bouteloua gracilis*) grassland, tobossa (*Hilaria mutica*) grassland, mixed native perennial grassland, and non-native perennial grassland. Shrubs may also be found within this PNVT with variable density and species composition. Within the Project area, these grasslands are only found between the Verde River and Fossil Creek along the most southern 6 miles of the alignments.

Great Basin Grassland

Great Basin grasslands tend to occur at lower elevations with vegetation coverage consisting primarily of grasses and interspersed shrubs. Grass species may include Indian ricegrass (*Achnatherum hymenoides*), threeawn species (*Aristida* spp.), blue grama (*Bouteloua gracilis*), and fescue species (*Festuca* spp.). Shrubs may include sagebrush (*Artemesia tridentata* spp.), saltbush (*Atriplex* spp.), and winterfat (*Krascheninnikovia lanata*). Within the Project area, Great Basin grasslands tend to occur in large contiguous clusters. The majority of this PNVT is located in the vicinity of Mormon Lake and in the northernmost 2 miles of the alignments.

Piñon-Juniper Evergreen Shrub

Piñon-juniper evergreen shrub is typically found on lower slopes in transition zones between interior chaparral and montane forests. This PNVT often contains the two-needle piñon (*Pinus edulis*), singleleaf piñon (*Pinus monophylla* var. *fallax*), Utah juniper (*Juniperus osteosperma*), or alligator juniper (*Juniperus deppeana*). Coexisting shrub species may include manzanita species (*Arctostaphylos* spp.), mountain mahogany (*Cercocarpus montanus*), antelope bushes (*Purshia* spp.), and sumacs (*Rhus* spp.). Piñon-juniper evergreen shrub is the dominant vegetation type throughout the southernmost 22 miles of the Project area.

Piñon-Juniper Woodland

This PNVT primarily occurs on lower slopes of mountains and in upland rolling hills at elevations ranging from 4,500 to 7,500 feet. The most common piñon pine is the two-needle piñon (*Pinus edulis*), with singleleaf piñon (*Pinus monophylla*) occurring in limited areas. One-seed juniper (*Juniperus monosperma*) is most common in Arizona. Some areas may contain Utah juniper (*Juniperus osteosperma*) and Rocky Mountain juniper (*Juniperus scopulorum*). Grasses, forbs, and shrubs may be found underneath the woodland canopy. Piñon-juniper woodland is found extensively throughout the Project area north of Mormon Lake.

Ponderosa Pine Forest

Ponderosa pine forests occur at elevations ranging from 6,000 to 9,000 feet on igneous, metamorphic, and sedimentary parent soils with good aeration and drainage. As indicated by its name, this community is dominated by ponderosa pine (*Pinus ponderosa*). Other trees may be present, including Gambel oak (*Quercus gambelii*), piñon pine (*Pinus edulis*), and juniper species (*Juniperus* spp.). The understory is typically shrubby with a mixture of grasses and forbs. This system is adapted to drought during the growing season and has evolved mechanisms to tolerate frequent, low intensity surface fires. This PNVT occupies the largest portion of the Project area, and is found throughout the Project area north of Arizona State Route (SR) 260.

Within the areas designated as ponderosa pine forest, there is an area in which the ground is covered with volcanic cinders. This area is located in the vicinity of Sunset Crater Volcano National Monument, and extends from the south side of Deadman Mesa to approximately FR 505. On these cinder hills, herbaceous vegetation is less dense than in surrounding areas, as the soil is covered by 2 to 4 inches of volcanic debris.

3.3.2.2 Environmental Consequences

Several types of vegetative and wetland communities occur within the Project area, as described in the previous section. Western must manage the vegetation throughout its system to comply with federal laws, regulations, and directives, including those for maintaining system reliability and public and worker safety. The following sections identify potential impacts to vegetation resulting from vegetation removal, and vegetation management and right-of-way maintenance activities. PCMs to minimize potential impacts to vegetation were considered as a part of the analysis of environmental consequences.

Impacts Resulting from Initial Vegetation Removal

Activities related to initial vegetation removal would have an impact on vegetation. As stated in Section 1.3, all vegetation within the 300-foot right-of-way areas was removed and/or altered from its natural state during the construction process in the 1960s. Since that time, successional vegetation growth has occurred within the rights-of-way, resulting in large woody species such as trees to reinhabit the right-of-way. Most of the current vegetation would be removed throughout the rights-of-way, resulting in a change of the mid-late seral to subclimax successional status of the Project area to a pre-successional condition. This change would be permanent until the transmission lines are decommissioned. It is anticipated that this impact would not ultimately result in an irretrievable loss of resources. As has been exhibited in the relatively short span of time since construction of these transmission lines, the large woody species and natural succession would ultimately reclaim the right-of-way area after decommissioning of the Project.

Impacts Resulting from Vegetation Management and Right-of-Way Maintenance

Vegetation management is anticipated to occur on a 5-year cyclical basis throughout the entire Project area. However, the majority of danger tree management would be required in tree-dominated PNVTs such as ponderosa pine and piñon-juniper evergreen shrub. Table 3-3 shows the number of danger trees identified by Western through LIDAR data located within each PNVT in the Project area.

The primary impacts resulting from both mechanical and manual methods of vegetation management and danger tree removal could include increased disturbance to surrounding non-target vegetation (e.g., trees falling on vegetation outside the right-of-way), sensitive plant communities such as riparian habitats or wetlands, special-status plants, trees that should remain in place, and local alteration of vegetation type within Western's rights-of-way through changes to density and species composition.

Vegetation management may also affect wetlands and riverine habitats. These areas are susceptible to erosion and compaction from heavy machinery. Removal of vegetation in upland areas can increase surface runoff, resulting in sedimentation of wetlands and aquatic habitats.

Table 3-3. Danger Trees within Each Plant Community		
Plant Community	**Acres**	**# of Danger Trees**
Mixed Broadleaf Deciduous Riparian Forest	1	0
Mixed Conifer with Aspen	8	<10
Cottonwood Willow Riparian Forest	10	<10
Wetland/Cienega	25	26
Montane/Subalpine Grassland	35	0
Semi-desert Grasslands	175	158
Great Basin Grassland	470	130
Piñon-Juniper Evergreen Shrub	810	1,905
Piñon-Juniper Woodland	1,280	293
Ponderosa Pine	1,770	7,053
TOTAL	**4,584**	**9,572**

Impacts would be minimized through implementation of PCMs presented in Section 2. These efforts would include containment of debris to reduce the potential for this material to contaminate wetlands and waterways in the vicinity. Additionally, sites would be assessed to determine whether mechanical or manual maintenance methods should be applied to minimize impacts in sensitive areas.

It is anticipated that the impacts to vegetation described in this section would exist until the transmission lines are decommissioned. Without routine vegetation management through manual or mechanical treatments, the area would revert to its natural state through successional regrowth.

Impacts Resulting from the Spread of Noxious Weeds of Invasive Plant Species

No known noxious weed hotspots are located within the Project area; however, maintenance efforts may contribute to the spread of noxious weeds and invasive plant species. Removal of late-successional, woody species may promote the invasion of non-native, invasive species that can out-compete native species. Western is required to comply with the Federal Noxious Weed Act of 1974, as amended (7 USC 61). Under Section 2814, Management of Undesirable Plants on Federal Lands, each federal land-management agency is required to:

- designate a lead office and person trained in the management of undesirable plant species
- establish and fund an undesirable plant management program
- complete and implement cooperative agreements with state agencies
- establish integrated management systems to control undesirable plant species

As provided in Section 2 of this EA and the BA, PCMs have been established to minimize impacts from noxious and invasive weeds. Any utility mowers, tracks, or other off-road equipment would be free of soil, weeds, vegetative matter, or other debris that could harbor seeds prior to entering the Project area. In addition, the appropriate Ranger District should notify Western of new or existing noxious weed hotspots. Should any hotspots be identified, vehicles would be free of soil, weeds, vegetative matter, or other debris that could harbor seed prior to moving the equipment between line segments.

3.3.2.3 Environmental Consequences from the No Action Alternative

Under the No Action alternative, Western would continue its need-driven management approach using current methods for vegetation management and right-of-way maintenance. Maintenance activities would be reactive, resulting in vegetation removal occurring when vegetation growth has reached a hazardous condition for operation of the transmission facilities. In general, much of the vegetation within the rights-of-way would be retained, thus increasing the potential for wildfires igniting within the rights-of-way and/or arcing with transmission facilities, resulting in unreliable and unsafe service for the transmission lines.

The Proposed Action would routinely remove vegetation before it becomes a hazardous condition, thus necessitating the implementation of the PCMs identified in Table 2-2. Implementation of the No Action alternative would likely result in similar impacts to vegetation as the Proposed Action; however, the impacts would be spread out over time and localized. In addition, under the No Action alternative proposed PCMs would not typically be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4).

3.3.3 Special-Status Plants

3.3.3.1 Affected Environment

For the purposes of this document, special-status species are defined as those plants whose geographic range and native habitats overlap with the Project area and that are:

- federally or state-listed, proposed for listing, or candidates for listing as threatened or endangered
- listed as sensitive by the USFS within the CNF

Table 3-4 lists the special-status plants known to occur within the Project area, including the vegetation community type in which each species occurs. None of these species is listed as endangered or threatened and, therefore, does not have any designated critical habitat.

Table 3-4. Special-Status Plant Species within the Project Area

Species Name	Status	Vegetation Community Type	Blooming Period
Cinder Phacelia (*Phacelia serrata*)	SOC	Ponderosa Pine – Volcanic Cinders	Late June to mid-September
Five Scale Bitterweed (*Hymenoxys quinquesquamata*)	SOC	Piñon-Juniper Woodland and Wetland/Cienega	July-September
Sunset Crater Beardtongue (*Penstemon clutei*)	SOC, USFS	Ponderosa Pine – Volcanic Cinders	April-August

SOC – USFWS Species of Concern
USFS – Forest Service Sensitive Species

Cinder Phacelia (*Phacelia serrata*)

Cinder phacelia is an annual with glandular and sticky leaves. Individuals are 4.0 to 13.4 inches in height. The species produces blue to light violet flowers from late June to mid-September. Cinder phacelia inhabits deep volcanic cinders associated with volcanic cones near ponderosa pine and piñon-juniper woodlands (Arizona Game and Fish Department [AZGFD] 2004; New Mexico Rare Plant Technical Council [NMRPTC] 2005). All known occurrences of this species within the CNF are located north of I-40. The only known occurrence of this species within the Project area is at the southeast corner of the Cinder Hills off-highway vehicle (OHV) area.

Five Scale Bitterweed (*Hymenoxys quinquesquamata*)

Five scale bitterweed is a perennial branched from a single woody stem. It produces flowers with yellow discs and rays from July through September. It is primarily known from open areas along the edges of pine-oak forests at elevations ranging from 5,000 tp 8,200 feet (Kleinman 2011; Bierner 2006). A single occurrence for this species is known from the CNF within the Project area near Potato Lake, approximately 1.5 miles north of Ashurst Lake.

Sunset Crater Beardtongue (*Penstemon clutei*)

Sunset Crater beardtongue is a perennial herb found in cinder fields with a layer of volcanic ash-cinder, 2 to 4 inches thick over a layer of silty soil. Other herbaceous vegetation is scarce in these areas. The species is found at elevations between 6,100 and 8,500 feet. It produces deep pink or rose-purple flowers from April to August (AZGFD 2003a). There are no known occurrences within the Project area; however, there are four occurrences within 0.25 mile, all located along the eastern edge of the Cinder Hills OHV Area. The Project area in this location contains suitable habitat for this species, indicating that it may be present despite the lack of documented occurrences.

3.3.3.2 Environmental Consequences

Within the Project area there are three sensitive plant species with known occurrences.

Under the Proposed Action, the removal of vegetation could affect special-status species, regardless if mechanical or manual methods were utilized. Individual plants could be trampled or otherwise damaged during vegetation management or right-of-way maintenance activities. To minimize this possibility, a botanist would identify and flag plants to be avoided in areas of known occurrences or suitable habitat. Methods of vegetation removal would be altered as appropriate to avoid impacts to special-status plant species.

As all three species are known to occur in open areas within woodlands, it is not anticipated that removal of trees or other large vegetation will have a long-term detrimental impact to the habitat for these species or curtail their populations.

3.3.3.3 Environmental Consequences from the No Action Alternative

Under the No Action alternative, Western would continue its need-driven management approach using current methods for vegetation management and right-of-way maintenance. Maintenance

activities would be reactive, resulting in vegetation removal occurring when vegetation growth has reached a hazardous condition for operation of the transmission facilities. In general, much of the vegetation within the rights-of-way would be retained, thus increasing the potential for wildfires igniting within the rights-of-way and/or arcing with transmission facilities, resulting in unreliable and unsafe operating conditions for the transmission lines.

The Proposed Action would routinely remove vegetation before it becomes a hazardous condition, thus necessitating the implementation of the PCMs identified in Table 2-2 for vegetation removal activities. Under the No Action alternative proposed PCMs may not be implemented. Consequently, implementation of the No Action alternative may result in higher impacts to special status plant species in the Project area than the Proposed Action, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4).

3.3.4 Wildlife

The Project area crosses approximately 90 miles of the CNF and numerous vegetation types. As a result, wildlife species may be impacted due to implementation of the Proposed Action. This section addresses impacts to wildlife species that are not protected under state or federal laws or regulations. Section 3.3.5 addresses special-status wildlife.

Information for this analysis was gathered through a literature review, and was provided by biologists from the AZGFD and CNF.

3.3.4.1 Affected Environment

A variety of wildlife species inhabit the CNF. These species range from rodents and lizards to big game and upland game species. All of Arizona's native wildlife, including threatened and endangered species, is protected under the general provisions of Arizona Revised Statutes (A.R.S.), Title 17. It is illegal to *take* wildlife unless authorized by the Arizona Game and Fish Commission. *Take* is specifically defined under A.R.S. § 17-101 to mean "pursuing, shooting, hunting, fishing, trapping, killing, capturing, snaring or netting wildlife or the placing or using of any net or other device or trap in a manner that may result in the capturing or killing of wildlife."

General wildlife that may be found within the Project area includes:

- Mammals such as pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), elk (*Cervus elaphus*), black bear (*Ursus americanus*), porcupine (*Erethizon dorsatum*), badger (*Taxidea taxus*), and coyote (*Canis latrans*)
- Raptors such as peregrine falcons (*Falco peregrinus*), American kestrels (*Falco sparverius*), and red-tailed hawks (*Buteo jamaicensis*)
- Woodland birds such as Stellar's jay (*Cyanocitta stelleri*), northern flicker (*Colaptes auratus*), pygmy nuthatch (*Sitta pygmaea*), and hairy woodpecker (*Picoides villosus*)
- Reptiles and amphibians such as Woodhouse toad (*Bufo woodhouseii*), tiger salamander (*Ambystoma tigrinum*), chorus treefrog (*Pseudacris triseriata*), and common kingsnake (*Lampropeltis getula*)

Management Indicator Species

Management Indicator Species (MIS) are identified in the land and resource management plans of each national forest, and are generally identified to represent habitat types that occur within the national forest boundary and/or because they are thought to be sensitive to the national forest system management activities. The CNF currently identifies 17 species as MIS based on Management Areas. Table 3-5 lists the MIS and their potential to occur within the right-of-way, the danger tree area (60 feet outside the rights-of-way), or within the 0.5 mile wide study area.

Two of the species included in this list are fully assessed in the next section as Special-Status Species (see Section 3.3.5); Mexican spotted owl (*Strix occidentalis lucida*) and northern goshawk (*Accipiter gentilis*).

Table 3-5. Management Indicator Species Potential for Occurrence within the Project Area

Species	Habitat	Potential for Occurrence		
		Within Rights-of-Way	Within Danger Tree Area	Within Study Area
Birds				
Cinnamon Teal (*Anas cyanoptera*)	Riparian / Open Water	**None.** The rights-of-way span two large creeks (Fossil Creek and West Clear Creek) which are unlikely habitat for teals.	**None.** The area spans two large creeks which are unlikely habitat for teals.	**High.** The rights-of-way cross within 0.5 mile of lakes and tanks which provide preferred open calm water.
Hairy Woodpecker (*Picoides villosus*)	Cinder Hills Off-Highway Vehicle Area; Ponderosa Pine and Mixed Conifer; Unprotected Timber Land	**High.** Over 60% of the rights-of-way lie within preferred habitat.	**High.** Over 60% of the area lies within preferred habitat.	**High.** A majority of the study area lies within preferred habitat.
Juniper Titmouse (*Baeolophus ridgwayi*)	Piñon-Juniper Woodland	**High.** Over 25% of the rights-of-way lie within piñon-juniper woodland.	**High.** Over 25% of the area lies within piñon-juniper woodland.	**High.** Over 25% of the study area lies within piñon-juniper woodland.
Lincoln's Sparrow (*Melospiza lincolnii*)	Riparian	**Moderate.** The species is a transient inhabitant of wetlands within the rights-of-way.	**Moderate.** The species is a transient inhabitant of wetlands within the area.	**Moderate.** The species is a transient inhabitant of wetlands.
Lucy's Warbler (*Vermivora luciae*)	Riparian	**Moderate.** Suitable habitat is present; however, documented occurrences within the rights-of-way are not confirmed.	**Moderate.** Suitable habitat is present; however, documented occurrences within the area are not confirmed.	**Moderate.** Suitable habitat is present; however, documented occurrences within the area are not confirmed.
Mexican Spotted Owl (*Strix occidentalis lucida*)	Ponderosa Pine and Mixed Conifer	**High.** Known suitable habitat and protected activity centers present.	**High.** Known suitable habitat and protected activity centers present.	**High.** Known suitable habitat and protected activity centers present.

Table 3-5. Management Indicator Species Potential for Occurrence within the Project Area				
Species	**Habitat**	**Potential for Occurrence**		
		Within Rights-of-Way	**Within Danger Tree Area**	**Within Study Area**
Northern Goshawk (*Accipiter gentilis*)	Ponderosa Pine and Mixed Conifer	**High.** Known suitable habitat present through large portion of the rights-of-way.	**High.** Known suitable habitat present through large portion of the area.	**High.** Known post-fledgling family area present within study area in addition to presence of suitable habitat.
Pygmy Nuthatch (*Sitta pygmaea*)	Cinder Hill Off-Highway Vehicle Area; Ponderosa Pine and Mixed Conifer	**High.** Known habitat present through large portion of the rights-of-way.	**High.** Known habitat present through large portion of the area.	**High.** Known habitat present through large portion of the study area.
Red-naped Sapsucker (*Sphyrapicus nuchalis*)	Aspen	**Low.** No suitable aspen habitat within the rights-of-way, but small amount of mixed conifer with aspen is present.	**Low.** No suitable aspen habitat within the area, but small amount of mixed conifer with aspen present.	**Low.** No suitable aspen habitat within the study area, but small amount of mixed conifer with aspen is present.
Wild Turkey (*Meleagris gallopavo merriamii*)	Ponderosa Pine and Mixed Conifer	**High.** Suitable habitat throughout much of the rights-of-way.	**High.** Suitable habitat throughout much of the area.	**High.** Suitable habitat throughout much of the study area.
Yellow-breasted Chat (*Icteria virens*)	Riparian; Verde Wild and Scenic River	**Moderate.** Suitable habitat is present at crossings of major waterways.	**Moderate.** Suitable habitat is present at crossings of major waterways.	**Moderate.** Suitable habitat is present at crossings of major waterways.
Mammals				
Abert's Squirrel (*Siurus aberti*)	Ponderosa Pine and Mixed Conifer; Unprotected Timber Land	**Low.** Species prefers dense, closed canopy forest which is not present within the rights-of-way.	**Low.** Species prefers dense, closed canopy forest which is extremely limited within the danger tree area.	**Moderate.** Species prefers dense, closed canopy forest which is limited within the study area.
Elk (*Cervus elaphus*)	Mountain Grassland; Piñon-Juniper Woodland; Ponderosa Pine and Mixed Conifer; Unprotected Timber Land	**High.** Known habitat within the rights-of-way.	**High.** Known habitat within the area.	**High.** Known habitat within the study area.
Mule Deer (*Odocoileus hemonius*)	Cinder Hills Off-Highway Vehicle Area; Piñon-Juniper Woodland; Unprotected Timber Land	**High.** Known habitat within the rights-of-way.	**High.** Known habitat within the area.	**High.** Known habitat within the study area.

Table 3-5. Management Indicator Species Potential for Occurrence within the Project Area				
Species	**Habitat**	**Potential for Occurrence**		
		Within Rights-of-Way	**Within Danger Tree Area**	**Within Study Area**
Pronghorn (*Antilocapra americana*)	Grassland and Sparse Piñon-Juniper Above the Rim; Mountain Grassland; Verde Valley	**High.** Herds are known to utilize portions of the rights-of-way.	**High.** Herds are known to utilize portions of the area.	**High.** Herds are known to utilize portions of the study area.
Red Squirrel (*Tamiasciurus hudsonicus*)	Ponderosa Pine and Mixed Conifer	**High.** Suitable habitat present within rights-of-way.	**High.** Suitable habitat present within area.	**High.** Suitable habitat present within study area.
Invertebrates				
Macroinvertebrates	Riparian / Open Water; Verde Wild and Scenic River	**High.** Macroinvertebrates inhabit all aquatic systems.	**High.** Macroinvertebrates inhabit all aquatic systems.	**High.** Macroinvertebrates inhabit all aquatic systems.

Birds

Cinnamon Teal

The cinnamon teal is a relatively common dabbling duck found throughout much of Mexico and the western United States. Cinnamon teals inhabit freshwater or brackish wetlands including highly alkaline waters. This omnivorous species feeds on seeds and various invertebrates (Gammonley 1996). Cinnamon teal was selected as a MIS for Management Area (MA) 12: Riparian and Open Waters. The primary reason the cinnamon teal was selected as a MIS was that it is considered a sensitive indicator of livestock grazing in wetlands and the species is economically important. Cinnamon teals are primarily a summer resident of CNF on seasonal and semi-permanent wetlands with higher densities on small, seasonal wetlands. The species is primarily known from Mormon Lake and the Anderson Mesa lakes complex. Studies on cinnamon teal have been limited resulting in inconclusive information regarding population trends on CNF (USFS 2002).

There is not suitable habitat for this species within the transmission line rights-of-way or danger tree area and limited habitat within the study area. The only suitable wetlands within the study area are part of the Anderson Mesa lakes complex. Specifically, Ashurst Lake, Potato Lake, and Breezy Tank No. 2 are located within the study area.

Hairy Woodpecker

The hairy woodpecker has the largest range of any woodpecker in North America. It is a year-round resident of forests from central Alaska east to Newfoundland and south to the Caribbean and Nicaragua. In Arizona, the species inhabits coniferous woodlands such and piñon-juniper areas. Hairy woodpeckers primarily feed on arthropods and a variety of fruits and seeds (Jackson et al 2002). The hairy woodpecker was selected as a MIS for the snag component of ponderosa pine, mixed conifer, and spruce-fir woodlands which corresponds to MA 3: Ponderosa Pine and Mixed Conifer Less than 40% Slope; MA 4: Ponderosa Pine and Mixed Conifer Greater than

40% Slope; MA 6: Unprotected Timber Land; MA 13: Cinder Hills; MA 31: Craters; MA 32: Deadman Wash; and MA 33: Doney. The hairy woodpecker is closely tied to snags and old ponderosa pine within younger stands and stands of old growth ponderosa. The population trend of hairy woodpeckers within CNF is stable or slightly increasing on a long-range scale. Habitat trend in ponderosa pine cover type for snags is declining, but the trend in mixed conifer and spruce-fir is increasing (USFS 2002).

Most of the trees within the rights-of-way are likely too young to provide suitable habitat; however, large trees which provide suitable habitat for the hairy woodpecker within the rights-of-way and in the danger tree area will be targeted for vegetation management. Suitable habitat is present within the study area.

Juniper Titmouse

Until recently the juniper titmouse and oak titmouse were listed as a single species (the plain titmouse). The juniper titmouse is a year-round resident of juniper and piñon-juniper woodlands of the intermountain region of the United States. Juniper titmice feed on terrestrial invertebrates and seeds, especially piñon pine seeds during years of small cone crops (Cicero 2000). The juniper titmouse was selected as a MIS for late seral piñon-juniper, particularly the snag component which corresponds to MA 7: Piñon-Juniper Woodland Less than 40% Slope; MA 8: Piñon-Juniper Woodland Greater than 40% Slope; MA 31: Craters; MA 32: Deadman Wash; and MA 33: Doney. The population trend of the juniper titmouse within CNF is stable to declining. It is thought that this may be a result of the fact that titmouse densities decrease with increases in tree density, total bird densities, proportion of junipers in a stand, and canopy cover (USFS 2002).

Over 25% of the rights-of-way lie within piñon-juniper woodlands with additional portions in piñon-juniper evergreen shrub. This ratio is similar for the danger tree and study areas.

Lincoln's Sparrow

Lincoln's sparrow tends to inhabit areas with dense shrub cover building nests in surprisingly boggy sites. The species' breeding range spans from Alaska to Newfoundland and south through the Rocky and Sierra Nevada mountains to the southern United States. Its winter range is primarily found in Mexico, but extends north into the southern Great Plains and along the Pacific coast of the United States. In Arizona, the species is known to breed in the White and San Francisco Mountains. The San Francisco Mountains are located within CNF. Lincoln's sparrows feed primarily on arthropods, but will eat small seeds when terrestrial invertebrates are not available (Ammon 1995). The Lincoln's sparrow was selected as a MIS for high elevation riparian scrub habitat comprised primarily of willows which corresponds to MA 12: Riparian and Open Water. Within the Forest, the species is known to breed in the inner-basin on the San Francisco Peaks between 8,300 and 10,000 feet in elevation, but is a fairly common summer resident over 5,000 feet elevation and common winter resident below 5,000 feet. At all elevations, the sparrow primarily inhabits wetlands (USFS 2002).

Within the rights-of-way, there are limited areas of potentially suitable habitat during summer and winter and no suitable breeding habitat. These potentially suitable summer and winter habitats are limited to the Anderson Mesa lakes complex and the vicinity of Mormon Lake. The same is true for the danger tree and study areas.

Lucy's Warbler

Lucy's warbler inhabits dense lowland riparian mesquite woodlands. As a result, its breeding range is tied closely to major river systems in the southwestern United States. The species is found along most of the Colorado River from southwestern Colorado to the Mexican border. Two other major river systems inhabited by Lucy's warbler are the Gila River and the southern portion of the Rio Grande from Elephant Butte Reservoir south to Big Bend, Texas. The species winters along the Pacific coast of Mexico. Lucy's warbler feed almost entirely on insects (Johnson et al. 1997). Lucy's warbler was selected as a MIS for late seral, low elevation (< 7,000 feet) riparian forest which corresponds to MA 12: Riparian and Open Water. There is little information on the status of this species within CNF. Statewide, the population may be on the decline; however, local experts indicate that the population within the Forest may be stable.

Within the rights-of-way, danger tree area, and study area, there are limited areas of potentially suitable habitat. These sites are primarily associated with the seasonal wetlands found in the Anderson Mesa lakes complex.

Pygmy Nuthatch

The pygmy nuthatch inhabits long-needles pine forests from southern British Columbia through the mountains of the western United States to central Mexico. The species is found in forests of ponderosa pine, Jeffrey pine, and similar species. Pygmy nuthatches nest in snags and prefer mature, old-growth forests. The feed primarily on insects, but shift to a diet of pine seeds during the winter (Kingery and Ghalambor 2001). The pygmy nuthatch was selected as a MIS for late seral ponderosa pine habitat which corresponds to MA 3: Ponderosa Pine and Mixed Conifer Less than 40% Slope; MA 4: Ponderosa Pine and Mixed Conifer Greater than 40% Slope; MA 13: Cinder Hills; MA 31: Craters; MA 32: Deadman Wash; and MA 33: Doney. Habitat trends for pygmy nuthatch have been declining within CNF; however, management efforts are in place to increase snag retention. Overall, statewide data indicate that pygmy nuthatch populations are stable on a gross, long-range scale (USFS 2002).

Within the rights-of-way, danger tree area and study area, there are large areas of ponderosa pine forest. However, within the rights-of-way, these areas were initially disturbed approximately 60 years ago. Therefore, it is unlikely that existing snags providing suitable nesting habitat are plentiful within the rights-of-way. However, vegetation management efforts will target the large trees in the area which would likely become snags in the near future.

Red-naped Sapsucker

The red-naped sapsucker has a breeding range from central British Columbia south to central Arizona and New Mexico and an overlapping winter range from south Utah to central Mexico. The CNF lies within the area inhabited year-round by red-naped sapsuckers. The species inhabits deciduous and mixed woodlands including aspen groves in open ponderosa pine forests. Sapsuckers feed on sap, fruit, and arthropods (Walters et al 2002). The red-naped sapsucker was selected as a MIS for late seral stage and snag component of aspen, specifically MA 5: Aspen. Population data indicates that red-naped sapsucker populations are stable within CNF as most aspen on the Forest is older which provides habitat for sapsuckers (USFS 2002).

There are no portions of MA 5: Aspen within the rights-of-way, danger tree, or study area; however, there is a small amount of mixed conifer with aspen according to the potential natural vegetation types data provided by CNF. Approximately 0.2 linear mile of the rights-of-way crosses this vegetation type while approximately 0.4 mile of danger tree area and 1.4 linear miles of study area cross mixed conifer with aspen. These areas are located in the vicinity of Hutch Mountain Lookout.

Wild Turkey

Wild turkey primarily inhabits oak woodlands and pine-oak forests. They are non-migratory and strongly social. Individuals spend most of the daylight hours on the ground and roost in trees at night to avoid predation (Eaton 1992). Within the CNF, the subspecies of turkey known as Merriam's wild turkey is found. This subspecies primarily inhabits ponderosa pine forests (AZGFD 2009). Merriam's wild turkeys are not typically found below the piñon-juniper zone and seldom occur where this is not adjacent to higher areas of ponderosa pine. Turkeys feed primarily on vegetable matter foraged from the forest floor, but may also feed on invertebrates and small reptiles and amphibians (Eaton 1992). The wild turkey was selected as a MIS for late seral ponderosa pine habitat which corresponds to MA 3: Ponderosa Pine and Mixed Conifer Less than 40% Slope; MA 4: Ponderosa Pine and Mixed Conifer Greater than 40% Slope; MA 31: Craters; MA 32: Deadman Wash; and MA 33: Doney, but is also known to inhabit mixed conifer, springs and seeps, and piñon-juniper (USFS 2002).

There are large portions of the rights-of-way, danger tree area, and study area that provide potentially suitable habitat for wild turkeys.

Yellow-breasted chat

The breeding range for the yellow-breasted chat is primarily found in the eastern United States; however, there are breeding areas scattered throughout the western United States and northern Mexico. The chat's winter range is from coastal Mexico south to Panama. In the western part of its range, the chat is largely restricted to riparian and shrubby habitats. Chats feed on small invertebrates throughout the summer and take fruits and berries when available (Eckerle and Thompson 2001). The yellow-breasted chat was selected as a MIS for late seral, low elevation riparian habitat which corresponds to MA 2: Verde Wild and Scenic River; and MA 12: Riparian and Open Water. It is felt that populations of yellow-breasted chat within CNF are stable or slightly decreasing, but the data is inconclusive (USFS 2002).

Within the rights-of-way, danger tree area, and study area suitable habitat for yellow-breasted chat is limited to the riparian areas of West Clear Creek, Fossil Creek (and tributaries such as Sally May Wash and Boulder Canyon), and Verde River. Within the study area, there is potential for suitable habitat to be present around tanks; however, most of these areas have very limited vegetation and are not likely to be utilized by chats.

Mammals

Abert's Squirrel

Abert's squirrel is a gray squirrel with long tufts on its ears. The species inhabits Ponderosa or yellow pine forests in Wyoming, Colorado, New Mexico, Utah, and Arizona between 5,900 and

9,800 feet in elevation. As a result, many populations are isolated from each other. Various parts of the ponderosa pine including inner bark, seeds, terminal buds, and staminate flowers are consumed extensively throughout the year. These squirrels also feed on fungi, carrion, and bones and antlers (Nash and Seaman 1977). Abert's squirrel was selected as a MIS for early seral stage ponderosa pine forests which corresponds to MA 3: Ponderosa Pine and Mixed Conifer Less than 40% Slope; MA 4: Ponderosa Pine and Mixed Conifer Greater than 40% Slope; MA 6: Unprotected Timber Land; MA 31: Craters; MA 32: Deadman Wash; and MA 33: Doney; however, recent research has indicated that the species' best habitat is intermediate to older aged forests. This squirrel tends to prefer forests with crowns that are interlocking or in close proximity. Population trend data for Abert's squirrel on the CNF is inconclusive, but statewide data from hunter harvest indicate a stable trend.

Abert's squirrel has the potential to occur throughout much of the ponderosa pine habitat in the central and northern portions of the project area. However, given their preference for dense, closed canopy forest, they are unlikely to be found within the rights-of-way or danger tree area.

Elk

The elk is a large deer found in the Rocky Mountain region of North America from northern British Columbia south almost to the U.S.-Mexico border. Bull elk grow large, many-tined antlers each year which shed in the fall or early winter. This is the most vocal of the deer species exhibiting a long, loud bugle (Whitaker 1996). Elk are managed for hunting throughout their range by state and federal agencies. Elk are managed by the Arizona Game and Fish Department (AZGFD) within Arizona. Elk was selected as a MIS for early-seral stage ponderosa pine, mixed-conifer, and spruce-fir habitat types which correspond to MA 3: Ponderosa Pine and Mixed Conifer Less than 40% Slope; MA 4: Ponderosa Pine and Mixed Conifer Greater than 40% Slope; MA 6: Unprotected Timber Land; MA 7: Piñon-Juniper Woodland Less than 40% Slope; MA 8: Piñon-Juniper Woodland Greater than 40% Slope; MA 9: Mountain Grassland; MA 31: Craters; MA 32: Deadman Wash; and MA 33: Doney. Elk are associated with deciduous thickets and early-seral stage of forests that contain an interspersion of the grass-forb vegetative type (USFS 2002). Elk populations within CNF peaked in 1994 at approximately 22,000 animals, but were reduced to about 14,000 by 2011. Beginning in 2011, antlerless permits were reduced by almost half in an effort to stabilize the declining elk population (AZGFD 2011a).

The entire rights-of-way, danger tree, and study area fall within AZGFD game management units (GMU) known to contain elk herds. Throughout the year, elk may utilize the entire area.

Mule deer

The mule deer is a mid-sized deer found throughout North America from the Yukon Territory of Canada to central Mexico. The species appears relatively similar to the white-tailed deer (*Odocoileus virginianus*) by a tail that is white to black above and tipped with black, antlers that branch dichotomously, and their characteristically larger ears. Mule deer are forage on an equivalent mix of woody and herbaceous plants (Anderson and Wallmo 1984). The mule deer was selected as a MIS for early-seral stages of aspen and piñon-juniper woodlands which correspond to MA 6: Unprotected Timber Land; MA 7: Piñon-Juniper Woodland Less than 40% Slope; MA 8: Piñon-Juniper Woodland Greater than 40% Slope; MA 9: Mountain Grassland; MA 13: Cinder Hills; MA 31: Craters; MA 32: Deadman Wash; and MA 33: Doney. Mule deer

may also be found in the ponderosa pine, mixed-conifer, and chaparral habitats. The species is managed as big game for hunting by the AZGFD. Forestwide there has been a decline in populations of mule deer. Aspen stands are dominated by old trees and continuing to be lost through forest succession resulting in coniferous trees (USFS 2002).

Mule deer can be found throughout much of the rights-of-way, danger tree, and study area.

Pronghorn

Pronghorn (often referred to as antelope) are found throughout the American West. Pronghorn inhabit grasslands and shrublands of the plains and desert. Females tend to produce twin fawns in early June (Whitaker 1996; Smithsonian National Museum of Natural History 2011). Pronghorn forage on a wide variety of plants including sagebrush, forbs, grasses, and cacti (O'Gara 1978). Pronghorn are managed for hunting by AZGFD. Pronghorn were selected as a MIS for early and late seral grasslands which corresponds to MA 9: Mountain Grassland; MA 10: Grassland and Sparse Piñon-Juniper Above the Mogollon Rim; MA 11: Verde Valley; MA 31: Craters; MA 32: Deadman Wash; and MA 33: Doney. Forestwide population trend for pronghorn is declining; however, GMU 7 (north of I-40 and east of the rights-of-way and US 89) is stable as of 2002 (USFS 2002). Since 2002, over 90 animals were transplanted to supplement the population of the Anderson Mesa herd (GMUs 5A and 5B) (ASGFD 2011b).

There are three GMUs that cross the rights-of-way, danger tree, and study area with known pronghorn herds. GMU 7 (north of I-40) contains approximately 1,008,644 acres of pronghorn habitat; however, only 246,721 acres (less than 25%) contain high or moderate quality habitat). This herd appears to maintain a stable population. The Anderson Mesa herd (GMUs 5A and 5B) exists between I-40 and the Clear Creek Canyon and ponderosa pine forests. This herd has struggled to maintain a stable population and has been supplemented with new animals in 2007 and 2009. GMU 6A crosses the southern portion of the rights-of-way; however, since the construction of I-17 and State Route 260 in the late 1960s, pronghorn populations have dwindled and even disappeared. In September 2001, a pronghorn herd was observed within this GMU between Highway 89A and I-17. This is the first known occurrence of pronghorn in this area for 35 years. However, this places the herd at least 17 miles from the rights-of-way and west of I-17. This herd is unlikely to utilize the rights-of-way, danger tree, or study area in the near future.

Individual pronghorn or small groups of pronghorn are known to utilize areas outside the known herd boundaries. Among these areas are Diversion Park and along Lake Mary Rd (J. Oertley, personal communication). Therefore, there is potential for pronghorn to utilize portions of the study area.

Red squirrel

The red squirrel is a diurnal tree squirrel found from Alaska to Newfoundland. Its southern reaches extend to Georgia through the Appalachian Mountains and to southern New Mexico and Arizona via the Rocky Mountains. Red squirrels gather female conifer cones in late summer through autumn and store them in middens. Depending upon habitat and food availability, middens will contain enough food to last one or two seasons (Steele 1998). The red squirrel was selected as a MIS for late seral stage mixed conifer and spruce-fir forests which correspond to MA 3: Ponderosa Pine and Mixed Conifer Less than 40% Slope; MA 4: Ponderosa Pine and Mixed Conifer Greater than 40% Slope; MA 31: Craters; MA 32: Deadman Wash; and MA 33:

Doney. In Arizona, the species is found where spruce, spruce with Douglas-fir, or white-fir with Douglas-fir occur at elevations above 7,500 feet. The population trend for red squirrels within Coconino National is inconclusive due to lack of information. However, while some habitat loss has occurred, the future trend toward smaller trees could affect red squirrels by reducing available snags that provide suitable nesting habitat and cache locations (USFS 2002).

Within the rights-of-way, danger tree area, and study area, the red squirrel inhabits ponderosa pine and piñon-juniper woodlands.

Macroinvertebrates

Macroinvertebrates are organisms that lack a backbone, are visible by the naked eye, are greater than 0.5 millimeter in size, and which require an aquatic environmental to exist and/or complete their life cycle. Macroinvertebrates provide a natural means of detecting the health of an aquatic system. Macroinvertebrates were selected as MIS for MA 2: Verde Wild and Scenic River and MA 12: Riparian and Open Water. Studies have been conducted within several streams, rivers, and creeks within CNF. Data appears to show stable populations of macroinvertebrates, the data is inconclusive. Macroinvertebrate population levels can vary from year to year based on water levels within aquatic systems (USFS 2002).

Macroinvertebrates are present within all aquatic systems in the rights-of-way, danger tree area, and study area.

3.3.4.2 Environmental Consequences

Impacts to wildlife could occur when habitats or individuals are disturbed or lost during Project-related activities. The significance of the impact depends, in part, on the sensitivity of the population.

Managing vegetation along the Project area has the potential to affect wildlife. Individuals may be directly harmed and habitat may be lost, fragmented, or degraded. Additionally, adverse impacts may occur from the direct loss of life through disruption of breeding and consequent loss of eggs, chicks, or fledglings, through collision mortality on roads, or through direct contact with mechanical equipment.

Habitat Loss and Degradation

Forests have become less resilient to natural disturbances as a result of fire suppression, cattle grazing, timber production, and human habitation in and around forests during the previous 100 years. Due to these impacts, the pine forests of the Southwest have become more dense with small diameter trees (Covington and Moore 1994), making the area more susceptible to large, severe wildfires (Swetnam and Betancourt 1998).

Relative to the size and limits of the right-of-way, a significant amount of habitat has already been lost or modified over the years through implementation of Western's current vegetation management procedures (see Section 1.4). The transmission lines were constructed in the 1960s. Given this, the faunal assemblage in the immediate vicinity of the Project area consists of those species that are supported by modified habitat conditions and associated human activities.

Wildlife that is highly sensitive to human disturbance has likely permanently moved away from the existing right-of-way. Similarly, animals that tend to avoid openings will no longer use the right-of-way and animals that prefer openings will have their habitats somewhat improved through the Proposed Action.

The Proposed Action is designed to create permanent changes in habitat conditions through conversion of existing conditions to stable, low-growing vegetation communities. This requires short-term disturbance to create long-term reductions in the need for vegetation removal and, therefore, reduces disturbance to local wildlife.

Mechanical vegetation removal would be the predominant treatment for the Project (see Section 2.1.1.1, Vegetation Removal Methods); however, manual vegetation removal methods would also be implemented where required (e.g., terrain, environmental resource constraints, etc.). In general, grasses would not be cut unless they are in areas with taller woody vegetation that would be mowed or masticated. Immediately following vegetation management activities, grasses and shrubs may be shorter than preferred by species such as turkey and pronghorn. However, these are fast-growing vegetation species. It is anticipated that impacts would be temporary and wildlife would utilize these areas again for fawning and grazing.

Habitat Fragmentation

While openings and habitat edges are beneficial for some wildlife (such as raptors), openings also fragment habitats. Habitat fragmentation creates a greater number of small habitat patches. Smaller patches may not have the same attributes and characteristics as more contiguous tracts of habitat. Fragmentation of primary habitat types can hinder regional wildlife movements, potentially resulting in reduced interaction between individuals and changes to long-term population dynamics.

Some species may benefit from the fragmentation of habitat. Many raptors hunt for prey along habitat edges. However, prey species are more vulnerable due to reduced cover. Species such as turkeys are less likely to move through areas of low vegetation. Pronghorn may still use areas for foraging, but fawning areas would be reduced.

Habitat within the Project area has been previously disturbed and degraded to varying degrees from construction of the transmission facilities. Under the Proposed Action, the cleared area within the rights-of-way would be regularly maintained to achieve Western's desired condition (see Section 1.3). This may result in a harder edge and somewhat greater fragmentation despite previous habitat alteration.

Management Indicator Species

Environmental consequences for each MIS are based on the amount of habitat impacted by Project activities and the severity of that impact. For each species, a statement is made defining if the Proposed Action is anticipated to have an effect, will likely have an effect, may have an effect, or will not have an effect. For those species for which there is potential for an effect, a statement is made assessing potential impact to the forest-wide population trends. Population trend data is based on the "Management Indicator Species Status Report for the CNF" published in 2002.

Within the study area, all species may experience indirect effects as a result of Project-related activities. These effects include noise and vibrations that may be heard and felt by individuals away from the immediate work area. Additionally, there will be increased traffic and human presence during periods of work. These effects are all short-term and are not anticipated to result in impacts to populations of MIS.

Table 3-6 provides the acreage of habitat for each species within CNF, rights-of-way, danger trees area, and study area. "Habitat" in this table is determined by Management Areas for which each species may be associated.

Table 3-6. Species Habitat* within Coconino National Forest and Project Area

Species	Forest-wide Habitat (acres)	Habitat within Rights-of-Way (acres / %)	Habitat within Danger Tree Area (acres / %)	Habitat within Study Area (acres / %)
Birds				
Cinnamon Teal	20,147	19 / 0.09	8 / 0.04	433 / 2.15
Hairy Woodpecker	766,645	1,252 / 0.16	697 / 0.09	31,666 / 4.13
Juniper Titmouse	420,987	1,382 / 0.33	584 / 0.14	26,262 / 6.24
Lincoln's Sparrow	20,147	19 / 0.09	8 / 0.04	433 / 2.15
Lucy's Warbler	20,147	19 / 0.09	8 / 0.04	433 / 2.15
Pygmy Nuthatch	699,993	1,181 / 0.17	644 / 0.09	29,151 / 4.16
Red-naped Sapsucker	3,370	0 / 0	0 / 0	0 / 0
Wild Turkey	686,240	1,079 / 0.16	610 / 0.09	27,518 / 4.01
Yellow-breasted Chat	23,040	35 / 0.15	15 / 0.07	550 / 2.39
Mammals				
Abert Squirrel	752,892	1,150 / 0.15	663 / 0.09	30,033 / 3.99
Elk	1,054,514	1,750 / 0.17	935 / 0.09	43,272 / 4.10
Mule Deer	501,392	1,554 / 0.31	671 / 0.13	30,410 / 6.07
Pronghorn	397,629	1,855 / 0.47	532 / 0.13	20,110 / 5.06
Red Squirrel	686,240	1,079 / 0.16	610 / 0.09	27,518 / 4.01
Invertebrates				
Macroinvertebrates	23,040	35 / 0.15	15 / 0.07	550 / 2.39
Total	**1,851,387**	**3,275 / 0.18**	**1,336 / 0.07**	**61,234 / 3.31**

* In this table, habitat is defined as the Management Area(s) each species is associated with. Percent indicates the percentage of the forest-wide habitat available contained within the rights-of-way, danger tree area, and study area.

Birds

Cinnamon Teal

The Proposed Action will have no effect on cinnamon teal. There is no suitable nesting or stopover habitat within the rights-of-way. The cinnamon teal is a common breeder in this area and is likely to use wetlands in the vicinity for stopovers during migration. Ashurst Lake is located within the study area; however, there are no hazardous trees or anticipated vegetation management activities that would affect species at the lake.

The management indicator habitat for cinnamon teal is riparian and open water. This habitat is unlikely to be impacted by project-related activities. Less than 0.14% of the available habitat within the CNF is located within the rights-of-way and/or danger tree area. Therefore, the Project

would not change the current trend in the population numbers for cinnamon teal or its indicator habitat.

Hairy Woodpecker

The Proposed Action will likely have an effect on the hairy woodpecker. The species inhabits snags of coniferous tree species. These trees may be declared hazardous trees and would, therefore, be targeted for vegetation management. However, as the rights-of-way were established in the 1960s, most of the trees located within the rights-of-way are likely too young to provide ideal habitat for the hairy woodpecker. Through avoidance of the breeding season, it is anticipated that impacts to the species will not alter the long-range stable population trend that currently exists within the CNF.

The management indicator habitat for hairy woodpecker is ponderosa pine and mixed conifer. This habitat is likely to be impacted by vegetation management activities. However, because the rights-of-way and danger tree area contain only 0.25% of the forest-wide total indicator habitat for hairy woodpecker, there would be little to no effect to the forest-wide population trend for the hairy woodpecker or its indicator habitat.

Juniper Titmouse

The Proposed Action will likely have an effect on the juniper titmouse. The species is known to inhabit areas located within the rights-of-way and study area. The project will remove vegetation within these areas that may be used by the juniper titmouse. However, as these transmission lines were installed approximately 50 years ago, the trees within the rights-of-way have likely not reached full height and are unlikely to provide the snag habitat preferred by the juniper titmouse. It is anticipated that impacts to the species will not substantially contribute to the current apparent decline in population trend of this species.

The management indicator habitat for the juniper titmouse is piñon-juniper woodland. This habitat is likely to be impacted by vegetation management activities. However, because the rights-of-way and danger tree area contain only 0.47% of the forest-wide total indicator habitat for juniper titmouse, there would be little to no effect to the forest-wide population trend or its indicator habitat.

Lincoln's Sparrow and Lucy's Warbler

The Proposed Action may have an effect on Lincoln's sparrow and Lucy's warbler; however, this effect is anticipated to be minimal. There is no breeding habitat within the rights-of-way or study area. Summer and winter habitat is limited to riparian areas which are anticipated to be avoided by the project. These areas have few hazardous trees and heavy equipment is not able to traverse the boggy areas preferred by these species. It is anticipated that vegetation management efforts within these habitat areas would be conducted by hand crews which would leave the shrubby groundcover inhabited by these species intact.

The management indicator habitat for both Lincoln's sparrow and Lucy's warbler is riparian shrubs. This habitat is unlikely to be directly impacted by vegetation management activities as riparian and wetland areas are anticipated to be avoided as discussed above. Because the rights-of-way and danger tree area contain only 0.14% of the forest-wide total indicator habitat for

these species, there would be little to no effect to the forest-wide population trends or their indicator habitat.

Pygmy Nuthatch

The Proposed Action may have an effect on the pygmy nuthatch. The nuthatch inhabits the ponderosa pine forests which contain the highest numbers of hazardous trees. While the number of suitable nesting snags within the rights-of-way is low, by removing trees that could become snags in the future, the proposed action will not further the efforts of snag recruitment. As the areas to be disturbed are currently poor quality nesting habitat for pygmy nuthatch, it is anticipated that the Proposed Action will not impact forest-wide population trends of the pygmy nuthatch.

The management indicator habitat for the pygmy nuthatch is ponderosa pine and mixed conifer. This habitat is likely to be impacted by vegetation management activities. However, because the rights-of-way and danger tree area contain only 0.26% of the forest-wide total indicator habitat for pygmy nuthatch, there would be little to no effect to the forest-wide population trend or its indicator habitat.

Red-naped Sapsucker

The Proposed Action is unlikely to have an effect on the red-naped sapsucker. There is only a small portion of the project area that is considered potential habitat for this species. Management Area 5 (Aspen), which provides the most ideal habitat for this species, is not located within the rights-of-way, danger tree area, or the study area; however, 8 acres mixed conifer with aspen is present within the rights-of-way. Although trees including snags could be removed, it is anticipated that the proposed action will not result in a change to the stable population trend of the red-naped sapsucker.

The management indicator habitat for the red-naped sapsucker is aspen. This habitat is unlikely to be impacted by vegetation management activities. Because the rights-of-way and danger tree area do not contain any of the indicator habitat for red-naped sapsucker, there would be no effect to the forest-wide population trend or its indicator habitat.

Wild Turkey

The Proposed Action may have an effect on wild turkeys. Turkeys rely on mature trees to produce nuts and seeds for sustenance as well as for roosting sites. These trees are most likely to be targeted for management within and adjacent to the rights-of-way. Further, it is known that turkeys are less likely to move through areas of low vegetation and may be reluctant to cross the rights-of-way to access certain portions of the forest. This fragmentation will be most apparent following the initial vegetation management activities, but should subside as shrubs begin to reestablish within the rights-of-way. Low growing shrub species are anticipated to be maintained following initial vegetation removal activities.

The management indicator habitat for the wild turkey is ponderosa pine and mixed conifer. This habitat is likely to be impacted by vegetation management activities. However, because the rights-of-way and danger tree area contain only 0.25% of the forest-wide total indicator habitat

for wild turkey, there would be little to no effect to the forest-wide population trend or its indicator habitat.

Yellow-breasted Chat

The Proposed Action may have an effect on yellow-breasted chats. There are three areas of suitable habitat within the rights-of-way. At West Clear Creek the transmission lines span the creek at a high enough elevation that no vegetation is intended to be cleared and will, therefore, not impact chats in this area. There are no hazardous trees in the vicinity of the Verde River and dense vegetation preferred by chats is projected to be left intact. However, at the southern crossing of Fossil Creek, there are hazardous trees located within the rights-of-way that will have to be removed. To minimize impacts to this valuable riparian habitat, areas within 250 feet of the water (where the mesquite bosques and other dense riparian vegetation is found) will be treated using only manual methods of tree removal and only the hazardous trees will be removed. Additionally this work will be done outside of the breeding season for migratory birds such as yellow-breasted chat. However, due to the species of trees and the clearance requirements for the transmission lines, it is anticipated that up to 75% of vegetation at this crossing may be removed.

The management indicator habitat for the yellow-breasted chat is riparian. This habitat may be impacted by vegetation management activities, but impacts will be minimized by the guidance provided above. Because the rights-of-way and danger tree area contain only 0.22% of the forest-wide total indicator habitat for yellow-breasted chat, there would be little to no effect to the forest-wide population trend or its indicator habitat.

Mammals

Abert's Squirrel

The Proposed Action may have an effect on Abert's squirrel. The squirrel has shown a preference for dense, closed canopy ponderosa pine forests. These areas are not present within the rights-of-way; however, they may exist within the study area. Removal of danger trees that may fall into the rights-of-way could reduce suitable habitat for Abert's squirrel. Vegetation removal within the rights-of-way will continue to fragment the habitat for this tree squirrel.

The management indicator habitat for Abert's squirrel is ponderosa pine and mixed conifer. This habitat is likely to be impacted by vegetation management activities. However, because the rights-of-way and danger tree area contain only 0.24% of the forest-wide total indicator habitat for Abert's squirrel, there would be little to no effect to the forest-wide population trend or its indicator habitat.

Elk

The Proposed Action is not anticipated to have an effect on elk. Elk utilize a variety of habitats including open areas near forests. Therefore, removal of woody vegetation within the rights-of-way will open it up for grazing by elk. Noise impacts from equipment may discourage elk from utilizing certain areas during project activities; however, this is temporary and is not anticipated to have an impact on the forestwide population of elk.

The management indicator habitats for elk are mountain grassland, piñon-juniper woodland, and ponderosa pine and mixed conifer. The woodland and coniferous forest habitat is likely to be impacted by vegetation management activities. However, because the rights-of-way and danger tree area contain only 0.26% of the forest-wide total indicator habitats for elk including grassland habitat, there would be little to no effect to the forest-wide population trend or its indicator habitats.

Mule deer

The Proposed Action is not anticipated to have an effect on mule deer. The species utilize a variety of habitats and forage on a variety of plant materials. Mule deer have been known to do well in areas that have been reverted to an earlier successional stage. Mule deer populations have been declining within CNF. While there is no indication that the proposed action will slow or reverse this trend, it is not anticipated that the project will exacerbate the declining mule deer populations within the Forest.

The management indicator habitat for mule deer is piñon-juniper woodland. This habitat is likely to be impacted by vegetation management activities. However, because the rights-of-way and danger tree area contain only 0.44% of the forest-wide total indicator habitat for mule deer, there would be little to no effect to the forest-wide population trend or its indicator habitat.

Pronghorn

The Proposed Action may have an effect on pronghorn. They utilize shrub cover during fawning and grasslands for foraging. Effectively, within the rights-of-way and study areas, pronghorn herds are only known from areas north of Mormon Lake. There are portion of Management Areas 10 and 11 located within the rights-of-way that are considered as pronghorn habitat, but have not had pronghorns present within those areas in approximately 35 years. Based on this and descriptions of pronghorn herd boundaries in the Arizona Statewide Pronghorn Management Plan, it is not anticipated that project activities south of Mormon Lake will impact existing herds.

In portions of the project area utilized by pronghorn, the proposed action is likely to remove shrubs and woody vegetation that provide cover during pronghorn fawning. However, these shrubs are fast-growing species and it is anticipated that pronghorn would utilize these areas again for fawning. In the immediate future, these areas would provide additional suitable grazing areas for pronghorn. It is anticipated that the proposed action would not contribute to the decline of the Anderson Mesa herd or the herd in GMU 7.

The management indicator habitats for pronghorn are grassland and sparse piñon-juniper above the rim and mountain grassland. This habitat is may be impacted by vegetation management activities. However, because the rights-of-way and danger tree area contain only 0.60% of the forest-wide total indicator habitat for pronghorn, there would be little to no effect to the forest-wide population trend or its indicator habitat.

Red squirrel

The Proposed Action may have an effect on the red squirrel. The squirrel relies on coniferous forests with snags. While the rights-of-way are unlikely to have the older trees likely to produce snags, it has cone-producing trees from which the red squirrel forages. These cone-producing

trees within and immediately adjacent to the rights-of-way will be targeted for removal in addition to other vegetation. Vegetation removal within the rights-of-way will continue to fragment the habitat for this tree squirrel. It is anticipated that the proposed action will not substantially contribute to a decline in the red squirrel population within CNF.

The management indicator habitat for the red squirrel is ponderosa pine and mixed conifer. This habitat is likely to be impacted by vegetation management activities. However, because the rights-of-way and danger tree area contain only 0.25% of the forest-wide total indicator habitat for the red squirrel, there would be little to no effect to the forest-wide population trend or its indicator habitat.

Macroinvertebrates

The Proposed Action is not anticipated to have an effect on macroinvertebrates. Macroinvertebrates are found in the streams, creeks, and rivers of the CNF. The proposed action is not anticipated to impact water flow or impact sedimentation within these waterways. Vegetation along West Clear Creek will not be impacted by the Proposed Action. Vegetation within 250 feet of the Verde River will be minimally impacted. Dense vegetation around the southern crossing of Fossil Creek may require up to 75% of the vegetation to be removed. This vegetation within 250 feet of waterways will be removed by manual methods and non-hazardous vegetation will be retained. These efforts are designed to minimize impacts to sensitive resources in these waterways. It is anticipated that the proposed action will not impact population trends of macroinvertebrates within CNF.

The management indicator habitat for macroinvertebrates is riparian and open water. This habitat is unlikely to be impacted by vegetation management activities. In addition, because the rights-of-way and danger tree area contain only 0.22% of the forest-wide total indicator habitat for macroinvertebrates, there would be little to no effect to the forest-wide population trend or indicator habitat.

3.3.4.3 Environmental Consequences from the No Action Alternative

Under the No Action alternative, Western would continue its need-driven management approach using current methods for vegetation management and right-of-way maintenance. Maintenance activities would be reactive, resulting in vegetation removal occurring when vegetation growth has reached a hazardous condition for operation of the transmission facilities. In general, vegetation within the rights-of-way would be retained, thus increasing the potential for wildfires igniting within the rights-of-way and/or arcing with transmission facilities, resulting in unreliable and unsafe operating conditions for the Project.

The Proposed Action would routinely remove vegetation before it becomes a hazardous condition, thus necessitating the implementation of the PCMs identified in Table 2-2 for vegetation removal activities. Consequently, implementation of the No Action alternative may result in higher impacts to wildlife in the Project area than the Proposed Action, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over implementation of PCMs (e.g., avoidance of breeding seasons for migratory birds and other species, etc.).

3.3.5 Special-Status Wildlife

This section presents a description of special-status wildlife resources that could occur within the Project area, and an assessment of the potential impacts to wildlife that could occur from implementation of the Proposed Action and No Action alternative. Information presented in this section is based on data gathered through a literature review, and was provided by biologists from the AZGFD and USFWS.

For purposes of this document, special-status wildlife species are defined as those animals (invertebrates, fish, amphibians, reptiles, birds, and mammals) whose geographic range and native habitats overlap with the Project area and that are:

- federally or state-listed, proposed for listing, or candidates for listing as threatened or endangered
- listed as sensitive by the USFS

The statute regulating the federal listing of species is the Endangered Species Act (ESA) of 1973 (16 United States Code 1531 et seq.), as amended. The ESA provides for the conservation of federally listed plant and animal species and their habitats. The ESA directs federal agencies to conserve listed species and imposes an affirmative duty on these agencies to ensure that their actions are not likely to jeopardize the existence of a listed species or adversely modify their habitat.

3.3.5.1 Affected Environment

Table 3-7 lists the special-status wildlife considered in this document. This list was compiled with the assistance of the USFWS and AZGFD, and represents special-status species and/or critical habitat known to occur within 0.25 mile of the Project area (study area).

Table 3-7. Special-Status Species within the Study Area

Species	Group	Status	Vegetation Community Type
Razorback Sucker [Critical Habitat] (*Xyrauchen texanus*)	Fish	LE	Water
Gila Topminnow (*Poeciliopsis occidentalis occidentalis*)	Fish	LE	Water
Loach Minnow [Critical Habitat] (*Tiaroga cobitis*)	Fish	LE	Water
Spikedace [Critical Habitat (*Meda fulgida*)	Fish	LE	Water
Headwater Chub (*Gila nigra*)	Fish	C USFS	Water
Roundtail Chub (*Gila robusta*)	Fish	C, USFS	Water
Gila Longfin Dace (*Agosia chrysogaster chrysogaster*)	Fish	SOC, USFS	Water

Table 3-7. Special-Status Species within the Study Area			
Species	**Group**	**Status**	**Vegetation Community Type**
Desert Sucker (*Catostomus clarkii*)	Fish	SOC, USFS	Water
Sonora sucker (*Catostomus insignis*)	Fish	SOC, USFS	Water
Chiricahua Leopard Frog (*Rana chiricahuensis*)	Amphibian	LT	Cottonwood Willow Riparian Forest; Piñon-Juniper Evergreen Shrub (Tank); Water
Northern Leopard Frog (*Rana pipiens*)	Amphibian	USFS	Montane/Subalpine Grassland, Ponderosa Pine (Tank), Water
Mexican Spotted Owl [Critical Habitat] (*Strix occidentalis lucida*)	Bird	LT	Piñon-Juniper Evergreen Shrub, Ponderosa Pine, Mixed Conifer w/Aspen
Northern Goshawk (*Accipiter gentilis*)	Bird	USFS	Piñon-Juniper Evergreen Shrub, Ponderosa Pine, Mixed Conifer w/Aspen
Bald Eagle (*Haliaeetus leucocephalus*)	Bird	DL, USFS, BGEPA	Ponderosa Pine
Golden Eagle (*Aquila chrysaetos*)	Bird	BGEPA	Ponderosa Pine, Piñon-Juniper Evergreen Shrub, Mixed Broad Leaf Deciduous Riparian Forest, Cottonwood Willow Riparian Forest, Great Basin Grassland
LE – USFWS Listed Endangered LT – USFWS Listed Threatened C – Candidate DL – Delisted		SOC – Species of Concern USFS – Forest Service Sensitive Species BGEPA – Bald and Golden Eagle Protection Act	

Fish

There are nine special-status fish species with known occurrences and/or designated critical habitat within the Project area (Figure 3-2 and Figure 3-3). These locations are limited to the Verde River and Fossil Creek.

Razorback Sucker

The portion of the Verde River within the Project area has been designated as Critical Habitat for the razorback sucker. The razorback sucker was listed as endangered on October 23, 1991. This species was once abundant throughout the Colorado River system, but has declined in recent decades. On March 21, 1994, Critical Habitat was designated for the razorback sucker along 15 reaches of the Colorado River system, totaling 1,724 miles of waterways. The Verde River was designated Critical Habitat from the boundary of Prescott National Forest (Township 18N, Range 2E, Section 31) to Horseshoe Dam at the Yavapai and Maricopa County lines (59 FR 13374-13400). In 2004, the USFS, BOR, USFWS, AZGFD, and APS worked together to restore native fish populations to Fossil Creek. Fossil Creek was stocked with razorback suckers as a part of that effort.

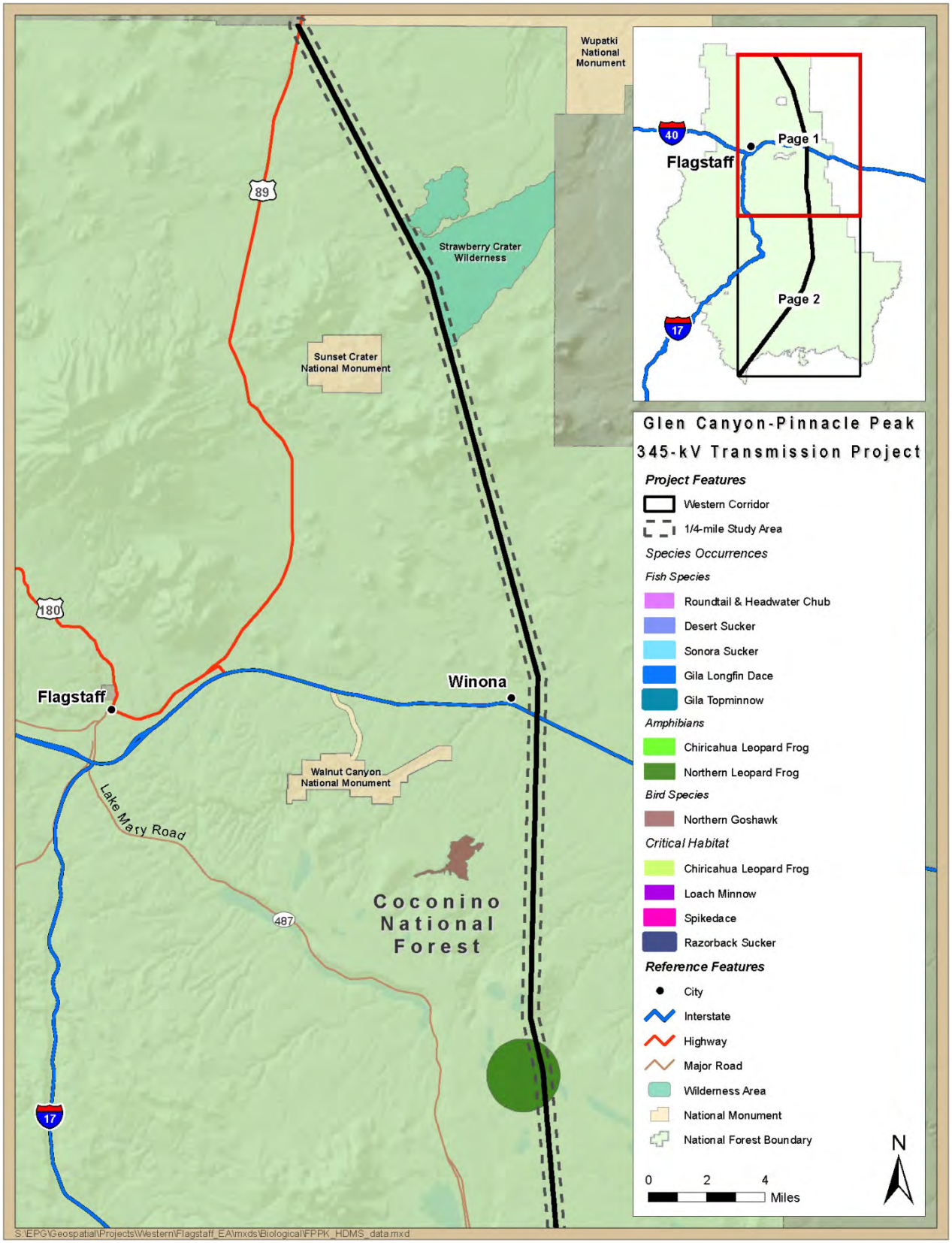

Figure 3-2. Special Status Species in the Project Area (Northern Half)

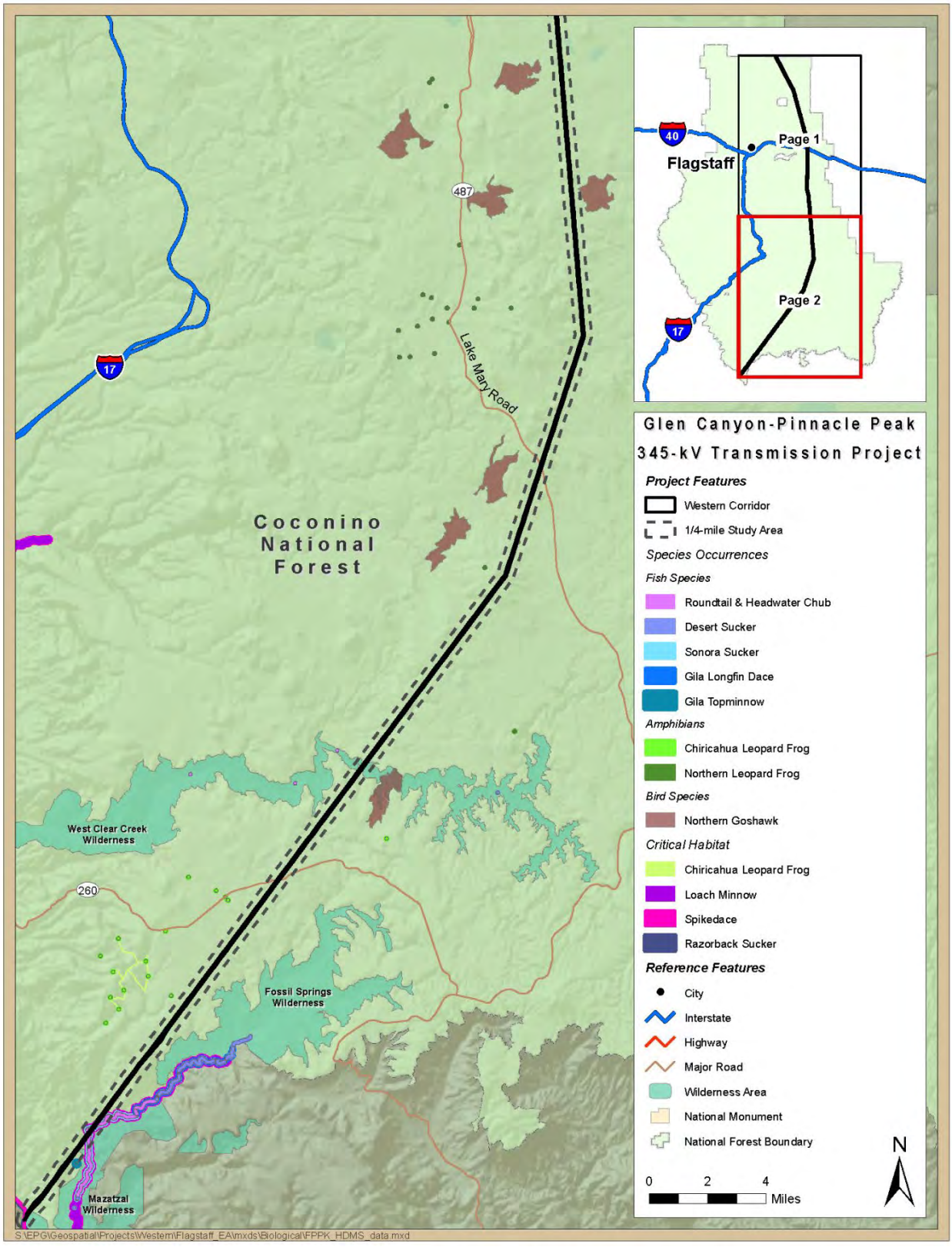

Figure 3-3. Special Status Species in the Project Area (Southern Half)

Gila Topminnow

The Gila topminnow is an endangered species with a known occurrence within the study area. This species was included on the original Endangered Species List published on March 11, 1967 (32 FR 4001), under the Wilderness Act of 1964. The subspecies is currently under a 5-year review (72 FR 20134-20136). No critical habitat has been designated for this species. On May 17, 1982 in the CNF, Deep Spring, and Sheepshead Springs were stocked with Gila topminnow to aid in recovery of the species (Weedman 1998). The only known occurrence of this species within the study area is at the gauging station immediately north of Stehr Lake. However, the species has been stocked and is becoming established at and downstream of the old diversion dam on Fossil Creek.

Spikedace and Loach Minnow

The spikedace and loach minnow inhabit similar areas and, as a result, have typically been considered together in listing documents by the USFWS. The spikedace was listed as threatened on July 1, 1986, and the loach minnow was listed as threatened on October 28, 1986. On February 23, 2012, both species were upgraded to endangered. With this change in listing status, designated Critical Habitat was reassigned (77 FR 10810-10932).

A Critical Habitat designation of 630 miles of streams for spikedace and 610 miles of streams for loach minnow was included in this reclassification. These Critical Habitat designations include portions of the Verde River and Fossil Creek at the confluence with the Verde River (75 FR 66482 – 66552). Critical Habitat for the loach minnow is designated in Fossil Creek approximately extending for 13.8 miles from its confluence with the Verde River to the old Fossil Diversion Dam. The Project area crosses Fossil Creek twice in the area designated as Critical Habitat. For the spikedace, this same portion of Fossil Creek is proposed as Critical Habitat as well as the Verde River. The Project area ends at the Verde River, placing this portion of Critical Habitat within it.

Both species were included in a native species repatriation effort in Fossil Creek. In 2007, both species were translocated into the creek and were subsequently augmented in 2008. Both species are currently considered to inhabit Fossil Creek (USFWS 2012).

Headwater Chub, Roundtail Chub, Desert and Sonora Suckers, and Gila Longfin Dace

The headwater and roundtail chubs are currently candidates for listing under the Endangered Species Act. The desert sucker, Sonora sucker, and Gila longfin dace are all considered Species of Concern by the USFWS. All five of these species are considered sensitive species by the USFS and all but the headwater chub are considered sensitive by the BLM. The headwater and roundtail chubs are also covered under an Arizona Statewide Conservation Agreement (AZGFD 2006). All five of these species are known to occur within the Project area in Fossil Creek (M. Childs, pers. comm.).

Amphibians

Chiricahua Leopard Frog

The Chiricahua leopard frog was listed as a candidate species on November 21, 1991 (56 FR 58804-58836) and was ultimately listed as a threatened species on June 13, 2002 (67 FR 40790-40811). The species' listing contained a special rule exempting accidental take through livestock use and maintenance of stock tanks. The species is limited to wetlands, and eggs must remain submerged in water. On March 15, 2011, the USFWS published a proposed rule to designate Critical Habitat for the Chiricahua leopard frog. There is no proposed Critical Habitat for the Chiricahua leopard frog within the Project area. The Buckskin Hills Critical Habitat Unit is located approximately 1.5 miles from the Project area and encompasses Sycamore Basin tank, Middle Tank, Black Tank, Needed Tank, Buckskin Tank, Walt's Tank, Partnership Tank, and Doren's Defeat Tank (76 FR 14125-14207). Within the Project area there is a known occurrence of this species in Fossil Creek.

Northern Leopard Frog

The northern leopard frog is designated as a sensitive species by the USFS. This species is adapted to living in colder climates and can be found at elevations up to 11,000 feet; however, it is still highly dependent upon water. It may forage far from water in areas with damp soils and vegetation (Stebbins 2003). There are two known occurrences for this species within the Project area. One is in the immediate vicinity of Ashurst Lake, and the other is at the Bar D Tank located approximately 1 mile northeast of the Buck Mountain Lookout Tower.

Birds

Mexican Spotted Owl

The Mexican spotted owl inhabits forested mountain ranges and deep canyons from southern Utah and Colorado through central Mexico. The species primarily inhabits mixed conifer dominated by Douglas-fir, pine, or true fir and pine-oak forests. They may also be found along steep, narrow canyons with cliffs and perennial water sources. Mexican spotted owls prey on small and medium-sized mammals with rodents and squirrels dominating their diet (Gutiérrez et al 1995). Their habitat is most emphasized in Management Areas with ponderosa pine and mixed conifer which correspond to MA 3: Ponderosa Pine and Mixed Conifer Less than 40% Slope; MA 4: Ponderosa Pine and Mixed Conifer Greater than 40% Slope; MA 31: Craters; MA 32: Deadman Wash; and MA 33: Doney. This species primarily uses habitat with cool microclimates, multistoried, multi-species stands with high canopy cover, and large numbers of snags. Breeding territories are of particular management importance and have been designated as PACs.

There are approximately 686,240 acres of Mexican spotted owl habitat within the CNF, and approximately 27,518 of these acres (4.01 percent of the CNF total) are within the Project study area. Of these 27,518 acres within the study area, only 1,079 acres (0.16 percent of the CNF total) are within the Project rights-of-way, and 610 acres (0.09 percent of the CNF total) are within the 60-foot potential danger tree areas.

The Mexican spotted owl was listed as a threatened species on March 16, 2003 (58 FR 14248-14271). In addition to being listed as threatened under the ESA, the Mexican spotted owl was selected as a MIS for the late seral stage of mixed conifer and spruce/fir. Approximately 9.6 million acres of federal land in Arizona, New Mexico, Colorado, and Utah were designated Critical Habitat for the Mexican spotted owl on August 31, 2001 (69 FR 53182-53298). The Mexican Spotted Owl Recovery Plan was completed in 1995; however, in June 2011, a draft revised recovery plan was made available for public review. The public comment period ended on August 23, 2011. The revised Recovery Plan is scheduled to be finalized and implemented in 2012.

Under both the original and revised Recovery Plans, there are three categories related to land management: PAC, Recovery Habitat, and Other Forest and Woodland Types.

PACs are the most heavily managed for Mexican spotted owls and are defined as "the area of concentrated use by a single owl or pair of owls and provides a location for specific management actions." PACs are at least 600 acres in size with no limit to how large they can be. Within each PAC is a nest/roost core area, as they are designed to protect resident breeding owls (USFWS 2011). As of 2002, there were 179 known PACs within CNF. Population trend data for Mexican spotted owls is inconclusive. Consistent monitoring has not been conducted over a long enough period of time to allow for reliable trend information.

Recovery Habitats are areas of forest and rocky canyons used by owls for various needs, but are outside of PACs. Recovery Habitat is "intended to (1) provide protection for areas that may be used by owls, (2) foster creation of replacement roost/nest habitat, and (3) simultaneously provide managers with greater management flexibility than is allowed in PACs" (*ibid*).

Other Forest and Woodland Types are areas that may be used for foraging and dispersal, but are unlikely to be used for nesting. No owl-specific management recommendations are made for these areas (*ibid*).

Mexican spotted owls are primarily cavity nesters that rely on large trees to nest and roost in. Recovery guidelines focus on retention of trees with a diameter at breast height of at least 24 inches. Emphasis is also placed on retention of large oaks over pines (*ibid*).

Critical Habitat is present within the study area along two stretches of the alignment. The northernmost is an 11-mile segment that runs from FR 124D near Pouroff Tank, to where the alignment crosses FH (Forest Highway) 3 (Lake Mary Rd) approximately 2 miles south of Happy Jack. The southernmost is a 7-mile segment that runs from Island and Road Tanks (near the junction of FRs 81A and 755) to where the Project area crosses SR 260.

Within these areas of Critical Habitat, there are 9 PACs within the study area (Figure 3-4). From north to south, the PACs that may be impacted are Sawmill Springs, Spruce Tank, Powerline Tank, Boondock, Schell Springs, Little Water, Power, Cash, and Meadow Canyon. Of these, only Boondock, Cash, and Meadow Canyon have portions of their core area that may be impacted. Table 3-8 shows the acres of Critical Habitat and PACs within the rights-of-way, danger tree area, and study area.

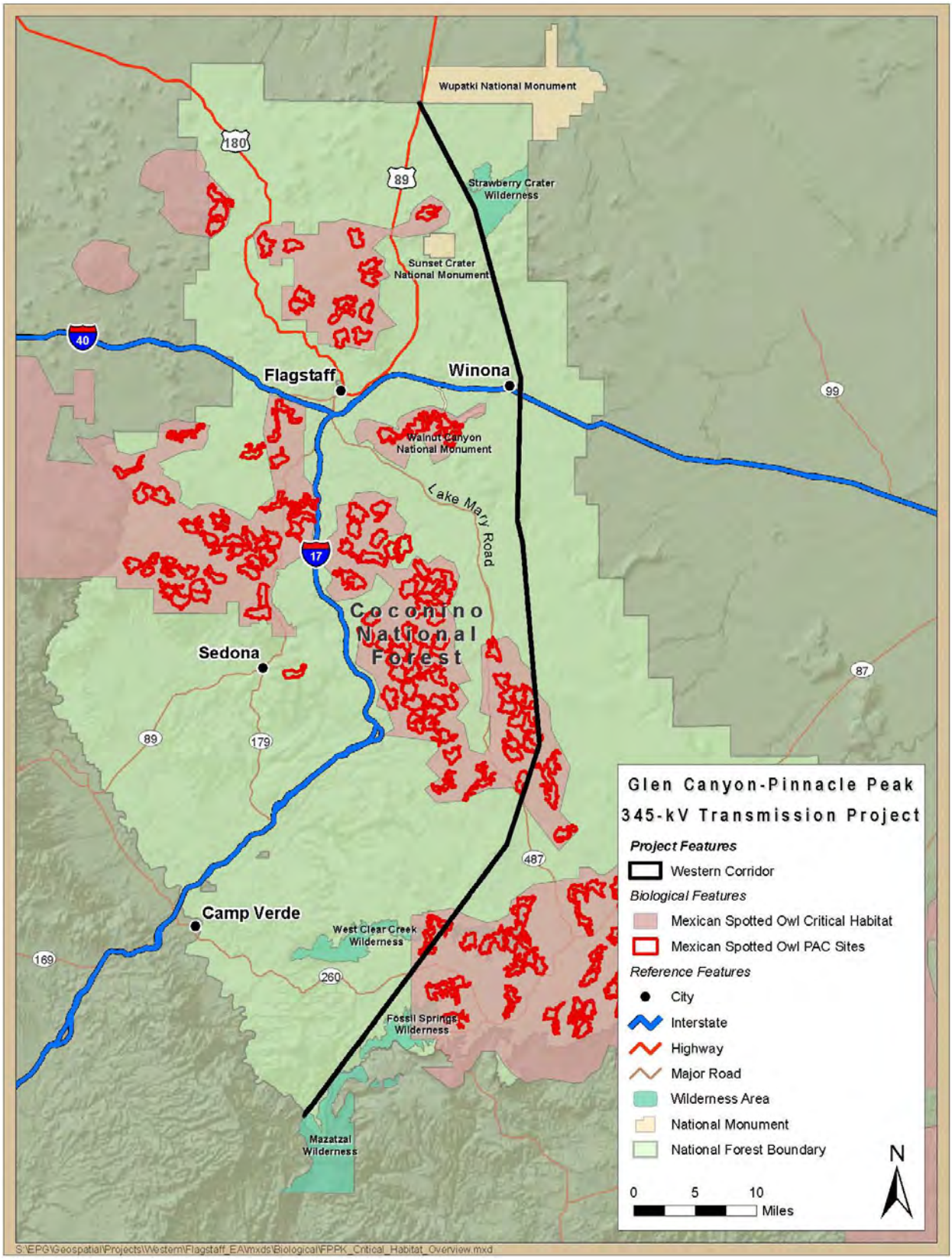

Figure 3-4. PAC Overview Map

Table 3-8. Acres of Mexican Spotted Owl Critical Habitat and PACs within Project Area			
	Rights-of-Way	**Danger Tree Area**	**Study Area**
Critical Habitat	557.77	223.25	4,714.93
Sawmill Springs PAC	1.76	1.47	90.86
Spruce Tank PAC	7.12	6.59	143.07
Powerline Tank PAC	0.61	0.59	37.09
Boondock PAC	30.33	11.53	251.12
Schell Springs PAC	2.99	3.52	85.63
Little Water PAC	0.00	0.00	25.48
Power PAC	3.69	4.26	95.68
Cash PAC	17.51	7.21	170.16
Meadow Canyon PAC	9.20	4.00	192.10

Northern Goshawk

The northern goshawk is found throughout much of the northern hemisphere. In North America, the species has a year-round range from Alaska to Newfoundland and south through the Rocky and Sierra Nevada Mountains to central Mexico. Goshawks will nest in most forest types found throughout its range including eastern deciduous forests as well as the ponderosa pine forests of the west. Goshawks prey on a wide variety of species including squirrels, rabbits, hares, larger passerines, woodpeckers, game birds, corvids, and occasionally reptiles and insects. Goshawks will hunt their prey both in the forest via short flights as well as flying rapidly along forest edges and across openings (Squires and Reynolds 1997). In addition to being a U.S. Forest Service sensitive species, the northern goshawk was selected as a MIS of late seral stage ponderosa pine habitat which corresponds to MA 3: Ponderosa Pine and Mixed Conifer Less than 40% Slope; MA 4: Ponderosa Pine and Mixed Conifer Greater than 40% Slope; MA 31: Craters; MA 32: Deadman Wash; and MA 33: Doney.

Within the CNF, northern goshawks most commonly inhabit ponderosa pine forests (Kennedy et al. 1994; AZGFD 2003b). There are approximately 686,240 acres of northern goshawk habitat within the CNF, and approximately 27,518 of these acres (4.01 percent of the CNF total) are within the Project study area. Of these 27,518 acres within the study area, only 1,079 acres (0.16 percent of the CNF total) are within the Project rights-of-way, and 610 acres (0.09 percent of the CNF total) are within the 60-foot potential danger tree areas.

Within Arizona, the species breeds in high, forested mountains and plateaus typically above 6,000 feet in elevation. Nest building and breeding activities begin in March, with egg-laying in mid- to late-April. Young are independent by mid-July. Post-fledging family areas (PFAs) have been designated within the CNF. These PFAs are areas surrounding a nest utilized by the family group between fledging and the young leaving the nest (USFS 2002). As of the end of 2010, there were 69 current PFAs within CNF (USFS 2011b).

Studies appear to indicate a significant increase in the statewide population of northern goshawk; however, forest-wide habitat trend for late-seral ponderosa pine has declined. Goshawk population trend data was inconclusive as of 2002 (USFS 2002).

Within the Project area, there is only one known goshawk PFA – the Cowhill PFA – located within the study area (Figure 3-3). No PFAs are located within the rights-of-way or danger tree

area. Over 30 linear miles of rights-of-way, danger tree, and study area are located within potentially suitable habitat for northern goshawk.

There are currently five bald eagle breeding areas (nesting territories) within 10 miles of the Project area. Four of these areas are located along the Verde River. The East Verde Breeding Area is located 3.7 miles downstream from the Project area; the Coldwater Breeding Area is 4.7 miles upstream; the Ladders Breeding Area is approximately 8.5 miles upstream; and the Table Mountain Breeding Area is just over 10 miles downstream. The remaining breeding area is the Lower Lake Mary, located 8.7 miles from the Project area (personal communication, Jacobson 2011).

There have not been thorough surveys conducted for golden eagle nesting sites. The AZGFD conducted helicopter-based golden eagle nest surveys throughout the area during 2011-2012. The data was not available as of the end of March 2012. Data available from the Heritage Data Management System was collected opportunistically and may include sites that are older and not currently active. There are 18 golden eagle nest occurrences within 10 miles of the Project area listed in the Heritage Data Management System. Four nests are within 1 to 2 miles of the Project area, four nests are within 3 to 4 miles, five nests are within 5 to 6 miles, four nests are within 6 to 8 miles, and one nest is 9.8 miles away.

3.3.5.2 Environmental Consequences

The Proposed Action has a greater potential to affect special-status wildlife than to affect general wildlife, due to the fact that these species are generally less tolerant of environmental changes. These changes can include habitat loss and degradation, habitat fragmentation, human presence, and noise.

Adverse impacts can be direct or indirect, temporary or permanent. Direct impacts result directly from Project-related activities on the landscape such as alteration, disturbance, or removal of biological resources. Indirect impacts are unintentional consequences of Project-related impacts and may occur later in time. An example of an indirect impact could be increased nest parasitism as a result of habitat fragmentation. Permanent impacts are considered to be any impacts that would last for the life of the transmission line. Resources may be able to recover, following decommissioning. Temporary impacts are those that occur only during project-related activities such as noise from machinery.

Impacts would be minimized through implementation of the PCMs presented in Section 2. These efforts would include containment of debris to reduce the potential for this material to contaminate wetlands and waterways in the vicinity. Additionally, sites would be assessed to determine whether mechanical or manual maintenance methods should be applied to minimize impacts in sensitive areas. Retention of large woody debris in northern goshawk and Mexican spotted owl habitat would lessen habitat loss for these species.

Fish

It is not anticipated that any of the special-status fish species or their critical habitat would be impacted as a result of Project-related activities. There should be no direct impacts to waterways, as PCMs would require that machinery remain outside of wetlands, creeks, rivers, and tanks.

PCMs would be established that would not allow debris to fall into streams, creeks, or rivers. This would allow water flow to remain unimpeded. Additionally, as the Proposed Action would not typically result in a bare-ground condition within the right-of-way, the level of sediment potential transported to Fossil Creek and/or the Verde River would be insignificant. Thus these indirect impacts are not likely to impact the special-status fish species known to occur within the Project area.

Amphibians

Chiricahua and Northern Leopard Frogs

The Chiricahua leopard frog and the northern leopard frog are primarily found inwetlands and waterways. These species, including Chiricahua leopard frog Critical Habitat, are not expected to be impacted as a result of Project-related activities. Northern leopard frogs have been found far from water when they are dispersing; however, project-related impacted are anticipated to be minimal.

PCMs would be developed restricting the use of machinery in wetlands or saturated areas. This would reduce the potential for direct impacts to these frog species, and reduce the potential for the spread of the pathogenic chytrid fungus (*Batrachochytrium dendrobatidis*). This fungus can be fatal to frogs and can be transmitted through soil and vegetation on machinery, vehicles, and even boots. However, the fungus must remain moist to be viable. If saturated areas cannot be avoided, efforts will be taken to rid vehicles of debris and to decontaminate them with quaternary ammonia to kill the fungus prior to moving to new areas.

Birds

Mexican Spotted Owl

The Proposed Action will likely have an effect on the Mexican spotted owl, but is not anticipated to have an adverse effect on the species. The Proposed Action is consistent with the activities evaluated in the BA, and therefore is consistent with the determination of effects as identified by the USFWS in the 2008 BO. The Proposed Action will implement all mitigation measures stipulated by the Biological Assessment, which are included as PCMs in Table 2-2 and identified in Table 3-8; however, the trees most likely to be hazardous to the transmission line are trees of a size likely to be utilized by Mexican spotted owl. Through the implementation of mitigation measures prescribed for the Mexican spotted owl (Table 2-2 and Table 3-9), impacts to this species would be minimized.

Approximately 4 miles of the Project area alignments are located within the PACs described above (see Figure 3-4 and Figure 3-5). Approximately 19.5 miles of Project area alignments are located within designated Critical Habitat. Table 3-9 lists mitigation measures established in the BA for this Project.

Table 3-9. Mitigation Measures for Mexican Spotted Owl		
Mitigation Measure	**Trigger**	**Applied Miles of Alignment**
1. Monitor and report proposed utility actions annually. This would include tree species, location, condition, and size class information as outlined in Appendix D of the Biological Assessment.	Any work within Mexican Spotted Owl designated critical habitat or PACs.	15.57 miles
2. Avoid ground work (use of equipment) within PACs between March 1 and August 31.	Routine maintenance within a PAC in breeding season.	4.84 miles
3. Avoid use of loud machinery within 0.25 mile of PACs between march 1 and August 31, with goal to limit noise levels at PAC boundary to < 56 decibels (dBA).	Routine maintenance within 0.25 mile of a PAC in breeding season.	10.75 miles
4. For hazard line maintenance and/or vegetation hazard treatment in a Mexican Spotted Owl PAC during the breeding season, coordinate the timing of the hazard treatments such that work is consolidated into the least number of days and least number of trips in and out of the PAC, to minimize the duration and frequency of disturbance to the Mexican Spotted Owl as much as possible.	Hazardous vegetation treatments within a PAC in breeding season.	4.84 miles
5. Coordinate disposal methods with the Forest Service District and, if appropriate/feasible, leave large (>12 inches) logs at edge of right-of-way in or adjacent to PACs.	Routine maintenance and hazardous vegetation treatments within or adjacent to PACs.	10.75 miles
6. When feasible, schedule hazard line maintenance and vegetation treatments after breeding season (i.e., defer activity to later date when low priority or when not an imminent threat to safe operation of lines/structures).	Hazardous vegetation treatments within a PAC.	4.84 miles
7. It is recommended that trees > 24 inches diameter at breast height be retained unless over-riding management situations require their removal to protect human safety and/or property (e.g., the removal of hazard trees along power lines).	Routine maintenance and hazardous vegetation treatments within or adjacent to PACs.	10.75 miles
8. Retention of hardwood, large downed logs, large trees, and snags is recommended to an extent that it does not significantly impede the overriding objective of reducing the risk of high-severity fire in Mexican Spotted Owl habitat.	Routine maintenance and hazardous vegetation treatments within or adjacent to PACs.	10.75 miles
Source: USFS 2008		

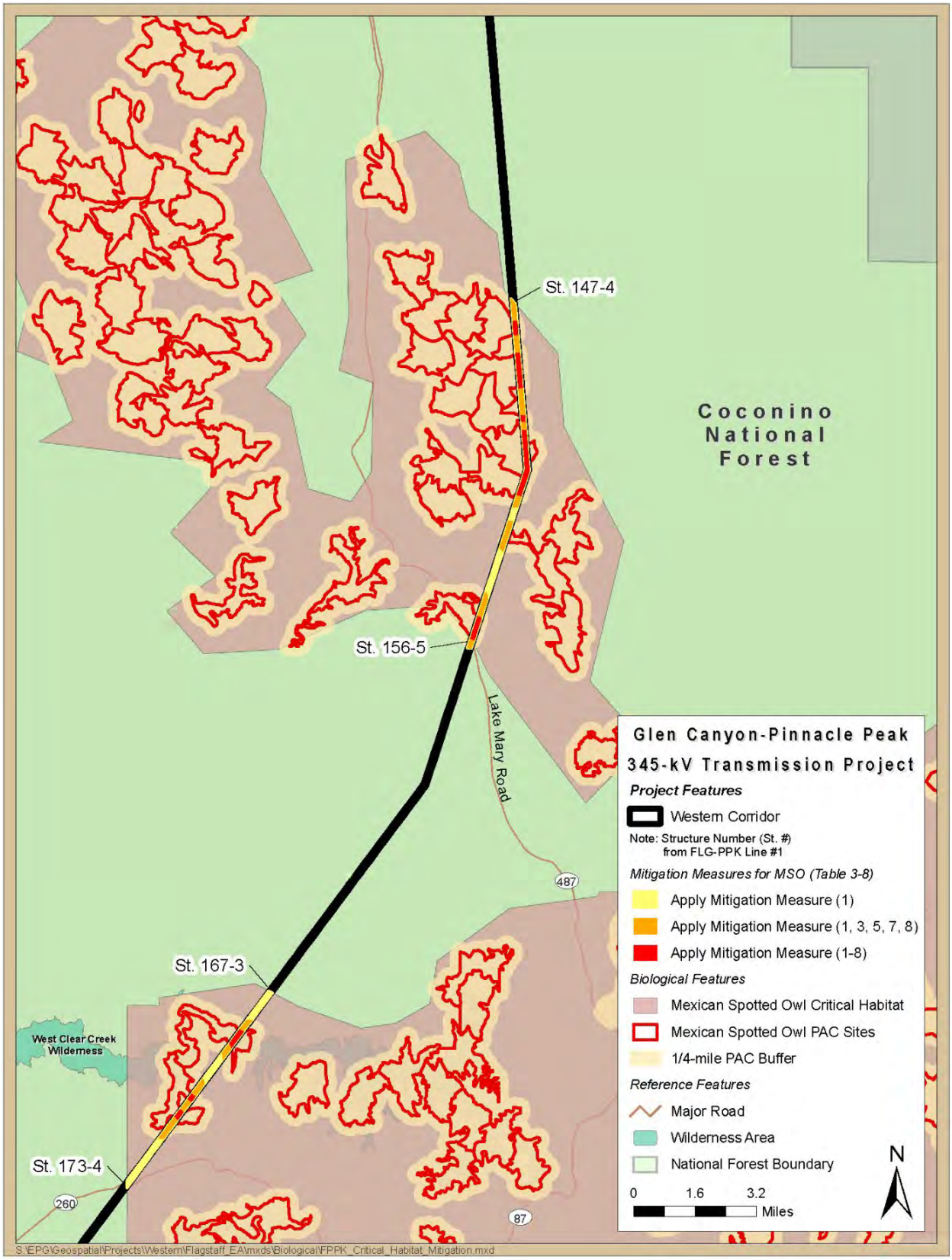

Figure 3-5. Mexican Spotted Owl Mitigation Areas

These mitigation measures would be implemented in all areas where required (Figure 3-5). Through implementation of these mitigation measures, it is anticipated that impacts to owls, chicks, and eggs will be minimized.

Impacts to Mexican spotted owl habitat would occur as a result of Project-related activities. This includes areas within PACs, potentially within the core areas. Within PACs, work would not occur between March 1 and August 31. This would avoid the courtship, breeding, nesting, and fledging periods. Additionally, use of loud machinery within 0.25 mile of the PACs would not occur during this period. Exceptions to this would be if it were found that there is a hazardous situation that could result in interrupted service of the transmission line(s) in which case PCM #30 would apply (see Table 2-2).

The Proposed Action would result in a large amount of edge habitat. These areas can be used by owls for foraging. Through retention of downed logs and other coarse woody debris, habitat would be created for some rodent prey species. Further, the Proposed Action's proactive method of vegetation management is intended to reduce the potential for high-severity wildfires within the rights-of-way and may also reduce the intensity of fires in the canopy of the forest, which provides critical nesting/roosting habitat for owls. It is anticipated that the Proposed Action will not have an impact on forest-wide population trends of Mexican spotted owl. According to the findings of the USFWS, the proposed vegetation maintenance "will not likely jeopardize the continued existence of the Mexican spotted owl and is not likely to destroy or adversely modify designated Critical Habitat of the species" (USFWS 2008).

Northern Goshawk

Within the Project area, the northern goshawk inhabits similar habitats as the Mexican spotted owl as well as pure ponderosa pine forests. Additionally, the northern goshawk has similar breeding and nesting seasons. As such, seasonal restriction mitigation measures similar to those for the Mexican spotted owl would be implemented for the northern goshawk. Within PFAs, work would not occur between March 1 and September 30. This would avoid the breeding, nesting, and fledging periods. Additionally, use of loud machinery within 0.25 mile of the PFA would not occur during this period. Exceptions to this would be if there is a hazardous situation that could result in a disturbance to operation of the transmission line(s).

Goshawks are known to forage by flying along forest edges and across openings (AZGFD 2003b). The Proposed Action will maintain habitat for prey species such as rodents through retention of coarse woody debris and may result in improved hunting areas through increased edge habitat.

The Proposed Action may have a direct effect on northern goshawk. The proposed action will implement mitigation measures such as seasonal avoidance to minimize impacts to northern goshawk; however, the trees most likely to be hazardous to the transmission line are trees likely to be utilized by goshawks. As goshawks are known to forage along forest edges and the Proposed Action includes retention of coarse woody debris which provides habitat for prey species. Through implementation of mitigation measures, there is still potential for direct impacts to individuals; however, as these impacts are anticipated to be minimal, they are not likely to cause a trend toward listing or loss of viability. Northern goshawks are anticipated to withstand the project-related impacts with little discernible effects to population trends.

Bald and Golden Eagles

There are known bald and golden eagle nests within the vicinity of the Project area, but no known nests within the Project area itself. The trees most likely to be removed are also trees most likely to be used by eagles. To reduce the potential for nest abandonment or impacts to foraging while nesting, ground work and use of loud machinery would be avoided during the breeding season (late January to September) within 1 mile of known nesting territories, unless the territory is confirmed to be inactive. Ground activities should also avoid winter roosting areas by 0.25 mile from October 15 to April 15.

Eagles require open spaces to forage, as they are large birds that often hunt from perches or while soaring. Bald eagles will frequently hunt for fish or other aquatic species, while the golden eagle focuses on terrestrial mammals. The Proposed Action would open up the Project area and could provide improved foraging opportunities for these species.

3.3.5.3 Environmental Consequences from the No Action Alternative

Under the No Action alternative, Western would continue its need-driven management approach using current methods for vegetation management and right-of-way maintenance. Maintenance activities would be reactive, resulting in vegetation removal occurring when vegetation growth has reached a hazardous condition for continued operation of the transmission facilities. The Proposed Action would routinely remove vegetation before it becomes a hazardous condition, thus necessitating the implementation of the PCMs identified in Table 2-2 for vegetation removal activities. Consequently, implementation of the No Action alternative may result in higher impacts to special status wildlife species in the Project area than the Proposed Action, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over the implementation of PCMs (see Section 1.4). However, the terms and conditions of the BO in relation to Mexican spotted owl would be implemented for either the Proposed Action or No Action alternative.

3.3.6 Cumulative Effects to Biological Resources

3.3.6.1 Plant Communities

Proposed Action

The projects listed in Table 3-1 being considered under cumulative impacts have a variety of potential impacts to vegetation. The rock pit developments/expansions will likely disturb the vegetation communities immediately surrounding the pits and may result in those areas experiencing a change in plant communities. The same may be experienced with the Grapevine Interconnect and the other existing transmission lines. The CNF Motorized Travel Management Plan will likely result in the loss of vegetation along designated routes; however, this plan will reduce the loss of vegetation and spread of invasive species throughout the CNF by restricting areas for off-road vehicle use. Additionally, the Four Forest Restoration Initiative will push to create healthier forests and improve plant diversity.

The Proposed Action could modify existing native plant communities into low-growing plant communities. Potential cumulative effects on habitats and vegetation could include decrease plant diversity, colonization of noxious weeds in disturbed sites, and increased fragmentation. The proposed changes to the maintenance of the right-of-way do not include construction of new rights-of-way or access roads. The noise, dust, human disturbance, and other related disturbances, in addition to construction-related disturbances of other projects in the vicinity of the Project area could add to the cumulative effects on vegetation. The implementation of Western's PCMs would minimize the Proposed Action's contribution to cumulatively considerable effects on plant communities.

No Action Alternative

Implementation of the No Action alternative would likely result in similar cumulative effects to vegetation as the Proposed Action; however, the cumulative effects would be spread out over time and localized. In addition, under the No Action alternative proposed PCMs would not typically be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4).

3.3.6.2 Special-Status Plant Species

None of the projects listed in Table 3-1 are anticipated to impact known special-status plant occurrences.

The Proposed Action and No Action alternatives are not anticipated to have a significant impact on special-status plant species through vegetation removal, as the species are typically found in openings of low-growing vegetation within forests. It is assumed that projects occurring within the vicinity of these plant species would incorporate avoidance and mitigation measures to minimize impacts to these species. Through implementation of PCMs to reduce adverse impacts to special-status plant species, it is anticipated that cumulatively considerable effects would be minimal.

3.3.6.3 Wildlife

Proposed Action

The projects considered in Table 3-1 may have impacts to wildlife species.

Birds

Birds are found throughout all habitat types in the project area. Waterfowl occurring along Fossil Creek are likely to benefit from the Fossil Creek Wild and Scenic River Comprehensive River Management Plan as it will reduce the number of people and cars near Fossil Creek. While vegetation management under this Project may slightly affect riparian vegetation and thus waterfowl habitat in the area of Fossil Creek, these effects would likely be offset or outweighed by cumulative improvement of waterfowl habitat in Fossil Creek and other areas on Anderson Mesa through projects such as the Fossil Creek Wild and Scenic River Management Plan and the Four Forest Restoration Initiative.

Species inhabiting forests and woodlands such as woodpeckers, warblers, and nuthatches may be impacted by projects such as the proposed new transmission lines, new recreation facilities and other facility and infrastructure improvements, and proposed rock pit expansions (Table 3-1). These activities in addition to the Proposed Action would combine to cumulatively reduce the availability of snags and large trees, which is the primary habitat component for these species. It is assumed that seasonal restrictions on development will minimize impacts to nesting activities. Forest Service management objectives in addition to the Four Forest Restoration Initiative have wildfire management as a priority. Management of wildfire for resource goals and low to moderate severity wildfires would slightly offset the loss of snags by increasing the growth rate of surviving trees and increasing the recruitment of snags over the next several decades.

Wild turkeys may be further impacted by the addition of new transmission lines that can result in increased habitat fragmentation.

All bird species may benefit from the CNF Motorized Travel Management Plan and the Four Forest Restoration Initiative. These plans are anticipated to guide management decisions to further species diversity and minimize impacts from visitors by limiting motorized vehicle use.

Overall the Proposed Action may initially reduce availability of snags and large trees but may aid in a cumulative result of snag recruitment through fire suppression in conjunction with management efforts.

Mammals

Mammal species may be impacted cumulatively by projects listed in Table 3-1 as a result of habitat loss and further habitat fragmentation. For example, squirrels may be subjected to increased predation by opening of the forest canopy through development of new transmission lines. Other species that depend on forest opening, however, may benefit from the effect of this project since it will be creating forest edge habitat in a forest environment where fire suppression over the last hundred years has resulted in a deficit of this seral stage. For example, by re-establishing forest openings under the transmission line, there would be increased grazing areas for ungulates such as mule deer, elk, and pronghorn. These effects for mammals would combine cumulatively with other projects such as the proposed expansion of the rock pits, development of new transmission lines and maintenance of other transmission lines, and high-severity wildfires such as the 2010 Schultz Fire.

Mammals may benefit from the CNF Motorized Travel Management Plan and the Four Forest Restoration Initiative. These plans are anticipated to guide management decisions to further species diversity and minimize impacts from visitors by limiting motorized vehicle use. Both of these projects are expected to reduce motorized use or the presence of hundreds of miles of roads which would counter the effect of habitat fragmentation by those mammal species dependent upon closed canopy forest types.

Overall, the Proposed Action may provide additional habitat for species dependent on edge habitat, but may result in an impact in the form of habitat fragmentation for those species dependent on closed canopy forests. Cumulatively, management and restoration efforts are anticipated to reduce high-severity wildfires and fragmentation due to roads off-setting potential impacts from this project.

Macroinvertebrates

Macroinvertebrates are unlikely to be negatively impacted by any of the proposed or recently completed projects listed in Table 3-1. It is assumed that all proposed or recently completed projects will utilize BMPs to avoid impacts to waterways, riparian areas, and tanks. As macroinvertebrates are only found in aquatic systems, it is anticipated that they will not be impacted by the projects listed in Table 3-1.

No Action Alternative

Implementation of the No Action alternative would likely result in similar cumulative effects to wildlife as the Proposed Action; however, the cumulative effects would be spread out over time and more localized. In addition, under the No Action alternative proposed PCMs may not be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4) thus potentially increasing cumulative effects to wildlife.

3.3.6.4 Special-Status Wildlife

Proposed Action

The projects considered in Table 3-1 may have impacts to special-status wildlife species.

Fish

Special-status fish species are unlikely to be negatively impacted by the proposed or recently completed projects. All projects located near waterways are anticipated to take extreme care with sediment and erosion control. Transmission lines would span waterways and, therefore, have minimal impacts. Fish are anticipated to benefit from the Fossil Creek Wild and Scenic River Comprehensive River Management Plan. As a result, fish are anticipated to cumulatively benefit from the projects listed in Table 3-1.

Amphibians

Both the Chiricahua leopard frog and the northern leopard frog have the potential to be impacted by the cumulative projects. These species are most commonly found around riparian areas and tanks, but may also move through forests and woodlands while migrating to new sites. None of the proposed or recently completed projects are anticipated to have any impact on wetlands. It is assumed that all projects will utilize BMPs to avoid the spread of chytrid fungus, which can be fatal to frogs. Frogs may benefit from the CNF Motorized Travel Management Plan and the Four Forest Restoration Initiative. These plans are anticipated to guide management decisions to further species diversity and minimize impacts from visitors by reducing motorized vehicle usea nd the presence of hundreds of miles of roads. Cumulatively, it is anticipated that amphibians will not be adversely impacted.

Birds

Mexican Spotted Owl

The cumulative projects listed in Table 3-1 may have an effect on Mexican spotted owls. These owls are known to inhabit areas encompassed entirely or partially by some of the cumulative projects. The Grapevine Interconnect and the Sandvig-Youngs Powerline are not located within or near any PACs or Critical Habitat. They cross very little suitable habitat for Mexican spotted owls.

Portions of Fossil Creek are located within Critical Habitat; however, it is not anticipated that the Fossil Creek Wild and Scenic River Comprehensive River Management Plan will result in impacts to the Mexican Spotted Owl.

The six rock pits located within proximity of this project are not located within PACs or Critical Habitat. However, they are located within potentially suitable habitat and may result in loss of habitat.

The proposed Year-round Recreation Site across from the Happy Jack Ranger Station is located within Critical Habitat, but not within a PAC. It is also being developed within an area which has been already developed.

Mexican spotted owls may benefit from the CNF Motorized Travel Management Plan and the Four Forest Restoration Initiative. These plans are anticipated to guide management decisions to further species diversity and minimize impacts from visitors by reducing motorized vehicle use and the presence of hundreds of miles of roads.

It is anticipated that these projects will use mitigation measures such as seasonal restrictions to minimize potential impacts to Mexican spotted owls. The cumulative projects are anticipated to have a minimal effect on the population, Critical Habitat, and over all stability of Mexican spotted owls.

Northern Goshawk

The cumulative projects may have an effect on northern goshawks. These raptors are known to inhabit areas encompassed by some of the cumulative projects.

The Grapevine Interconnect and the Sandvig-Youngs Powerline are not located within or near any PFAs. They cross very little suitable habitat for goshawks.

The six rock pits located within proximity of this project are not located within any PFAs. However, they are located within potentially suitable habitat and may result in loss of habitat.

The proposed Year-round Recreation Site across from the Happy Jack Ranger Station is not located within a PFA; however, it is being developed within potentially suitable habitat. It is also being developed within an area which has been already developed.

Northern goshawks may benefit from the CNF Motorized Travel Management Plan and the Four Forest Restoration Initiative. These plans are anticipated to guide management decisions to

further species diversity and minimize impacts from visitors by reducing motorized vehicle use and the presence of hundreds of miles of roads.

It is anticipated that these projects will implement mitigation measures to minimize impacts to the northern goshawk. It is assumed that guidance provided by the Avian Powerline Interaction Committee (APLIC) will be incorporated into new transmission designs to minimize the potential for electrocution. The cumulative projects are anticipated to have a minimal effect on the population, Critical PFAs, and over all stability of northern goshawks.

Bald and Golden Eagles

Bald and golden eagles utilize much of the habitat encompassed by the CNF. They tend to nest and roost in tall trees and along cliffs while foraging along waterways and open areas. The cumulative projects are anticipated to have minimal impacts on nesting and roosting habitat. However, foraging habitat is likely to be impacted. This impact is anticipated to be temporary as eagles are known to utilize transmission line corridors following construction. Transmission structures are frequently used for nesting and for hunting prey while perched. It is assumed that guidance provided by APLIC will be incorporated into new transmission designs to minimize the potential for electrocution.

Habitat may be lost as a result of the development of new rock pits and the expansion of existing ones as well as the development of new transmission lines and recreation facilities. However, eagles may benefit from the CNF Motorized Travel Management Plan and the Four Forest Restoration Initiative. These plans are anticipated to guide management decisions to further species diversity and minimize impacts from visitors by reducing motorized vehicle use and the presence of hundreds of miles of roads. The cumulative projects are anticipated to have a minimal effect on eagle populations.

No Action Alternative

Implementation of the No Action alternative would likely result in similar cumulative effects to special-status wildlife species as the Proposed Action; however, the cumulative effects would be spread out over time and more localized. Under the No Action alternative proposed PCMs may not be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4) thus potentially increasing cumulative effects to special-status wildlife species.

3.4 CULTURAL RESOURCES

3.4.1 Introduction and Methodology

This section of the EA describes the area of potential effect (APE) for cultural resources and examines the potential effects including damage, loss, degradation, or other disturbance to cultural resources under the Proposed Action and No Action alternatives.

The term “cultural resource” refers to a broad category of resources that includes prehistoric and historic archaeological sites, buildings, districts, structures, locations, or objects considered

important to a culture or community for scientific, traditional, religious, or other reasons. Cultural resources deemed significant for their contribution to broad patterns of history, prehistory, architecture, engineering, and culture are eligible for listing on the National Register of Historic Places (NRHP) and afforded certain protections under the NHPA. Because the Project is a federal undertaking, it is subject to compliance with Section 106 of the NHPA of 1966, as amended (16 U.S.C. 470 et seq.). Section 106 (36 CFR Part 800, as amended August 5, 2004) requires federal agencies to consider the effects of their undertakings on historic properties, and consult with the SHPO. In addition, Section 106 and the American Indian Religious Freedom Act (AIRFA) of 1978 also specify that Native American concerns be taken into consideration.

To be eligible for listing on the NRHP, a property must be significant under one or more of four evaluation criteria:

- Criterion A: Associated with events that have made a significant contribution to the broad patterns of our history
- Criterion B: Associated with the lives of persons significant in our past
- 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
- Criterion D: Yielded, or may be likely to yield, information important in prehistory or history

In addition, a property must be able to convey its significance through the retention of specific aspects of integrity, such as location, design, materials, setting, workmanship, feeling, and association. In general, properties less than 50 years of age, unless of exceptional importance, are not eligible for listing on the NRHP.

Cultural Resource Surveys

Cultural resource surveys were conducted between May 17 and July 14, 2011, with subsequent visits to complete select site recordation between August and October 2011. Two 5-person teams of archaeologists conducted a 600-foot wide comprehensive Class III survey for the entire length of the Project crossing the CNF. The survey was conducted systematically, with linear transects a maximum of 15 meters wide. The goals of the cultural resource field survey were to:

- identify and record all cultural resources, including prehistoric sites, historic sites 45 years or older, and traditional cultural properties
- identify areas not surveyable and why (e.g., density of vegetation, degree of slope, etc.)
- re-record previously recorded sites
- evaluate the significance of cultural resources

Cultural sites and diagnostic artifacts were recorded with submeter accuracy using a GPS unit (Trimble GeoXT GeoExplorer 2008 Series). In addition, data regarding each site were entered into the geographic information system (GIS) database using the GPS unit, in accordance with a standardized data dictionary. This information included site type, quantity and type of artifacts, site condition or integrity, and any explanatory comments.

3.4.2 Definition of the Area of Potential Effects

As defined in Section 106 (36 CFR Part 800.16[d]), the APE refers to the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties," is "influenced by the scale and nature of an undertaking," and "may be different for different kinds of effects caused by the undertaking." As described in Section 1, the APE for the Project consists of a 420-foot wide area centered on the Western rights-of-way.

To comply with NHPA Section 106, Environmental Planning Group (EPG) archaeologists conducted a cultural resources study consisting of a detailed Class I records review, as well as an intensive Class III pedestrian survey in support of the EA and CNF's and Western's compliance with the NHPA (in preparation). Because much of the CNF cultural data are legacy files with poor spatial accuracy, probable site locations were first marked during surveys across the entire Project area, then compared with the locations of previously known sites. Subsequently, field crews returned to the field to either update existing site files or to create new documentation for the observed cultural sites. The first phase (Phase I) of site recordation commenced in the southern end of the Project area where site densities were observed to be lower than in the northern end of the Project area (Phase II). Due to the high density of sites in the northernmost seven miles of the Project, sites in that area are scheduled for future recordation in accordance with a programmatic agreement (PA) (currently in preparation) among Western, CNF, SHPO, and interested tribes.

In addition, Section 106 specifies that as the lead federal agency, it is Western's responsibility to ensure that consultation occurs with interested tribes to identify properties of special significance to them in the Project area. This responsibility is reinforced by the AIRFA, directing federal agencies to minimize interference with the free exercise of Native religion, and accommodate access to and use of important religious sites. Properties identified through the tribal consultation process may include traditional cultural properties (TCP), sacred landscape or landscape elements, and traditional use areas important for Native American cultural and religious practices. Since the Project area is located on CNF lands, Western has delegated the tribal consultation process to the CNF.

3.4.3 Affected Environment

The intensive Class III pedestrian survey conducted within the Project APE revealed the presence of numerous cultural properties. All are Prehistoric, Protohistoric, or Historic-era archaeological sites, and all are considered either eligible for listing on the NRHP, or their NRHP eligibility remains unevaluated. Western treats all unevaluated or potentially eligible properties in the same manner as properties that are determined eligible for NRHP listing.

Prehistoric properties include prehistoric habitation sites, agricultural field areas, and activity areas ranging in age perhaps as early as Paleoindian (8950 BC) through the AD 1400s. Protohistoric properties consist of Puebloan and Apachean rock shelters, petroglyphs, and artifact scatters ranging in age from the late AD 1400s to the early AD 1800s. Historic sites consist of Mormon settlements, lumber camps, man-made cave shelters, trails, wagon roads, paved roads, railroad beds, ranching homesteads, mining/quarry sites, and trash dumps and range in age from the mid AD 1800s to the AD 1960s.

A total of 145 cultural sites not determined to be ineligible for listing on the NRHP were recorded and evaluated in the Phase I recording area (southern 83 miles of the Project area). Approximately 73 cultural sites are present in the Phase II recording area (northern 7 miles of the Project area) and remain to be fully recorded and evaluated in accordance with the PA. Sites within the Phase I recording area that are eligible or potentially eligible for listing on the NRHP are listed in Appendix C.

Table 3-10. Summary of NRHP-eligible or Unevaluated Cultural Resource Sites in the Phase I Recording Area

Site Type	Count
Archaic artifact scatter	5
Historic architectural site	3
Historic mining site	1
Historic transportation site	5
Multicomponent artifact scatter	1
Multicomponent petroglyph site	1
Multicomponent rockshelter and petroglyph site	1
Multicomponent site with features	4
Paleoindian artifact scatter	1
Prehistoric artifact scatter	60
Prehistoric artifact scatter with features	1
Prehistoric field house/agricultural site	15
Prehistoric habitation site	44
Prehistoric petroglyph site	4
Protohistoric site	2
Unrelocated prehistoric site	1
Total	**145**

3.4.4 Environmental Consequences from the Proposed Action

Short-term impacts include the potential for surface and subsurface disturbance of cultural properties during implementation of the Project. Through implementation of the PCMs, Western would ensure that impacts to significant cultural resources are avoided to the greatest extent possible. Although it is possible that undiscovered cultural resources exist in the APE (e.g., buried cultural sites, etc.), implementing the PCMs would also help to ensure that adverse impacts to such resources are avoided. This would be accomplished by instructing vegetation removal crews in the identification of cultural resources and by monitoring vegetation removal activities in archaeological and historic architectural sensitive zones. PCMs applicable to cultural resources are listed in Table 2-2.

No mechanical vegetation removal methods would occur within the boundaries of cultural sites; rather, vegetation within the boundaries of site that are NRHP eligible or unevaluated for their NRHP eligibility would be removed using manual methods (hand crews). At sites with standing architecture or petroglyphs, monitoring of vegetation removal activities by a Western- and CNF-approved archaeologist would be conducted to ensure those features are not damaged by the

felling of large trees. Disposal of vegetation from sites would be completed in accordance with the procedures identified in Section 2.1.1.2 or in coordination with the CNF.

3.4.5 Environmental Consequences of the No Action Alternative

Under the No Action alternative, Western would continue its need-driven management approach using current methods for vegetation management and right-of-way maintenance. Maintenance activities would be reactive, resulting in vegetation removal occurring when vegetation growth has reached a hazardous condition for operation of the transmission facilities. In general, vegetation within the rights-of-way would be retained, thus increasing the potential for wildfires igniting within the rights-of-way and/or arcing with transmission facilities, resulting in unreliable and unsafe operating conditions for the Project.

The Proposed Action would routinely remove vegetation before it becomes a hazardous condition, thus necessitating the implementation of the PCMs identified in Table 2-2 for vegetation removal activities. Consequently, implementation of the No Action alternative may result in higher impacts to cultural resources in the Project area than the Proposed Action, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over implementation of PCMs (see Section 1.4).

3.4.6 Cumulative Effects to Cultural Resources

3.4.6.1 Proposed Action

A cumulative impact on cultural resources could occur if the characteristics of a property that rendered it eligible for listing in the National Register were altered or degraded, or if cultural resources were damaged. Implementation of the Proposed Action, along with past, present, and reasonably foreseeable actions, would consist of planned vegetation removal and/or management within the Western rights-of-way and selective removal of danger trees adjacent to the rights-of-way. Vegetation treatment would consist of manual removal of vegetation within the boundaries of cultural sites, and cultural monitoring of vegetation removal within the boundaries of special status sites (those with important surface architectural or petroglyph features).

Although no traditional cultural properties have yet been identified within the Project area, and additional sites will be recorded and evaluated for NRHP eligibility in the Phase II area, Western has designed PCMs for cultural resources and would avoid impacts to all known sites that have not been determined ineligible for National Register listing. Implementation of cultural resource PCMs would eliminate the Proposed Action's contribution to cumulatively considerable effects on cultural resources.

3.4.6.2 No Action Alternative

Implementation of the No Action alternative would likely result in similar cumulative effects to cultural resources as the Proposed Action; however, under the No Action alternative proposed PCMs may not be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4). In such cases, implementation of the No Action alternative could contribute to cumulatively considerable

effects to cultural resources in combination with the past, present, and reasonably foreseeable actions presented in Table 3-1.

3.5 LAND USE

3.5.1 Introduction and Methodology

Land use policies and regulations control the type and degree of land use and activities permitted in a given area. This section of the EA characterizes the applicable plans regulating land use within the Project area, and analyzes potential land use impacts under the Proposed Action and No Action alternative.

Existing land use data was collected through analysis of aerial photography, field verification, review of existing studies and plans, and coordination with Western and the CNF. Planned land use information was collected through review of existing plans for Coconino County and the CNF, including the CNF Land and RMP that, as required by the National Forest Management Act (NFMA), "provides for integrated multiple-use and sustained-yield of goods and services from the USFS CNF in a way that maximizes long-term net public benefits in an environmentally sound manner," (CNF RMP 1987).

3.5.2 Affected Environment

3.5.2.1 Existing Land Use

Federal Lands

Much of the approximate 6,545-acre Project area falls within the 1,821,495-acre Forest. The CNF (and the Project area), located in north central Arizona, encompasses portions of Coconino, Yavapai, and Gila counties. Land uses within the CNF are managed under the USFS CNF-wide standards and guidelines, as well as individual Management Area standards and guidelines. A Management Area is a unit of land where given management practice is applied to "attain multiple-use and other goals and objectives" (CNF RMP 1987). In situations where Management Area standards and guidelines conflict with USFS CNF-wide standards and guidelines, the Management Area standards and guidelines supersede the Forest. The Project area crosses through 18 Management Areas. Table 3-11 illustrates these areas crossed by and in close proximity to the Project area, and provides a brief description of each area's management emphasis. The Project area is also in close proximity to lands managed by the National Park Service (Wupatki National Monument), and the Prescott and Tonto National Forests (Mazatzal Wilderness).

Table 3-11. Management Areas Crossed by the Project

Forest Management Areas*	Name	Relative Project Area Location	Total Acreage	Acreage Within Project Area	Acreage Within Right-of-Way	Management Emphasis*
MA-1	**Wilderness Areas**		155,910	13.66	7.17	"Manage the wilderness resource to ensure its character and values are dominant and enduring. Its management must be consistent over time and between areas to ensure its present and future availability and enjoyment as wilderness. Manage wilderness to ensure that human influence does not impede the free play of natural forces or interfere with natural successions in the ecosystems and to ensure that each wilderness offers outstanding opportunities for solitude or a primitive and unconfined type of recreation. Manage wilderness as one resource rather than a series of separate resources"**
	Strawberry Crater Wilderness	Nearby	45,505	0	0	
	West Clear Creek Wilderness	Spans	215,303	10.15	7.17	
	Fossil Springs Wilderness	Nearby	10,431	0	0	
	Mazatzal Wilderness	Portion within danger tree area	89,496	3.51	0	
MA-2	Verde Wild and Scenic River	Within	2,888	23.19	15.68	"Maintain the Wild & Scenic River outstandingly remarkable values for scenic, fish, wildlife, and historic and cultural values, while also protecting the river's free-flowing character. Protection and enhancement of the specific outstandingly remarkable values and water quality within the VWSR provides the foundation upon which all management actions and authorizations of uses are based."
MA-3	Ponderosa Pine and Mixed Conifer; Less than 40%	Within	511,015	554.02	272.12	"Emphasize a combination of multiple-uses including a sustained-yield of timber and firewood production, wildlife habitat, livestock grazing, high quality water, and dispersed recreation."
MA-4	Ponderosa Pine and Mixed Conifer; Greater than 40% Slope	Within	46,319	19.94	9.46	"Emphasize wildlife habitat, watershed condition, and dispersed recreation. Management intensity is low."
MA-6	Unprotected Timber Land	Within	67,146	123.68	70.28	"Emphasize a combination of wildlife habitat, watershed condition, and livestock grazing. Other resources are managed in harmony with the emphasized resources."
MA-7	Piñon-juniper lands <40% slope	Within	273,815	850.32	584.55	"Emphasize firewood production, watershed condition, wildlife habitat, and livestock grazing. Other resources are managed in harmony with the emphasized resources."
MA-8	Piñon-Juniper Woodland; Greater than 40% Slope	Within	18,915	0.41	0.16	"Emphasize wildlife habitat, watershed condition, and dispersed recreation. Management intensity is low."
MA-9	Mountain Grassland	Within	9,049	21.41	16.19	"Emphasize livestock grazing, visual quality, and wildlife habitat. Other resources are managed in harmony with emphasized resources. The smaller mountain meadows in remote areas are managed mostly for wildlife habitat, especially for elk summer range."
MA-10	Grassland and Sparse Piñon-Juniper Above the Mogollon Rim	Within	160,494	1,397.58	1,152.39	"Emphasize range management, watershed condition, and wildlife habitat. Other resources are managed to improve outputs and quality. Emphasis is on prescribed burning to achieve management objectives. Walnut Canyon National Monument entrance road is within this MA. The management and use of the 1000 foot right-of-way along the entrance road is directed toward the protection and maintenance of the cultural and natural resources of the area."
MA-11	Verde Valley	Within	169,529	312.03	216.18	"Emphasize watershed condition, range management, wildlife habitat for upland game birds, and dispersed recreation."
MA-12	Riparian and Open Water	Within	20,490	26.45	18.91	"Emphasize wildlife habitat, visual quality, fish habitat, and watershed condition on the wetlands, riparian forest, and riparian scrub. Emphasize dispersed recreation, including wildlife and fish recreation, on the open water portion."
MA-13	Cinder Hills	Within	13,711	134.81	101.73	"Emphasize OHV recreation opportunities and amenities. Monitor communities of plants such as *Penstemon cluteii* where and when they occur in the OHV area. Ensure continued existence of this endemic plant. Mitigate scenic integrity of areas seen from the Monument, Highway 89, and neighboring rural residential areas. Protect the Kana-a Lava flow and Gyp Crater geologic features associated with Sunset Crater."
MA-31	Craters (Cr)	Within	29,940	231.68	158.54	"Maintain cinder ecosystems, un-tracked appearance of cinder cones, and remote recreation opportunities with a high sense of self-exploration. Continue opportunities for firewood cutting and livestock grazing in the piñon/juniper woodland. Restore natural grasslands. Re-establish or maintain fire and other ecosystem processes in the piñon/juniper woodland."
MA-32	Deadman Wash (DW)	Within	58,133	655.66	470.33	"Restore and maintain grasslands and grassland adapted wildlife species, especially antelope. Provide large tracts of un-roaded landscape for disturbance sensitive species and remote recreation experiences. Protect cultural resources. Continue opportunities for livestock grazing, hunting, and firewood gathering. Balance recreation use demands on O'Leary Peak with sensitive wildlife species needs and Native American cultural values. Focus on maintenance and/or improvement of soil condition and watershed function. System roads and trails should receive adequate maintenance so that accelerated soil erosion is minimal. Non-system roads will be rehabilitated and some poorly located roads will be re-located. Rate of implementation will be dependent on funding and Forest priorities for road maintenance."
MA-33	Doney (D)	Within	40,530	227.99	168.79	"Most of this MA is within the Urban/Rural Influence Zone. Reduce the risk of catastrophic wildfire, especially within the Urban/Rural Influence Zone. Reintroduce fire's natural role as much as possible. Emphasize daytime recreation activities, both motorized and non-motorized. Balance recreation demands with protection of soils, water, and vegetation. Maintain public access to public lands. Restore natural grasslands, and promote healthy piñon/juniper woodland. Ponderosa pine lands progress towards desired forest structure (goshawk habitat). Reduce instances of illegal activities and trash dumping. Maintain scenic quality. Opportunities for firewood or other forest products are rare, however, firewood sales may be used as a tool for management."
AD-NPS	Wupatki National Monument	Nearby	35,423	0	0	
AD-Private	Private Land	Within		17.12	12.46	
SD/JM	Mazatzal Wilderness on Prescott and Tonto National Forests	Within		2.24	0	

*Quoted from the *Coconino National Forest Land and Resource Management Plan*
** Quoted from *FSM 2300 – RECREATION, WILDERNESS, AND RELATED R*ESOURCE MANAGEMENT, CHAPTER 2320 – WILDERNESS MANAGEMENT, Amendment No.: 2300-2007-1

County Lands

In addition to the federal land, the Project area crosses private land; which not being located within any municipality, falls under the jurisdiction of the county it is located within. The Project area crosses two private parcels located within Coconino County. One of these locations is designated as a General Zone, and one is designated as Open Space and Conservation Zone, per the Coconino County Comprehensive Plan and Zoning Code. The General Zone is a "general rural land use category intended for application to those unincorporated areas of the County not specifically designated in any other zone classification…" according to the Coconino County Zoning Ordinance, and "…only those uses are permitted which are complementary and compatible with a rural environment," (Coconino County 1964, updated 2011). The Open Space and Conservation Zone is "intended primarily for those areas of the County where it is desirable and necessary to provide permanent open spaces when such are necessary to safeguard the public health, safety and general welfare and to provide for the location and preservation of scenic areas and recreation areas." Further, "This zone classification is intended to be applied primarily to lands held under public ownership," (*ibid*).

No private parcels within the Project area are located within Yavapai or Gila County; within these counties the Project area falls entirely within CNF-managed lands. Therefore, the land use components of these counties' General/Comprehensive Plans are not included in this analysis.

3.5.2.2 Future Land Use

Future land use is based on information contained in existing planning documents (including the USFS CNF Land and RMP, the Coconino County Comprehensive Plan, and the Coconino County Zoning Ordinance). The USFS CNF plan information was the primary basis of this analysis and represents guidelines for land management.

Federal Lands

The USFS CNF Plan provides an in-depth description of current and future management directions and emphases for Management Areas within the CNF. Existing land uses within the CNF, prescribed on a per Management Area basis, are expected to remain as currently managed under the USFS CNF Land and RMP (see Table 3-11).

County Lands

The Coconino County Comprehensive Plan is "intended to serves as a roadmap for the future by establishing goals and policies to direct growth responsibly, solve problems, and improve the quality of life for county residents." The plan discusses the future land uses envisioned for unincorporated portions of the county. Within the Project area, the majority of land is not categorized by the comprehensive plan because it is under CNF jurisdiction; however, as noted above, two private parcels within the Project area fall under the jurisdiction of Coconino County.

The existing land uses within these two private parcels are expected to remain as currently managed under the Coconino County Comprehensive Plan.

3.5.3 Environmental Consequences

3.5.3.1 Federal Lands

The Proposed Action would result in initial vegetation clearing and continued vegetation management of up to approximately 4,300 acres of CNF land. The Proposed Action would also include the potential for selective removal of danger trees within a 1,310-acre area of CNF land. These land uses are compatible with the CNF Land and RMP standards and guidelines, as well as the individual Management Area standards and guidelines.

3.5.3.2 County Lands

The Proposed Action would result in vegetation clearing and management, and selective removal of danger trees within private land under the jurisdiction of Coconino County. For these private parcels, which fall under the Coconino County zoning classifications of General and Open Space and Conservation, "utilities" is an approved conditional use; therefore activities undertaken as part of the Proposed Action, namely maintenance associated with the "utility" use, are compatible with the Coconino County Comprehensive Plan and the Coconino County Zoning Ordinance.

3.5.4 Environmental Consequences of the No Action Alternative

Under the No Action alternative, Western would continue its need-driven management approach using current methods for vegetation management and right-of-way maintenance. Maintenance activities would be reactive, resulting in vegetation removal occurring when vegetation growth has reached a hazardous condition for operation of the transmission facilities. In general, vegetation within the rights-of-way would be retained, thus increasing the potential for wildfires igniting within the rights-of-way and/or arcing with transmission facilities, resulting in unreliable and unsafe operating conditions for the Project.

The Proposed Action would routinely remove vegetation before it becomes a hazardous condition, thus necessitating the implementation of the PCMs identified in Table 2-2 for vegetation removal activities. Consequently, implementation of the No Action alternative may result in higher impacts to land use in the Project area than the Proposed Action, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over implementation of PCMs (see Section 1.4).

3.5.5 Cumulative Effects to Land Use

3.5.5.1 Proposed Action

Cumulative effects on land use could include the generation of noise, dust, and odors. Additionally, removal of vegetation within the Project area could result in increased accessibility to CNF land; this, along with potential future growth and development of nearby non-federal lands, could result in increased access. Based on current information, the Proposed Action, along with other past, present and reasonably foreseeable future actions, would not conflict with land use or land use plans.

3.5.5.2 No Action Alternative

Implementation of the No Action alternative would likely result in similar cumulative effects to land use as the Proposed Action; however, the cumulative effects would be spread out over time and more localized. Under the No Action alternative proposed PCMs may not be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4). However, the No Action alternative is not anticipated to contribute to cumulatively considerable effects to land use in combination with the past, present, and reasonably foreseeable actions presented in Table 3-1.

3.6 RECREATION

3.6.1 Introduction and Methodology

This section of the EA examines the potential effects to recreational resources under the Proposed Action and No Action alternative.

Existing recreation data was collected through review of existing studies and plans, and coordination with Western and the CNF. Recreation data was collected through review of existing plans for the USFS CNF, including the CNF Land and RMP.

In order to better capture potential effects to recreation, the study area analyzed for recreation resources has been expanded and includes land within 0.5 mile of the transmission lines. Certain existing roads outside this 0.5-mile buffer may be maintained as part of the Proposed Action, as needed.

3.6.2 Affected Environment

3.6.2.1 Recreation Opportunity Spectrum

The ROS is an inventory and management tool that categorizes lands managed by the USFS into six classes. Each ROS classification is defined by its setting and by the probable recreational experiences and activities that it affords (CNF RMP 1987). In the USFS recreation site planning process, ROS classifications are used to set recreational development strategies. Table 3-11 provides descriptions, acreages, percentage of the study area located within each ROS class, and percentage of the study area ROS class within the USFS CNF.

The majority of the study area falls within the Roaded Natural class, which is characterized by predominantly natural-appearing environments with moderate evidences of the sight and sounds of man. Additionally, very small portions of the proposed study area are located within areas categorized as Semi-primitive Motorized, Semi-primitive Non-motorized, and Primitive.

With the exception of the Semi-primitive Non-motorized area, contained within the West Clear Creek Wilderness Area, no class other than Roaded Natural can be found within the Project area or existing right-of-way. The Semi-primitive Non-motorized area within the West Clear Creak Wilderness Area is an area where Project facilities span at such a height that vegetation will not interfere with safe and reliable transmission line operation, and may not need to be removed or maintained.

Of the ROS classes contained within the study area, the Primitive class is the most sensitive, as it is characterized by a generally unmodified natural environment. As noted in Table 3-12, the Primitive class makes up less than 1 percent of the study area, and is not located within the Project area or existing right-of-way. No disturbance is anticipated to occur within this area.

3.6.2.2 Wilderness Areas and Recreation Sites

As stated in the CNF Land and RMP, a Wilderness Area is managed to "…ensure its character and values are dominant and enduring…" and "…to ensure its present and future availability and enjoyment as wilderness." The Land and Resource Management Plan goes on to say that Wilderness Areas are managed "…to ensure that human influence does not impede the free play of natural forces or interfere with natural successions in the ecosystems and to ensure that each wilderness offers outstanding opportunities for solitude or a primitive and unconfined type of recreation."

Portions of the Strawberry Crater, West Clear Creek, Fossil Springs, and Mazatzal Wilderness Areas are located within the study area. Small portions of Strawberry Crater, West Clear Creek, and Mazatzal Wilderness Areas are also located within the Project area. Only the West Clear Creek Wilderness Area is within the existing right-of-way; but as noted above, is located in an area where Project facilities span at such a height that vegetation will not interfere with safe and reliable transmission line operation, and may not need to be removed or maintained. Additionally, PL 98-406, the Congressional Act that designated the West Clear Creek Wilderness Area, was enacted in 1984; after the transmission lines and associated right-of-way were in place. As stated in PL 98-406, Sec. 101(b) a wilderness designation is "Subject to valid existing rights…," which in this case consists of the maintenance activities within the pre-existing transmission line right-of-way. Furthermore, per PL 98-406 Sec 101(d), the designation of wilderness areas is not intended to create "protective perimeters or buffer zones around each wilderness area" (*ibid*). Therefore, it is only the management of fall-in trees outside the existing transmission line rights-of-way and within the West Clear Creek Wilderness Area, to which the wilderness management guidelines will apply.

Recreational uses on the CNF within the Project area are primarily of a dispersed nature, including hiking, horseback riding, wildlife viewing, bird watching, OHV use, and hunting. Strawberry Crater Trailhead, Forked Pine Campground, Ashurst Lake, and Childs Campground are designated recreation sites within the study area.

The Strawberry Crater Trailhead is the only USFS CNF-designated recreation site within the Project area, and no designated recreation sites are located within the designated right-of-way.

The Strawberry Crater Trailhead provides access for non-mechanized recreation activity (hiking, horseback riding, wildlife viewing, bird watching) within the Strawberry Crater Wilderness, which is outside the right-of-way of the Project.

The Fossil Creek and Verde Scenic River corridors are both located within the Project area and existing right-of-way. The Fossil Creek and Verde Scenic Rivers provide recreation opportunities including fishing, boating, rafting, hiking, biking, and photography.

Table 3-12. Recreation Opportunity Spectrum				
ROS Class	**ROS Class Description**	**Acreage within Study Area**	**Approximate Percentage of the Study Area***	**Approximate Percentage of the Study Area ROS Class within Forest**
Roaded Natural	Settings are characterized by a more natural appearing environment with moderate evidence of human activity. Interaction between users is low to moderate. Resource modification and utilization practices are evident but harmonious with the natural environment. Conventional motor vehicle use is common on paved, graveled, and unsurfaced roads.	59,942	93%	<1%
Semi-Primitive Motorized	Settings are predominantly natural environments of moderate to large size. Interaction between visitors is low, but there is often evidence of other humans. The area is managed in such a way that the minimum onsite controls and restrictions present are subtle. Motor vehicle use is permitted.	2,817	4 %	<1%
Semi-Primitive Non-Motorized	Settings are predominantly natural environments of moderate to large size. Interaction between visitors is low, but there is often evidence of other humans. The area is managed in such a way that the minimum onsite controls and restrictions present are subtle. Motor vehicle use is prohibited.	831	1%	1%
Primitive	Settings are characterized by an unmodified natural environment of fairly large size. Interaction between users is low and evidence of others is minimal. The area is managed to be essentially free of man-made "improvements" and facilities. Motor vehicles and other motorized equipment are not permitted.	244	<1%	<1%
*Approximately 1% of the study area is located outside of the CNF, and thus does not fall under any ROS classification				

A portion of the General Crook National Recreation Trail crosses Project area and existing right-of-way. This portion of the trail parallels Arizona SR 260. Recreation opportunities on the General Crook National Recreation Trail include hiking, horseback riding, mountain biking, and wildlife viewing. Additionally, the section of SR 260 adjacent to the General Crook National Recreation Trail is referred to as the General Crook Trail or the Zane Grey Highway. Recreation

opportunities along this stretch of roadway include wildlife viewing and access to other areas of the CNF.

The Arizona National Scenic Trail is a more than 800-mile long National Scenic Trail that crosses through Project area and existing right-of-way. The Arizona National Scenic Trail extends from the Arizona-Utah border to the Arizona-Mexico border, crossing numerous biological zones and highlighting some of Arizona's greatest attributes. Within the study area, some of the recreational uses on the Arizona National Scenic Trail include hiking, backpacking, horseback riding, mountain biking, and cross-country skiing (Arizona Trail Association).

3.6.3 Environmental Consequences

Short-term impacts include brief audible disturbances during aerial patrol and LIDAR detection as part of the hazard tree identification process, the disturbance of land during implementation of the Project, and potential temporary restrictions on access to forest roads—thus, potentially restricting access to the one recreation site within the Project area, and additional recreation sites within the study area. The Proposed Action would not modify the ROS classification in the area and would be in compliance with ROS management objectives. No new access roads would be constructed; however, maintenance to existing access roads may occur, as necessary.

While no initial vegetation removal or routine vegetation maintenance would occur within any of the wilderness areas within the Project study area, selective danger tree removal could, at some point, be necessary on the outer boundary of the West Clear Creek and/or Mazatzal Wilderness Areas located within the Project area (Figures 3-6 and 3-7). No danger trees are currently identified in either of these areas; however, it is possible that a hazard situation could develop over the useful life of the transmission lines. In such a case, no mechanical vegetation removal methods or motorized vehicles would be allowed within Wilderness Areas. These techniques would be completed in a manner consistent with CNF management guidelines and the 1964 Wilderness Act. The Strawberry Crater Wilderness area is located within close proximity to the Project area, however; no initial or routine vegetation will occur within the area because it is located just outside the Wilderness boundary (Figure 3-8).

Vegetation clearing and selective tree removal activities are expected to occur within the Verde Scenic River corridor, but will take place in an area that, due to topography, is not visible to recreationalists on the river. Vegetation clearing and selective tree removal activities are also expected to occur within the Fossil Creek Scenic River corridor, and may be visible to recreationalists on the creek; however, any actions taken within this corridor would be consistent with the CNF Land and RMP standards and guidelines and Wild and Scenic Rivers Act of 1968.

The portions of the Arizona National Scenic Trail and the General Crook National Recreation Trail that cross the existing rights-of-way and Project area do so in regions of sparse existing vegetation. Given the current recreational settings, vegetation clearing within these areas is not anticipated to impact recreationalists.

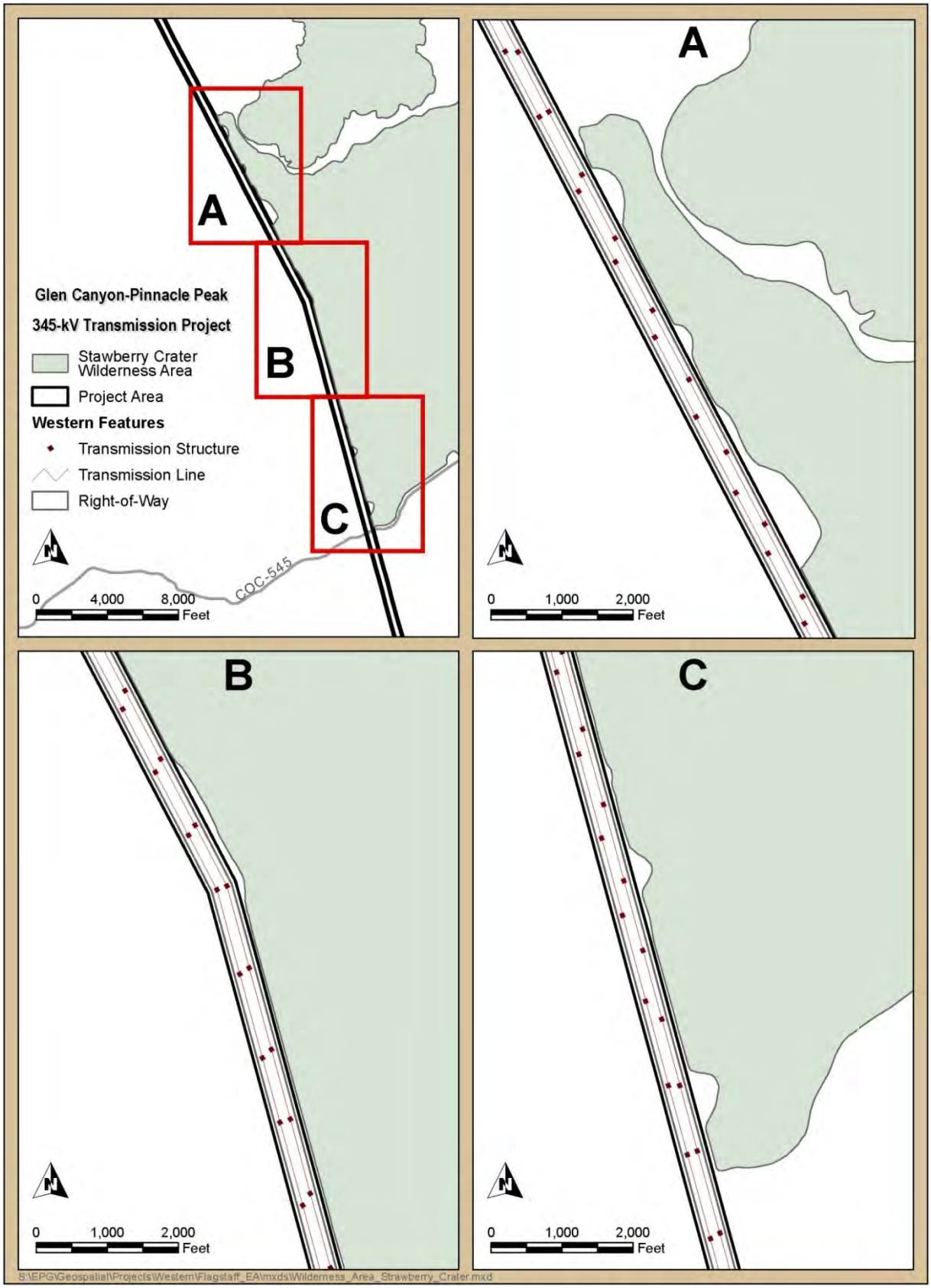

Figure 3-6. Project Area Proximity: Strawberry Crater Wilderness Area

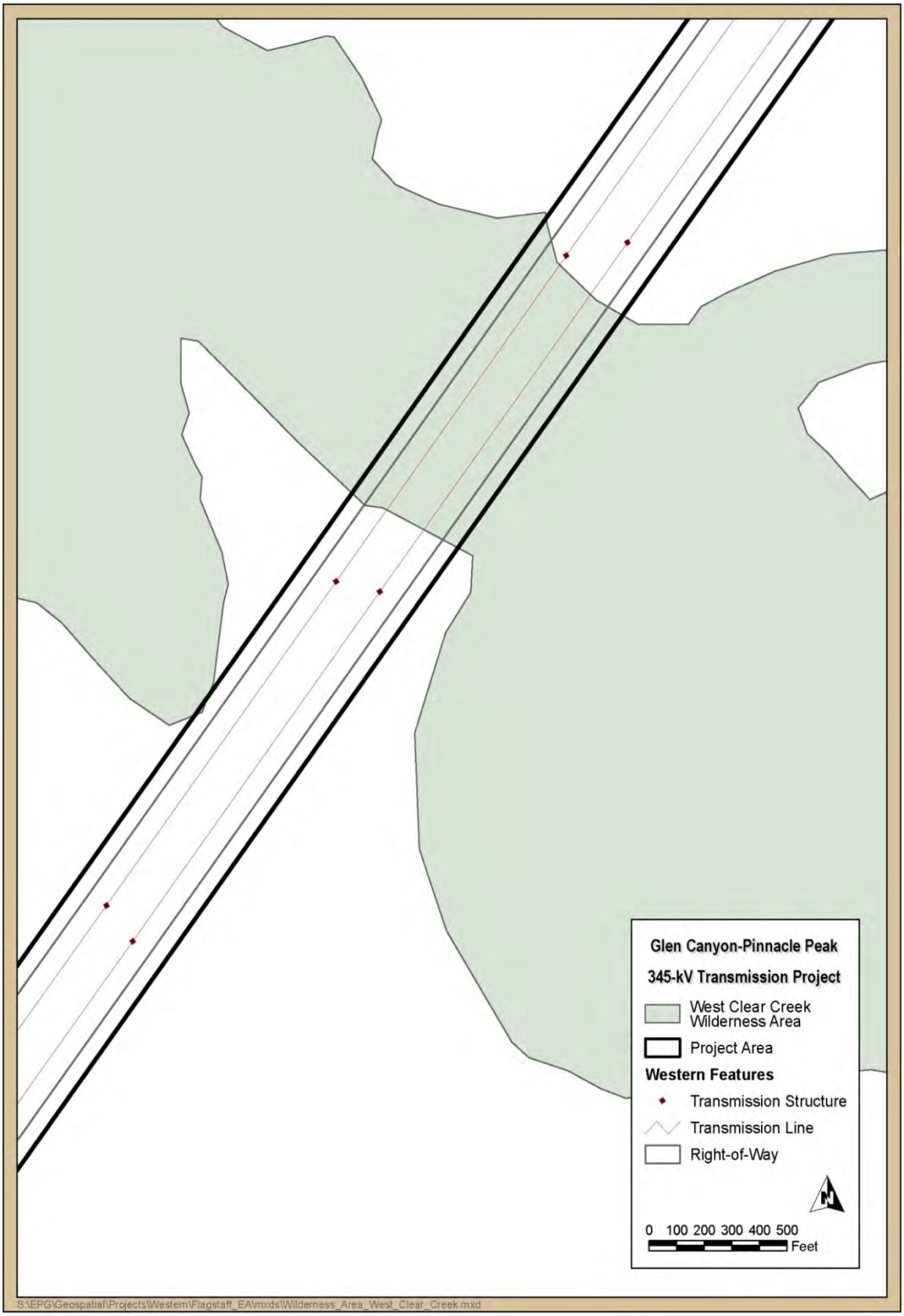

Figure 3-7. Project Area Proximity: West Clear Creek Wilderness Area

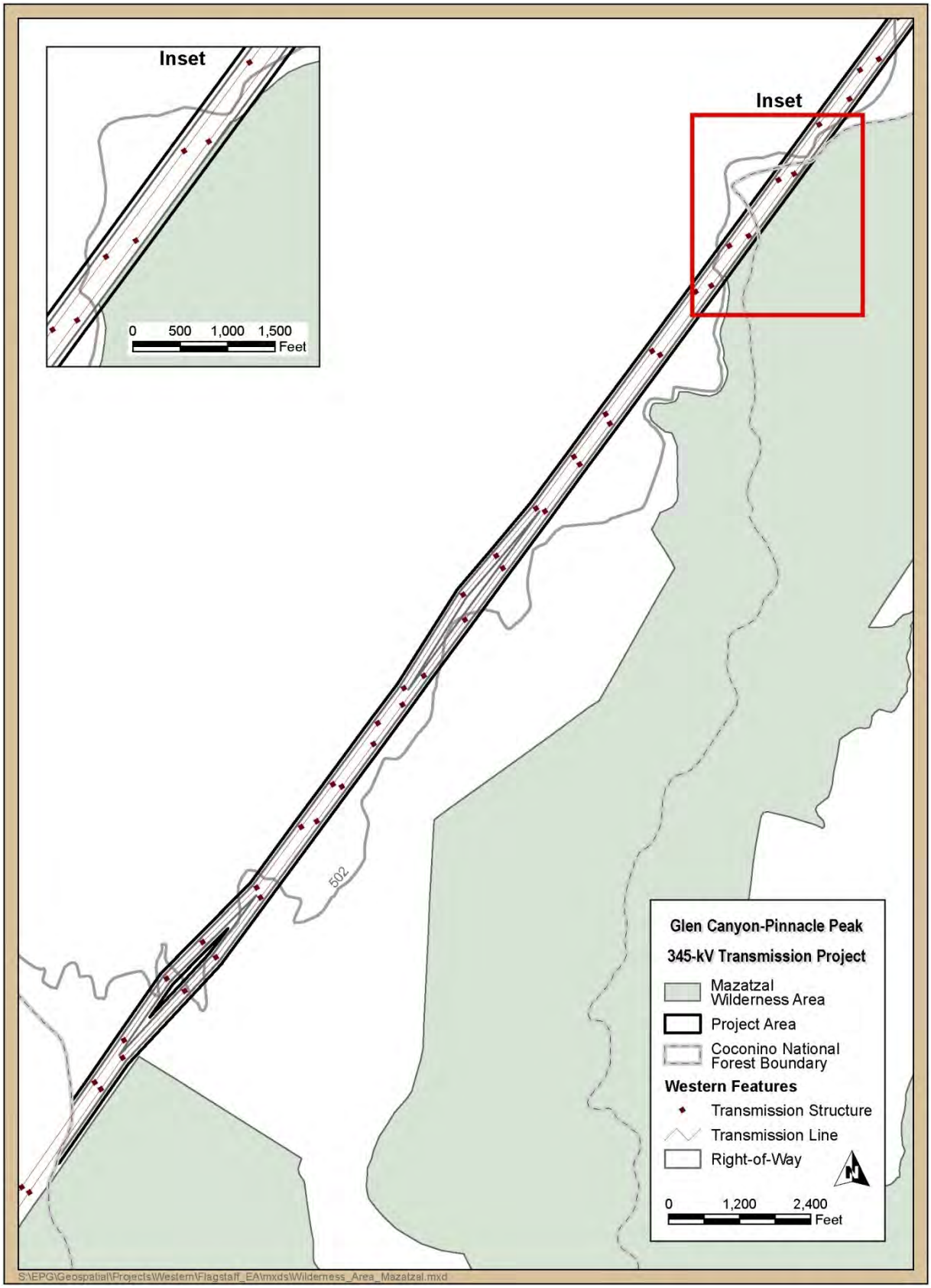

Figure 3-8. Project Area Proximity: Mazatzal Wilderness Area

3.6.4 Environmental Consequences of the No Action Alternative

Under the No Action alternative, Western would continue its need-driven management approach using current methods for vegetation management and right-of-way maintenance. Maintenance activities would be reactive, resulting in vegetation removal occurring when vegetation growth has reached a hazardous condition for operation of the transmission facilities. In general, vegetation within the rights-of-way would be retained, thus increasing the potential for wildfires igniting within the rights-of-way and/or arcing with transmission facilities, resulting in unreliable and unsafe operating conditions for the Project.

The Proposed Action would routinely remove vegetation before it becomes a hazardous condition, thus necessitating the implementation of the PCMs identified in Table 2-2 for vegetation removal activities. Consequently, implementation of the No Action alternative may result in higher impacts to recreation in the Project area than the Proposed Action, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over implementation of PCMs (see Section 1.4).

3.6.5 Cumulative Effects to Recreation

3.6.5.1 Proposed Action

Potential cumulative effects on recreation resulting from implementation of the Proposed Action along with past, present, and reasonably foreseeable future actions would include changes to visitation within the recreation study area.

The proposed changes to the designated system of roads, trails, and areas for motorized use on the CNF, as part of the CNF Motorized Travel Management Plan Environmental Impact Statement, will likely modify visitation patterns in that it is expected to concentrate motorized use on designated roads and camping corridors. This may limit recreation opportunities within the recreation study area by restricting OHV use. Additionally, the concentration of motorized use may also increase disturbance in select areas.

Actions associated with the Mogollon Rim Ranger District Year-Round Recreation Site Access Points Project, including the development of additional public access, parking areas, and facilities, may result in increased opportunity for visitation within the recreation study area, while also potentially increasing disturbance in select areas.

The Coconino and Tonto Forests' planned Fossil Creek Wild and Scenic River Comprehensive River Management Plan (CRMP) may include the development of several new recreation facilities; however, the CRMP is intended to reduce visitation within the recreation study area and potentially reduce disturbance in select areas.

The generation of noise and dust associated with the Proposed Action as a result of these and other past, present, and reasonably foreseeable future actions, could diminish select recreational experiences in the recreation study area. However, the reasonably foreseeable actions mentioned above will also provide increased recreational opportunities within the recreation study area. Therefore, both improvements to recreational opportunities as well as isolated short-term impacts could be experienced by recreationists in the recreation study area.

3.6.5.2 No Action Alternative

Implementation of the No Action alternative would likely result in similar cumulative effects to recreation as the Proposed Action; however, the certain cumulative effects (e.g., noise and dust generation) would be spread out over time and more localized. Under the No Action alternative proposed PCMs may not be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4). However, the No Action alternative is not anticipated to contribute to cumulatively considerable effects to recreation in combination with the past, present, and reasonably foreseeable actions presented in Table 3-1.

3.7 WILDLAND FIRE

3.7.1 Introduction and Methodology

The term *wildland fire* is applied to any nonstructural fire that occurs in the wildland. On the CNF, wildland fires are of two different types: (1) unplanned ignitions or prescribed fires that are declared wildfires and (2) prescribed fires that are planned ignitions (USFS 2011c). Unplanned ignitions, usually as a result of lightning strike, may be managed the same as a prescribed fire depending on the fire management objectives in the area that the fire is burning in, and other factors such as weather, topography, and fuel load and character. Generally, management response to wildland fire on the CNF is based on objectives established in the pertinent LRMP (Land/Resource Management Plan).

The CNF is divided into five Fire Management Units (FMU):

- ponderosa pine
- piñon-juniper
- brush
- ponderosa pine urban
- brush urban

FMUs are used to describe safety considerations, physical, biological, and social characteristics that can help direct planning guidance across the USFS CNF. Each FMU is defined by objectives, topographic features, access, values to be protected, political boundaries, fuel types, or major fire regimes that set it apart from adjacent FMUs. Each FMU is tied to specific management objectives outlined in the USFS CNF LRMP.

USFS CNF-wide goals are intended to guide managers in all aspects of resource management. Within the area traversed by the Project, the primary USFS CNF-wide goals include:

- allowing wildfire to play a more natural role in wilderness
- Fire continuing to play a natural ecological role within the constraints of human health and safety
- reducing the risk and potential for destructive crown fire, especially in the Urban Rural Influence Zone and the Wildland Urban Interface

USFS CNF-wide standards and guidelines relative to fire management include guidelines for fire suppression. In all situations when a fire is declared to be a wildfire, it will be suppressed in a

rapid, energetic, and thorough manner regardless of the size of the fire. Fires that are not declared to be wildfires may be allowed to burn in order to reduce hazardous fuel accumulations and reduce the future possibility of destructive crown fires.

Fire suppression objectives have been established for four suppression zones as follows:

- Urban Interface – The suppression objective is to hold fires to 10 acres or less.
- Commercial Timber Land – The suppression objective is to hold fires to 100 acres or less per fire start. Prescribed fire using both planned and unplanned ignitions is used to accomplish fuel treatment and other management objectives. Suppression action gives top priority to protecting life and property, resource values, and private in-holdings.
- Piñon-Juniper and Desert Grasslands – The suppression objective is to hold fires to 100 acres or less per start. In ponderosa stringers and other identified important habitats the suppression objective is 300 acres or less per start. Planned and unplanned ignitions may also be used to treat fuel loads and other management objectives.
- Fires that are not a threat to other areas outside the wilderness are allowed to burn naturally, provided prescribed prescriptions are met.

When a fire is reported, a determination is made as to whether or not the fire is a wildfire or a prescribed fire. If prescribed, the fire will be monitored to ensure that it remains within prescription. Wildfires are suppressed using methods appropriate to each individual situation.

3.7.2 Affected Environment

The majority of the Project is located within the shrub/urban, piñon-juniper woodland and ponderosa pine FMUs.

The ponderosa pine FMU is dominated by ponderosa pine with local occurrences of Gambel oak, piñon pine, and one or more species of juniper. Ground cover typically consists of a variety of species of grasses and forbs. A shrubby understory is generally not typical of this vegetation type and, in the presettlement condition, this type was park-like with large open areas between large, mature ponderosa pines.

The piñon-juniper FMU, as the name implies, is floristically dominated by two species of piñon pine and several species of juniper. This type is of fairly short stature and often quite open, although it may be locally dense but never impenetrable. Several shrubby species characteristic of the shrub/urban FMU may also be present, especially in areas where piñon-juniper is ecotonal with more shrubby, lower elevation habitats.

The shrub/urban FMU is variable, but dominated by shrubby species including Manzanita, mountain mahogany, antelope brush, and species of sumac, along with scattered individuals of piñon pine and alligator juniper.

Ponderosa Pine FMU

The goal for wildfire suppression in this FMU is to keep the total wildfire-burned acreage at or below 750 acres per year over a 10-year period. This goal applies to wildfires where suppression is deemed the appropriate response.

Piñon-Juniper FMU

The goal for wildlife suppression in this FMU is to hold fires to 1,000 acres or less, with an ancillary goal of minimizing suppression costs and providing for maximum personnel safety.

Shrub/Urban FMU

The goal for wildlife suppression in this FMU is to hold fires to 1,000 acres or less, with an ancillary goal of minimizing suppression costs and providing for maximum personnel safety.

3.7.3 Environmental Consequences

Under the Proposed Action nearly all vegetation would be removed (typically mowed) within the Project rights-of-way. In addition, individual danger trees would be removed from another 60-foot band outside the 300-foot-wide mowed area. Vegetation management to achieve and maintain Western's desired condition would then occur on a 5-year cycle, instead of the current reactive approach to imminent danger trees.

Clearing within the ponderosa pine FMU would result in removal of substantial biomass of ponderosa pine, Gambel oak, and junipers. The actual biomass removal in the piñon-juniper FMU might be higher, owing to the greater density of piñons and junipers per acre. Clearing in the shrub/urban FMU would probably result in the least amount of biomass removal, but the total would still be substantial. Follow-on clearing needs in the shrub/urban FMU would probably be less than in other FMUs, because it is unlikely vegetation would ever reach conflicting heights except for isolated individual trees.

Proposed vegetation removal for this Project should reduce the potential for wildfire outbreak in the vicinity of the transmission lines via the removal of fuels. Vegetation removal would also minimize the potential for arcing between the transmission conductors and nearby trees, further reducing the likelihood of igniting wildfires. The area of cleared vegetation could act as a firebreak, especially in the case of wildfire in the crowns of pines on either side of the Project.

3.7.4 Environmental Consequences of the No Action Alternative

Under the No Action alternative, Western would continue its need-driven management approach using current methods for vegetation management and right-of-way maintenance. Maintenance activities would be reactive, resulting in vegetation removal occurring when vegetation growth has reached a hazardous condition for operation of the transmission facilities. In general, vegetation within the rights-of-way would be retained, thus increasing the potential for wildfires igniting within the rights-of-way and/or arcing with transmission facilities, resulting in unreliable and unsafe operating conditions for the Project. Consequently, implementation of the No Action alternative may result in higher wildland fire impacts in the Project area than the Proposed Action.

3.7.5 Cumulative Effects to Wildland Fire

3.7.5.1 Proposed Action

Potential cumulative impacts on wildland fire ecology are complex in consideration of existing and future electrical transmission and distribution systems and changes in CNF plans to accommodate and/or restrict human access and recreation opportunities.

The effects occasioned by implementation of the Proposed Action may include an increased spread of species that thrive on disturbed soil surfaces, including invasive and weedy species that also prosper from over story removal and soil disturbance. In the Project area, this may result in a lesser tendency for wildfire to be anything more than ground level fire due to the removal of over story trees and shrubby species that could form fire ladders to the tree canopy.

Improved access by virtue of vegetation removal in the Project area could also enhance fire-fighting efforts by making it easier for crews and equipment to reach fires. Conversely, it could also lead to more human-caused ignitions by virtue of providing greater access to the recreating public.

The CNF plans to increase recreation opportunities by creating new parking areas and other recreation facilities (toilets, trash receptacles, kiosks, and picnic tables), and could increase the chances of human-caused ignition and affect CNF opportunities for controlled burns. Conversely, CNF plans to make changes to off-road motor vehicle use and concentrate such use on designated roads and camping corridors, which could act to reduce the potential for human-caused ignitions. Plans that may reduce the number of people and vehicles in the Fossil Creek area in summer months could also help reduce the probability of undesired ignitions in that area.

3.7.5.2 No Action Alternative

Implementation of the No Action alternative may result in increased cumulative effects to wildland fire than those anticipated for the Proposed Action. Under the No Action alternative, vegetation within the rights-of-way would largely remain, thus increasing the potential for wildfires igniting within the rights-of-way and/or arcing with transmission facilities. In addition, proposed PCMs may not be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4). As such, implementation of the No Action alternative could contribute to cumulatively considerable effects to wildland fire in combination with the past, present, and reasonably foreseeable actions presented in Table 3-1.

3.8 VISUAL RESOURCES

3.8.1 Introduction

This section of the EA addresses visual resources, including scenic attractiveness, concern levels, and scenic integrity objectives (SIO) related to the vegetation management and right-of-way maintenance for the Project. The text below provides a description of the methodology, affected visual resource environment for the Proposed Action, and the potential impacts to visual resources.

3.8.2 Methodology

Per CNF direction, the visual resource inventory and assessment was based upon the USFS Scenery Management System (SMS) (U.S. Department of Agriculture, USFS, Agriculture Handbook Number 701, 1995). The SMS approach defines a system for the inventory and analysis of aesthetic values of National Forest lands. This approach identifies scenic attractiveness, concern levels, and SIOs which describe acceptable degrees of alteration that can be made to the natural landscape through the integration of aesthetics with other biological, physical, and cultural resources. Visual resource inventory for all lands on the Coconino was updated in 2010 and was used in this assessment.

Scenic attractiveness is a measure of the aesthetic value inherit in a landscape character unit and is based on landform patterns and features, surface water characteristics, vegetation patterns, and land use and cultural features. Scenic attractiveness ranking units are used by the USFS to describe specific landscape types found within the regional landscape. Scenic attractiveness rankings are categorized into three classes: A (distinctive), B (typical), and C (indistinctive).

The USFS uses "Constituent Analysis" to characterize viewer sensitivity. This analysis serves as a guide to perceptions of attractiveness, helps identify special places, and helps to define the meaning viewers give to the landscape. Constituent analysis assesses the relative importance of aesthetics to sensitive viewers, expressed as a Concern Level value of 1, 2, or 3, to reflect the relative High, Medium, or Low importance of aesthetics. Viewers that were assigned concern levels were identified by CNF and considered in the inventory.

The five SIOs are Very High, High, Moderate, Low, and Very Low. Under the SMS, higher SIOs represent highly valued natural landscapes where management activities should result in little or no deviation from those values. Greater modification to the landscape is acceptable in low SIO landscapes. Very High SIO is generally reserved for designated Wilderness Areas, but may apply to additional areas of the CNF where the valued landscape character is intact and there is no evidence of apparent modification. High SIO landscapes are typically associated with areas that appear unaltered; where the valued landscape character appears intact, and any structures or surface modifications are designed to blend with the natural landscape. Moderate SIO landscapes may appear slightly altered, but alternatives are visually subordinate to the overall landscape. In Low SIO landscapes, deviations may begin to dominate the landscape.

The visual study included a data inventory and assessment of potential affected visual resources associated with the Proposed Action. Data sources included existing land use plans, aerial photography, and CNF SIO data.

3.8.3 Affected Environment

The following sections describe the affected environment for visual resources crossed by the Project in four ranger districts. The Project area consists of two 345 kV transmission lines, existing access roads, and right-of-way clearing required for construction. These modifications are evident along the entire Project area; however, regrowth of vegetation, in particular piñon-juniper trees, has occurred since construction. Regionally, the Project area is located within the Flagstaff character type, which is characterized as an undissected plateau that contains extensive lava flows and volcanic cones. Vegetation is predominantly coniferous forest (mountain conifer),

mountain meadow grassland, plains grassland, and ponderosa or piñon-juniper woodland. Dry washes and riparian deciduous forest are also associated with the Flagstaff character type and are common along watercourses.

3.8.3.1 Scenic Attractiveness

The project area primarily traverses Class B landscapes associated with moderately varied terrain occupied by piñon-juniper grassland and ponderosa woodland. The northern portion of the Project area crosses Class A landscapes associated with volcanic craters and cinder cones. These volcanic features occur near Sunset Crater National Monument and are a unique landform type in the area. In the southern portion of the Project area, Class A landscapes crossed by the project include rolling terrain, escarpments, and rocky outcroppings near Mazatzal Wilderness and the Verde River. Class C landscapes are crossed by the Project area in the northern portion near US-89 and I-40 where terrain is typically flat with piñon-juniper or grassland vegetation.

3.8.3.2 Concern Levels

The northern portion of the Project area traverses the Peaks Ranger District northeast of Flagstaff and the Mormon Lake Ranger District near FR 125. U.S. Highway 89, a concern level 1 route, is crossed by the Project area near the southwestern edge of the Wupatki National Monument. The Project area is immediately adjacent to the boundary of Strawberry Crater Wilderness (a concern level 1 use area) and crosses through the Cinder Hills OHV Area (with concern level 2 and 3 routes). Sunset Crater National Monument is located 2.4 miles west of the Project area along FR 545 (a concern level 1 route), which also provides access to the Painted Desert Vista (approximately 1.2 miles east of the Project area). Sunset Crater National Monument and Painted Desert Vista are concern level 1 use areas. The Project area would cross FR 505 (Indian Reservation Route 15) which is also identified as a concern level 1 route. There are several lakes near Anderson Mesa, a few of which offer campground and picnic facilities for recreation users. A concern level 1 use area includes developed campground and picnic facilities at Ashurst Lake and Kinnikinick Lake, approximately 0.5 mile and 3.5 miles from the Project area, respectively. Recreation viewers associated with Upper Lake Mary and Mormon Lake are approximately 4 miles from the Project area, and are at a lower elevation generally southwest of Anderson Mesa. Lake Mary Road (FH 3), a concern level 1 route approximately 3 miles from the Project area, also skirts the edge of Anderson Mesa providing access to recreation areas near Mormon Lake.

The southern portion of the Project crosses the Mogollon Rim Ranger District south of FR 125 and continues through the Yavapai Red Rock Ranger District until the boundary of the Tonto National Forest at the Verde River. The Project area would roughly parallel or cross several secondary forest roads, inventoried as concern level 2 routes including FR 124 and FR 294. Lake Mary Road (FH 3), FR 125, and FR 229 are crossed by the Project and were inventoried as concern level 1 routes. The Arizona National Scenic Trail, also a concern level 1 route, crosses the Project area near Bargaman Park and the Pine Springs Trailhead. Other concern level 1 routes include the General George Crook National Recreation Trail, which is a historic trail, and SR 260 which would be crossed by the Project. Fossil Springs Wilderness and Mazatzal Wilderness are not crossed by the Project, but occur within 0.25 to 1 mile of the Project area, and were inventoried as concern level 1 use areas. The Project area roughly parallels and crosses Childs Power Road, a concern level 1 route, several times in steep to rolling terrain. The Project

area spans West Clear Creek near Tule Canyon which is a concern level 1 stream. Similarly, Fossil Creek and the Verde River (a designated scenic river) are identified as concern level 1 streams, and are spanned by the Project as it continues into the Tonto National Forest.

3.8.3.3 Scenic Integrity Objectives

The majority of the Project area is associated with Low SIO data (approximately 79 miles) for the entire width of the right-of-way. Low SIO refers to landscapes where the valued landscape character appears moderately altered. In Low SIO areas, landscape alterations may begin to dominate the landscape view. Isolated areas of Moderate SIO data (approximately 10 miles) are associated with portions of the Project near Bargaman Park and the Arizona National Scenic Trail, West Clear Creek Wilderness, Fossil Springs Wilderness, Mazatzal Wilderness, and the Verde River. Moderate SIO refers to landscapes where the valued landscape character appears slightly altered, but alterations are visually subordinate to the overall landscape. Generally, the majority of the Project area is natural in appearance; however, human modifications include existing transmission lines, substations, pipelines, major travel routes, and several unpaved roads.

3.8.4 Environmental Consequences

The primary purpose of the impact assessment is to evaluate and characterize the level of visual modification, or visual contrast, to the landscape that would result from the Proposed Action. Visual contrast is defined as the degree of perceived change that occurs in the landscape due to modifications necessary for the Proposed Action. Visual contrast for the Proposed Action would primarily result from the removal of vegetation that has regrown within the rights-of-way. The assessment for visual contrast is performed by comparing visual elements (form, line, color, and texture) of the existing landscape with the visual elements associated with the implementation of the Proposed Action. In this regard, existing vegetation conditions within the Project area were evaluated in conjunction with Western's Proposed Action to clear the entire Project area of vegetation. The existing structures and modifications to vegetation within the rights-of-way and Project area have altered the scenic integrity of the landscape.

Portions of the Project area (i.e., existing contrast resulting from transmission line construction) are currently visible to viewers associated with USFS concern level routes/streams and use areas. Removal of vegetation within the Project area due to Project construction in the 1960's is evident; however, regrowth of woody vegetation over time has reduced visual contrast since construction of the facilities. Regrowth of vegetation varies along the right-of-way; however, the existing transmission line structures generally dominate the setting. Visual contrast as a result of the Proposed Action would be strongest on steep to rolling topography occupied by dense woodland vegetation; and weakest on flat, sparsely vegetated topography. However, as stated in Section 2.1 of this EA, in areas of steep terrain where the Project crosses canyons, washes, and/or depressions, Project facilities may span many of these features at such a height that vegetation would not interfere with safe and reliable transmission line operation; thus not requiring removal. This would minimize visual contrast when crossing canyons near the West Clear Creek Wilderness.

3.8.4.1 Initial Vegetation Removal

Scenic Attractiveness

The majority of the Project area traverses piñon-juniper grassland in gently rolling to steep terrain. Portions of the Project area would cross flat grasslands with less dense areas of piñon-juniper; however, the majority of the route crosses piñon-juniper with isolated portions of dense conifer woodlands. The level of landscape contrast or change would be greatest where tree clearing would occur in these dense woodlands (where regrowth within the rights-of-way is approximately 40%) where the entire right-of-way would be cleared of vegetation. The removal of this dense vegetation would create a stronger level of line contrast at the edge of the right-of-way. Occurrences of dense woodland within the Project area would require substantial vegetation removal; however, there are areas of piñon-juniper grassland that would require minimal removal. Visual contrast would be weaker for portions of the Project area where the majority of the vegetation has been cleared or maintained since construction of the facilities. Likewise, portions of the Project area that cross grassland or sparse areas of piñon-juniper would result in weaker landscape contrast because the right-of-way edge would be less severe than densely wooded areas. Leftover vegetation debris (i.e., chips, slash, and logs) would be disposed as described in Section 2.1.1.2. Generally, the debris would be distributed throughout the right-or-way and may result in short-term impacts due to color contrast of freshly mulched vegetation materials. Over time, the debris would begin to turn a grayish color and become incorporated into the soil; thus color contrast would be reduced.

Visual impacts to scenic attractiveness would be low for the majority of the Project area which crosses Class B and C landscapes where right-of-way vegetation clearing is evident. Resulting contrast would be weak for the majority of the Project area which traverses flat to rolling terrain occupied by piñon-juniper grassland. Impacts would be low-moderate for Class A landscapes near Strawberry Crater Wilderness because project contrast would be weak where woody vegetation within the right-of-way is sparse to moderate. Based on the project description, vegetation would not be removed for an isolated Class A landscape, a side canyon within the Project area near West Clear Creek Wilderness; thus impacts are not anticipated. In addition, there are no danger trees identified in this area and it is likely that conductor clearance across the canyon is sufficient to avoid clearing of vegetation within the canyon. Other Class A landscapes crossed by the project occur near Fossil Springs Creek where escarpments and canyons occur in rough terrain. Removal of vegetation would result in moderate contrast while in steep terrain. Impacts would be minimized through the implementation of PCM 39 which would only remove danger trees (including selective thinning of some understory vegetation to minimize fire hazards) within the rights-of-way for isolated areas. There are some danger tress identified within these Class A landscapes; however, the removal of those trees and some select understory vegetation would result in a low level of contrast.

Concern Levels

Moderate visual contrast would be visible for concern level 1 routes including FR 545, FR 505, I-40, Lake Mary Road (FH 3), SR 260, and Childs Power Road where vegetation clearing would be evident. Impacts are anticipated to be low for concern level 1 viewers associated with U.S. Highway 89 and I-40, because the Project would cross these travel routes perpendicularly, which

would reduce viewing duration for travel routes associated with a high rate of speed. Moderate impacts are anticipated for FR 545, Lake Mary Road [FR FH 3], SR 260, and Childs Power Road because viewing duration would be slightly longer along these recreation destination travel routes that are crossed by the Project. Impacts to concern level 1 routes FR 125, FR 294, and FR 229 are anticipated to be low because visual contrast would be weak where existing right-of-way vegetation clearing is evident. The majority of the access road for the Project is identified as either a concern level 2 or 3 route (moderate to low concern respectively). Although viewing duration would be higher because it roughly parallels the right-of-way, vegetation removal would occur primarily within piñon-juniper grassland resulting in low contrast; thus low impacts are anticipated. Moderate to low visual contrast may be visible for recreation viewers with views of the Proposed Action while immediately adjacent to Strawberry Crater Wilderness and Mazatzal Wilderness (concern level 1 use areas). These concern level 1 viewers and other dispersed recreation viewers may have direct views of the Project area, resulting in moderate impacts for the Project area associated with dense woodland vegetation requiring removal and low impacts for grassland areas requiring minimal removal. Concern level 1 recreation viewers associated with West Clear Creek Wilderness would have inferior views (i.e., below) of the transmission lines spanning the West Clear Creek, a concern level 1 stream, near Tule Canyon. Vegetation removal at the canyon crossing is not anticipated, because the Project would span the area at such a height that it would not be required; therefore, impacts are not anticipated. Due to topography and existing piñon-juniper grassland, viewers associated with the Cinder Hills OHV area (includes concern level 2 and 3 routes) may have completely to partially screened views of the Project area resulting in minimal to low impacts. Recreational travel routes associated with this OHV area may cross or parallel the Project resulting in direct views of low visual contrast; therefore, low impacts are anticipated for isolated portions of the Project area. Portions of the Project crossing the Arizona National Scenic Trail (concern level 1 route) and Bargaman Park would require some removal of danger trees; however, impacts could be reduced through the implementation of PCM 39 which would preserve all trees not identified as a danger tree within the right-of-way for an isolated area. Impacts are not anticipated for the Pine Springs Trailhead because the project area would be screened by existing vegetation. Impacts are anticipated to be similar as SR 260 for viewers along the General George Crook National Recreational Trail, a concern level 1 trail, where moderate visual contrast would occur with the removal of dense woodland vegetation. Impacts could be reduced through the implementation of PCM 39 which would preserve all trees not identified as a danger tree within the right-of-way for an isolated area. Moderate impacts are anticipated for viewers along Childs Power Road, a concern level 1 route, as well as viewers along concern level 1 streams including Fossil Creek, Clear Creek, and the Verde River where moderate project contrast may be visible. Contrast could be reduced through the implementation of selective PCM 34, such as minimizing clearing of understory vegetation to the extent practicable, PCM 39 which would retain vegetation not identified as a danger tree, or other measures as prescribed by the forest Landscape Architect to reduce viewer impacts.

The Proposed Action would be completely screened by vegetation and topography for viewers associated with the Painted Desert Vista (approximately 1.2 miles from the Project area) and Sunset Crater National Monument (approximately 2.4 miles from the Project area); therefore impacts are not anticipated for these concern level 1 use areas. Weak visual contrast associated with the Proposed Action may be visible for a concern level 1 recreation use area at Ashurst Lake, which is within 0.5 mile of the Project area; however, modifications to the right-of-way

may not be evident at this distance or would be partially screened by existing vegetation resulting in low impacts. Visual contrast would not be evident for a concern level 1 recreation use area at Kinnikinick Lake, because the Project area would be completely screened by topography and vegetation; thus impacts are not anticipated. Likewise, visual contrast would not be evident for viewers associated with Upper Lake Mary and Mormon Lake, which are located west of the Project area below Anderson Mesa (approximately 4 miles), due to screening by topography. Impacts are not anticipated for Fossil Springs Wilderness (a concern level 1 recreation use area), because inferior views (i.e., below) would reduce visibility of the Project area and it would also be screened by existing vegetation and/or topography.

Scenic Integrity Objectives

Overall, given the existing right-of-way conditions (i.e., modified landscape) and implementation of selective PCM 34 and 39, the Proposed Action would not substantially degrade existing scenic integrity attractiveness or cause substantial dominant visual contrast or alteration in the landscape seen by concern level viewers or cause a visual interruption of a unique viewshed or scenic view. The Proposed Action would result in acceptable levels of landscape alteration (i.e., landscape contrast) for Project areas associated with Low SIO data. In Project areas associated with Moderate SIO data, the Proposed Action could result in acceptable levels of landscape alterations (i.e., visual contrast) primarily because the transmission line structures modify the existing landscape. In addition, contrast associated with vegetation clearing along portions of the right-of-way is currently evident. The application of PCMs, such as minimizing clearing of understory vegetation, retaining vegetation not identified as a hazard tree within the rights-of-way, or other measures prescribed by the forest Landscape Architect, would achieve an acceptable level of modification for areas associated with Moderate SIO data where visible to concern level 1 viewers.

3.8.4.2 Vegetation Management and Right-of-Way Maintenance

The level of visual contrast or alteration to the landscape would generally remain the same throughout the duration of the vegetation management and right-of-way maintenance portion of the Proposed Action. Impacts to scenic attractiveness, concern levels, and scenic integrity objectives would remain the same as the initial vegetation removal for the Proposed Action.

3.8.5 Environmental Consequences of the No Action Alternative

Under the No Action alternative, Western would continue its need-driven management approach using current methods for vegetation management and right-of-way maintenance. Maintenance activities would be reactive, resulting in vegetation removal occurring when vegetation growth has reached a hazardous condition for operation of the transmission facilities. Vegetation identified for removal along the rights-of-way through the No Action alternative would have the potential to impact similar scenic attractiveness, concern level, and SIO data identified for the Proposed Action; however, scenic integrity would largely remain the same as existing conditions.

The Proposed Action would routinely remove vegetation before it becomes a hazardous condition, thus necessitating the implementation of the PCMs identified in Table 2-2 for

vegetation removal activities. Consequently, implementation of the No Action alternative may result in higher impacts to visual resources in the Project area than the Proposed Action, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over implementation of PCMs (see Section 1.4).

3.8.6 Cumulative Effects to Visual Resources

3.8.6.1 Proposed Action

Cumulative effects to visual resources could result from (1) the incremental alteration of scenic integrity in natural areas, and (2) altering viewsheds or vistas associated with concern level viewers based on the Proposed Action in context with past, present, and reasonably foreseeable future actions.

Cumulative effects to visual resources relate to the modifications of the landscape and the viewsheds associated with concern level routes and use areas. Reasonably foreseeable actions that would likely effect visual resources applicable to this Project include residential development, utility development such as high-voltage transmission lines, and transportation corridor development. These developments, when added to direct effects of the Proposed Action, would incrementally convert natural landscapes into industrial landscapes, which overtime would adversely affect scenic integrity. The existing APS 230kV transmission line, which parallels the Project for approximately 5 miles, is anticipated to remain in use with the reissuance of a special use permit from CNF. The existing APS 69kV Sandvig-Youngs powerline corridor, which crosses the Project area, would be expanded to accommodate another 69kV line. The expansion of this corridor would result in modifications similar to the existing line. In addition to transmission line projects, power generation facilities that would require interconnection includes the Grapevine Wind Interconnection Project, which would require a 345kV transmission line connection across CNF land, therefore contributing to the modification of natural landscapes within the CNF. Other industrial developments near the Project area include rock pit developments near Pine Hill Cinders, Youngs Canyon, Salmon Lake, Buck Butte, Yellowjacket Tanks, and Perry Lake. With the exception of Perry Lake and Yellowjacket, each of these pits would be expanded resulting in permanent disturbance to existing landform. Development associated with the CNF Motorized Travel Management Plan, year-round recreation site access points for the Mogollon Rim Ranger District, would likely result in landform and vegetation modifications that are non-industrial; however, these developments would incrementally modify the natural landscape which would affect scenic integrity. Forest Service plans for improvement or development of new or existing campgrounds, trails, and trailheads would also incrementally modify the natural landscape into a developed setting; however, developed settings typically incorporate materials and borrow attributes of the landscape character to help them remain visually subordinate. Forest service plans for closing roads would result in fewer impacts to visual resources. Closed roads could be restored which would may improve scenic integrity. Landscape modifications associated with the Fossil Creek Wild and Scenic River management plan and the Four Forest Restoration Initiative EIS would focus on restoring the natural landscape which will likely result in short term impacts but would be a long term positive effect for scenic integrity.

Cumulative effects associated with similar linear facilities (i.e. transmission lines) could possibly be reduced by consolidating, to the extent practicable, like facilities and sharing access wherever possible. In addition, through the implementation of PCMs, incremental effects of the Proposed Action would not be cumulatively considerable.

3.8.6.2 No Action Alternative

Implementation of the No Action alternative would likely result in similar cumulative effects to land use as the Proposed Action; however, these effects would be spread out over time and more localized. Under the No Action alternative proposed PCMs for visual resources may not be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4). However, the No Action alternative is not anticipated to contribute to cumulatively considerable effects to visual resources in combination with the past, present, and reasonably foreseeable actions presented in Table 3-1.

3.9 WATER RESOURCES

3.9.1 Introduction and Methodology

This section describes the affected environment and environmental consequences for water resources, which includes perennial and intermittent streams, wells/springs, designated wetlands, and water bodies.

An inventory of water resources was conducted to identify perennial and intermittent streams, water bodies, wetlands, wells, and springs for the Project. All water resources crossed by the centerline or within 600 feet of the centerline were inventoried. Information and data for the water resources inventory was obtained from the United States Geological Survey (USGS), Arizona Department of Environmental Quality (ADEQ), Arizona Department of Water Resources (ADWR), and USFWS.

3.9.2 Affected Environment

3.9.2.1 Watersheds

The Project is located within two watersheds: the Little Colorado River Watershed and the Verde River Watershed (Table 3-13). The Little Colorado River Watershed encompasses 26,794 square miles and elevation ranges between 2,700 and 12,600 feet above sea level (ADEQ 2011a). The average precipitation for the Little Colorado River Watershed is between 4 and 28.5 inches annually (ADWR 2010a). The groundwater level for the Little Colorado River Watershed ranges between 50 and 1,500 feet below ground surface (*ibid*). The study area is located mostly within this watershed.

The study area enters the Verde River Watershed south of Mormon Lake and east of Stoneman Lake. The Verde River Watershed encompasses 6,188 square miles and elevation ranges between 1,750 and 12,600 feet above sea level (ADEQ 2011b). The Verde River is perennial throughout its length. The average precipitation for the Verde River Watershed is between 10.6 and 28.5 inches annually (ADWR 2010b). The groundwater level for the Verde River Watershed ranges between 1 and 1,375 feet below ground surface (*ibid*).

3.9.2.2 Perennial and Intermittent Streams

A perennial stream has surface flow throughout the year, drying only during periods of drought (ADWR 2011). An intermittent stream only flows at certain times of the year, when it receives water from springs, snowmelt, surface runoff, or other sources. An ephemeral wash or stream flows only in direct response to precipitation and receives little or no water from springs, melting snow, or other sources (*ibid*).

There are 11 intermittent streams and no perennial streams within the study area in the Little Colorado River Watershed (Table 3-13). There are several un-named ephemeral washes located northeast of the study area in the Little Colorado River Watershed.

Three perennial and nine intermittent streams are located within the study area in the Verde River Watershed (ADWR 2010b). There are also several un-named ephemeral washes present.

There is one Outstanding Natural Resource Waters (ONRWs), or "unique waters," Fossil Creek, within the Project area (ADEQ 2011e). Fossil Creek is located west of Deadman Mesa and is crossed by the centerline near East Childs Road. There are two perennial streams within the Project area that are "attaining all uses": West Clear Creek, north of Highway 260, and Fossil Creek, west of Deadman Mesa (ADEQ 2009).

3.9.2.3 Water Bodies

Nineteen water bodies are found within 600 feet of the centerline (Table 3-13). Most of these water bodies represent small stock ponds; however, several larger waterbodies, approaching 1 mile in length, are found within the study area east of Mormon lake.

3.9.2.4 Wetlands

An inventory of wetland areas was conducted using data from the USFWS (2011). Six wetlands are present within the study area, mostly in an area east of Mormon Lake, some of which are associated with the waterbodies listed in Table 3-13. The Project area also crosses a wetland area associated with the Verde River at the southern-most portion of the study area.

3.9.2.5 Wells/Springs

A well is an artificial excavation or hole for the purposes of withdrawing water from underground aquifers (USGS 2011a). A spring is defined as a place where water emerges naturally from the earth without artificial assistance onto the land surface or into a body of surface water (ADWR 2011). A total of one well and two springs is recorded within 600 feet of the centerline of the study area (see Table 3-13).

Table 3-13. Water Resources within the Glen Canyon-Pinnacle Peak Vegetation Removal Project Area

Watershed	Perennial Streams	Intermittent streams	Waterbodies	Wells/Springs
Little Colorado River Watershed	None	Hulls Wash Ball Court Wash	Breezy Lake Mormon Canyon	Wells (1) Springs (1)

Table 3-13. Water Resources within the Glen Canyon-Pinnacle Peak Vegetation Removal Project Area				
Watershed	**Perennial Streams**	**Intermittent streams**	**Waterbodies**	**Wells/Springs**
		Deadman Wash San Francisco Wash Youngs Canyon Padre Canyon Anderson Canyon Cabin Draw Mormon Canyon Sawmill Wash Kinnikinick Canyon	Tank 3 un-named waterbodies	
Verde River Watershed	Verde River Fossil Creek West Clear Creek	Bargaman Draw Sheep Tank Draw Brady Canyon Tule Canyon Meadow Canyon Tin Can Draw Mud Tanks Draw Boulder Canyon Sally May Wash	Rocky Bottom Tank Sin Agua Tank Powerline Tank (2) Bar D Tank Buckhead Tank Island Tank Road Tank Ernies Tank Gnat Tank Benata Tank 3 un-named waterbodies	Wells (0) Springs(1)
Sources: United States Geological Survey, United States Fish and Wildlife Services, Arizona Department of Water Resources.				

3.9.3 Environmental Consequences

This section discusses the impacts to water resources that may occur from implementation of the Project.

The Proposed Action may impact water resources present within the study area. Two types of impacts could potentially affect water resources:

- Direct impacts resulting from loss of vegetation associated with wetlands or riparian areas (see Sections 3.3.2.1 and 3.3.2.2), or the accidental spillage of fuel or other hazardous substance into a water resource.
- Indirect impacts resulting from increased sedimentation due to loss of vegetation

Very little ground disturbance is anticipated for the Proposed Action. Existing roads will be used for the vegetation removal. These existing roads would be maintained where needed, which could include removal of obstacles and repairing minor erosion. The possible equipment used for this maintenance could include backhoes, graders, and small dozers. Appropriate and effective implementation of best management practices (BMP) would mitigate adverse effects to water resources within the Project area.

3.9.4 Environmental Consequences of the No Action Alternative

Under the No Action alternative, Western would continue its need-driven management approach using current methods for vegetation management and right-of-way maintenance. Because

existing vegetation within the right-of-way would typically be left in place (except for danger trees), impacts to water resources under this alternative would likely be less than the Proposed Action. Maintenance activities would be reactive, resulting in vegetation removal occurring when growth has reached a hazardous condition for continued operation of the facilities; however, existing vegetation and ground cover would minimize soil runoff and sedimentation from maintenance activities into nearby streams, wetlands, and waterbodies.

3.9.5 Cumulative Effects to Water Resources

3.9.5.1 Proposed Action

Ground-disturbing activities could potentially increase the sedimentation to rivers and water bodies within the Project area, thereby adding to the cumulative effects to water resources. The major river crossings that could be cumulatively affected are the Verde River and Fossil Creek. No cumulative effects to West Clear Creek are anticipated to be associated with this action, as no vegetation removal or right-of-way maintenance activities will occur in this area. There are also numerous intermittent streams and small water bodies that could be cumulatively affected as well. With implementation of PCMs, the contribution of cumulative effects to water resources from vegetation clearing is not considerable.

3.9.5.2 No Action Alternative

Under the No Action alternative, individual trees or stands of trees would be targeted for removal as emergency situations arise rather than comprehensive vegetation removal, thus substantially preserving vegetation filtering of sediment that could otherwise make its way to water resources. Under the No Action alternative, proposed PCMs for water resources may not be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4); however, the No Action alternative is not anticipated to contribute to cumulatively considerable effects to water resources in combination with the past, present, and reasonably foreseeable actions presented in Table 3-1.

3.10 GEOLOGY AND SOILS

3.10.1 Introduction and Methodology

This section presents an overview of the geology, geological hazards, mineral resources, and soils present with the Project area. The main purpose of this overview is to identify sensitive geological, mineral, and soil resources that may potentially be impacted by the Project, as well as geological hazards that may adversely affect the Project.

An inventory of geological units within the Project area was conducted, using the Arizona State geological map (AGS 2000). An inventory of geological hazards was conducted that identified Quaternary faults, past earthquakes, and floodplains within 1 mile of the centerline for the Project area. The data for this inventory was obtained from the USGS, Northern Arizona University Earthquake Information Center, and the Federal Emergency Management Agency (FEMA).

An inventory of mineral resources was conducted to identify locatable, leasable, and salable mineral resources present in the study area. Locatable resources are typically metallic mineral deposits, such as copper or gold. Leasable resources include energy resources, such as petroleum, natural gas, or coal. Salable resources include sand and gravel. Information for the inventory was obtained from the BLM and USFS' Land and Mineral Legacy Rehost 2000 System (LR2000) database maintained online (BLM and USFS 2011), and the USGS Active Mines and Mineral Plants data, which shows active mines through 2003 (USGS 2011b).

An inventory of soil resources was conducted, which identified soil erosion hazards within 300 feet of the Project centerline. This inventory was based on data compiled as Terrestrial Ecosystem Units (TEU) by the CNF. TEUs have been rated for three levels of erosion hazard for bare-ground conditions: slight, moderate, and severe. For slight erosion hazards, all vegetative groundcover could be removed from the site and the resulting soil loss would not exceed tolerance levels for loss of productivity; these units would generally stabilize under natural conditions (MacDonald 2010). For moderate erosion hazards, removal of vegetative groundcover would reduce site productivity if left unchecked; reasonable and economically feasible mitigation measures could be applied to reduce or eliminate soil loss. For severe erosion hazards, removal of vegetative ground cover would have a high probability of reducing soil productivity before mitigation measures could be applied.

3.10.2 Affected Environment

The Project area is located within two physiographic provinces, as defined by the Arizona Geological Survey (Trapp and Reynolds 1995): the Colorado Plateau and the Transition Zone. The Colorado Plateau contains uplifted areas and basins, with the uplifted areas being bounded by monoclines (Case and Joesting 1972; Woodward 1973). The Transition Zone, which lies between the Colorado Plateau to the north and the Basin and Range Physiographic Province to the south, has characteristics of both provinces, such as broad mountain ranges, mesas, and narrow valleys (Brand and Stump 2011). The area of the Colorado Plateau that is crossed by the Project area is dominated by Tertiary and Quaternary volcanic and basaltic rocks, but exposures of Permian and Triassic sedimentary rocks are also present. For the Transition Zone, the Project area also contains volcanic rocks, but Tertiary sedimentary rocks and Quaternary alluvium are also present.

Geological Hazards

Quaternary Faults

Quaternary Faults are recent faults that have had movement within the past 10,000 years. They are, therefore, considered to be active. Two Quaternary faults are present within 1 mile of the centerline, located at the northern-most portion of the Project area between U.S. Highway 89 and Wupatki National Monument.

Earthquakes

Only one known earthquake has occurred within 1 mile of the Project centerline. This earthquake happened at the northern portion of the route between U.S. Highway 89 and Wupatki National Monument in 1959, and had a magnitude of 5 on the Richter scale.

Floodplains

The Project crosses FEMA-designated floodplains near the southern terminus of the Project area in Boulder Canyon. Areas with specific flooding hazard include Fossil Creek, and the confluence of Fossil Creek with the Verde River at the southern boundary of the Project area.

Mineral Resources

No active or pending mining claims are recorded in the LR2000 within the study area. There are no active leases crossed by the Project centerline. No oil or gas leases are recorded in the LR2000 within the study area. No salable mineral claims, including sand and gravel pits, are recorded in the LR2000 within the study area.

Soil Resources

A total of 10 terrestrial ecosystem units are present within 210 feet of the Project area centerline. Within the Project area (420 foot-wide total), approximately 2,187 acres of soils have slight erosion hazard; 1,973 acres have moderate erosion hazard, and 440 acres have severe erosion hazard (Figure 3-9) (Table 3-14).

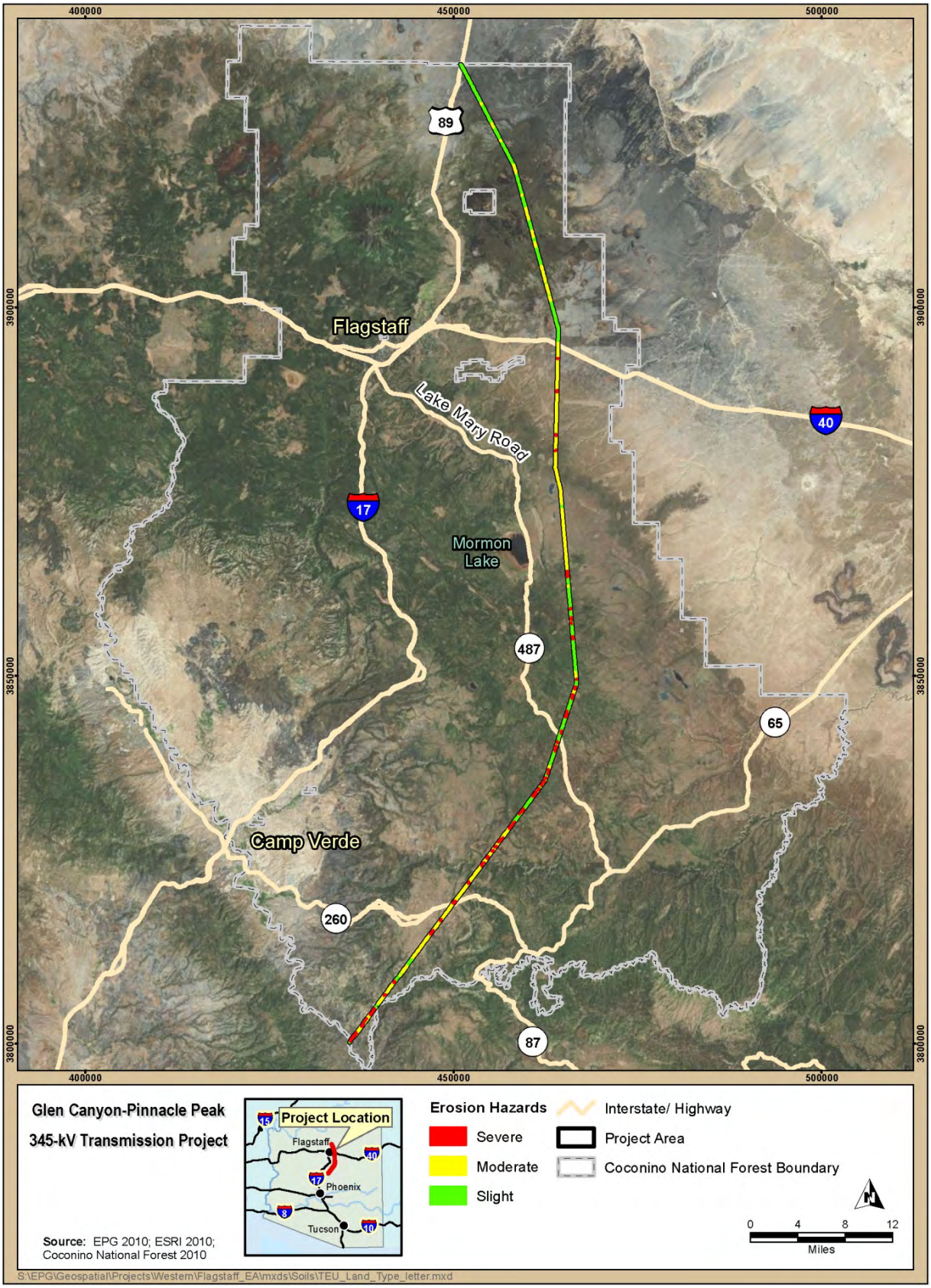

Figure 3-9. Soil Erosion Hazards

Table 3-14. Terrestrial Ecosystem Units, Their Characteristics, and Acreages within 300 Feet of the Centerline			
Map Unit	**Natural Vegetation**	**Erosion Hazard**	**Acreage**
14	Ponderosa Pine	Slight	36.9
33	Cottonwood Willow Riparian Forest	Slight	12.2
41	Great Basin Grassland	Slight	43.5
50	Wetland/Cienega	Severe	27.2
55	Montane/Subalpine Grassland	Moderate	38.9
56	Mixed Broad Leaf Deciduous Riparian Forest	Slight	1.0
382	Semi-desert Grasslands	Slight	17.1
391	Great Basin Grassland	Slight	8.3
402	Semi-desert Grasslands	Moderate	16.1
403	Semi-desert Grasslands	Slight	6.4
404	Semi-desert Grasslands	Moderate	56.6
411	Great Basin Grassland	Slight	81.0
420	Semi-desert Grasslands	Moderate	79.9
426	Piñon Juniper Woodland	Slight	114.6
427	Piñon Juniper Woodland	Moderate	8.0
430	Piñon Juniper Evergreen Shrub	Severe	117.5
433	Piñon Juniper Woodland	Slight	69.2
435	Piñon Juniper Woodland	Severe	15.5
437	Piñon Juniper Woodland	Moderate	139.0
439	Piñon Juniper Woodland	Moderate	22.7
441	Piñon Juniper Woodland	Moderate	73.7
443	Piñon Juniper Woodland	Slight	324.7
444	Piñon Juniper Woodland	Slight	116.5
453	Great Basin Grassland	Moderate	187.8
462	Piñon Juniper Evergreen Shrub	Slight	101.2
463	Piñon Juniper Evergreen Shrub	Moderate	63.7
465	Piñon Juniper Woodland	Moderate	124.0
466	Piñon Juniper Evergreen Shrub	Slight	2.2
473	Piñon Juniper Woodland	Slight	6.9
491	Piñon Juniper Woodland	Moderate	267.0
492	Piñon Juniper Evergreen Shrub	Moderate	523.1
493	Piñon Juniper Evergreen Shrub	Moderate	2.3
510	Ponderosa Pine	Slight	128.6
511	Ponderosa Pine	Moderate	16.6
512	Ponderosa Pine	Slight	16.3
513	Ponderosa Pine	Moderate	33.7
515	Great Basin Grassland	Moderate	149.0
520	Ponderosa Pine	Moderate	58.5
523	Ponderosa Pine	Slight	19.6
530	Ponderosa Pine	Severe	102.3

Table 3-14. Terrestrial Ecosystem Units, Their Characteristics, and Acreages within 300 Feet of the Centerline			
Map Unit	**Natural Vegetation**	**Erosion Hazard**	**Acreage**
550	Ponderosa Pine	Moderate	9.1
555	Ponderosa Pine	Severe	3.6
559	Ponderosa Pine	Slight	160.8
561	Ponderosa Pine	Moderate	94.9
565	Ponderosa Pine	Severe	61.5
575	Ponderosa Pine	Severe	19.6
578	Ponderosa Pine	Slight	17.6
579	Ponderosa Pine	Slight	55.5
582	Ponderosa Pine	Slight	298.3
584	Ponderosa Pine	Severe	92.5
585	Ponderosa Pine	Slight	403.0
586	Ponderosa Pine	Slight	145.3
654	Mixed Conifer w/Aspen	Moderate	8

3.10.3 Environmental Consequences

Geological Hazards

Quaternary faults and earthquakes are unlikely to affect vegetation removal. Flooding within the identified floodplain areas may affect vegetation removal by sweeping away vegetation debris left in the Project area. Vegetation debris would be left in the Project area following vegetation removal, in order to stabilize the land surface and mitigate the potential for erosion of the land surface. If this stabilizing debris is removed, erosion rates may increase for these areas within the Project area.

Mineral Resources

The Project area includes no known mineral resources or active mining areas. Vegetation removal would not limit access to or permanently occupy mineral resources within the Project area.

Soil Resources

This section discusses effects to soil resources that may occur as a result of the Project's two component vegetation removal plan: (1) initial vegetation removal within and adjacent to the right-of-way, and (2) vegetation management and right-of-way maintenance.

Erosion is the natural process by which water or wind removes soil from its natural location. Vegetation removal has the potential to impact soil resources by increasing the amount of exposure of susceptible soils to water or wind erosion at the land surface. While bare-ground conditions would not be a typical result of this action, in isolated areas this potential could result in a degradation of the land surface, reduced long-term soil productivity through loss of topsoil

material, and nonpoint pollution as eroded soil material is washed into nearby streams or water bodies.

The greatest potential impact to soil resources would occur during the initial vegetation removal phase, where mechanical and/or manual methods would be used to clear the Project right-of-way of vegetation, as described in Section 2.1.1 (Initial Vegetation Removal). As vegetation is removed, it would be dispersed across the right-of-way as wood chips (mechanical vegetation removal) or as scattered limbs/logs and stumps cut flush with the ground surface (manual methods). The application of this debris to the cleared land surface would assist in mitigating impacts to soil resources by intercepting rainfall, limiting impact erosion, and slowing surface runoff; and combined with existing grasses in the right-of-way (which are not removed as a part of Project activities), further limits erosion (Forest Service Handbook 2509.31.14).

For areas that have been classified as having moderate and severe erosion hazards, appropriate and effective implementation of BMPs would mitigate adverse effects to soil resources within the Project area (Appendix E).

3.10.4 Environmental Consequences of the No Action Alternative

Geological Hazards

Under the No Action alternative, Western would continue its need-driven management approach using current methods for vegetation management and right-of-way maintenance. Geological hazards would not have a greater effect on the Project area beyond the current condition.

Mineral Resources

Under the No Action alternative, access to mineral resource locations would continue to not be limited or permanently occupied within the Project area. Mineral resources would not be affected under the No Action alternative.

Soil Resources

Under the No Action alternative, Western would continue its need-driven management approach using current methods for vegetation management and right-of-way maintenance. This reactive approach to vegetation management would potentially increase the probability that hazard vegetation or danger trees could cause wildfires from transmission line flash-overs. A flash-over can occur when a tree falls on the line or grows close enough to the line that an electrical discharge occurs through the tree to the ground, which in turn could start a fire. Wildfires are capable of destroying all vegetation at the land surface, thereby exposing the soil stratum to unrestricted rainfall impact and/or surface runoff, greatly increasing loss of soil material and reducing soil productivity.

3.10.5 Cumulative Effects to Geology and Soils

3.10.5.1 Proposed Action

Geological Hazards

There are no cumulative effects from geological hazards associated with the Proposed Action. Other projects will not have cumulative effects from geological hazards. Only two Quaternary faults and one earthquake epicenter are located within 1 mile of the centerline. Floodplains were identified along Fossil Creek and the Verde River. With implementation of PCMs, the Proposed Action would not have any cumulative effects from geological hazards.

Soils

Impacts to soils are generally localized and do not result in regional cumulative effects. Soil conditions could vary significantly over short distances, effectively limiting the geographic range of the impacts to soil resources. Therefore, the impacts of the Proposed Action to soil resources would be localized within the Project Area. Vegetation-clearing activities could increase erosion and reduce soil productivity. However, these impacts would be temporary and not cumulatively considerable through the implementation of BMPs and PCMs.

Impacts to soils are generally local to the watershed in which the Project occurs and do not result in regional cumulative effects. Soils vary considerably over short distances, effectively limiting the geographic range of the impacts within a given watershed.

Vegetation removal activities would potentially adversely affect soil resources through increased soil erosion beyond natural rates, and lead to compacted soils, both of which could result in reduced soil productivity and increased sedimentation into the watershed. Vegetation removal activities would potentially beneficially affect soil resources through reduction of wildfire occurrence within the Project Area. Wildfires sterilize soils and cause hydrophobic surface conditions which slow vegetation recovery and increase surface runoff and soil erosion.

Other actions that may lead to cumulative effects for soil resources include other transmission line projects which cause ground disturbance (impacts to soil resources) at structure locations and along access roads, livestock grazing (soil compaction), maintenance of Forest roads (soil compaction and reduced vegetation cover), and OHV use (soil compaction and reduced vegetation cover).

Mineral Resources

No mineral resources have been identified within the Project Area. Therefore, vegetation management and right-of-way maintenance activities would not have cumulative effects to mineral resources.

3.10.5.2 No Action Alternative

Implementation of the No Action alternative would likely result in similar cumulative effects to geology and soils as the Proposed Action; however, these effects would be spread out over time and more localized. Under the No Action alternative proposed PCMs for geology and soils may not be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4). However, the No Action alternative is not anticipated to contribute to cumulatively considerable effects to geology and soils in combination with the past, present, and reasonably foreseeable actions presented in Table 3-1.

3.11 PUBLIC HEALTH AND SAFETY

3.11.1 Introduction and Methodology

This section examines potential impacts to public health and safety that could be associated with the Proposed Action and No Action alternative.

Impacts to public health and safety were evaluated based on a review of existing regulations, safety standards, Western's SOPs, and available literature. Industry practices are required to be protective of worker and public safety and health. Impacts associated with maintenance activities were assessed by comparing the Proposed Action with baseline conditions and existing safety standards and regulations.

3.11.2 Affected Environment

The entire Project area is located within the boundaries of the CNF. The general baseline conditions for assessing potential impacts to public health and safety are related to hazardous materials, physical hazards, fire hazards, and electric and magnetic fields (EMF).

3.11.2.1 Hazardous Materials

Hazardous substances are defined by federal and state regulations to protect public health and the environment. Hazardous materials have certain chemical, physical, or infectious properties that cause them to be considered hazardous. Hazardous substances are defined in Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLA (commonly known as Superfund) establishes requirements concerning closed and abandoned hazardous waste sites; provides for liability of persons responsible for releases of hazardous waste at these sites; and establishes a trust fund to provide for cleanup when no responsible party can be identified.

In Arizona, the ADEQ – Waste Programs Division has been tasked with protecting and enhancing public health and the environment by reducing risks associated with waste management, contaminated sites, and regulated substances. The Division ensures the proper handling, storage, treatment and disposal of wastes, and proper operation and maintenance of underground storage tanks (UST). The Division also investigates complaints and violations regarding hazardous waste and USTs.

A search of publicly available databases was used to determine if there were any Superfund sites or USTs within the Project area; none was identified (Environmental Protection Act [EPA] 2011). Two underground storage tanks were located within 1 mile of the Project area (Table 3-15) (ADEQ 2011c). The Winona Trading Post UST is located 0.85 mile from the Project area and the Childs Power Plant UST is located 0.10 mile from the Project area. It is not anticipated that USTs would be impacted by the Proposed Action; however, knowledge of their location relative to Project-related activities would ensure avoidance of USTs.

Table 3-15. USTs within 1 Mile of the Project Area

Faculty ID	Status	Site Name	Location
0-003902	Leaking	Winona Trading Post	Northwest corner of the intersection of Townsend-Winona Rd and I-40
0-000393	Not-Leaking	APS – Childs Power Plant	Along Child's Power Road, approximately 0.1 mile east of the Project area

Source: ADEQ 2011c

3.11.2.2 Physical Hazards

Project-related activities may present a physical hazard to maintenance workers and, to a lesser degree, the general public. Physical hazards resulting include injury from falling trees, injury from improper use of vegetation clearing tools, construction site dangers, lightning hazards, vehicle or aerial accidents, and electrocution. Unplanned or planned tree falls could injure maintenance workers or the general public through blunt force trauma or flying debris. Tree-falls on steep slopes could cause a person to lose footing and fall. Improper use of tools, such as machetes or chainsaws, could result in physical injury ranging from minor lacerations to loss of limbs and death. Potential for physical injury should be low if standard safety measures are followed.

3.11.2.3 Fire Hazards

Maintenance workers, CNF staff, and the general public could be exposed to risk from fire hazards. A fire could originate from either routine maintenance or the lack of adequate right-of-way maintenance. Routine maintenance could start a fire by igniting nearby fuel sources, such as dry underbrush. This could be caused by sparks from a maintenance vehicle or tool or a discarded burning cigarette. The lack of adequate maintenance could lead to a fire if a tree is too close to a transmission line that causes an arc. A fire could start away from the right-of-way for various reasons and later move into the right-of-way, endangering maintenance workers and fire fighters.

3.11.2.4 Electric and Magnetic Fields

There is a great deal of public concern regarding possible health hazards from the delivery and use of electric power. EMF are phenomena that occur both naturally and as a result of human activity. Naturally-occurring EMF are caused by the weather and Earth's geomagnetic field. Magnetic fields associated with transmission lines are created when current flows through the conductors; their strengths are determined primarily by line current, line height, and distance.

Electrical transmission and distribution systems are not the only sources of magnetic fields. Local sources of magnetic fields in homes and workplaces include electric wiring and appliances.

There is considerable uncertainty regarding the health effects of EMF; the current scientific evidence indicates that these fields do not cause disease. The following findings have been established from the available information and have been used to establish Western's existing policies associated with its existing transmission infrastructure:

- Any exposure-related health risk to the exposed individual would likely be small
- The most biologically significant types of risks from exposures have not been established
- Most health concerns are related to the magnetic field
- The measures employed to reduce EMF from transmission lines can affect line safety, reliability, efficiency, and maintainability, depending on the type and extent of such measures

No federal regulations have established environmental limits on the strengths of fields from power lines; however, the federal government continues to conduct and encourage research on the EMF issue.

3.11.2.5 Intentional Destructive Acts

Power transmission lines, like other elements of the United States energy infrastructure, could potentially be the target of vandals, terrorist attacks, or sabotage. The United States Court of Appeals for the Ninth Circuit decided that NEPA documents issued by the DOE should explicitly address the potential environmental consequences of intentional destructive acts such as vandalism, sabotage, or terrorism (DOE 2006). However, since neither the possibility nor the probability of an attack is truly known, the risk of terrorism or sabotage and any consequent environmental impact cannot be reliably estimated.

3.11.3 Environmental Consequences

Project activities would be designed to meet all applicable standards to reduce the risk of an accidental release of hazardous materials. Additionally, activities would comply with all safety standards and practices so as to provide a safe workplace for Project personnel and to prevent adverse offsite impacts to the public at large.

It is not anticipated that any hazardous materials will be stored onsite. Should onsite refueling be necessary, appropriate BMPs will be implemented to avoid spills or contamination. Western's Construction Standard – Standard 13 Environmental Quality Protection, would be adhered to. Within Standard 13 are procedures that are designed to avoid contamination and spills by hazardous materials.

It is assumed that physical safety of Project personnel and the general public will be protected through implementation of BMPs and SOPs. These practices include proper attire such as hard hats, vests, and chaps if using chainsaws. Other practices may include adequate signage to alert the public to potential dangers.

Through the implementation of BMPs, SOPs, and Western's Construction Standards, it is anticipated that there would be no impacts to public or worker health and safety.

3.11.4 Environmental Consequences of the No Action Alternative

Under the No Action Alternative, Western would continue its need-driven management approach using current methods for vegetation management and right-of-way maintenance. Maintenance activities would be reactive, resulting in vegetation removal occurring when growth has reached a hazardous condition for continued operation. Impacts under this alternative would likely be similar to the Proposed Action.

3.11.5 Cumulative Effects to Public Health and Safety

3.11.5.1 Proposed Action

Potential impacts on public health and safety could result from hazardous materials, physical hazards, fire, and electric and magnetic fields from the Proposed Action, as well as current or reasonably foreseeable future projects in the vicinity of the Project area.

Hazardous materials include gasoline, engine oil, and brake and transmission fluids, among other toxic pollutants; however, most of these substances only become hazardous if spilled or handled inappropriately. It is assumed that personnel associated with the Proposed Action and other current and future projects would implement appropriate BMPs to reduce, if not eliminate, the potential for adverse impacts to public health and safety. It is anticipated that through the utilization of BMPs and PCMs, the contribution of Western's actions to the cumulative effects to public health would be minimal.

3.11.5.2 No Action Alternative

Implementation of the No Action alternative would likely result in similar cumulative effects to public health and safety as the Proposed Action; however, these effects would be spread out over time and more localized. Under the No Action alternative proposed PCMs for public health and safety may not be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4). However, the No Action alternative is not anticipated to contribute to cumulatively considerable effects to public health and safety in combination with the past, present, and reasonably foreseeable actions presented in Table 3-1.

3.12 AIR QUALITY

3.12.1 Introduction and Methodology

This section describes the affected environment and the environmental consequences of the Proposed Action and No Action alternative in relation to air quality conditions throughout Coconino and Yavapai counties, which encompass the Project area. The air quality study was conducted to assess regional impacts, specifically on Coconino and Yavapai counties and the

City of Flagstaff, to existing air quality in regards to effects and environmental consequences of the Proposed Action and No Action alternative.

The quality of surface air (air quality) is evaluated by measuring ambient concentrations of pollutants that are known to have harmful effects on public health. The degree of air quality degradation is then compared to ambient air quality standards (AAQS), such as the National Ambient Air Quality Standards (NAAQS). This Project will need to comply with both the NAAQs and the State of Arizona's Air Quality Standards.

3.12.2 Affected Environment

The following sections describe the affected environments with regard to air quality for the Project.

3.12.2.1 Climate and Meteorology

Generally, the location of the Project is within an arid climate that covers Arizona and is largely influenced by seasonal variations in location and strength of a semipermanent, subtropical high-pressure circulation. The circulation is strongest during the summers, causing warm, dry conditions and heavy precipitation in the form of the North American Monsoon (Emanuel and Garfin 2006).

Specifically in Yavapai County, the climate varies from hot, arid conditions typical to the Sonoran Desert at the lower elevations, to mid-Canada at the higher elevations. The temperature variation from daytime high to nighttime low throughout the year varies approximately 35 degrees (Arizona Cooperative Extension 2010). Coconino County's climate is similar, with variations in geography, from snow-capped peaks to temperate valleys to warm desert canyons. Summer thunderstorms occur across the region (Coconino County 2003). The prevailing winds typically are from the south or south-west for both counties (Western Regional Climate Center [WRCC] 1999-2002).

The City of Flagstaff is located at an approximate elevation of 7,000 feet; experiencing a variety of weather, including cold winters and mild summers, with moderate humidity and considerable diurnal temperature changes. The average rainfall precipitation is approximately 23 inches per year and 100 inches of snowfall, with two distinct periods of precipitation occurring from November through April when Pacific storm systems move over the area, and July to August when the rainy season occurs over most of Arizona in the form of the North American Monsoon, as described above (Preston et al. 2007).

Prevailing winds in the Flagstaff area are southerly for most of the year, due to terrain influences and short-wave weather disturbances moving across the Great Basin region of the West. Winds greater than 40 mph are more likely to occur during the spring months, with damaging winds of greater than 60 mph occasionally occurring in the area outside of Flagstaff in the mountains during the winter and spring months (WRCC 1999-2002).

3.12.2.2 Air Quality Conditions

Non-attainment areas are defined as areas of the country where air pollution levels persistently exceed the NAAQS. Attainment areas are areas of the country where air pollution levels are below the NAAQS. Criteria air pollutants refer to a group of pollutants for which regulatory agencies have adopted ambient air quality standards and region-wide pollution reduction plans. Criteria air pollutants include ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter, and lead. Toxic air contaminants (TAC) refer to a category of air pollutants that pose a present or potential hazard to human health, but that tend to have more localized impacts than criteria air pollutants. Reactive and volatile organic compounds and gasses (VOC) and nitrogen oxides (NO_x) are also regulated as criteria pollutants because they are precursors to ozone formation. Certain ROGs may also qualify as TACs. Two subsets of particulate matter are: inhalable particulate matter less than ten microns in diameter (PM_{10}) and fine particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). The degree of air quality degradation is then compared to AAQS, such as the NAAQS.

The regional area that the Project is part of is within an attainment area. The air quality in the CNF remains high, despite prescribed burns and fugitive dust that can occasionally cause air pollution. The CNF requires a Prevention of Significant Deterioration (PSD) permit application to determine the potential effect increased emissions from major stationary sources may have on air quality-related values in the CNF Class I areas (CNF RMP 1987).

Air quality in both Yavapai and Coconino counties is considered to be high due to the lack of large industry and densely populated urban areas. Yavapai County does not address air quality in their comprehensive plan but Coconino does. The most common contributors to air pollution that may be found in Coconino are from the following four sources: dust and other local particulates, prescribed burns, regional haze, and power plants. Dust from dirt roads generates the most concern among residents, with the other three sources being generated outside of the County's jurisdiction (Coconino County 2003).

In Flagstaff and the surrounding areas, there is no concentration of industry; therefore pollution is low and the air nearly contaminant free. The possible pollution sources are similar to those presented for Yavapai and Coconino counties. On colder evenings, smoke from residences burning fires can create temporary air quality issues due to strong radiational inversions that occur. In spring and fall months, prescribed burns occur in the region, contributing to occasional smoke and haze issues. During the winter and spring months, fog occasionally forms due to radiational cooling from snow cover on the ground, but the fog usually breaks up quickly in the morning (NOAA 2007).

For this Project, all areas in northern Arizona must meet federal standards set by the U.S. Environmental Protection Agency. The ADEQ is responsible for issuing air quality permits, monitoring air quality, and enforcing regulations (ADEQ 2011a).

3.12.3 Environmental Consequences

The analysis examines the Project area and determines the baseline conditions for attainment of air quality standards and for current levels of emissions. The No Action alternative (i.e., continuation of existing maintenance practices) is used to establish the baseline activities (and

their associated air quality impacts) from which the Proposed Action would deviate. Air quality impacts from the Proposed Action are then analyzed and compared to baseline conditions, ensuring criteria of state and/or federal air quality standards are met.

Under the Proposed Action, Western would employ vegetation management practices that would promote low-growing plant communities within the right-of-way. In general, air quality impacts from this action would be minimal. Project activities would be temporary, intermittent, of short duration, and widely dispersed along a narrow, long strip of land. The Proposed Action would not involve the installation of any significant stationary source of air pollution. Any air quality impacts that would be caused by the mobile sources of emissions used to conduct Project activities would be minimal and local and would not cause regional changes to air quality.

Initial Vegetation Removal Activities

Some examples of initial vegetation removal activities that could affect air quality include: vehicle access to and along the Project area, and manual and/or mechanical removal of vegetation. The primary cause of air quality impacts associated with these activities would be the exhaust from vehicles. The removal of vegetation could also lead to the emission of fugitive dust particles through the exposure of bare ground. These potential impacts would be minimized through implementation of the appropriate air quality PCMs (see Table 2-2).

Vegetation Management and Right-of-Way Maintenance

The vegetation management and right-of-way maintenance activities that would most likely cause adverse air quality effects is the proposed grading of existing access roads and vehicle access when completing vegetation management tasks. PCMs (see Table 2-2) for these activities could help to reduce fugitive dust and exhaust emissions. Similarly, repairing portions of access roads and mechanical vegetation management by means of Cut-Shredders, masticators, or other equipment could also cause fugitive dust and exhaust emissions. The frequency of these activities would be rare following the initial clearing; therefore, impacts to air quality for vegetation management and right-of-way maintenance activities would be minimal and isolated.

3.12.4 Environmental Consequences of the No Action Alternative

Under the No Action alternative, Western would continue to conduct maintenance activities within the study area in a reactive manner, clearing only those trees that pose an immediate threat to the transmission lines. The activities conducted under the No Action alternative would likely be similar to those conducted under the vegetation management and right-of-way maintenance component of the Proposed Action; however, impacts would be infrequent and isolated because vegetation would be cleared from the Project rights-of-way only on an as-needed, emergency basis.

Over the long term, adverse air quality impacts from the No Action alternative would be similar to those under the Proposed Action. Under the Proposed Action, once the vegetation type had been converted within the right-of-way, the frequency of maintenance activities would likely be reduced, resembling the activity frequency of the No Action alternative. However, long-term

adverse air quality impacts are not expected to be significant for either the Proposed Action or the No Action alternative.

3.12.5 Cumulative Effects to Air Quality

3.12.5.1 Proposed Action

Dispersed OHV/recreation activities that occur in the area could temporarily increase particulate emissions, reducing air quality resulting in potential cumulative air-quality impacts. Areas that this could occur include the year-round recreation site access points for the Mogollon Rim Ranger District and certain areas within the Coconino National Forest Motorized Travel Management Plan and the Fossil Creek Wild and Scenic River Comprehensive River Management Plan. Temporary air quality impacts may occur as well with future projects that include the APS 69kV Sandvig-Youngs powerline, and the Grapevine Interconnect and existing projects that include the APS 230kV transmission line from Leupp substation to the Coconino substation and the 69kV transmission line from the TAP substation to the Coconino substation when vegetation management activities are occurring at the same time as construction or maintenance activities are occurring with these other projects; however, there are no substantial permanent sources of emissions to occur from these maintenance activities and the temporary dispersed OHV activities.

3.12.5.2 No Action Alternative

Implementation of the No Action alternative would likely result in similar cumulative effects to air quality as the Proposed Action; however, these effects would be spread out over time and more localized. Under the No Action alternative proposed PCMs for air quality may not be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4). However, the No Action alternative is not anticipated to contribute to cumulatively considerable effects to air quality in combination with the past, present, and reasonably foreseeable actions presented in Table 3-1.

3.13 NOISE

3.13.1 Introduction and Methodology

This section examines the affected environment and environmental consequences for the noise environment as a result of the Proposed Action and the No Action alternative in Coconino and Yavapai counties, which encompass the Project area. A description of the environmental setting, and any applicable noise ordinances and limitations, is provided; followed by an analysis of the noise effects associated with vegetation removal and management activities in each portion of the Project area.

To describe environmental noise and to assess Project impacts on areas that are sensitive to noise, a measurement scale that simulates human perception is customarily used. The A-weighted scale of frequency sensitivity of the human ear, which is less sensitive to low frequencies, and correlates well with human perceptions of the annoying aspects of noise. The

A-weighted decibel scale (dBA) is cited in most noise criteria. Noise is measured in decibels, which are logarithmic units that conveniently compare wide ranges of sound intensities. Table 3-16 illustrates the range of noise levels generated by Western's typical construction equipment.

Community noise levels are usually closely related to the intensity of nearby human activity. Noise levels are generally considered low when ambient levels are below 45 dBA, moderate when in the 45 to 60 dBA range, and high when above 60 dBA. In Wilderness Areas, the L_{dn} noise levels (i.e., an average level occurring over a 24-hour day/night period) is likely to be below 35 dBA. In small towns or wooded and lightly used residential areas, the L_{dn} is more likely to be around 50 or 60 dBA. Levels around 75 dBA are more common in busy urban areas, and levels up to 85 dBA occur near major freeways and airports. Although people often accept high levels associated with very noisy urban residential and residential-commercial zones, high noise levels are nevertheless considered to be adverse to public health.

Surrounding land uses dictate what noise levels would be considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are approximately 7 decibels lower than corresponding daytime levels. In rural areas away from roads and other human activity, the day-to-night difference can be considerably less. Areas with full-time human occupation and residency are often considered incompatible with substantial nighttime noise, because of the likelihood of disrupting sleep. Noise levels above 45 dBA at night can result in the onset of sleep interference (EPA 1974).

Table 3-16. Typical Noise Emission Characteristics of Construction Equipment

Type of Equipment	Typical Noise Level, dBA at 50 feet
Backhoe	80
Chain saw	80
Compactor	82
Crane, Mobile	83
Excavator/Shovel	82
Loader	85
Paver	89
Truck	88

Source: Federal Transit Administration 2006

3.13.2 Affected Environment

Noise levels in the area are highest near major transportation facilities, especially highway and freeway crossings, and near other localized noise sources such as the City of Flagstaff.

Another noise source along existing rights-of-way is audible transmission-line noise generated from *corona discharge*, which is usually experienced as a random crackling or hissing sound. Corona noise is primarily audible during wet weather such as fog and rain. For example, the typical corona noise for a 345 kV transmission line is less than 26 dBA during fair weather conditions and 49 dBA during wet weather.

Although federal standards of the Noise Control Act of 1972 and the Occupational Safety and Health Act of 1970 would be applicable to the Project, applicable CNF and county noise standards would also be included. The CNF noise standards include ensuring that aircraft operations are conducted so as to eliminate or reduce noise impacts on visitors, and restore and protect appropriate levels of natural quiet (CNF RMP 1987).

In Coconino County, the protection of the natural quiet is a countywide desirable community characteristic. The impacts of noise generated by major industrial uses are considered when projects occur in the county, especially when adjacent to recreation areas (Coconino County 2003).

3.13.3 Environmental Consequences

There are two basic considerations for evaluating noise impacts from the Proposed Action. First, noise levels projected for the Proposed Action must comply with the applicable federal, state, or local standards or regulations. Noise impacts on the surrounding community are enforced through local ordinance, supported by nuisance complaints and subsequent investigation. The second measure of impact is the increase in noise levels above the existing ambient level as a result of the introduction of a new source of noise. A change in noise level due to a new noise source can create an impact on people or biological resources.

3.13.3.1 Initial Vegetation Removal Activities

Construction noise resulting from initial vegetation removal activities, typically ranging from 70 to 85 dBA at a distance of 50 feet, would be temporary or short term; although due to the nature of initial vegetation removal activities, they would generally be of a longer duration than vegetation management activities. Sensitive noise receptors such as isolated residences, recreational facilities, and wildlife habitat could potentially be disturbed by noise generated from these activities. Implementation of PCMs and keeping initial vegetation removal activities to a relatively short duration would ensure that any noise or vibration generated by the initial vegetation removal activities would not significantly adversely affect sensitive receptors or conflict with applicable federal or state noise guidelines.

3.13.3.2 Vegetation Management and Right-of-Way Maintenance

For vegetation management and right-of-way maintenance activities, recreation areas and sensitive habitats within the vicinity of the Project may be disturbed during aerial inspection by a helicopter, as well as by activities when vegetation removal and maintenance is required along the right-of-way. However, aerial inspections would typically only occur four times a year and would disturb an area along the right-of-way for less than 2 minutes (based on typical cruising and inspection rates as described in Section 1.4.1). This would result in a less than significant, short-term impact as defined by the significance criteria listed above. The maintenance activities would (typically) be relatively short, addressing vegetation issues where needed and would not significantly adversely affect sensitive receptors or conflict with applicable federal and state noise guidelines. As such, a less than significant, short-term noise impact would be expected.

3.13.4 Environmental Consequences of the No Action Alternative

Under the No Action alternative, the Proposed Action would not be implemented as described in Section 2. Western would continue to conduct routine maintenance activities within the study area in a reactive manner, clearing only those trees that pose an immediate threat to the transmission lines. However, noise impacts resulting from the No Action alternative would be generally similar to, but spaced temporally based on emergency maintenance activities, the impacts resulting from vegetation management and right-of-way maintenance activities of the Proposed Action described above.

3.13.5 Cumulative Effects to Noise

3.13.5.1 Proposed Action

Temporary noise disturbance could occur in wildlife habitats in the CNF but due to the temporary nature of the initial removal of the vegetation and maintenance activities, the temporary construction and/or maintenance on future and existing projects in the CNF, and the temporary dispersed OHV/recreation activities, the potential for cumulative effects would not occur. Western would implement PCMs to reduce noise in the Project area, thereby eliminating the Proposed Action's contribution to cumulative noise effects.

3.13.5.2 No Action Alternative

Implementation of the No Action alternative would likely result in similar cumulative effects to noise as the Proposed Action; however, these effects would be spread out over time and more localized. Under the No Action alternative proposed PCMs for noise may not be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4). However, the No Action alternative is not anticipated to contribute to cumulatively considerable effects to noise in combination with the past, present, and reasonably foreseeable actions presented in Table 3-1.

3.14 TRANSPORTATION

3.14.1 Introduction and Methodology

This section of the EA examines the potential effects to transportation resources under the Proposed Action and No Action alternative.

Existing transportation data was collected through a review of existing plans and maps, and with the coordination of Western and the CNF. The review of existing plans for the CNF included the Land and Resource Management Plan (1987) and the Draft EIS for Travel Management (2010).

In order to better capture potential effects to recreation, the study area that was analyzed for transportation resources has been expanded and includes land within 0.5 mile of the transmission lines. Certain existing roads outside this 0.5-mile buffer are to be maintained according their existing road maintenance level as part of the Proposed Action, as needed.

3.14.2 Affected Environment

The area that could potentially be affected by Project activities includes streets, highways, and roadways that would be crossed by or that run parallel to the transmission lines rights-of-way. U.S. interstates, state roadways, CNF roadways, and county roadways represent major thoroughfares that cross these rights-of-way. In total, very few major roadways cross the study area, including I-40, U.S. Highway 89, SR 260, Forest Highway (FH) 3, and County Road 505.

I-40 is a major east-west highway in Arizona that passes through Flagstaff before heading east to New Mexico. It is crossed by the Flagstaff to Glen Canyon transmission lines, which begin less than 1 mile south of the Interstate at the Flagstaff Substation (approximately 15 miles east of the City of Flagstaff). SR 260 (also known as Zane Grey Highway) is a major thoroughfare that is crossed by the Pinnacle Peak to Flagstaff lines in the southern portion of the study area, south of the West Clear Creek Wilderness Area. U.S. Highway 89 is a major north-south thoroughfare that begins in Flagstaff and is crossed by the Flagstaff to Glen Canyon lines at the very northern boundary of the CNF where the Project study area ends. County Road 505 is the only major county-managed road near the study area, and is crossed by the Flagstaff to Glen Canyon lines just north of I-40 near the small unincorporated community of Winona. This road is managed by Coconino County under an easement agreement with CNF.

Across the approximately 90-mile study area, most of the roads that are crossed or are within 0.5 mile of the transmission lines are Forest Service System roads characterized as dirt, unimproved, or 4 wheel drive roads that are suitable for high clearance vehicles. The second and third types of roads that can be found in the study area are each suitable for passenger vehicle travel; these roads are classified as primary and secondary passenger roads. The only primary road located in the study area is FH 3. This road crosses three ranger districts, beginning near State Highway 87 and Clint Wells Campground, heads north and crosses the Pinnacle Peak to Flagstaff transmission lines near Happy Jack, passes east of Mormon Lake, and stretches northwest where it terminates just south of the I-17 and I-40 junction near Flagstaff. Table 3-17 lists forest roads by Ranger District that fall within these three general categories. The study area crosses each Ranger District within the CNF, including Red Rock, Mogollon, and Flagstaff districts. The greatest number of roads is crossed within the Mogollon District.

In accordance with the USFS' Travel Management Rule (TMR) regulations established in November 2005, the CNF issued the Final EIS for Travel Management on the CNF in November 2011, which addresses these regulations. Under the TMR, all forests must restrict OHV use and all other motorized vehicles, to designated roads and trail systems. Under the Final EIS proposed action, a total of approximately 4,317 miles of existing Forest system roads will be closed. Approximately 3,097 miles of roads and 39 miles of designated trails open to motorized travel would remain open in the CNF (USFS 2011d). Many closures would take place within the study area right-of-way. Administrative use by the CNF would be exempt from these closures.

Table 3-17. Forest Service Road Types within the Study Area			
	Road Type		
Ranger District	**Dirt, Unimproved, or 4 Wheel Drive**	**Primary Passenger Car**	**Secondary Passenger Car**
Red Rock	Forest Roads: 9D, 9E, 502, 677, 708, 9235A[1], 9247B	Forest Highway 3	–
Mogollon	Forest Roads: 81, 81A, 81B, 82B, 83, 109B, 124D, 135L, 229B, 229D, 294B, 683, 756, 9264D[1], 9356B[1], 9356D[1], 9359F, 9361B, 9483L[1], 9485H[1], 9366H, 9367J[1]	Forest Highway 3	Forest Roads: 81, 81E, 229
Flagstaff	Forest Roads: 4B, 82, 233, 244, 244B, 498, 511, 764, 775, 786, 9122P, 9127W[1], 9140R[1], 9483G[1]	Forest Highway 3	Forest Roads: 124, 124H, 125, 294
[1]Roads are designated to be closed under CNF Final EIS for Travel Management Source: USDA 2008			

3.14.3 Environmental Consequences

Potential impacts that could result from initial vegetation removal and continued vegetation management and maintenance along the rights-of-way include short-term or temporary closure of interstates, state roadways, National Forest roadways, and county roadways. As indicated in the Affected Environment section, very few major roads are crossed by the study area; therefore, impacts to heavily traveled roads are expected to be minimal. Upon implementation, the TMR would limit travel on roads previously open to the public, and could create more OHV traffic on roads that remain open. While Western expects to use public roads and roads within its rights-of-way for initial removal and maintenance wherever possible, it may be necessary to utilize CNF administrative roads under agreement with the CNF. The minimal impacts that may occur as a result of the Proposed Action would be higher during the initial vegetation removal phase and drop off significantly during the routine 5-year vegetation management cycle described in Section 2. Western is not proposing to improve or repair any roads as a part of this action, but will maintain existing CNF system roads to their current maintenance level, as needed based on wear or damage from Project activities.

3.14.4 Environmental Consequences of the No Action Alternative

Under the No Action alternative, Western would continue to conduct routine maintenance activities within the study area in a reactive manner, removing only those trees that pose an immediate threat to the transmission lines. The activities conducted under the No Action alternative would be similar to those conducted under the vegetation management and right-of-way maintenance component of the Proposed Action. Impacts to transportation would be infrequent and isolated because vegetation would be cleared from the Project rights-of-way only on an as-needed, emergency basis.

3.14.5 Cumulative Effects to Transportation

3.14.5.1 Proposed Action

Cumulative impacts could result from the closure or disruption of travel on U.S. interstates, state roadways, National Forest roadways (including primary and secondary passenger roads and off-highway routes), and county roadways. While major transportation corridors that cross the Project area are most likely to experience the closures from routine maintenance, other USFS CNF projects such as activities associated with enforcing the TMR and development of two new recreation sites near the transmission lines could result in cumulative impacts. Increased visitation to areas that have not frequently been used for travel or recreation could experience an increase in usage. With the utilization of PCMs, Western's actions to cumulative effects impacting transportation would not be considerable.

3.14.5.2 No Action Alternative

Implementation of the No Action alternative would likely result in similar cumulative effects to transportation as the Proposed Action; however, these effects would be spread out over time and more localized. Under the No Action alternative proposed PCMs for transportation may not be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4). However, the No Action alternative is not anticipated to contribute to cumulatively considerable effects to transportation in combination with the past, present, and reasonably foreseeable actions presented in Table 3-1.

3.15 SOCIOECONOMICS

3.15.1 Introduction and Methodology

This section describes the social and economic characteristics of the study area and its surrounding environment, as well as the social and economic changes that could result from the Proposed Action. This brief assessment is based on secondary research and data that has been collected and published for a number of different purposes. Examples of secondary data sources include the U.S. Census Bureau and the Arizona Department of Commerce. This information is useful for understanding the current social and economic conditions and provides a basis for which to assess potential impacts to these resources.

3.15.2 Affected Environment

The CNF is located within three Arizona counties: Coconino, Yavapai, and Gila. The study area and CNF falls primarily within Coconino County, which encompasses 18,661 square miles within Arizona (Arizona Department of Commerce 2009). Coconino County is the second largest county in the United States, but is home to a dispersed population spread across a landscape that is characterized by rugged mountains, deep canyons, and thick forests of pine, spruce, aspen, and oak. Table 3-18 characterizes the population across counties and communities in proximity to the study area. The largest city in proximity to the CNF is Flagstaff, with an estimated population of 61,000 residents. Yavapai County is the most populated county that

makes up a portion of the CNF, with much of its population located in Prescott and Prescott Valley. Between 2009 and 2020 the populations in Coconino, Gila, and Yavapai counties are expected to grow by approximately 22.8 percent, 23.4 percent, and 41.6 percent, respectively. In total, this represents an expected population growth of more than 131,000 residents, with most growth expected in Yavapai County.

Table 3-18. Population Estimates and Projections

Location	1990	2000	2009	Percent Change (00-09)	2020 (projected)	Percent Change 2009-2020 (projected)
Coconino County	96,591	116,320	129,849	11.6%	159,435	22.8%
Flagstaff	48,857	52,894	60,611	14.6%	–	–
Williams	2,532	2,842	3,336	17.4%	–	–
Sedona	7,720	10,192	11,598	13.8%	–	–
Gila County	40,216	51,335	52,199	1.7%	64,396	23.4%
Payson	8,377	13,620	15,547	14.1%	–	–
Yavapai County	107,714	167,517	215,686	28.8%	305,343	41.6%
Camp Verde	6,243	9,451	10,670	12.9%	–	–
Prescott	26,455	33,938	42,749	26.0%	–	–
Prescott Valley	8,858	23,535	38,463	63.4%	–	–
Cottonwood	5,918	9,179	11,361	23.8%	–	–

Source: U.S. Census 2000; U.S. Census 2009a; Arizona Department of Commerce 2006

Between 2000 and 2009 the number of vacant homes increased by 26.1 percent, 37.6 percent, and 17.3 percent in Coconino, Gila, and Yavapai counties, respectively (Table 3-19); indicating that there is no shortage of existing housing. However, over time, if growth reaches the levels expected as presented in Table 3-14, new housing development must occur. Regardless, any notable population increases in these communities may result in more CNF visitors.

Table 3-19. Housing Characteristics

Location	2000 Number of Units	2000 Vacant Units	2000 Percent Vacant	2009 Number of Units	2009 Vacant Units	2009 Percent Vacant	Percent change 2000 to 2009
Coconino County	53,443	12,995	24.3%	59,957	15,642	26.1%	1.8%
Flagstaff	21,396	2,090	9.8%	23,923	2,843	11.9%	2.1%
Williams	1,204	147	12.2%	1,330	168	12.6%	0.4%
Sedona	5,684	756	13.3%	7,197	1,443	20.1%	6.7%
Gila County	28,189	8,049	28.6%	30,573	11,494	37.6%	9.0%
Payson	7,033	1,201	17.1%	8,150	1,601	19.6%	2.6%
Yavapai County	81,730	11,559	14.1%	103,628	17,921	17.3%	3.2%
Camp Verde	3,988	320	8.0%	4,456	624	14.0%	6.0%
Prescott	17,144	2,046	11.9%	22,087	3,203	14.5%	2.6%
Prescott Valley	9,484	520	5.5%	15,379	1,637	10.6%	5.2%
Cottonwood	4,427	444	10.0%	5,563	480	8.6%	-1.4%

Source: U.S. Census 2000; U.S. Census 2009a

Table 3-20 presents annual employment and wage information estimates for Coconino, Gila, and Yavapai counties for 2009.

Table 3-20. Employment and Wage Estimates by Industry – 2009

	Coconino County		Gila County		Yavapai County	
Industry	**Average Annual Employment**	**Annual Average Wage**	**Average Annual Employment**	**Annual Average Wage**	**Average Annual Employment**	**Annual Average Wage**
Goods-Producing	6,004	$47,626	2,419	$53,694	8,154	$38,503
Natural Resources and Mining	134	$28,167	976	$60,936	1,754	$50,928
Construction	2,135	$36,246	617	$33,192	3,759	$32,089
Manufacturing	3,735	$54,830	825	$60,467	2,642	$39,380
Service-Providing	35,216	$29,568	6,583	$27,648	36,519	$29,534
Trade, Transportation, and Utilities	9,387	$26,943	2,295	$26,883	11,558	$28,693
Information	364	$37,803	90	$31,793	538	$38,523
Financial Activities	1,350	$36,988	334	$30,598	1,954	$35,429
Professional and Business Services	2,690	$36,824	465	$30,301	3,516	$34,602
Education and Health Services	7,694	$47,794	1,763	$38,962	10,338	$36,897
Leisure and Hospitality	12,302	$17,939	1,448	$14,305	7,110	$16,397
Other Services	1,404	$26,008	182	$19,929	1,462	$24,483
Unclassified	25	$26,468	6	$16,937	44	$34,686
Government Employment (State, Local, Federal)	15,130	$46,431	5,003	$35,098	11,154	$39,845
Average Annual Wage	-	$36,019	-	$34,809	-	$32,904

Source: Arizona Department of Commerce 2010

3.15.3 Environmental Consequences

If the Proposed Action is implemented, surrounding communities that receive power from the Project would likely be at a lower risk of experiencing power outages, wildfires, and other threats to public safety that could be caused by the lines. Impacts to population, housing, wages, and the local economy are expected to be minimal as a result of vegetation management and periodic right-of-way maintenance. A small number of temporary employment opportunities would result during each phase. Most of these opportunities would result from the initial clearing of the line, while fewer temporary opportunities would be created every 5 years as part of the regular vegetation management cycle.

3.15.4 Environmental Consequences of the No Action Alternative

Under the No Action alternative, vegetation maintenance along the Project would continue to be monitored in a reactive manner through quarterly helicopter flyovers. Residents in communities that receive electricity from the lines would continue to be at risk for power outages or potential wildfires, as trees continue to grow within proximity to the Project facilities.

3.15.5 Cumulative Effects to Socioeconomic Resources

3.15.5.1 Proposed Action

Cumulative impacts could occur to certain groups as the result from the implementation of the Forest Service TMR and the Proposed Action. These affected groups could include hikers, OHV user groups, and others who visit the areas within or surrounding the Project area. For example, these users could be impacted if limited access is a factor that decreases their visitor experience within the CNF. However, the implementation of Western's PCMs would likely result in very minimal social impacts to these user groups and would still allow access to the more popular sites in the CNF. No significant cumulative impacts are expected to affect economic resources.

3.15.5.2 No Action Alternative

Implementation of the No Action alternative would likely result in similar cumulative effects to socioeconomic resources as the Proposed Action; however, these effects would be spread out over time and more localized. Under the No Action alternative proposed PCMs for socioeconomic resources may not be implemented, as emergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection (see Section 1.4). However, the No Action alternative is not anticipated to contribute to cumulatively considerable effects to socioeconomic resources in combination with the past, present, and reasonably foreseeable actions presented in Table 3-1.

3.16 ENVIRONMENTAL JUSTICE

3.16.1 Introduction and Methodology

Executive Order 12898 (1998) requires federal agencies to address high and disproportionate environmental impacts on minority and low-income populations. Should potentially significant and adverse impacts attributable to the proposed Project fall disproportionately on minority or low-income populations, environmental justice impacts would result. The required analysis involves screening the Project study area to determine if environmental justice populations exist. The study area for environmental justice populations includes all census tracts that are crossed by the Project within the CNF. If such populations exist, the analysis further involves determining whether any impacts would be significant, and if they would disproportionately affect any environmental justice populations. This brief assessment is based on secondary research and data that has been collected and published by the U.S. Census Bureau.

Council on Environmental Quality (CEQ) guidance suggests that an environmental justice population may be identified if "the minority population percentage of the affected area exceeds 50 percent" (1997). Minority populations are defined as "individual(s) who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic Origin; or Hispanic" (*ibid*). Those who were American Indian or Alaskan Native, Asian, Black, "other race," or "two or more races" were aggregated and divided by the total population for each census tract to determine which areas were greater than 50 percent minority. It is important to note that the "other race" category consists of all single race populations other than "White," "Black or African American," "American Indian or Alaska

Native," "Asian," and "Native Hawaiian or Other Pacific Islander" race categories. This category comprises write-in entries, and could include Hispanic or Latino populations if the respondent considered this to be their race.

The CEQ defines low-income populations based on an annual statistical poverty threshold. In identifying low-income populations, poverty thresholds do not vary geographically and are identical across the United States (U.S. Census 2009b). In 2009, the poverty threshold for an individual living alone was $10,956. For a family of four (two adults and two children), the poverty threshold was $21,756. If the income for a family of four was below $21,756, then each person in the household was considered to be below the poverty level.

3.16.2 Affected Environment

As indicated in Section 3.15 – Socioeconomics, the CNF is located within three Arizona counties: Coconino, Yavapai, and Gila counties. The Project is located in sparse, unpopulated areas, crossing five census tracts with a total population estimated to be approximately 38,000 in 2009 (U.S. Census 2009c). Table 3-21 displays the race composition of Coconino, Gila, and Yavapai counties, including the specific census tracts crossed by the Project. Based on the information presented in the table, no communities or specific census tract crossed by the line contains a potential environmental justice population. The census tracts are composed of a largely white population.

Table 3-21. Race and Ethnicity – 2009 (percentage of total population*)

	White Alone	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some Other Race, or Two or More Races	Hispanic or Latino
Coconino County	60.8%	1.2%	28.8%	1.2%	0.2%	7.8%	12.5%
Flagstaff	72.6%	2.2%	12.4%	2.1%	0.2%	10.5%	18.0%
Williams	71.2%	2.1%	1.9%	3.1%	0.0%	21.7%	36.7%
Sedona	92.1%	1.9%	0.4%	0.0%	1.0%	4.5%	13.1%
Census tract 13	80.9%	0.0%	11.6%	0.2%	0.0%	7.3%	10.8%
Census tract 14	90.0%	0.0%	3.0%	0.8%	0.0%	6.2%	11.2%
Census tract 15	92.5%	0.0%	4.2%	0.4%	0.3%	2.5%	2.8%
Gila County	78.2%	0.2%	14.6%	0.2%	0.3%	6.5%	16.9%
Payson	95.6%	0.1%	0.9%	0.1%	0.0%	3.3%	7.3%
Census tract 1	99.6%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%
Yavapai County	90.4%	0.7%	1.8%	0.7%	0.1%	6.3%	12.6%
Camp Verde	83.2%	1.2%	8.0%	0.0%	0.2%	7.4%	15.1%
Prescott	92.7%	0.4%	1.7%	1.6%	0.0%	3.7%	8.3%
Prescott Valley	86.7%	0.7%	1.7%	1.0%	0.2%	9.7%	15.9%
Cottonwood	89.9%	0.7%	1.1%	0.0%	0.1%	8.2%	19.6%
Census tract 16	86.0%	90.0%	5.9%	0.0%	0.1%	0.1%	14.5%
3-County Total	79.1%	0.8%	12.4%	0.8%	0.2%	6.8%	13.1%

Source: U.S. Census 2009c
*Percentages for races are rounded and may not total 100%

Despite high poverty levels in Coconino and Gila counties, Table 3-22 indicates that each census tract crossed by the Project is below the state average of 14.7 percent of the total population below the poverty-level. Therefore, no environmental justice populations exist based on low-income thresholds for the study area.

Table 3-22. Poverty Levels 2009

	Total Population Below Poverty Level	Percentage of Population Below Poverty Level	Percentage Greater or Less Than 3-County total (+/-)
Coconino County	21,265	17.4%	2.7%
Flagstaff	9,968	18.3%	3.6%
Williams	552	17.0%	2.3%
Sedona	1,291	11.3%	-3.4%
Census tract 13	948	8.1%	-6.6%
Census tract 14	244	4.5%	-10.2%
Census tract 15	265	8.3%	-6.4%
Gila County	9,794	19.3%	4.6%
Payson	1,277	8.4%	-6.3%
Census tract 1	204	8.1%	-6.6%
Yavapai County	26,118	12.7%	-2.0%
Camp Verde	1,762	16.6%	1.9%
Prescott	4,863	12.1%	-2.6%
Prescott Valley	4,978	13.7%	-1.0%
Cottonwood	1,840	16.8%	2.1%
Census tract 16	2,077	14.1%	-0.6%
Arizona	914,040	14.7%	–

Source: U.S. Census 2009c

3.16.3 Environmental Consequences

No environmental justice populations exist within the study area; therefore, no impacts would be expected to result from the implementation of the Proposed Action.

3.16.4 Environmental Consequences of the No Action Alternative

If the No Action alternative is selected, vegetation maintenance along the Glen Canyon to Flagstaff and Flagstaff to Pinnacle Peak transmission lines would continue to be monitored in a reactive manner through quarterly helicopter flyovers. All residents, including environmental justice populations in communities that receive electricity from the lines, would likely continue to be at risk for power outages or potential wildfires as trees continue to grow within proximity to the lines.

3.16.5 Cumulative Effects to Environmental Justice

Because no environmental justice populations were identified in the previous section, no cumulative impacts are expected to result from the combination of this Project (either the Proposed Action or No Action alternatives) and others within proximity to the Project area.

3.17 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This section summarizes the potential Project-related impacts associated with the two primary components of the Proposed Action: initial vegetation removal, and vegetation management and right-of-way maintenance. As each activity type has already been discussed at length, only a summary of the impacts is provided below. Additionally, there is overlap among resource issues. Potential water-quality degradation exists as a result of the Proposed Actions and is discussed for vegetation, wildlife, fishes, water, and geology/soils. Potential erosion impacts exist as a result of the Proposed Actions and are discussed in sections on vegetation, wildlife, fishes, water, and geology/soils. The need to contain and remove hazardous materials is important for biological resources, water, geology/soils, and public health and safety. The spread of noxious weeds has potential impacts for vegetation, special-status plants, and special-status wildlife. Changes in traffic patterns are discussed in both transportation and public health and safety sections. The potential for degradation of views from sensitive viewer locations and/or changes to the scenic quality of an important landscape may occur as a result of the Proposed Action. Resource-specific PCMs have been incorporated into the Proposed Action (see Table 2-2) to avoid and minimize any potentially resultant environmental effects to sensitive resources, as described in the previous sections.

3.17.1 No Action Alternative

Project-related impacts associated with the No Action alternative would not change over existing conditions. These are the existing impacts of as-needed maintenance, repairs, and vegetation management. The Proposed Action may increase the potential for impacts in the short term, but to the extent that vegetation management and maintenance strategies described above reduce the need for long-term management, as is expected, the Proposed Action would be expected to have a net benefit compared to the No Action alternative.

3.18 CONCLUSION

Western has proactively coordinated with the CNF and SHPO to identify the occurrence of or potential for sensitive resources within the Project area. Additionally, Western has coordinated with these federal and state agencies to determine the most effective methods to reduce public and worker safety hazards and minimize potential impacts to the environment from the Proposed Action. As a result of this collaborative effort, PCMs have been developed for this Project that will allow Western to efficiently manage operation and maintenance activities while minimizing the potential for environmental impacts.

SECTION 4 – AGENCIES AND TRIBES CONSULTED

Western encourages the involvement of participating government agencies in the planning and preparation of any EA it pursues. As part of this EA, the USFS was invited and agreed to be a cooperating agency for this Project. In February 2011, Western provided the USFS with a memorandum of understanding (MOU), which was signed and returned to Western on March 1, 2011 (Appendix A).

The MOU states the purpose and need for the Project, indicating that Western must meet legal requirements, including compliance with the National Electric Safety Code, Western States Coordinating Council, and Western directives for protecting human safety and maintaining the reliability of the operation of the transmission system. The MOU emphasizes the importance of receiving feedback from the USFS throughout the NEPA process, especially comments and concerns on the draft and final EA documents.

Western involved the USFS throughout the NEPA process, including scoping, through the development of the draft and final EA. Comments received on the EA, such as those regarding the Proposed Action, Project conservation measures, environmental consequences, and cumulative effects, were considered by Western prior to the finalization of the document.

The following is a list of agencies and tribes contacted for this Proposed Action:

FEDERAL
US Forest Service, Coconino National Forest
US Fish and Wildlife Service
US Geological Survey
US Department of Agriculture, Natural Resources Conservation Service

TRIBAL
Fort McDowell Yavapai Nation
Havasupai Tribe
Hopi Tribe
Hualapai Tribe
Pueblo of Acoma
Pueblo of Zuni
San Carlos Apache Nation
San Juan Southern Paiute Tribe
Salt River Pima-Maricopa Indian Community
Tonto Apache Tribe
White Mountain Apache Tribe
Yavapai-Apache Nation
Yavapai-Prescott Tribe

STATE
Arizona Department of Environmental Quality
Arizona Department of Public Safety
Arizona Department of Transportation
Arizona Department of Mines and Mineral Resources
Arizona Department of Water Resources
Arizona Game and Fish Department
Arizona State Land Department
Arizona State Parks
State Historic Preservation Office

COUNTY
Coconino County, Arizona
Gila County, Arizona
Yavapai County, Arizona

CITIES
Flagstaff
Sedona

ORGANIZATION
Northern Arizona Council of Governments

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SECTION 6 – REFERENCES

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Appendix A USFS Correspondence

MEMORANDUM OF UNDERSTANDING BETWEEN REGION 3 OF THE UNITED STATES FOREST SERVICE, DEPARTMENT OF AGRICULTURE, AND REGION 4 OF THE UNITED STATES BUREAU OF RECLAMATION, DEPARTMENT OF THE INTERIOR, RELATING TO CONSTRUCTION, OPERATION, AND MAINTENANCE OF GLEN CANYON-PINNACLE PEAK 345-KV TRANSMISSION LINES

THIS MEMORANDUM OF UNDERSTANDING entered into the 21 day of June, 1962, by and between the BUREAU OF RECLAMATION, UNITED STATES DEPARTMENT OF THE INTERIOR, hereinafter referred to as Reclamation, represented by the Regional Director, Region 4, and the FOREST SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE, hereinafter referred to as the Service, represented by the Regional Forester, Region 3, witnesseth that:

WHEREAS, Reclamation plans to construct the Glen Canyon-Pinnacle Peak Transmission Lines, Colorado River Storage Project, Arizona, hereinafter referred to as the Project, and needs to construct, operate, and maintain certain project facilities, including the Flagstaff Substation, on lands within the Coconino and Tonto National Forests, and

WHEREAS, the Service is willing to make available to Reclamation the use of such National-Forest lands as needed for this purpose;

NOW, THEREFORE, the parties hereto agree as follows:

A. THE SERVICE:

1. Hereby grants to Reclamation, subject to all valid claims and limitations included herein, permission to construct, operate, and maintain the Glen Canyon-Pinnacle Peak Transmission Lines to be located essentially as shown on Reclamation Drawings Nos. 864-423-1351

(Sheet 1 of 2) and -1352 (Sheet 2 of 2), both revised April 2, 1962, and entitled, "345-KV Transmission Line, Glen-Canyon - Flagstaff, Surveyed Alignment"; and 864-423-953 (Sheet 1 of 2) and -955 (Sheet 2 of 2), both revised April 19, 1962, and entitled, "345-KV Transmission Line, Flagstaff-Pinnacle Peak, Proposed Alignment", all of which Drawings are attached hereto and made a part hereof. Additional drawings to show the surveyed alignment of the Flagstaff-Pinnacle Peak segment are to be furnished by Reclamation to the Service.

The Service further grants Reclamation the privilege to construct and maintain access roads where needed in connection with the Project. Approved standards for National Forest roads will be made available by the Service, and construction of permanent roads shall conform therewith.

2. Agrees to cooperate fully with Reclamation in all matters relating to the use and administration of National Forest lands for project purposes; and the Regional Forester hereby designates the Forest Supervisors of the Coconino and Tonto National Forests, each with respect to his jurisdiction, to represent the Regional Forester in all matters pertaining to the administration of National-Forest lands covered by this Memorandum of Understanding.

3. On a reimbursable basis, as provided by paragraph B. 12., below, will make an authorized liaison representative of the Service available at times requested by Reclamation to assist Reclamation and its contractors in the construction of the Project through the Forest lands and to make decisions of location and procedures required

under this Memorandum and under Reclamation construction specifications, and for such work will render its bills to Reclamation periodically but not more often than monthly. Any bills outstanding against Reclamation at the end of any fiscal year shall be submitted to Reclamation prior to the 10th day of July following.

B. RECLAMATION WILL:

1. Prior to use and occupancy of National-Forest lands, for either survey or construction work, establish contact with the Forest Supervisor of the Coconino National Forest, Flagstaff, Arizona, and the Forest Supervisor of the Tonto National Forest, Phoenix, Arizona, and all matters relating to such use of the respective National Forest lands will be taken up directly with the appropriate Forest Supervisor or his designated representative.

2. Prior to undertaking actual construction work, review and obtain approval by the appropriate Forest Supervisor of the proposed location for all temporary access roads, borrow areas, or construction work areas in the interest of affording adequate protection to National Forest resources. All roads, whether temporary or permanent, shall be so constructed as to provide drainage of water from the roadway at intervals such that surface water will not be permitted to accumulate in sufficient volume to cause serious erosion. On continuous grades where culverts are not provided, standard drainage dips shall be constructed into the road surface at intervals prescribed by the Forest Service with relation to road gradient and soil type. All road fills which block natural drainage courses shall be provided with adequate

grades shall be held to a minimum. All borrow areas, camp, or other auxiliary sites will be subject to approval of the Forest Supervisor in advance of use or occupancy and, as appropriate, to approval by the Arizona State Health Department.

3. Wherever existing fences are crossed, to provide facilities to assure that such fences remain effective at the point of crossing for the enclosure and control of livestock at all times.

4. Determine, in cooperation with the Service, which of the access roads are to become permanent and to improve such permanent roads to comply with approved standards of the Service.

5. Prepare and submit plans and specifications for all permanent access roads to be built by Reclamation across National-Forest land to the Service sufficiently in advance of construction to allow examination on the ground and approval before construction begins. Plans will include centerline traverse, profile, and size and location of all drainage structures, and shall provide for installation of cattle guards in all existing fences crossed by such roads.

6. Reseed, cross-ditch, or otherwise treat all disturbed areas, including abandoned access roads, as may be prescribed by the Service to prevent erosion, and to fully repair all damage to National-Forest roads, trails, and other improvements resulting from the exercise of the privilege authorized by this Memorandum.

7. Maintain improvements and premises in an orderly, neat, sanitary, and safe manner; and in exercising the privileges authorized by this Memorandum, comply with the regulations of the Department of

Agriculture and laws which are applicable to the areas or operations covered by this Memorandum.

8. In recognition of the intensive use made of National-Forests under the principle of multiple-use management, agree to free use by the public of permanent roads constructed by Reclamation but subject to such restrictions as the Forest Supervisor and the Regional Director or their authorized representatives agree are necessary in the interest of public safety.

9. Take all reasonable precautions to prevent and suppress forest fires and shall not dispose of any material by burning in open fires during the fire season without obtaining the written consent of the Forest Supervisor or his authorized agent. As requested, join with the Service in preparing a fire plan which shall set forth in detail the plan for prevention, control, and extinguishing of fires on and in the vicinity of the project area. Said plan and the terms thereof shall become a part of this Memorandum.

10. Cut and deck merchantable timber and dispose of slash and unmerchantable timber in a manner prescribed by the Forest Supervisor or his designated representative.

11. Provide and maintain mediums or devices of high visibility such as PAFCO Air Safety Markers, at points mutually agreed upon, to mark the power line as a warning to firefighting airplanes or other aircraft necessarily flying low.

12. Reimburse the Service for the actual and necessary salary and travel expense of the representative furnished by Service

is $22,000.

C. THE SERVICE AND RECLAMATION MUTUALLY AGREE THAT:

1. Upon issuance of specifications by Reclamation for any part of the work contemplated herein, the Forest Supervisors will be furnished a copy for review. Such review will be for purposes of determining the effect upon the forest resources. The Forest Supervisors will advise Reclamation in writing within fifteen days after receipt of the specifications whether any changes are recommended.

2. Reclamation may request and Service agrees to perform certain reseeding and other work in the Forest required of Reclamation under this Memorandum. In that event, Reclamation will reimburse the Service for such work, such reimbursement to include wages, salaries, travel, material, equipment use, and other expense incurred by the Service in performing the work for Reclamation. Such reimbursement shall be under the authority of Section 601, Economy Act of June 30, 1932 (47 Stat. 417), as amended, and the expense itemized, identified and billed to Reclamation by Service periodically but not more often than monthly, it being understood that such reimbursement will include an amount of ten percent (10%) for accrual of annual and sick leave and general administrative expense.

3. This Memorandum may be amended or modified by an exchange of correspondence between the parties hereto.

4. This Memorandum shall automatically terminate upon receipt by the Service of written notice from Reclamation that the lands within the terms of this Memorandum are no longer needed for the intended

further formality as if this agreement had never been executed.

5. That upon abandonment, Reclamation will remove within one (1) year, all structures and facilities which have been placed on National-Forest lands in the exercise of this use.

6. The liability of Reclamation under this Memorandum is contingent on the necessary appropriation and reservation of funds being made therefor.

IN WITNESS WHEREOF, the parties hereto have signed this Memorandum as of the day and year first above written.

UNITED STATES FOREST SERVICE

FRED H. KENNEDY, Regional Forester

By /s/ R. J. Nelson
ACTING REGIONAL FORESTER.

UNITED STATES BUREAU OF RECLAMATION

By /s/ F. M. Clinton
Regional Director, Region 4

USDA United States Department of Agriculture | Forest Service | Coconino National Forest, Supervisor's Office | 1824 S. Thompson Street Flagstaff, AZ 86001-2529 Phone: (928) 527-3600 Fax: (928) 527-3620

File Code: 1950
Date: March 24, 2011

John Holt
Environmental Manager
Department of Energy
Western Area Power Administration
Po Box 6457
Phoenix, AZ 85005-6457

Dear Mr. Holt,

I would like to thank you for your letter inviting the Coconino National Forest to participate as a cooperating agency on the Flagstaff-Pinnacle Peak Vegetation Management Project. I understand the project is important to meet regulatory requirements for improved efficiency and reliability in emergency situations. I accept your invitation and look forward to working toward the joint development of an environmental assessment with the Western Area Power Administration.

Based on planning efforts and conversations between agency staff I understand it will be the role of the Forest Service to oversee the efforts of the development of the environmental assessment, provide data and information, provide guidance on Forest Service NEPA rules and regulations, participate in IDT meetings, and lead efforts to inform tribal interests through tribal consultation. Coconino National Forest staff will also participate in efforts to comply with the National Historic Preservation Act and the Endangered Species Act by reviewing surveys and findings, reviewing effects analysis reports, and communicating the potential impacts of the project to the State Historic Preservation Office and Fish and Wildlife Service for the purposes of project clearance.

Should you have any questions or additional project-related needs, please contact Mike Dechter (mdechter@fs.fed.us) or Judy Adams (jadams05@fs.fed.us).

Sincerely,

M. EARL STEWART
for Forest Supervisor

cc: Judy Adams, Craig J Johnson

Department of Energy
Western Area Power Administration
Desert Southwest Customer Service Region
P.O. Box 6457
Phoenix, AZ 85005-6457

M... 01 2011

Mr. Mike Dechter
United States Department of Agriculture
Coconino National Forest
1824 S. Thompson St
Flagstaff, AZ 86001

Subject: Invitation to Participate as Cooperating Agency, Flagstaff-Pinnacle Peak Vegetation Management Project Environmental Assessment

Dear Mr. Dechter:

The U.S. Department of Energy (DOE) Western Area Power Administration (Western) Western is the lead agency on the environmental assessment for the project. The Project involves clear-cutting the right-of-way, as well as possible improvements and vegetation clearing on existing access roads (not Forest Service Roads). The Project could potentially affect the existing transmission line right-of-way, staging areas, and up to 30 miles of access roads that are not crowned and graded (such as Forest Service Roads). In addition, a 150-foot extension to the existing right-of-way (300 feet in width) will be sought to accommodate removal of "danger trees."

The purpose of the Project is based on both legal requirements and Western's desire to improve efficiency and reliability when situations such as emergency maintenance are necessary. Western must comply with the National Electric Safety Code, Western States Coordinating Council, and Western directives for protecting human safety and maintaining the reliable operation of the transmission system. In order to comply with these regulations and management practices, Western must remove vegetation along the right-of-way that could grow or fall into the transmission line and cause a safety hazard or a fire hazard that could result in electrocution, damage to the transmission line, or a power outage.

Western's proposed action for this vegetation management triggers a National Environmental Policy Act (NEPA) review process of the action. Western will be the lead agency for consultations with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act, the Arizona State Historic Preservation Officer, under Section 106 of the National Historic Preservation Act, Tribes and other interested parties.

The Council on Environmental Quality NEPA Implementing Regulations 940 CFR Part 1506.2) require Federal agencies to cooperate with state and local agencies to the fullest extent possible to reduce duplication between NEPA, state and local permitting requirements. We are inviting you to become a cooperating agency. Should you decide not to become a formal cooperating agency for the EA, we will still continue to keep your

agency informed of Project developments and you will receive the draft and final documents. Any concerns or comments you provide to us during the NEPA process will be fully considered in finalizing the EA and Finding of No Significant Impact (FONSI), if no significant impacts are found.

Western extends an invitation to Coconino National Forest to participate as a cooperating agency in development of the environmental assessment for the Flagstaff Pinnacle Peak Vegetation Management Project. We request you provide your response to the invitation of cooperating agency to Western by March 31, 2011. For additional information please contact Ms. Linette King of Western at (602) 605-2434 or via e-mail at LKing@wapa.gov.

Sincerely,

John Holt

John Holt
Environmental Manager

cc:
Amy Jerome
EPG
4141 North 32nd Street, Suite 102
Phoenix, AZ 85018

United States Department of Agriculture **Forest Service** **Coconino National Forest, Supervisor's Office**

1824 S. Thompson Street
Flagstaff, AZ 86001-2529
Phone: (928) 527-3600
Fax: (928) 527-3620

File Code: 2360
Date: November 9, 2011

Dr. Clinton M. Pattea
President
Fort McDowell Yavapai Nation
P.O. Box 17779
Fountain Hills, AZ 85269

Dear President Pattea,

The Coconino National Forest (CNF) in conjunction with the Western Area Power Administration (WAPA) is proposing to develop and implement a vegetation management and right-of-way maintenance program on the CNF that allows for safe and reliable operation of their existing Glen Canyon-Flagstaff and Flagstaff-Pinnacle Peak 345 kV transmission lines. The clearance and maintenance of vegetation under the 345 kV transmission lines was analyzed under the Endangered Species Act in 2008, resulting in a Biological Opinion for clearance of vegetation within the right-of-way. Since that time, new safety standards have been established to increase clearance distance from the lines. As a result this project will involve increasing clearance around the transmission lines beyond the existing right-of-way of 300 feet. This project involves the implementation of a vegetation management program that includes clearing vegetation in the existing right-of-way and clearing any hazard trees that can fall into the transmission lines. This means trees up to 60 feet from either side of the right-of-way may also be removed.

Tree removal will be completed by mechanical means with a cut-shredder or tractor-mounted mower with rubber tires or tracks. In areas with sensitive wildlife or cultural resources, hand crews would be used to cut or trim trees. Each hand crew would consist of six to eight crew members driving three to four pickup or bucket trucks. Crews would either walk to the right-of-way and vegetation treatment area from the nearest access point, or drive to and/or within the right-of-way where access to the vegetation treatment area is available.

Vegetation treated will be disposed of through shredding/chipping, lop and scatter, or through the removal of whole logs. Most areas will be treated with a mower or shredder that automatically shreds and chips the material into pieces less than 4-inches length and width. Where these machines are not used, limbs would be lopped and scattered and logs would be cut to manageable lengths of 7-8 feet or less, and left within or adjacent to the right-of-way off of access routes.

Once the rights-of-way have been sufficiently cleared of vegetation, WAPA would continue to manage the project area to achieve their desired condition within their rights-of-way. WAPA's policy on Transmission Vegetation Management Program Western Order (O) 450.3A specifies

that "*Western's desired condition beneath and adjacent to its transmission line facilities is characterized by stable, low growth plant communities free from noxious or invasive plants. These communities will typically be comprised of herbaceous plants and low growing shrubs which ideally are native to the local area. Vegetation on the bordering areas of transmission line rights-of-way can be managed so that increased tree height is allowed in relation to an increasing distance from the transmission line. Accumulations of vegetation debris from intensive or repetitive vegetation treatments may require mitigation to reduce risks from wildfire and enhance the fire survivability of the transmission facilities.*"

A more detailed description of the proposed action and maps of the project area are attached. Information on this project will be updated regularly on the project web site: http://www.fs.fed.us/r3/coconino/nepa/nepa_project.shtml?project=35015. We would be happy to provide any other information regarding the proposal that we have. We would like to know if the proposed action is one that you would like the Forest to consult on. If you would like to reply to this letter but do not have a wish to prepare an official letter of response, please fill in the appropriate line below and mail a copy back to our office; Coconino National Forest, 1824 S. Thompson St. Flagstaff, AZ 86001. If you have any questions or concerns, please feel free to contact our Tribal Relations Specialist Craig J. Johnson at (928) 527-3475 or by email; cjjohnson@fs.fed.us

☐ We do not wish to be contacted again regarding this project

_____

Signature Date

☐ We have concerns regarding this project and would like to initiate consultation

_____

Signature Date

Sincerely,

M. EARL STEWART
Forest Supervisor

USDA United States Department of Agriculture | Forest Service | Coconino National Forest, Supervisor's Office | 1824 S. Thompson Street Flagstaff, AZ 86001-2529 Phone: (928) 527-3600 Fax: (928) 527-3620

File Code: 2360
Date: November 9, 2011

Dr. Clinton M. Pattea
President
Fort McDowell Yavapai Nation
P.O. Box 17779
Fountain Hills, AZ 85269

Dear President Pattea,

The Coconino National Forest (CNF) in conjunction with the Western Area Power Administration (WAPA) is proposing to develop and implement a vegetation management and right-of-way maintenance program on the CNF that allows for safe and reliable operation of their existing Glen Canyon-Flagstaff and Flagstaff-Pinnacle Peak 345 kV transmission lines. The clearance and maintenance of vegetation under the 345 kV transmission lines was analyzed under the Endangered Species Act in 2008, resulting in a Biological Opinion for clearance of vegetation within the right-of-way. Since that time, new safety standards have been established to increase clearance distance from the lines. As a result this project will involve increasing clearance around the transmission lines beyond the existing right-of-way of 300 feet. This project involves the implementation of a vegetation management program that includes clearing vegetation in the existing right-of-way and clearing any hazard trees that can fall into the transmission lines. This means trees up to 60 feet from either side of the right-of-way may also be removed.

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☒ We do not wish to be contacted again regarding this project

Dr. Clinton M. Pattea — 11-15-11

Signature — Date

☐ We have concerns regarding this project and would like to initiate consultation

_____

Signature — Date

Sincerely,

Kristin M. Bail

for M. EARL STEWART
Forest Supervisor

United States Department of Agriculture **Forest Service** **Coconino National Forest, Supervisor's Office**

1824 S. Thompson Street
Flagstaff, AZ 86001-2529
Phone: (928) 527-3600
Fax: (928) 527-3620

File Code: 2360
Date: November 9, 2011

Mr. Leigh Kuwanwisiwma
Director
Hopi Cultural Preservation Office
P.O. Box 123
Kykotsmovi, AZ 86039

Dear Director Kuwanwisiwma,

The Coconino National Forest (CNF) in conjunction with the Western Area Power Administration (WAPA) is proposing to develop and implement a vegetation management and right-of-way maintenance program on the CNF that allows for safe and reliable operation of their existing Glen Canyon-Flagstaff and Flagstaff-Pinnacle Peak 345 kV transmission lines. The clearance and maintenance of vegetation under the 345 kV transmission lines was analyzed under the Endangered Species Act in 2008, resulting in a Biological Opinion for clearance of vegetation within the right-of-way. Since that time, new safety standards have been established to increase clearance distance from the lines. As a result this project will involve increasing clearance around the transmission lines beyond the existing right-of-way of 300 feet. This project involves the implementation of a vegetation management program that includes clearing vegetation in the existing right-of-way and clearing any hazard trees that can fall into the transmission lines. This means trees up to 60 feet from either side of the right-of-way may also be removed.

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Signature Date

☐ We have concerns regarding this project and would like to initiate consultation

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Signature Date

Sincerely,

M. EARL STEWART
Forest Supervisor

THE HOPI TRIBE

LeRoy N. Shingoitewa
CHAIRMAN

Herman G. Honanie
VICE-CHAIRMAN

November 29, 2011

M. Earl Stewart, Forest Supervisor
Attention: Craig Johnson, Tribal Relations Specialist
Coconino National Forest
1824 S Thompson Street
Flagstaff, Arizona 86001-2529

Re: Glen Canyon-Flagstaff and Flagstaff-Pinnacle Peak 345kV Transmission Lines
Vegetation Management and Right-of-way Maintenance Program

Dear Supervisor Stewart,

This letter is in response to your correspondence dated November 9, 2011, Coconino National Forest and Western Area Power Administration proposing to develop and implement a vegetation management and right-of-way maintenance program for the Glen Canyon-Flagstaff and Flagstaff-Pinnacle Peak 345kV transmission lines. The Hopi Tribe claims cultural affiliation to prehistoric cultural groups on the Coconino National Forest. The Hopi Cultural Preservation Office supports the identification and avoidance of prehistoric archaeological sites and we consider the prehistoric archaeological sites of our ancestors to be "footprints" and Traditional Cultural Properties. Therefore, we appreciate Coconino National Forest's continuing solicitation of our input and your efforts to address our concerns.

This proposal was discussed at a September 19 administrative meeting with representatives of Coconino National Forest regarding the Schedule of Proposed Actions. At that meeting, we reviewed maps that depicted a high site density and discussed shrines associated with habitation sites in the Wupatki area.

The enclosed draft environmental assessment indicates that a cultural resources survey of the area of potential effect has been conducted. Therefore, to assist us in determining if this proposal may affect cultural resources significant to the Hopi Tribe, please provide us with a copy of the survey report for review and comment. Subsequent to our review of the survey report we will request site visits to identify possible Traditional Cultural Properties in the project area.

If you have any questions or need additional information, please contact Terry Morgart at 928-734-3619 or tmorgart@hopi.nsn.us. Thank you for your consideration.

Respectfully,

Leigh J. Kuwanwisiwma, Director
Hopi Cultural Preservation Office

xc: Arizona State Historic Preservation Office
Western Area Power Administration

United States Department of Agriculture **Forest Service** **Coconino National Forest, Supervisor's Office**

1824 S. Thompson Street
Flagstaff, AZ 86001-2529
Phone: (928) 527-3600
Fax: (928) 527-3620

File Code: 2360
Date: November 9, 2011

Ms. Bernadine Jones
Chaiworman
The Havasupai Tribe
P.O. Box 10
Supai, AZ 86435

Dear Chaiworman Jones,

The Coconino National Forest (CNF) in conjunction with the Western Area Power Administration (WAPA) is proposing to develop and implement a vegetation management and right-of-way maintenance program on the CNF that allows for safe and reliable operation of their existing Glen Canyon-Flagstaff and Flagstaff-Pinnacle Peak 345 kV transmission lines. The clearance and maintenance of vegetation under the 345 kV transmission lines was analyzed under the Endangered Species Act in 2008, resulting in a Biological Opinion for clearance of vegetation within the right-of-way. Since that time, new safety standards have been established to increase clearance distance from the lines. As a result, this project will involve increasing clearance around the transmission lines beyond the existing right-of-way of 300 feet. This project involves the implementation of a vegetation management program that includes clearing vegetation in the existing right-of-way and clearing any hazard trees that can fall into the transmission lines. This means trees up to 60 feet from either side of the right-of-way may also be removed.

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Signature Date

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Signature Date

Sincerely,

M. EARL STEWART
Forest Supervisor

United States Department of Agriculture **Forest Service** **Coconino National Forest, Supervisor's Office**
1824 S. Thompson Street
Flagstaff, AZ 86001-2529
Phone: (928) 527-3600
Fax: (928) 527-3620

File Code: 2360
Date: November 9, 2011

Mr. Ben Shelly
President
The Navajo Nation
P.O. Box 7440
Window Rock, AZ 86515

Dear President Shelly,

The Coconino National Forest (CNF) in conjunction with the Western Area Power Administration (WAPA) is proposing to develop and implement a vegetation management and right-of-way maintenance program on the CNF that allows for safe and reliable operation of their existing Glen Canyon-Flagstaff and Flagstaff-Pinnacle Peak 345 kV transmission lines. The clearance and maintenance of vegetation under the 345 kV transmission lines was analyzed under the Endangered Species Act in 2008, resulting in a Biological Opinion for clearance of vegetation within the right-of-way. Since that time, new safety standards have been established to increase clearance distance from the lines. As a result, this project will involve increasing clearance around the transmission lines beyond the existing right-of-way of 300 feet. This project involves the implementation of a vegetation management program that includes clearing vegetation in the existing right-of-way and clearing any hazard trees that can fall into the transmission lines. This means trees up to 60 feet from either side of the right-of-way may also be removed.

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Sincerely,

M. EARL STEWART
Forest Supervisor

United States Department of Agriculture **Forest Service** **Coconino National Forest, Supervisor's Office**

1824 S. Thompson Street
Flagstaff, AZ 86001-2529
Phone: (928) 527-3600
Fax: (928) 527-3620

File Code: 2360
Date: November 9, 2011

Mr. Ivan Smith
Chairman
Tonto Apache Tribe
Tonto Apache Reservation No. 30
Payson, AZ 85541

Dear Chairman Smith,

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Forest Supervisor

United States Department of Agriculture **Forest Service** **Coconino National Forest, Supervisor's Office**

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Flagstaff, AZ 86001-2529
Phone: (928) 527-3600
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M. EARL STEWART
Forest Supervisor

United States Department of Agriculture **Forest Service** **Coconino National Forest, Supervisor's Office**

1824 S. Thompson Street
Flagstaff, AZ 86001-2529
Phone: (928) 527-3600
Fax: (928) 527-3620

File Code: 2360
Date: November 9, 2011

Mr. David Kwail
Chairman
The Yavapai-Apache Nation
2400 Datsi Street
Camp Verde, AZ 86322

Dear Chairman Kwail,

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M. EARL STEWART
Forest Supervisor

United States Department of Agriculture **Forest Service** **Coconino National Forest, Supervisor's Office**

1824 S. Thompson Street
Flagstaff, AZ 86001-2529
Phone: (928) 527-3600
Fax: (928) 527-3620

File Code: 2360
Date: November 9, 2011

Mr. Ernest Jones, Sr.
President
Yavapai-Prescott Indian Tribe
530 East Merritt Street
Prescott, AZ 86301

Dear President Jones,

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_____

Signature Date

☐ We have concerns regarding this project and would like to initiate consultation

_____

Signature Date

Sincerely,

M. EARL STEWART
Forest Supervisor

United States Department of Agriculture **Forest Service** **Coconino National Forest, Supervisor's Office**

1824 S. Thompson Street
Flagstaff, AZ 86001-2529
Phone: (928) 527-3600
Fax: (928) 527-3620

File Code: 2360
Date: November 9, 2011

Mr. Ronnie Lupe
Chairman
White Mountain Apache Tribe
P.O. Box 700
White River, AZ 85941

Dear Chairman Lupe,

The Coconino National Forest (CNF) in conjunction with the Western Area Power Administration (WAPA) is proposing to develop and implement a vegetation management and right-of-way maintenance program on the CNF that allows for safe and reliable operation of their existing Glen Canyon-Flagstaff and Flagstaff-Pinnacle Peak 345 kV transmission lines. The clearance and maintenance of vegetation under the 345 kV transmission lines was analyzed under the Endangered Species Act in 2008, resulting in a Biological Opinion for clearance of vegetation within the right-of-way. Since that time, new safety standards have been established to increase clearance distance from the lines. As a result, this project will involve increasing clearance around the transmission lines beyond the existing right-of-way of 300 feet. This project involves the implementation of a vegetation management program that includes clearing vegetation in the existing right-of-way and clearing any hazard trees that can fall into the transmission lines. This means trees up to 60 feet from either side of the right-of-way may also be removed.

Tree removal will be completed by mechanical means with a cut-shredder or tractor-mounted mower with rubber tires or tracks. In areas with sensitive wildlife or cultural resources, hand crews would be used to cut or trim trees. Each hand crew would consist of six to eight crewmembers driving three to four pickup or bucket trucks. Crews would either walk to the right-of-way and vegetation treatment area from the nearest access point, or drive to and/or within the right-of-way where access to the vegetation treatment area is available.

Vegetation treated will be disposed of through shredding/chipping, lop and scatter, or through the removal of whole logs. Most areas will be treated with a mower or shredder, which automatically shreds and chips the material into pieces less than 4-inches length and width. Where these machines are not used limbs would be lopped and scattered and logs would be cut to manageable lengths of 7-8 feet or less, and left within or adjacent to the right-of-way off of access routes.

Once the rights-of-way have been sufficiently cleared of vegetation, WAPA would continue to manage the project area to achieve their desired condition within their rights-of-way. WAPA's policy on Transmission Vegetation Management Program Western Order (O) 450.3A specifies

that "*Western's desired condition beneath and adjacent to its transmission line facilities is characterized by stable, low growth plant communities free from noxious or invasive plants. These communities will typically be comprised of herbaceous plants and low growing shrubs which ideally are native to the local area. Vegetation on the bordering areas of transmission line rights-of-way can be managed so that increased tree height is allowed in relation to an increasing distance from the transmission line. Accumulations of vegetation debris from intensive or repetitive vegetation treatments may require mitigation to reduce risks from wildfire and enhance the fire survivability of the transmission facilities.*"

A more detailed description of the proposed action and maps of the project area are attached. Information on this project will be updated regularly on the project web site: http://www.fs.fed.us/r3/coconino/nepa/nepa_project.shtml?project=35015. We would be happy to provide any other information regarding the proposal that we have. We would like to know if the proposed action is one that you would like the Forest to consult on. If you would like to reply to this letter but do not have a wish to prepare an official letter of response, please fill in the appropriate line below and mail a copy back to our office; Coconino National Forest, 1824 S. Thompson St. Flagstaff, AZ 86001. If you have any questions or concerns, please feel free to contact our Tribal Relations Specialist Craig J. Johnson at (928) 527-3475 or by email; cjjohnson@fs.fed.us

☐ We do not wish to be contacted again regarding this project

_____

Signature Date

☐ We have concerns regarding this project and would like to initiate consultation

_____

Signature Date

Sincerely,

M. EARL STEWART
Forest Supervisor

Appendix B Cultural Resources Class III Survey Report

CULTURAL RESOURCES CLASS III SURVEY REPORT

Appendix B – Cultural Resources Class III Survey Report is a confidential appendix that will contain the results of the Class III pedestrian survey conducted for the Project. The Cultural Resources Class III Survey Report will provide information on the following:

- A description of the proposed action
- A summary of previous research and the results of literature and records searches
- A description of efforts used to identify cultural resources in the project area, including the qualifications of consultants employed to undertake the work
- A description of all cultural resources encountered
- Assessment and recommendations of NRHP eligibility for each property recorded
- An evaluation of the potential for the proposed action to directly or indirectly impact NRHP-eligible properties
- A discussion of mitigation/treatment alternatives to avoid or minimize impacts to NRHP-eligible properties

Appendix C List of Non-Ineligible Phase I Area Cultural Resource Sites

Table C-1. NRHP-eligible and Unevaluated Cultural Resource Sites in the Phase I Recording Area.				
Site Number	**Description**	**Eligibility**	**Potential Impact(s)**	**Mitigation**
AR-03-04-01-0207	Southern Sinagua field houses (2)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-0213	Southern Sinagua room block (1-2 rooms)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-0214	Southern Sinagua field houses (2)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-0218	Southern Sinagua room block (2-4 rooms)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-0220	Southern Sinagua room block (2-4 rooms), field house, petroglyphs, and cairns	Recommended eligible	Damage to petroglyphs, ground disturbance	Cultural monitoring and manual vegetation removal
AR-03-04-01-0220	Southern Sinagua field house with tools	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-0222	Southern Sinagua agricultural feature with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-0240	General Crook National Historic Trail (SR 260)	Non-contributing portion of eligible site	None	No further work is necessary
AR-03-04-01-1133	Multicomponent Apache roasting pit (not found) and historic trash scatter	Determined eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-1135	Multicomponent site, 1-2 room masonry structure, historic trash scatter	Determined eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-1138	Multicomponent site, prehistoric sherd scatter, historic foundation and cement trough	Determined eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-1139	Historic quarry, platform, roads, and ditch	Determined eligible	Damage to historic features, ground disturbance	Manual vegetation removal
AR-03-04-01-1875	Archaic artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1877	Prehistoric lithic scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1878	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1879	Southern Sinagua artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1880	Southern Sinagua artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1881	Petroglyph panel and Southern Sinagua artifact scatter with tools	Recommended eligible	Damage to petroglyphs, ground disturbance	Cultural monitoring and manual vegetation removal
AR-03-04-01-1882	Southern Sinagua room block (2 rooms)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-1883	Southern Sinagua artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1884	Multicomponent site, Southern Sinagua artifact scatter with tools and historic can dump	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1885	Linear rock alignment, Southern Sinagua artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1886	Southern Sinagua artifact scatter with tools and grinding slick	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1887	Prehistoric lithic scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal

Table C-1. NRHP-eligible and Unevaluated Cultural Resource Sites in the Phase I Recording Area.				
Site Number	**Description**	**Eligibility**	**Potential Impact(s)**	**Mitigation**
AR-03-04-01-1888	Southern Sinagua field house, grinding slicks, and tools	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-1889	Southern Sinagua field houses with tools	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-1890	Prehistoric lithic scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1891	Southern Sinagua field house, petroglyphs, and grinding slick	Recommended eligible	Damage to petroglyphs, ground disturbance	Cultural monitoring and manual vegetation removal
AR-03-04-01-1892	Southern Sinagua field house with tools	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-1893	Southern Sinagua field houses (2) and rock feature	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-1893	Southern Sinagua room block (3-6 room) and field houses (2)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-1894	Southern Sinagua artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1895	Southern Sinagua field house with tools	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-1896	Southern Sinagua field house with tools	Determined eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-1897	Southern Sinagua field house with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1898	Prehistoric lithic scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1899	Southern Sinagua agricultural terraces and field house, below Salome Fort	Recommended eligible	Damage to standing architecture, ground disturbance	Cultural monitoring and manual vegetation removal
AR-03-04-01-1901	Prehistoric petroglyphs and grinding slicks	Recommended eligible	Damage to petroglyphs, ground disturbance	Cultural monitoring and manual vegetation removal
AR-03-04-01-1902	Southern Sinagua artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1903	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1904	Prehistoric artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1905	Prehistoric artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1906	Multicomponent site, Southern Sinagua artifact scatter and historic corral	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-01-1907	Southern Sinagua room block (2 rooms) and agricultural field	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-01-1908	Southern Sinagua room block (2-4 rooms), field house, petroglyphs, grinding slicks, and rock piles	Recommended eligible	Damage to petroglyphs, ground disturbance	Cultural monitoring and manual vegetation removal
AR-03-04-01-1909	Prehistoric and Apachean petroglyphs	Recommended eligible	Damage to petroglyphs, ground disturbance	Cultural monitoring and manual vegetation removal
AR-03-04-01-1910	Prehistoric petroglyphs	Recommended eligible	Damage to petroglyphs, ground disturbance	Cultural monitoring and manual vegetation removal
AR-03-04-01-1911	Southern Sinagua room block (1-2 rooms)	Recommended eligible	Damage to petroglyphs, ground disturbance	Cultural monitoring and manual vegetation removal

Table C-1. NRHP-eligible and Unevaluated Cultural Resource Sites in the Phase I Recording Area.				
Site Number	**Description**	**Eligibility**	**Potential Impact(s)**	**Mitigation**
AR-03-04-02-0066	Historic Route 66 alignment	Non-contributing portion of eligible site	None	No further work is necessary
AR-03-04-02-0293	Northern Sinagua room block (8-10 room) and midden	Recommended eligible	Damage to standing architecture, ground disturbance	Cultural monitoring and manual vegetation removal
AR-03-04-02-0357	Northern Sinagua room block (1-2 rooms)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-0496	Northern Sinagua room block (5 room), midden, water retention basin	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-0768	Northern Sinagua pithouses (3+)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-0769	Northern Sinagua room block (4-5 rooms) and pithouses	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-1233	Northern Sinagua artifact scatter	Determined eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-1284	Northern Sinagua artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-1672	Historic Beale Wagon Road, US Army (1857-1863)	Non-contributing portion of eligible site	None	No further work is necessary
AR-03-04-02-1686	Northern Sinagua room block (9-12 rooms)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-1697	Northern Sinagua field house	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-1699	Northern Sinagua room block pithouse	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-1700	Northern Sinagua field house, pithouse, and artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-1702	Northern Sinagua room block (5-8 room) with standing architecture, pithouses, possible Kiva	Recommended eligible	Damage to standing architecture, ground disturbance	Cultural monitoring and manual vegetation removal
AR-03-04-02-1816	Northern Sinagua artifact scatter	Determined eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-1904	Northern Sinagua field house and water retention basin	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-1909	Northern Sinagua water retention basin with tools	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-1914	Northern Sinagua room blocks (4-8 rooms, total)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-1916	Northern Sinagua artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-1917	Northern Sinagua room block (4-6 rooms)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-1918	Northern Sinagua room block (2 rooms)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-1925	Northern Sinagua room block (9-12 rooms), Kiva, midden, and water retention basin	Recommended eligible	Damage to standing architecture, ground disturbance	Cultural monitoring and manual vegetation removal
AR-03-04-02-2100	Northern Sinagua field house	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-2342	Northern Sinagua room block (6-8 rooms)	Recommended eligible	Ground disturbance	Manual vegetation removal

Table C-1. NRHP-eligible and Unevaluated Cultural Resource Sites in the Phase I Recording Area.				
Site Number	**Description**	**Eligibility**	**Potential Impact(s)**	**Mitigation**
AR-03-04-02-2489	Northern Sinagua room block (2 rooms), field houses (2)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-2490	Northern Sinagua field house	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-2492	Northern Sinagua room blocks (6-8 rooms and 1-2 rooms), field houses (2)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-2789	Northern Sinagua artifact scatter	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-2843	Northern Sinagua habitation site	Determined eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-2844	Northern Sinagua artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-2853	Northern Sinagua artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-2854	Northern Sinagua artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-2871	Northern Sinagua pit house and agricultural features	Determined eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-3600	Historic Greenlaw North Railroad bed (AD 1900-1918)	Non-contributing portion of eligible site	None	No further work is necessary
AR-03-04-02-3655	Northern Sinagua artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-4073	Northern Sinagua field house with tools	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-4419	Northern Sinagua room block (5-8 rooms)	Determined eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-5045	Northern Sinagua artifact scatter	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-5046	Northern Sinagua room block (5-8 rooms), Kiva, and semi-circular wall	Recommended eligible	Damage to standing architecture, ground disturbance	Cultural monitoring and manual vegetation removal
AR-03-04-02-5047	Northern Sinagua sherd scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-5048	Northern Sinagua pit houses (2+)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-5139	Northern Sinagua artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-5140	Northern Sinagua artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-5142	Rock feature, Basque (ca. 1920s-1950s)	Unevaluated	Damage to standing architecture	Cultural monitoring and manual vegetation removal
AR-03-04-02-5142	Northern Sinagua artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-5145	Prehistoric artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-5146	Northern Sinagua habitation, one 1 room masonry field house with tools	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-5147	Northern Sinagua artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-5148	Northern Sinagua agricultural features with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-5149	Northern Sinagua room block (4-6 rooms)	Recommended eligible	Ground disturbance	Manual vegetation removal

Table C-1. NRHP-eligible and Unevaluated Cultural Resource Sites in the Phase I Recording Area.				
Site Number	**Description**	**Eligibility**	**Potential Impact(s)**	**Mitigation**
AR-03-04-02-5150	Northern Sinagua field house with tools	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-5151	Northern Sinagua field house with tools	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-02-5152	Northern Sinagua artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04- 02-5153	Prehistoric artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-5154	Northern Sinagua artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04- 02-5155	Prehistoric artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-02-5156	Prehistoric pithouses (2-3)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-04-0008	Historic dugout cave/store room (ca. AD 1910)	Recommended eligible, Criterion A	Damage to standing architecture	Cultural monitoring and manual vegetation removal
AR-03-04-04-0306	Northern Sinagua artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-04-0307	Archaic and Northern Sinagua artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-04-0308	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-04-0309	Prehistoric lithic scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-04-0310	Protohistoric/Apachean lithic scatter with tools	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-04-0311	Middle Archaic lithic scatter with tools	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-04-0312	Archaic lithic scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-04-0313	Southern Sinagua and Protohistoric/Apachean rock shelter with petroglyphs and grinding slicks	Recommended eligible	Damage to petroglyphs, ground disturbance	Cultural monitoring and manual vegetation removal
AR-03-04-04-0314	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-04-0316	Prehistoric artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-04-0317	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-04-0318	Prehistoric artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0750	Northern Sinagua artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0751	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0753	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0754	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0755	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0756	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0757	Prehistoric lithic scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0758	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal

Table C-1. NRHP-eligible and Unevaluated Cultural Resource Sites in the Phase I Recording Area.				
Site Number	**Description**	**Eligibility**	**Potential Impact(s)**	**Mitigation**
AR-03-04-05-0760	Sinagua field house with tools	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-05-0762	Prehistoric room block (4-6 rooms) and field houses (2-3)	Recommended eligible	Ground disturbance	Manual vegetation removal
AR-03-04-05-0763	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0764	Paleoindian artifact scatter with tools (possible Folsom point)	Recommended eligible	Ground disturbance	Cultural monitoring and manual vegetation removal
AR-03-04-05-0767	Northern Sinagua artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0769	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0770	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0772	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0773	Rock ring, artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0774	Prehistoric artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0775	Cohonina artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0776	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0778	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0779	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0780	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0781	Prehistoric artifact scatter	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-05-0836	Not relocated, possible prehistoric field house, presumed destroyed	Unevaluated	None	No further work is necessary
AR-03-04-05-0837	Prehistoric artifact scatter	Determined eligible	Ground disturbance	Manual vegetation removal
AR-03-04-07-0142	Prehistoric artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AR-03-04-07-0143	Historic Mormon "Millville" lumber camp (AD 1876-1880s)	Recommended eligible	Damage to historic structures, ground disturbance	Cultural monitoring and manual vegetation removal
AR-03-04-07-1275	Archaic artifact scatter with tools	Unevaluated	Ground disturbance	Manual vegetation removal
AZ I:14:334(ASM)	Historic AT&SF Railroad	Determined eligible	None	Manual vegetation removal

Appendix D Orders, Standards, Practices, and Guidance

U.S. Department of Energy

ORDER

Western
AREA POWER
ADMINISTRATION

WAPA O 430.1A

DATE: 03-18-08

SUBJECT: RIGHT-OF-WAY MANAGEMENT GUIDANCE FOR VEGETATION, ENCROACHMENTS, AND ACCESS ROUTES

1. PURPOSE. This Order delegates and clarifies responsibilities and establishes Right of Way (ROW) guidance and organizational support for the safe and reliable operation of the power system owned and/or maintained by the Western Area Power Administration (Western).

2. CANCELLATION. This Order cancels WAPA Order 430.1, Right-of-Way Management Guidance for Danger Trees, Encroachments, and Access Routes, dated 11-21-01.

3. SCOPE. The provisions of this Order apply to all organizational elements of Western.

4. DEFINITIONS.

   a. Danger Trees. Trees located within or adjacent to the easement or permit area that present a hazard to employees, the public, or power system facilities. Characteristics used in identifying a danger tree include but are not limited to the following:

   - encroachment within the safe distance to the conductor as a result of the tree bending, growing, swinging, or falling toward the conductor;
   - deterioration or physical damage to the root system, trunk, stem or limbs and/or the direction and lean of the tree;
   - vertical or horizontal conductor movement and increased sag as a result of thermal, wind, and ice loading;
   - exceeding facility design specifications;
   - fire risk;
   - other threats to the electric power system facilities or worker/public safety.

b. Emergency Situations. An emergency situation occurs when a danger tree or encroachment poses an immediate danger to Western's facility as well as the welfare of the public and Western's maintenance personnel. For these situations it is not necessary to notify a landowner or government entity prior to removing the danger tree or encroachment.

c. Encroachments. Encroachments are conditions or developments that occur within the transmission line ROW that impair Western's rights to operate and maintain the facilities or present a hazard to the safe operation of the power system. Examples of potential encroachments are houses, businesses, signs, light structures, outbuildings, landfills, roadways, vegetation, etc.

d. Maintenance Manager. The individual located in the Regional or Field Office who is accountable for managing maintenance and/or operations functions. For example, in the Rocky Mountain Region this would be the Maintenance Manager; in the Bismarck Office this would be the North Dakota Maintenance Manager.

e. Right-Of-Way (ROW). Western acquires easements across State and private lands, is issued grants, permits or easements across Federal lands, and assumed the Bureau of Reclamation (Reclamation) responsibilities set forth in various agreements historically negotiated between Reclamation and other Federal agencies, such as the Bureau of Land Management, Bureau of Indian Affairs, National Park Service and U.S. Forest Service. As applied to a specific situation, ROW refers to rights acquired by Western as set forth in the applicable granting document.

f. Western Authorized Representative. The Western field representative in the Region who has the authority to take a maintenance action (this will be the Regional Manager or his designee).

5. POLICY. Maintenance Managers have the authority and responsibility for implementing and overseeing the proper maintenance of Western's ROWs. This includes all activities within ROWs that ensure the safe and reliable operation of the power system, as well as protection of the environment, the public, and Western's maintenance personnel. These activities include routine maintenance of access routes; vegetation management; identification of potential encroachments; and development of positive landowner relations. Regional Realty Officers, Environmental Managers, and Safety Managers, and, when necessary, the Corporate Services Office (CSO) Office of General Counsel (OGC) and CSO Natural Resources Office (NRO), will provide support to Maintenance Managers.

6. BACKGROUND. Western acquires easements across State and private lands, is issued grants, permits or easements across Federal lands, and assumed the Bureau of Reclamation (Reclamation) responsibilities set forth in various agreements

historically negotiated between Reclamation and other Federal agencies, such as the Bureau of Land Management, Bureau of Indian Affairs, National Park Service and U.S. Forest Service. Western's rights to maintain vegetation, to challenge a use that is considered to impair or encroach upon Western's rights, and to access the power facilities are dictated by the language contained in these agreements.

a. State and Private Land. Generally, the easement agreement provides for the perpetual right to access, construct, operate, and maintain the power system facility in a manner that ensures safe operation and system integrity.

   (1) Vegetation Management and Control. Responsibility for these functions is often Western's and may, based upon the terms of the easement contract, or other agreements, require compensation to the landowner for damages to crops or trees. Contracts are generally reviewed by the Regional Realty Officers to determine the extent of Western's right to maintain or clear vegetation.

   (2) Landowner's Use of the Easement Area. Easement provisions specify Western's rights to operate and maintain the power facilities. Where landowners add uses or developments in the easement area, the Maintenance Managers must determine, through the review of the easement contract, whether the use or development must cease, or be removed or mitigated some other way to protect Western's rights.

   (3) General Access Rights Language. Language defining Western's access rights is usually provided in the easement agreement. To ensure that open and safe access is available across private land, the easement agreement must be thoroughly researched and verified to identify access routes and any restrictions that regulate their use.

b. Federal Land. ROW agreements are sometimes limited to a specific term and specify stipulations or conditions associated with vegetation management, compatible land uses, and access rights.

   (1) Vegetation Management and Control. Responsibility for these functions is Western's, but is affected by land and resource plans, resource management plans, or other planning instruments approved by the land management agency, and these dictate tree removal or trimming criteria within and adjacent to the ROW, as well as other uses allowed on the same lands traversed by the power facility.

   (2) ROW Use and Development. Uses or developments within Western's ROWs are authorized by the government entity managing the land and are usually reviewed and concurred upon by a Western authorized representative prior to the use being authorized.

(3) Access Routes. Access routes can be authorized in the same ROW agreement or in a separate permit or agreement. These authorizations may contain specific terms and conditions that restrict the season of use and/or construction or road improvement activities allowed on the authorized access routes.

7. RESPONSIBILITIES.

a. Regional Managers. Provide oversight of the ROW maintenance program in their respective Regions.

b. Regional Maintenance Managers. Develop long-term strategies and programs, in coordination with Regional safety, environment, and realty personnel, to resolve vegetation, encroachment, and access problems in and along Western's transmission line ROWs.

c. Regional Safety Managers. Support the Maintenance Managers in providing guidance for resolution of safety concerns as well as ensuring the Regional ROW program meets Western's safety goals and objectives.

d. Regional Environmental Managers. Support the Maintenance Managers in ensuring that maintenance activities employed to resolve vegetation, encroachment, and access problems comply with environmental laws and regulations.

e. Regional Realty Officers. Support the Maintenance Managers in the identification and resolution of vegetation, encroachment, public relations, and access problems. The Regional Realty Officers also provide coordination in working with the landowners and have the responsibility of identifying land rights, including vegetation control rights.

f. Office of General Counsel (OGC). Provides legal advice, counsel, and representation.

g. CSO Natural Resources Office (NRO). Provides advice and support to the Regional Maintenance Managers, Realty Officers and Environmental Managers in order to resolve vegetation, encroachment, and access problems.

8. GENERAL GUIDANCE. As a component of each Regional Office's routine maintenance activities, Maintenance Managers will develop a ROW management program, including performance measures and will coordinate its development and implementation with Regional safety, environment, and realty personnel as well as CSO NRO and OGC, when necessary. This program will include a long-term strategy to inventory Western's rights as they pertain to vegetation management,

use restrictions, encroachments and access. The program will identify potential problem areas or situations to be resolved and the resolution process.

a. Vegetation Management. It shall be the responsibility of the Regional Realty Officers to inventory the vegetation management rights, including any compensation rights to landowners, for a power facility on an as needed basis. The following guidance is provided for vegetation management practices within and adjacent to the ROW. Prior to vegetation management activities, an effort will be made to notify landowners. Such notifications or attempts to notify landowners shall be documented.

(1) Easements on State and Private Lands.

(a) Where provided in the easement agreement, Maintenance Managers shall manage the vegetation within and adjacent to the easement in accordance with WAPA Order 450.3A (latest version).

(b) Where the easement agreement does not provide for the rights to manage vegetation in or adjacent to the easement area, or if the rights are limited, the following shall apply in accordance with each Region's Vegetation Management Plan:

1) Emergency Situations. If the vegetation is creating an emergency situation, the Maintenance Managers have the discretion to address emergency situations, including removing danger trees.

2) Non-Emergencies. If vegetation is not causing an emergency situation, Western will work with the landowner to conduct the required vegetation management activity. If necessary, Western will expand its land rights to manage the vegetation within or adjacent to the easement.

(c) CSO OGC and NRO will provide assistance and consultation to support the Maintenance Managers and support the future expansion of easement rights to include all required vegetation management activities.

(2) ROW Agreements on Federal Lands.

(a) Where provided in the ROW agreement, the Maintenance Managers shall manage vegetation within the ROW.

(b) Where land use plans or terms contained in the agreement with the Federal land management agency and Western dictate trees may only be trimmed (sides or on top) within the ROW, the NRO will assist the

Maintenance Manager and Realty Officer in obtaining modifications to the ROW agreement to allow for all required vegetation management activities.

(c) Where the ROW agreement does not provide for the removal of trees in or adjacent to the ROW, the Maintenance Managers have discretion in removing danger trees without notification to the Federal land managers. Western will contact the Federal agency following removal of danger trees. The CSO NRO will provide assistance to the Maintenance Managers to expand ROW rights to allow more extensive vegetation management activities consistent with current industry standards and requirements as provided for in Western's Transmission Vegetation Management Program.

(3) Tree Removal Criteria. Criteria that will be used to determine the need for tree removal activities include either of the following two conditions:

(a) Any tree classified as being a "Danger Tree" as defined in 4a above.

(b) Requirements established in WAPA Order 450.3A (latest version).

(4) Vegetation Management Clearances. The following table provides the minimum clearance distances (lateral and vertical) to be achieved at the time of transmission vegetation management work as required by the North American Electric Reliability Council (NERC) Standard FAC-003-1 ("Clearance 1" values). However, it is Western's policy to proactively manage to a desired condition of much lower growth and low vegetation density. The desired condition considers the reduction of fuel loading to reduce the risk and intensity of wildfire on and adjacent to the ROW. It is also Western's policy to encourage the land management agencies to manage lands adjacent to the ROWs in a manner which further reduces vegetation and wildfire hazards that are a threat to the safe and reliable operation of the power facility.[1]

[1] The minimum clearance is based on the OSHA 29 CFR § 1910.333 minimum approach distance for non-electrical workers (rounded up to the nearest foot) plus 5 feet to account for conductor and tree movement due to wind and ice loading or increased conductor sag as a result of thermal loading. In addition, another 5 feet is added to allow for an average tree growth of 12 inches per year and a re-treatment interval of not less than 5 years. In situations where more rapid tree growth can be expected because of species or better than average growing conditions, a distance (either horizontal or vertical) greater than 5 feet is required.

TRANSMISSION LINE ROW MINIMUM CLEARANCE[1] REQUIREMENTS FOR VEGETATION AFTER TREATMENT	
Line Voltage	Minimum Clearance[1] Between Conductor and Vegetation
69 kV	20 feet
115 kV	21 feet
138 kV	22 feet
161 kV	22 feet
230 kV	23 feet
345 kV	26 feet
500 kV	29 feet

(5) Customer Focus. It is Western's policy that landowners are our customers. Maintenance Managers have the responsibility to ensure early notification to the private landowner or government entity prior to the vegetation management or encroachment removal activities within or adjacent to the ROW. Where emergency removal of danger trees is necessary within or adjacent to the ROW and prior notice is not possible, the Maintenance Manager is responsible for initiating or coordinating notification after the fact. The Regional Realty Officers will provide support in mitigating such actions.

b. Encroachments.

(1) State and private land. The Maintenance Managers shall be accountable for identifying potential encroachments. The Regional Realty Officer is accountable for verification and resolution. Where encroachments are found to be compatible with Western's rights, a license will be issued by the Western authorized representative. Where the encroachment is found to be incompatible, the Realty Officer shall coordinate the removal or mitigate the use or development. The Regional Realty Officer may consult or ask assistance from the NRO and OGC in those cases involving complex legal issues and landowner investments.

(2) Federal land. For situations where uses or developments are located within ROWs on Federal lands that appear to impair Western's rights to operate and maintain its facilities, the Regional Realty Officer will be responsible for contacting the government entity and resolving the problem. If necessary, the Regional Realty Officer may consult with or ask assistance from the NRO and OGC.

c. Access Routes.

(1) To ensure safe, reliable access to Western's facilities for maintenance purposes, it shall be the responsibility of the Maintenance Managers to

identify and locate access routes in support of facility maintenance programs across private, State and Federal lands, where necessary. Maintenance Managers have the discretion to reopen blocked access routes where Western's right of access is being impeded. Regional Realty Officers will be responsible to respond to the Maintenance Managers when requested to coordinate the reopening of such routes with the landowners and/or land management agency and will be supported by the NRO and OGC, when necessary.

(2) Where new access is needed across State or private land, the Regional Realty Officer must consult with the Environmental Manager and the NRO to develop an acquisition plan to obtain access easements. Where access is needed across Federal lands, the Regional Realty Officer shall perform the same coordination as for State or private lands except that Western will obtain an amendment to its ROW authorization. In either case, Western will strive to obtain access routes with the fewest restrictions as to season of use or impacts to resources.

9. REFERENCES.

a. WAPA 450.1B, Environmental Considerations in the Planning, Design, Construction, and Maintenance of Power Facilities and Activities, latest version.

b. WAPA Engineering Manual (EM) 6460.3, Property Damage Investigation Appraisal and Settlement, latest version.

c. WAPA EM 6404, Construction Management Practices and Procedures, Chapter V, Real Estate, of 02-20-90, latest version.

d. Transmission Line Right-of-Way Handbook, latest version.

e. WAPA Order 450.3A, Transmission Vegetation Management Program, latest version.

f. www.arborday.org/treeguide

g. Code of Federal Regulations (CFR) 29 CFR § 1910.333.

h. Alcoa Conductor Accessories Sag 10, version 3.0 Software.

i. National Electric Safety Code (NESC).

10. CONTACT. Questions concerning this Order should be addressed to the CSO NRO at (720) 962-7272.

Timothy J. Meeks
Administrator

U.S. Department of Energy
Washington, D.C.

ORDER

DOE O 450.1A

Approved: 6-4-08

SUBJECT: ENVIRONMENTAL PROTECTION PROGRAM

1. PURPOSE. To implement sound stewardship practices that are protective of the air, water, land, and other natural and cultural resources impacted by Department of Energy (DOE) operations, and by which DOE cost effectively meets or exceeds compliance with applicable environmental, public health, and resource protection requirements. The objectives are—

   a. To implement sustainable practices for enhancing environmental, energy, and transportation management performance, as stipulated in section 3(a) of Executive Order (E.O.) 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, through environmental management systems that are part of Integrated Safety Management (ISM) systems established pursuant to DOE P 450.4, *Safety Management System Policy*, dated 10-15-96.

   b. To achieve the DOE Sustainable Environmental Stewardship goals found in the Attachment to this Order.

2. CANCELLATION. DOE O 450.1, *Environmental Protection Program*, dated 1-15-03. Cancellation of a directive does not, by itself, modify or otherwise affect any contractual obligation to comply with the Order. Contractor requirement documents (CRDs) that have been incorporated into or attached to a contract remain in effect until the contract is modified to either eliminate requirements that are no longer applicable or substitute a new set of requirements.

3. APPLICABILITY.

   a. All Departmental Elements. Except as noted in paragraph 3c, this Order applies to all Departmental elements that are responsible for the management and operation of the Department's facilities and activities, including elements of the National Nuclear Security Administration (NNSA), the Western Area Power Administration, and the Southwestern Power Administration, and including those created after the Order is issued. (Go to www.directives.doe.gov/pdfs/reftools/org-list.pdf for the current listing of Departmental elements.)

      (1) The Administrator of NNSA will assure that NNSA employees comply with their respective responsibilities under this Order. Nothing in this Order will be construed to interfere with the NNSA Administrator's authority under section 3212(d) of Public Law (P.L.) 106-65 to establish Administration specific policies, unless disapproved by the Secretary.

(2) Where ISM systems are not applicable, Departmental elements must ensure the implementation of environmental management systems. These Departmental elements must interpret all references to ISM within this Order to mean environmental management systems.

b. DOE Contractors. The Contractor Requirements Document (CRD), Attachment 1, sets forth requirements of this Order that will apply to management and operation, facility management, or other contracts under which the contractor manages Government facilities or fleets.

(1) This CRD must be included, as appropriate, in all contracts that include DEAR 970.5223-1, Integration of Environment, Safety, and Health into Work Planning and Execution, and all site/facility management contracts involving activities associated with the use, storage, disposal and transportation of waste; emissions to air; discharges to water; and management of cultural and natural resources.

(2) The office identified in paragraph 5d is responsible for notifying the contracting officer of which contracts are affected. Once notified, the contracting officer is responsible for incorporating the CRD into each affected contract via the laws, regulations, and DOE directives clause of the contract.

(3) Pursuant to the DEAR clause 970.5204-2, Laws, Regulations and DOE Directives, regardless of the performer of the work, a contractor with the CRD incorporated into its contract is responsible for compliance with the requirements of the CRD. As such, the contractor is responsible for flowing down the requirements of this CRD to subcontracts at any tier to the extent necessary to ensure the contractor's compliance with the requirements.

c. Exclusions.

(1) Activities conducted under the authority of the Director, Naval Nuclear Propulsion Program, as described in E.O. 12344 and set forth in Public Laws 98-525 and 106-65.

(2) Activities conducted by the Bonneville Power Administration as authorized by Delegation Order No. 00-033.00A.

(3) Activities conducted by the Office of the Secretary, Chief Information Office, Office of Congressional and Intergovernmental Affairs, Office of Economic Impact and Diversity, Energy Information Administration, Office of the General Counsel, Office of Hearings and Appeals, Office of

Inspector General, Office of Intelligence and Counterintelligence, Office of Policy and International Affairs, and Office of Public Affairs.

4. REQUIREMENTS.

a. Implementation of Environmental Management System. Each DOE site must develop and implement an environmental management system. This environmental management system must be integrated into the site's ISM system developed pursuant to DOE P 450.4, *Safety Management System Policy*, dated 10-15-96, and DOE M 450.4-1, *Integrated Safety Management System Manual*, dated 11-1-06.

b. Elements of Environmental Management System. Each environmental management system must—

(1) Reflect the environmental management system elements and framework found in the International Organization for Standardization's (ISO) 14001:2004 (E) International Standard or equivalent, including policies, procedures and training to identify operations and activities with significant environmental impacts; to manage, control, and mitigate the impacts of these operations and activities; and to assess performance, implement corrective actions where needed, and ensure continual improvement.

(2) Include environmental, energy, and transportation objectives and measurable targets that are reviewed annually, updated as appropriate, and contribute to achieving the DOE Sustainable Environmental Stewardship goals found in Attachment 2 of this Order, and the energy and transportation goals in DOE O 430.2B, *Departmental Energy, Renewable Energy and Transportation Management*, dated 2-27-08.

(3) Address tenant or concessionaire activities wherever such activities affect DOE's environmental, energy, and transportation management.

(4) Contain the elements of an Environmental Compliance Management Plan pursuant to the Council on Environmental Quality's *Instructions for Implementing E.O. 13423*, page 9, section B, including—

(a) A clear statement by senior leadership committing to achieve and maintain compliance with applicable environmental protection requirements.

(b) Clearly articulated roles and responsibilities related to environmental performance at all appropriate levels to ensure accountability for less than desired environmental performance.

(c) An environmental compliance audit and review program that identifies compliance deficiencies and root causes of non-compliance.

(d) Integration of compliance management information and resource allocation procedures to ensure that audit findings and root causes of non-compliance are tracked and addressed, including allocation of funding.

c. Scope of the Environmental Management System. The environmental management system must encompass the environmental aspects of site operations and activities, including environmental aspects of energy and transportation functions, and it must promote the long-term stewardship of a site's natural and cultural resources throughout its design and construction, operation, closure, and post-closure life cycle. The environmental management system must address the following—

(1) Sustainable practices for enhancing environmental, energy, and transportation management performance, as stipulated in Section 3(a) of E.O. 13423 and its Implementing Instructions.

(2) Protection of public health and the environment including, but not limited to—

(a) Conformity with State Implementation Plans to attain and maintain national ambient air quality standards.

(b) Implementation of a watershed approach for surface water protection.

(c) Implementation of a site-wide approach for groundwater protection.

(d) Protection of other natural resources, including biota.

(e) Assessment of the hazard of engineered nanomaterials and implementation of appropriate environment, safety and health controls in accordance with DOE P 456.1, *Secretarial Policy Statement on Nanoscale Safety*, dated 9-15-05.

(3) Protection of site resources from wildland fires consistent with site wildland and operation fire management plans that consider the Federal Wildland Fire Management Policy recommendations. (See DOE G 450-1.4, *Implementation Guide, Wildland Fire Management Program, for Use with DOE O 450.1, Environmental Protection Program,* dated 2-11-04).

(4) Identification and protection of cultural resources.

(5) The conduct of environmental and effluent monitoring, as appropriate, to characterize pre-operational conditions and to detect, characterize, and respond to releases from site operations and activities; assess impacts; estimate dispersal patterns in the environment; characterize the pathways of exposure to members of the public; characterize the exposures and doses to individuals and the population; and evaluate the potential impacts to the biota in the vicinity of the release. Where appropriate, use an integrated monitoring system and sampling approach to avoid duplicative data collection.

(6) Assurance that analytical work for environmental and effluent monitoring supports data quality objectives, using a documented approach for collecting, assessing, and reporting environmental data.

(7) The conduct of appropriate operational assessments, such as pollution prevention opportunity assessments, of site operations and activities to identify opportunities to implement sustainable practices as part of achieving DOE's Sustainable Environmental Stewardship goals found in Attachment 2 of DOE O 450.1A.

d. Validation of the Environmental Management System.

(1) An environmental management system shall be considered fully implemented when—

(a) The environmental management system has been the subject of a formal audit by a qualified party outside the control or scope of the environmental management system.

(b) The appropriate contractor senior management and DOE field office management have recognized and addressed the findings of the audit.

(c) The appropriate senior manager accountable for implementation of the environmental management system and the cognizant Field Office Manager have declared conformance of the environmental management system to the requirements of paragraph 4b of this Order.

(2) Environmental management systems, including those already declared under the previous requirements of canceled DOE O 450.1 *Environmental Protection Program*, dated 1-15-03, must meet the new requirements for being "fully implemented" by June 30, 2009.

(3) To remain fully implemented, at least every three years: (a) the environmental management system must be audited by a qualified party outside the control or scope of the environmental management system, and (b) the conformance declaration 4d(1)(c) is renewed, as appropriate.

e. DOE ISM Systems. As part of integrating environmental management systems into DOE ISM systems pursuant to DOE M 450.4-1, Program Secretarial Officers, Administrators, and Field Office Managers shall incorporate appropriate performance objectives, measures and commitments to support the following at site(s) under their purview—

(1) Compliance with applicable environmental protection requirements.

(2) Achievement of the DOE Sustainable Environmental Stewardship goals found in Attachment 2 of this Order and the energy and transportation goals in DOE O 430.2B.

(3) Implementation and oversight of the environmental management system.

5. RESPONSIBILITIES.

a. Assistant Secretary for Energy Efficiency and Renewable Energy, in addition to responsibilities in paragraph 5c, serves as the Senior Agency Officer (SAO) pursuant to E.O. 13423 and must do the following—

(1) Provide progress reports, as requested, on DOE implementation of E.O. 13423 to the Chairman of the Council on Environmental Quality, the Director of the Office of Management and Budget, and the Federal Environmental Executive.

(2) Coordinate with Program Secretarial Officers, the Administrator for the National Nuclear Security Administration, Administrators of the Western Area Power Administration, and the Southwestern Power Administration, DOE Field Office Managers, and the Office of Human Capital Management to promote the implementation of E.O. 13423 and the sustainable environmental, energy and transportation goals of this Order and DOE O 430.2B in performance standards and performance evaluations of relevant DOE personnel, such as field office managers, environmental and energy program managers, vehicle fleet managers, contracting officials, and others, as appropriate.

(3) Establish leadership awards to recognize outstanding environmental, energy, or transportation management performance.

b. Chief Health, Safety and Security Officer, in coordination with other Departmental elements, must do the following.

(1) Develop new, or revise existing, DOE environmental protection directives, guidance, and procedures to—

(a) Provide guidance to Departmental elements for ensuring site ISM systems provide for environmental management systems.

(b) Disseminate information to Departmental elements to maximize the use of safe alternatives to ozone-depleting substances (ODS) in DOE's efforts to phase out ODS uses.

(c) Provide guidance to Departmental elements to incorporate sustainability goals, including the multi-year energy and transportation goals, into environmental management systems.

(2) Evaluate the effectiveness of Departmental elements' implementation of the requirements and responsibilities of this Order.

(3) Serve as DOE primary liaison, as appropriate, to other Federal agencies and national and international standard-setting organizations on environment, safety and health standards by—

(a) Reviewing environment, safety, and health standards developed by other Federal agencies and national and international standard-setting organizations applicable to DOE operations and activities.

(b) Coordinating appropriate review and comment of applicable standards by affected Departmental elements and transmitting DOE comments.

(4) Support the SAO in the preparation of Departmental progress reports required pursuant to E.O. 13423 that address areas covered by this Order. Specifically, submit to the Federal Environmental Executive required annual reports for the Department on the status of implementation of the environmental management system requirements of E.O. 13423, as well as required reports on the sustainable environmental practices and goals for which the SAO has delegated responsibility to the Chief Health, Safety, and Security Officer.

(5) Support the SAO in managing the Environmental Sustainability Star (*ES*tar) Award (formerly the Pollution Prevention Star Award) program, including preparing and submitting DOE site nominations to the White House "Closing the Circle Awards" program.

(6) Support the SAO in securing an implementation schedule from the Office of the Federal Environmental Executive (OFEE) when a site implements a new EMS.

c. Program Secretarial Officers, the Administrator for the National Nuclear Security Administration, and the Administrators of the Western Area Power Administration, and the Southwestern Power Administration must do the following—

(1) Implement the requirements identified in paragraph 4e and the responsibilities of paragraph 5c(3) by June 30, 2009.

(2) Address as part of their annual ISM effectiveness review under paragraph I3e(4) of DOE M 450.4-1, the implementation of the requirements of paragraph 4e and the responsibilities of paragraph 5c.

(3) Ensure that the field offices under their purview implement the requirements identified under paragraph 4e and the responsibilities under paragraph 5d(1) and (5) of this Order, and that sites under their purview revise their environmental management systems to encompass the requirements of paragraphs 4b, 4c, and 4d of this Order by June 30, 2009.

(4) Ensure that environmental management systems for sites under their purview include site-specific objectives and measurable targets in their environmental management systems that contribute to the achievement of the DOE Sustainable Environmental Stewardship goals found in Attachment 2 of this Order, and the energy and transportation goals in DOE O 430.2B.

(5) Assess as part of the line oversight of field office conducted under paragraph I3e(3) of DOE M 450.4-1, the implementation of the requirements of paragraph 4e, and responsibilities of paragraph 5d of this Order.

(6) Request through the annual Department budgetary process the funding and resources needed to implement the requirements of this Order and the findings and recommendations from oversight and review activities conducted in accordance with paragraph I3e(3) and (4) of DOE M 450.4-1.

(7) On an annual basis, select “best in class” environmental sustainability nominees from submissions from sites under their purview, and transmit the nominating information to the Office of Health, Safety and Security (HSS) for consideration for *ES*tar Awards and submittal to the White House “Closing the Circle Awards” program.

(8) Ensure sites under their purview monitor progress toward meeting the requirements of paragraphs 4b, 4c, and 4d of this Order, and make such information available annually to the SAO and HSS.

(9) Ensure that agreements, permits, leases, licenses, or other legally-binding obligations between DOE and a tenant or concessionaire entered into after the effective date of this Order, require that the tenant or concessionaire take actions relating to matters within the scope of the contract that facilitate DOE's compliance with the requirements of this Order.

(10) Coordinate with the SAO, DOE Field Office Managers, and the Office of Human Capital Management to promote the implementation of E.O. 13423 and the sustainable environmental, energy and transportation goals of this Order and DOE O 430.2B in performance standards and performance evaluations of relevant DOE personnel, such as field office managers, environmental and energy program managers, vehicle fleet managers, contracting officials, and others as appropriate.

(11) Ensure all personnel whose actions are affected by this Order receive, as part of their ISM training, environmental management system awareness training that addresses how to implement, manage, measure, and continually improve upon the sustainable environmental, energy, and transportation practices and goals of E.O. 13423 and its Implementing Instructions.

d. Field Office Managers, in coordination with their reporting sites and Program Secretarial Officers and Administrators, must do the following—

(1) Implement the requirements identified in paragraph 4e and the responsibilities of paragraph 5d(5) by June 30, 2009.

(2) Address as part of their annual ISM effectiveness reviews under paragraph I3f(4) of DOE M 450.4-1, the implementation of the requirements of paragraph 4e and the responsibilities of paragraph 5d, and the implementation of the requirements of paragraph 4a, 4b, 4c, and 4d of this Order by sites under their purview.

(3) Assess as part of the review and approval of contractors' ISM system descriptions and updates conducted under paragraph I3f(3) of DOE M 450.4-1, the implementation of the requirements in paragraphs 4a, 4b, 4c, and 4d of this Order.

(4) At sites with multiple environmental management systems, ensure that site-wide environmental aspects are integrated into each environmental management system or within the Field Office ISM system.

(5) Ensure that sites under their purview revise their environmental management system to encompass the requirements of paragraphs 4b, 4c, and 4d of this Order by June 30, 2009.

(6) Identify when a new environmental management system is needed, propose a schedule for full implementation, and work through HSS to conduct the required consultation with the OFEE.

(7) For those sites which have chosen to register their environmental management system to the ISO 14001:2004 (E) International Standard, field office oversight need only verify that the registration and associated audits address the scope of the environmental management system required by paragraphs 4b and 4c.

(8) Ensure that sites under their purview include site-specific objectives and targets in their environmental management systems that contribute to the achievement of the DOE Sustainable Environmental Stewardship goals found in Attachment 2 of this Order, and the energy and transportation goals in DOE O 430.2B.

(9) Ensure sites monitor progress toward meeting the requirements of paragraphs 4b, 4c, and 4d of this Order, and make such information available annually to the SAO and HSS.

(10) Ensure sites' annual budget requests include the funding and resources needed to implement the requirements of this Order, including achievement of the DOE Sustainable Environmental Stewardship goals found in Attachment 2 of this Order, and the energy and transportation goals in DOE O 430.2B.

(11) Ensure sites' compliance with the requirements of the Emergency Planning and Community Right-to-Know Act and the Pollution Prevention Act of 1990, without regard to Standard Industrial Classification/North American Industrial Classification designations.

(12) Ensure that sites under their purview conduct environmental monitoring pursuant to the requirements in paragraphs 4c(5) and (6) of this Order.

(13) Ensure that agreements, permits, leases, licenses, or other legally-binding obligations between DOE and a tenant or concessionaire entered into after the effective date of this Order, require that the tenant or concessionaire take actions relating to matters within the scope of the contract that facilitate DOE's compliance with this Order.

(14) Coordinate with their cognizant Program Secretarial Officer or Administrator to promote the implementation of E.O. 13423 and the sustainable environmental, energy and transportation goals of this Order and DOE O 430.2B in performance standards and performance evaluations of relevant DOE personnel, such as field office managers,

environmental and energy program managers, vehicle fleet managers, contracting officials, and others as appropriate.

(15) Ensure all personnel whose actions are affected by this Order receive, as part of their ISM training, environmental management system awareness training that addresses how to implement, manage, measure, and continually improve upon the sustainable environmental, energy, and transportation practices and goals of E.O. 13423 and its Implementing Instructions.

e. Office of Human Capital Management, in coordination with other Departmental elements, must develop or revise existing DOE directives, policies, and documents to accomplish the following—

(1) Include, as appropriate, training on this Order in the standard senior-level management training for program managers, contracting personnel, procurement and acquisition personnel, facility managers, and all employees whose actions have environmental consequences or the potential for such.

(2) Coordinate with the SAO, Program Secretarial Officers, the Administrator for the National Nuclear Security Administration, Administrators of the Western Area Power Administration, and the Southwestern Power Administration, and DOE Field Office Managers to promote the implementation of E.O. 13423 and the sustainable environmental, energy, and transportation goals of this Order and DOE O 430.2B in performance standards and performance evaluations of relevant DOE personnel, such as field office managers, environmental and energy program managers, vehicle fleet managers, contracting officials, and others as appropriate.

f. Office of Management, in coordination with other Departmental elements, must develop or revise existing DOE directives, policies, and documents to accomplish the following—

(1) Ensure property management policies and procedures preclude the Department's disposal of ozone-depleting substances (ODS) without prior coordination with the Department of Defense.

(2) Ensure that procurement policies and procedures promote the Department's acquisition of recycled-content and biobased-content materials, Electronic Procurement Environmental Assessment Tool (EPEAT)-registered electronics and other environmentally preferable products and services.

(3) Ensure incorporation of planning and management requirements for historic property preservation pursuant to Section 3(b)(vi) of E.O. 13327, *Federal Real Property Asset Management.*

(4) Request through the annual Department budgetary process the funding and resources needed to implement the requirements of this Order.

g. Office of the Chief Financial Officer, in coordination with other Departmental elements, must develop or revise existing DOE directives, policies, and documents to accomplish the following.

(1) Reference DOE's Sustainable Environmental Stewardship goals in the Department's strategic and annual performance plans required by the Government Performance and Results Act of 1993.

(2) Ensure that requests for funding by Program Secretarial Officers, the Director, Office of Management, the Administrator for the National Nuclear Security Administration and the Administrators of the Western Area Power Administration and the Southwestern Power Administration to implement the requirements of this Order are considered in the formulation of DOE's annual budget request.

6. DEFINITIONS.

a. Environmental Aspect: An element of an organization's activities, products, or services that can interact with the environment.

b. Environmental Management System: The set of processes and practices that enable an organization to increase its operating efficiency, continually improve overall environmental performance, and better manage and reduce its environmental impacts, including those environmental aspects related to energy and transportation functions. Environmental management system implementation reflects accepted quality management principles based on the "Plan, Do, Check, Act," model found in the ISO 14001:2004(E) International Standard and using a standard process to identify and prioritize current activities, establish goals, implement plans to meet the goals, evaluate progress, and make improvements to ensure continual improvement.

c. Environmentally Preferable Products: Products or services that have a lesser or reduced effect on human health and environment when compared with competing products or services that serve the same purpose, including materials that result in no waste, less waste, or less toxic waste across the entire life-cycle. This comparison may consider raw materials acquisition, manufacturing, packaging, distribution, reuse, operation, maintenance, or disposal of the product or service.

The Environmentally Preferable Procurement goal in Attachment 2 of this Order contains examples of sustainable acquisition practices.

d. Field Office Managers: The terms "field office" and "field office managers" are used interchangeably to indicate the DOE field office with direct management and oversight of operational activities, which may be performed by contractors or by Government-Owned-Government-Operated (GOGO) personnel at the site. "Field offices" may have various other designations, including operations office, site office, and project office. Where multiple levels of DOE field organizations exist, applicable DOE Program Secretarial Officers and Administrators should determine in their ISM system descriptions how to apply these responsibilities.

7. REFERENCES.

a. Executive Order (E.O.) 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*. ofee.gov/eo/EO_13423.pdf

b. Instructions for Implementing E.O. 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*. ofee.gov/eo/eo13423_instructions.pdf

c. E.O. 13327, *Federal Real Property Asset Management*.

d. ISO 14001:2004(E) Environmental Management Systems: Requirements with Guidance for Use. webstore.ansi.org

e. Title XXXII of P.L. 106-65, National Nuclear Security Administration Act, as amended.

f. DOE Handbook, *Chemical Management*, Vol. 2, Chemical Safety and Lifecycle Management, DOE-HDBK-1139/2-2006.

g. DOE G 450.1-4, *Implementing Guide, Wildland Fire Management Program for Use with DOE 450.1, Environmental Protection Guidance*, dated 2-11-04.

h. DOE P 450.4, *Safety Management System Policy*, dated 10-15-96.

i. DOE M 450.4-1, *Integrated Safety Management System Manual*, dated 11-1-06.

j. DOE O 430.2B, *Departmental Energy, Renewable Energy, and Transportation Management*, dated 2-27-08.

k. DOE O 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, dated 7-28-06.

l. Emergency Planning and Community Right-to-Know Act or Title III of Superfund Amendments and Reauthorization Act of 1986, 42 U.S.C. 11001, et seq.

m. Pollution Prevention Act of 1990, 42 U.S.C. 13101, et seq.

n. Office of the Federal Environmental Executive Memorandum dated January 15, 2008, *Clarification of Declaration of Conformance Requirements in Instructions to Executive Order 13423*. www.fedcenter.gov/Clarification Document/

8. NECESSITY FINDING STATEMENT. In compliance with Sec. 3174 of P.L. 104-201 (50 U.S.C. 2584 note), DOE hereby finds that this Order is necessary for the protection of human health and the environment or safety, fulfillment of current legal requirements, or conduct of critical administrative functions.

9. CONTACT. For assistance, contact the Office of Nuclear Safety, Quality Assurance and Environment at 202-586-5680.

BY ORDER OF THE SECRETARY OF ENERGY:

JEFFREY F. KUPFER
Acting Deputy Secretary

CONTRACTOR REQUIREMENTS DOCUMENT
DOE O 450.1A, *Environmental Protection Program*

Contractors managing and operating Department of Energy (DOE), including National Nuclear Security Administration (NNSA), facilities are responsible for: (1) compliance with the requirements of this contractor requirements document (CRD) regardless of the performer of the work, and (2) flowing down the requirements of the CRD of the Order to subcontracts to the extent necessary to ensure contractors' compliance with the requirements.

As directed by the contracting officer, to assist the Department in meeting its responsibilities under E.O. 13423, *Strengthening Federal Environmental, Energy, and Transportation Management,* and its Implementing Instructions, contractors must—

1. Develop and implement an environmental management system. This system must be integrated into the site's Integrated Safety Management (ISM) system. (See the CRD in DOE M 450.4-1, *Integrated Safety Management System Manual*, dated 11-1-06.)

    a. Each environmental management system must—

        (1) Reflect the environmental management system elements and framework found in the International Organization for Standardization's (ISO) 14001:2004 (E) International Standard or equivalent, including policies, procedures and training to identify operations and activities with significant environmental impacts; to manage, control, and mitigate the impacts of these operations and activities; and to assess performance, implement corrective actions where needed, and ensure continual improvement.

        (2) Include environmental, energy, and transportation objectives and measurable targets that are reviewed annually, updated as appropriate, and contribute to achieving the DOE Sustainable Environmental Stewardship goals found in Attachment 2 of DOE O 450.1A, *Environmental Protection Program*, dated 6-4-08, and the energy and transportation goals in the CRD in DOE O 430.2B, *Departmental Energy, Renewable Energy and Transportation Management*, dated 2-27-08.

        (3) Address tenant or concessionaire activities wherever such activities affect DOE's environmental, energy, and transportation management.

        (4) Contain the elements of an Environmental Compliance Management Plan pursuant to the Council on Environmental Quality's *Instructions for Implementing Executive Order 13423*, page 9, section B, including—

            (a) A clear statement by senior leadership committing to achieve and maintain compliance with applicable environmental protection requirements.

(b) Clearly articulated roles and responsibilities related to environmental performance at all appropriate levels to ensure accountability for less than desired environmental performance.

(c) An environmental compliance audit and review program that identifies compliance deficiencies and root causes of non-compliance.

(d) Integration of compliance management information and resource allocation procedures to ensure that audit findings and root causes of non-compliance are tracked and addressed, including allocation of funding.

b. The environmental management system must encompass the environmental aspects of site operations and activities, including environmental aspects of energy and transportation functions, and it must promote the long-term stewardship of a site's natural and cultural resources throughout its design and construction, operation, closure, and post-closure life cycle. The environmental management system must address the following—

(1) Sustainable practices for enhancing environmental, energy, and transportation management performance, as stipulated in Section 3(a) of E.O. 13423 and its Implementing Instructions.

(2) Protection of public health and the environment, including but not limited to—

(a) Conformity with State Implementation Plans to attain and maintain national ambient air quality standards.

(b) Implementation of a watershed approach for surface water protection.

(c) Implementation of a site-wide approach for groundwater protection.

(d) Protection of other natural resources, including biota.

(e) Assessment of the hazard of engineered nanomaterials and implementation of appropriate environment, safety and health controls. (See DOE P 456.1, *Secretarial Policy Statement on Nanoscale Safety*, dated 9-15-05.)

(3) Protection of site resources from wildland fires consistent with site wildland and operation fire management plans that consider the Federal

Wildfire Management Policy recommendations. (See DOE G 450-1.4, *Implementation Guide, Wildland Fire Management Program,* for Use with DOE 450.1, *Environmental Protection Program,* dated 2-11-04).

(4) Identification and protection of cultural resources.

(5) The conduct of environmental and effluent monitoring, as appropriate, to characterize pre-operational conditions, and to detect, characterize, and respond to releases from site operations and activities; assess impacts; estimate dispersal patterns in the environment; characterize the pathways of exposure to members of the public; characterize the exposures and doses to individuals and the population; and evaluate the potential impacts to the biota in the vicinity of the release. Where appropriate, conduct an integrated monitoring and sampling approach to avoid duplicative data collection.

(6) Assurance that analytical work for environmental and effluent monitoring supports data quality objectives, using a documented approach for collecting, assessing, and reporting environmental data.

(7) The conduct of appropriate operational assessments, such as pollution prevention opportunity assessments, of site operations and activities to identify opportunities to implement sustainable practices as part of achieving DOE's Sustainable Environmental Stewardship goals found in Attachment 2 of DOE O 450.1A.

c. The environmental management system must be validated according to the following criteria.

(1) An environmental management system shall be considered fully implemented when—

(a) The environmental management system has been the subject of a formal audit by a qualified party outside the control or scope of the environmental management system.

(b) The appropriate contractor senior management and DOE field office management have recognized and addressed the findings of the audit.

(c) The appropriate senior manager accountable for implementation of the environmental management system and the cognizant Field Officer Manager, have declared conformance of the environmental management system to the requirements of this CRD.

(2) Environmental management systems, including those already declared under the previous requirements of the CRD in DOE O 450.1 must meet the new requirements for being "fully implemented" by June 30, 2009.

(3) To remain fully implemented, at least every three years (a) the environmental management system must be audited by a qualified party outside the control or scope of the organization implementing the environmental management system, and (b) the conformance declaration 1c(1)(c) is renewed, as appropriate.

2. Monitor progress toward meeting the requirements of paragraph 1a, 1b, and 1c of this CRD, and make such information available annually through the DOE operations/field/site office to the Senior Agency Officer (SAO) and the Office of Health, Safety and Security.

3. Include in site environmental management systems practices to maximize the use of safe alternatives to ozone-depleting substances (ODS), whereby—

a. The use of ODS in new equipment and facilities is eliminated.

b. The use of ODS in existing equipment is phased out as the existing equipment reaches its expected service life, and the maintenance of equipment is conducted to prevent or fix leaks.

c. The replacement of leaking equipment is carried out when leak repair is no longer cost-effective or where it is life-cycle cost-effective to replace the equipment.

d. Coordination is conducted within DOE and with the Department of Defense's (DoD) Defense Supply Center Richmond, a component of the Defense Logistics Agency (DLA), as appropriate, before disposal of ODS removed or reclaimed from equipment (including disposal as part of a contract, trade, or donation). For situations in which the recovered ODS is a critical requirement for DoD missions, the DOE facility transfers the ODS to DoD. (See DLA's ODS website at: www.dscr.dla.mil/ExternalWeb/UserWeb/AviationEngineering/Ozone/contact.htm)

4. Assist the Department in meeting the chemical emergency planning, release, and reporting requirements of the Emergency Planning and Community Right-to-Know Act and the Pollution Prevention Act of 1990, without regard to Standard Industrial Classification/North American Industrial Classification designations. All other statutory and regulatory exemptions apply.

5. Assist the Department in meeting obligations imposed on it by E.O. 13327, *Federal Real Property Asset Management*, Section 3b(vi), by ensuring incorporation of planning and management requirements for historic property.

SUSTAINABLE ENVIRONMENTAL STEWARDSHIP GOALS

1. PURPOSE.

   a. To establish Department of Energy (DOE) Sustainable Environmental Stewardship goals that advance the sustainable practices for enhancing environmental, energy, and transportation management performance, as stipulated in Executive Order (E.O.) 13423, *Strengthening Federal Environment, Energy, and Transportation Management*.

   b. To integrate sustainable practices into DOE operations as cost-effective business practices that will—

      (1) prevent pollution,

      (2) reduce environmental hazards,

      (3) protect public health and the environment,

      (4) avoid pollution control and waste disposal costs, and

      (5) improve operational capability and overall mission sustainability.

2. GOALS, OBJECTIVES, AND SUSTAINABLE PRACTICES.

   The Department is to achieve these performance-based Sustainable Environmental Stewardship goals through site implementation of the accompanying sustainable practices, as appropriate, and their integration into environmental management systems pursuant to DOE 450.1A and its Contractor Requirements Document (CRD). DOE sites are to consider legal requirements, requirements in E.O. 13423 and its Implementing Instructions, mission performance, and life-cycle costs when selecting specific sustainable practices for achieving the Sustainable Environmental Stewardship goals. Additionally, sites may identify other sustainable practices appropriate to site-specific operations and activities, as necessary to achieve the goals.

3. PERFORMANCE MEASURES.

   Measure progress toward meeting the requirements of paragraph 4 of DOE O 450.1A and paragraph 1 of its CRD, and make such information available annually through the Pollution Prevention Tracking and Reporting System to the Senior Agency Official and the Chief Health, Safety and Security Officer pursuant to paragraphs 5c(8) and 5d(7) of DOE O 450.1A and paragraph 2 of its CRD.

GOAL	REDUCE OR ELIMINATE THE GENERATION AND/OR TOXICITY OF WASTE AND OTHER POLLUTANTS AT THE SOURCE THROUGH POLLUTION PREVENTION
OBJECTIVE	Reduce environmental hazards, protect environmental resources, minimize life-cycle cost and liability of DOE programs, and maximize operational sustainability by eliminating or minimizing the generation of wastes and other pollutants, through source reduction including segregation, substitution, and reuse, that would otherwise require storage, treatment, disposal, and long-term monitoring and surveillance (i.e., future environmental legacies).
SUSTAINABLE PRACTICES	• Establish operational assessments, such as pollution prevention opportunity assessments, of waste generating activities, as objectives and measurable targets in site environmental management systems. • Based on operational assessments, establish objectives and measurable targets in site environmental management systems for the prevention, reduction, reuse, and recycling of waste streams generated at sites. • Identify through the annual Department budgetary process the funding and resources needed to implement this sustainable environmental stewardship goal and site-specific objectives and targets that are not alternatively funded through Energy Savings Performance Contracts (ESPCs). • Participate in voluntary environmental partnership programs (e.g., National Waste Minimization Program, Waste Wise, National Environmental Performance Track, etc.) where there is a programmatic benefit from doing so (community outreach, technology transfer, regulatory incentives, etc.).

GOAL	REDUCE OR ELIMINATE THE ACQUISITION, USE, AND RELEASE OF TOXIC AND HAZARDOUS CHEMICALS AND MATERIALS
OBJECTIVE	Reduce environmental hazards, protect environmental resources, minimize life-cycle cost and liability of DOE programs, and maximize operational sustainability by eliminating or minimizing the acquisition, use, and associated release of toxic and hazardous chemicals and materials, including hazardous substances, ozone-depleting substances (ODS), and other pollutants, that would otherwise require control, treatment, monitoring, and reporting.
SUSTAINABLE PRACTICES	• Establish operational assessments, such as pollution prevention opportunity assessments, of activities using toxic and hazardous chemicals and materials, as objectives and measurable targets in site environmental management systems. • Based on operational assessments, establish objectives and measurable targets in site environmental management systems for minimizing the acquisition, use, and disposal of toxic and hazardous chemicals and materials to reduce releases of pollutants to the environment (air, water, soil, biota). For example— – using more environmentally benign solvents and solvent-less systems that reduce or eliminate the use and/or generation of hazardous substances; or – designing analytical products and processes that reduce or eliminate the use and/or generation of hazardous substances. • Employ tools such as the Green Chemical Alternatives Purchasing Wizard to identify more environmentally benign alternatives and substitutes for laboratory-related chemicals or processes. (web.mit.edu/environment/academic/purchasing.html) • Ensure sites' environmental management systems include practices to maximize the use of safe alternatives to ODS whereby— – the use of ODS in new equipment and facilities is eliminated, – the use of ODS in existing equipment is phased out as the existing equipment reaches its expected service life, and the maintenance of equipment is conducted to prevent or fix leaks,

GOAL	REDUCE OR ELIMINATE THE ACQUISITION, USE, AND RELEASE OF TOXIC AND HAZARDOUS CHEMICALS AND MATERIALS
	– the replacement of leaking equipment is carried out when leak repair is no longer cost-effective, or where it is life-cycle cost-effective, to replace the equipment, and – coordination is conducted within DOE and with the Department of Defense's (DoD) Defense Supply Center Richmond, a component of the Defense Logistics Agency (DLA), as appropriate, before disposal of ODS removed or reclaimed from equipment (including disposal as part of a contract, trade, or donation). For situations in which the recovered ODS is a critical requirement for DoD missions, the DOE facility transfers the ODS to DoD. (See DLA's ODS website at www.dscr.dla.mil/ExternalWeb/UserWeb/AviationEngineering/Ozone/contact.htm) – Implement a chemical inventory tracking system that integrates information throughout the entire chemical lifecycle covering procurement, storage, use, transfer/movement, and final disposition. • Identify through the annual Department budgetary process the funding and resources needed to implement this sustainable environmental stewardship goal and site-specific objectives and targets that are not alternatively funded through ESPCs. • Participate in voluntary environmental partnership programs (e.g., Adopt Your Watershed, Climate Leaders, Green Chemistry and Engineering Programs, National Environmental Performance Track, National Partnership for Environmental Priorities, etc.) where there is a programmatic benefit from doing so (community outreach, technology transfer, regulatory incentives, etc.).

GOAL	MAXIMIZE THE ACQUISITION AND USE OF ENVIRONMENTALLY PREFERABLE PRODUCTS IN THE CONDUCT OF OPERATIONS
OBJECTIVE	Reduce or eliminate environmental hazards, conserve environmental resources, minimize life-cycle cost and liability of DOE programs, and maximize operational sustainability through the procurement of recycled-content, biobased-content, and other environmentally preferable products thereby minimizing the economic and environmental impacts of managing toxic by-products and hazardous wastes generated in the conduct of site activities.
SUSTAINABLE PRACTICES	• Establish environmentally preferable purchasing objectives and measurable targets in site environmental management systems. • Specify environmentally preferable products in the acquisition of site supplies and services. • Procure the following environmentally preferable products, when available, affordable, and effective— – Environmental Protection Agency (EPA) designated recycled-content products, – Department of Agriculture designated biobased-content products, – EPA Significant New Alternatives Policy (SNAP) Program acceptable substitutes for ODS, – EPA Energy Star® labeled and FEMP-designated products, – Other environmentally preferable products, such as— o Cleaning products certified by GreenSeal, a U.S. standard setting and environmental labeling organization (www.greenseal.org), o EPA's list of green cleaning resources (www.epa.gov/epp/pubs/products/cleaning.htm), o GreenGuard indoor air quality certified office supplies, furniture, and building materials (www.greenguard.org), o General Services Administration Advantage "environmental aisle" providing access to green products online (www.gsaadvantage.gov),

GOAL	MAXIMIZE THE ACQUISITION AND USE OF ENVIRONMENTALLY PREFERABLE PRODUCTS IN THE CONDUCT OF OPERATIONS
	○ EcoLogo, the Canadian government's green product certification mark (www.environmentalchoice.com). • Utilize American Petroleum Institute (API) rated re-refined oil, retread truck tires, antifreeze/engine coolant recyclers, water recycling/reclamation vehicle wash facilities, and biobased lubricants, fuels and degreasers/cleaners. • Integrate environmentally preferable purchasing into new construction and major renovation projects, pursuant to the High Performance Sustainable Building requirements of DOE Order 413.3A. *Program and Project Management for the Acquisition of Capital Assets*, and into construction and renovation-related general plant projects and institutional general plant projects, where life-cycle cost-effective. • Identify through the annual Department budgetary process the funding and resources needed to implement this sustainable environmental stewardship goal and site-specific objectives and targets that are not alternatively funded through ESPCs. • Participate in voluntary environmental partnership programs where there is a programmatic benefit from doing so (community outreach, technology transfer, regulatory incentives, etc.).

GOAL	REDUCE OR ELIMINATE THE ENVIRONMENTAL IMPACTS OF ELECTRONIC ASSETS
OBJECTIVE	Reduce or eliminate environmental hazards, conserve environmental resources, minimize life-cycle cost and liability of DOE programs, and maximize operational sustainability through the incorporation of electronics stewardship practices thereby minimizing the economic and environmental impacts of managing toxic by-products and hazardous wastes generated in the conduct of site activities.
SUSTAINABLE PRACTICES	• Establish electronics stewardship objectives and measurable targets in site environmental management systems. • Specify environmentally preferable electronics qualified through the Electronic Procurement Environmental Assessment Tool (EPEAT) or its successor, in the solicitation and acquisition of desktop computers, notebooks, monitors, and other electronic products for which there are EPEAT standards. – Utilize the EPEAT network to identify specific models of desktop computers, notebooks and monitors registered by manufacturers and vendors as environmentally preferable and listed according to three tiers of ascending environmental performance and order of preference - bronze, silver, and gold (www.epeat.net). – Utilize the EPEAT network to identify other electronic products (e.g. servers, printers, copiers, etc.) registered in the future by manufacturers and vendors as environmentally preferable. – Strive to purchase EPEAT silver-rated electronic products or higher (gold) as available. • Enable Energy Star® features (power management capabilities) on all computers, monitors, printers, copiers, and other electronic equipment, or to the maximum degree based on mission needs. • Extend the useful lifespan of computer systems and other electronic products through software upgrades and use of EPA's Guidance to Improve the Operation of Electronic Products provided at www.federalelectronicschallenge.net/docs/oamdm.pdf. Strive to extend the useful life of electronic equipment to four (4) or more years. • Reuse surplus and recycle end-of-life electronics.

GOAL	REDUCE OR ELIMINATE THE ENVIRONMENTAL IMPACTS OF ELECTRONIC ASSETS
	– Utilize the recycling services available through the following sources as an environmentally compliant means for disposition of end-of-life electronics— o Environmental Protection Agency Recycling Electronics and Asset Disposition (READ) Services Government Wide Acquisition Contract (www.epa.gov/oam/read/index.htm), o Department of Justice UNICOR Electronic Recycling Program (www.unicor.gov/recycling), o General Services Administration Federal Supply Service Multiple Award Schedule 899, Reclamation, Recycling and Disposal Services, o Recyclers who meet or exceed EPA's guidelines for materials management; safe electronics recycling (www.epa.gov/plugin), o Recyclers that are members, in good standing, of one or more of the following professional associations— International Association of Electronic Recyclers, Institute of Scrap Recycling Industries, National Recycling Coalition, Electronic Industries Alliance. - Utilize GSA's Computers for Learning Program (GSAXcess) for transferring surplus computer systems and other surplus electronics to eligible schools (gsaxcess.gov); - Specify in IT contracts for leased electronic equipment "take-back" provisions where, at the end of the lease period, the equipments is reused, refurbished, donated, or recycled using environmentally sound management practices.

GOAL	REDUCE OR ELIMINATE THE ENVIRONMENTAL IMPACTS OF ELECTRONIC ASSETS
	• Identify through the annual Department budgetary process the funding and resources needed to implement this sustainable environmental stewardship goal and site-specific objectives and targets that are not addressed through ESPCs. • Participate in the Federal Electronics Challenge, the Electronics Reuse and Recycling Challenge, and the Plug-in to eCycling Partnership where there is a programmatic benefit from doing so (community outreach, technology transfer, regulatory incentives, etc.).

GOAL	REDUCE DEGRADATION AND DEPLETION OF ENVIRONMENTAL RESOURCES THROUGH POST-CONSUMER MATERIAL RECYCLING
OBJECTIVE	Protect environmental resources, minimize life-cycle cost of DOE programs, and maximize operational sustainability by diverting materials suitable for reuse and recycling from landfills thereby minimizing the economic and environmental impacts of waste disposal and long-term monitoring and surveillance.
SUSTAINABLE PRACTICES	• Establish post-consumer material recycling objectives and measurable targets in site environmental management systems. • Recycle office paper, cardboard, aluminum, plastics, and glass. • Recycle spent oil, hydraulic fluid, lubricants, and solvents. • Recycle construction and demolition debris. – Reuse demolition rubble (concrete, brick, and other masonry) on-site by crushing the material to stone for grading, laying utilities, and building roads, driveways, and parking areas. Pulverize and reuse gravel asphalt and sub-base. – Utilize the General Services Administration Construction Waste Management Database to identify recyclers of 15 commonly-recycled construction and demolition debris such as concrete, asphalt, masonry, metal, plastic, and wood (www.wbdg.org/tools/cwm.php). – Specify recycling of construction materials into new construction and major renovation projects, pursuant to the High Performance Sustainable Building requirements of DOE Order 413.3A, and into construction and renovation-related general plant projects and institutional general plant projects, where life-cycle cost-effective. • Recycle empty, non-refillable, high-density polyethylene (HDPE) plastic pesticide product containers.

GOAL	REDUCE DEGRADATION AND DEPLETION OF ENVIRONMENTAL RESOURCES THROUGH POST-CONSUMER MATERIAL RECYCLING
	– Utilize the Ag Container Recycling Council (ACRC), a non-profit organization to collect and recycle professional end-users' containers of EPA registered pesticide products to include agricultural, turf, forestry, vegetative management, specialty pest control, adjuvants, crop oils, and surfactants (www.acrecycle.org). • Collect spent toner cartridges and batteries for remanufacturing. • Recycle surplus commodities and by-products. • Utilize material exchange programs such as Recycler's World Network (www.recycle.net) or the DOE Materials Exchange Network (www.er.doe.gov/epic/recycle.html) to transfer unwanted materials to alternate users. • Identify, through the annual Department budgetary process, the funding and resources needed to implement this sustainable environmental stewardship goal and site-specific objectives and targets that are not alternatively funded through ESPCs.

U.S. Department of Energy

ORDER

WAPA O 450.3A

DATE: 03-13-08
Page Change: 02-23-09

SUBJECT: TRANSMISSION VEGETATION MANAGEMENT PROGRAM

1. OBJECTIVES. The objective of this Order is to define the Transmission Vegetation Management Program (TVMP) for the Western Area Power Administration (Western); to ensure the safe and reliable operation of the electrical transmission system in an environmentally sensitive, cost effective, and socially responsible manner.

2. CANCELLATION. This Order cancels WAPA Order 450.3, Transmission Vegetation Management Program, dated 05-10-07.

3. BACKGROUND. This Order is in accordance with the requirements defined in the North American Electric Reliability Council (NERC) Standard FAC-003-1.

4. APPLICABILITY.

   a. Western Program Areas. This Order applies to all Western programs involved with vegetation management beneath and adjacent to transmission lines and associated facilities that make up the transmission system maintained by Western. At a minimum, this standard shall apply to all 200 kV and above transmission lines and to any lower voltage lines designated by the Regional Reliability Organization (RRO) as critical to the reliability of each Region's electric system.

   b. Contractors. Contractors in support of Western's TVMP are responsible for ensuring full compliance with the requirements set forth in applicable Contracts and are also responsible for any subcontractor's compliance.

5. POLICY. It is Western's policy to identify and perform maintenance management activities in support of obtaining a desired condition for transmission line rights-of-way (ROW) and associated facilities. Western will apply the concept of Integrated Vegetation Management (IVM) as a practice for creating and maintaining a desired condition. Western's IVM Guidance Manual (see paragraph 13 of this Order) provides guidance for these practices.

6. RESPONSIBILITIES.

   a. Chief Operating Officer. Ensures full compliance with NERC and RRO reliability standards

   b. CSO Engineering. Provides oversight in the development of Engineering and Maintenance policies and standards.

   c. CSO Natural Resources Office. Provides support to the Regions relative to environment and lands programs. Serves as a point of contact with DOE Headquarters offices for the purpose of policy development, reporting, regulatory review, Native American issues, and other requirements.

   d. Office of General Counsel. Provides legal advice, counsel, and representation.

   e. Regional Managers. Provide oversight of the maintenance and safety policy and programs in their respective regions.

   f. Regional Maintenance Managers. Develop long-term strategies and programs, in coordination with Regional safety, environmental, and realty personnel, to address vegetation issues in and along all Western maintained transmission lines and associated facilities.

   g. Regional Environmental Managers. Support the Maintenance Managers in ensuring that the maintenance activities employed to manage Western's TVMP are in compliance with environmental laws and regulations.

   h. Regional Safety Managers. Support the Maintenance Managers in advising supervisors and foremen on the applications of the Power System Safety Manual and applicable safety and health regulations.

   i. Regional Reality Officers. Support the Maintenance Managers in the resolution of vegetation management problems by working with landowners in identifying and enforcing vegetation control rights

7. DESIRED CONDITION. Western's desired condition beneath and adjacent to its transmission line facilities is characterized by stable, low growth plant communities free from noxious or invasive plants. These communities will typically be comprised of herbaceous plants and low growing shrubs which ideally are native to the local area. Vegetation on the bordering areas of transmission line easements/ROWs can be managed so that increased tree height is allowed in relation to an increasing distance from the transmission line. Accumulations of vegetation debris from intensive or repetitive vegetation treatments may require mitigation to reduce risks from wildfire and enhance the fire survivability of the transmission facility. The

density of the remaining vegetation will also be a consideration in assessing overall fire risk. Adequate access routes are required and must be maintained to provide for efficient, cost effective vegetation treatment activities.

a. Areas of Concern. The desired condition will allow Western to manage vegetation such that it does not threaten power system safety or reliability. Vegetation management activities will be undertaken to the maximum extent that is reasonable and practical within three main areas of concern:

(1) Vegetation within the defined boundary of a facility (ROW, fence line, etc.);
(2) Vegetation adjacent to the facility; and
(3) Prevention of wildfire on and off the facility.

b. Guidance. On-the-ground conditions can be extremely variable and specific for each transmission facility or unique section of a facility. In general, it is Western's practice to perform vegetation management activities in support of achieving the desired condition of low, stable growth plant communities. However, reasonable accommodations can be made in consideration of other critical resources or management issues. The principal purpose of the transmission facility is for the safe and reliable operation of the power system and all other resource and management issues are considered secondary. When constraints do not allow for the immediate removal of trees and other taller vegetation, the desired condition should identify the maximum tree height and density thresholds allowed. American National Standards, ANSI A300, part 7, *Tree, Shrub, and Other Woody Plant Maintenance - Standard Practices (Integrated Vegetation Management, a. Electrical Utility Rights-of-way),* may be used for additional guidance and reference.

c. Objective. Western's intent is to secure and maintain a manageable landscape that minimizes vegetative threats to transmission system reliability and safety, and ultimately does not require frequent re-treatments. Achieving a desired condition is a process that may take several iterations over an extended period of time. However, once defined, the desired condition will serve as the guide for future vegetation management decisions. All subsequent vegetation treatment activities should consistently move toward achieving and maintaining the desired condition. Once achieved, the desired condition will be proactively maintained by occasional re-treatments.

8. PRACTICES. Western's TVMP practices are guided by internal manuals, handbooks, guidelines, orders, and standards outlining objectives, practices, approved procedures, and work specifications set forth in paragraph 14. These various formal documents are kept current through internal working committees from the functional organizations where the document resides.

9. REQUIREMENTS.

a. Maintenance Schedule. Aerial and ground patrol schedules for each transmission facility are developed and maintained by each regional maintenance organization. Maintenance schedules are based on requirements and procedures set forth in Western's maintenance program. Other conditions where additional inspections may be necessary are those where catastrophic results could occur. Aerial or ground patrols may be conducted after an outage occurrence.

b. Vegetation clearance levels for each transmission line. Clearance 1 distances required by NERC FAC-003-1 are provided in Western Order 430.1A, Right-of-Way Management Guidance for Vegetation, Encroachments, and Access Routes. Western's desired condition is a condition of low growth plant communities; these values represent the maximum but not preferred vegetation height thresholds allowed. NERC FAC-003-1, Clearance 2 distances are provided in Western's Power System Safety Manual (PSSM), Table A-1.

c. Qualifications and Training. Personnel involved in the design, implementation, and execution of the TVMP shall be qualified and trained as provided in individual position descriptions and contract language. The Western Transmission Vegetation Management Committee was established to design and provide oversight of the TVMP, and committee membership qualifications are outlined in the charter. Western staff involved in the preparation and implementation of annual plans discussed in paragraph 9 of this Order shall be included. PSMM Chapter 11 also addresses field crew training requirements for trimming and felling trees and brush near power lines. Contractors hired by Western must be fully qualified with respect to all certifications, licenses, training, and other skills and requirements as presented in the most recent version of Western's statement of work.

d. Mitigation Measures. WAPA Order 430.1A and the Regional Transmission Vegetation Management Program Statements provide mitigation measures and processes to achieve sufficient clearances for the protection of the transmission systems in identified locations where Western is restricted from attaining the clearances specified in paragraph 9b.

e. Inspections and Emergency Procedures. Transmission line maintenance personnel are responsible for inspection of Western's transmission facilities from vehicles, on foot or from aircraft. Routine inspections of vegetation are made during scheduled ground and aerial line patrols. Any encroachments, including vegetation, are documented and forwarded to the proper functional organization for assessment and resolution. Typical patrol reports will describe the

encroachment, clearance between the conductor and encroachment, and other pertinent information, such as when the reading was taken, and why there is a problem. If an imminent threat of a transmission line outage is identified and requires action (such as switching the line out of service), the threat shall immediately be reported verbally for resolution.

Western's craft personnel and IVM contractors are responsible for complying with prescribed clearance and safety rules and regulations, are qualified to recognize safety hazards and unsafe conditions, and are required to initiate action to alleviate or eliminate the hazards. Duties include the immediate reporting of safety hazards and unsafe conditions and initiating action to correct the safety hazard. Line crew members are required to report potential power system troubles to their Foreman. While on patrol, they are qualified to make on-the-spot decisions as to the urgency for immediate communication of vegetation conditions that present an imminent threat of a transmission system outage so that action may be taken.

10. ANNUAL PLANS FOR VEGETATION MANAGEMENT WORK. Each Regional Maintenance Organization shall create and implement an annual plan for vegetation management activities to ensure the reliability of the power system. The plan shall describe the methods used, such as manual clearing, mechanical clearing, herbicide treatment, or other actions. The plan should be flexible enough to adjust to changing conditions, taking into consideration anticipated growth of vegetation and all other environmental factors that may have an impact on the reliability of the transmission systems. Adjustments to the plan shall be documented as they occur. The plan should take into consideration the time required to obtain permissions or authorizations from landowners or regulatory authorities and also to conduct the appropriate environmental review. Each maintenance organization shall have systems and procedures for documenting and tracking the planned vegetation management work and ensuring that the vegetation management work is completed according to work specifications

11. REPORTING REQUIREMENTS. Each Region will report quarterly to their RRO, and upon request, will also report sustained transmission line outages determined to have been caused by vegetation. If there are no sustained transmission line outages for the quarter, the report shall be submitted indicating full compliance. Multiple sustained outages on an individual line, if caused by the same vegetation, shall be reported as one outage regardless of the actual number of outages within a 24-hour period.

    a. Western is not required to report to the RRO, or the RRO's designee, certain sustained transmission line outages caused by vegetation. These outages are: (1) vegetation-related outages that result from vegetation falling into lines from outside the ROW that result from natural disasters (examples of disasters that

could create non-reportable outages include, but are not limited to, earthquakes, fires, tornados, hurricanes, landslides, wind shear, major storms as defined either by Western or an applicable regulatory body, ice storms, and floods); and (2) vegetation-related outages due to human or animal activity (examples of human or animal activity that could cause a non-reportable outage include, but are not limited to, logging, animal severing tree, vehicle contact with tree, arboricultural, horticultural, agricultural activities, or removal or digging of vegetation).

b. The outage information provided by Western to the RRO, or the RRO's designee, shall include at a minimum: the name of the circuit(s) experiencing the outage, the date, time and duration of the outage; a description of the cause of the outage; other pertinent comments; and any countermeasures taken by Western.

c. An outage shall be categorized as one of the following:

- Category 1 — Grow-ins: Outages caused by vegetation growing into lines from vegetation inside and/or outside of the ROW;
- Category 2 — Fall-ins: Outages caused by vegetation falling into lines from inside the ROW;
- Category 3 — Fall-ins: Outages caused by vegetation falling into lines from outside the ROW.

12. DOCUMENTATION. All documentation required in this section shall be retained for a minimum period of 5 years.

a. Each Region shall document that they have performed the vegetation inspections identified in 8a above. This information shall be retained in Western's maintenance management databases (Maximo, TAMIS, SIMS, TLDB, etc.).

b. Western shall retain documentation that describes the clearances identified in 8b above. This information shall be retained in Western's PSSM, Table A1 (Clearance 2), and WAPA Order 430.1A (Clearance 1).

c. Western shall retain documentation that describes the qualifications of personnel directly involved in the design, implementation, and execution of the TVMP as required in 8c. This information shall be retained in the employee's position descriptions and training records maintained by Western and the Corporate Human Resource Information System (CHRIS).

d. Each Region shall document any areas identified as not meeting this Order for vegetation management and any mitigating measures taken to address these deficiencies as identified in 8d. This information shall be retained by each

Regional Lands Office and attached to the appropriate authorizing document (easement, permit, etc.). It should also be noted in the geographic information system (GIS) database so that it is available to the maintenance organization responsible for planning and completing vegetation management activities.

e. Western shall maintain a documented process for the immediate communication of imminent threats by vegetation as required in 8e above. This information shall be retained in the employee's position description and the Standard Operating Procedures.

f. Each Region shall document that the annual work plan identified in paragraph 9 has been implemented. This will be documented in the appropriate procurement records (for contract work) and in Western's maintenance management databases (Maximo, TAMIS, SIMS, TLDB, etc.).

g. Each Region shall retain copies of all quarterly reports and additional outage reports submitted to the RRO, or the RRO's designee, as identified in paragraph 10.

h. Each Region shall develop a Transmission Vegetation Management Program statement which identifies Regional specific practices.

13. CERTIFICATION. Each Region shall demonstrate compliance through self-certification submitted to the compliance monitor (RRO or RRO's designee) in accordance with the requirements of NERC FAC-003-1.

14. REFERENCES.

a. North American Electric Reliability Council (NERC) Reliability Standard FAC-003-1.

b. Western Area Power Administration Integrated Vegetation Management Guidance Manual, latest version.

c. American National Standards, ANSI A300 (part 7)-2006 IVM for Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (Integrated Vegetation Management, a. Electrical Utility Rights-of-Way).

d. Chapter 13, Power System Maintenance Manual (PSMM), latest revision.

e. WAPA Order 430.1A, Right-of-Way Management Guidance for Vegetation, Encroachments, and Access Routes, latest revision.

f. Chapter 11, PSMM, Trimming and Felling of Trees and Brush Near Power Lines, latest revision.

g. Chapter 1, Power System Operations Manual (PSOM), Power System Switching Procedure, latest revision.

h. Chapter 4, PSOM, Power System Operating Guidelines, latest revision.

i. Power System Safety Manual (PSSM), latest revision.

j. Regional Transmission Vegetation Management Program Statements.

k. ANSI A300, (Part 1) – 2001 Pruning for Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance.

l. ANSI Z133.1 – 2000, for Arboricultural Operations – Pruning, Repairing, Maintaining, and Removing Trees, and Cutting Brush – Safety Requirements.

m. Western Transmission Vegetation Management Committee (TVMC) Charter.

15. CONTACT. Questions concerning this Order should be addressed to the CSO Engineering Office at (720) 962-7296.

Timothy J. Meeks
Administrator

U.S. Department of Energy

Western AREA POWER ADMINISTRATION

PAGE CHANGE

WAPA O 450.3A

DATE: 03-13-08
Change 1: 02-23-09

SUBJECT: TRANSMISSION VEGETATION MANAGEMENT PROGRAM

1. PURPOSE. To transmit revised pages 3 and 4 to WAPA O 450.3A, Transmission Vegetation Management Program, dated 03-13-08.

2. EXPLANATION OF CHANGES. To correct the references to the paragraph numbers identified in paragraph 8 and paragraph 9d.

3. LOCATION OF CHANGES.

Page	Paragraph
3	8
4	9d

After filing the attached pages, this transmittal may be discarded.

Western AREA POWER ADMINISTRATION

Timothy J. Meeks
Administrator

Western Area Power Administration

DESERT SOUTHWEST REGION SPILL RESPONSE PLAN

February 2012

Arthur Ruiz

Western Area Power Administration – Desert Southwest Region
SPILL RESPONSE PLAN

This Plan describes emergency response, notification, cleanup, and disposal procedures for oil and hazardous material spills at DSW facilities and during transportation of bulk oil*.

EMERGENCY PROCEDURES	These procedures are for emergencies involving a spill (see **SPILL DEFINITION APPENDIX**).

1) Alert - Inform others nearby.
- Get help.
- Call or have someone call the local emergency response unit (usually 911).

2) Evacuate - Warn those in danger to evacuate the area.

3) Evaluate - Evaluate the situation, think through your response, and decide on your actions.
- If you are trained for the situation, proceed to the next step.
- If you are not trained, make the notifications in step 7) below and wait for help.

4) Rescue - Using appropriate personal protection equipment (PPE), take victims to safety.
- Render first aid and arrange for medical care.

5) Decontaminate - Wash or rinse any contaminants from the victim.

SPILL RESPONSE PROCEDURES	Once the procedures above have been addressed or if no emergency exists, then proceed as follows:

6) Stop and Contain Flow - Stop the discharge
- Contain the flow (use appropriate PPE).
NOTE: See the **CLEANUP APPENDIX** for techniques and the **RESOURCES APPENDIX** for equipment, materials, and personnel

7) Notification - Report the following to Dispatch Immediately. **Phone: 1-800-973-7583**

- Exact location and equipment involved,
- exact time and date of spill and discovery,
- suspected cause of the spill,
- substance spilled, estimated gallons, and PCB content (ppm), if applicable,
- immediate actions taken to contain spill,
- personnel available for containment and/or cleanup response, and
- probability of spill reaching a water body, wetland, or drain.

NOTE: Notifications made by Dispatch & Environment are in the NOTIFICATIONS APPENDIX.

8) Cleanup - Clean up the spilled material. **(**See the **CLEANUP APPENDIX** for techniques)
- Equipment, materials, and personnel are listed in the **RESOURCES APPENDIX**

9) Spill Report - Fill out a Spill Report Form (see **SPILL REPORT APPENDIX**)
- Submit the completed form to Division Manager within 48 hours of spill discovery

10) Dispose of the Waste - See the **CLEANUP APPENDIX** for specific techniques.

Western Area Power Administration – Desert Southwest Region
SPILL RESPONSE PLAN

SPILL DEFINITION APPENDIX

APPLICABILITY: The Spill Response Plan applies to the first person to discover a spill and the cleanup crew.

SPILL DEFINITION:

PETROLEUM PRODUCTS WITHOUT PCBs (including kerosene, jet fuel, gasoline, diesel fuel, hydraulic fluid, electrical insulating oil, etc.): any amount on the ground or any amount that reaches or may reach a water body (e.g., irrigation ditch, perennial or intermittent stream, or lake), wetland, or drain.

OIL CONTAINING DETECTABLE AMOUNTS OF PCB, BUT LESS THAN 50 PPM: Any amount that reaches the ground.

PCB-OIL: Any quantity of PCB (50 PPM or greater) running off or about to run off the surface of the equipment or that reaches the ground.

BATTERY ACID: Any amount of battery acid that cannot be cleaned up immediately or any amount that reached the ground or a drain.

UNKNOWN CHEMICALS: Any amount of unknown spilled chemical.

PESTICIDES: Any amount of spilled pesticide (herbicide, insecticide, rodenticide, etc.).

SPILLS THAT DO NOT NEED TO BE REPORTED: This plan does not apply to incidental spills, drips, and leaks of chemicals and liquids (unless described above) that are encountered in the normal course of business and are promptly cleaned up and properly disposed of under the following conditions.

1) You routinely handle and know the hazards of that substance; and
2) You have read and understand the MSDS; and
3) You received hazard communication training within the last two years.

Western Area Power Administration – Desert Southwest Region
SPILL RESPONSE PLAN

SPILL RESPONSE PROCEDURES

These procedures are for guidance in spill response at DSW facilities.

1) Stop the discharge and contain the flow.

Prior to stopping or containing the flow, wear appropriate personal protective equipment.

Your main goal is stop the spill from spreading, both into the ground and along the surface. You will do this through quick response and prompt cleanup. Stop spreading by catching, blocking, damming, or diverting the spill into a smaller area. You may have to construct berms or diversions. Use buckets or drums to catch liquid leaking or spilling from equipment. Use sorbent material to catch or contain spilled liquid. Make sure the absorbent material you use is designed for use with the spilled substance. For example, some acids and bases may not be compatible with some types of absorbents.

In some cases you may have to block drains, ditches, and culverts. Cover culverts with sheets of plastic and secure with rocks or dirt. Build temporary earthen or sorbent dams in ditches and/or other drainage.

NOTE: If the flow cannot be contained within a reasonable amount of time, notify Dispatch immediately (see Section 2 below) so additional cleanup-crew members can be dispatched.

2) Immediately notify Dispatch.

Report the following to Dispatch:

Dispatch	**Phone: 1-800-973-7583**

- Exact location and equipment involved,
- exact time and date of spill and discovery,
- suspected cause of the spill,
- substance spilled, estimated quantity in gallons, and PCB content (ppm), if applicable,
- immediate actions taken to contain spill,
- personnel available for containment and/or cleanup response, and
- probability of spill reaching a water body (e.g., irrigation ditch, perennial or intermittent stream, or lake), wetland or drain.

Dispatch and Environment will make notifications listed in the NOTIFICATIONS APPENDIX.

3) Cleanup the spilled material.

a) Spills of battery acids, solvents, and other chemicals routinely used by Western:

Be sure you have read and understand the MSDS. Do not respond to unknown chemical spills.

Wear personal protection equipment appropriate for the chemical involved.

Remove all spilled material, contaminated soil, and debris. Clean contaminated facility equipment (e.g., scaffolds, electrical components, etc.) and non-disposable cleanup equipment (e.g., shovels, backhoe, etc.) with rags and cleaner. Use sorbent material to absorb liquids. Be sure the absorbents you use are compatible with the chemical.

Remove contaminated soil and gravel. Place contaminants and debris in DOT-approved containers for disposal. Use compatible containers and/or liners when acid or other caustic materials are involved. If containers are not immediately available, build a containment area, line it with heavy duty plastic cover the cleanup debris with more plastic, and weight the plastic down with anything that will hold it against the wind.

b) Spills of oil containing no measurable amount of PCBs:

Remove all oil and oil-stained soil. Clean oil-stained equipment (e.g., scaffolds, electrical components, etc.) and non-disposable cleanup equipment (e.g., shovels, backhoe, etc.) with rags. IF necessary, use a solvent that is non-hazardous. Use sorbent material to absorb oil. Use pumps to remove large amounts of freestanding oil and oil/water mixtures. Place emulsified oil and water into drums or tanks and allow it to settle until the oil can be removed. Contact Environment for procedures to remove oil from oil/water mixtures. Generally all of the water and oil mixture is removed as waste oil. It is nearly impossible to sufficiently clean the water for release back to the environment.

Remove oil stained and/or soaked soil and gravel. Place spilled oil, oil-stained soil, sorbents, solvent used for cleaning, rags, and other expendable material in DOT-approved containers for disposal. Place oil-stained soil in DOT-approved containers or load into a dump truck or other suitable containers at the discretion of the cleanup crew supervisor. Line the dump truck with plastic first. If containers or trucks are not available and in the usual case where it will take several days to get state approval to dispose of the waste, stockpile the material on large sheets of plastic, cover with more plastic and weight down the cover against the wind. Place new gravel where oil-stained gravel was removed.

c) Spills of oil containing any measurable amount (i.e., above current detection limits) of PCBs but less than 50 PPM:

Wear appropriate personal protection equipment when cleaning up oil containing PCBs.

Remove all oil, oil-stained soil, and a 1-foot buffer of soil around the visible spill area. Clean oil-stained equipment (e.g., scaffolds, electrical components, etc.) and non-disposable cleanup

equipment (e.g., backhoe, etc.) using the "double wash/rinse" method required by the regulations (see definition below). Do not use solvents that would become hazardous wastes.

Use sorbent material to absorb oil. Use pumps to remove large amounts of free standing oil and oil/water mixtures. The pump may have to be disposed of since PCB decontamination of a pump is difficult or impossible. Remove oil stained and soaked soil and gravel. Place spilled oil, oil-stained soil, sorbents, disposable personal protective equipment, solvent used for cleaning, rags, and other expendable materials in DOT-approved containers for disposal.

After decontamination, take random grab samples from the area of the spill and analyze them for PCB content. Clean the spill area to the lowest level you can through the use of normal cleanup methods. Place new gravel where oil-stained gravel was removed.

> NOTE: "***Double wash/rinse*** means a minimum requirement to cleanse solid surfaces (both impervious and nonimpervious) two times with an appropriate solvent (Generally, PF Solvent and some of the citrus-based solvents work well). A volume of PCB-free fluid sufficient to cover the contaminated surface completely must be used in each wash/rinse. The wash/rinse requirement does not mean the mere spreading of solvent or other fluid over the surface, nor does the requirement mean a once-over wipe with a soaked cloth. Precautions must be taken to contain any runoff resulting from the cleansing and to dispose properly of wastes generated during the cleansing."

d) <u>Spills involving: 1) less than 1 pound of PCBs, by weight, from oil that is 50 PPM or greater but less than 500 PPM PCBs or 2) less than 270 gallons of untested mineral oil</u>:
NOTE: The procedures below must be completed within 48 hours of the original notification to Dispatch or Environment.

Wear appropriate personal protection equipment when cleaning up oil containing PCBs.

Remove all oil, oil-stained soil, and a 1-foot buffer of soil around the visible spill area. Clean oil-stained equipment (e.g., scaffolds, electrical components, etc.) and non-disposable cleanup equipment (e.g., backhoe, etc.) using the "double wash/rinse" method described above.

Use sorbent material to absorb oil. Use pumps to remove large amounts of free standing oil or oil/water mixtures. The pump may have to be disposed of since PCB decontamination of a pump is difficult or impossible. Remove oil stained or soaked soil and gravel. Place spilled oil, oil-stained soil, sorbents, disposable personal protective equipment, solvent used for cleaning, rags, and other expendable materials in DOT-approved containers for disposal.

After decontamination, take random grab samples from the area of the spill for PCB content analysis. Restore the cleanup to its original configuration by back-filling with clean soil and/or gravel.
Environment or Dispatch will obtain cleanup measures for spills that contaminate surface water, sewers, drinking water, grazing lands, and vegetable gardens from the EPA as described in the **NOTIFICATIONS APPENDIX**.

e) Spills involving: 1) oil containing greater than 500 PPM PCBs, 2) 1 pound or more of PCBs, by weight, from oil that is 50 PPM or greater but less than 500 PPM PCBs, or 3) 270 gallons or more of untested mineral oil:
NOTE: Begin the cleanup described below and restrict access to the spill area and document these actions within 24 hours of when you notify. See 40CFR761.125(c)(1) for details.

Wear appropriate personal protection equipment when cleaning up oil containing PCBs.

Remove all oil, oil-stained soil, and a 1-foot buffer of soil around the visible spill area. For spills where there are insufficient visible traces yet there is other evidence of a spill, determine the boundaries of the spill by using a statistically based sampling scheme. Clean oil-stained equipment (e.g., scaffolds, electrical components, etc.) and non-disposable cleanup equipment (e.g., backhoe, etc.) using the "double wash/rinse" method described above. Do not use solvents that would become hazardous wastes.

Use sorbent material to absorb oil. Use pumps to remove large amounts of free standing oil and oil/water mixtures. The pump may have to be disposed of since PCB decontamination of a pump is difficult or impossible. Remove oil stained or soaked soil and gravel. Place spilled oil, oil-stained soil, sorbents, disposable personal protective equipment, solvent used for cleaning, rags, and other expendable materials in DOT-approved containers for disposal.

After decontamination, take samples from the area of the spill according to the EPA Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup and Verification of PCB Cleanup by Sampling and Analysis and analyze for PCB content (NOTE: Environment Personnel will do the sampling). Clean the spill area according to the regulations or to the lowest level you can with normal cleanup methods, whichever results in lower concentration. Complete decontamination promptly. After decontamination, place new gravel where oil-stained gravel was removed.

Environment or Dispatch will obtain cleanup requirements for spills that contaminate surface water, sewers, drinking water, grazing lands, and vegetable gardens from the EPA as described in the NOTIFICATIONS APPENDIX. Unusual cleanups, such as cleanups of groundwater, surface water, wetlands, and so forth will be managed by Environment.

4) File a Spill Report.

The cleanup crew supervisor will complete a Spill Report (see **SPILL REPORT APPENDIX**) and submit to the appropriate Manager within 48 hours. The Manager will review and revise the Spill Report Form and forward it to the Office of Environment as soon as possible. Environment will forward the report to management and regulatory agencies.

5) Dispose of the Waste. (Contact the Office of Environment for assistance).

a) Waste from spills of battery acids, solvents, and other chemicals:

Label containers used for disposal with the content and date. Contact Environment for disposal information.

b) Waste from spills of oil containing no measurable amount of PCBs:

Label containers used for disposal with the content and date. Contact Environment for the location of a disposal site. Environment will usually need a few days to a couple of weeks to obtain sample results and other information to get permission to dispose of the soil. Remember this when you are cleaning up the spill.

c) Waste from spills of oil containing PCBs at concentrations of less than 50 PPM:

Label containers used for disposal with the content and date. Contact Environment for a location for disposal of the containers. Dispose of the containers in a manner that is both economically feasible and environmentally safe (i.e., incineration, PCB landfill, or industrial waste landfill, or permitted low level PCB oil recycler). Environment will manage the disposal of the waste and the requirements with the regulatory agencies.

d) Waste from spills of oil containing PCBs at concentrations of 50 PPM or greater:

Label containers used for disposal with the content and date (See Western's Power System Maintenance Manual, Chapter 5, Labeling of Polychlorinated Biphenyl (PCB) Items for proper use of labels). Send these PCB waste containers to one of the RMR PCB storage buildings with a completed Bill of Lading within 30 days of the day the articles were first placed in them for storage. If it is not desirable or practical to ship the waste to these PCB storage buildings, then Environment will arrange to ship them to a permanent PCB disposal site within 30 days of the day the articles were first placed in the containers. Ship PCB containers in the PCB storage buildings to a permitted PCB disposal or treatment facility within nine months from the time the waste articles were first placed in the PCB waste containers. Label the vehicle used to transport PCB waste containers on all four sides with PCB labels if 45 kilograms (99.4 pounds) in the liquid phase or one or more PCB transformers are being shipped.

> **NOTE: Dispose of contaminated personal clothing as contaminated PCB debris if the clothing is contaminated during cleanup or handling of equipment, items, or material containing any concentration of PCBs**.

sewers, drinking water, grazing lands, and vegetable gardens from the EPA as described on pages 9 & 10. Unusual cleanups, such as cleanups of groundwater, surface water, wetlands, and so forth will be managed by Environment.

Equipment, materials, and personnel available are listed on pages 8 and 9.

9) File a Spill Report.

The cleanup crew supervisor will complete a Spill Report Form (see page 13) and submit to the appropriate Manager within 48 hours of spill discovery. The Manager will review and revise the

Spill Report Form and forward it to the Office of Environment as soon as possible. Environment will forward the report to management and regulatory agencies.

10) Dispose of the Waste. (Contact the Office of Environment for assistance).

a) Waste from spills of battery acids, solvents, and other chemicals:

Label containers used for disposal with the content and date. Contact Environment for disposal information.

b) Waste from spills of oil containing no measurable amount of PCBs:

Label containers used for disposal with the content and date. Contact Environment for the location of a disposal site. Environment will usually need a few days to a couple of weeks to obtain sample results and other information to get permission to dispose of the soil. Remember this when you are cleaning up the spill.

c) Waste from spills of oil containing PCBs at concentrations of less than 50 PPM:

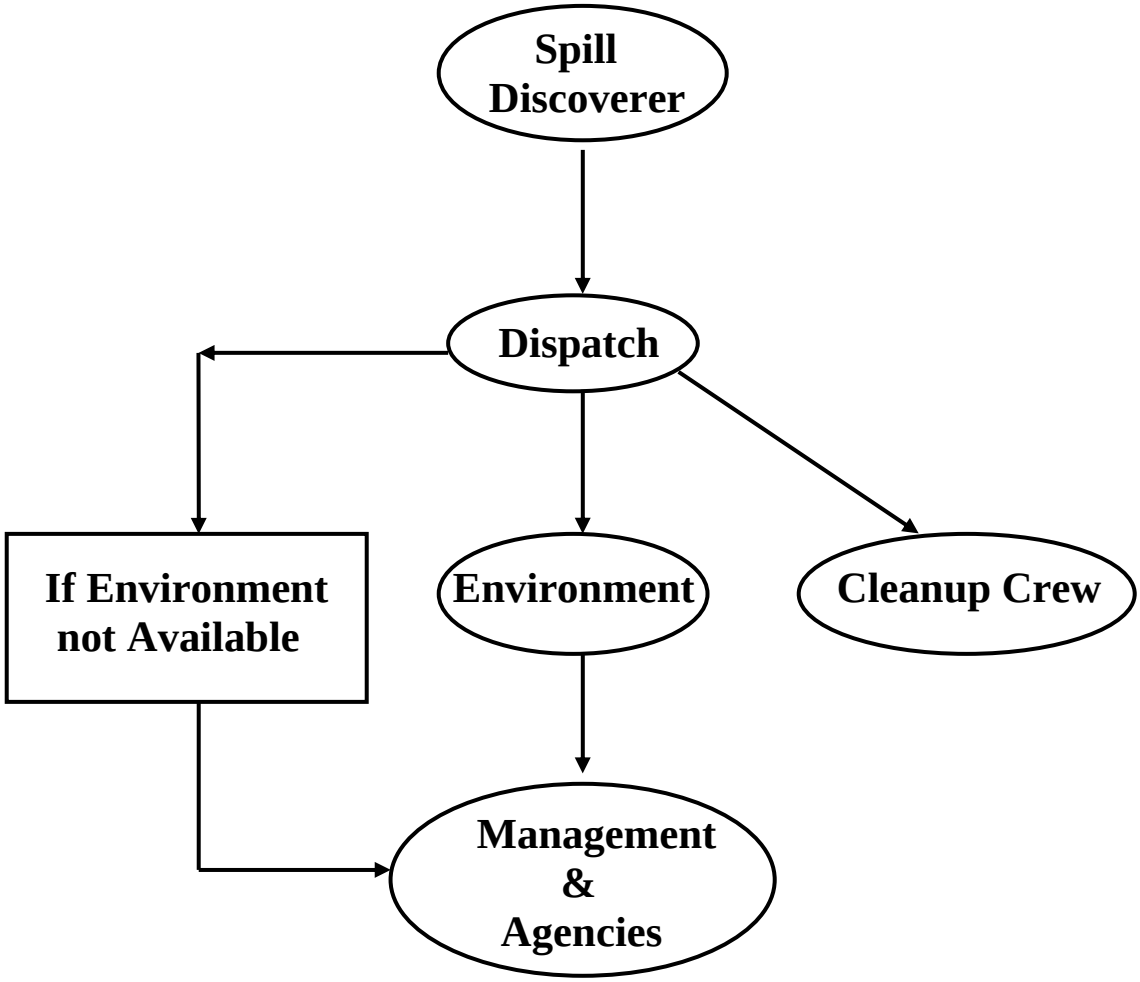
Label containers used for disposal with the content and date. Contact Environment for a location for disposal of the containers. Dispose of the containers in a manner that is both economically feasible and environmentally safe (i.e., incineration, PCB landfill, or industrial waste landfill, or permitted low level PCB oil recycler). Environment will manage the disposal of the waste and the requirements with the regulatory agencies.

d) Waste from spills of oil containing PCBs at concentrations of 50 PPM or greater:

Label containers used for disposal with the content and date (See Western's Power System Maintenance Manual, Chapter 5, Labeling of Polychlorinated Biphenyl (PCB) Items for proper use of labels). Send these PCB waste containers to one of the DSW PCB storage buildings with a completed Bill of Lading within 30 days of the day the articles were first placed in them for storage. If it is not desirable or practical to ship the waste to these PCB storage buildings, then Environment will arrange to ship them to a permanent PCB disposal site within 30 days of the day the articles were first placed in the containers. Ship PCB containers in the PCB storage buildings to a permitted PCB disposal or treatment facility within nine months from the time the waste articles were first placed in the PCB waste containers. Label the vehicle used to transport PCB waste containers on all four sides with PCB labels if 45 kilograms (99.4 pounds) in the liquid phase or one or more PCB transformers are being shipped.

NOTE: Dispose of contaminated personal clothing as contaminated PCB debris if the clothing is contaminated during cleanup or handling of equipment, items, or material containing any concentration of PCB's.

NOTIFICATIONS



Western Area Power Administration – Desert Southwest Region
SPILL RESPONSE PLAN

NOTIFICATIONS APPENDIX

AGENCY	PHONE NUMBERS
U. S. Coast Guard National Response Center (NRC) Spill Conditions for Report**:** 1) Any RQ (i.e., 1 lb. of PCB by weight) or 2) oil spilled or threatens to spill into navigable waters.	1-800-424-8802 (24 hours)
ADEQ Emergency Response, 1110 W. Washington St., Phoenix, AZ 85007. Spill Conditions for Report**:** 1) Any RQ (i.e., 1 lb. of PCB by weight), 2) any amount of oil, or 3) any oil onto surface waters.	800-234-5677 (24 hours)
AZ SERC. Spill Conditions for Report**:** 1) Any RQ (i.e., 1 lb. of PCB by weight), 2) 25 gallons or more of oil, or 3) any oil onto surface waters	602-677-6914
U.S. Environmental Protection Agency, Region IX *** 24-Hour Environmental Emergencies, Spill Conditions for Report**:** 1) 50 PPM or greater PCBs directly contaminates surface water, sewers, drinking water supplies, grazing lands, or vegetable gardens or 2) exceeds 1 pound of PCBs by weight *** *NOTE: Region IX includes AZ, CA, NV*	1-800-300-2193 (24 hours)
U.S. Department of Energy File the special DOE Report Form for both "Unusual" and "Off-Normal" occurrences by next business day. The DOE report form and an example can be found on the DSW LAN at 'N: Jn1sn\User\ Division\ENVIRON\Report'. Email the completed form to: steven.woodbury@eh.doe.gov with CCs to mathias@wapa.gov. For information call Steve Woodbury at 202-586-4371 or Larry Sterling at 202-586-2417. Spill Conditions for Report**:** "Unusual" Occurrences = Spills of 1) Any RQ (i.e., 1 lb. of PCB by weight) or 2) 100 gallons or more of oil "Off-Normal" Occurrences = Spills of 1) 50% of any RQ (i.e., 1/2 lb. of PCB), 2) 42 gallons or more of oil, or 3) any release that is reported to a State/local agency	NO PHONE NOTIFICATION REQUIRED
Arizona Highway Patrol Spill Conditions for Report**:** Any spill on or near a public road.	602-223-2000

Western Area Power Administration – Desert Southwest Region
SPILL RESPONSE PLAN

CLEANUP APPENDIX

PCB CHART: Pounds of PCB may be calculated with the following formula or derived from the chart below:

- Pounds of PCB = [13.64 (PPM) (Gallons)] / [0.91 (PPM) + 1.8 (1,000,000 - PPM)]

POUNDS OF PCB AT DIFFERENT GALLONS AND PPM

	GALLONS															
PPM	1	10	15	25	50	75	100	200	300	400	500	600	700	800	900	1000
50	0	0	0.01	0.01	0.02	0.03	0.04	0.076	0.114	0.152	0.189	0.227	0.2652	0.303	0.341	0.379
100	0	0.01	0.01	0.02	0.04	0.06	0.08	0.152	0.227	0.303	0.379	0.455	0.5305	0.606	0.682	0.758
200	0	0.02	0.02	0.04	0.08	0.11	0.15	0.303	0.455	0.606	0.758	0.909	**1.061**	**1.213**	**1.364**	**1.516**
300	0	0.02	0.03	0.06	0.11	0.17	0.23	0.455	0.682	0.909	**1.137**	**1.364**	**1.5916**	**1.819**	**2.046**	**2.274**
400	0	0.03	0.05	0.08	0.15	0.23	0.3	0.606	0.91	**1.213**	**1.516**	**1.819**	**2.1222**	**2.425**	**2.729**	**3.032**
500	0	0.04	0.06	0.09	0.19	0.28	0.38	0.758	**1.137**	**1.516**	**1.895**	**2.274**	**2.6529**	**3.032**	**3.411**	**3.79**
600	0	0.05	0.07	0.11	0.23	0.34	0.45	0.91	**1.364**	**1.819**	**2.274**	**2.729**	**3.1836**	**3.638**	**4.093**	**4.548**
700	0.01	0.05	0.08	0.13	0.27	0.4	0.53	**1.061**	**1.592**	**2.123**	**2.653**	**3.184**	**3.7144**	**4.245**	**4.776**	**5.306**
800	0.01	0.06	0.09	0.15	0.3	0.45	0.61	**1.213**	**1.819**	**2.426**	**3.032**	**3.639**	**4.2452**	**4.852**	**5.458**	**6.065**
900	0.01	0.07	0.1	0.17	0.34	0.51	0.68	**1.365**	**2.047**	**2.729**	**3.412**	**4.094**	**4.7761**	**5.458**	**6.141**	**6.823**
1000	0.01	0.08	0.11	0.19	0.38	0.57	0.76	**1.516**	**2.274**	**3.033**	**3.791**	**4.549**	**5.4061**	**6.065**	**6.823**	**7.582**
2000	0.02	0.15	0.23	0.38	0.76	**1.14**	**1.52**	**3.034**	**4.551**	**6.068**	**7.585**	**9.102**	**10.619**	**12.14**	**13.65**	**15.17**
3000	0.02	0.23	0.34	0.57	**1.14**	**1.71**	**2.28**	**4.553**	**6.83**	**9.107**	**11.38**	**13.66**	**15.937**	**18.21**	**20.49**	**22.77**
4000	0.03	0.3	0.46	0.76	**1.52**	**2.28**	**3.04**	**6.074**	**9.111**	**12.15**	**15.19**	**18.22**	**21.26**	**24.3**	**27.33**	**30.37**
5000	0.04	0.38	0.57	0.95	**1.9**	**2.85**	**3.8**	**7.597**	**11.39**	**15.19**	**18.99**	**22.79**	**26.588**	**30.39**	**34.18**	**37.98**
6000	0.05	0.46	0.68	**1.14**	**2.28**	**3.42**	**4.56**	**9.12**	**13.68**	**18.24**	**22.8**	**27.36**	**31.921**	**36.48**	**41.04**	**45.6**
7000	0.05	0.53	0.8	**1.33**	**2.66**	**3.99**	**5.32**	**10.65**	**15.97**	**21.29**	**26.61**	**31.94**	**37.26**	**42.58**	**47.91**	**53.23**
8000	0.06	0.61	0.91	**1.52**	**3.04**	**4.56**	**6.09**	**12.17**	**18.26**	**24.35**	**30.43**	**36.52**	**42.604**	**48.69**	**54.78**	**60.86**
9000	0.07	0.69	**1.03**	**1.71**	**3.43**	**5.14**	**6.85**	**13.7**	**20.55**	**27.4**	**34.25**	**41.1**	**47.953**	**54.8**	**61.65**	**68.5**
10000	0.08	0.76	**1.14**	**1.9**	**3.81**	**5.71**	**7.62**	**15.23**	**22.85**	**30.46**	**38.08**	**45.69**	**53.308**	**60.92**	**68.54**	**76.15**

OIL SPILL RESPONSE PLAN FOR TRANSPORTATION OF OIL IN BULK IN QUANTITIES OF 3,500 GALLONS OR MORE

When This Plan Applies: This plan meets the requirements of 49 CFR 130, "Oil Spill Prevention and Response Plans" (Oil Spill Plan). The plan is required when transporting any quantity of petroleum oil, including dielectric oil, in a tank or other container with a **capacity** of 3,500 gallons or more. In other words, if your **tanker or mobile transformer** has a capacity of 3,500 gallons or more, although you are transporting less than 3,500 gallons, this plan is required. Transportation includes loading and unloading tank trucks as well as driving the trucks on public roads.

What you Need to Transport Oil

1) **Shipping paper** that indicates what the tank contains.
   - Example: bill of lading that indicates that the tank contains dielectric oil or transformer oil.
   - Carry the shipping paper with you in the cab of the truck.

2) **Spill Response Plan** (this plan)
   - At the office from which the oil transportation is managed and
   - on the truck.

CLEANUP APPENDIX

3) **Spill Control Equipment** to be carried on truck:
    - Shovels
    - Absorbent booms and blankets
    - Personal protective equipment (tyvek coveralls, gloves, booties)
    - Tools to repair valves
    - Large, heavy-duty plastic bags or other containers

Spill Response

1) This **Spill Response Plan** applies to bulk oil transportation.

2) Repair leaking tanks and equipment immediately. Make sure repairs are sufficient to stop leaks and the leaks do not continue during transportation.

    - The cleanup crew completes the Spill Report Form (see page 13) and submits it to their State Manager within 48 hours of spill discovery.

    - The State Manager reviews and revises, if necessary, the Spill Report Form and forwards it to the Office of Environment as soon as possible.

    - Environment forwards the Spill Report Form to management and regulatory agencies as appropriate.

ON SITE SPILL REPORT FORM
(To Be Complete On-Site the Day of the Spill)

SPILL REPORT APPENDIX

FACILITY/MOBILE UNIT_____ RECORD DATE _____

Name of Recorder and Phone Number	
Date and Time of Spill	
Date and Time of Discovery	
Material Spilled	
PCB Content (ppm) if Applicable	
Quantity Spilled (Gallons)	
Location of Spill within Facility	
Source of Spill (Equipment Involved)	
Cause of Spill	
Corrective Actions Being Taken and Time That Will Be Needed To Contain and Cleanup the Spill	
Personnel Available For Response	
Probability of Spill Reaching a Waterbody or Harming the Environment	
Waterway Affected	
Amount Entering Waterway	
Other Environmental Damage	
Comments or Other Information	

DESERT SOUTHWEST REGION
RIGHT-OF-WAY MANAGEMENT POLICY

PURPOSE: Set forth procedures for implementing WAPA Order 430.1A, dated March 18, 2008, Right-of-Way Management Guidance for Vegetation, Encroachments, and Access Routes.

DEFINITIONS:

Danger Trees Trees located within or adjacent to the easement or permit area that present a hazard to employees, the public, or power system facilities. Characteristics used in identifying a danger tree include but are not limited to the following:

- encroachment within the safe distance to the conductor as a result of the tree bending, growing, swinging, or falling toward the conductor;
- deterioration or physical damage to the root system, trunk, stem or limbs and/or the direction and lean of the tree;
- vertical or horizontal conductor movement and increased sag as a result of thermal, wind, and ice loading;
- exceeding facility design specifications;
- fire risk;
- other threats to the electric power system facilities or worker/public safety.

Emergency Situations An emergency situation occurs when a danger tree or encroachment poses an immediate danger to Western's facility as well as the welfare of the public and Western's maintenance personnel. For these situations it is not necessary to notify a landowner or government entity prior to removing the danger tree or encroachment.

Encroachments Encroachments are conditions or developments that occur within the transmission line ROW that impair Western's rights to operate and maintain the facilities or present a hazard to the safe operation of the power system. Examples of potential encroachments are houses, businesses, signs, light structures, outbuildings, landfills, roadways, vegetation, etc.

Maintenance Manager The individual located in the Regional or Field Office who is accountable for managing maintenance and/or operations functions.

Right-of-Way (ROW) Western acquires easements across State and private lands, is issued grants, permits or easements across Federal lands, and assumed the Bureau of Reclamation (Reclamation) responsibilities set forth in various agreements historically negotiated between Reclamation and other Federal agencies, such as the Bureau of Land Management, Bureau of Indian Affairs, National Park Service and U.S. Forest Service. As applied to a specific situation, ROW refers to rights acquired by Western as set forth in the applicable granting document.

Western Authorized Representative The Western field representative in the Region who has the authority to take a maintenance action (this will be the Regional Manager or his designee).

ROLES AND RESPONSIBILITIES:

DSW's Manager for Transmission Line and Substation Maintenance develops strategies and procedures, in coordination with Regional safety, environmental, and realty personnel, to resolve danger tree issues in and along Western's transmission line easements and ROW permit areas. Manager coordinates with Regional personnel on resolutions, compensations, and public relation issues involving danger trees.

Foreman III – Schedules routine aerial/ground patrols to identify; coordinates the tree removal with landowner whenever possible; schedules tree removal; coordinates tree removal with Regional personnel to insure compliance with environmental and safety requirements; coordinates with Lands to identify the terms and conditions of the easement contracts and/or permits; maintains applicable records. Foreman III will have work performed by Contractors and/or DSWR Line Crew personnel. However, in the future, tree-felling type work will be done primarily by Contractors.

Line Crew – conducts routine aerial/ground patrols to identify trees. Line Crew serves as an initial contact with landowners. Line Crew reports all pertinent information to Foreman III and Lands. May at the discretion of the Foreman III perform the removal of danger trees or act as monitor for contract personnel.

Realty Specialist – Support maintenance personnel in the identification and resolution of trees including any related public relations issues and potential compensation or tort claim problems. The Regional Realty personnel also provide coordination in working with the landowners and have the responsibility of identifying land rights, including vegetation control rights.

Environmental Specialist – Support maintenance personnel in the resolution of trees relative to environmental clearances.

Safety Manager – Assists Maintenance and Lands with obtaining local law enforcement in cases when the landowner has threatened the safety of Western's personnel.

Tree Removal Criteria (reference WAPA Order 430.1A): The following table provides criteria for tree removal or trimming when the clear distance from the nearest point on a tree to the conductor is less than the distances specified for the voltage shown. The Maintenance Manger has discretion in applying a more stringent criterion based upon the danger tree problems, landownership, terrain, and contract easement or permit rights to remove such trees.

Transmission Line ROW Minimum Clearance Requirements For Vegetation After Treatment

Line Voltage	Minimum Clearance Between Conductor and Vegetation
69-kV	20 feet
115-kV	21 feet
138-kV	22 feet
161-kV	22 feet
230-kV	23 feet
345-kV	26 feet
500-kV	29 feet

Procedures for Danger Trees:

If a tree is within the minimum clearance distances listed above the tree may be removed immediately in cases of emergency or scheduled to be removed.

Steps to be followed:

- Line Crew identifies tree problem by aerial and ground patrol.
- Line Crew reports problem with as much information as possible to Foreman III and Realty Specialist.
- Foreman III reviews report with Line Crew. At the same time the Realty Specialist researches the ownership and reviews the contract and /or permit. Also, the Environmental Specialist reviews the information for environmental clearance.
- If the tree is on private land then 1) where provided in the easement contract the tree may be removed within and adjacent to the easement, no compensation is required but the landowner may file a tort claim; 2) if the easement does not allow for removal of the tree then compensation for the tree must be negotiated prior to removing the tree. However, if the tree is presenting an emergency situation then the tree should be removed immediately and the underlying landowner may file a tort claim; 3) if the easement contracts specify special circumstances, i.e. trees

may only be topped or trimmed, the Realty Officer negotiates modifications to the easement contract to allow tree removal.

- If the tree is on public land then 1). Where provided in the permit the trees may be removed within the permit areas; 2). Where the permit terms dictate trees may only be topped the Realty Officer negotiates modifications to the permit to allow tree removal 3). Where the permit does not provide for the removal of danger tress then such trees may be removed after notification to the Federal land manager.

- Foreman III schedules the tree for removal coordinating with Environment, Lands and the landowner; 1) Lands will send a notification letter to landowner, 2) environment reviews for compliance.

- Safety may need to coordinate the tree removal with the local law enforcement agencies in cases where the landowner has posed a threat to maintenance personnel.

- Contractor or Line Crew removes the tree on the scheduled date.

- Foreman III will coordinate with Environmental and where allowable, notify a Contractor to treat tree stump with chemical to prevent re-growth.

- Foreman III will maintain all applicable records.

Procedures for Non Danger Trees: If distance to tree is less than the minimum clearance distances listed above, the tree may be removed or trimmed to meet the clearance requirement. Coordinate with the landowner and schedule the necessary work to either remove the tree or follow up to verify the landowner trims the tree, as Western will not trim trees.

Steps to be followed:

- Line Crew investigates the findings of the aerial or ground patrol and initially determines the category rating for the tree. The Lineman shall fill out right-of-way report with all pertinent information, location, access, problems, clearance, and may also discuss the alternatives with the landowner. If the landowner is not present then a notification card is left on the doorknob

- Realty Specialist will send a notification letter advising landowner to have the tree trimmed or Western will remove by a defined date. When applicable, the above requirements for contract review and compensation shall be performed.

Summary: It is Desert Southwest's strategy that danger trees and potential danger trees will be removed from within or adjacent to the easement. Western will not trim trees but will notify the underlying landowner of the importance of either removing the tree or having the tree trimmed to comply with safe clearances.

When the removal of a danger tree is necessary within or adjacent to the easement the following actions should be considered:

- If the easement or permit allows for the removal of the tree no compensation is required. Western will notify the underlying landowner of the danger and schedule the date to have the tree removed. If the tree poses an emergency situation and no prior notification to the underlying landowner is possible then the tree should be removed immediately. The landowner may file a tort claim.

- If the easement does not allow for removal of the tree, compensation for the tree must be negotiated prior to removal. However, if the tree is presenting an emergency situation then as stated above the tree should be removed immediately and the underlying landowner may file a tort claim.

- If the contract or permit has special circumstances, i.e. the trees may only be topped or trimmed then modifications to the easement contract or permit to allow tree removal will be negotiated by the Regional Realty Officer.

_____ _____

Rick Hillis Date
Assistant Regional Manager
For Maintenance

A. Introduction

1. Title: **Transmission Vegetation Management Program**

2. Number: FAC-003-1

3. Purpose: To improve the reliability of the electric transmission systems by preventing outages from vegetation located on transmission rights-of-way (ROW) and minimizing outages from vegetation located adjacent to ROW, maintaining clearances between transmission lines and vegetation on and along transmission ROW, and reporting vegetation-related outages of the transmission systems to the respective Regional Reliability Organizations (RRO) and the North American Electric Reliability Council (NERC).

4. Applicability:

4.1. Transmission Owner.

4.2. Regional Reliability Organization.

4.3. This standard shall apply to all transmission lines operated at 200 kV and above and to any lower voltage lines designated by the RRO as critical to the reliability of the electric system in the region.

5. Effective Dates:

5.1. One calendar year from the date of adoption by the NERC Board of Trustees for Requirements 1 and 2.

5.2. Sixty calendar days from the date of adoption by the NERC Board of Trustees for Requirements 3 and 4.

B. Requirements

R1. The Transmission Owner shall prepare, and keep current, a formal transmission vegetation management program (TVMP). The TVMP shall include the Transmission Owner's objectives, practices, approved procedures, and work specifications[1].

R1.1. The TVMP shall define a schedule for and the type (aerial, ground) of ROW vegetation inspections. This schedule should be flexible enough to adjust for changing conditions. The inspection schedule shall be based on the anticipated growth of vegetation and any other environmental or operational factors that could impact the relationship of vegetation to the Transmission Owner's transmission lines.

R1.2. The Transmission Owner, in the TVMP, shall identify and document clearances between vegetation and any overhead, ungrounded supply conductors, taking into consideration transmission line voltage, the effects of ambient temperature on conductor sag under maximum design loading, and the effects of wind velocities on conductor sway. Specifically, the Transmission Owner shall establish clearances to be achieved at the time of vegetation management work identified herein as Clearance 1, and shall also establish and maintain a set of clearances identified herein as Clearance 2 to prevent flashover between vegetation and overhead ungrounded supply conductors.

R1.2.1. Clearance 1 — The Transmission Owner shall determine and document appropriate clearance distances to be achieved at the time of transmission vegetation management work based upon local conditions and the expected time frame in which the Transmission Owner plans to return for future

[1] ANSI A300, Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices, while not a requirement of this standard, is considered to be an industry best practice.

vegetation management work. Local conditions may include, but are not limited to: operating voltage, appropriate vegetation management techniques, fire risk, reasonably anticipated tree and conductor movement, species types and growth rates, species failure characteristics, local climate and rainfall patterns, line terrain and elevation, location of the vegetation within the span, and worker approach distance requirements. Clearance 1 distances shall be greater than those defined by Clearance 2 below.

R1.2.2. Clearance 2 — The Transmission Owner shall determine and document specific radial clearances to be maintained between vegetation and conductors under all rated electrical operating conditions. These minimum clearance distances are necessary to prevent flashover between vegetation and conductors and will vary due to such factors as altitude and operating voltage. These Transmission Owner-specific minimum clearance distances shall be no less than those set forth in the Institute of Electrical and Electronics Engineers (IEEE) Standard 516-2003 (*Guide for Maintenance Methods on Energized Power Lines*) and as specified in its Section 4.2.2.3, Minimum Air Insulation Distances without Tools in the Air Gap.

R1.2.2.1 Where transmission system transient overvoltage factors are not known, clearances shall be derived from Table 5, IEEE 516-2003, phase-to-ground distances, with appropriate altitude correction factors applied.

R1.2.2.2 Where transmission system transient overvoltage factors are known, clearances shall be derived from Table 7, IEEE 516-2003, phase-to-phase voltages, with appropriate altitude correction factors applied.

R1.3. All personnel directly involved in the design and implementation of the TVMP shall hold appropriate qualifications and training, as defined by the Transmission Owner, to perform their duties.

R1.4. Each Transmission Owner shall develop mitigation measures to achieve sufficient clearances for the protection of the transmission facilities when it identifies locations on the ROW where the Transmission Owner is restricted from attaining the clearances specified in Requirement 1.2.1.

R1.5. Each Transmission Owner shall establish and document a process for the immediate communication of vegetation conditions that present an imminent threat of a transmission line outage. This is so that action (temporary reduction in line rating, switching line out of service, etc.) may be taken until the threat is relieved.

R2. The Transmission Owner shall create and implement an annual plan for vegetation management work to ensure the reliability of the system. The plan shall describe the methods used, such as manual clearing, mechanical clearing, herbicide treatment, or other actions. The plan should be flexible enough to adjust to changing conditions, taking into consideration anticipated growth of vegetation and all other environmental factors that may have an impact on the reliability of the transmission systems. Adjustments to the plan shall be documented as they occur. The plan should take into consideration the time required to obtain permissions or permits from landowners or regulatory authorities. Each Transmission Owner shall have systems and procedures for documenting and tracking the planned vegetation management work and ensuring that the vegetation management work was completed according to work specifications.

R3. The Transmission Owner shall report quarterly to its RRO, or the RRO's designee, sustained transmission line outages determined by the Transmission Owner to have been caused by vegetation.

R3.1. Multiple sustained outages on an individual line, if caused by the same vegetation, shall be reported as one outage regardless of the actual number of outages within a 24-hour period.

R3.2. The Transmission Owner is not required to report to the RRO, or the RRO's designee, certain sustained transmission line outages caused by vegetation: (1) Vegetation-related outages that result from vegetation falling into lines from outside the ROW that result from natural disasters shall not be considered reportable (examples of disasters that could create non-reportable outages include, but are not limited to, earthquakes, fires, tornados, hurricanes, landslides, wind shear, major storms as defined either by the Transmission Owner or an applicable regulatory body, ice storms, and floods), and (2) Vegetation-related outages due to human or animal activity shall not be considered reportable (examples of human or animal activity that could cause a non-reportable outage include, but are not limited to, logging, animal severing tree, vehicle contact with tree, arboricultural activities or horticultural or agricultural activities, or removal or digging of vegetation).

R3.3. The outage information provided by the Transmission Owner to the RRO, or the RRO's designee, shall include at a minimum: the name of the circuit(s) outaged, the date, time and duration of the outage; a description of the cause of the outage; other pertinent comments; and any countermeasures taken by the Transmission Owner.

R3.4. An outage shall be categorized as one of the following:

R3.4.1. Category 1 — Grow-ins: Outages caused by vegetation growing into lines from vegetation inside and/or outside of the ROW;

R3.4.2. Category 2 — Fall-ins: Outages caused by vegetation falling into lines from inside the ROW;

R3.4.3. Category 3 — Fall-ins: Outages caused by vegetation falling into lines from outside the ROW.

R4. The RRO shall report the outage information provided to it by Transmission Owner's, as required by Requirement 3, quarterly to NERC, as well as any actions taken by the RRO as a result of any of the reported outages.

C. Measures

M1. The Transmission Owner has a documented TVMP, as identified in Requirement 1.

M1.1. The Transmission Owner has documentation that the Transmission Owner performed the vegetation inspections as identified in Requirement 1.1.

M1.2. The Transmission Owner has documentation that describes the clearances identified in Requirement 1.2.

M1.3. The Transmission Owner has documentation that the personnel directly involved in the design and implementation of the Transmission Owner's TVMP hold the qualifications identified by the Transmission Owner as required in Requirement 1.3.

M1.4. The Transmission Owner has documentation that it has identified any areas not meeting the Transmission Owner's standard for vegetation management and any mitigating measures the Transmission Owner has taken to address these deficiencies as identified in Requirement 1.4.

M1.5. The Transmission Owner has a documented process for the immediate communication of imminent threats by vegetation as identified in Requirement 1.5.

M2. The Transmission Owner has documentation that the Transmission Owner implemented the work plan identified in Requirement 2.

M3. The Transmission Owner has documentation that it has supplied quarterly outage reports to the RRO, or the RRO's designee, as identified in Requirement 3.

M4. The RRO has documentation that it provided quarterly outage reports to NERC as identified in Requirement 4.

D. Compliance

1. Compliance Monitoring Process

1.1. Compliance Monitoring Responsibility

RRO

NERC

1.2. Compliance Monitoring Period and Reset

One calendar Year

1.3. Data Retention

Five Years

1.4. Additional Compliance Information

The Transmission Owner shall demonstrate compliance through self-certification submitted to the compliance monitor (RRO) annually that it meets the requirements of NERC Reliability Standard FAC-003-1. The compliance monitor shall conduct an on-site audit every five years or more frequently as deemed appropriate by the compliance monitor to review documentation related to Reliability Standard FAC-003-1. Field audits of ROW vegetation conditions may be conducted if determined to be necessary by the compliance monitor.

2. Levels of Non-Compliance

2.1. Level 1:

2.1.1. The TVMP was incomplete in one of the requirements specified in any subpart of Requirement 1, or;

2.1.2. Documentation of the annual work plan, as specified in Requirement 2, was incomplete when presented to the Compliance Monitor during an on-site audit, or;

2.1.3. The RRO provided an outage report to NERC that was incomplete and did not contain the information required in Requirement 4.

2.2. Level 2:

2.2.1. The TVMP was incomplete in two of the requirements specified in any subpart of Requirement 1, or;

2.2.2. The Transmission Owner was unable to certify during its annual self-certification that it fully implemented its annual work plan, or documented deviations from, as specified in Requirement 2.

2.2.3. The Transmission Owner reported one Category 2 transmission vegetation-related outage in a calendar year.

2.3. Level 3:

2.3.1. The Transmission Owner reported one Category 1 or multiple Category 2 transmission vegetation-related outages in a calendar year, or;

2.3.2. The Transmission Owner did not maintain a set of clearances (Clearance 2), as defined in Requirement 1.2.2, to prevent flashover between vegetation and overhead ungrounded supply conductors, or;

2.3.3. The TVMP was incomplete in three of the requirements specified in any subpart of Requirement 1.

2.4. Level 4:

2.4.1. The Transmission Owner reported more than one Category 1 transmission vegetation-related outage in a calendar year, or;

2.4.2. The TVMP was incomplete in four or more of the requirements specified in any subpart of Requirement 1.

E. Regional Differences

None Identified.

Version History

Version	Date	Action	Change Tracking
Version 1	TBA	1. Added "Standard Development Roadmap." 2. Changed "60" to "Sixty" in section A, 5.2. 3. Added "Proposed Effective Date: April 7, 2006" to footer. 4. Added "Draft 3: November 17, 2005" to footer.	01/20/06

Effective Dates

This standard becomes effective on the first calendar day of the first calendar quarter one year after the date of the order approving the standard from applicable regulatory authorities where such explicit approval is required. Where no regulatory approval is required, the standard becomes effective on the first calendar day of the first calendar quarter one year after Board of Trustees adoption.

Requirement	Jurisdiction									
	Alberta	British Columbia	Manitoba	New Brunswick	Newfound-land	Nova Scotia	Ontario	Quebec	Saskatch-ewan	USA
R1 – R7 (All Req.)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

Effective dates for individual lines when they undergo specific transition cases:

1. A line operated below 200kV, designated by the Planning Coordinator as an element of an Interconnection Reliability Operating Limit (IROL) or designated by the Western Electricity Coordinating Council (WECC) as an element of a Major WECC Transfer Path, becomes subject to this standard the latter of: 1) 12 months after the date the Planning Coordinator or WECC initially designates the line as being an element of an IROL or an element of a Major WECC Transfer Path, or 2) January 1 of the planning year when the line is forecast to become an element of an IROL or an element of a Major WECC Transfer Path.

2. A line operated below 200 kV currently subject to this standard as a designated element of an IROL or a Major WECC Transfer Path which has a specified date for the removal of such designation will no longer be subject to this standard effective on that specified date.

3. A line operated at 200 kV or above, currently subject to this standard which is a designated element of an IROL or a Major WECC Transfer Path and which has a specified date for the removal of such designation will be subject to Requirement R2 and no longer be subject to Requirement R1 effective on that specified date.

4. An existing transmission line operated at 200kV or higher which is newly acquired by an asset owner and which was not previously subject to this standard becomes subject to this standard 12 months after the acquisition date.

5. An existing transmission line operated below 200kV which is newly acquired by an asset owner and which was not previously subject to this standard becomes subject to this standard 12 months after the acquisition date of the line if at the time of acquisition the line is designated by the Planning Coordinator as an element of an IROL or by WECC as an element of a Major WECC Transfer Path.

A. Introduction

1. **Title:** Transmission Vegetation Management

2. **Number:** FAC-003-2

3. **Purpose:** To maintain a reliable electric transmission system by using a defense-in-depth strategy to manage vegetation located on transmission rights of way (ROW) and minimize encroachments from vegetation located adjacent to the ROW, thus preventing the risk of those vegetation-related outages that could lead to Cascading.

4. **Applicability**

   4.1. Functional Entities:

   4.1.1 Transmission Owners

   4.2. Facilities: Defined below (referred to as "applicable lines"), including but not limited to those that cross lands owned by federal[1], state, provincial, public, private, or tribal entities:

   4.2.1. Each overhead transmission line operated at 200kV or higher.

   4.2.2. Each overhead transmission line operated below 200kV identified as an element of an IROL under NERC Standard FAC-014 by the Planning Coordinator.

   4.2.3. Each overhead transmission line operated below 200 kV identified as an element of a Major WECC Transfer Path in the Bulk Electric System by WECC.

   4.2.4. Each overhead transmission line identified above (4.2.1 through 4.2.3) located outside the fenced area of the switchyard, station or substation and any portion of the span of the transmission line that is crossing the substation fence.

5. **Background:**

   This standard uses three types of requirements to provide layers of protection to prevent vegetation related outages that could lead to Cascading:

   a) Performance-based — defines a particular reliability objective or outcome to be achieved. In its simplest form, a results-based requirement has four

[1] EPAct 2005 section 1211c: *"Access approvals by Federal agencies."*

components: *who, under what conditions (if any), shall perform what action, to achieve what particular bulk power system performance result or outcome*?

b) Risk-based — preventive requirements to reduce the risks of failure to acceptable tolerance levels. A risk-based reliability requirement should be framed as: *who, under what conditions (if any), shall perform what action, to achieve what particular result or outcome that reduces a stated risk to the reliability of the bulk power system*?

c) Competency-based — defines a minimum set of capabilities an entity needs to have to demonstrate it is able to perform its designated reliability functions. A competency-based reliability requirement should be framed as: *who, under what conditions (if any), shall have what capability, to achieve what particular result or outcome to perform an action to achieve a result or outcome or to reduce a risk to the reliability of the bulk power system*?

The defense-in-depth strategy for reliability standards development recognizes that each requirement in a NERC reliability standard has a role in preventing system failures, and that these roles are complementary and reinforcing. Reliability standards should not be viewed as a body of unrelated requirements, but rather should be viewed as part of a portfolio of requirements designed to achieve an overall defense-in-depth strategy and comport with the quality objectives of a reliability standard.

This standard uses a defense-in-depth approach to improve the reliability of the electric Transmission system by:

- Requiring that vegetation be managed to prevent vegetation encroachment inside the flash-over clearance (R1 and R2);
- Requiring documentation of the maintenance strategies, procedures, processes and specifications used to manage vegetation to prevent potential flash-over conditions including consideration of 1) conductor dynamics and 2) the interrelationships between vegetation growth rates, control methods and the inspection frequency (R3);
- Requiring timely notification to the appropriate control center of vegetation conditions that could cause a flash-over at any moment (R4);
- Requiring corrective actions to ensure that flash-over distances will not be violated due to work constrains such as legal injunctions (R5);
- Requiring inspections of vegetation conditions to be performed annually (R6); and
- Requiring that the annual work needed to prevent flash-over is completed (R7).

For this standard, the requirements have been developed as follows:

- Performance-based: Requirements 1 and 2
- Competency-based: Requirement 3

- Risk-based: Requirements 4, 5, 6 and 7

R3 serves as the first line of defense by ensuring that entities understand the problem they are trying to manage and have fully developed strategies and plans to manage the problem. R1, R2, and R7 serve as the second line of defense by requiring that entities carry out their plans and manage vegetation. R6, which requires inspections, may be either a part of the first line of defense (as input into the strategies and plans) or as a third line of defense (as a check of the first and second lines of defense). R4 serves as the final line of defense, as it addresses cases in which all the other lines of defense have failed.

Major outages and operational problems have resulted from interference between overgrown vegetation and transmission lines located on many types of lands and ownership situations. Adherence to the standard requirements for applicable lines on any kind of land or easement, whether they are Federal Lands, state or provincial lands, public or private lands, franchises, easements or lands owned in fee, will reduce and manage this risk. For the purpose of the standard the term “public lands” includes municipal lands, village lands, city lands, and a host of other governmental entities.

This standard addresses vegetation management along applicable overhead lines and does not apply to underground lines, submarine lines or to line sections inside an electric station boundary.

This standard focuses on transmission lines to prevent those vegetation related outages that could lead to Cascading. It is not intended to prevent customer outages due to tree contact with lower voltage distribution system lines. For example, localized customer service might be disrupted if vegetation were to make contact with a 69kV transmission line supplying power to a 12kV distribution station. However, this standard is not written to address such isolated situations which have little impact on the overall electric transmission system.

Since vegetation growth is constant and always present, unmanaged vegetation poses an increased outage risk, especially when numerous transmission lines are operating at or near their Rating. This can present a significant risk of consecutive line failures when lines are experiencing large sags thereby leading to Cascading. Once the first line fails the shift of the current to the other lines and/or the increasing system loads will lead to the second and subsequent line failures as contact to the vegetation under those lines occurs. Conversely, most other outage causes (such as trees falling into lines, lightning, animals, motor vehicles, etc.) are not an interrelated function of the shift of currents or the increasing system loading. These events are not any more likely to occur during heavy system loads than any other time. There is no cause-effect relationship which creates the probability of simultaneous occurrence of other such events. Therefore these types of events are highly unlikely to cause large-scale grid failures. Thus, this standard places the highest priority on the management of vegetation to prevent vegetation grow-ins.

B. Requirements and Measures

R1. Each Transmission Owner shall manage vegetation to prevent encroachments into the MVCD of its applicable line(s) which are either an element of an IROL, or an element of a Major WECC Transfer Path; operating within their Rating and all Rated Electrical Operating Conditions of the types shown below[2] [*Violation Risk Factor: High*] [*Time Horizon: Real-time*]:

1. An encroachment into the MVCD as shown in FAC-003-Table 2, observed in Real-time, absent a Sustained Outage,[3]
2. An encroachment due to a fall-in from inside the ROW that caused a vegetation-related Sustained Outage,[4]
3. An encroachment due to the blowing together of applicable lines and vegetation located inside the ROW that caused a vegetation-related Sustained Outage,[4]
4. An encroachment due to vegetation growth into the MVCD that caused a vegetation-related Sustained Outage.[4]

M1. Each Transmission Owner has evidence that it managed vegetation to prevent encroachment into the MVCD as described in R1. Examples of acceptable forms of evidence may include dated attestations, dated reports containing no Sustained Outages associated with encroachment types 2 through 4 above, or records confirming no Real-time observations of any MVCD encroachments. (R1)

R2. Each Transmission Owner shall manage vegetation to prevent encroachments into the MVCD of its applicable line(s) which are <u>not</u> either an element of an IROL, or an element of a Major WECC Transfer Path; operating within its Rating and all Rated Electrical Operating Conditions of the types shown below[2] [*Violation Risk Factor: Medium*] [*Time Horizon: Real-time*]:

1. An encroachment into the MVCD, observed in Real-time, absent a Sustained Outage,[3]
2. An encroachment due to a fall-in from inside the ROW that caused a vegetation-related Sustained Outage,[4]
3. An encroachment due to blowing together of applicable lines and vegetation located inside the ROW that caused a vegetation-related Sustained Outage,[4]

[2] This requirement does not apply to circumstances that are beyond the control of a Transmission Owner subject to this reliability standard, including natural disasters such as earthquakes, fires, tornados, hurricanes, landslides, wind shear, fresh gale, major storms as defined either by the Transmission Owner or an applicable regulatory body, ice storms, and floods; human or animal activity such as logging, animal severing tree, vehicle contact with tree, or installation, removal, or digging of vegetation. Nothing in this footnote should be construed to limit the Transmission Owner's right to exercise its full legal rights on the ROW.

[3] If a later confirmation of a Fault by the Transmission Owner shows that a vegetation encroachment within the MVCD has occurred from vegetation within the ROW, this shall be considered the equivalent of a Real-time observation.

[4] Multiple Sustained Outages on an individual line, if caused by the same vegetation, will be reported as one outage regardless of the actual number of outages within a 24-hour period.

4. An encroachment due to vegetation growth into the line MVCD that caused a vegetation-related Sustained Outage[4]

M2. Each Transmission Owner has evidence that it managed vegetation to prevent encroachment into the MVCD as described in R2. Examples of acceptable forms of evidence may include dated attestations, dated reports containing no Sustained Outages associated with encroachment types 2 through 4 above, or records confirming no Real-time observations of any MVCD encroachments. (R2)

R3. Each Transmission Owner shall have documented maintenance strategies or procedures or processes or specifications it uses to prevent the encroachment of vegetation into the MVCD of its applicable lines that accounts for the following:

3.1 Movement of applicable line conductors under their Rating and all Rated Electrical Operating Conditions;

3.2 Inter-relationships between vegetation growth rates, vegetation control methods, and inspection frequency.

[*Violation Risk Factor: Lower*] [*Time Horizon: Long Term Planning*]:

M3. The maintenance strategies or procedures or processes or specifications provided demonstrate that the Transmission Owner can prevent encroachment into the MVCD considering the factors identified in the requirement. (R3)

R4. Each Transmission Owner, without any intentional time delay, shall notify the control center holding switching authority for the associated applicable line when the Transmission Owner has confirmed the existence of a vegetation condition that is likely to cause a Fault at any moment [*Violation Risk Factor: Medium*] [*Time Horizon: Real-time*].

M4. Each Transmission Owner that has a confirmed vegetation condition likely to cause a Fault at any moment will have evidence that it notified the control center holding switching authority for the associated transmission line without any intentional time delay. Examples of evidence may include control center logs, voice recordings, switching orders, clearance orders and subsequent work orders. (R4)

R5. When a Transmission Owner is constrained from performing vegetation work on an applicable line operating within its Rating and all Rated Electrical Operating Conditions, and the constraint may lead to a vegetation encroachment into the MVCD prior to the implementation of the next annual work plan, then the Transmission Owner shall take corrective action to ensure continued vegetation management to prevent encroachments [*Violation Risk Factor: Medium*] [*Time Horizon: Operations Planning*].

M5. Each Transmission Owner has evidence of the corrective action taken for each constraint where an applicable transmission line was put at potential risk. Examples of acceptable forms of evidence may include initially-planned work orders, documentation of constraints from landowners, court orders, inspection records of increased monitoring, documentation of the de-rating of lines, revised work orders, invoices, or evidence that the line was de-energized. (R5)

R6. Each Transmission Owner shall perform a Vegetation Inspection of 100% of its applicable transmission lines (measured in units of choice - circuit, pole line, line miles or kilometers, etc.) at least once per calendar year and with no more than 18 calendar months between inspections on the same ROW[5] [*Violation Risk Factor: Medium*] [*Time Horizon: Operations Planning*].

M6. Each Transmission Owner has evidence that it conducted Vegetation Inspections of the transmission line ROW for all applicable lines at least once per calendar year but with no more than 18 calendar months between inspections on the same ROW. Examples of acceptable forms of evidence may include completed and dated work orders, dated invoices, or dated inspection records. (R6)

R7. Each Transmission Owner shall complete 100% of its annual vegetation work plan of applicable lines to ensure no vegetation encroachments occur within the MVCD. Modifications to the work plan in response to changing conditions or to findings from vegetation inspections may be made (provided they do not allow encroachment of vegetation into the MVCD) and must be documented. The percent completed calculation is based on the number of units actually completed divided by the number of units in the final amended plan (measured in units of choice - circuit, pole line, line miles or kilometers, etc.) Examples of reasons for modification to annual plan may include [*Violation Risk Factor: Medium*] [*Time Horizon: Operations Planning*]:

- Change in expected growth rate/ environmental factors
- Circumstances that are beyond the control of a Transmission Owner[6]
- Rescheduling work between growing seasons
- Crew or contractor availability/ Mutual assistance agreements
- Identified unanticipated high priority work
- Weather conditions/Accessibility
- Permitting delays
- Land ownership changes/Change in land use by the landowner
- Emerging technologies

[5] When the Transmission Owner is prevented from performing a Vegetation Inspection within the timeframe in R6 due to a natural disaster, the TO is granted a time extension that is equivalent to the duration of the time the TO was prevented from performing the Vegetation Inspection.

[6] Circumstances that are beyond the control of a Transmission Owner include but are not limited to natural disasters such as earthquakes, fires, tornados, hurricanes, landslides, ice storms, floods, or major storms as defined either by the TO or an applicable regulatory body.

M7. Each Transmission Owner has evidence that it completed its annual vegetation work plan for its applicable lines. Examples of acceptable forms of evidence may include a copy of the completed annual work plan (as finally modified), dated work orders, dated invoices, or dated inspection records. (R7)

C. Compliance

1. Compliance Monitoring Process

1.1 Compliance Enforcement Authority

1.2 Regional Entity Evidence Retention

The following evidence retention periods identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show that it was compliant for the full time period since the last audit.

The Transmission Owner retains data or evidence to show compliance with Requirements R1, R2, R3, R5, R6 and R7, Measures M1, M2, M3, M5, M6 and M7 for three calendar years unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

The Transmission Owner retains data or evidence to show compliance with Requirement R4, Measure M4 for most recent 12 months of operator logs or most recent 3 months of voice recordings or transcripts of voice recordings, unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

If a Transmission Owner is found non-compliant, it shall keep information related to the non-compliance until found compliant or for the time period specified above, whichever is longer.

The Compliance Enforcement Authority shall keep the last audit records and all requested and submitted subsequent audit records.

1.3 Compliance Monitoring and Enforcement Processes:

Compliance Audit

Self-Certification

Spot Checking

Compliance Violation Investigation

Self-Reporting

Complaint

Periodic Data Submittal

1.4 Additional Compliance Information

Periodic Data Submittal: The Transmission Owner will submit a quarterly report to its Regional Entity, or the Regional Entity's designee, identifying all Sustained Outages of applicable lines operated within their Rating and all Rated Electrical Operating Conditions as determined by the Transmission Owner to have been caused by vegetation, except as excluded in footnote 2, and including as a minimum the following:

- The name of the circuit(s), the date, time and duration of the outage; the voltage of the circuit; a description of the cause of the outage; the category associated with the Sustained Outage; other pertinent comments; and any countermeasures taken by the Transmission Owner.

A Sustained Outage is to be categorized as one of the following:

- Category 1A — Grow-ins: Sustained Outages caused by vegetation growing into applicable lines, that are identified as an element of an IROL or Major WECC Transfer Path, by vegetation inside and/or outside of the ROW;
- Category 1B — Grow-ins: Sustained Outages caused by vegetation growing into applicable lines, but are not identified as an element of an IROL or Major WECC Transfer Path, by vegetation inside and/or outside of the ROW;
- Category 2A — Fall-ins: Sustained Outages caused by vegetation falling into applicable lines that are identified as an element of an IROL or Major WECC Transfer Path, from within the ROW;
- Category 2B — Fall-ins: Sustained Outages caused by vegetation falling into applicable lines, but are not identified as an element of an IROL or Major WECC Transfer Path, from within the ROW;
- Category 3 — Fall-ins: Sustained Outages caused by vegetation falling into applicable lines from outside the ROW;
- Category 4A — Blowing together: Sustained Outages caused by vegetation and applicable lines that are identified as an element of an IROL or Major WECC Transfer Path, blowing together from within the ROW.
- Category 4B — Blowing together: Sustained Outages caused by vegetation and applicable lines, but are not identified as an element

of an IROL or Major WECC Transfer Path, blowing together from within the ROW.

The Regional Entity will report the outage information provided by Transmission Owners, as per the above, quarterly to NERC, as well as any actions taken by the Regional Entity as a result of any of the reported Sustained Outages.

Table of Compliance Elements

R#	Time Horizon	VRF	Violation Severity Level			
			Lower	Moderate	High	Severe
R1	Real-time	High	N/A	N/A	The Transmission Owner failed to manage vegetation to prevent encroachment into the MVCD of a line identified as an element of an IROL or Major WECC transfer path and encroachment into the MVCD as identified in FAC-003-Table 2 was observed in real time absent a Sustained Outage.	The Transmission Owner failed to manage vegetation to prevent encroachment into the MVCD of a line identified as an element of an IROL or Major WECC transfer path and a vegetation-related Sustained Outage was caused by one of the following: • A fall-in from inside the active transmission line ROW • Blowing together of applicable lines and vegetation located inside the active transmission line ROW • A grow-in
R2	Real-time	Medium	N/A	N/A	The Transmission Owner failed to manage vegetation to prevent encroachment into the MVCD of a line not identified as an element of an IROL or Major WECC transfer path and encroachment into the MVCD as identified in FAC-003-Table 2 was observed in real time absent a Sustained Outage.	The Transmission Owner failed to manage vegetation to prevent encroachment into the MVCD of a line not identified as an element of an IROL or Major WECC transfer path and a vegetation-related Sustained Outage was caused by one of the following: • A fall-in from inside the

						active transmission line ROW • Blowing together of applicable lines and vegetation located inside the active transmission line ROW • A grow-in
R3	Long-Term Planning	Lower	N/A	The Transmission Owner has maintenance strategies or documented procedures or processes or specifications but has not accounted for the inter-relationships between vegetation growth rates, vegetation control methods, and inspection frequency, for the Transmission Owner's applicable lines. (Requirement R3, Part 3.2)	The Transmission Owner has maintenance strategies or documented procedures or processes or specifications but has not accounted for the movement of transmission line conductors under their Rating and all Rated Electrical Operating Conditions, for the Transmission Owner's applicable lines. Requirement R3, Part 3.1)	The Transmission Owner does not have any maintenance strategies or documented procedures or processes or specifications used to prevent the encroachment of vegetation into the MVCD, for the Transmission Owner's applicable lines.
R4	Real-time	Medium	N/A	N/A	The Transmission Owner experienced a confirmed vegetation threat and notified the control center holding switching authority for that applicable line, but there was intentional delay in that notification.	The Transmission Owner experienced a confirmed vegetation threat and did not notify the control center holding switching authority for that applicable line.
R5	Operations Planning	Medium	N/A	N/A	N/A	The Transmission Owner did not take corrective action when it was constrained from performing planned vegetation work where an applicable line

						was put at potential risk.
R6	Operations Planning	Medium	The Transmission Owner failed to inspect 5% or less of its applicable lines (measured in units of choice - circuit, pole line, line miles or kilometers, etc.)	The Transmission Owner failed to inspect more than 5% up to and including 10% of its applicable lines (measured in units of choice - circuit, pole line, line miles or kilometers, etc.).	The Transmission Owner failed to inspect more than 10% up to and including 15% of its applicable lines (measured in units of choice - circuit, pole line, line miles or kilometers, etc.).	The Transmission Owner failed to inspect more than 15% of its applicable lines (measured in units of choice - circuit, pole line, line miles or kilometers, etc.).
R7	Operations Planning	Medium	The Transmission Owner failed to complete 5% or less of its annual vegetation work plan for its applicable lines (as finally modified).	The Transmission Owner failed to complete more than 5% and up to and including 10% of its annual vegetation work plan for its applicable lines (as finally modified).	The Transmission Owner failed to complete more than 10% and up to and including 15% of its annual vegetation work plan for its applicable lines (as finally modified).	The Transmission Owner failed to complete more than 15% of its annual vegetation work plan for its applicable lines (as finally modified).

D. Regional Differences

None.

E. Interpretations

None.

F. Associated Documents

Guideline and Technical Basis (attached).

Guideline and Technical Basis

Enforcement:

The Requirements within a Reliability Standard govern and will be enforced. The Requirements within a Reliability Standard define what an entity must do to be compliant and binds an entity to certain obligations of performance under Section 215 of the Federal Power Act. Compliance will in all cases be measured by determining whether a party met or failed to meet the Reliability Standard Requirement given the specific facts and circumstances of its use, ownership or operation of the bulk power system.

Measures provide guidance on assessing non-compliance with the Requirements. Measures are the evidence that could be presented to demonstrate compliance with a Reliability Standard Requirement and are not intended to contain the quantitative metrics for determining satisfactory performance nor to limit how an entity may demonstrate compliance if valid alternatives to demonstrating compliance are available in a specific case. A Reliability Standard may be enforced in the absence of specified Measures.

Entities must comply with the "Compliance" section in its entirety, including the Administrative Procedure that sets forth, among other things, reporting requirements.

The "Guideline and Technical Basis" section, the Background section and text boxes with "Examples" and "Rationale" are provided for informational purposes. They are designed to convey guidance from NERC's various activities. The "Guideline and Technical Basis" section and text boxes with "Examples" and "Rationale" are not intended to establish new Requirements under NERC's Reliability Standards or to modify the Requirements in any existing NERC Reliability Standard. Implementation of the "Guideline and Technical Basis" section, the Background section and text boxes with "Examples" and "Rationale" is not a substitute for compliance with Requirements in NERC's Reliability Standards."

Effective dates:

The first two sentences of the Effective Dates section is standard language used in most NERC standards to cover the general effective date and is sufficient to cover the vast majority of situations. Five special cases are needed to cover effective dates for individual lines which undergo transitions after the general effective date. These special cases cover the effective dates for those

lines which are initially becoming subject to the standard, those lines which are changing their applicability within the standard, and those lines which are changing in a manner that removes their applicability to the standard.

Case 1 is needed because the Planning Coordinators may designate lines below 200 kV to become elements of an IROL or Major WECC Transfer Path in a future Planning Year (PY). For example, studies by the Planning Coordinator in 2011 may identify a line to have that designation beginning in PY 2021, ten years after the planning study is performed. It is not intended for the Standard to be immediately applicable to, or in effect for, that line until that future PY begins. The effective date provision for such lines ensures that the line will become subject to the standard on January 1 of the PY specified with an allowance of at least 12 months for the Transmission Owner to make the necessary preparations to achieve compliance on that line. The table below has some explanatory examples of the application.

Date that Planning Study is completed	PY the line will become an IROL element	Date 1	Date 2	Effective Date The latter of Date 1 or Date 2
05/15/2011	2012	05/15/2012	01/01/2012	05/15/2012
05/15/2011	2013	05/15/2012	01/01/2013	01/01/2013
05/15/2011	2014	05/15/2012	01/01/2014	01/01/2014
05/15/2011	2021	05/15/2012	01/01/2021	01/01/2021

Case 2 is needed because a line operating below 200kV designated as an element of an IROL or Major WECC Transfer Path may be removed from that designation due to system improvements, changes in generation, changes in loads or changes in studies and analysis of the network.

Case 3 is needed because a line operating at 200 kV or above that once was designated as an element of an IROL or Major WECC Transfer Path may be removed from that designation due to system improvements, changes in generation, changes in loads or changes in studies and analysis of the network. Such changes result in the need to apply R1 to that line until that date is reached and then to apply R2 to that line thereafter.

Case 4 is needed because an existing line that is to be operated at 200 kV or above can be acquired by a Transmission Owner from a third party such as a Distribution Provider or other end-user who was using the line solely for local distribution purposes, but the Transmission Owner, upon acquisition, is incorporating the line into the interconnected electrical energy transmission network which will thereafter make the line subject to the standard.

Case 5 is needed because an existing line that is operated below 200 kV can be acquired by a Transmission Owner from a third party such as a Distribution Provider or other end-user who was using the line solely for local distribution purposes, but the Transmission owner, upon acquisition, is incorporating the line into the interconnected electrical energy transmission network. In this special case the line upon acquisition was designated as an element of an Interconnection Reliability Operating Limit (IROL) or an element of a Major WECC Transfer Path.

Defined Terms:

Explanation for revising the definition of ROW:
The current NERC glossary definition of Right of Way has been modified to address the matter set forth in Paragraph 734 of FERC Order 693. The Order pointed out that Transmission Owners may in some cases own more property or rights than are needed to reliably operate transmission lines. This modified definition represents a slight but significant departure from the strict legal definition of "right of way" in that this definition is based on engineering and construction considerations that establish the width of a corridor from a technical basis. The pre-2007 maintenance records are included in the revised definition to allow the use of such vegetation widths if there were no engineering or construction standards that referenced the width of right of way to be maintained for vegetation on a particular line but the evidence exists in maintenance records for a width that was in fact maintained prior to this standard becoming mandatory. Such widths may be the only information available for lines that had limited or no vegetation easement rights and were typically maintained primarily to ensure public safety. This standard does not require additional easement rights to be purchased to satisfy a minimum right of way width that did not exist prior to this standard becoming mandatory.

Explanation for revising the definition of Vegetation Inspections:
The current glossary definition of this NERC term is being modified to allow both maintenance inspections and vegetation inspections to be performed concurrently. This allows potential efficiencies, especially for those lines with minimal vegetation and/or slow vegetation growth rates.

Explanation of the definition of the MVCD:

The MVCD is a calculated minimum distance that is derived from the Gallet Equations. This is a method of calculating a flash over distance that has been used in the design of high voltage transmission lines. Keeping vegetation away from high voltage conductors by this distance will prevent voltage flash-over to the vegetation. See the explanatory text below for Requirement R3 and associated Figure 1. Table 2 below provides MVCD values for various voltages and altitudes. Details of the equations and an example calculation are provided in Appendix 1 of the Technical Reference Document.

Guidelines:

Requirements R1 and R2:

R1 and R2 are performance-based requirements. The reliability objective or outcome to be achieved is the management of vegetation such that there are no vegetation encroachments within a minimum distance of transmission lines. Content-wise, R1 and R2 are the same requirements; however, they apply to different Facilities. Both R1 and R2 require each Transmission Owner to manage vegetation to prevent encroachment within the MVCD of transmission lines. R1 is applicable to lines that are identified as an element of an IROL or Major WECC Transfer Path. R2 is applicable to all other lines that are not elements of IROLs, and not elements of Major WECC Transfer Paths.

The separation of applicability (between R1 and R2) recognizes that inadequate vegetation management for an applicable line that is an element of an IROL or a Major WECC Transfer Path is a greater risk to the interconnected electric transmission system than applicable lines that are not elements of IROLs or Major WECC Transfer Paths. Applicable lines that are not elements of IROLs or Major WECC Transfer Paths do require effective vegetation management, but these lines are comparatively less operationally significant. As a reflection of this difference in risk impact, the Violation Risk Factors (VRFs) are assigned as High for R1 and Medium for R2.

Requirements R1 and R2 state that if inadequate vegetation management allows vegetation to encroach within the MVCD distance as shown in Table 2, it is a violation of the standard. Table 2 distances are the minimum clearances that will prevent spark-over based on the Gallet equations as described more fully in the Technical Reference document.

These requirements assume that transmission lines and their conductors are operating within their Rating. If a line conductor is intentionally or inadvertently operated beyond its Rating and Rated Electrical Operating Condition (potentially in violation of other standards), the occurrence of a clearance encroachment may occur solely due to that condition. For example, emergency actions taken by a Transmission Operator or Reliability Coordinator to protect an Interconnection may cause excessive sagging and an outage. Another example would be ice loading beyond the line's Rating and Rated Electrical Operating Condition. Such vegetation-related encroachments and outages are not violations of this standard.

Evidence of failures to adequately manage vegetation include real-time observation of a vegetation encroachment into the MVCD (absent a Sustained Outage), or a vegetation-related encroachment resulting in a Sustained Outage due to a fall-in from inside the ROW, or a vegetation-related encroachment resulting in a Sustained Outage due to the blowing together of the lines and vegetation located inside the ROW, or a vegetation-related encroachment resulting in a Sustained Outage due to a grow-in. Faults which do not cause a Sustained outage and which are confirmed to have been caused by vegetation encroachment within the MVCD are considered the equivalent of a Real-time observation for violation severity levels.

With this approach, the VSLs for R1 and R2 are structured such that they directly correlate to the severity of a failure of a Transmission Owner to manage vegetation and to the corresponding performance level of the Transmission Owner's vegetation program's ability to meet the objective of "preventing the risk of those vegetation related outages that could lead to Cascading." Thus violation severity increases with a Transmission Owner's inability to meet this goal and its potential of leading to a Cascading event. The additional benefits of such a combination are that it simplifies the standard and clearly defines performance for compliance. A performance-based requirement of this nature will promote high quality, cost effective vegetation management programs that will deliver the overall end result of improved reliability to the system.

Multiple Sustained Outages on an individual line can be caused by the same vegetation. For example initial investigations and corrective actions may not identify and remove the actual outage cause then another outage occurs after the line is re-energized and previous high conductor temperatures return. Such events are considered to be a single vegetation-related Sustained Outage under the standard where the Sustained Outages occur within a 24 hour period.

The MVCD is a calculated minimum distance stated in feet (or meters) to prevent spark-over, for various altitudes and operating voltages that is used in the design of Transmission Facilities. Keeping vegetation from entering this space will prevent transmission outages.

If the Transmission Owner has applicable lines operated at nominal voltage levels not listed in Table 2, then the TO should use the next largest clearance distance based on the next highest nominal voltage in the table to determine an acceptable distance.

Requirement R3:
R3 is a competency based requirement concerned with the maintenance strategies, procedures, processes, or specifications, a Transmission Owner uses for vegetation management.

An adequate transmission vegetation management program formally establishes the approach the Transmission Owner uses to plan and perform vegetation work to prevent transmission Sustained Outages and minimize risk to the transmission system. The approach provides the basis for evaluating the intent, allocation of appropriate resources, and the competency of the Transmission

Owner in managing vegetation. There are many acceptable approaches to manage vegetation and avoid Sustained Outages. However, the Transmission Owner must be able to show the documentation of its approach and how it conducts work to maintain clearances.

An example of one approach commonly used by industry is ANSI Standard A300, part 7. However, regardless of the approach a utility uses to manage vegetation, any approach a Transmission Owner chooses to use will generally contain the following elements:

1. *the maintenance strategy used (such as minimum vegetation-to-conductor distance or maximum vegetation height) to ensure that MVCD clearances are never violated.*
2. *the work methods that the Transmission Owner uses to control vegetation*
3. *a stated Vegetation Inspection frequency*
4. *an annual work plan*

The conductor's position in space at any point in time is continuously changing in reaction to a number of different loading variables. Changes in vertical and horizontal conductor positioning are the result of thermal and physical loads applied to the line. Thermal loading is a function of line current and the combination of numerous variables influencing ambient heat dissipation including wind velocity/direction, ambient air temperature and precipitation. Physical loading applied to the conductor affects sag and sway by combining physical factors such as ice and wind loading. The movement of the transmission line conductor and the MVCD is illustrated in Figure 1 below. In the Technical Reference document more figures and explanations of conductor dynamics are provided.

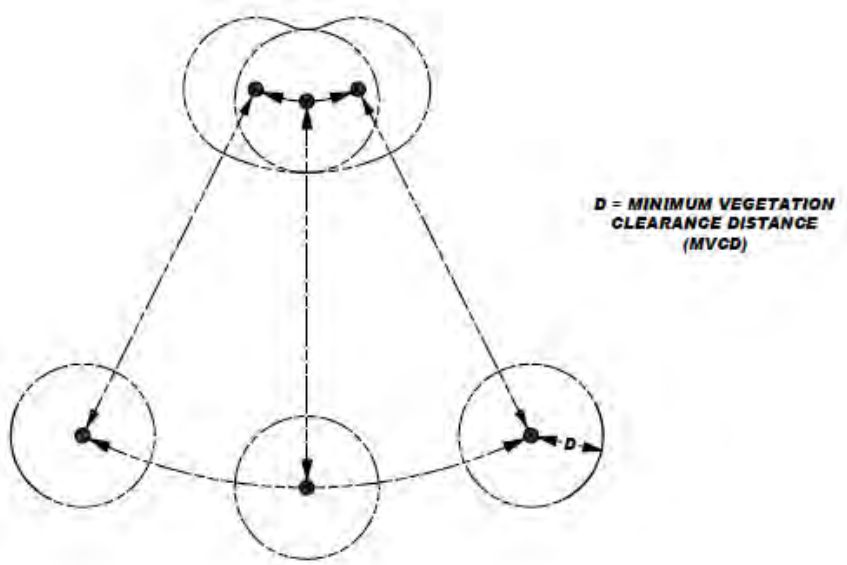


Figure 1

A cross-section view of a single conductor at a given point along the span is shown with six possible conductor positions due to movement resulting from thermal and mechanical loading.

Requirement R4:

R4 is a risk-based requirement. It focuses on preventative actions to be taken by the Transmission Owner for the mitigation of Fault risk when a vegetation threat is confirmed. R4 involves the notification of potentially threatening vegetation conditions, without any intentional delay, to the control center holding switching authority for that specific transmission line. Examples of acceptable unintentional delays may include communication system problems (for example, cellular service or two-way radio disabled), crews located in remote field locations with no communication access, delays due to severe weather, etc.

Confirmation is key that a threat actually exists due to vegetation. This confirmation could be in the form of a Transmission Owner's employee who personally identifies such a threat in the field. Confirmation could also be made by sending out an employee to evaluate a situation reported by a landowner.

Vegetation-related conditions that warrant a response include vegetation that is near or encroaching into the MVCD (a grow-in issue) or vegetation that could fall into the transmission conductor (a fall-in issue). A knowledgeable verification of the risk would include an assessment of the possible sag or movement of the conductor while operating between no-load conditions and its rating.

The Transmission Owner has the responsibility to ensure the proper communication between field personnel and the control center to allow the control center to take the appropriate action until or as the vegetation threat is relieved. Appropriate actions may include a temporary reduction in the line loading, switching the line out of service, or other preparatory actions in recognition of the increased risk of outage on that circuit. The notification of the threat should be communicated in terms of minutes or hours as opposed to a longer time frame for corrective action plans (see R5).

All potential grow-in or fall-in vegetation-related conditions will not necessarily cause a Fault at any moment. For example, some Transmission Owners may have a danger tree identification program that identifies trees for removal with the potential to fall near the line. These trees would not require notification to the control center unless they pose an immediate fall-in threat.

Requirement R5:
R5 is a risk-based requirement. It focuses upon preventative actions to be taken by the Transmission Owner for the mitigation of Sustained Outage risk when temporarily constrained from performing vegetation maintenance. The intent of this requirement is to deal with situations that prevent the Transmission Owner from performing planned vegetation management work and, as a result, have the potential to put the transmission line at risk. Constraints to performing vegetation maintenance work as planned could result from legal injunctions filed by property owners, the discovery of easement stipulations which limit the Transmission Owner's rights, or other circumstances.

This requirement is not intended to address situations where the transmission line is not at potential risk and the work event can be rescheduled or re-planned using an alternate work methodology. For example, a land owner may prevent the planned use of chemicals on non-threatening, low growth vegetation but agree to the use of mechanical clearing. In this case the Transmission Owner is not under any immediate time constraint for achieving the management objective, can easily reschedule work using an alternate approach, and therefore does not need to take interim corrective action.

However, in situations where transmission line reliability is potentially at risk due to a constraint, the Transmission Owner is required to take an interim corrective action to mitigate the potential risk to the transmission line. A wide range of actions can be taken to address various situations. General considerations include:

- Identifying locations where the Transmission Owner is constrained from performing planned vegetation maintenance work which potentially leaves the transmission line at risk.
- Developing the specific action to mitigate any potential risk associated with not performing the vegetation maintenance work as planned.
- Documenting and tracking the specific action taken for the location.
- In developing the specific action to mitigate the potential risk to the transmission line the Transmission Owner could consider location specific measures such as modifying the inspection and/or maintenance intervals. Where a legal constraint would not allow any vegetation work, the interim corrective action could include limiting the loading on the transmission line.
- The Transmission Owner should document and track the specific corrective action taken at each location. This location may be indicated as one span, one tree or a combination of spans on one property where the constraint is considered to be temporary.

Requirement R6:
R6 is a risk-based requirement. This requirement sets a minimum time period for completing Vegetation Inspections. The provision that Vegetation Inspections can be performed in conjunction with general line inspections facilitates a Transmission Owner's ability to meet this requirement. However, the Transmission Owner may determine that more frequent vegetation specific inspections are needed to maintain reliability levels, based on factors such as anticipated growth rates of the local vegetation, length of the local growing season, limited ROW width, and local rainfall. Therefore it is expected that some transmission lines may be designated with a higher frequency of inspections.

The VSLs for Requirement R6 have levels ranked by the failure to inspect a percentage of the applicable lines to be inspected. To calculate the appropriate VSL the Transmission Owner may choose units such as: circuit, pole line, line miles or kilometers, etc.

For example, when a Transmission Owner operates 2,000 miles of applicable transmission lines this Transmission Owner will be responsible for inspecting all the 2,000 miles of lines at least once during the calendar year. If one of the included lines was 100 miles long, and if it was not inspected during the year, then the amount failed to inspect would be 100/2000 = 0.05 or 5%. The "Low VSL" for R6 would apply in this example.

Requirement R7:
R7 is a risk-based requirement. The Transmission Owner is required to complete its an annual work plan for vegetation management to accomplish the purpose of this standard. Modifications to the work plan in response to changing conditions or to findings from vegetation inspections may be made and documented provided they do not put the transmission system at risk. The annual work plan requirement is not intended to necessarily require a "span-by-span", or even a "line-by-line" detailed description of all work to be performed. It is only intended to require that the Transmission Owner provide evidence of annual planning and execution of a vegetation management maintenance approach which successfully prevents encroachment of vegetation into the MVCD.
For example, when a Transmission Owner identifies 1,000 miles of applicable transmission lines to be completed in the Transmission Owner's annual plan, the Transmission Owner will be responsible completing those identified miles. If a Transmission Owner makes a modification to the annual plan that does not put the transmission system at risk of an encroachment the annual plan may be modified. If 100 miles of the annual plan is deferred until next year the calculation to determine what percentage was completed for the current year would be: 1000 – 100 (deferred miles) = 900 modified annual plan, or 900 / 900 = 100% completed annual miles. If a Transmission Owner only completed 875 of the total 1000 miles with no acceptable documentation for modification of the annual plan the calculation for failure to complete the annual plan would be: 1000 – 875 = 125 miles failed to complete then, 125 miles (not completed) / 1000 total annual plan miles = 12.5% failed to complete.

The ability to modify the work plan allows the Transmission Owner to change priorities or treatment methodologies during the year as conditions or situations dictate. For example recent line inspections may identify unanticipated high priority work, weather conditions (drought) could make herbicide application ineffective during the plan year, or a major storm could require redirecting local resources away from planned maintenance. This situation may also include complying with mutual assistance agreements by moving resources off the Transmission Owner's system to work on another system. Any of these examples could result in acceptable deferrals or additions to the annual work plan provided that they do not put the transmission system at risk of a vegetation encroachment.

In general, the vegetation management maintenance approach should use the full extent of the Transmission Owner's easement, fee simple and other legal rights allowed. A comprehensive approach that exercises the full extent of legal rights on the ROW is superior to incremental management because in the long term it reduces the overall potential for encroachments, and it ensures that future planned work and future planned inspection cycles are sufficient.

When developing the annual work plan the Transmission Owner should allow time for procedural requirements to obtain permits to work on federal, state, provincial, public, tribal lands. In some cases the lead time for obtaining permits may necessitate preparing work plans more than a year prior to work start dates. Transmission Owners may also need to consider those special landowner requirements as documented in easement instruments.

This requirement sets the expectation that the work identified in the annual work plan will be completed as planned. Therefore, deferrals or relevant changes to the annual plan shall be documented. Depending on the planning and documentation format used by the Transmission Owner, evidence of successful annual work plan execution could consist of signed-off work orders, signed contracts, printouts from work management systems, spreadsheets of planned versus completed work, timesheets, work inspection reports, or paid invoices. Other evidence may include photographs, and walk-through reports.

FAC-003 — TABLE 2 — Minimum Vegetation Clearance Distances (MVCD)[7]
For **Alternating Current** Voltages (feet)

(AC) Nominal System Voltage (KV)	(AC) Maximum System Voltage (kV)[8]	MVCD (feet) Over sea level up to 500 ft	MVCD (feet) Over 500 ft up to 1000 ft	MVCD feet Over 1000 ft up to 2000 ft	MVCD feet Over 2000 ft up to 3000 ft	MVCD feet Over 3000 ft up to 4000 ft	MVCD feet Over 4000 ft up to 5000 ft	MVCD feet Over 5000 ft up to 6000 ft	MVCD feet Over 6000 ft up to 7000 ft	MVCD feet Over 7000 ft up to 8000 ft	MVCD feet Over 8000 ft up to 9000 ft	MVCD feet Over 9000 ft up to 10000 ft	MVCD feet Over 10000 ft up to 11000 ft
765	800	8.2ft	8.33ft	8.61ft	8.89ft	9.17ft	9.45ft	9.73ft	10.01ft	10.29ft	10.57ft	10.85ft	11.13ft
500	550	5.15ft	5.25ft	5.45ft	5.66ft	5.86ft	6.07ft	6.28ft	6.49ft	6.7ft	6.92ft	7.13ft	7.35ft
345	362	3.19ft	3.26ft	3.39ft	3.53ft	3.67ft	3.82ft	3.97ft	4.12ft	4.27ft	4.43ft	4.58ft	4.74ft
287	302	3.88ft	3.96ft	4.12ft	4.29ft	4.45ft	4.62ft	4.79ft	4.97ft	5.14ft	5.32ft	5.50ft	5.68ft
230	242	3.03ft	3.09ft	3.22ft	3.36ft	3.49ft	3.63ft	3.78ft	3.92ft	4.07ft	4.22ft	4.37ft	4.53ft
161*	169	2.05ft	2.09ft	2.19ft	2.28ft	2.38ft	2.48ft	2.58ft	2.69ft	2.8ft	2.91ft	3.03ft	3.14ft
138*	145	1.74ft	1.78ft	1.86ft	1.94ft	2.03ft	2.12ft	2.21ft	2.3ft	2.4ft	2.49ft	2.59ft	2.7ft
115*	121	1.44ft	1.47ft	1.54ft	1.61ft	1.68ft	1.75ft	1.83ft	1.91ft	1.99ft	2.07ft	2.16ft	2.25ft
88*	100	1.18ft	1.21ft	1.26ft	1.32ft	1.38ft	1.44ft	1.5ft	1.57ft	1.64ft	1.71ft	1.78ft	1.86ft
69*	72	0.84ft	0.86ft	0.90ft	0.94ft	0.99ft	1.03ft	1.08ft	1.13ft	1.18ft	1.23ft	1.28ft	1.34ft

* Such lines are applicable to this standard only if PC has determined such per FAC-014 (refer to the Applicability Section above)

[7] The distances in this Table are the minimums required to prevent Flash-over; however prudent vegetation maintenance practices dictate that substantially greater distances will be achieved at time of vegetation maintenance.

[8] Where applicable lines are operated at nominal voltages other than those listed, The Transmission Owner should use the maximum system voltage to determine the appropriate clearance for that line.

TABLE 2 (CONT) — Minimum Vegetation Clearance Distances (MVCD)[7]
For **Alternating Current** Voltages (meters)

(AC) Nominal System Voltage (KV)	(AC) Maximum System Voltage (kV)[8]	MVCD meters Over sea level up to 152.4 m	MVCD meters Over 152.4 m up to 304.8 m	MVCD meters Over 304.8 m up to 609.6m	MVCD meters Over 609.6m up to 914.4m	MVCD meters Over 914.4m up to 1219.2m	MVCD meters Over 1219.2m up to 1524m	MVCD meters Over 1524 m up to 1828.8 m	MVCD meters Over 1828.8m up to 2133.6m	MVCD meters Over 2133.6m up to 2438.4m	MVCD meters Over 2438.4m up to 2743.2m	MVCD meters Over 2743.2m up to 3048m	MVCD meters Over 3048m up to 3352.8m
765	800	2.49m	2.54m	2.62m	2.71m	2.80m	2.88m	2.97m	3.05m	3.14m	3.22m	3.31m	3.39m
500	550	1.57m	1.6m	1.66m	1.73m	1.79m	1.85m	1.91m	1.98m	2.04m	2.11m	2.17m	2.24m
345	362	0.97m	0.99m	1.03m	1.08m	1.12m	1.16m	1.21m	1.26m	1.30m	1.35m	1.40m	1.44m
287	302	1.18m	0.88m	1.26m	1.31m	1.36m	1.41m	1.46m	1.51m	1.57m	1.62m	1.68m	1.73m
230	242	0.92m	0.94m	0.98m	1.02m	1.06m	1.11m	1.15m	1.19m	1.24m	1.29m	1.33m	1.38m
161*	169	0.62m	0.64m	0.67m	0.69m	0.73m	0.76m	0.79m	0.82m	0.85m	0.89m	0.92m	0.96m
138*	145	0.53m	0.54m	0.57m	0.59m	0.62m	0.65m	0.67m	0.70m	0.73m	0.76m	0.79m	0.82m
115*	121	0.44m	0.45m	0.47m	0.49m	0.51m	0.53m	0.56m	0.58m	0.61m	0.63m	0.66m	0.69m
88*	100	0.36m	0.37m	0.38m	0.40m	0.42m	0.44m	0.46m	0.48m	0.50m	0.52m	0.54m	0.57m
69*	72	0.26m	0.26m	0.27m	0.29m	0.30m	0.31m	0.33m	0.34m	0.36m	0.37m	0.39m	0.41m

* Such lines are applicable to this standard only if PC has determined such per FAC-014 (refer to the Applicability Section above)

TABLE 2 (CONT) — Minimum Vegetation Clearance Distances (MVCD)[7]
For **Direct Current** Voltages feet (meters)

(DC) Nominal Pole to Ground Voltage (kV)	(DC) Nominal Pole to Ground Voltage (kV)	(DC) Nominal Pole to Ground Voltage (kV)	(DC) Nominal Pole to Ground Voltage (kV)	(DC) Nominal Pole to Ground Voltage (kV)	(DC) Nominal Pole to Ground Voltage (kV)	(DC) Nominal Pole to Ground Voltage (kV)	(DC) Nominal Pole to Ground Voltage (kV)	(DC) Nominal Pole to Ground Voltage (kV)	(DC) Nominal Pole to Ground Voltage (kV)	(DC) Nominal Pole to Ground Voltage (kV)	(DC) Nominal Pole to Ground Voltage (kV)	(DC) Nominal Pole to Ground Voltage (kV)
	Over sea level up to 500 ft	Over 500 ft up to 1000 ft	Over 1000 ft up to 2000 ft	Over 2000 ft up to 3000 ft	Over 3000 ft up to 4000 ft	Over 4000 ft up to 5000 ft	Over 5000 ft up to 6000 ft	Over 6000 ft up to 7000 ft	Over 7000 ft up to 8000 ft	Over 8000 ft up to 9000 ft	Over 9000 ft up to 10000 ft	Over 10000 ft up to 11000 ft
	(Over sea level up to 152.4 m)	(Over 152.4 m up to 304.8 m	(Over 304.8 m up to 609.6m)	(Over 609.6m up to 914.4m	(Over 914.4m up to 1219.2m	(Over 1219.2m up to 1524m	(Over 1524 m up to 1828.8 m)	(Over 1828.8m up to 2133.6m)	(Over 2133.6m up to 2438.4m)	(Over 2438.4m up to 2743.2m)	(Over 2743.2m up to 3048m)	(Over 3048m up to 3352.8m)
±750	14.12ft (4.30m)	14.31ft (4.36m)	14.70ft (4.48m)	15.07ft (4.59m)	15.45ft (4.71m)	15.82ft (4.82m)	16.2ft (4.94m)	16.55ft (5.04m)	16.91ft (5.15m)	17.27ft (5.26m)	17.62ft (5.37m)	17.97ft (5.48m)
±600	10.23ft (3.12m)	10.39ft (3.17m)	10.74ft (3.26m)	11.04ft (3.36m)	11.35ft (3.46m)	11.66ft (3.55m)	11.98ft (3.65m)	12.3ft (3.75m)	12.62ft (3.85m)	12.92ft (3.94m)	13.24ft (4.04m)	13.54ft (4.13m)
±500	8.03ft (2.45m)	8.16ft (2.49m)	8.44ft (2.57m)	8.71ft (2.65m)	8.99ft (2.74m)	9.25ft (2.82m)	9.55ft (2.91m)	9.82ft (2.99m)	10.1ft (3.08m)	10.38ft (3.16m)	10.65ft (3.25m)	10.92ft (3.33m)
±400	6.07ft (1.85m)	6.18ft (1.88m)	6.41ft (1.95m)	6.63ft (2.02m)	6.86ft (2.09m)	7.09ft (2.16m)	7.33ft (2.23m)	7.56ft (2.30m)	7.80ft (2.38m)	8.03ft (2.45m)	8.27ft (2.52m)	8.51ft (2.59m)
±250	3.50ft (1.07m)	3.57ft (1.09m)	3.72ft (1.13m)	3.87ft (1.18m)	4.02ft (1.23m)	4.18ft (1.27m)	4.34ft (1.32m)	4.5ft (1.37m)	4.66ft (1.42m)	4.83ft (1.47m)	5.00ft (1.52m)	5.17ft (1.58m)

Notes:

The SDT determined that the use of IEEE 516-2003 in version 1 of FAC-003 was a misapplication. The SDT consulted specialists who advised that the Gallet Equation would be a technically justified method. The explanation of why the Gallet approach is more appropriate is explained in the paragraphs below.

The drafting team sought a method of establishing minimum clearance distances that uses realistic weather conditions and realistic maximum transient over-voltages factors for in-service transmission lines.

The SDT considered several factors when looking at changes to the minimum vegetation to conductor distances in FAC-003-1:

- avoid the problem associated with referring to tables in another standard (IEEE-516-2003)
- transmission lines operate in non-laboratory environments (wet conditions)
- transient over-voltage factors are lower for in-service transmission lines than for inadvertently re-energized transmission lines with trapped charges.

FAC-003-1 uses the minimum air insulation distance (MAID) without tools formula provided in IEEE 516-2003 to determine the minimum distance between a transmission line conductor and vegetation. The equations and methods provided in IEEE 516 were developed by an IEEE Task Force in 1968 from test data provided by thirteen independent laboratories. The distances provided in IEEE 516 Tables 5 and 7 are based on the withstand voltage of a dry rod-rod air gap, or in other words, dry laboratory conditions. Consequently, the validity of using these distances in an outside environment application has been questioned.

FAC-003-01 allowed Transmission Owners to use either Table 5 or Table 7 to establish the minimum clearance distances. Table 7 could be used if the Transmission Owner knew the maximum transient over-voltage factor for its system. Otherwise, Table 5 would have to be used. Table 5 represented minimum air insulation distances under the worst possible case for transient over-voltage factors. These worst case transient over-voltage factors were as follows: 3.5 for voltages up to 362 kV phase to phase; 3.0 for 500 - 550 kV phase to phase; and 2.5 for 765 to 800 kV phase to phase. These worst case over-voltage factors were also a cause for concern in this particular application of the distances.

In general, the worst case transient over-voltages occur on a transmission line that is inadvertently re-energized immediately after the line is de-energized and a trapped charge is still present. The intent of FAC-003 is to keep a transmission line that is *in service* from becoming de-energized (i.e. tripped out) due to spark-over from the line conductor to nearby vegetation. Thus, the worst case transient overvoltage assumptions are not appropriate for this application. Rather, the appropriate over voltage values are those that occur only while the line is energized.

Typical values of transient over-voltages of in-service lines, as such, are not readily available in the literature because they are negligible compared with the maximums. A conservative value for the maximum transient over-voltage that can occur anywhere along the length of an in-service ac line is approximately 2.0 per unit. This value is a conservative estimate of the transient over-

voltage that is created at the point of application (e.g. a substation) by switching a capacitor bank without pre-insertion devices (e.g. closing resistors). At voltage levels where capacitor banks are not very common (e.g. Maximum System Voltage of 362 kV), the maximum transient over-voltage of an in-service ac line are created by fault initiation on adjacent ac lines and shunt reactor bank switching. These transient voltages are usually 1.5 per unit or less.

Even though these transient over-voltages will not be experienced at locations remote from the bus at which they are created, in order to be conservative, it is assumed that all nearby ac lines are subjected to this same level of over-voltage. Thus, a maximum transient over-voltage factor of 2.0 per unit for transmission lines operated at 302 kV and below is considered to be a realistic maximum in this application. Likewise, for ac transmission lines operated at Maximum System Voltages of 362 kV and above a transient over-voltage factor of 1.4 per unit is considered a realistic maximum.

The Gallet Equations are an accepted method for insulation coordination in tower design. These equations are used for computing the required strike distances for proper transmission line insulation coordination. They were developed for both wet and dry applications and can be used with any value of transient over-voltage factor. The Gallet Equation also can take into account various air gap geometries. This approach was used to design the first 500 kV and 765 kV lines in North America.

If one compares the MAID using the IEEE 516-2003 Table 7 (table D.5 for English values) with the critical spark-over distances computed using the Gallet wet equations, for each of the nominal voltage classes and identical transient over-voltage factors, the Gallet equations yield a more conservative (larger) minimum distance value.

Distances calculated from either the IEEE 516 (dry) formulas or the Gallet “wet” formulas are not vastly different when the same transient overvoltage factors are used; the “wet” equations will consistently produce slightly larger distances than the IEEE 516 equations when the same transient overvoltage is used. While the IEEE 516 equations were only developed for dry conditions the Gallet equations have provisions to calculate spark-over distances for both wet and dry conditions.

While EPRI is currently trying to establish empirical data for spark-over distances to live vegetation, there are no spark-over formulas currently derived expressly for vegetation to conductor minimum distances. Therefore the SDT chose a proven method that has been used in other EHV applications. The Gallet equations relevance to wet conditions and the selection of a Transient Overvoltage Factor that is consistent with the absence of trapped charges on an in-service transmission line make this methodology a better choice.
The following table is an example of the comparison of distances derived from IEEE 516 and the Gallet equations.

Comparison of spark-over distances computed using Gallet wet equations vs. IEEE 516-2003 MAID distances

(AC) Nom System Voltage (kV)	(AC) Max System Voltage (kV)	Transient Over-voltage Factor (T)	Clearance (ft.) Gallet (wet) @ Alt. 3000 feet	Table 7 (Table D.5 for feet) IEEE 516-2003 MAID (ft) @ Alt. 3000 feet
765	800	2.0	14.36	13.95
500	550	2.4	11.0	10.07
345	362	3.0	8.55	7.47
230	242	3.0	5.28	4.2
115	121	3.0	2.46	2.1

Rationale:

During development of this standard, text boxes were embedded within the standard to explain the rationale for various parts of the standard. Upon BOT approval, the text from the rationale text boxes was moved to this section.

Rationale for Applicability (section 4.2.4):
The areas excluded in 4.2.4 were excluded based on comments from industry for reasons summarized as follows: 1) There is a very low risk from vegetation in this area. Based on an informal survey, no TOs reported such an event. 2) Substations, switchyards, and stations have many inspection and maintenance activities that are necessary for reliability. Those existing process manage the threat. As such, the formal steps in this standard are not well suited for this environment. 3) NERC has a project in place to address at a later date the applicability of this standard to Generation Owners. 4) Specifically addressing the areas where the standard does and does not apply makes the standard clearer.

Rationale for R1 and R2:
Lines with the highest significance to reliability are covered in R1; all other lines are covered in R2.

Rationale for the types of failure to manage vegetation which are listed in order of increasing degrees of severity in non-compliant performance as it relates to a failure of a Transmission Owner's vegetation maintenance program:

1. This management failure is found by routine inspection or Fault event investigation, and is normally symptomatic of unusual conditions in an otherwise sound program.

2. This management failure occurs when the height and location of a side tree within the ROW is not adequately addressed by the program.

3. This management failure occurs when side growth is not adequately addressed and may be indicative of an unsound program.

4. This management failure is usually indicative of a program that is not addressing the most fundamental dynamic of vegetation management, (i.e. a grow-in under the line). If this type of failure is pervasive on multiple lines, it provides a mechanism for a Cascade.

Rationale for R3:
The documentation provides a basis for evaluating the competency of the Transmission Owner's vegetation program. There may be many acceptable approaches to maintain clearances. Any approach must demonstrate that the Transmission Owner avoids vegetation-to-wire conflicts under all Ratings and all Rated Electrical Operating Conditions. See Figure 1 for an illustration of possible conductor locations.

Rationale for R4:
This is to ensure expeditious communication between the Transmission Owner and the control center when a critical situation is confirmed.

Rationale for R5:
Legal actions and other events may occur which result in constraints that prevent the Transmission Owner from performing planned vegetation maintenance work.

In cases where the transmission line is put at potential risk due to constraints, the intent is for the Transmission Owner to put interim measures in place, rather than do nothing.
The corrective action process is not intended to address situations where a planned work methodology cannot be performed but an alternate work methodology can be used.

Rationale for R6:
Inspections are used by Transmission Owners to assess the condition of the entire ROW. The information from the assessment can be used to determine risk, determine future work and evaluate recently-completed work. This requirement sets a minimum Vegetation Inspection frequency of once per calendar year but with no more than 18 months between inspections on the same ROW. Based upon average growth rates across North America and on common utility practice, this minimum frequency is reasonable. Transmission Owners should consider local and environmental factors that could warrant more frequent inspections.

Rationale for R7:
This requirement sets the expectation that the work identified in the annual work plan will be completed as planned. It allows modifications to the planned work for changing conditions, taking into consideration anticipated growth of vegetation and all other environmental factors, provided that those modifications do not put the transmission system at risk of a vegetation encroachment.

Version History

Version	Date	Action	Change Tracking
1	TBA	1. Added "Standard Development Roadmap." 2. Changed "60" to "Sixty" in section A, 5.2. 3. Added "Proposed Effective Date: April 7, 2006" to footer. 4. Added "Draft 3: November 17, 2005" to footer.	01/20/06
1	April 4, 2007	Regulatory Approval - Effective Date	New
2	November 3, 2011	Adopted by the NERC Board of Trustees	

Appendix E Typical Erosion Control Best Management Practices

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

PART 1 - To be completed by the Landscape Architect or Design Engineer

I. PROJECT DESCRIPTION

A. Owner Name and Address:

Arizona Department of Transportation
205 South 17th Avenue
Phoenix, Arizona 85007-3213

B. Project TRACS Number: _____

C. Project Location: _____

City: _____ County: _____

Beginning Latitude (NAD 83): ___° ___' ____"
Beginning Longitude (NAD 83): ___° ___' ____"

Ending Latitude (NAD 83): ___° ___' ____"
Ending Longitude (NAD 83): ___° ___' ____"

To obtain the project latitude/longitude data, refer to the ADOT Web Link below:
http://tpd.azdot.gov/website/receiving_waters/viewer.htm

D. Project Description: _____

II. HYDROLOGIC INFORMATION

A. Project Size:

Length (Mi.) _____

Area (Ac.) _____

B. Area to be Graded (Ac.): _____

C. Runoff Coefficient:

Existing _____

Developed _____

D. Receiving Water(s), refer to the same ADOT Web Link above: _____

III. PRESERVATION OF EXISTING VEGETATION

A. In accordance with the specifications, existing vegetation will be preserved. Clearing limits shall be confined to areas that require grading. Existing vegetation outside the boundaries of the cleared area shall be protected from damage by construction activities. Existing trees within the area to be cleared shall be preserved and protected, wherever possible.

IV. SOIL STABILIZATION MEASURES

A. All disturbed soil, which will not be paved, riprapped or otherwise covered to prevent erosion, will be revegetated and/or landscaped in accordance with the project plans and specifications.

B. Scheduling of the revegetation effort can be found on PART 2 of this sheet under SCHEDULE OF MAJOR ACTIVITIES.

V. MEASURES TO CONTROL EROSION AND SEDIMENT

A. Temporary Erosion and Sediment Controls: (Refer to the Following SWPPP Site Plan and Specifications)

_____ Erosion Control Mattings
_____ Temporary Diversion Dikes
_____ Check Dams
_____ Rock Inlet/Outlet Protection
_____ Sediment Control Berms
_____ Silt Fences
_____ Wattles (Excelsior/Straw)
_____ Excelsior Logs / Sediment Logs
_____ Seeding (Class II with mulch)
_____ Others Describe: _____

B. Permanent Erosion and Sediment Controls and Post-construction Storm Water Management Measures: (Refer to SWPPP Site Plan and Specifications)

_____ Crown Ditch/Dike
_____ Rock Protection
_____ Rock Riprap Channel Lining
_____ Sediment Basin
_____ Embankment Curb
_____ Spillways and Downdrains
_____ Minibenching
_____ Seeding established as a perennial vegetative cover with a density of 70% of the native background vegetative cover.
_____ Others Describe: _____

VI. MAINTENANCE AND INSPECTIONS

A. Frequency of Inspections:

___ At least once every 7 calendar days, OR
___ Every 14 calendar days and within 24 hours after a rainfall of 0.5 inches (12.7 mm) or more.

NOTE: RAINFALL GAUGE TO BE KEPT ON-SITE TO DETERMINE DEPTH OF RAINFALL

B. Inspection Procedure:

ADOT's Contractor's Inspection Log and Compliance Evaluation Report (CER) will be completed by the contractor or his representative and will be kept on file for 3 years. A signed copy of the CER will be sent to the ADOT resident engineer. If repairs are necessary, they shall be initiated within 24 hours of the inspection report.

PART 2 - To be completed by ADOT & CONTRACTOR

I. SCHEDULE OF MAJOR ACTIVITIES

A. Project Schedule: _____

Start Date: _____

End Date: _____

B. Construction Sequencing Schedule: (Attach Additional Sheets) Construction Activities _____

II. INVENTORY OF POLLUTANTS

A. The materials or substances checked below are expected to be onsite during construction:

___Concrete ___Asphalt
___Paints ___Fertilizer
___Herbicides ___Wood
___Fuel ___ Oil
___Others, List: _____

III. POLLUTION CONTROL MEASURES

A. Other Best Management Practices:

___Wind Erosion and Dust Control
___Solid Waste Management
___Equipment Maintenance Procedures
___Designated Washout Areas
___Stabilized Construction Entrance
___Protected Chemical and Material Storage Area
___Other, Describe: _____

IV. SPILL PREVENTION AND RESPONSE

A. Spill Prevention:
The procedures outlined in the Best Management Practices listed under Pollution Control Measures will be followed to prevent and contain spills of hazardous material. These preventative action include BMP's on equipment maintenance and proper handling, storage and disposal of chemicals and materials. All manufacturer's recommendations for usage, clean-up and disposal shall be followed.

B. Spill Response:
In the event of any accidental spill of chemicals or hazardous materials, contact the ADOT Traffic Operations Center at 800-379-3701. If a reportable quantity is discharged into the storm water, ADOT shall contact the National Response Center and document the spill to the EPA. ADOT's Hazardous Materials Specialist shall provide instructions.

V. CERTIFICATION OF COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS

A. This Storm Water Pollution Prevention Plan (SWPPP) has been prepared in accordance with the latest updated version of ADOT's EROSION AND POLLUTION CONTROL MANUAL FOR HIGHWAY DESIGN AND CONSTRUCTION, published by ADOT Intermodal Transportation Division.

___SWPPP is in compliance with other Federal, State Laws, or Local Regulations.

VI. POLLUTION PREVENTION PLAN CERTIFICATION

A. I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Applies to VI. B., C., and D)

B. The operator/contractor as defined in AZPDES should sign the SWPPP in accordance with CGP Part VII. K, and retain the SWPPP on-site at the construction site or other location easily accessible during normal business hours.

Signature: (operator/contractor) _____
Date: _____
Name: _____
Title: _____
Company: _____

C. ADOT Resident Engineer

Signature: (owner) _____
Date: _____
Name: _____
Title: _____
ADOT District: _____

D. MUNICIPALITY for Municipal Separate Storm Sewer System (MS4)

Signature: _____
Date: _____
Name: _____
Title: _____
MS4 Name: _____

VII. OTHER REQUIREMENTS

A. A copy of the General Permit and NOI are attached in accordance to AZPDES General Permit for Storm Water Discharges From Construction Activities To The Water Of The United States.

B. Projects that are within ¼ mile of impaired or unique waters require the SWPPP to be sent to ADEQ in combination with the NOI. To check the ADOT Impaired, Unique and Not-attaining Waters Interactive Web Map, please turn on the Buffers and Mile Markers Layers: *http://tpd.azdot.gov/website/waters/viewer.htm*

C. For further requirements, check the ADEQ's Smart NOI Web Page: *https://az.gov/webapp/noi/smartnoi/menu.do*

	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADSIDE DEVELOPMENT SECTION	
DESIGN				
DESIGN				
DRAWN				
CHECKED			AZPDES SWPPP INDEX SHEET	
TEAM LEADER				
ROUTE	MP	LOCATION		SHEET OF
TRACS NO.				___ OF ___

NO.	DESCRIPTION OF REVISION	MADE BY	DATE
NO.1			
NO.2			

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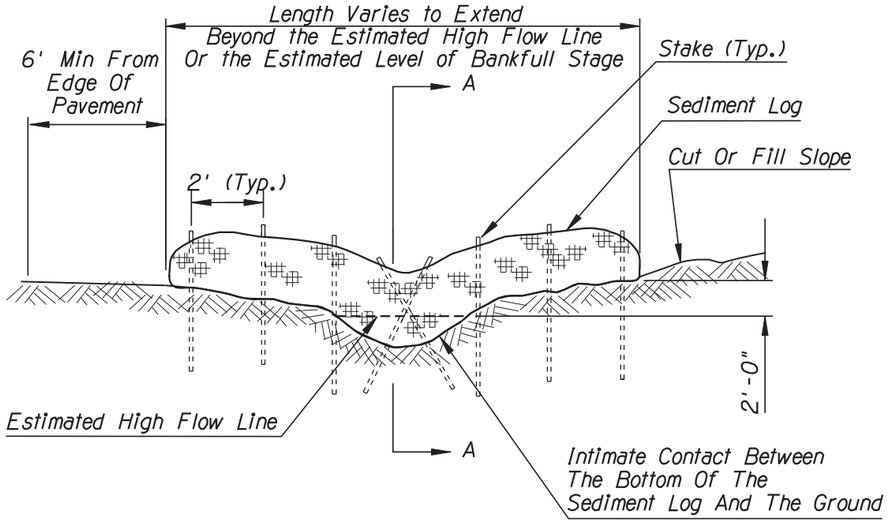
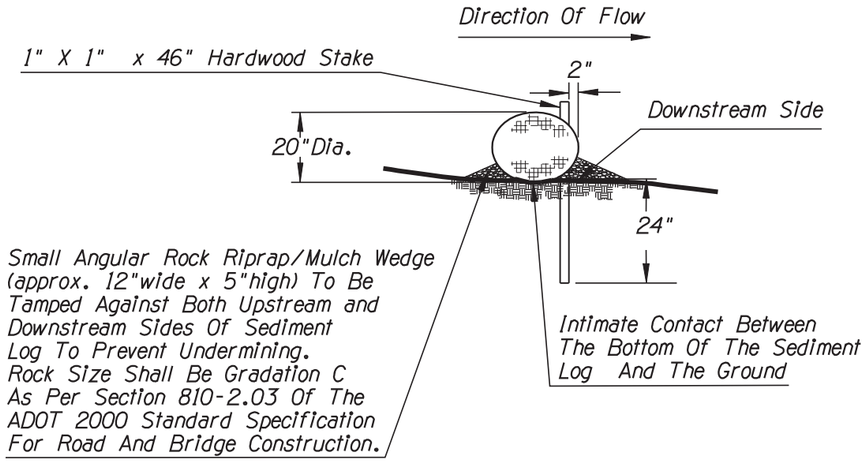
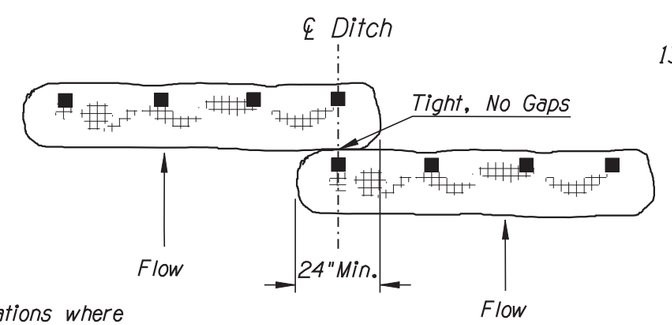


SEDIMENT LOG IN DITCH/CHANNEL
SECTIONAL ELEVATION (NTS)

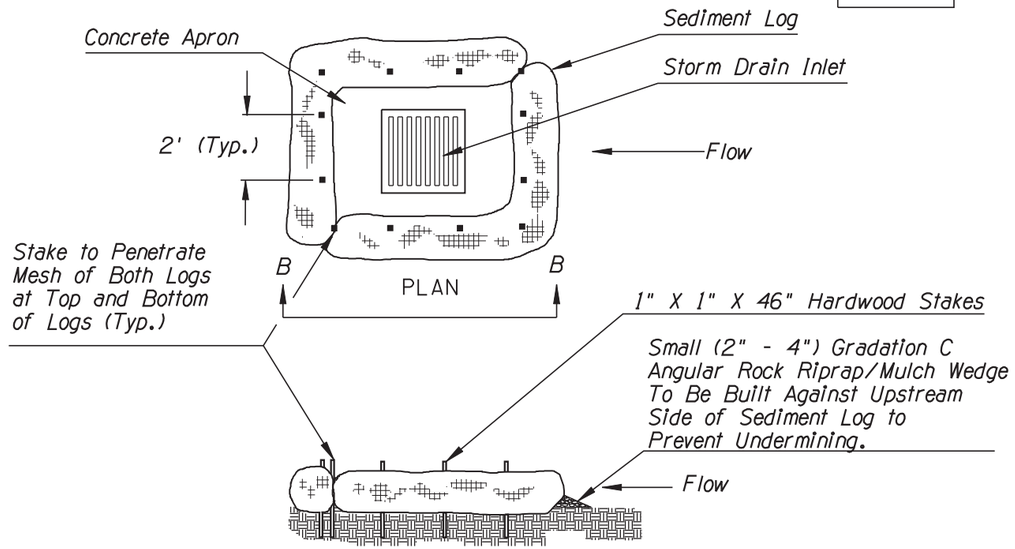


SECTION A-A (NTS)



Note:
Overlap applies to situations where ditch/channel is wider than length of single Sediment Log.

TYPICAL OVERLAP
PLAN (NTS)



During Construction

SEDIMENT LOG AT STORM DRAIN
SECTION-ELEVATION B-B (NTS)

NOTES:

1. No Sediment Logs shall be installed in the urban freeway medians, as well as where cable barrier systems are employed.
2. Sediment Logs shall be located as indicated in plans SWPPP or as directed by the Engineer.
3. Logs shall be selected, installed, and maintained with manufacturers' specifications and good engineering practices.
4. Lay sediment log across prepared ditch or channel. Trenching or burial of Sediment Logs is not required. The intimate contact between the bottom of the Log and the ground is mandatory. The Logs shall be installed in the ditch, swale or channel bottom perpendicular to the flow of water as shown on detail this sheet.
5. Stake Log as shown. Stakes shall be placed through downstream side only as shown.
6. DO NOT drive stakes through center of the log. Stakes must be driven into the ground as shown.
7. Ensure that no gaps exist between soil and bottom of Sediment Log. Repair any rills or undercuts promptly.
8. In rock conditions the Engineer will evaluate placement of Sediment Logs.
9. For ditch slopes that exceed 5%, install rock riprap for channel/ditch lining or rock check dams in place of Sediment Logs.
10. Remove Sediment Log and stakes once final stabilization requirements are met.
11. Contractor to dispose Sediment Logs and trapped sediment material and to fill shallow trench created by Sediment Log.
12. The installation and maintenance of Sediment Log BMPs shall not negatively impact traffic safety, as well as the designed function of roadway or bridge drainage facilities. For erosion/sediment control purposes, Sediment Log BMPs shall be installed and maintained to carry the storm water of at least 2-year, 24-hour events.
13. The Sediment Log BMP's pay/bid item shall include all materials used for this BMP, all ground preparation, furnishing, installing, final removal, and disposal of this temporary BMP, as well as returning the area to an acceptable condition as approved by the Engineer.

	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADSIDE DEVELOPMENT SECTION	
DESIGN	E LEROY BRADY	10-2007		
DESIGN	ZITAO FANG	10-2007		
DRAWN	ZITAO FANG	10-2007		
CHECKED	E LEROY BRADY	10-2007	EROSION/SEDIMENT CONTROL AND WATER QUALITY PROTECTION DETAILS	
TEAM LEADER	E LEROY BRADY	10-2007		
ROUTE	MP	LOCATION		SHEET OF
TRACS NO.				___ OF ___

DETAIL E1

NO.1 DESCRIPTION OF REVISION | DATE | MADE BY
NO.2 DESCRIPTION OF REVISION | DATE | MADE BY

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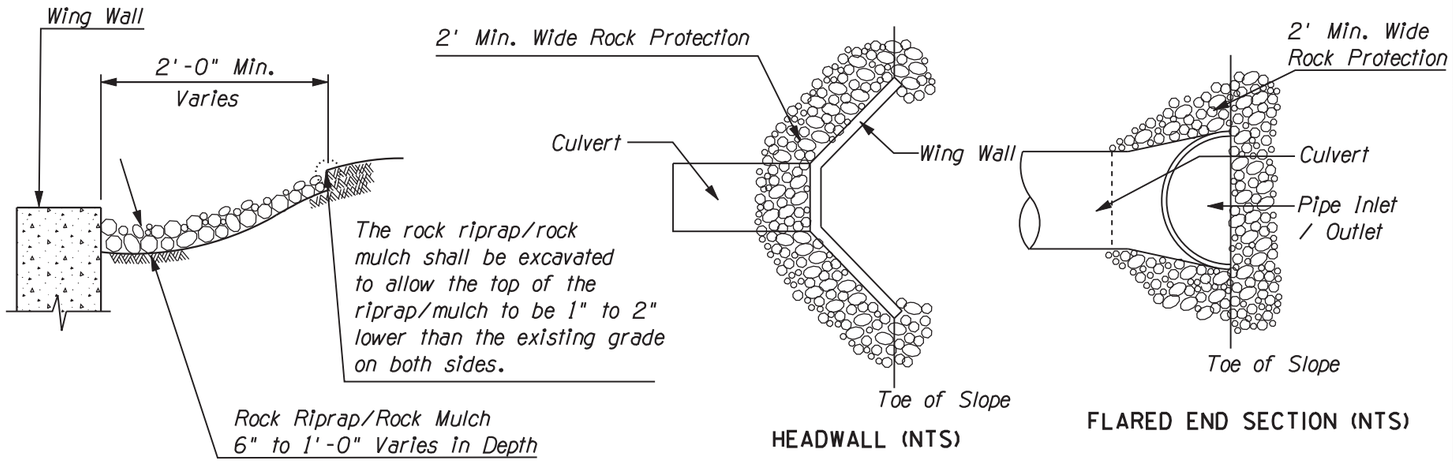
9	ARIZ.				

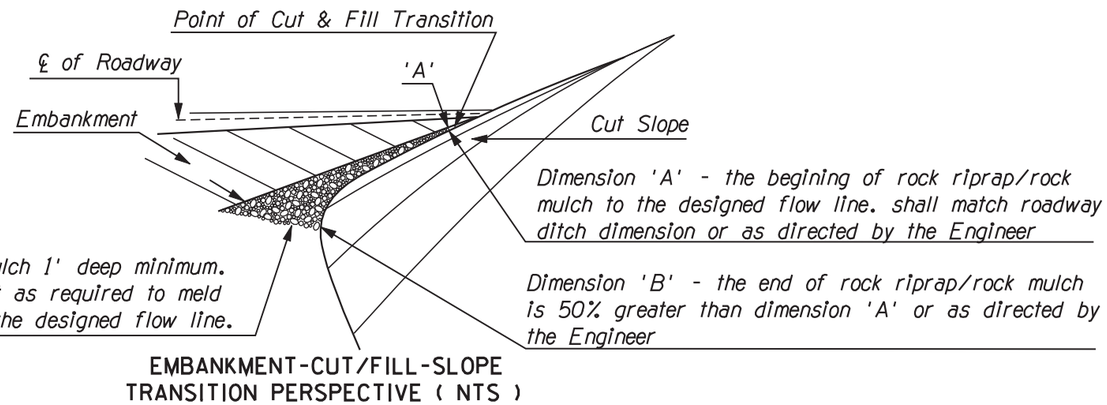


ROCK PROTECTION BMP FOR INLETS/OUTLETS
ROCK RIPRAP/ROCK MULCH FOR HEADWALL TRANSITION
CROSS SECTION (NTS)

HEADWALL (NTS)

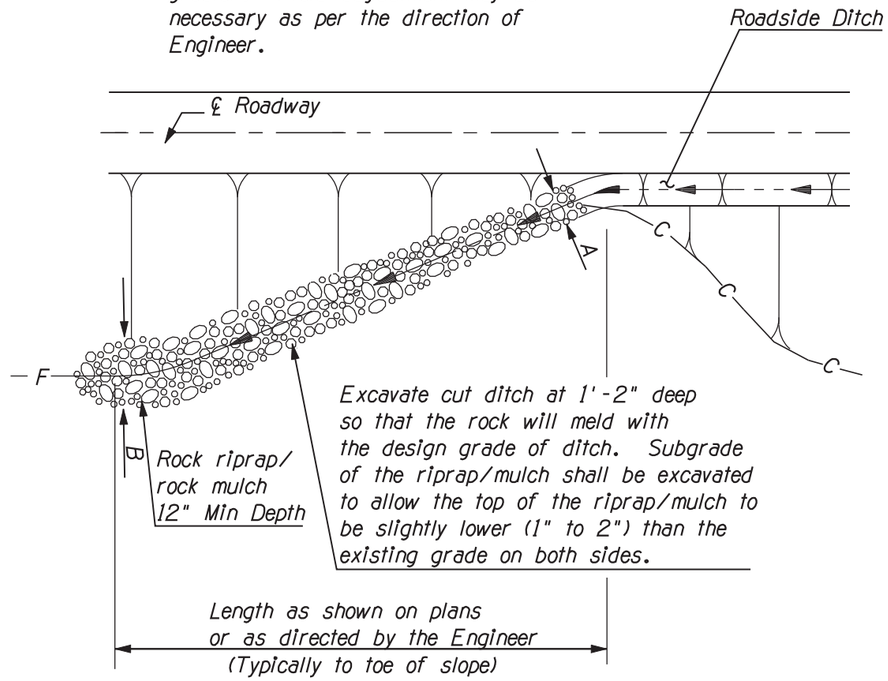
FLARED END SECTION (NTS)

DETAIL E2

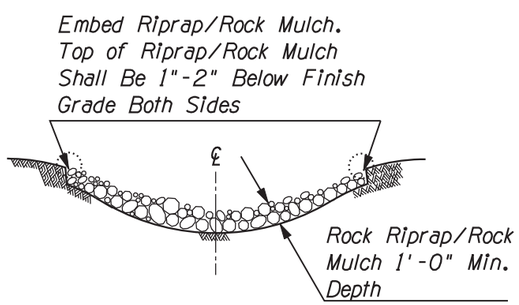


EMBANKMENT-CUT/FILL-SLOPE
TRANSITION PERSPECTIVE (NTS)

NOTE:
Cut and fill transition should be placed as shown on plans or where the length of the roadside ditch is 50 feet or greater. Field adjustment may be necessary as per the direction of Engineer.



CUT AND FILL TRANSITION
PLAN VIEW



CUT AND FILL TRANSITION
ROCK RIPRAP/ROCK MULCH CHANNEL LINING
CROSS SECTION (NTS)

DETAIL E3

ROCK PROTECTION BMP FOR CUT & FILL TRANSITION
ROCK RIPRAP/ROCK MULCH CHANNEL LINING

GENERAL NOTES FOR ROCK PROTECTION BMP DETAIL E2 & E3:
ROCK RIPRAP/ROCK MULCH IN THE CLEAR ZONE/RECOVERY AREA

1. Rock Riprap/Rock Mulch within the traffic Clear Zone/Recovery Area shall conform to the requirements of Section 810-2.03 Sieve Size Gradation A and/or Gradation C, and Section 913.
2. The minimum depth of the rock riprap/rock mulch shall be 12" for Channel Lining and Cut & Fill Transition. The ground surface shall be excavated to a depth that the rock will meld with the grade of the ditch.
3. Within traffic recovery area/clear zone, any rock size 4 inches or greater shall be imbedded into the finished grade so that any portion of the rock above the grade will be less than 4 inches in height.
4. The installation and maintenance of Rock Protection BMPs shall not negatively impact traffic safety, as well as the designed function of roadway or bridge drainage facilities. For erosion/sediment control purposes, Rock Protection BMPs shall be installed and maintained to carry the storm water of at least 2-year, 24-hour events.
5. The Rock Protection BMP's pay/bid item shall include all materials used for this BMP, all ground preparation, furnishing, installing, as well as returning the area to an acceptable condition as approved by the Engineer.

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DRAWN	ZITAO FANG	9-2007	EROSION/SEDIMENT CONTROL AND WATER QUALITY PROTECTION DETAILS
CHECKED	E LEROY BRADY	9-2007	
TEAM LEADER	E LEROY BRADY	9-2007	
ROUTE	MP	LOCATION	SHEET OF
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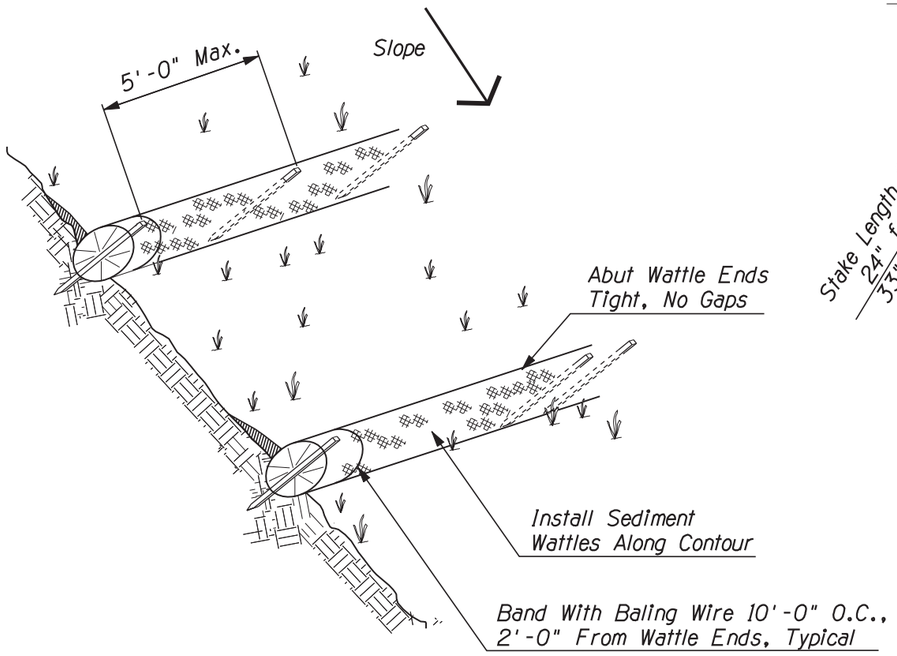
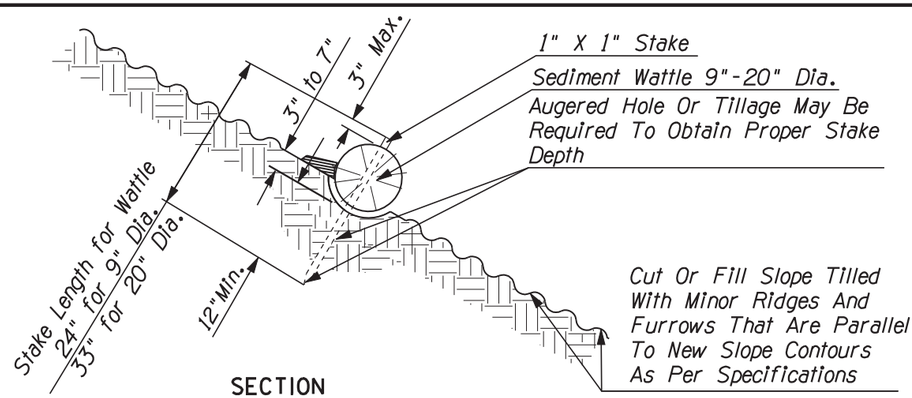
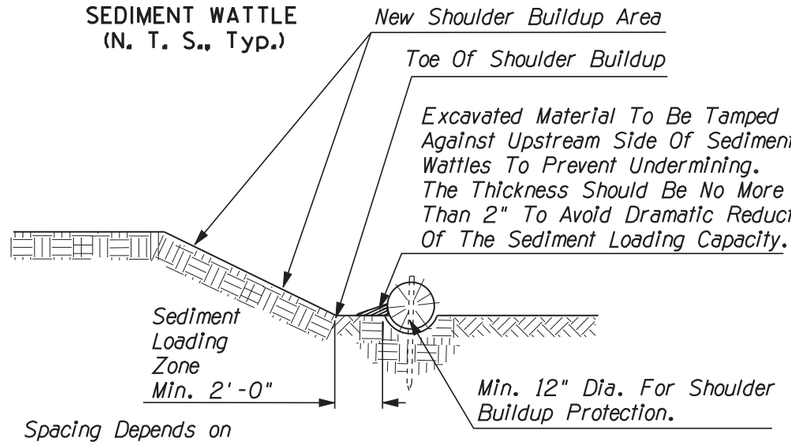


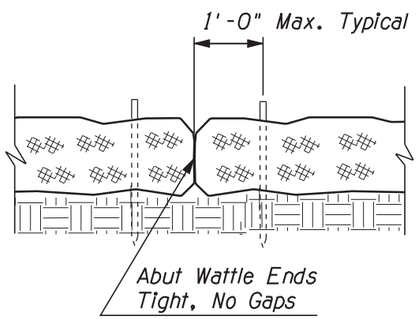
SEDIMENT WATTLE LAYOUT
(N. T. S., Typ.)



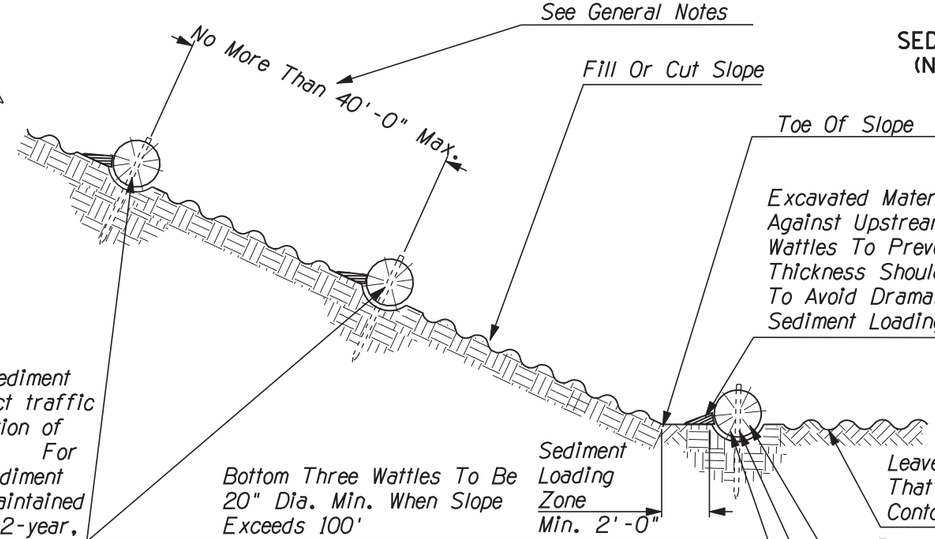
SECTION
SEDIMENT WATTLE
(N. T. S., Typ.)



SECTION
SEDIMENT WATTLE
(N. T. S., Typ.)



SEDIMENT WATTLE CONNECTION
(N. T. S., Typ.)



SECTION
SEDIMENT WATTLE
(N. T. S., Typ.)

DETAIL E4
SEDIMENT WATTLE

NOTES

Sediment wattles to be installed as slopes are constructed to grade or as directed by the engineer. They shall be selected, installed, and maintained in conformance with manufacturers' specifications to meet site conditions for slope protection and in accordance with good engineering practices. No Sediment Wattles shall be installed in the urban freeway medians, as well as where cable barrier systems are employed.

Trenches to be constructed along and parallel to the contours. Trench depth to be 1/3 the thickness of the sediment wattle. Place excavated material on uphill side of trench.

Locate sediment wattles as indicated on plans or as directed by the engineer. Space wattle trenches according to the following schedule:

Slope Ratio	Maximum Spacing Intervals
1:1 and Steeper, Apply Minibenching or Other Suitable BMPs.	
2:1	10'-0"
3:1	20'-0"
4:1	30'-0"
5:1	40'-0"
6:1	40'-0"

Sediment wattles to be in continuous contact with trench bottom and sides. No daylight should be seen under the wattle. Do not overlap the ends on top of each other.

Stakes to penetrate soil of trench bottom 12" minimum. Stake to be exposed 3" maximum above top of wattle. Space stakes 5'-0" o.c. Max., 1'-0"max. At wattle ends, typical. A 20" dia. wattle may be made from 2 - 3 rolled excelsior or straw blankets.

Repair any rills or gullies promptly.

Construction of cut slopes 2:1 and steeper in soil and rock materials that can be ripped shall whenever possible be constructed using minibenching best management practice (BMP).

Where minibenches are used, loosening the surface soil is not required. For the seeded areas, tillage is to be performed to form minor ridges and furrows that are parallel to new slope contours and as specified in Section 805.

GENERAL NOTE

The installation and maintenance of Sediment Wattle BMPs shall not negatively impact traffic safety, as well as the designed function of roadway or bridge drainage facilities. For erosion/sediment control purposes, Sediment Wattle BMPs shall be installed and maintained to carry the storm water of at least 2-year, 24-hour events.

The Sediment Wattle BMP's pay/bid item shall include all materials used for this BMP, all ground preparation, furnishing, installing, final removal, and disposal of this temporary BMP, as well as returning the area to an acceptable condition as approved by the Engineer.

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DESIGN	E LEROY BRADY	10-2007	
DESIGN	ZITAO FANG	10-2007	
DRAWN	ZITAO FANG	10-2007	EROSION/SEDIMENT CONTROL AND WATER QUALITY PROTECTION DETAILS
CHECKED	E LEROY BRADY	10-2007	
TEAM LEADER	E LEROY BRADY	10-2007	
ROUTE	MP	LOCATION	SHEET OF
TRACS NO.			___ OF ___

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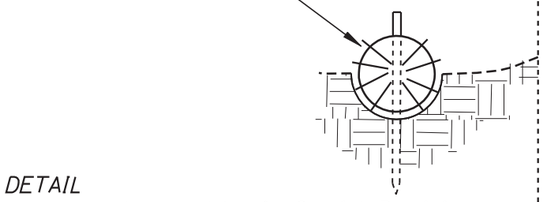
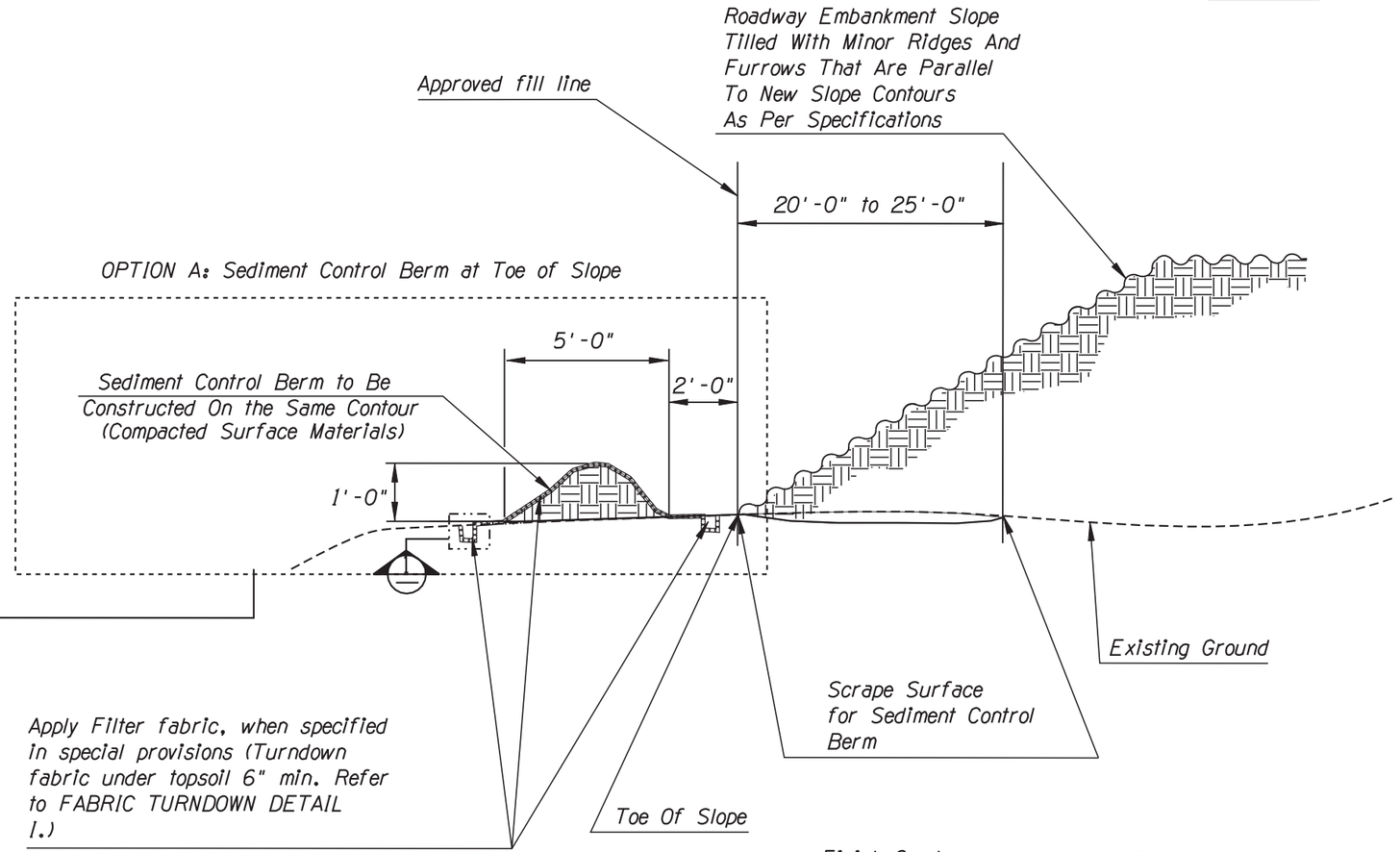
OPTION B: Sediment Wattle at Toe of Slope
(Only As Called Out In Layout Plans And/Or In Special Provisions)



NOTE TO THIS DETAIL
When called out on layout plans and/or in Special Provisions, for urban situations, or where surface materials are not available, use wattles. Wattles shall be selected, installed, and maintained in accordance with manufacturers' specifications and good engineering practices. Refer to Sediment Wattle Detail.

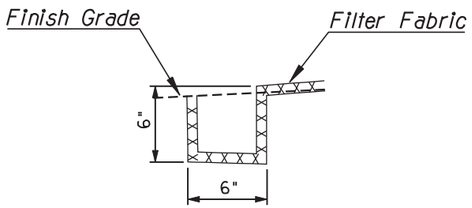
OPTION A: Sediment Control Berm at Toe of Slope



Notes:
Locate Sediment Control Berms as indicated on plans or as directed by the Engineer. Surface materials i.e. soil, rock, branches, leaves, slash and chips shall be scraped from the existing grade as needed to construct the erosion berm prior to placement of roadway embankment. After scraping material into berm, compact berm as shown. Rock and slash shall extend no more than 4" above the surface. Sediment Control Berm shall be constructed on the same contour and beyond the toe of new slope. For the seeded areas, tillage is to be performed to form minor ridges and furrows that are parallel to new slope contours and as specified in Section 805.

The installation and maintenance of Sediment Control Berm BMPs shall not negatively impact traffic safety, as well as the designed function of roadway or bridge drainage facilities. For erosion/sediment control purposes, Sediment Control Berm BMPs shall be installed and maintained to carry the storm water of at least 2-year, 24-hour events.

The Sediment Control Berm BMP's pay/bid item shall include all materials used for this BMP, all ground preparation, furnishing, installing, final removal, and disposal of this temporary BMP, as well as returning the area to an acceptable condition as approved by the Engineer.



FABRIC TURNDOWN DETAIL I

Detail E5

SEDIMENT CONTROL BERM
(N. T. S., TYP.)

	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADSIDE DEVELOPMENT SECTION
DESIGN	E LEROY BRADY	9-2007	
DESIGN	ZITAO FANG	9-2007	
DRAWN	ZITAO FANG	9-2007	
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TEAM LEADER	E LEROY BRADY	9-2007	
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NO.1 NO.2 DESCRIPTION OF REVISION MADE BY DATE

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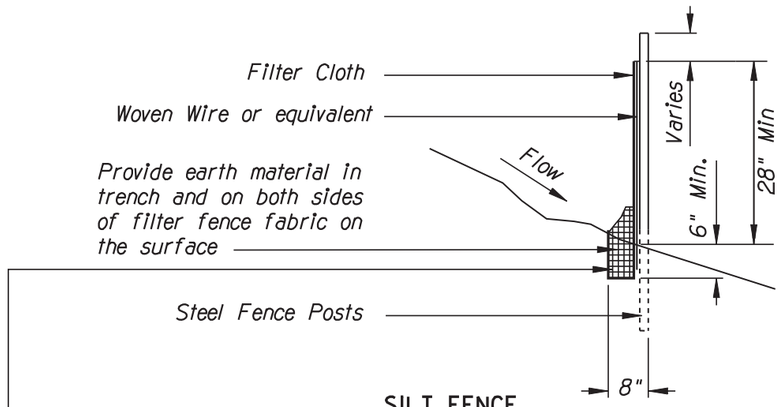
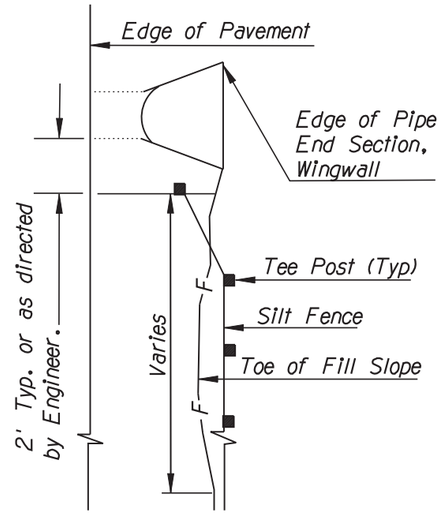
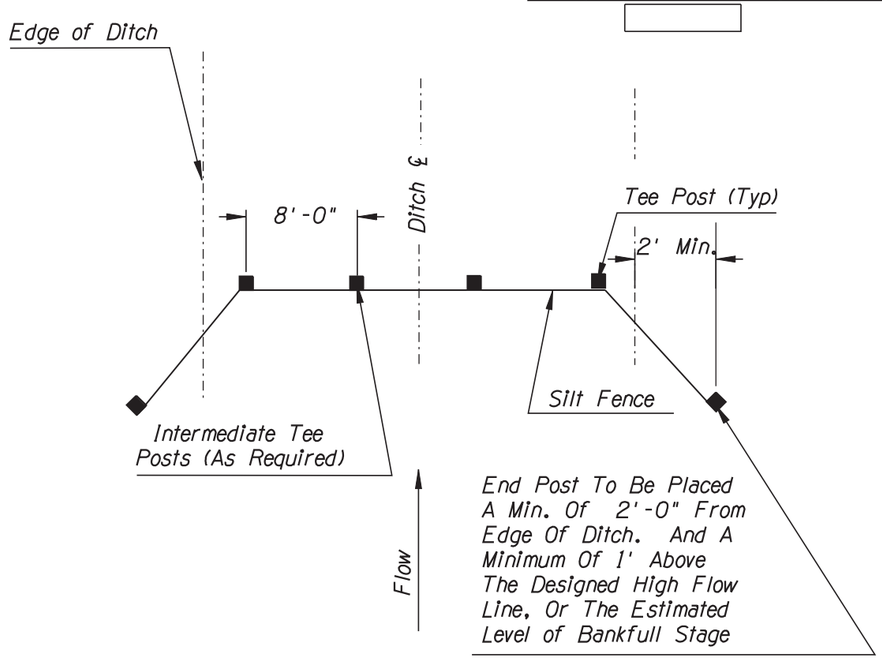


SILT FENCE
SECTION VIEW
(N. T. S., Typ.)

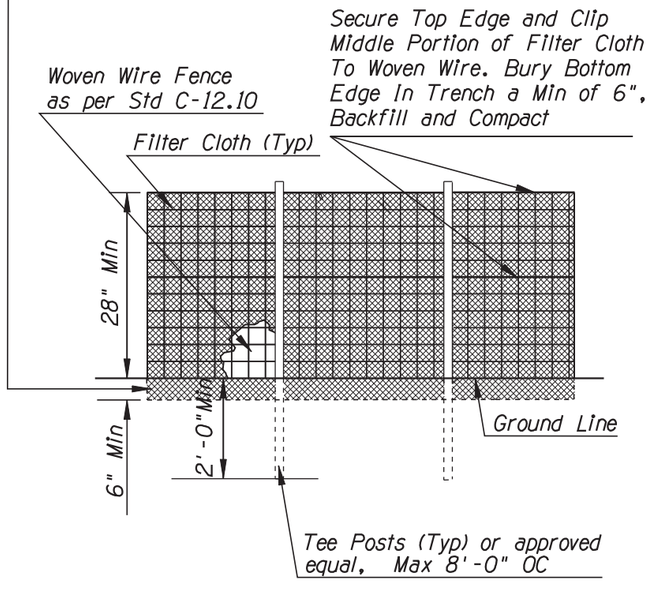
Silt fence filter fabric in the installation trench shall be buried a minimum of twenty inches. The section of the trench shall be a minimum of 6" (deep) X 8" (wide). Filter fabric is to be buried along the side and bottom of the trench and back up to the upstream slope grade. Silt fence filter fabric section shall be a "J" form to prevent under cuts and carry stress from upstream sediment loading.



PLAN VIEW
PIPE INLET/OUTLET
SILT FENCE PLACEMENT



FILTER FABRIC SILT FENCE
DITCH CHECK FOR MINOR FLOW SITUATION
(N. T. S., Typ.)



DETAIL E6

SILT FENCE
ELEVATION VIEW
(N. T. S., Typ.)

GENERAL NOTES:

Silt fences may be required as directed by the Engineer. Silt fences are for temporary erosion control in terms of sheet flow and minor concentrated flow areas only; they shall be selected, installed, and maintained with manufacturer's specifications and good engineering practices. Remove silt fences upon achieving the Final Stabilization Requirements.

Silt fences are to be installed at areas of construction disturbance as required; especially, the downslope perimeters of construction disturbed areas.

The contractor shall supply a rain gauge and monitor the amount of rainfall and document the precipitation results within 24 hours of their occurance and submit this information to the Engineer.

Once a silt fence has been installed it is the responsibility of the contractor to properly maintain this device.

The installation and maintenance of Silt Fence BMPs shall not negatively impact traffic safety, as well as the designed function of roadway or bridge drainage facilities. For erosion/sediment control purposes, Silt Fence BMPs shall be installed and maintained to carry the storm water of at least 2-year, 24-hour events.

The Silt Fence BMP's pay/bid item shall include all materials used for this BMP, all ground preparation, furnishing, installing, final removal, and disposal of this temporary BMP, as well as returning the area to an acceptable condition as approved by the Engineer.

Filter cloth shall be a woven polypropylene fabric and shall conform to the following specifications:

Apparent Opening Size - 20-50 US Std. Sieve
Mullen Burst - 200-275 p.s.i.
Trapezoidal Tear - 50-60 lbs.
Grab Elongation - 15-25%
Grab Tensile - 100 lbs. min.
UV Resistance - 70-90 %

Wire mesh fence fabric shall be standard woven wire fence fabric, as specified in Construction Standard C-12.10 .

Posts shall be steel line posts as specified in Construction Standard C-12.10. with a minimum length of 6'-0" .

Plastic filter cloth shall be attached to the top wire and midpoint of the fence fabric every 3'-0" and shall also be attached to the posts at the top, middle, and bottom with wire ties.

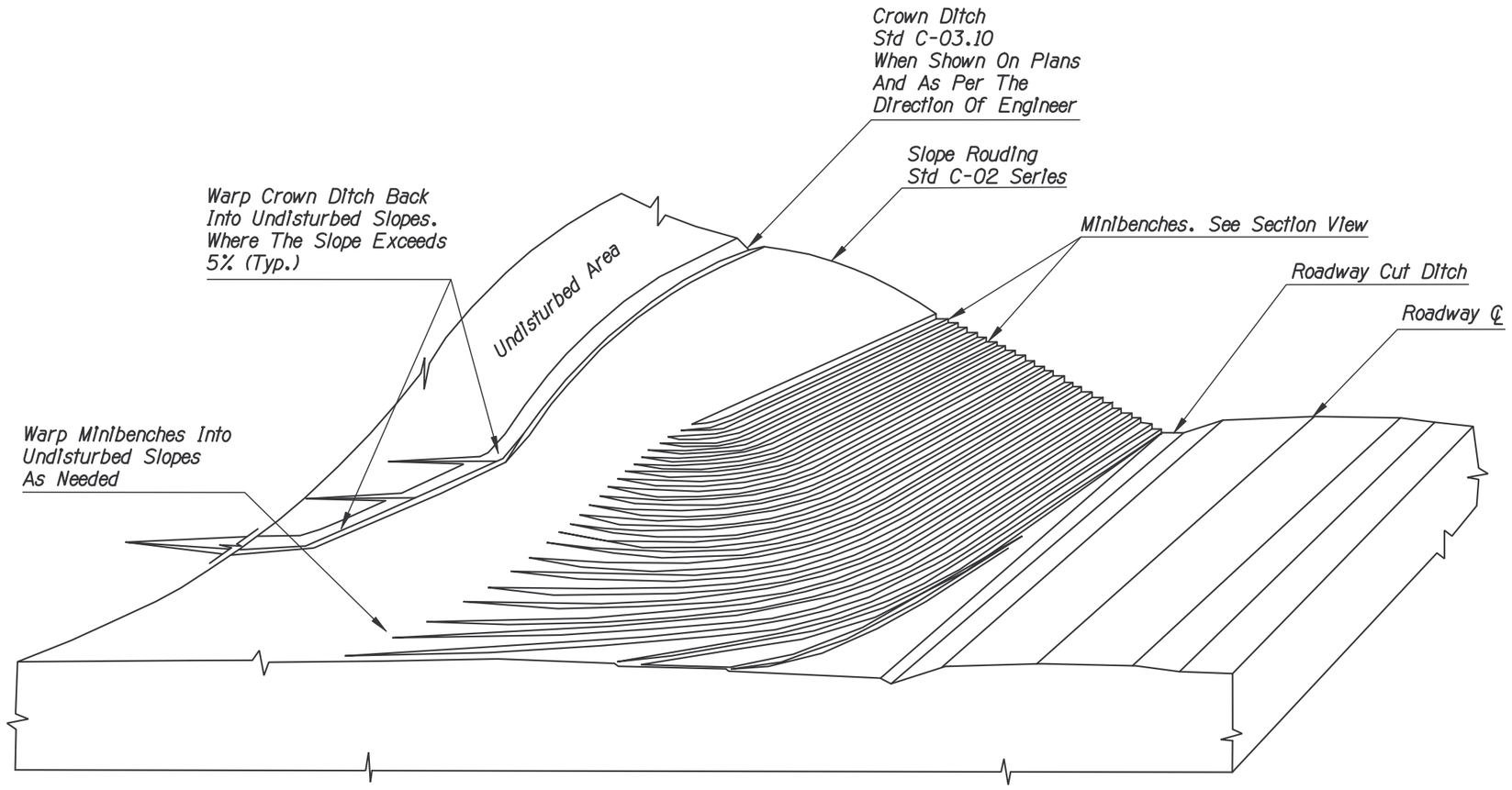
Unless otherwise specified, silt fences shall be installed on the same elevation or contour line.

Silt fence ditch check shall not be applied within the banks of living streams or natural washes. They shall not be applied within the flow path of box or pipe culvert inlets and outlets.

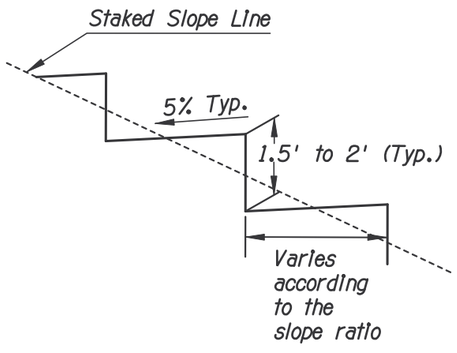
	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADSIDE DEVELOPMENT SECTION
DESIGN	E LEROY BRADY	9-2007	
DESIGN	ZITAO FANG	9-2007	
DRAWN	ZITAO FANG	9-2007	
CHECKED	E LEROY BRADY	9-2007	EROSION/SEDIMENT CONTROL AND WATER QUALITY PROTECTION DETAILS
TEAM LEADER	E LEROY BRADY	9-2007	
ROUTE	MP	LOCATION	SHEET OF
TRACS NO.			___ OF ___

NO.1 DESCRIPTION OF REVISION | NO.2 DESCRIPTION | DATE | MADE BY | DATE | DESCRIPTION OF REVISION

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				



PERSPECTIVE VIEW OF MINIBENCHES



SECTION VIEW
MINI BENCHES
(N. T. S., Typ.)

GENERAL NOTES:

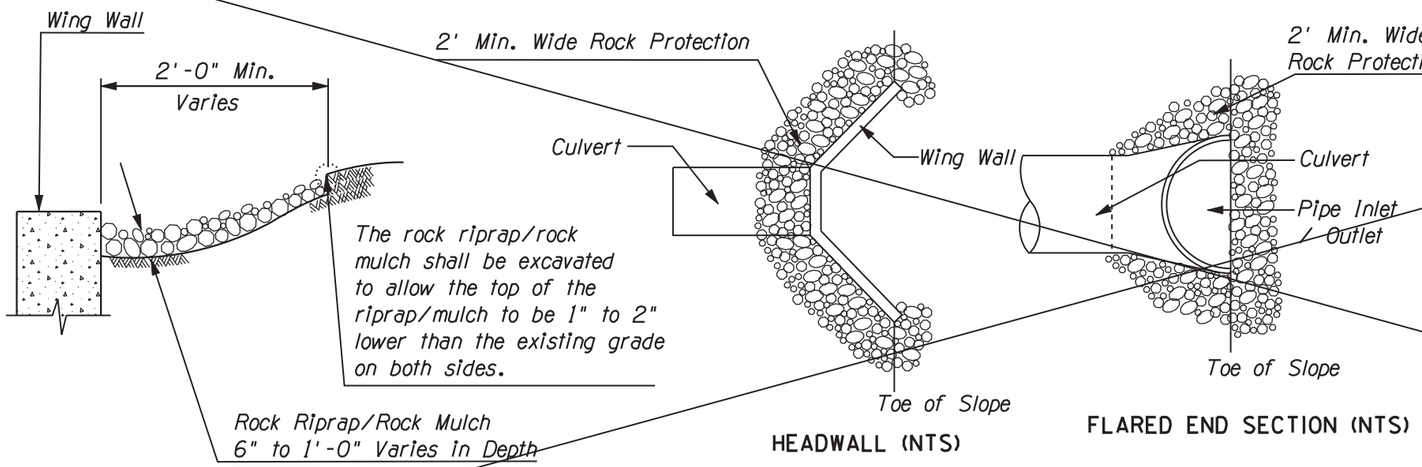
1. Minibenches to be constructed horizontal as the cut is being constructed.
2. Apply slope rounding as per Section 203, Subsection 3.03(B) of the Standard Specifications.
3. Dimensions of the ditches are noted on plan sheets.
4. The horizontal dimension of the bench is a function of the staked slope line.
5. Apply seeding for revegetation and permanent erosion control as the slope is being constructed to conform to the application limits of the seeding/mulching equipment.
6. Each bench must be constructed on the same elevation (contour line).
7. Minibenches shall be constructed on all soil and soil/rock slopes that are suitable.
8. Use earth diversion dike in lieu of crown ditch when suitable and as per the approval from the Engineer.
9. The potential volume and speed of run-on water should be carefully considered prior to selection of crown ditches as a diversionary measure. Other supplemental BMPs may be necessary in conjunction with crown ditches, earthen dikes or other run-on diversion measures, to prevent scour and provide outlet protection.

DETAIL E7
MINI BENCHING

	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADSIDE DEVELOPMENT SECTION
DESIGN	E LEROY BRADY	2-2006	
DESIGN	ZITAO FANG	2-2006	
DRAWN	ZITAO FANG	2-2006	
CHECKED	E LEROY BRADY	2-2006	EROSION/SEDIMENT CONTROL AND WATER QUALITY PROTECTION DETAILS
TEAM LEADER	E LEROY BRADY	2-2006	
ROUTE	MP	LOCATION	SHEET OF
TRACS NO.			___ OF ___

NO. | DESCRIPTION OF REVISION | MADE BY | DATE

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	RAM-600-I-554	142	143	
		101L MA 042			



ROCK RIPRAP/ROCK MULCH FOR HEADWALL TRANSITION CROSS SECTION (NTS)

HEADWALL (NTS)

FLARED END SECTION (NTS)

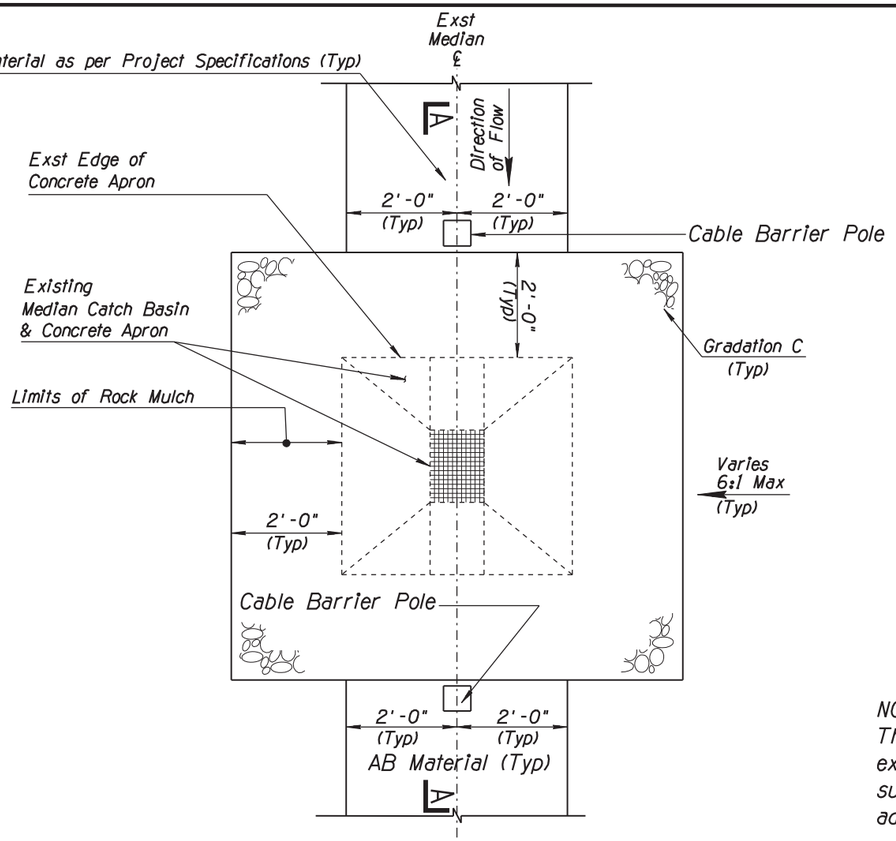
DETAIL EXX

GENERAL NOTES FOR DETAIL E3:
ROCK RIPRAP/ROCK MULCH IN THE CLEAR ZONE/RECOVERY AREA

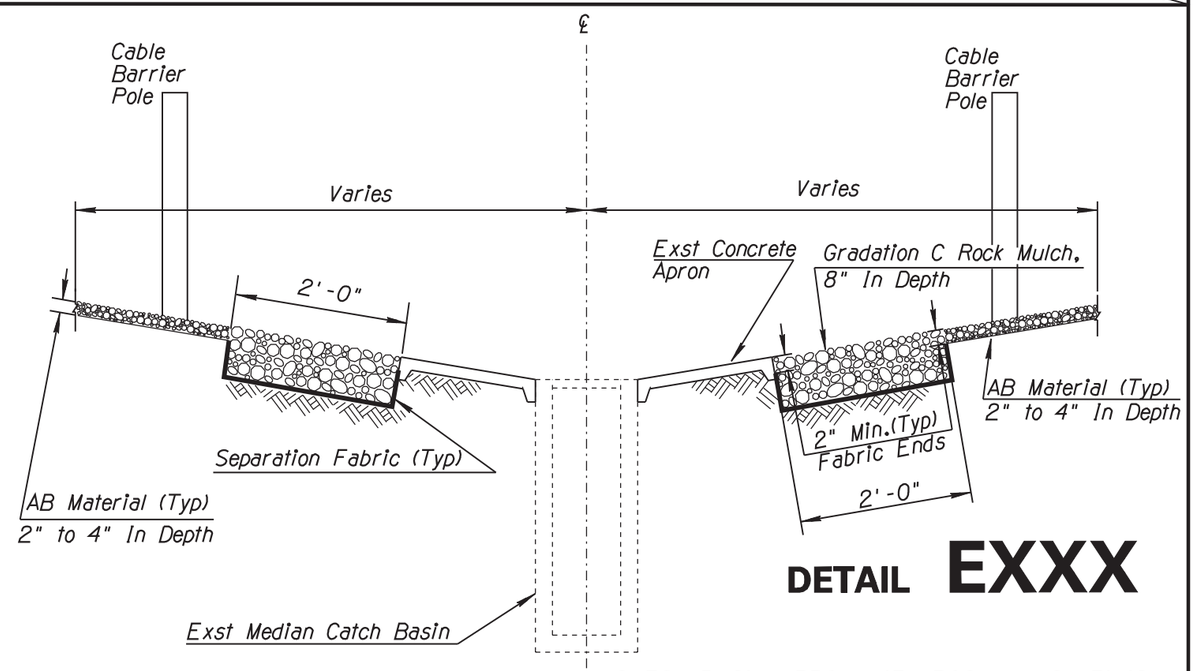
Rock Riprap/Rock Mulch within the traffic Clear Zone/Recovery Area shall conform to the requirements of Section 810-2.03 Sieve Size Gradation A and/or Gradation C, and Section 913.

The minimum depth of the rock riprap/rock mulch shall be 12" for Channel Lining and Cut & Fill Transition. The ground surface shall be excavated to a depth that the rock will meld with the grade of the ditch.

Within traffic recovery area/clear zone, any rock size 4 inches or greater shall be imbedded into the finished grade so that any portion of the rock above the grade will be less than 4 inches in height.



PLAN VIEW OF CATCH BASIN APRON WITH ROCK MULCH FINISH
Layout View (NTS)



DETAIL EXXX

CATCH BASIN APRON WITH ROCK MULCH FINISH
Section A-A (NTS)

NOTE:
The AB shall be placed so that the bottom strand of the existing cable barrier shall be 21-inches above the finished surface of the AB material. The depth of the AB may be adjusted, in order to meet this requirement.

	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADSIDE DEVELOPMENT SECTION	
DESIGN	E LEROY BRADY	6-2006		
DESIGN	ZITAO FANG	6-2006		
DRAWN	ZITAO FANG	6-2006		
CHECKED	E LEROY BRADY	6-2006	EROSION & SEDIMENT CONTROL DETAILS	
TEAM LEADER	E LEROY BRADY	6-2006		
ROUTE 101L	MP	LOCATION PIMA FREEWAY-SRPMIC BOUNDARY TO CAMELBACK RD.		SHEET 3 OF 4
TRACS NO. H4914 01C			PROJECT NO. RAM-600-I-554	___ OF ___

NO.1 DESCRIPTION OF REVISION | MADE BY | DATE | NO.2 DESCRIPTION OF REVISION | MADE BY | DATE

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Appendix F Public Comments and Response to Public Comments on the Draft Environmental Assessment

Mike Dechter, NEPA Coordinator
Coconino National Forest
1824 S. Thompson Street
Flagstaff, AZ 86004

RE: Glen Canyon to Pinnacle Peak 345kV Transmission Line Vegetation Management

Dear Mr. Dechter:

On December 19, 2011, the Center for Biological Diversity (Center) supplied comment on Western Area Power Administration's (Western) Environmental Assessment (EA) for the Glen Canyon to Pinnacle Peak 345kV Transmission Line Vegetation Management Project (project). Below is each of the comments provided by the Center, followed by responses from Western, provided in *italics*.

Comment #1: Indicator species

The project area covers 10 distinct potential natural vegetation types. See EA 3-2 to 3-5 (Table 3-1). In addition, it crosses through 18 Management Areas designated by the Coconino Forest Plan, including three Wilderness Areas. Id. at 3-28. The National Forest Management Act ("NFMA") and its implementing regulations require emphasis in the project on maintenance of viable populations of up to 17 management indicator species ("MIS"). Id. at 3-9. ("The CNF currently identifies 17 species as MIS.") The project EA mentions just four MIS in particular: northern goshawk, Mexican spotted owl, pronghorn antelope, and wild turkey. Id. Other MIS associated with riparian forest, aspen and pinyon-juniper woodland are omitted from analysis. The EA contains no information on forest-wide habitat or population trends for any MIS.

Response

The Final EA mentions, evaluates, and provides information on forest-wide habitat and population trends for all 17 MIS. See Section 3.3.4.1 of the Final EA for a complete discussion on all MIS for the Coconino National Forest.

Comment #2: Amphibians

The project area contains known occurrences of threatened Chiricahua leopard frog and sensitive northern leopard frog. See id. at 3-16. The proposed action may spread chytrid fungus, which can kill frogs, to uninfected wetlands and saturated areas on machinery, vehicles, "and even boots." Id. at 3-20. The action will not avoid frog habitat and proposed mitigation focuses on decontamination of vehicles.

Response

Project Conservation Measures (PCM) (see Table 2-2 of the Final EA) have been added to the Final EA to minimize the potential for spread of chytrid fungus. Specifically, PCM #19 reads: "To minimize impacts to Chiricahua and Northern Leopard Frogs, wet areas will be avoided to the extent practicable and all activity will be minimized during winter and other wet periods. This would minimize the potential for the spread of the pathogenic chytrid fungus

(Batrachochytrium dendrobatidis), which can be fatal to frogs. If wet areas cannot be avoided, debris will be removed from vehicles and decontaminated with quaternary ammonia to kill the fungus prior to moving to new areas." In addition, PCM #35 (included in the Draft EA) states: "To minimize impacts to soils and wetlands, mechanical clearing of vegetation will be prohibited within 100 feet of a wetland during the wet season (July 1 to September 30 and December 1 to March 31)." This will minimize the potential for the spread of chytrid fungus.

Comment #3a: Mexican Spotted Owl

The EA suggests that removal of large, nest-quality trees from critical habitat of threatened Mexican spotted owl will "benefit" the species. Id. at 3-24 [emphasis added]. The analysis lacks scientific integrity. The project is likely to adversely affect spotted owl and critical habitat by removing and fragmenting habitat, including trees larger than 24-inches diameter, inside of up to eight (8) Protected Activity Centers ("PAC"). Id. at 3-17 to 3-18. "The Mexican spotted owl may be directly impacted by the Proposed Action." Id. at 3-20. "Many trees that are or may become suitable nesting trees would be removed as a part of this Project." Id. at 3-21. Formal consultation with the U.S. Fish and Wildlife Service ("FWS") under Section 7 of the Endangered Species Act ("ESA") is required.

Response

The EA for the project does not state that the Proposed Action will "benefit" MSO. Section 3.3.5.2 of the Final EA states: "The Proposed Action will likely have an effect on the Mexican spotted owl. […] Impacts to Mexican spotted owl habitat would occur as a result of Project-related activities. This includes areas within PACs, potentially within the core areas." (Final EA, page 3-38). The EA does state, however, that "The Proposed Action would result in a large amount of edge habitat. These areas can be used by owls for foraging. Through retention of downed logs and other coarse woody debris, habitat would be created for prey species such as rodents. Further, the Proposed Action's proactive method of vegetation management is intended to reduce the potential for wildland fire within the rights-of-way and may also reduce the intensity of fires in the canopy of the forest, which provides critical nesting/roosting habitat for owls." These are well-established and accepted scientific principles, and are not lacking in integrity.

The environmental consequences of the No Action alternative describes that the No Action alternative may result in higher impacts to special status species wildlife because vegetation would continue to be removed reactively and on an emergency basis. Under these conditions, Western is not subject to implementing any PCMs, and protection of MSO is not considered for tree removal activities. However, the Proposed Action would routinely remove vegetation before it becomes a hazardous condition, thus necessitating the implementation of the PCMs identified in Table 2-2 for project activities.

Formal consultation with the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act has been completed for this action. The US Forest Service completed a Biological Assessment (BA) for Maintenance in Utility Corridors on Arizona Forests, including Western's corridor in the Coconino National Forest, in February 2008. The USFWS issued a Biological Opinion (BO) concurring with the determination of effects for the Proposed Action in

July 2008. See response to Comment #3b: Mexican Spotted Owl for more detail on formal consultation with the USFWS for this action.

Comment #3b: Mexican Spotted Owl (continued)

The FWS in 2008 completed a biological opinion on powerline operation and maintenance on national forest lands in northern Arizona. See id. at 1-1. It is not clear if the instant action was included in the proposed action for that biological opinion. Regardless, that opinion pre-dates the April 17, 2009 letter of the Forest Service to FWS requesting re-initiation of formal consultation on implementation of land and resource management plans for national forest lands in the Southwestern Region, including the Coconino National Forest. According to the April 17, 2009 letter, "[i]t has now become apparent that the Forest Service will likely soon exceed the amount of take issued for at least one species, the Mexican spotted owl." In addition, "it has become apparent that the Forest Service is unable to fully implement and comply with the monitoring requirements associated with the Reasonable and Prudent Measures for several species (including MSO) in the [2005 biological opinion]." The FWS accepted the Forest Service's request and reinitiated formal consultation on forest plan implementation.

The project will implement the Coconino Forest Plan. Therefore, it is subject to the reinitiated consultation on forest plan implementation. The Forest Service already has admitted that it cannot or will not implement terms and conditions intended to avoid jeopardizing spotted owl, including those outlined in the 2008 biological opinion on powerline operation and maintenance. Even if the agency can implement reasonable and prudent measures to avoid jeopardy in the instant project, the proposed action contains "exceptions" when such measures would not occur. EA at 3-21; also see id. at 3-23 (Table 3-5). "[E]mergency situations prioritize resolution of the emergency (i.e., vegetation removal) over resource protection…" Id. at 3-24.

Response

Western's Proposed Action for this project is the implementation of the action analyzed in the BA for Threatened and Endangered Species – Phase II Maintenance in Utility Corridors on Arizona Forests, February 2008, and subsequent concurrence with determination of effects identified in the BO issued by the USFWS in July 2008 (Consultation #22410-2007-F-0365). A review of these documents in conjunction with Western's EA for this project reveals complete consistency between the action analyzed in the February 2008 BA and subsequent BO, and Western's Proposed Action for this project.

The April 17, 2009 letter from the Forest Service to USFWS requested re-initiation of formal consultation for a BO (Consultation #2-22-03-F-366, Continued Implementation of the Land and Resource Management Plans for the Eleven National Forests and National Grasslands of the Southwestern Region) unaffiliated with this action. Western is the lead federal agency for this project. As such, the project will implement Western's Proposed Action (see Section 2 of the Final EA).This project includes terms and conditions associated with the recent March 30, 2012 Biological Opinion by including mitigations to minimize activities within ¼ mile of Mexican spotted owl Protected Activity Centers (PAC). Where these design features cannot be met, this project follows the site-specific 2008 Biological Opinion specific to utility line maintenance. This is in compliance with the 2012 Biological Opinion where it states, "Site-specific projects will conform to the S&Gs, as well as the programmatic framework established in the LRMPs. If not,

the action would be considered outside the scope of this consultation and would require separate site specific ESA §7(a)(2) consultation to address the effects of that particular proposed action."

The statement cited by the Center from the Forest Service of "[i]t has now become apparent that the Forest Service will likely soon exceed the amount of take issued for at least one species, the Mexican spotted owl" is irrelevant for this project as the USFWS issued a separate BO specific to Western's Proposed Action (Consultation #22410-2007-F-0365) which allows for take of one pair of MSO for each PAC affected by this project in addition to incidental take outside of the PACs as a result of this action (BO #22410-2007-F-0365, Pages 61-62). This issue is addressed by the recent re-consultation of the LRMP BO and new BO issued May 30, 2012. Furthermore, since this project is Western's action, Western is solely responsible for implementing the PCMs, which include all of the Reasonable and Prudent Measures and terms and conditions for the MSO of the 2008 BO prepared for this action.

Western Order 450.3A, Section 7b states "The principal purpose of the transmission facility is for the safe and reliable operation of the power system and all other resource and management issues are considered secondary." Thus, when vegetation conditions threaten the safe and reliable operation of the transmission facility (resulting in emergency situations), Western is required to resolve the emergency immediately, giving only secondary consideration to resource protection (i.e., PCMs). This is a requirement of both the Proposed Action and No Action alternatives. The Proposed Action will eliminate emergency situations for Western's rights-of-way related to vegetation threats, thus requiring the implementation of PCMs for resource protection, including all MSO PCMs. Conversely, implementation of the No Action alternative will result in repeated emergency vegetation situations throughout Western's rights-of-way which, per Western Order 450.3A, can be resolved without regard to PCMs otherwise required through the Proposed Action.

Comment #3c: Mexican Spotted Owl (continued)

Moreover, the Forest Service admits uncertainty regarding its prediction in the 2008 biological opinion that powerline operation and maintenance will not cause "take" (i.e., killing or displacement) of spotted owl. Data submitted by the action agency to the FWS demonstrates failure to monitor owl occupancy or behavior in many of the PAC that will be directly impacted by the project. [1] "Within these areas of critical habitat, there are 8 PACs within 0.25 mile of the Project area… Of these, only Boondock, Cash, and Meadow Canyon have portions of their core area that may be impacted." EA at 3-17.

Response

The BO (#22410-2007-F-0365) issued for the project BA at Pages 61 and 62, does allow for a take for up to one pair of MSO for each PAC within the project area for this action. As for the failure of the US Forest Service to monitor owl occupancy or behavior in many of the PACs in the project area, this is irrelevant for this action, as Western is solely responsible for implementing all PCMs for this project (including MSO measures specified in the 2008 BO [#22410-2007-F-0365]. Please see response to Comment #3b: Mexican Spotted Owl, paragraph 3.

Comment #3d: Mexican Spotted Owl (continued)

The EA contains no information about foreseeable cumulative effects to spotted owl and its critical habitat, including effects of the Upper Beaver project (Decision Notice 3/25/10), the Marshall project (Decision Notice 1/27/11), the Clints Well project (proposed action 10/23/09) and the Long Valley project (proposed action 7/29/10). Spotted owl is a MIS. See id. at 3-9. Therefore, forest-wide habitat and population trends are relevant to the analysis.

Response

Cumulative effects to all resources are included throughout Section 3 of the Final EA. In addition, forest-wide habitat and population trends for MSO are included in Section 3.3.5.2 of the Final EA. Cumulative effects for this action in conjunction with applicable past, present, and reasonably foreseeable future actions have been evaluated based on the projects listed in Table 3-1 of the Final EA and in coordination with Coconino National Forest. The specific projects mentioned above (Upper Beaver project, Marshall project, Clint's Well project, and Long Valley project) have been considered and evaluated as a part of the larger Four Forest Restoration Initiative EIS: South Kaibab and Coconino action (see Table 3-1 of the Final EA).

Comment #4: Invasive Weeds

Spread of invasive weeds is a reasonably foreseeable and potentially significant forest-wide cumulative impact of the proposed action. Similar ground-based logging activities combined with past, ongoing and foreseeable livestock grazing and the Four Forests Restoration Initiative threaten to overrun the forest with invasive species. This has important long-term implications for native plant communities in fire-adapted ecosystems and wildlife associated with grassland habitats, including MIS of "primary concern" like pronghorn antelope. EA at 3-9.

Livestock grazing, logging, prescribed fire, off-road vehicle use and other practices that disturb soils can spread weeds. Livestock act as vectors for seed travel, disturb soil and reduce the competitive and reproductive capacities of native species. The project area overlaps an undisclosed number of grazing allotments.

Response

As stated in the description of the Proposed Action for this project, grassland areas will require little, if any, vegetation removal, thus significantly minimizing the potential for spread of invasive weeds as a result of project activities. Furthermore, impacts resulting from the spread of noxious weeds of invasive plant species are included and fully disclosed in Section 3.3.2.2 of the Final EA. PCMs to minimize the potential of noxious weed infestation as a result of this project are also included in Table 2-2 of the EA.