In cooperation with the Washington Department of Ecology

# Melvin R. Sampson Hatchery Yakima Basin Coho Project

## Draft Environmental Impact Statement

**March 2017**

**DOE/EIS-0522**

# Melvin R. Sampson Hatchery
# Yakima Basin Coho Project

## Draft
## Environmental Impact Statement
## DOE/EIS-0522

Bonneville Power Administration

In cooperation with the

Washington Department of Ecology

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# Abstract

**Responsible Agency:** Bonneville Power Administration (BPA)

**Cooperating Agency**: Washington Department of Ecology (Ecology)

**Title of Proposed Project:** Melvin R. Sampson Hatchery Yakima Basin Coho Project, DOE/EIS - 0522

**State Involved:** Washington

**Abstract:** BPA is proposing to fund the construction and operation of the Melvin R. Sampson (MRS) Hatchery for coho production in the Yakima River Basin in central Washington. The proposed hatchery would be owned and operated by the Confederated Tribes and Bands of the Yakama Nation (Yakama Nation). The project would help support the Yakama Nation's goals to enhance existing anadromous fish stocks, maintain genetic resources, reintroduce stocks formerly present, and provide increased harvest opportunities in the Yakima Basin. Funding the hatchery would help mitigate for effects of the Federal Columbia River Power System on fish and wildlife. To operate the hatchery, the Yakama Nation would acquire water rights from Ecology.

The proposed action includes construction and operation of a new coho hatchery, release of juvenile and adult coho reared at the hatchery, operation of acclimation sites, and collection of adult coho broodstock. This environmental impact statement (EIS) analyzes the Proposed Action and a No Action Alternative and considers potential impacts to land use, recreation, transportation, geology and soils, vegetation, water resources, wetlands and floodplains, fish, wildlife, cultural resources, socioeconomics and environmental justice, air quality and climate change, visual resources, and noise, hazardous waste, public health, and safety.

**Public review of and comment on this Draft EIS will continue through May 1, 2017.** Responses to comments will be included in the Final EIS.

**For more information, please contact:**
Dave Goodman - ECF-4
Environmental Protection Specialist
Bonneville Power Administration
P. O. Box 3621
Portland, OR 97208-3621
Telephone: (503) 230-4764
Email: jdgoodman@bpa.gov

**To submit a comment:**

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| Online: | *www.bpa.gov/comment* |
| Mail: | Bonneville Power Administration<br>Public Affairs – DKE-7<br>P.O. Box 14428<br>Portland, OR 97291-4428 |
| Toll-free: | 800-622-4519 |
| Fax: | 503-230-4019 |

The EIS is posted on the project website at: *www.bpa.gov/goto/MelvinSampsonHatchery*. For additional copies of this document, please call 1-800-622-4520 and ask for the document by name. You may also request additional copies by writing to the address above.

For additional information on DOE NEPA activities, please contact the Director, Office of NEPA Policy and Compliance, GC-54, U.S. Department of Energy, 1000 Independence Avenue S.W., Washington D.C. 20585, phone: 800-472-2756 or visit the DOE NEPA Web site at *www.energy.gov/NEPA*.

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# Acronyms and Abbreviations

| | |
|---|---|
| 1-DMax | 1-day maximum temperature |
| BA | Biological Assessment |
| BiOp | Biological Opinion |
| BMP | best management practices |
| BP | Before Present |
| BPA | Bonneville Power Administration |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| cfs | cubic feet per second |
| $CH_4$ | methane |
| CO | carbon monoxide |
| $CO_2$ | carbon dioxide |
| $CO_{2e}$ | carbon dioxide equivalent |
| Corps | U.S. Army Corps of Engineers |
| Council | Northwest Power and Conservation Council |
| DAHP | Department of Archaeology and Historic Preservation |
| Db | decibel |
| dBA | A-weighted decibel |
| dBA $L_{eq}$ | A-weighted decibels at equivalent continuous levels |
| EA | Environmental Assessment |
| Ecology | Washington State Department of Ecology |
| EDNA | environmental designations for noise abatements |
| EFH | Essential Fish Habitat |
| EIS | Environmental Impact Statement |
| EPA | Environmental Protection Agency |
| ESA | Endangered Species Act |
| ESU | Evolutionarily Significant Unit |
| FEMA | Federal Emergency Management Agency |
| FTA | Federal Transit Authority |
| GHG | greenhouse gas |
| gpm | gallons per minute |
| HDPE | high-density polyethylene |
| HGMP | Hatchery and Genetic Management Plan |
| HSRG | Hatchery Scientific Review Group |
| HVAC | heating, ventilation, and air conditioning |
| I-90 | Interstate 90 |
| IPaC | Information for Planning and Conservation |
| kVA | kilovolt amps |

| | |
|---|---|
| MCR | Middle Columbia River |
| Mg/L | milligram per liter |
| MIPT | Monitoring Implementation Planning Team |
| ml | milliliter |
| MP | milepost |
| MR&E | monitoring, research, and evaluation |
| MRS Hatchery | Melvin R Sampson Hatchery |
| $N_2O$ | nitrous oxide |
| NAAQS | National Ambient Air Quality Standards |
| NEPA | National Environmental Policy Act |
| NLCD | National Land Cover Database |
| NMFS | National Marine Fisheries Service |
| $NO_2$ | nitrogen dioxide |
| NPDES | National Pollution Discharge Elimination System |
| NRCS | Natural Resource Conservation Service |
| NTU | nephelometric turbidity unit |
| $O_3$ | ozone |
| Pb | lead |
| PCB | polychlorinated biphenyls |
| PEMC | freshwater emergent wetland |
| $PM_{2.5}$ | fine particulate matter |
| $PM_{10}$ | course particulate matter |
| PSSC | palustrine scrub shrub wetland |
| PUBH | freshwater pond |
| Reclamation | U.S. Bureau of Reclamation |
| RM | river mile |
| SEPA | State Environmental Policy Act |
| SMP | Shoreline Master Program |
| $SO_2$ | sulfur dioxide |
| SPCC | Spill Prevention, Control, and Countermeasure |
| SR 10 | State Route 10 |
| US 97 | U.S. Highway 97 |
| USC | U.S. Code |
| USDA | U.S. Department of Agriculture |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |
| WAAQS | Washington Ambient Air Quality Standards |
| WAC | Washington Administrative Code |
| WDFW | Washington Department of Fish and Wildlife |
| WDNR | Washington Department of Natural Resources |

| | |
|---|---|
| WRIA | Water Resource Inventory Area |
| WSDOT | Washington Department of Transportation |
| WY | water year |
| Yakama Nation | Confederated Tribes and Bands of the Yakama Nation |
| YKFP | Yakima-Klickitat Fisheries Project |
| YSFWPB | Yakima Subbasin Fish and Wildlife Planning Board |

# Executive Summary

## Chapter 1 Introduction

The Bonneville Power Administration (BPA) is proposing to fund construction and operation of the Melvin R. Sampson Hatchery (MRS Hatchery) in the Yakima Basin in central Washington. Operation of the MRS Hatchery would involve production of coho salmon for release in the Yakima and Klickitat River basins. The proposed hatchery would be owned and operated by the Confederated Tribes and Bands of the Yakama Nation (Yakama Nation) and would be constructed on land owned by the Yakama Nation northwest of Ellensburg in Kittitas County, Washington. The property borders the Yakima River and is adjacent to Interstate 90 (I-90).

The proposed MRS Hatchery would include a hatchery building (which would include areas for egg incubation, early rearing, water treatment and reuse equipment, as well as an administration area), adult holding and spawning ponds, a shop building, three new employee houses, access roads, and site utilities that include pipes for water intake and discharge (outfall).

The proposed coho hatchery program is a component of the Yakima/Klickitat Fisheries Project (YKFP), which has the goal of enhancing existing stocks of anadromous fish in the Yakima and Klickitat River basins while maintaining genetic resources, reintroducing stocks formerly present in the basins, applying knowledge gained about hatchery supplementation throughout the Columbia River Basin, and providing increased harvest opportunities.

BPA is considering funding the construction of the proposed hatchery through its responsibilities under the Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act, 16 USC Sec. 839 et seq.) and the 2008 Memorandum of Agreement among the Umatilla, Warm Springs, and Yakama Tribes, Bonneville Power Administration, U.S. Army Corps of Engineers (Corps), and U.S. Bureau of Reclamation (Reclamation) (2008 Fish Accords). Under this agreement, BPA agreed to make funds available to construct the proposed hatchery subject to Northwest Power and Conservation Council (Council) review and meeting all federal, state, and local compliance requirements. The proposed hatchery would be one element of a continuing effort by BPA, the Yakama Nation, and several other partners and cooperators to protect and manage anadromous fish populations and mitigate for effects of the Federal Columbia River Power System in these waters.

In meeting the need for action, BPA seeks to achieve the following purposes:

- Support efforts to mitigate for effects of the development and operation of the Federal Columbia River Power System on fish and wildlife in the mainstem Columbia River and its tributaries under the Northwest Power Act.
- Assist in carrying out commitments related to proposed hatchery actions that are contained in the 2008 Fish Accords with the Yakama Nation and others.
- Implement BPA's Fish and Wildlife Implementation Plan Environmental Impact Statement and Record of Decision policy direction, which calls for protecting weak stocks, while sustaining overall populations for fish for their economic and cultural value.

- Minimize harm to natural and human resources, including species listed under the Endangered Species Act (ESA).

BPA has prepared this Environmental Impact Statement (EIS) pursuant to the regulations implementing the National Environmental Policy Act of 1969 (NEPA) (42 USC 4321 et seq.), which requires federal agencies to assess the impacts its actions may have on the environment. Major federal actions significantly impacting the quality of the human environment must be analyzed in an EIS. The Washington State Department of Ecology (Ecology) is a cooperating agency for this EIS.

Public scoping for the MRS Hatchery EIS was initiated with the publication of the Notice of Intent in the Federal Register (80 FR 70770) on November 16, 2015. Concurrent with the publication of the Notice of Intent, BPA mailed a letter and map describing the Proposed Action to neighboring landowners; affected tribes; local, state, and federal government officials; and known interested parties. BPA held a public scoping meeting in Ellensburg, Washington, on December 9, 2015. The public comment period began on November 16, 2015, and BPA accepted comments on the project from the public until January 4, 2016. During the comment period, BPA received 10 comment letters. Issues raised during the scoping process were divided into categories and responded to within the EIS. Comment letters can be viewed at: https://www.bpa.gov/goto/MelvinSampsonHatchery.

# Chapter 2 Alternatives

This EIS evaluates two alternatives: the Proposed Action and a No Action alternative.

## Proposed Action

Under the Proposed Action, BPA would fund the Yakama Nation's construction and operation of the MRS Hatchery. The MRS Hatchery would be developed based on the 2012 *Yakima Subbasin Summer- and Fall-Run Chinook and Coho Salmon Hatchery Master Plan* (Master Plan). The Proposed Action would include:

- Construction and operation of a new coho hatchery facility (MRS Hatchery) at the former Holmes Ranch property.
- Release and adaptive management (adjustment of release proportions to meet objectives for survival or adult return) of juvenile and adult coho reared at the MRS Hatchery, throughout the Yakima Basin.
- Operation of proposed and future acclimation sites throughout the Yakima Basin.
- Collection of adult coho broodstock from existing facilities at Roza and Prosser Dams, or at other existing collection sites.

The MRS Hatchery and related facilities would be constructed on an 8-acre developable portion of the Holmes Ranch property situated about 5 miles northwest of Ellensburg, Washington. Project facilities would include a hatchery building (which would include areas for egg incubation, early rearing, water treatment and reuse equipment, as well as an administration area), adult holding and spawning ponds, a shop building, three new employee houses, access roads, and site utilities that include pipes for water intake and discharge (outfall). Surface water and groundwater would be used throughout the year at the MRS Hatchery for various purposes throughout the juvenile fish life cycle.

Coho eggs would be incubated, then hatched and reared to parr or smolt stage at the MRS Hatchery, with the goal of providing up to 700,000 coho parr and smolts. This release number would be expected to eventually produce enough returning adults to provide for broodstock needs, to meet the goals for treaty and nontreaty harvest in the Yakima and Naches River basins, and to provide for natural spawning.

The MRS Hatchery would initially rear and release 500,000 parr and up to 200,000 smolts in the upper Yakima and Naches River watersheds using broodstock collected from existing facilities at Roza and Prosser Dams, or at other existing collection sites. The broodstock goal is to collect 1,000 fish that would be processed over a four month period. No more than 400 fish would be held at the adult holding ponds at the MRS Hatchery at any given time. The fish would be held onsite for two to three months, from October through January. Per National Marine Fisheries Service (NMFS) consultation (NWR-2011-06509; NMFS 2016) up to 200,000 smolts could be released in addition to the 500,000 parr. Conversion to an all-smolt release (i.e., 700,000 smolts) is proposed if the parr/smolt release strategy does not meet adult return objectives, or if drought conditions preclude summer parr releases.

The Yakama Nation would use mobile acclimation units for a small number of coho smolts in the Yakima Basin. The units would consist of portable aluminum raceways, and would be placed either on private or Forest Service lands, with approval from the applicable landowner.

### No Action Alternative

Under the No Action alternative, the proposed MRS Hatchery would not be constructed. The Yakama Nation would likely continue implementing its coho restoration program, using a combination of artificial production, reliance on out-of-basin broodstock, and habitat improvements to meet natural production and harvest goals. Summer parr releases would continue to be the primary method for increasing fish production in upper basin tributaries.

## Chapter 3 Affected Environment and Environmental Consequences

This EIS analyzes potential impacts associated with construction and operation of the Proposed Action and No Action alternative for the following environmental resource areas: land use and recreation, transportation, geology and soils, vegetation, water resources, wetlands and floodplains, fish, wildlife, cultural resources, socioeconomics and environmental justice, air quality and climatic change.

Table ES-1 summarizes the environmental impacts of the Proposed Action and the No Action alternative. Table ES–2 summarizes potential mitigation measures that would be implemented to avoid or minimize environmental impacts. A more detailed discussion of impacts and mitigation measures is presented in Chapter 3, Affected Environment, Environmental Consequences, and Mitigation Measures.

## Table ES–1. Summary of Impacts

| Potentially Affected Resource | Proposed Action | No Action Alternative |
|---|---|---|
| **Land Use and Recreation** Section 3.1 | Construction-related impacts (e.g., noise, dust, traffic) at the MRS Hatchery site would mostly only be noticeable within the immediate project site and are not expected to interfere with adjacent and surrounding land uses. Impacts to potential users of the John Wayne Pioneer Trail would be limited to a short segment of the trail and construction activities would not preclude continued use of the trail in a safe manner. The project would be consistent with county plans and zoning.<br>Operation of the MRS Hatchery and activities at acclimation and release sites are not expected to interfere with adjacent and surrounding land uses and recreation. | Current land uses in the study area would continue under the No Action alternative. No new facilities would be constructed and disruptions to adjacent properties, recreational sites, and land uses would not occur. As with the Proposed Action, the acclimation and release sites are not expected to interfere with adjacent and surrounding land uses and recreation. |
| **Transportation** Section 3.2 | Project-related traffic would utilize major highways (I-90 and US 97) to the maximum extent possible and would have a low impact on transportation and traffic around the Holmes Ranch property. Construction traffic approaching the hatchery site on SR 10 and Klocke Road would likely be noticeable on these low volume roads.<br>Long-term operation of the project would result in low, localized traffic impacts due to increased traffic associated with the new residences and additional employees at the MRS Hatchery, and traffic to setup and monitor the acclimation and release sites. | No change in traffic patterns or volumes would result from the No Action alternative. |
| **Geology and Soils** Section 3.3 | Site preparation and other construction activities at the MRS Hatchery site would result in approximately 8.3 acres of soil disturbance, temporarily increasing the potential for erosion. Erosion and sedimentation impacts would be minimized by using best management practices (BMPs), and exposed soils would be revegetated or stabilized with gravel following construction.<br>MRS Hatchery operation would permanently replace some of the existing soils with base course or fill. In general, existing slopes and drainage patterns of undisturbed soils would remain intact and erosion and sedimentation would not increase as a result of the project. Operational activities at acclimation and release sites are not expected to affect geology and soils. | The No Action alternative would have no impacts on soils or geologic resources. |
| **Vegetation** Section 3.4 | Construction activities at the MRS Hatchery site would temporarily impact up to 4.6 acres of vegetation and would permanently remove up to 3.7 acres of pasture and grassland. Areas temporarily disturbed would be revegetated with native species after construction.<br>Impacts to vegetation communities would be low because hatchery operations would not require substantial vegetation maintenance on the MRS Hatchery grounds, access roads, or in the New Cascade Canal (see Section 2.2.1).<br>Acclimation and release activities at other sites within the basin would have no long-term impacts and would result in low to no impacts to vegetation. Any vegetation removal required for mobile acclimation units would be minimal and temporary. | No new construction would occur and no vegetation would be removed at the Holmes Ranch property. Any vegetation removal required for mobile acclimation units would be minimal and temporary. |

## Table ES–1. Summary of Impacts

| Potentially Affected Resource | Proposed Action | No Action Alternative |
|---|---|---|
| **Water Resources** Section 3.5 | Some in-water work would be required for construction of the MRS Hatchery and low water quality impacts may occur during in-water work. Erosion and transport of pollutants from hatchery construction to surface waters and groundwater is expected to be minimized through erosion control and construction BMPs.<br>Groundwater pumping during hatchery operations is expected to cause local aquifer drawdown, especially during the months of November and December. However, the impacts would be localized and recovery would be rapid. Impacts to surface water hydrology are expected to be low; surface water diversion flows would be low relative to the total flow in the source stream. In addition, surface water use would be non-consumptive. Water quality impacts are expected to be low or avoided because effluent would be treated prior to discharge to meet the conditions of the National Pollution Discharge Elimination System (NPDES) General Permit (Ecology 2015).<br>Surface water diversions for mobile acclimation sites would not cause dewatering of any reaches and changes to stream flow and water quality would likely be low. Water quality may be slightly affected by the discharge of fish wastes from mobile acclimation units; however, NPDES permits would not be needed for these sites because rearing levels would be well below permit minimums and the duration would be only 4-6 weeks. | Surface or groundwater resources would not be modified as a result of the No Action alternative. Continued use of existing acclimation and release sites and the implementation of the new sites would have low to no impact on water quantity and quality. |
| **Wetlands and Floodplains** Section 3.6 | Potential short-term construction impacts to wetlands on the MRS Hatchery site include erosion, human disturbance, sedimentation, or accidental fuel and oil leaks related to construction. The majority of these impacts would be prevented with appropriate BMPs.<br>Discharge water would be treated to meet the requirements of the NPDES General Permit (Ecology 2015) and would not impact wetland water quality.<br>Acclimation and release activities would have low to no impacts to wetlands. The mobile acclimation facilities may be located within the 100-year floodplain and the Yakama Nation would coordinate with the local floodplain administrator (Kittitas County) to minimize impacts from the acclimation and release activities. The impact of the Proposed Action on floodplains would be low. | No new construction would occur at the Holmes Ranch property. Current conditions of wetlands and floodplains would continue. As with the Proposed Action, acclimation and release activities would have low to no impacts to wetlands and low impacts to floodplains. |

## Table ES–1. Summary of Impacts

| Potentially Affected Resource | Proposed Action | No Action Alternative |
|---|---|---|
| **Fish**<br>Section 3.7 | Construction impacts on fish or their habitat are anticipated to be localized to the hatchery site and short term. In-water construction may temporarily alter water quality, disturb or displace individuals, or temporarily reduce the amount of available habitat. However, the area impacted for MRS Hatchery construction would be small (less than about 100 linear feet of surface waters) and provides low quality habitat; therefore, impacts on fish are expected to be low. Little, if any, direct mortality is anticipated and construction-related sediment and turbidity is anticipated to be low.<br>MRS Hatchery-related construction is not likely to adversely affect ESA-listed bull trout or MCR steelhead. Construction of in-water elements for the MRS Hatchery may temporarily displace juvenile individuals from habitat.<br>Operational effects on aquatic habitat and fish species include seasonal disturbance and minor flow reductions associated with surface water diversions, and minor water quality degradation from effluent return to the respective waterbodies. Surface water diversion would not cause dewatering of any reaches, and impacts on bull trout and their critical habitat, if any, would be low to none. By complying with acceptable effluent discharge values in accordance with the 2015 Upland Fin-Fish Hatching and Rearing NPDES General Permit (Ecology 2015), the impact of effluent on receiving waters, the aquatic environment, and fish is expected to be low. Water quality changes due to discharges from the facilities could disrupt the behavior and distribution of individual fish immediately adjacent to and downstream of the outfall structure, but the overall impact is expected to be low. Off-site operations, including adult and juvenile coho releases throughout the Yakima River Subbasin, are expected to have low impacts on bull trout. | Development of a locally-derived, naturally-sustaining in-basin coho population using an integrated facility would not be achieved.<br>Impacts on nontarget fish species from continuing coho reintroduction activities of the YKFP (e.g., ecological interactions from juvenile releases, MR&E activities) would remain at current levels. |
| **Wildlife**<br>Section 3.8 | There are no ESA-listed terrestrial wildlife species or potential suitable habitat for such species in the MRS Hatchery property. Wildlife species typically occurring in the area would likely avoid the hatchery site during construction, although less mobile species could potentially experience mortality. Accidental fuel and oil leaks during construction could also create short-term, local, and low impacts on wildlife.<br>Permanent removal of up to 3.7 acres of vegetated habitat could create long-term, moderate impacts on species that currently use the area. Project operations would result in increases in daily human activity and noise that could impact the ability of local wildlife to forage, roost, or nest. Mitigation measures would be implemented to minimize the impacts of construction and operation on wildlife. For most wildlife species, suitable habitat for breeding, rearing, and foraging would remain available at the proposed site for the MRS Hatchery and acclimation sites. The overall impact on wildlife would be low. | Habitats at the hatchery site would not be altered, and existing human disturbance would continue. Species adapted to current conditions at the hatchery site and acclimation sites would continue to use them. The use of new acclimation and release sites would have a low impact to wildlife. |

## Table ES–1. Summary of Impacts

| Potentially Affected Resource | Proposed Action | No Action Alternative |
|---|---|---|
| **Cultural Resources** Section 3.9 | One known cultural resource would be permanently removed during construction (the existing residential structure), and temporary visual impacts to the Chicago-Milwaukee-St. Paul-Pacific Railroad line, which is now the John Wayne Pioneer Trail, would occur during construction of the MRS Hatchery. Additionally, the Holmes Ranch property is in an area of high potential for archaeological resources and impacts on yet-to-be-discovered cultural resources could occur. A preconstruction survey would be required and other mitigation measures would be implemented to minimize impacts, as possible.<br>Construction and operation of the MRS Hatchery would have a low impact on cultural resources as the area would be surveyed before project construction and any impacts to the resources would be previously determined and mitigated as needed. | No ground disturbance or removal of cultural resources would occur at the Holmes Ranch property. The use of new mobile acclimation and release sites would not result in any ground disturbance. |
| **Socioeconomics and Environmental Justice** Section 3.10 | Construction of the MRS Hatchery would result in a direct short-term beneficial impact on employment in the region through employment of approximately 30 people for a period of 16.5 months, and their indirect spending in the area.<br>Hiring of permanent hatchery workers would have a low beneficial impact on the regional economy and the Yakama Nation.<br>The availability of fisheries resources for local populations and tribal members would ultimately increase, resulting in long-term beneficial impacts to subsistence fisheries.<br>Construction and operation of the Proposed Action would not have significant environmental impacts that would be disproportionately borne by minority or low income populations. | Economic conditions and opportunities in the region would not change as a result of the No Action alternative. |
| **Air Quality and Climate Change** Section 3.11 | Construction effects on air quality are expected to be low, short term, local, and would cease when construction is complete.<br>Operational emissions resulting from additional employee and delivery trips and potential use of an emergency power generator would be low and would not significantly reduce the air quality of the surrounding region. Air emissions resulting from additional truck trips and generators at acclimation sites would not reduce the air quality of the surrounding region. | There would be no change in air quality and no change to GHG emissions as a result of this alternative. |
| **Visual Resources** Section 3.12 | Construction equipment and personnel would be temporarily visible by motorists on Klocke Road and users of the John Wayne Pioneer Trail.<br>New structures associated with the MRS Hatchery and hatchery operation would be visible intermittently and for a short period of time by users of the John Wayne Pioneer Trail and motorists on Klocke Road. Although the new structures would be periodically obscured by a partial vegetation screen, the changes in existing views represent a long-term moderate impact to visual resources. Acclimation structures are not expected to create noticeable visual obstructions; their presence would create annual short-term low impacts. | Existing views and viewer groups would not experience a change in visual resources. Existing and new acclimation and release sites under the YKFP would be used and would create annual short-term low impacts. |

## Table ES–1. Summary of Impacts

| Potentially Affected Resource | Proposed Action | No Action Alternative |
|---|---|---|
| **Noise, Hazardous Waste, Public Health, and Safety** Section 3.13 | Construction at the MRS Hatchery site would cause moderate short-term noise impacts in areas directly adjacent to construction activity. Noise generated during operation is not expected to generate noise levels that would exceed thresholds for nearby receptors. Hazardous materials storage would be limited on-site and consist of designated, enclosed storage areas with full secondary containment provided. During construction, the potential for other public health and safety impacts (e.g., air emissions, hazardous material release) are expected to be short-term, localized and low.<br>Operational impacts to public health and safety at the hatchery and acclimation sites would be low. | Existing noise levels would continue. Chemicals would not be used and the use of new and existing acclimation and release sites would not generate hazardous waste or materials. Public health and safety impacts would continue to be low. |

## Table ES–2. Potential Mitigation Measures

| Mitigation Measures |
|---|
| **Land Use and Recreation** |
| • Because of the low magnitude of impacts on land use and recreation, no mitigation measures are recommended. |
| **Transportation** |
| • Employ traffic control flaggers and post signs warning of construction activity and merging traffic, when necessary for interruptions of traffic. |
| **Geology and Soils** |
| • Minimize the construction disturbance area and removal of vegetation, to the greatest extent possible.<br>• Locate staging areas in previously disturbed or graveled areas, where practicable, to minimize soil and vegetation disturbance.<br>• Conduct peak construction activities during the dry season (between June 1 and November 1) as much as possible to minimize erosion, sedimentation, and soil compaction.<br>• Prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) that would include appropriate BMPs, such as delineation of construction limits within 200 feet of streams and wetlands, and installation of silt fences, straw bales, and jute matting.<br>o Erect silt fencing per Ecology's BMP C233. Erect silt fencing along the entire building footprint to the south and along the western perimeter. This fencing area includes all potential areas that slope toward the historic side channel/Bypass to preclude entry of sediment into riparian areas and stream channels.<br>o Erect sediment barriers per Ecology BMP C235.<br>• Inspect erosion and sediment controls weekly, maintain them as needed to ensure their continued effectiveness, and remove them from the proposed hatchery site when vegetation is re-established and the area has been stabilized.<br>• Minimize the area of soils exposed at any one time and use dust abatement measures when necessary<br>• Prepare and implement a fugitive dust control plan including the use of water trucks or other appropriate methods to control dust during construction, the use of gravel on access road surfaces in areas of sustained wind, and the establishment of a 15-mile-per-hour speed limit for construction vehicle use on unpaved roads and surfaces. |
| **Vegetation** |
| • Inspect equipment to remove vegetation and dirt clods that may contain noxious weeds.<br>• Dispose of excavated noxious weeds in a manner that prevents reestablishment in wetlands and adjacent areas.<br>• Implement a revegetation plan to restore native plant communities, provide wildlife habitat, reduce the risk of weed encroachment, and ensure adequate growth.<br>o Reseed disturbed areas after construction and regrading are complete, at the appropriate time period for germination.<br>o Monitor germination of seeded areas; if vegetative cover is inadequate, implement contingency measures and reseed to ensure adequate revegetation of disturbed soils. |

**Water Resources**

- Implement measures to control erosion (see mitigation measures in Geology and Soils) to eliminate potential sediment discharge into waterways.
- Implement a revegetation plan (see mitigation measures in Vegetation) to ensure stabilization of disturbed soils.
- Design and construct access roads such that drainage from the road surface directly into surface waters is minimized and direct sediment-laden waters are drained into vegetated areas.
- Review water quality mitigation measures, required BMPs, and permit requirements with construction contractors and inspectors during a preconstruction meeting covering environmental requirements.
- Develop and implement a work area isolation/dewatering plan for instream work that includes provisions for erosion and sediment control.
- Operate machinery primarily from the top of the river/creek bank along adjacent upland areas. Do not operate stationary equipment in the flowing water. It may be necessary to traverse the channel to install the work area isolation structure (cofferdam). Once the cofferdam is constructed, operate all machinery from behind the confines of the cofferdam.
- Stockpile and cover excavated streambed and bank materials away from the stream channel or flank with sediment fencing or fiber wattles to minimize fine sediment being transported into the waterbodies.
- Use a screened diesel or electric sump pumps, if needed, to capture seepage flow from cofferdam areas. Direct all seepage flow to an on-site detention area.
- Wash heavy equipment that may work below the ordinary high water mark (OHWM) elevation before it is delivered to the job site and after it is used to prevent the spread of aquatic invasive species.
- Prepare and implement a Spill Prevention, Control, and Countermeasure (SPCC) plan to address fuel and chemical storage, spill containment and cleanup, construction contractor training, and proper spilled material disposal. SPCC plan should include provisions to store fuel (and potential pollutants) and refuel construction equipment at least 300 feet away from streams or wetlands, and to use of pumps, funnels, absorbent pads, and drip pans when fueling or servicing vehicles.
- Inspect machinery daily for fuel or lubricant leaks and, prior to entering wetlands, waterways, or floodplains, and completely clean off any external petroleum products, hydraulic fluid, coolants, and other pollutants.
- Prohibit discharge of vehicle wash water into any stream, water body, or wetland without pretreatment to meet state water quality standards.
- If dust-abatement additives or stabilization chemicals (typically magnesium chloride, calcium chloride salts, or ligninsulfonate) are used, the following additional measures will be implemented:
    - Do not apply dust-abatement additives and stabilization chemicals within at least 25 feet of surface water (distances might be greater where vegetation is sparse) and apply them so as to minimize the likelihood that they would enter the water.
    - Do not use petroleum-based products for dust abatement.
    - Avoid application of dust abatement chemicals during or just before wet weather, and in areas that could result in unfiltered delivery of the dust abatement materials to surface water.
    - Ensure spill containment equipment is available during application of dust abatement chemicals.
- Comply with the NPDES permit for effluent discharge.

- Comply with the Total Maximum Daily Load allocations for the Yakima Basin.
- Minimize the storage of hazardous materials on-site. When stored, storage shall consist of designated, enclosed storage areas with full secondary containment provided to fully contain accidental spills of chemicals stored at the proposed facilities.
- Comply with all chemical handling, application, and disposal regulations by the U.S. Department of Agriculture (USDA) and Center for Veterinary Medicine regulations and other state and federal regulations to protect human and environmental health.
- Train all staff in regard to chemical handling and application safety.
- Conduct a pump test on wells at the Holmes Ranch property once pumps are installed and operational to monitor effects on groundwater during periods of peak groundwater demand for fish rearing (April - December).

**Wetlands and Floodplains**

- Implement measures to control erosion and fugitive dust (see mitigation measures in Geology and Soils) to eliminate potential for sediment discharge into wetlands.
- Implement a revegetation plan (see mitigation measures in Vegetation) to ensure stabilization of disturbed soils.
- Install signage, fences, and flagging to restrict work areas and confine vehicles and equipment to designated routes that avoid wetlands and waterways.
- When working next to wetlands and waterways, limit disturbance to the minimum necessary to achieve construction objectives, minimize habitat alteration, and limit the effects of erosion and sedimentation.
- Implement an SPCC plan (see mitigation measures in Water Resources).
- Stockpile wetland soils removed from Wetland A during diversion channel construction and use them to re-fill the channel once construction is completed
- Re-grade disturbed wetlands and vegetated areas to pre-construction contours and revegetate with appropriate native species.
- Locate mobile acclimation units outside of regulated floodways, 100-year flooplains, or at the highest elevation practicable. Monitor mobile acclimation units at risk of flooding and re-locate as appropriate.

**Fish**

- Implement measures to control erosion (see mitigation measures in Geology and Soils) and potential spills of hazardous materials (see mitigation measures in Water Resources) to minimize potential for impacting water bodies.
- Implement an SPCC plan and comply with the NPDES General Permit (see mitigation measures in Water Resources).
- Screen the proposed Bypass intake structure to meet NMFS criteria. Equip the outfall with a bar rack to prevent entry of adult fish.
- Construct all in-water work during the negotiated agency-approved work window of November 1 through December 31.
- Install and remove cofferdams during the appropriate work window for each waterbody.
- In October, place a picket weir downstream of the proposed outfall location to prevent adult fish from entering during the in-water work period. The Yakama Nation would seine the Bypass and

historic side channel to herd adult fish from the affected reach prior to installation of the picket barrier.

- Operate equipment in the active channel only if necessary to install and remove cofferdams. Install the cofferdam from the top of bank to the extent possible.
- Experienced fisheries biologists would remove all fish species from the immediate area where the cofferdams would be installed. Fish salvage would adhere to the following protocol:
    - Flush adult fish that do not disperse from the construction area from the area behind the cofferdams. As part of any dewatering process, use beach seines and sanctuary nets to herd all fish from the area(s) of capture or release.
    - Capture by seining juveniles that do not displace voluntarily, and if necessary, use a backpack electrofisher. Once captured, place fish into a 5-gallon bucket using small dip-nets. Captured fish would be released back into the stream channel a safe distance (about 150 feet) upstream of the work area. Qualified Yakama Nation and/or Washington Department of Fish and Wildlife (WDFW) biologists would conduct work by following NMFS guidelines (NMFS 2000).
    - Do not use seining or electrofishing if water temperatures exceed 64°F.
    - Transport fish in aerated buckets or tanks and release as quickly as possible and as near capture sites upstream as possible.
    - Notify USFWS and NMFS in the highly unlikely event that an ESA-listed fish is injured or killed during the salvage operation. Fish salvage biologists would prepare a report for the Services that summarizes the number of fish handled, species, and individual lengths.
- To minimize pulses of sediment downstream, remove the cofferdams incrementally.
- Dewater and actively pump in-water work areas prior to pouring concrete forms. Fully cure all poured on-site concrete structures prior to contact with surface waters to prevent concrete leachate from entering live waters.
- Create sumps as necessary within the work area to capture any seepage flow. Pump all seepage flow to an on-site temporary settling pond, Baker tank, or other facility as determined by the contractor. Seepage flow would percolate into the ground or alluvial material prior to entry back into the water.
- Install a fish screen that would meet NMFS screening criteria, on pumps used for cofferdam dewatering.
- Adaptively manage juvenile coho releases based on studies on non-target fish via MRS Hatchery-specific MR&E activities.
- Conduct all MR&E activities in accordance with the terms and conditions of the existing Section 7 ESA consultation for MCR steelhead (NMFS 2013).
- Comply with all applicable terms and conditions of the existing USFWS Section 10 permit issued for the overall Yakama Nation Fisheries program (TE-05166B-0; incorporated herein by reference), and any future ESA Section 7 consultations terms and conditions.
- Screen all surface water pumps for acclimation units (one per site, to be used for all tanks) according to NMFS juvenile salmonid criteria.

**Wildlife**

- Clean work areas would be maintained with proper litter control and sanitation to prevent wildlife attraction.
- Minimize lighting and use lighting fixtures that direct light downward and not towards off-site areas to minimize disturbance to wildlife.
- Develop and implement a plan to minimize and manage predatory wildlife being attracted to fish and other potential food sources available at the facility.
- Implement measures to control erosion (see mitigation measures in Geology and Soils) and potential spills of hazardous materials (see mitigation measures in Water Resources) to minimize potential for impacting habitat.
- Implement a revegetation plan (see mitigation measures in Vegetation) to ensure stabilization of disturbed soils.

**Cultural Resources**

- Prepare an Archaeological/Cultural Resource Inadvertent Discovery Plan.
- Protect any unanticipated cultural resources discovered during construction as follows:
  - Stop work in the immediate vicinity of the discovery and protect find in place.
  - Notify Yakama Nation Project Manager, BPA Archaeologist, and BPA Environmental Compliance Lead immediately.
  - Implement mitigation or other measures as instructed by BPA.

**Socioeconomics and Environmental Justice**

- Because of the low magnitude of impacts on socioeconomic and environmental justice resources, no mitigation measures are recommended.

**Air Quality and Climate Change**

- Sequence and schedule construction work to minimize the amount of bare soil exposed to wind erosion.
- Implement measures to control fugitive dust (see mitigation measures in Geology and Soils).
- Do not burn vegetation or other debris associated with construction clearing.
- Ensure that all vehicle engines are maintained in good operating condition to minimize exhaust emissions.
- Handle and dispose of all potentially odorous waste during operation in a manner that does not generate odorous emissions.
- Implement vehicle idling restrictions.
- Encourage carpooling and the use of shuttle vans among construction workers to minimize construction-related traffic and associated emissions.
- Encourage the use of the proper size of equipment for each job because larger equipment requires the use of additional fuel.
- Use alternative fuels, such as propane, for stationary equipment at the construction sites or use electrical power where practicable.
- Reduce electricity use in the construction office and during facility operation by using compact fluorescent or LED bulbs and turning off computers and other electronic equipment every night.
- Recycle or salvage nonhazardous construction and demolition debris, as well as waste generated during facility operation, where practicable.

**Visual Resources**

- Avoid removing vegetation along the John Wayne Pioneer Trail or waterbodies within and around the hatchery site.
- Limit areas of disturbance to those necessary for construction and operation.
- Implement a revegetation plan (see mitigation measures in Vegetation).

**Noise, Hazardous Waste, Public Health, and Safety**

- Schedule construction work during daylight hours between 7:00 a.m. and 9:00 p.m.
- Locate stationary construction equipment as far away from noise-sensitive receptors as possible.
- Require sound-control devices that are at least as effective as those originally provided by the manufacturer on all construction equipment powered by gasoline or diesel engines.
- Select pumps and backup generators that do not generate excessively high noise levels.
- Implement an SPCC plan (see mitigation measures in Water Resources).

# 1 Purpose of and Need for Action

## 1.1 Introduction

The Bonneville Power Administration (BPA) is proposing to fund construction and operation of the Melvin R. Sampson Hatchery (MRS Hatchery) in the Yakima Basin in central Washington. Operation of the MRS Hatchery would involve production of coho salmon for release in the Yakima and Klickitat River basins. The proposed hatchery would be owned and operated by the Confederated Tribes and Bands of the Yakama Nation (Yakama Nation) and would be constructed on land owned by the Yakama Nation northwest of Ellensburg in Kittitas County, Washington.

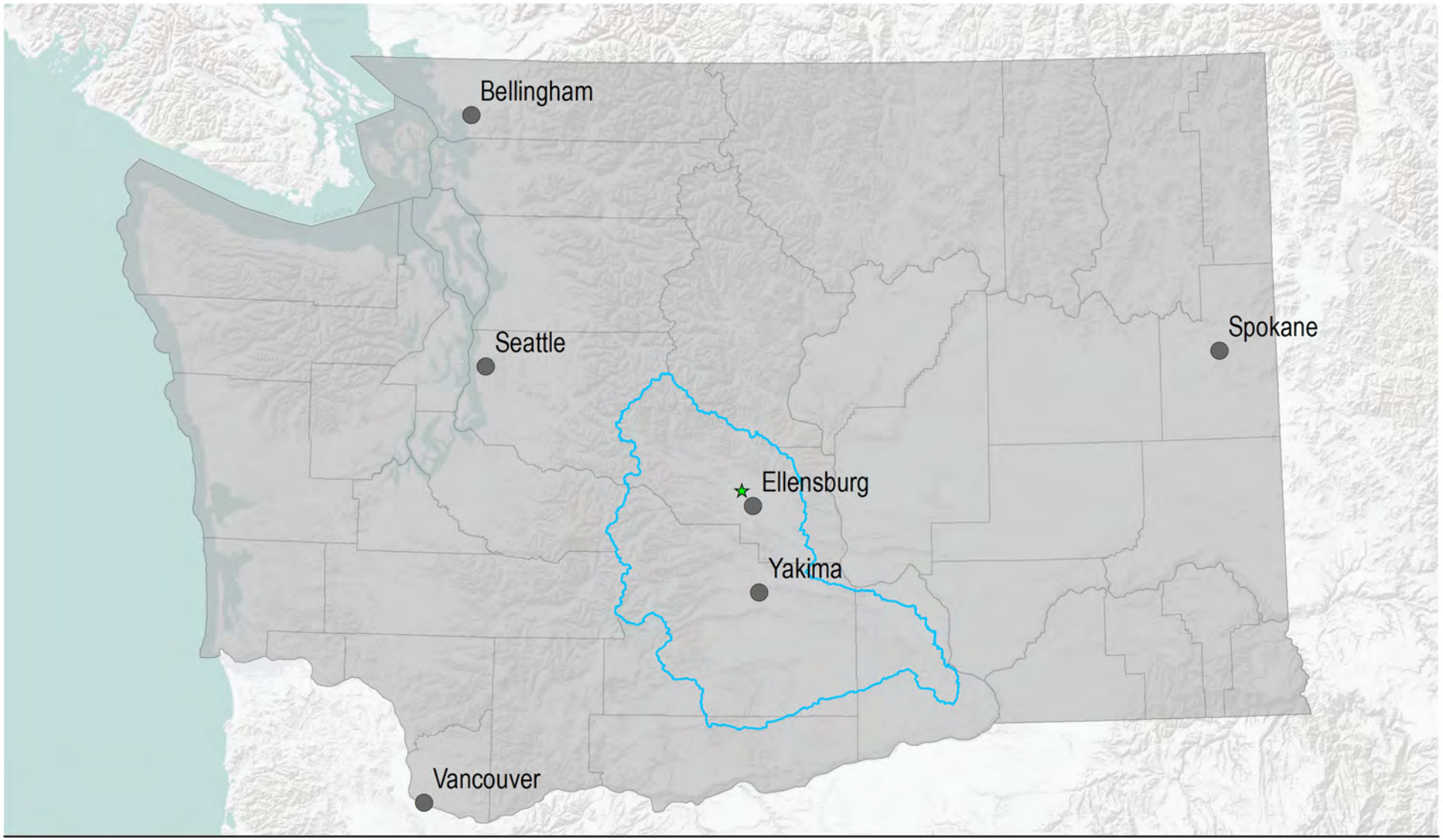
The hatchery would be named after Melvin R. Sampson. Mr. Sampson served as a Yakama tribal councilman for 18 years and was chairman of the Yakama Nation for 4 years. For the past 23 years he has served as policy advisor and project coordinator for the Yakima-Klickitat Fisheries Project.

The goal of the MRS Hatchery would be to produce and release up to 700,000 coho smolts for harvest and for restoration of natural coho spawning in the Yakima Basin. Currently, coho are produced outside of the Yakima Basin for release in Yakima Basin tributaries. The property borders the Yakima River and is adjacent to Interstate 90 (I-90).

BPA is considering funding the construction of the hatchery through its responsibilities under the Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act, 16 USC Sec. 839 et seq.) and the 2008 Memorandum of Agreement among the Umatilla, Warm Springs, and Yakama Tribes, BPA, U.S. Army Corps of Engineers (Corps), and U.S. Bureau of Reclamation (Reclamation) (2008 Fish Accords). Under this agreement, BPA agreed to make funds available to construct the proposed hatchery subject to Northwest Power and Conservation Council (Council) review and meeting all legal compliance conditions. The proposed hatchery would be one element of a continuing effort by BPA, the Yakama Nation, and cooperators to protect and manage anadromous fish populations and mitigate for effects of the Federal Columbia River Power System in these waters.

BPA has prepared this Environmental Impact Statement (EIS), pursuant to regulations implementing the National Environmental Policy Act (NEPA), to assess the potential effects of the Proposed Action on the environment.

This chapter further describes BPA's need to take action and the purposes that BPA seeks to achieve in addressing this need. The chapter also provides project background information, identifies the entities involved in the development of this EIS, and summarizes the public scoping process and comments received.




LEGEND

Project Location

City

Yakima River Basin

County Boundary

DATA SOURCE: (ESRI 2016, USGS 2016)

Bonneville POWER ADMINISTRATION

N

0 20 40 60 80 100 Miles

# PROJECT LOCATION

FIGURE 1.1-1

## 1.2 Need for Action

BPA needs to respond to the Yakama Nation's request to fund their Council proposal to construct and operate a coho hatchery in the Yakima Basin.

The Yakama Nation has proposed a coho hatchery to restore natural spawning and increase harvest opportunities in the Yakima Basin. Coho were extirpated from the Yakima Basin by the early 1980s. The coho hatchery analyzed in this EIS was identified in the Yakama Nation's Yakima/Klickitat Fisheries Project (YKFP), which has the goal of enhancing existing stocks of anadromous fish in the Yakima and Klickitat River basins while maintaining genetic resources, reintroducing stocks formerly present in the basins, applying knowledge gained about hatchery supplementation throughout the Columbia River basin, and providing harvest opportunities.

Ongoing reintroduction efforts initiated in the mid-1980s have resulted in hatchery-produced coho naturally reproducing in the basin. The proposed hatchery would be located on property called the Holmes Ranch where Yakama Nation biologists observed naturally spawning coho rearing in the early 2000s. Recognizing the high quality off-channel and overwinter habitat for all types of salmonids, including coho, the Yakama Nation purchased the property in October 2005.

## 1.3 Purposes

In meeting the need for action, BPA seeks to achieve the following purposes:

- Support efforts to mitigate for effects of the development and operation of the Federal Columbia River Power System on fish and wildlife in the mainstem Columbia River and its tributaries under the Northwest Power Act.
- Assist in carrying out commitments related to proposed hatchery actions that are contained in the 2008 Columbia Basin Fish Accords Memorandum of Agreement with the Yakama Nation and others.
- Implement BPA's Fish and Wildlife Implementation Plan EIS and Record of Decision policy direction, which calls for protecting weak stocks, while sustaining overall populations for fish for their economic and cultural value.
- Minimize harm to natural and human resources, including species listed under the Endangered Species Act (ESA).

## 1.4 Background

BPA is a federal power marketing agency within the U.S. Department of Energy (USDOE). BPA's operations are governed by several statutes, including the Northwest Power Act. Under the Act, BPA must protect, mitigate, and enhance fish and wildlife affected by the development and operation of federal hydroelectric facilities on the Columbia River and its tributaries. BPA must fulfill this duty in a manner consistent with the Columbia River Basin Fish and Wildlife Program developed by the Council. The Council in turn gives deference to project proposals developed by state and tribal fishery

managers. The Council review process for project proposals is discussed further in Section 1.4.1.

In addition to its responsibilities under the Northwest Power Act, on May 2, 2008, BPA signed the 2008 Memorandum of Agreement among the Umatilla, Warm Springs, and Yakama Tribes, BPA, Corps, and Reclamation (2008 Fish Accords). This agreement includes funding for the Yakama Nation's MRS Hatchery. BPA conditioned its funding commitment on securing a favorable recommendation from the Council and on compliance with all its other mandates, including NEPA.

In the Treaty of 1855 (12 Stat. 951) between the Yakama Nation and the U.S., the Yakama Nation reserved the right to fish at all usual and accustomed places. These reserved rights were confirmed by a federal district court in *U.S. vs. Oregon* in 1969. Today, the Yakama Nation and other Columbia River treaty tribes are recognized as fisheries managers together with state and federal fisheries agencies.

The Yakama Nation exercises its fisheries management authority in many ways, including as a party to *U.S. v. Oregon*. Through the ongoing *U.S. v. Oregon* process, the parties to the case develop and update the Columbia River harvest and production management plans. The current plan, the 2008-2017 U.S. v. Oregon Management Agreement, is the result of an order of the federal District Court for the District of Oregon. The 2008-2017 Plan identifies a short-term production goal of 1.0 million coho to be released in the Yakima River Basin. BPA is not a party to *U.S. v. Oregon*. BPA is not privy to the parties' deliberations and does not influence the decisions the parties make.

Historically, Yakama Nation members fished for Chinook, coho, steelhead, and other species in the Yakima River and throughout the Columbia River Basin. Because of high harvest rates and degraded habitat, the native Yakima River coho population was extirpated. The Yakama Nation is working toward a program that will increase harvest toward historic levels and restore natural production of historic salmon populations in the Yakima Basin. Because this will require decades of work before basin habitat is able to produce coho at sufficient levels to meet harvest and natural production goals as outlined in the 2012 Yakima Basin Summer- and Fall-Run Chinook and Coho Salmon Hatchery Master Plan and subsequent ESA consultation, artificial production is needed in the short-term to produce coho for recolonizing stream habitat and to meet harvest needs.

### 1.4.1 Northwest Power Act/Council's Fish and Wildlife Program

The Council incorporates a three-step review as part of the project approval process for "artificial production initiatives," such as the proposed MRS Hatchery. That process is summarized as follows.

- Step 1
    - Develop conceptual engineering design.
    - Prepare conceptual program in the form of a Master Plan and obtain Council approval. In this step, Council requests that the Independent Scientific Review Panel (ISRP) review individual fish and wildlife projects and make recommendations on matters related to those projects.

- Step 2
  - Develop preliminary engineering design and cost estimates.
  - Prepare an EIS or Environmental Assessment (EA) in compliance with NEPA.
  - Prepare a Biological Assessment (BA) in compliance with ESA.
  - Obtain Council approval of preliminary design.
- Step 3
  - Develop final design and engineering cost estimates for construction bidding.
  - Prepare all permit applications for project construction.
  - Obtain Council approval of final program design and operational conditions.

As approved by the Council for certain projects falling under the 2008 Fish Accords, Steps 2 and 3 of the three-step review process have been combined. The MRS Hatchery is currently within that combined Step 2 and 3 review.

### 1.4.2 Yakima Basin Summer- and Fall-Run Chinook and Coho Salmon Hatchery Master Plan

In early 1996, the Yakama Nation's coho supplementation project in the Yakima Basin was one of the high priority supplementation projects approved by the Council. The project was expected to progress through four experimental design phases: 1) select and introduce donor stock, 2) test and initiate recolonization of natural habitat, 3) continue colonization and transition to local broodstock, and 4) implement a local adaptation phase. Phases 1 and 2 have been accomplished. In 2007, BPA developed a Supplement Analysis for Phase 2 (SA-13-EIS-0169-YKFP Coho SA), tiering off of the 1996 Yakima Fisheries Project Final EIS. The actions needed for implementation of Phases 3 and 4 are described in the Yakama Nation's *Yakima Subbasin Summer- and Fall-Run Chinook and Coho Salmon Hatchery Master Plan* (Master Plan) (Yakama Nation 2012a).

The Master Plan identifies new programs to be a part of the ongoing YKFP: two Chinook hatchery programs and two coho hatchery programs. The overall purpose of these programs is to increase harvest levels, natural spawning abundance, and spatial/temporal distribution of Chinook and coho in the Yakima Basin without substantially increasing production.

The two coho programs of the YKFP are: 1) a segregated harvest program in the lower Yakima River that will not include natural-origin coho as broodstock, referred to as the Lower Yakima Segregated Coho Program, and 2) an upper Yakima River reintroduction program, referred to as the Upper Yakima Integrated Coho Program, where natural-origin broodstock are used and returning hatchery-origin adults are allowed to spawn in the wild. The purpose of the Lower Yakima Segregated Coho Program is to provide harvest to meet federal and state commitments regarding reserved fishing rights made in the *U.S. v. Oregon* case. The purpose of the Upper Yakima Integrated Coho Program is to contribute to harvest, but also to reestablish natural spawning coho in tributaries where they historically spawned.

The Yakama Nation submitted the Master Plan to the Council in May 2012 to initiate Step 1 of the Council's review process (as described in Section 1.4.1). The ISRP reviewed the Master Plan in September 2012, requesting additional information and clarification from the Yakama Nation (Yakama Nation 2012). Based on the information received, the ISRP approved the conceptual program to proceed to Step 2 of the Council review process in July 2013 (Yakama Nation 2013).

This EIS considers the actions proposed in the Master Plan as part of Phase 3 of the Upper Yakima Integrated Coho Program. These actions include the construction and operation of an integrated coho hatchery, referred to as the MRS Hatchery; the release of juvenile coho reared at the MRS Hatchery into the upper Yakima Basin; and the monitoring, research and evaluation (MR&E) activities associated with the releases. The integrated coho program would increase the distribution of coho salmon in the tributaries by outplanting parr, releasing smolts that have been acclimated in temporary acclimation ponds, and by outplanting adults. Every 6 years a series of tributaries would be selected for reintroduction. After 6 years the tributaries would be monitored for natural production. The integrated program would rear and release 500,000 parr (at 100 fish per pound) and up to 200,000 smolts (at 20 fish per pound) in the upper Yakima and Naches Rivers. The program would allow for all hatchery coho rearing to occur in-basin, and would transition to locally-adapted broodstock at ever-increasing rates as natural-origin broodstock become available (NMFS 2013).

The Master Plan is incorporated by reference in this EIS. It includes biological data, ecological rationale, and environmental and engineering research used to support much of the analysis in the EIS.

## 1.5 Cooperating Agency

### 1.5.1 Washington Department of Ecology

The Washington Department of Ecology (Ecology) is a cooperating agency on this EIS. For BPA to proceed with funding the project, the Yakama Nation must acquire sufficient ground and surface water rights to support operation of the MRS Hatchery. Ecology is responsible for granting these water rights. To grant the water rights, Ecology must comply with the Washington State Environmental Policy Act (SEPA). The EIS will help facilitate Ecology's SEPA process.

## 1.6 Public Scoping and Key Issues

Public scoping for the MRS Hatchery EIS was initiated with the publication of the Notice of Intent in the Federal Register (80 FR 70770) on November 16, 2015. Concurrent with the publication of the Notice of Intent, BPA mailed a letter and map describing the Proposed Action to neighboring landowners, affected tribes, local, state, and federal government officials, and known interested parties. The public letter was posted on a project website established by BPA to provide information about the project and the EIS process: https://www.bpa.gov/goto/MelvinSampsonHatchery.

BPA held a public scoping meeting to describe the project and to solicit comments in Ellensburg, Washington on December 9, 2015, with attendance from a total of 19 members of the public. BPA also received ten comments from nine individual

commenters electronically or by mail. The public comment period began on November 16, 2015 and BPA accepted comments until January 4, 2016.

During the scoping period, BPA received written comments from the following individuals/organizations:

| Name | Organization |
|---|---|
| Bangs | Individual |
| Franks | U.S. Fish and Wildlife Service |
| Gonseth | Washington State Department of Transportation |
| Kelly | Individual |
| Lyyski | City of Ellensburg |
| Nelson | Washington Department of Fish and Wildlife |
| Pace (two separate comments) | Individual |
| Smith | Individual |
| Somers | U.S. Environmental Protection Agency |

Issues raised during the scoping process were divided into categories as shown below. Responses to the scoping questions or cross references to where responses can be found are shown in *italics* in the following sections.

### 1.6.1 Water Resources

BPA received numerous comments on the usage of water associated with the MRS Hatchery. Specifically, commenters requested information on how the water to be used for the MRS Hatchery would affect existing public and private wells in the area, ground and surface water rights, or wetlands and floodplain processes. Additional comments requested information on WA Ecology's role in granting sufficient water rights necessary for hatchery operation. *In general, Section 3.5 includes information responding to these comments*.

### 1.6.2 Artificial Production

Certain commenters questioned the need for new hatcheries in general as an appropriate method for BPA to support the recovery of endangered fish species and to mitigate for the Federal Columbia River Power System. Commenters also raised concerns about the relationship between hatchery and existing fish in the proposed release locations. Many commenters requested that BPA fully consider the physical, ecological, and economic impacts of the construction and operation of the MRS Hatchery. *In general, Section 3.7 includes information responding to these comments.*

### 1.6.3 Hatchery Construction

Some commenters requested information on impacts associated with the construction of the MRS Hatchery itself, including incorporating measures to reduce the environmental and ecological impacts of the MRS Hatchery infrastructure. *In general, Section 2.2.4 includes information responding to these comments; impacts of construction on each specific resource are addressed in the applicable sections of Chapter 3*.

### 1.6.4 Hatchery Operation

Certain comments requested information on hatchery operations, specifically relating to how hatchery effectiveness would be monitored. *In general, Section 2.2.6 describes the monitoring and evaluation framework for the MRS Hatchery.*

### 1.6.5 Acclimation and Releases

Many commenters asked for more information and analysis on the acclimation and release sites for the juvenile hatchery fish, including broodstock collection locations, and how to determine the most appropriate tributaries for release. *See Section 2.2.5.2 for descriptions of acclimation, 2.2.5.1 for broodstock collection, and Section 3.7.2 for analysis of the environmental consequences associated with broodstock collection, acclimation, and release*.

### 1.6.6 Other Impacts

Other comments included requests to include a cumulative impacts analysis (*see the cumulative impacts analysis for each potentially affected resource within Chapter 3),* impacts on historic or traditional cultural places and treaty rights (*see Section 3.9*), means of access for proposed work activities (*see Section 3.2.2),* impacts on surrounding property values (*see Section 3.10.2)*, impacts of climate change (*see Section 3.11.2)*, and impacts of hazardous waste accidents or clean-ups (*see Section 3.13.2)*.

## 1.7 Issues beyond the Scope of this EIS

Most of the issues raised during the scoping process are considered to be within the scope of the Proposed Action and are addressed in this EIS. However, some issues are considered to be either beyond the scope of this EIS or are outside the scope of the Proposed Action—the following describes those issues.

- Types, locations, times of year, methods, enforcement, and outreach associated with harvest.
- The effectiveness of individual hatchery programs.
- The survival of naturally occurring coho populations across their life-cycle.
- How fish pass through Roza Dam.
- Funding in the MRS Hatchery proposal for additional outreach and enforcement to help educate and inform potential anglers of the coho salmon on how to reduce or minimize impacts on the resident fish.
- Suction dredge mining in streams where coho would be released.

Issues associated with fish restoration, harvest levels, hatchery programs in general, or the relative importance/priorities of other ongoing fish protection programs or projects are more appropriately addressed in other forums. Examples of such forums include the Council's project proposal solicitation process, or the processes by which Washington Department of Fish and Wildlife (WDFW) and National Marine Fisheries Service (NMFS) set harvest limits, or when a government agency proposes to adopt a policy relating to these broader, general programs.

# 2 Proposed Action and Alternatives

This chapter describes the existing coho program, the Proposed Action, the No Action alternative, and alternatives considered but eliminated from detailed study. It also compares the alternatives by project purpose and potential environmental consequences.

## 2.1 Existing Coho Program

The Yakama Nation is currently implementing Phase 2 of the coho restoration program described in the Master Plan, using a combination of artificial production and habitat improvements to meet natural production and harvest goals. The goals of Phase 2 are to increase coho spawning in tributaries, phase out imported releases of coho in the Yakima Basin, and test and monitor new acclimation techniques.

Currently, a portion of the juvenile coho released into the Yakima River as part of the overall YKFP coho reintroduction program have been reared out-of-basin at the Eagle Creek National Fish Hatchery, located outside of Estacada, Oregon. On a small scale, smolts and parr are released into several tributaries. Smolts are acclimated before release using existing or mobile acclimation units. Tributaries are chosen based on three criteria: 1) health of watershed; 2) presence of functional stream system; and 3) presumed and known historic use by coho.

The current program includes reintroducing juveniles and adults into select tributaries to monitor and assess current rearing and spawning conditions. Phase 2 also includes monitoring and assessing the feasibility of small-scale mobile acclimation units that seeded individual tributaries with coho, creating self-sustaining populations.

## 2.2 Proposed Action

Under the Proposed Action, BPA would fund the Yakama Nation for the construction and operation of the MRS Hatchery as described in the integrated coho program in the *Yakima Subbasin Summer- and Fall-Run Chinook and Coho Salmon Hatchery Master Plan*[1]. The Proposed Action would involve:

- Construction and operation of a new coho hatchery facility, known as the MRS Hatchery, at the former Holmes Ranch property.
- In-basing rearing of integrated coho juveniles at the MRS Hatchery using localized broodstock, with a goal to phase out all out-of-basin production (Yakama Nation 2012a). The transition to locally-adapted broodstock would occur at ever-increasing rates as natural-origin broodstock become available (NMFS 2013).

[1] The 2012 Master Plan also includes actions not being proposed at this time or evaluated in this EIS, including the segregated coho program and the Chinook programs

- Release and adaptive management (adjustment of release proportions to meet objectives for survival or adult return) of juvenile and adult coho reared at the MRS Hatchery.
- Operation of proposed and future juvenile acclimation sites.
- Collection of adult coho broodstock.
- Monitoring, research, and evaluation.

Hatchery operations would include spawning, incubation, and juvenile coho rearing using both surface and groundwater (see Section 2.2.3.2). Coho eggs would be incubated, then hatched and reared to parr or smolt stage at the MRS Hatchery, with the goal of providing up to 700,000 coho parr and smolts. This release number would be expected to eventually produce enough returning adults to provide for in-basin broodstock needs, to meet the goals for treaty and nontreaty harvest in the Yakima and Naches River basins, and to provide for natural spawning.

The MRS Hatchery would initially rear and release 500,000 parr (at 100 fish per pound) and up to 200,000 smolts (at 20 fish per pound) in the upper Yakima and Naches River watersheds using broodstock collected from existing facilities at Roza and Prosser Dams, or at other existing collection sites. Per existing ESA consultation with NMFS (NMFS consultation (NWR-2011-06509; NMFS 2016)), up to 200,000 smolts could be released in addition to the 500,000 parr. The proposed rearing of parr and smolts at the MRS Hatchery would support the Yakama Nation's priority release strategy, which is based on 7 years of data collected during Phase 2 of the Yakama Nation's coho program (i.e., recolonization of natural habitat with donor stock), which showed higher adult returns from parr releases. However, this strategy could be converted to a full smolt release strategy (i.e., 700,000 smolts) if adult return objectives are not being met (NMFS 2016). Because parr are released in the summer (mid to late July), if conditions within the basin (including circumstances such as climate change or drought) prove unsuitable for releasing parr, increased rearing and releases of smolts may better meet adult return objectives.

Recent Hatchery Scientific Review Group (HSRG) reviews of hatchery programs in Washington State include general recommendations for programs to shift toward using localized broodstock to improve survival (HSRG 2014). The Proposed Action would implement HSRG recommendations and shift to locally-adapted coho broodstock and in-basin rearing; the use of out-of-basin broodstock would be phased out (Yakama Nation 2012a). The use of a localized broodstock is required to meet the goal of providing a self-sustaining coho run throughout the species' historic range in the Yakima Basin. This goal requires the use of a localized broodstock, which would eventually become a natural-origin-only broodstock program. This means that all first generation hatchery fish would be left to spawn in the wild and their off-spring would be considered wild, one generation removed from domestication.

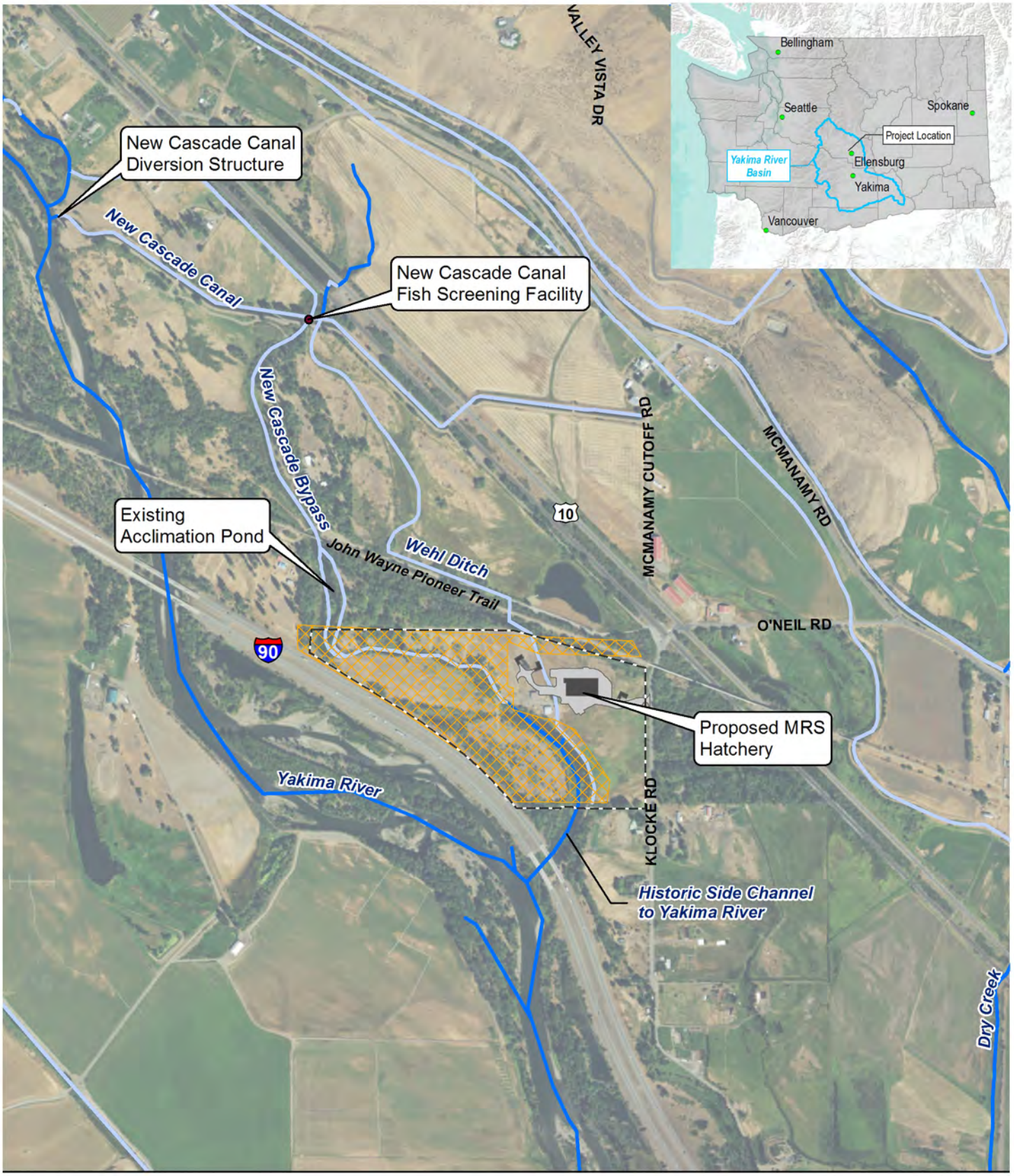
The Yakama Nation observed that out-of-basin returning coho from the Little White Salmon Hatchery stock did not complete their journey to spawning tributaries and therefore did not complete spawning or the construction of redds. Their lack of spawning was attributed to reduced endurance and an inability to sustain their journey from the ocean to natal spawning streams. In addition to reduced fitness, a salmons' imprinting to a watershed begins at the egg stage and becomes stronger as fish mature to the smolt

stage. Using localized wild broodstock and rearing juveniles in the Yakima Basin is anticipated to reduce straying rates and improve successful return and spawn, which would boost the overall ecosystem of the basin through increased introduction of marine-derived nutrients (Johnston 2016). Further, hatchery releases from the local brood source (Yakima River returns) have resulted in higher smolt-to-adult survival than releases from out-of-basin (non-Yakima River origin) hatchery broodstock. The higher return rate for the local broodstock supports the goal to convert the program to a locally adapted broodstock and to conduct all fish culture activities in-basin (Yakama Nation 2012a).

### 2.2.1 Project Area

The MRS Hatchery would be located on the Yakama Nation's Holmes Ranch property, totaling approximately 50 acres. It is situated about 5 miles northwest of Ellensburg, Washington. The property is bordered by I-90 to the south, Klocke Road to the east, John Wayne Pioneer Trail (a National Recreation Trail) to the north, and private property to the west (Figure 2.2-1). The property is near the Yakima River. A canal, called the New Cascade Canal diverts water from the Yakima River about 1 mile northwest (and upstream) of the property. Some of that water is used for irrigation, while some flows into the New Cascade Bypass channel that runs through the property, then drains into a historic side channel of the Yakima River, and then into the Yakima River (see Figure 2.2-1). Bypass water from the canal, in addition to groundwater, supports a series of large, deep ponds that are currently used to acclimate coho from mid-March to May.

Most of the property is subject to a conservation easement that protects its habitat value. The MRS Hatchery and related facilities would be constructed on an 8-acre portion of the Holmes Ranch property reserved for hatchery development.




**LEGEND**

- Stream/River
- Ditch/Canal/Aqueduct
- Conservation Easement
- Proposed Building
- Proposed Paved Area
- Holmes Ranch Property

**DATA SOURCE:** (Source DNR 2016, Kittatus County 2016, ESRI Online 2016)

Bonneville POWER ADMINISTRATION

N

0 500 1,000 Feet

# PROJECT AREA

**FIGURE 2.2-1**

### 2.2.2 Hatchery Facilities

The MRS Hatchery would include the following components:

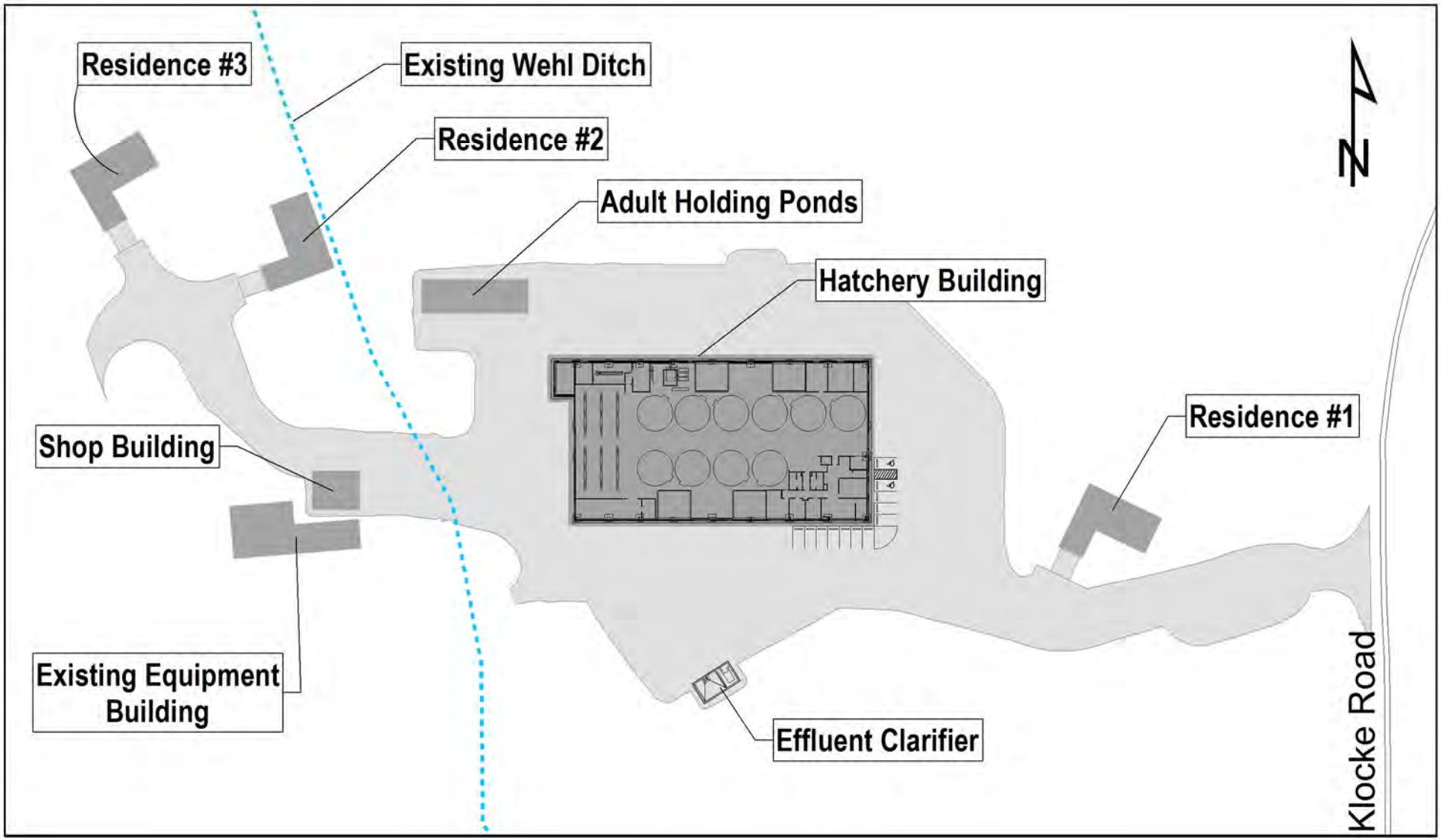
- Hatchery building (including areas for egg incubation, early rearing, water treatment and reuse equipment, as well as an administration area and parking lot)
- Adult holding and spawning ponds
- Shop building
- Three employee houses
- Intake screens and a surface water pump station to provide Yakima River water via the existing New Cascade Canal diversion to the MRS Hatchery
- Stoplog supports to allow surface water to be diverted
- Use of one existing groundwater well in addition to up to eight new wells
- Centralized degassing headbox for groundwater treatment and supply
- Site utilities that include pipes for water intake and discharge (outfall)
- Waste treatment pond
- Acclimation ponds and tanks
- Access roads

These components are described in more detail in the sections below; building features are shown in Figure 2.2-2.

#### 2.2.2.1 Hatchery Building

The MRS Hatchery building would be a pre-engineered metal building approximately 228 feet by 124 feet, located roughly in the center of the 8-acre developable portion of the project site. The building would have a central drive-through beneath the roof ridgeline that would provide vehicular access to all of the grow-out tanks. The drive-through would be accessible from either the west- or east-end of the building, through one of two 12-foot-wide by 14-foot-high roller doors.

The overall layout of the building would include distinct areas for egg preparation, incubation, early rearing, grow-out, administration, and miscellaneous areas for storage and other purposes.




Building

Asphalt Pavement

**DATA SOURCE:** : Mcmillian Jacobs 2016

Bonneville POWER ADMINISTRATION

0 200 400 600 800 1,000 Feet

# SIMPLIFIED SITE PLAN

**FIGURE 2.2-2**

#### 2.2.2.1.1 Administration

The administration area would be located in the southeast corner of the MRS Hatchery building and would total approximately 2,880 square feet. Dedicated parking spaces for 11 vehicles, including 2 handicapped spaces, and 2 bus or RV spaces, would be available directly outside the entrances to the administration area. The administration area within the MRS Hatchery building would include dedicated spaces for reception, office spaces, restrooms with showers, a conference/break room, vestibule/mud room, mechanical and electrical control room, large viewing room for visitors and staff, laboratory area, storage area, and closet.

### 2.2.2.2 Adult Holding and Spawning Ponds

Two adult holding ponds, 8 feet wide by 64 feet long, would be located off of the northwest corner of the MRS Hatchery building. The holding ponds would be covered by a shed roof. The two ponds would be adjacent and parallel with each other, separated by a recessed walkway that would allow hatchery operators to manually move crowders, an instrument that would move fish to smaller areas of the holding ponds. The southern pond would be equipped with a pump and piping to accommodate reuse of the water during months where groundwater is in short supply. The piping would route the holding pond discharge to a gas control tower located on a large slab area to the east of the pond entrances. The gas control tower would provide gas stabilization of surface water and reuse water before returning the flow to the ponds through the up-well area. At times when water is plentiful, water from the adult holding ponds would be discharged at a rate of up to 0.5 cubic feet per second (cfs) to the North Pond up gradient of the MRS Hatchery facilities.

In addition to the gas control tower, the concrete slab located to the east of the holding pond entrances would include an area for spawning and monitoring adult fish. The slab area would also include a recessed spawning area immediately adjacent to the adult holding pond entrances. This area would be dedicated to collecting and harvesting adults and discharging biological waste through a floor drain to a nearby holding tank. Access to the adults in the ponds from the recessed spawning area would be facilitated by removable stoplogs (hydraulic control elements that would adjust the water level in the holding ponds) located in the east walls of the holding ponds.

### 2.2.2.3 Shop Building

A shop building would be constructed for vehicle maintenance, storage of equipment, and other uses required for facility operations and maintenance. The new shop would be 30 feet wide by 36 feet long (1,080 square feet). The shop would be located on the west side of the existing irrigation ditch, just north of the existing equipment building, garage, and shop. Vehicular access to the shop would be via a new access road from the east.

### 2.2.2.4 Residences

Three new residences would be constructed at the MRS Hatchery. One residence would be located near the site entrance off of Klocke Road, while the other two would be located west of the existing irrigation ditch. Each residence would include over 2,000 square feet of living space, in addition to an attached two-car garage with

approximately 480 square feet of space. Each unit would have three bedrooms, two bathrooms, and sanitary sewer and potable water service. The residences would be heated with electric furnaces. An irrigation system would also be provided.

The residences would be accessible via the new access road off of Klocke Road and would include a concrete pad in front of the garage with approximate dimensions of 15 feet by 18 feet.

#### 2.2.2.5 Access Roads

Access to the MRS Hatchery would be from Klocke Road, which borders the project site on the east. A new paved road would provide access to, and circulation around, the MRS Hatchery building. The new road, approximately 250 feet long, would also provide access to the eastside residence and the adult holding ponds. Access to the west side residences, the effluent clarifier, and the new shop building would be via gravel road connected to the paved road.

#### 2.2.2.6 Site Utilities

Site utilities would include a water supply for fire suppression, sanitary sewer and potable water service for the MRS Hatchery building and residences, in addition to electrical service and an irrigation system.

Electrical upgrades would include a new 3-phase overhead power service, which would be extended to the site from approximately 0.5 mile away.

A screened fire suppression water intake would be installed near the outfall structure in the side channel. The pipe would be routed to a pumper connection near the effluent clarifier. In the case of fire, pumped water would flow to two hydrants located on either side of the hatchery building.

The location of the proposed septic drain field is not known at this time, and would be contingent on the final layout of the groundwater wells and on the results of the geotechnical investigation. Groundwater would be used to supply potable water to the residences and the MRS Hatchery facility. Existing potable wells on site would be used; however, if test pumps determine that capacity is inadequate for the increased use, additional potable wells and sanitary systems would be necessary. Such wells would be sited after the locations of process water wells are determined, contingent on the final location of the groundwater wells, and on the water quality tests and other results from the geotechnical investigation. The potable water system would be sized to provide enough water for peak demands in the morning and at evenings in the residences, along with demands occurring at the MRS Hatchery building.

The residences would each have a septic tank, which would drain by gravity to the drain field.

#### 2.2.2.7 Storm Drainage

Storm drainage has been accommodated in the site design through the civil site layout, ensuring that the direction of sloping surfaces routes stormwater to designated infiltration areas. A formal piping system with catch basins would not be utilized; instead, stormwater would sheet flow across graded surfaces to a vegetated filter strip. The filter strip would consist of vegetated areas, both undisturbed and re-seeded, immediately

adjacent to the impermeable surface. The vegetated filter strip would be wide enough to slow sheet flow, protect against erosion, and allow biological treatment prior to infiltration of stormwater within the surrounding pastureland.

#### 2.2.2.8 Monitoring and Alarm System

A programmable logic controller-based monitoring and alarm system would be provided to assist hatchery staff with facility operations. Monitoring points would include water supply flows from each well and pump station, makeup (newly supplied) water flows to reuse modules, water levels in each tank, and dissolved oxygen levels and water temperatures in each reuse module. Adjustable setpoints for alarm notifications would be programmed into the system based on input from hatchery staff.

### 2.2.3 Water Rights, Supply, and Effluent

The MRS Hatchery would use a combination of surface water and groundwater, for which the Yakama Nation would obtain water rights. Treated effluent would be discharged back into the Yakima River. The following sections provide more detail about water rights, water supply, and effluent.

#### 2.2.3.1 Water Rights

Under the proposal, a surface water right would be obtained for 10 cfs of water to be diverted from the New Cascade Canal fish screening facility and into the New Cascade Bypass. There is an existing water right of 4.5 cfs for the project site. The existing water right, which is for irrigation (consumptive use), would be put into trust permanently[2] with the granting of the new water right. Up to 6 to 7 cfs of the 10 cfs would be pumped into the MRS Hatchery, with the remaining 3 to 4 cfs providing sweeping velocity and fish passage flow at the intake screen. No surface water would be used at the MRS Hatchery during the April 1 – October 31 irrigation season.

In addition, a groundwater right of 2.5 cfs would be obtained for the MRS Hatchery for continuous year-round use.

#### 2.2.3.2 Water Supply

Surface water and groundwater would be used throughout the year at the MRS Hatchery for various purposes throughout the juvenile fish life cycle as follows in Table 2.2-1. The requirements for the total supply flow and the water supply source are described in Table 2.2-2.

[2] Through the Washington State Trust Water Rights program, a trust holds the water right for future uses without relinquishing the right. Water held in trust stays in the river to benefit groundwater and instream flows, and other beneficial uses (see http://www.ecy.wa.gov/programs/wr/market/trust.html).

**Table 2.2-1. Proposed Groundwater Water and Surface Water Use (cfs)**

| | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Groundwater*** | | | | | | | | | | | | |
| Proposed Groundwater Right | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| Groundwater Withdrawal | 2.1 | 2.0 | 2.0 | 1.8 | 1.8 | 1.8 | 1.8 | 2.1 | 1.6 | 0.2 | 0.2 | 0.2 |
| MRS Hatchery Use | 2.1 | 2.0 | 2.0 | 1.8 | 1.8 | 1.8 | 1.8 | 2.1 | 1.6 | 0.2 | 0.2 | 0.2 |
| Groundwater Return from MRS Hatchery (Side Channel) | 2.1 | 2.0 | 2.0 | 1.8 | 1.8 | 1.8 | 1.8 | 2.1 | 1.6 | 0.2 | 0.2 | 0.2 |
| ***Surface Water*** | | | | | | | | | | | | |
| Proposed Surface Water Right | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 10 | 10 | 10 |
| Surface Water Diversion to New Cascade Bypass | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 10 | 10 | 10 |
| Intake for MRS Hatchery Use and Outflow to Side Channel | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4.5 | 6.0 | 4.8 | 3.0 | 3.0 |
| Continued Flow from New Cascade Bypass to Side Channel (0.1 mi) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5.5 | 4.0 | 5.2 | 7.0 | 7.0 |
| Side Channel Downstream of MRS Hatchery Outfall | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 10 | 10 | 10 |

**Table 2.2-2. Hydraulic Systems Requirements**

| System | Flow/Unit | Units | Total Supply Flow | Water Supply |
|---|---|---|---|---|
| Incubation | 4 gpm/stack | 15 stacks + 3 Spares | 72 gpm | Groundwater |
| Early Rearing | 48 gpm/tank | 18 tanks | 864 gpm | Groundwater |
| Grow-Out Tanks | 135 gpm/pond | 10 tanks | 1350 gpm make up water | Groundwater/Surface Water |
| Effluent Treatment Facilities | 1,500 gpm to micro strainer | 1 cell | 15 gpm to clarifier | Groundwater/Surface Water |
| Adult Holding Facilities | 680 gpm | 2 cells | 1360 gpm max flow | Groundwater/Surface Water |

gpm = gallons per minute

#### 2.2.3.2.1 Groundwater Supply

The groundwater supply system would be developed and designed to provide continuous year-round flow of up to 2.5 cfs to the MRS Hatchery, consistent with the water right application for the MRS Hatchery. A portion of the groundwater supply system would be chilled for use in regulating process water temperature for adult holding,

incubation, and grow-out tanks. Groundwater would also be used as potable water for the residences and administrative portion of the MRS Hatchery.

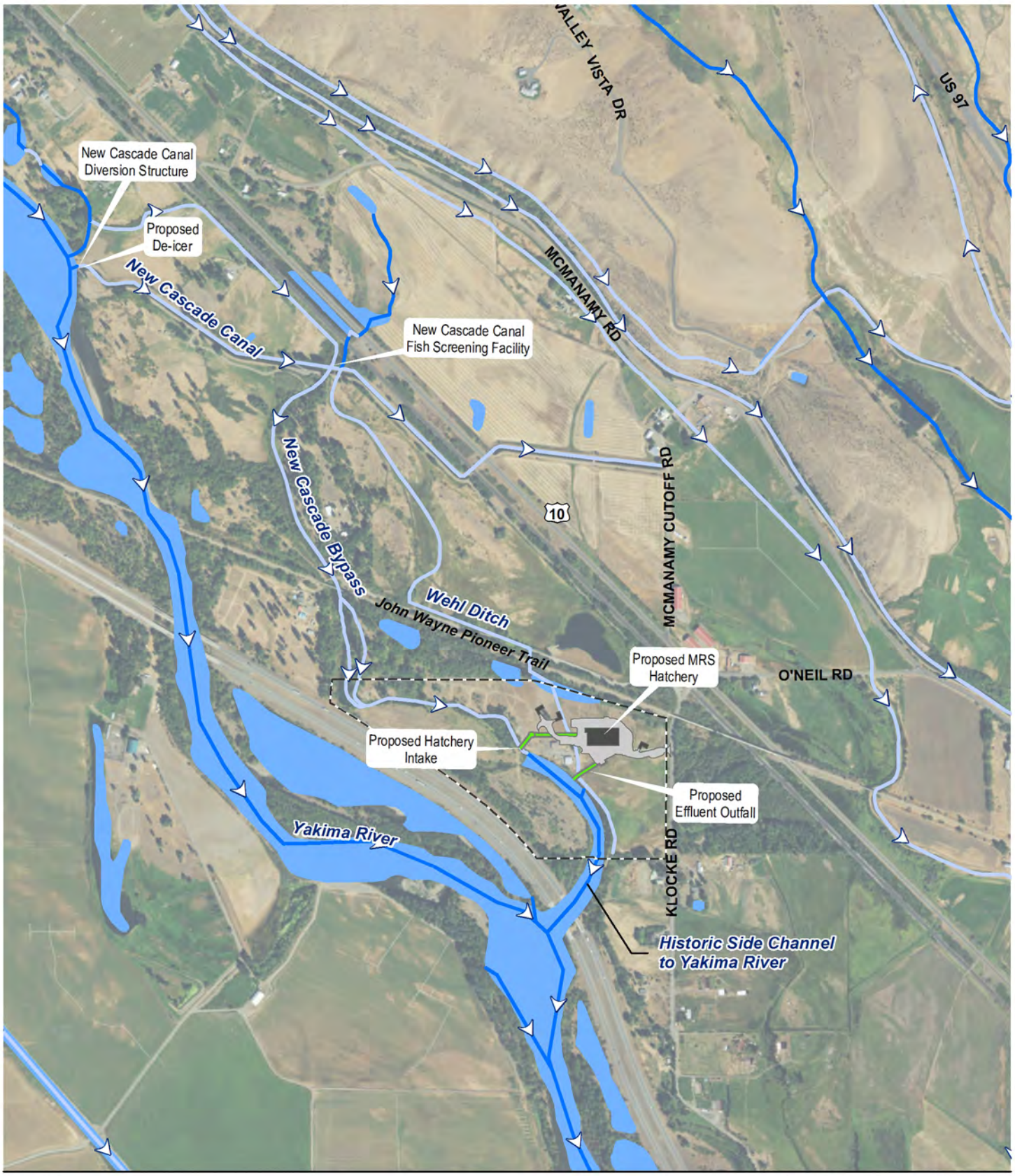
Groundwater investigations and testing will help determine well development strategies. The preliminary design indicates that groundwater would be supplied to hatchery operations by pumping from nine submersible groundwater pumps located in shallow wells throughout the project site. The wells would include one existing 30-foot-deep well located near the east entrance to the site, and up to eight new wells dispersed throughout the site. A shallow aquifer would provide the groundwater source to the pumps. Separate groundwater transmission pipelines would be routed underground from each well to the central gas stabilization headbox in the MRS Hatchery building.

Groundwater supply would be available year-round, according to the groundwater right application; however, the full 2.5-cfs groundwater right is not expected to be utilized throughout the year. When fully utilized, the estimated maximum groundwater flow required for the ambient supply is 2.34 cfs, while the remaining 0.16 cfs of the 2.5 cfs total water right would supply the chilled water. The highest demand for groundwater would occur April – October, when the surface water right is not available. During the November – March period when surface water is available, the MRS Hatchery operators would have the option to minimize groundwater use to allow the aquifer to recharge. The MRS Hatchery operators would develop guidelines for water source selection over time once the facility is up and running. Wells would be located to minimize interferences between aquifer drawdown cones of depression.

The groundwater treatment system would have two primary components: ambient and chilled water supply systems. Both systems would utilize a degassing/aeration process that would be accomplished via degassing columns located at a headbox inside the MRS Hatchery building. Individual pipes from each well would enter the MRS Hatchery building below grade along the north wall of the water treatment area. Each supply pipe would rise up through the floor slab and route flow through flowmeters and isolation valves prior to being collected into an overhead pipe manifold. A tee with a valved branch and quick-connect would be provided on each well line upstream of the flowmeter to allow operators to blow off sediment and flush individual well lines prior to using the water in the MRS Hatchery.

#### 2.2.3.2.2 Surface Water Supply

The Proposed Action would require surface water from November through March. This water would be diverted from the Yakima River through the existing New Cascade Canal Diversion. This diversion is located on the east bank of the Yakima River approximately 7 miles northwest of Ellensburg, Washington (Figure 2.2-3). The diversion, which is owned and operated by Reclamation, provides about 150 cfs of irrigation water from April through October. One element of the diversion structure, the trash rack, would be subject to ice formation if operated in the winter. Under the Proposed Action, the trash rack would be converted to a high-density polyethylene (HDPE) structure with fiberglass reinforcement to minimize the formation of ice. Construction would occur during the in-water work period and dewatering would not be necessary.




**LEGEND**

- Holmes Ranch Property
- Proposed Paved Area
- Proposed Building
- Water Body
- Flow
- MRS Intake/Outfall
- Stream/River
- Ditch/Canal/Aqueduct

**DATA SOURCE:** (Source DNR 2016, Kittatus County 2016, ESRI Online 2016)

Bonneville POWER ADMINISTRATION

N

0 500 1,000 Feet

# SURFACE WATER NEAR THE HOLMES RANCH PROPERTY

**FIGURE 2.2-3**

Water diverted into the New Cascade Bypass flows south through the channel for approximately 0.8 mile before passing under a small bridge located on the west side of the Holmes Ranch property. A surface water intake structure would be constructed approximately 20 feet upstream of this bridge. This intake would supply up to 6 to 7 cfs of surface water to the MRS Hatchery facility from November through March when irrigation water flows are shut off. The remaining 3 to 4 cfs of surface water right would continue to flow through the side channel, providing in-stream flows for fish.

The surface water intake structure would consist of two small, sheet pile walls in series to provide a diversion backwater, and a cone screen to filter water, exclude fish, and bypass flow to an off-stream surface water sump (or wet well). The sheet piles would be buried and backfilled in the channel. Water filtered through the cone screen would be routed to a sump. Water pumped from the sump would then be routed to a flow splitter that diverts a portion of the surface water flow directly to the adult holding ponds degasser, while the remainder of the surface water continues on to the MRS Hatchery building filtration sump.

The surface water treatment system for the MRS Hatchery building would provide filtered and disinfected makeup water to re-supply the grow-out tanks. This surface water makeup supply would enter the MRS Hatchery building below grade along the north wall of the water treatment area. A supply pipe would deliver up to 3 cfs of flow into a precast concrete sump containing a microstrainer. The microstrainer would be rated to remove entrained particulate down to a 54-micron size. Booster pumps would pull filtered water out of the sump, and lift it through an ultraviolet disinfection process. The disinfected surface water would then be distributed via overhead piping to the top of four reuse system gas towers for aeration prior to use in the grow-out tanks. A normally closed bypass valve would allow the surface water to be used as a backup supply to the early rearing tanks.

#### 2.2.3.2.3 Chilled Water Supply System

A chiller would be utilized to cool incubation water to facilitate the raising of fish at the MRS Hatchery. The size of the chiller is still under consideration. To ensure reliable operation during critical fish development periods, the chiller would include some backup capacity, which could double as available capacity should significant increases in ambient or water temperatures occur.

### 2.2.3.3 Water Effluent

The process water effluent from adult holding ponds and from the MRS Hatchery building would be collected in a drain system and conveyed to an outfall in the side channel downstream of the surface water intake. Drain pipes would be sized to accommodate flows into the drain system during power outages and vessel draining, particularly from the grow-out tank reuse systems, which would exceed typical supply flows.

The effluent treatment system would actively remove solids and associated biological oxygen demand from the effluent in accordance with best management practices (BMPs) and statewide hatchery National Pollutant Discharge Elimination System (NPDES) General Permit requirements (Ecology 2015). Solids would be concentrated in a small backwash side stream.

Filtered water and clarified backwash water would then be routed, combined into a single 18-inch pipe, and routed toward a single 24-inch outfall where it would be discharged into the side channel.

The overall size of the clarifier would be 30 feet by 16 feet. Solids accumulated in the clarifier would periodically be pumped out to either a tank truck for haul-off or land-applied on site at the discretion of the Yakama Nation.

#### 2.2.3.4 Process Water Reuse Systems

Process water reuse systems would be designed to treat and reuse approximately 75 percent of the effluent flow from the grow-out tanks to minimize overall water demand. Provisions for 95 percent recirculation are included in reuse pipe and equipment sizing to mitigate risks associated with groundwater abundance.

### 2.2.4 Construction Activities

#### 2.2.4.1 Facility Construction

The MRS Hatchery construction would require approximately 16.5 months, using standard construction industry methods and equipment. Mobilization and staging would occur on upland areas of the site. If required, temporary access roads would be graded within the site footprint to facilitate safe and efficient movement of equipment throughout the site. No riparian, wetland, or other aquatic resources would be disturbed, and no trees would be removed from the site to accommodate staging.

The work effort would include clearing and grubbing, demolition of the existing residence, barn, and other outbuildings, excavation for pipe installation and structure foundations, building erection, road construction, and final site grading and planting. The existing concrete ditch (or Wehl ditch) would be removed and replaced with a 24-inch pipe buried in its place. The anticipated equipment that would be used during the construction is shown in Table 2.2-3.

### Table 2.2-3. Construction Equipment

| Item No. | Description | Number on Site | Comment |
|---|---|---|---|
| 1 | Superintendent and Foreman Pickups | 4 | |
| 2 | 100-ton Crane | 1 | Used for building erection |
| 3 | Mini Trac Excavator | 1 | |
| 4 | 50,000 lb. Excavator | 2 | |
| 5 | 80,000 lb. Excavator | 1 | |
| 6 | Vibratory Roller | 1 | |
| 7 | Dump Truck – Onsite | 1 | Used onsite for miscellaneous work tasks |
| 8 | Rock Delivery Dump Truck with Trailer | 4 | Will make material delivery, will be onsite briefly during construction |
| 9 | Well Drill Rig | 1 | Onsite to drill water supply wells |
| 10 | Grader | 1 | Used for road and parking area subgrade and final grading |
| 11 | D-6 Bulldozer | 1 | |
| 12 | All Terrain Forklift | 1 | |
| 13 | Dewatering Pumps | 4 to 6 | 2-inch through 6-inch size, electric powered |
| 14 | Diesel Generators | 2 | 50 to 100 kilowatts |
| 15 | Air Compressor | 1 | Industrial trailer mounted |
| 16 | Jumping Jack Plate Compactor | 2 | |
| 17 | HDPE Pipe Welder | 1 | |
| 18 | Boom Truck | 1 | |

Vehicle usage during construction is estimated as follows:

- Employee vehicles – up to 30 per day.
- Material delivery trucks – up to 10 per day.
- Dump trucks – up to 20 per day during import of fill material.
- Total during construction would range from a minimum of 20 per day to as high as 60 per day.

Noise during construction would include the following:

- Employee vehicles arriving for work in the morning and departing in the evening.
- Construction operating equipment such as dozers, excavators, and dump trucks.
- Electric pumps used for construction dewatering.
- Air wrenches used to install the pre-engineering metal building, fabricated steel materials, and equipment.
- Hammers, circular saws, and other small tools used in construction.

- Vibrator rollers, jumping jacks, and plate compactors used to compact the soil subgrade during construction.
- Concrete pump truck.
- Portable diesel generators.
- Air conditioner used for the temporary construction office trailer.

#### 2.2.4.2 In-Water Work

The recommended in-water work window for Yakima River tributaries is July 15-August 31; however, the New Cascade Canal diversion operates to provide irrigation water from April through October. Considering this and onsite conditions, the proposed in-water work at both the New Cascade Canal fish screen and the MRS Hatchery intake facility would occur immediately following the irrigation season completion and shutdown of the canal. Specifically, the in-water work window would be November through March. Specific details for each in-water work element are provided in the following sections.

##### 2.2.4.2.1 New Cascade Canal Fish Screening Facility Modifications

The work effort would require concrete forming and placement, so completing this work prior to freezing conditions would be preferred. Total duration of the work effort would be approximately 4 to 6 weeks.

Dewatering would consist of placement of gravel-filled bags or water-filled sacks with a plastic tarp across the canal immediately upstream from the work area. Any seepage would be directed toward a trash pump and pumped around the screen structure back into the canal. A properly sized settling tank would be used to treat the water prior to discharge back into the canal. It is anticipated that the groundwater or seepage flows would be less than 1 cfs during the construction period.

##### 2.2.4.2.2 MRS Hatchery Intake Structure (in Bypass)

The intake screen structure would be constructed by bypassing the groundwater seepage flows around the intake construction area. Super sacks would be placed on the upstream and downstream side of the intake area. A corrugated metal pipe would then be installed in a vertical orientation on the downstream side of the intake. This pipe would be used as a sump, allowing the groundwater level to be pumped down below the bottom of the intake excavation area. The water collected in the sump would be routed to a constructed settling pond located south of the intake. It is anticipated that the groundwater or seepage flows would be in the 3 to 4 cfs range during the construction period. The discharge from the settling pond would then be discharged into a vegetative strip to provide natural filtering prior to flowing back into the channel. The treated water would be reintroduced back into the channel immediately downstream from the cofferdam.

Coho adults have recently started to spawn in the work area during the proposed in-water window. A temporary picket fish barrier would be erected across the mouth of the channel prior to initiation of the construction work to prevent coho adults from moving up the channel and spawning.

#### 2.2.4.2.3 MRS Hatchery Outfall Structure (in Historic Side Channel)

The outfall structure would be constructed by placing a small gravel- or water-filled sack cofferdam into the side channel prior to in-water work to isolate the outfall construction area. The cofferdam would be placed in a semi-circle to allow groundwater seepage to flow past the construction area. The outfall would be armored with large rock upstream and downstream of the pipe, and quarry spalls or rounded river rock would be placed on the channel bottom to dissipate energy at the return location. To prevent fish from swimming up the outfall, it would be equipped with a bar rack.

A screened fire suppression water intake would be installed near the outfall structure.

### 2.2.5 Operation and Maintenance

Occasional maintenance may be necessary throughout the life of the MRS Hatchery to remove debris from screens/outfall bars, check or replace stoplogs at the New Cascade Canal fish screen, and check or perform minor repairs on sills/screens at the proposed bypass intake. Minor replacement of armoring adjacent to the new intake and outfall structures may be necessary. Periodic dewatering of infrastructure could be required to conduct inspections or minor maintenance for the life of the MRS Hatchery. All in-water maintenance activities would occur during the standard in-water work window for Yakima River tributaries, July 15–August 31.

Hatchery production would involve artificial propagation of coho salmon as described in the 2010 *Yakima Basin Coho Reintroduction Project Hatchery and Genetic Management Plan* (HGMP) and the 2013 NMFS BiOp (biological opinion). Specific methods of production would include: 1) collection of eggs from adult fish (broodstock) caught at the fish trapping facilities and transport of eggs to the proposed MRS Hatchery, and 2) egg incubation and rearing of fish within the MRS Hatchery to a release ready stage, transport of fish to acclimation sites, and release of juvenile and adult fish into the wild.

#### 2.2.5.1 Adult Coho Broodstock Collection

Up to 1,000 coho adults would be collected at Roza Dam for broodstock for the proposed MRS Hatchery. Adults may also be collected at Prosser Dam as a backup source, and possibly in the future at the Cowiche or Wapatox Dams. The broodstock goal is to collect 1,000 fish that would be processed over a 4-month period. No more than 400 fish would be held at the adult holding ponds at the MRS Hatchery at any given time. The fish would be held and spawned onsite for 2 to 3 months, from October through January. The collection of adult coho at Roza and Prosser Dams has been the subject of ESA consultation for both bull trout (USFWS 2007a) and steelhead (NMFS 2013).

#### 2.2.5.2 Acclimation and Release

Under the Proposed Action, coho parr, smolts, and adults would be released into tributaries of the Yakima River. The smolts would be acclimated before release in a combination of existing ponds and mobile acclimation units. The following sections provide more detail about coho acclimation and release.

#### 2.2.5.2.1 Parr and Smolt Releases

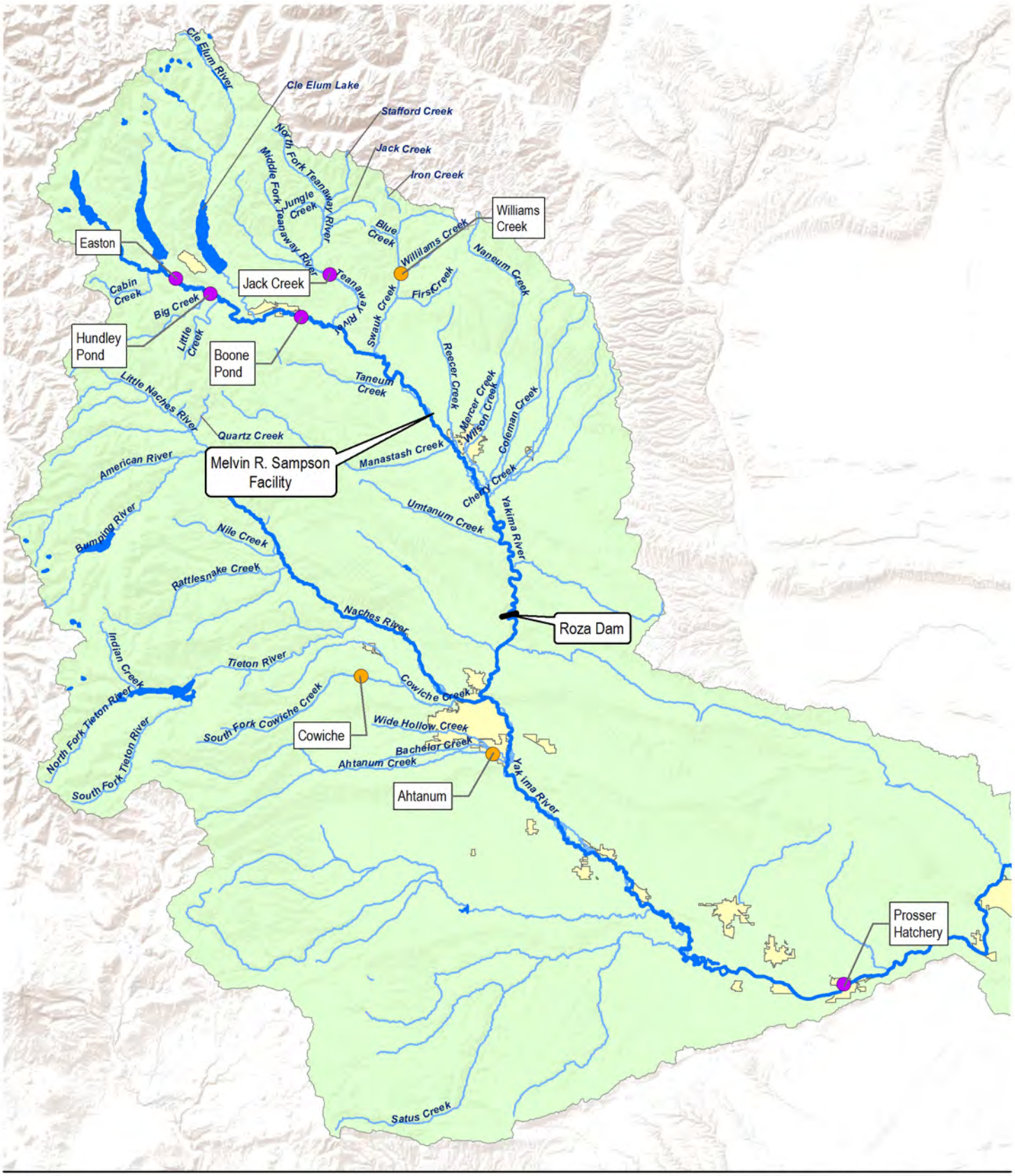
Under the Proposed Action, the MRS Hatchery would produce and release 500,000 coho parr and up to 200,000 coho smolts as part of the overall coho reintroduction program. Per NMFS consultation (NWR-2011-06509; NMFS 2016) the production of up to 200,000 smolts and 500,000 parr is authorized. Conversion to an all-smolt release (i.e., 700,000 smolts) is proposed if the parr/smolt release strategy does not meet adult return objectives, or if drought conditions preclude summer parr releases.

All fish from the integrated program would be coded wire-tagged, but not adipose fin-clipped. Coho juveniles reared at the MRS Hatchery would be released into many tributaries that are currently outplanted with hatchery coho brought in from hatcheries outside of the Yakima Basin, along with several additional waterbodies (Figure 2.2-4; Table 2.2-4). Juvenile releases would continue to focus on tributaries where bull trout and steelhead are not present or occur at low abundance. In tributaries that support spawning and rearing habitat for bull trout, coho adult outplantings would be well downstream of known bull trout spawning and rearing habitat to minimize the risk of coho adults preying on bull trout. In the future, additional tributaries could be subject to juvenile acclimation and release, in consultation with the U.S. Fish and Wildlife Service (USFWS) and NMFS. The number and life stage of coho salmon released would depend on a number of factors that include habitat conditions and presence of sensitive species within the tributaries. The Yakama Nation would review drought reports on an annual basis and focus releases of coho into streams that are not expected to experience dewatering during summer months.

Prior to release, smolts would be acclimated in ponds adjacent to tributaries in which they would be released to help encourage their return as adults to these tributary locations. A number of existing ponds, including Jack Creek, Hundley, Boone, and Easton would continue to be used to acclimate coho smolts from the MRS Hatchery. Under the Proposed Action, mobile acclimation units would be used for a small number of coho smolts in the basin. Similar to the mobile acclimation units currently being used by the Yakama Nation, these units would consist of portable aluminum raceways that are 20 feet long, 5 feet wide, and 4 feet tall.

The mobile acclimation units would be placed either on private or Forest Service lands, with approval from the applicable landowner. The units would be placed on level ground requiring minimal grading and vegetation removal. No mechanical clearing would occur and no trees would be removed. The mobile acclimation units would be placed adjacent to each subject tributary in upland areas that have existing disturbance (such as spur roads). The Yakama Nation would not place acclimation units in sensitive areas (e.g., wetlands). A single screened surface water pump with aboveground piping would be installed to deliver surface water from subject tributary(ies) to up to three tanks at each location. Water would be returned to the tributary using a single outlet hose placed below the water's surface. The surface water intake and outlet would be removed following each acclimation season. Installation of the intake and outlet would not require any disturbance to the riverbank or bed, and would be completed in less than a few hours.

Following the acclimation season, if desired by the landowner, the Yakama Nation would remove each mobile acclimation unit from the riverbank. The Yakama Nation would acquire a 5-year temporary water right from Ecology for the tributary in question. Sites would begin acclimation in late February and fish would be released in early to mid-April. The goal would be to acclimate the fish for a minimum of 4 weeks.




**LEGEND**

- Mobile Acclimation Site
- Permanent Acclimation Site
- Rivers and Streams
- Dam
- Cities and Towns
- Yakima River Basin

**DATA SOURCE:** (Source DNR 2016, Kittatus County 2016, ESRI Online 2016)

Bonneville POWER ADMINISTRATION

N

0 5 10 Miles

# EXISTING PONDS AND PROPOSED MOBILE COHO ACCLIMATION SITES

**FIGURE 2.2-4**

### Table 2.2-4. Prioritized List of Tributaries Identified for Coho Reintroduction Under the Proposed Action

| Location | Activity | | | Priority |
|---|---|---|---|---|
| | Parr Releases | Adult Outplanting | Smolt Acclimation and Release | |
| ***Naches River*** | | | | |
| Cowiche Creek, including South Fork | X | X | X | First |
| Rattlesnake Creek | | X | Existing (may be de-commissioned) | First |
| Little Naches | X | X | | First |
| Quartz Creek | X | | | First |
| Nile Creek | X | | | First |
| Tieton River | | X | | First |
| South Fork Tieton River[a] | | X | | Second |
| North Fork Tieton River[a] | | X | | Second |
| Rock Creek | X | | | Second |
| North Fork Little Naches | X | X | | Second |
| Bumping River | | X | | Second |
| American River | X | X | | Second |
| ***Upper Yakima River*** | | | | |
| Wilson Creek | X | X | | First |
| Reecer Creek | X | X | | First |
| Swauk Creek | X | X | | First |
| Iron Creek | X | | | First |
| First Creek | X | | | First |
| Blue Creek | X | | | Second |
| Williams Creek | | | X | First |
| Taneum Creek | | X | | First |
| Big Creek | | X | | First |
| Mainstem Upper Yakima (including acclimation sites) | X | X | X (four existing sites) | First |
| Upper Cle Elum River | X | X | | First |
| Cabin Creek | X | | | First |
| Lower Cle Elum River (below dam) | X | | | First |
| Manastash | X | X | | Second |
| Cherry Creek | X | | | Second |
| Mercer Creek | X | | | Second |
| Coleman Creek | X | X | | Second |

**Table 2.2-4. Prioritized List of Tributaries Identified for Coho Reintroduction Under the Proposed Action**

| Location | Activity | | | Priority |
|---|---|---|---|---|
| | Parr Releases | Adult Outplanting | Smolt Acclimation and Release | |
| Nanuem Creek | X | | | Second |
| Little Creek | X | X | | Second |
| Teanaway River, including mainstem, South, Middle, and North Forks | X | X | | Second |
| Jack Creek | | | X (existing) | Second |
| Indian Creek | X | | | First |
| Stafford Creek | X | | | Second |
| Jungle Creek | X | | | Second |
| ***Mainstem Yakima River*** | | | | |
| Ahtanum Creek | X | X | X (smolt release) | First |

[a] Coho releases are proposed following construction of fish passage facilities at Tieton Dam, and in coordination with Reclamation (Newsome 2016a).

Existing ponds that may be used for acclimatizing smolts include the Stiles Pond, Lost Creek Pond, Easton Pond, Prosser Hatchery, and Boone Pond.

In summary, the Proposed Action would result in the following changes to ongoing juvenile release strategies currently being conducted in accordance with the Master Plan:

- **Increase in the number of parr releases, and decrease in the number of smolt releases.** The Proposed Action would increase the number of coho parr released from 27,000 to 500,000 annually and the number of coho smolt releases would be reduced. While the total number of releases associated with the MRS Hatchery would remain approximately 700,000 fish, an additional 300,000 to 600,000 fish would be released under other programs not addressed in this EIS. As a result, the total release of coho juveniles (parr and smolt) would be 1-1.3 million fish.
- **Acclimation and release of MRS Hatchery-propagated coho into new tributaries.** Juvenile coho propagated at the MRS Hatchery would be released into tributaries that are not currently subject to coho releases, with a goal of seeding more habitats throughout the basin. It should be noted that, under the No Action alternative, the YKFP also calls for the expansion of juvenile release tributaries (see Section 2.3). Under the Proposed Action, however, these tributaries would be seeded with MRS Hatchery coho. In the future, additional tributaries could be subject to juvenile acclimation and release, in consultation with the USFWS and NMFS.

#### 2.2.5.2.2 Adult Releases

Currently, and as described in Phase 2 of the Master Plan (see Section 1.4.2), the Yakama Nation initiated outplanting coho adults that had returned to the Prosser

Hatchery into numerous tributaries throughout the basin. Under the Proposed Action (Phase 3), the Yakama Nation would continue adult outplanting. Potential impacts of adult outplanting are considered under the Proposed Action because MRS Hatchery-reared juveniles released into the Yakima Basin would return as adults, and could be selected for outplanting.

#### 2.2.5.2.3 Adaptive Management of MRS Hatchery Juvenile Releases

The Yakama Nation would adjust its release numbers in the YKFP with the addition of MRS Hatchery juvenile releases, but the overall release numbers would remain static. Over time, such adjustments may include releasing more smolts and less parr, or switching to a full smolt-release protocol, which is similar to existing protocols. The Yakama Nation has developed MR&E objectives and tasks through the Monitoring Implementation Planning Team (MIPT), a joint process between the Yakama Nation and WDFW. As part of the MIPT review process, the Yakama Nation and WDFW would continue to monitor competitive interactions between released coho juveniles and nontarget fish species. Monitoring would include a Type 1 analysis, which examines the spatial and temporal overlap between nontarget fish and hatchery-released coho, residuals, and returning adults. Monitoring would also include a Type 2 analysis, which examines the spatial and temporal overlap between nontarget fish and all life history stages (fry, parr, smolt, adult) of naturally produced offspring of returning hatchery adults.

Modifications to the coho releases associated with the MRS Hatchery would be determined by management criteria determined through the MIPT and would be reported to NMFS. Depending on the scale of the modification, NMFS would either write a letter to the file explaining how the change in impacts does not rise to the level requiring re-initiation of ESA consultation, or would require an updated BA.

### 2.2.5.3 Facility Operations and Maintenance

During operation, the estimated vehicle trips would be as follows:

- Employee personal vehicles – 5 per day
- Delivery trucks – 1 per day
- Maintenance and general support vehicles – 1 per day
- Total average trips per day – 7 to 10

The noise during operation would include the following:

- Employee vehicles exiting and entering the MRS Hatchery site.
- Trucks delivering fish feed, supplies, and fuel to the MRS Hatchery site.
- Visitor vehicles and buses.
- Heating, ventilation, and air conditioning (HVAC) system outdoor equipment (heat pumps, etc.) for the MRS Hatchery building, residences, and shop building.
- Transport trucks entering the MRS Hatchery site to delivery adults to the onsite holding raceways or to load and transport juvenile fish.

Energy use associated with the process water systems would vary significantly depending on fish life stage. Lighting and HVAC loads would vary seasonally as well. The total connected load for the MRS Hatchery is presently shown to be 625 kilovolt amps (if all potential loads are “ON” at the same time). Actual peak energy usage would typically be 30 percent to 40 percent lower than connected load. There are pending decisions on the amount of water chilling that would occur in the late summer that could increase energy use by 60 to 160 kilovolt amps for a 3- to 4-month period.

### 2.2.6 Monitoring, Research, and Evaluation

The Proposed Action is part of the overall YKFP coho reintroduction program. MR&E activities associated with coho have been ongoing for many years. Similar MR&E activities would take place as part of overall MRS Hatchery operations.

As part of ongoing MR&E activities for artificial propagation programs in the Yakima Basin, the Yakama Nation has developed monitoring and evaluation objectives and tasks through the MIPT, discussed above.

The monitoring and evaluation framework is described in detail in the Master Plan. The Master Plan identifies a set of Decision Rules that are the strategy for achieving program and biological objectives. The purpose of the MR&E plan is to:

- Evaluate performance relative to goals and expectations and adjust hatchery and harvest management operations according to the Decision Rules. Indicators of program success include benefits to fisheries as well as abundance, productivity, distribution, and composition of naturally produced populations.
- Test key assumptions and adjust the Decision Rules accordingly.

Future studies to determine whether the MRS Hatchery activities are achieving program and biological objectives, consistent with the Master Plan, would occur under the Proposed Action. All terms and conditions of the existing USFWS Section 10 permit issued for bull trout for the overall YKFP MR&E program would be followed (TE-05166B-0). However, the existing USFWS Section 10 permit will expire in March 2019, which is likely prior to the initiation of MR&E activities associated with the MRS Hatchery. BPA and the Yakama Nation therefore would request consultation for future MR&E activities that are specific to the proposed MRS Hatchery until a period when a future ESA Section 7 consultation is completed for the overall YKFP fisheries program.

The Proposed Action includes the following MR&E activities associated with fish reared at the MRS Hatchery:

- Coho Spawning Surveys
- Snorkel Surveys
- Juvenile Collection at Roza, Prosser, Cowiche, and Wapatox Dams
- Tributary Juvenile Monitoring – Seining, Electrofishing, and Pit-Tagging

## 2.3 No Action Alternative

Under the No Action alternative, the proposed MRS Hatchery would not be constructed. However, the Yakama Nation would still expand juvenile release and acclimation

locations, but would not convert to complete in-basin rearing as proposed under Phase 3 of the Master Plan. The Yakama Nation would likely continue Phase 2 of the coho restoration program described in the Master Plan as currently implemented, using a combination of artificial production and habitat improvements to meet natural production and harvest goals. The goals of Phase 2 were to increase coho spawning in tributaries, phase out imported releases of coho in the Yakima Basin, and test and monitor new acclimation techniques.

Under the No Action alternative, a portion of the juvenile coho released into the Yakima River as part of the overall YKFP coho reintroduction program would continue to be reared out of basin. The release of out-of-basin juveniles is expected to result in reduced survival and adult returns and would not meet the goal of providing a self-sustaining coho run throughout its historic range (see Section 2.1).

Because the No Action alternative would continue to use out-of-basin broodstock, broodstock collection would continue to occur at Prosser Dam, supplemented with production from the Eagle Creek National Fish Hatchery, located outside of Estacada, Oregon. Summer parr plants would continue to be the primary method for increasing fish production in upper basin tributaries. These fish would continue to be released into tributaries or acclimated using ponds or a mobile acclimation system.

Summer parr plants and adult coho plants have been used to increase fish abundance in multiple tributaries. In addition, the Yakama Nation has initiated the use of mobile acclimation sites for the release of smolts in several tributaries throughout the basin, and continued the volitional release of smolts from mainstem, permanent acclimation sites. Releases of coho smolts, which have occurred in the upper Yakima and Naches Rivers since 1997, would continue. The total number of smolts has typically ranged from 650,000 to 1,000,000 each year depending on brood success (Table 2.3-1).

**Table 2.3-1. Total Number of Hatchery-Reared Coho Smolts Released into the Yakima Basin, 1997-2016**

| Brood year | Total Release[a] | Brood year | Total Release[a] |
|---|---|---|---|
| 1997 | 1,467,000 | 2007 | 1,018,293 |
| 1998 | 1,004,394 | 2008 | 899,172 |
| 1999 | 928,190 | 2009 | 980,053 |
| 2000 | 567,563 | 2010 | 765,838 |
| 2001 | 620,818 | 2011 | 1,022,269 |
| 2002 | 810,002 | 2012 | 822,390 |
| 2003 | 604,701 | 2013 | 966,392 |
| 2004 | 654,872 | 2014 | 865,798 |
| 2005 | 942,911 | 2015 | 1,093,591 |
| 2006 | 1,024,499 | 2016 | 974,561 |

[a] Smolts have comprised the majority of releases.
Source: Yakama Nation, unpublished data (Newsome 2016a)

Release of coho parr, which the Yakama Nation began in 2007, would continue under the No Action alternative, likely increasing in number in tributaries. On average, the Yakama Nation has released about 27,000 parr annually into numerous tributaries of the Yakima Basin, including Nile Creek, North Fork Little Naches River, Little Naches River, South Fork Cowiche Creek, Rattlesnake Creek, Quartz Creek, Big Creek, Reecer Creek, Hundley Creek, and Wilson Creek.

## 2.4 Alternatives Considered but Eliminated from Detailed Study

No additional alternatives were identified for consideration during scoping for this EIS.

A couple of options to the MRS Hatchery were identified during the early development of the Yakama Nation's Master Plan. These options were not carried through Master Plan development as they either did not meet legal requirements, failed to achieve biological objectives, or were inconsistent with study findings from Phase 1 and Phase 2 of the Yakima coho program. The options identified included the following:

- **Eliminate Hatchery Production and Improve Habitat** – Under this option, production of hatchery coho would be eliminated and actions would be implemented in the Yakima Basin to increase habitat quantity. This option was eliminated as it would rely on adult stray coho from other basins or hatchery programs, and would not achieve the long-term objective of creating sustainable runs of coho.
- **Implement a One Million Smolt Segregated Program at Prosser** – Under this option, the Yakama Nation would produce one million smolts at the Prosser Hatchery and would release smolts below Prosser Dam. This option was eliminated as it would not achieve long-term conservation objectives of restoring natural production to the Naches and Upper Yakima Rivers, and it would require substantial capital improvements to the existing facilities at Prosser Hatchery.

## 2.5 Comparison of the Alternatives

Table 2.5-1 compares the project alternatives by the project purposes identified in Chapter 1. Table 2.5-2 summarizes and compares the potential environmental consequences of the alternatives. See Chapter 3 for a full discussion of environmental consequences.

## Table 2.5-1. Comparison of Alternatives by Project Purposes

| Purposes of Action | Proposed Action | No Action Alternative |
|---|---|---|
| **Support efforts to mitigate for effects of the development and operation of the Federal Columbia River Power System on fish and wildlife in the mainstem Columbia River and its tributaries under the Northwest Power Act.** | Would support mitigation efforts for coho in the Yakima Basin, using locally-adapted broodstock, in compliance with HSRG principles. Over time, use of out-of-basin broodstock would be phased out entirely. | Would support mitigation efforts for coho in the Yakima Basin, using both locally-adapted and out-of-basin broodstock. |
| **Assist in carrying out commitments related to proposed hatchery actions that are contained in the 2008 Fish Accords with the Yakama Nation and others.** | The 2008 Fish Accords identify funding a Yakama Nation coho program. BPA funding for the Proposed Action would meet the commitments made to the Yakama Nation in the 2008 Fish Accords. | Would not further the commitments made in the 2008 Fish Accords. |
| **Implement BPA's Fish and Wildlife Implementation Plan Environmental Impact Statement and Record of Decision policy direction, which calls for protecting weak stocks while sustaining overall populations for fish for their economic and cultural value.** | Would reintroduce a naturally spawning population of coho in the Yakima Basin. | Would not support an increase in naturally spawning coho in the Yakima Basin. |
| **Minimize harm to natural and human resources, including species listed under the ESA.** | A number of minimization measures or construction techniques would be employed to minimize effects on natural and human resources and listed species and designated critical habitat. (See Table 2.5-2for a summary of environmental impacts.) | No change to current practices. (See Table 2.5-2 for a summary of environmental impacts.) |

## Table 2.5-2. Summary of Impacts for the Proposed Action and No Action Alternative

| Potentially Affected Resource | Proposed Action | No Action Alternative |
|---|---|---|
| **Land Use and Recreation Section 3.1** | Construction-related impacts (e.g., noise, dust, traffic) at the MRS Hatchery site would mostly only be noticeable within the immediate project site and are not expected to interfere with adjacent and surrounding land uses. Impacts to potential users of the John Wayne Pioneer Trail would be limited to a short segment of the trail and construction activities would not preclude continued use of the trail in a safe manner. The project would be consistent with county plans and zoning.<br>Operation of the MRS Hatchery and activities at acclimation and release sites are not expected to interfere with adjacent and surrounding land uses and recreation. | Current land uses in the study area would continue under the No Action alternative. No new facilities would be constructed and disruptions to adjacent properties, recreational sites, and land uses would not occur. As with the Proposed Action, the acclimation and release sites are not expected to interfere with adjacent and surrounding land uses and recreation. |
| **Transportation Section 3.2** | Project-related traffic would utilize major highways (I-90 and US 97) to the maximum extent possible and would have a low impact on transportation and traffic around the Holmes Ranch property. Construction traffic approaching the hatchery site on SR 10 and Klocke Road would likely be noticeable on these low volume roads.<br>Long-term operation of the project would result in low, localized traffic impacts due to increased traffic associated with the new residences and additional employees at the MRS Hatchery, and traffic to setup and monitor the acclimation and release sites. | No change in traffic patterns or volumes would result from the No Action alternative. |
| **Geology and Soils Section 3.3** | Site preparation and other construction activities at the MRS Hatchery site would result in approximately 8.3 acres of soil disturbance, temporarily increasing the potential for erosion. Erosion and sedimentation impacts would be minimized by using BMPs, and exposed soils would be revegetated or stabilized with gravel following construction.<br>MRS Hatchery operation would permanently replace some of the existing soils with base course or fill. In general, existing slopes and drainage patterns of undisturbed soils would remain intact and erosion and sedimentation would not increase as a result of the project. Operational activities at acclimation and release sites are not expected to affect geology and soils. | The No Action alternative would have no impacts on soils or geologic resources. |
| **Vegetation Section 3.4** | Construction activities at the MRS Hatchery site would temporarily impact up to 4.6 acres of vegetation and would permanently remove up to 3.7 acres of pasture and grassland. Areas temporarily disturbed would be revegetated with native species after construction.<br>Impacts to vegetation communities would be low because hatchery operations would not require substantial vegetation maintenance on the MRS Hatchery grounds, access roads, or in the New Cascade Canal.<br>Acclimation and release activities at other sites within the basin would have no long-term impacts and would result in low to no impacts to vegetation. Any vegetation removal required for mobile acclimation units would be minimal and temporary. | No new construction would occur and no vegetation would be removed at the Holmes Ranch property. Any vegetation removal required for mobile acclimation units would be minimal and temporary. |

## Table 2.5-2. Summary of Impacts for the Proposed Action and No Action Alternative

| Potentially Affected Resource | Proposed Action | No Action Alternative |
|---|---|---|
| **Water Resources Section 3.5** | Some in-water work would be required for construction of the MRS Hatchery and low water quality impacts may occur during in-water work. Erosion and transport of pollutants from hatchery construction to surface waters and groundwater is expected to be minimized through erosion control and construction BMPs.<br>Groundwater pumping during hatchery operations is expected to cause local aquifer drawdown, especially during the months of November and December. However, the impacts would be localized and recovery would be rapid. Impacts to surface water hydrology are expected to be low; surface water diversion flows would be low relative to the total flow in the source stream. In addition, surface water use would be non-consumptive. Water quality impacts are expected to be low or avoided because effluent would be treated prior to discharge to meet the conditions of the NPDES General Permit (Ecology 2015).<br>Surface water diversions for mobile acclimation sites would not cause dewatering of any reaches and changes to stream flow and water quality would likely be low. Water quality may be slightly affected by the discharge of fish wastes from mobile acclimation units; however, NPDES permits would not be needed for these sites because rearing levels would be well below permit minimums and the duration would be only 4-6 weeks. | Surface or groundwater resources would not be modified as a result of the No Action alternative. Continued use of existing acclimation and release sites and the implementation of the new sites would have low to no impact on water quantity and quality. |
| **Wetlands and Floodplains Section 3.6** | Potential short-term construction impacts to wetlands on the MRS Hatchery site include erosion, human disturbance, sedimentation, or accidental fuel and oil leaks related to construction. The majority of these impacts would be prevented with appropriate BMPs.<br>Discharge water would be treated to meet the requirements of the NPDES General Permit (Ecology 2015) and would not impact wetland water quality.<br>Acclimation and release activities would have low to no impacts to wetlands. The mobile acclimation facilities may be located within the 100-year floodplain and the Yakama Nation would coordinate with the local floodplain administrator (Kittitas County) to minimize impacts from the acclimation and release activities. The impact of the Proposed Action on floodplains would be low. | No new construction would occur at the Holmes Ranch property. Current conditions of wetlands and floodplains would continue. As with the Proposed Action, acclimation and release activities would have low to no impacts to wetlands and low impacts to floodplains. |

## Table 2.5-2. Summary of Impacts for the Proposed Action and No Action Alternative

| Potentially Affected Resource | Proposed Action | No Action Alternative |
|---|---|---|
| **Fish Section 3.7** | Construction impacts on fish or their habitat are anticipated to be localized to the hatchery site and short term. In-water construction may temporarily alter water quality, disturb or displace individuals, or temporarily reduce the amount of available habitat. However, the area impacted for MRS Hatchery construction would be small (less than about 100 linear feet of surface waters) and provides low quality habitat; therefore, impacts on fish are expected to be low. Little, if any, direct mortality is anticipated and construction-related sediment and turbidity is anticipated to be low.<br>MRS Hatchery-related construction is not likely to adversely affect ESA-listed bull trout or MCR steelhead. Construction of in-water elements for the MRS Hatchery may temporarily displace juvenile individuals from habitat.<br>Operational effects on aquatic habitat and fish species include seasonal disturbance and minor flow reductions associated with surface water diversions, and minor water quality degradation from effluent return to the respective waterbodies. Surface water diversion would not cause dewatering of any reaches, and impacts on bull trout and their critical habitat, if any, would be low to none. By complying with acceptable effluent discharge values in accordance with the 2015 Upland Fin-Fish Hatching and Rearing NPDES General Permit (Ecology 2015), the impact of effluent on receiving waters, the aquatic environment, and fish is expected to be low. Water quality changes due to discharges from the facilities could disrupt the behavior and distribution of individual fish immediately adjacent to and downstream of the outfall structure, but the overall impact is expected to be low. Off-site operations, including adult and juvenile coho releases throughout the Yakima Subbasin, are expected to have low impacts on bull trout. | Development of a locally-derived, naturally-sustaining in-basin coho population using an integrated facility would not be achieved.<br>Impacts on nontarget fish species from continuing coho reintroduction activities of the YKFP (e.g., ecological interactions from juvenile releases, MR&E activities) would remain at current levels. |
| **Wildlife Section 3.8** | There are no ESA-listed terrestrial wildlife species or potential suitable habitat for such species in the MRS Hatchery property. Wildlife species typically occurring in the area would likely avoid the hatchery site during construction, although less mobile species could potentially experience mortality. Accidental fuel and oil leaks during construction could also create short-term, local, and low impacts on wildlife.<br>Permanent removal of up to 3.7 acres of vegetated habitat could create long-term, moderate impacts on species that currently use the area. Project operations would result in increases in daily human activity and noise that could impact the ability of local wildlife to forage, roost, or nest. Mitigation measures would be implemented to minimize the impacts of construction and operation on wildlife.<br>For most wildlife species, suitable habitat for breeding, rearing, and foraging would remain available at the proposed site for the MRS Hatchery and acclimation sites. The overall impact on wildlife would be low. | Habitats at the hatchery site would not be altered, and existing human disturbance would continue. Species adapted to current conditions at the hatchery site and acclimation sites would continue to use them. The use of new acclimation and release sites would have a low impact to wildlife. |

## Table 2.5-2. Summary of Impacts for the Proposed Action and No Action Alternative

| Potentially Affected Resource | Proposed Action | No Action Alternative |
|---|---|---|
| **Cultural Resources Section 3.9** | One known cultural resource would be permanently removed during construction (the existing residential structure), and temporary visual impacts to the Chicago-Milwaukee-St. Paul-Pacific Railroad line, which is now the John Wayne Pioneer Trail, would occur during construction of the MRS Hatchery. Additionally, the Holmes Ranch property is in an area of high potential for archaeological resources and impacts on yet-to-be-discovered cultural resources could occur. A preconstruction survey would be required and other mitigation measures would be implemented to minimize impacts.<br>Construction and operation of the MRS Hatchery would have a low impact on cultural resources as the area would be surveyed before project construction and any impacts to the resources would be previously determined and mitigated as needed. | No ground disturbance or removal of cultural resources would occur at the Holmes Ranch property. The use of new mobile acclimation and release sites would not result in any ground disturbance. |
| **Socioeconomics and Environmental Justice Section 3.10** | Construction of the MRS Hatchery would result in a direct short-term beneficial impact on employment in the region through employment of approximately 30 people for a period of 16.5 months, and their indirect spending in the area.<br>Hiring of permanent hatchery workers would have a low beneficial impact on the regional economy and the Yakama Nation.<br>The availability of fisheries resources for local populations and tribal members would ultimately increase, resulting in long-term beneficial impacts to subsistence fisheries.<br>Construction and operation of the Proposed Action would not have significant environmental impacts that would be disproportionately borne by minority or low income populations. | Economic conditions and opportunities in the region would not change as a result of the No Action alternative. |
| **Air Quality and Climate Change Section 3.11** | Construction effects on air quality are expected to be low, short term, local, and would cease when construction is complete.<br>Operational emissions resulting from additional employee and delivery trips and potential use of an emergency power generator would be low and would not significantly reduce the air quality of the surrounding region. Air emissions resulting from additional truck trips and generators at acclimation sites would not reduce the air quality of the surrounding region. | There would be no change in air quality and no change to GHG emissions as a result of this alternative. |
| **Visual Resources Section 3.12** | Construction equipment and personnel would be temporarily visible by motorists on Klocke Road and users of the John Wayne Pioneer Trail.<br>New structures associated with the MRS Hatchery and hatchery operation would be visible intermittently and for a short period of time by users of the John Wayne Pioneer Trail and motorists on Klocke Road. Although the new structures would be periodically obscured by a partial vegetation screen, the changes in existing views represent a long-term moderate impact to visual resources. Acclimation structures are not expected to create noticeable visual obstructions; their presence would create annual short-term low impacts. | Existing views and viewer groups would not experience a change in visual resources. Existing and new acclimation and release sites under the YKFP would be used and would create annual short-term low impacts. |

## Table 2.5-2. Summary of Impacts for the Proposed Action and No Action Alternative

| Potentially Affected Resource | Proposed Action | No Action Alternative |
|---|---|---|
| **Noise, Hazardous Waste, Public Health, and Safety Section 3.13** | Construction at the MRS Hatchery site would cause moderate short-term noise impacts in areas directly adjacent to construction activity. Noise generated during operation is not expected to generate noise levels that would exceed thresholds for nearby receptors. Hazardous materials storage would be limited on-site and consist of designated, enclosed storage areas with full secondary containment provided. During construction, the potential for other public health and safety impacts (e.g., air emissions, hazardous material release) are expected to be short-term, localized, and low.<br>Operational impacts to public health and safety at the hatchery and acclimation sites would be low. | Existing noise levels would continue. Chemicals would not be used and the use of new and existing acclimation and release sites would not generate hazardous waste or materials. Public health and safety impacts would continue to be low. |

# 3 Affected Environment, Environmental Consequences, and Mitigation Measures

This chapter includes an analysis of the potential impacts of the Proposed Action and the No Action alternative on the human and natural environment. Each section of this chapter includes a description of the affected environment for a specific resource, an analysis of the impacts on that resource, including cumulative impacts, and a list of mitigation measures that would help lessen or avoid impacts.

## 3.1 Land Use and Recreation

### 3.1.1 Affected Environment

The study area for land use and recreation includes the Holmes Ranch Property and surrounding properties within one half mile of the property site. This distance represents a reasonable maximum distance within which project-related noise, air quality, and traffic impacts could cause disturbance to land uses or recreational users. The study area also includes properties that share a common source of water as the proposed project. The acclimation and release sites for coho from the MRS hatchery are also included in the study area. The project study area is predominantly in Kittitas County; however, some release sites are located in Yakima County, Washington.

Land use is characterized by land ownership, functional land use classifications (e.g., agricultural, commercial, residential), county zoning, and comprehensive plan designations, as well as local, state, or regional land use planning documents that establish long-term development goals and policies. Recreational resources in the project area include public spaces that are used for recreational activities such as hiking, biking, swimming, fishing, and/or boating.

#### 3.1.1.1 Land Ownership

The Yakama Nation Land Enterprise owns the 50-acre Holmes Ranch Property where the project site for the MRS Hatchery is located. Surrounding properties within the study area are in private ownership or owned by the Yakama Nation, BPA, Burlington Northern Santa Fe railroad, WDFW, Washington Department of Transportation (WSDOT), and Kittitas County.

#### 3.1.1.2 Land Use Types

Land use types were identified throughout the study area using the USGS National Land Cover Database (NLCD) (USGS 2011). Land use types in the project study area include pastureland, cropland, forestland, wetland, herbaceous and shrub land, and developed areas, including rural residential, rights-of-way, and recreation areas. The current land use types on the Holmes Ranch property include agricultural, forestland, wetland, and developed areas. In addition, a portion of the Holmes Ranch property is covered by a conservation easement, which can only be used for salmon recovery or salmon enhancement. The conservation easement exists because the Salmon Recovery Board

provided financial assistance to the Yakama Nation for purchase of the property; the conservation easement was included as a condition for financial assistance. Figure 3.1-1 shows land use within the study area.

#### 3.1.1.2.1 Agriculture

In Kittitas County, the main crops are hay, grain, and vegetables. Additionally, livestock is a main agricultural commodity. About half of the hatchery site that would be developed is classified by the Natural Resource Conservation Council (NRCS) as prime farmland or farmland of statewide importance, as defined under the Farmland Protection Policy Act (7 USC 4201 *et seq*.). These farmland classifications indicate that about half of the hatchery development area has physical and chemical properties that are suitable and conducive to farming. For more information on soils that comprise prime farmland see section 3.3.2.2 in Geology and Soils.

#### 3.1.1.2.2 Forestland, Wetland, Herbaceous, and Shrub Land

Vegetated areas near the hatchery site consist of forestland, wetlands, and herbaceous and shrub land. Specific habitat types observed within the immediate project site include ponderosa pine forest, willow-dominated riparian habitat, Aspen groves, woody wetlands, and emergent wetlands. The acclimation sites have primarily herbaceous and shrub cover.

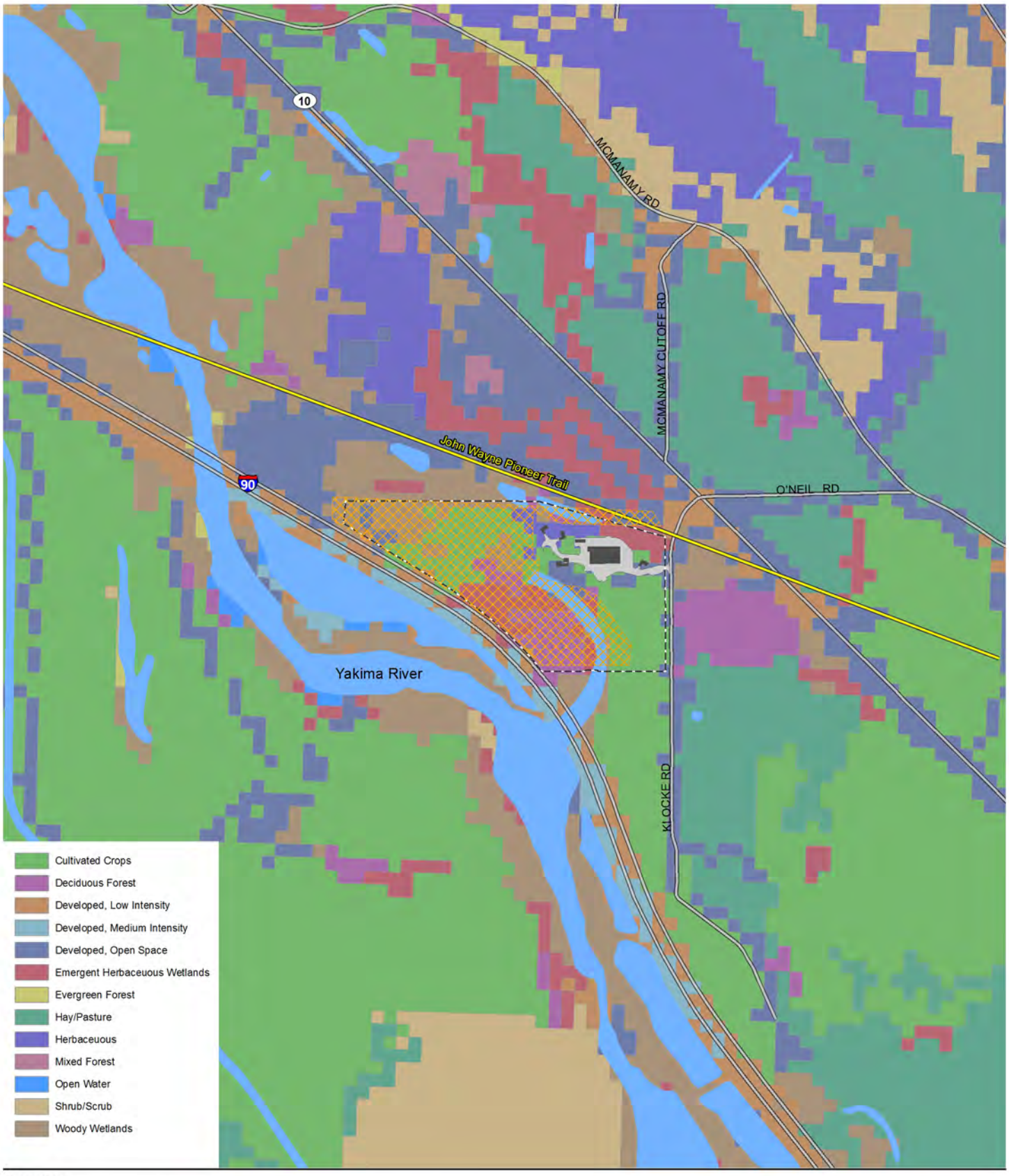
#### 3.1.1.2.3 Developed

Developed land near the Holmes Ranch property includes rural residential, transportation right-of-way, and recreation.

Rural residential properties are concentrated along Klocke Road, Oneil Road, and McManamy Road.

Right-of-way uses include a Burlington Northen Santa Fe railroad corridor, WSDOT highways and properties, and Kittitas County roads and properties.

Designated recreational land includes the John Wayne Pioneer Trail and Yakima River, which are further described below.




**LEGEND**

- Holmes Ranch Property
- Proposed Building
- Proposed Paved Area
- Conservation Easement
- Road
- John Wayne Pioneer Trail

**DATA SOURCE:** (Source: WSDOT 2016, NLCD 2016, ESRI 2016

Bonneville POWER ADMINISTRATION

N

0 1,000 2,000 Feet

# USGS NATIONAL LAND COVER DATABASE – LAND USE

**FIGURE 3.1-1**

#### 3.1.1.3 Zoning

The hatchery site is zoned Agriculture 20 (A-20 per the Kittitas County Zoning Ordinance (KCC Title 17; 2016b)). The intent of this zoning classification is to preserve fertile farmland from encroachment by nonagricultural land uses, and protect the rights and traditions of those engaged in agriculture (KCC Section 17.29.010; 2016b). A-20 is Resource land, which allows resource-based industries, including but not limited to recreation-related tourism, agriculture, fisheries, forestry, and mining. Properties surrounding the hatchery site are zoned A-20, with the exception of an adjacent parcel, which is zoned Agriculture 5 (A-5).

The Yakima River is considered a shoreline of the state, as defined under the Washington State Shoreline Management Act (RCW 90.58) and its associated rules (Washington Administrative Code (WAC) 173-18) and as designated under the Kittitas County Shoreline Master Program (Kittitas County 2016a). The shoreline and upland areas within 200 feet of the Yakima River's ordinary high water mark are also included in the shoreline jurisdiction. Shoreline types in the area include Rural Conservancy and Aquatic shorelines. Shoreline uses are regulated under the Kittitas County Shoreline Master Program (Kittitas County 2016a) and are generally limited to water-dependent uses that do not result in a loss of shoreline ecological functions and are substantially consistent with the Shoreline Master Program (SMP). Under the Kittitas County SMP (2016a), aquaculture is an allowed use in the shoreline area. The Holmes Ranch property includes land within the shoreline jurisdiction of Kittitas County (SMP Chapter 1.2).

#### 3.1.1.4 Comprehensive Plan Designation

Most properties around the Holmes Ranch property are designated Rural Working under Kittitas County's Comprehensive Plan (2016c), which generally encourages farming, ranching, and storage of agriculture products, and some commercial and industrial uses compatible with rural environment and supporting agriculture and/or forest activities. The hatchery site is designated Rural Working. An adjacent parcel is designated Rural Residential and a parcel approximately 2,000 feet to the south of the hatchery site is designated Mineral Lands.

#### 3.1.1.5 Recreation

##### 3.1.1.5.1 John Wayne Pioneer Trail

The John Wayne Pioneer Trail is a National Recreational Trail that is approximately 285 miles long, following a former rail line from the western slopes of the Cascade Mountains to the Idaho border. Horseback riders, bicyclists, and hikers use the western part of the trail that extends eastward from the Cascade Mountain foothills, through tunnels underneath Snoqualmie Pass, and along the banks of the Columbia River. West of the Columbia River, the trail is developed with amenities such as trailhead parking, signage, and restrooms, and the trail itself is maintained to a smooth surface. The trail continues east of the Columbia River but with minimal amenities and lesser use. The portion of the trail that crosses through the project study area occurs in the western segment, between mile points 71 and 72.

#### 3.1.1.5.2 Yakima River and Tributaries

Recreational activities along the Yakima River include fishing, boating, swimming, camping, picnicking, wildlife viewing, scenic viewing, hiking, biking, and horseback riding. Designated recreational sites are concentrated southeast of the study area between Ellensburg and Yakima in the Yakima River Canyon, and in forested areas northwest of the study area. The study area occurs in what is known as the “farmlands stretch” of the river, which extends from Thorp to the Yakima River Canyon and flows through mostly private lands. This section is considered dangerous for floating due to the Yakima running high in the summer and strainers, side channels, and a spillover dam. A historic, low-gradient side channel of the Yakima River is located within the hatchery site.

## 3.1.2 Environmental Consequences of Proposed Action

### 3.1.2.1 MRS Hatchery Construction

Development of the proposed project would add a new resource-based land use (a hatchery) to the hatchery site and would expand the area of residential land uses. While construction of hatchery facilities is an allowed use within the A-20 zoning district, development of the hatchery would require a Conditional Use Permit and Floodplain Permit from the County. Construction of facilities within the shoreline jurisdiction would require a Shoreline Substantial Development Permit under the Kittitas County Shoreline Master Plan. Because the impact would be limited to the hatchery site and the project would be consistent with county plans and zoning, this would be considered a low impact to land use. Construction activities associated with the proposed project would not change land use or zoning.

Construction of the hatchery would result in short-term increases in truck traffic, air emissions, and noise (see Sections 3.2, 3.11, 3.13). However, these impacts would be temporary, intermittent, and would mostly only be noticeable within the immediate hatchery site. Therefore, construction impacts would be low on adjacent and surrounding land uses.

Construction activities would cause short-term impacts to recreational users on the John Wayne Pioneer Trail. During construction, potential trail users could experience increased noise, traffic, and air emissions as they pass along the northern project boundary. In addition, views in this area would be affected by the presence of construction equipment and personnel. However, impacts to potential trail users would be limited to a short segment of the trail and construction activities would not preclude continued use of the trail in a safe manner. The trail crosses over Klocke Rd (a main construction entrance) via a pedestrian bridge; therefore, trail users would not be required to encounter road crossings with high levels of construction traffic.

### 3.1.2.2 MRS Hatchery Operation and Maintenance

The proposed development at the hatchery site is an allowed use under the Kittitas County Zoning Ordinance. Land use at the site would be a mix of resource-based and residential. Because both residential and resource-based uses are approved in areas zoned as A-20, the area would not need to be rezoned.

Development of the hatchery site would result in permanent impacts to approximately 4 acres of farmland soils. However, when considered at the county scale, the magnitude of this impact is low, representing less than 0.001 percent decrease in the amount of farmland soils available in the county. See Section 3.3.2.2 for additional information on impacts to agricultural soils.

Operation of the hatchery would be low impact in terms of truck traffic, air emissions, and noise and is therefore expected to have a low impact on adjacent and surrounding land uses (see Sections 3.2, 3.11, and 3.13).

The only operational impacts to recreational users on the John Wayne Pioneer Trail relate to visual resources (see Section 3.12). The MRS Hatchery would impact views along the portion of trail that is adjacent to the hatchery site; however, the number of visible structures and duration of visibility would depend on the viewer's location and the extent of vegetative screening. New structures would be intermittently visible to trail users, and for only a short period of time as they pass along the northern project boundary (approximately 1,600 feet).

#### 3.1.2.3 Acclimation and Release

Acclimation and release sites would be located on either private or Forest Service lands, with approval from the applicable landowner. Sites would be chosen where acclimation and release structures and operations would be compatible with existing land uses and zoning designations and would not require zone changes or conditional use permits. The acclimation and release sites would be low impact in terms of truck traffic, air emissions, and noise and therefore would have a low impact on adjacent and surrounding land uses or recreational sites and users (see Sections 3.2, 3.11, and 3.13).

#### 3.1.2.4 Cumulative Effects

Based on development trends in Kittitas County, current land use in the study area is not expected to change significantly over the next 50 years. There are no major commercial or residential developments planned in Kittitas County in the foreseeable future. In addition, there are no transportation or recreational projects planned within the study area in the foreseeable future. The proposed project would result in the development of the hatchery site, but would not convert existing zoning designations or preclude existing land uses from continuing on adjacent and surrounding properties. Therefore, the incremental impact of the project to past, present, and reasonably foreseeable future land use and recreation impacts would be low.

#### 3.1.2.5 Mitigation Measures

Because of the low magnitude of impacts on land use and recreation, no mitigation measures are recommended.

### 3.1.3 Environmental Consequences of No Action Alternative

Current land uses in the study area would remain under the No Action alternative. No new facilities would be constructed and temporary disruptions to adjacent properties, recreational sites and activities, and land uses would not occur. Under the No Action alternative, the three new acclimation and release sites as part of the YKFP would be

used and use of current acclimation and release sites would continue. As with the Proposed Action, the acclimation and release sites would be low impact in terms of truck traffic, air emissions, and noise and therefore would have a low impact on adjacent and surrounding land uses or recreational sites and users.

# 3.2 Transportation

## 3.2.1 Affected Environment

The study area for transportation includes the road network surrounding the hatchery site, as well as the roads used to access acclimation sites. Roads and highways that are currently used to access the hatchery site include I-90, U.S. Highway 97 (US 97), State Route 10 (SR 10) and Klocke Road. Acclimation and release sites are located on private and public lands accessed primarily by low volume state local roads.

I-90, located south of the hatchery site, is a 4-lane, divided paved highway with a speed limit of 70 mph. This Interstate highway travels through the cities of Spokane, Vantage, and Seattle in the State of Washington. The highway is owned and maintained by WSDOT. Average daily traffic volume on I-90 near the project (milepost [MP] 101 to 106) was 28,000 vehicles in 2015 (WSDOT 2015).

US 97, located north of the project, is a 2-lane undivided paved road with a speed limit of 65 mph. US 97 begins in north-central California and ends in north-central Washington, traveling though the cities of Yakima, Ellensburg, and Wenatchee in the State of Washington. The highway is owned and maintained by WSDOT. Average daily traffic volumes on US 97 near the project (MP 136 to 137) was 2,600 vehicles in 2015 (WSDOT 2015).

SR 10, located north of the hatchery site, is a two-lane, undivided paved road with a speed limit of 55 mph. SR 10 is owned by WSDOT and maintained by Kittitas County. It begins north of Ellensburg (south of the hatchery site) and continues approximately 20 miles north until it terminates just south of the city of Cle Elum. The route generally runs parallel to US 97. Average daily traffic volume on SR 10 near Klocke Road (MP 103 to 105) was 1,300 vehicles in 2015 (WSDOT 2015).

Klocke Road is a two-lane undivided paved road with a speed limit of 25 mph. The road, which would serve as the main access for the hatchery site, runs along the eastern boundary of the Holmes Ranch property and terminates at the intersection with SR 10. The road dead ends in a rural residential neighborhood and is therefore only used by residents to access their homes. The road is owned and maintained by Kittitas County Public Works. The road currently has no existing maintenance or operational issues. Average daily traffic on Klocke Road was 211 vehicles in 2015 (Kittitas County Public Works 2016).

## 3.2.2 Environmental Consequences of Proposed Action

### 3.2.2.1 MRS Hatchery Construction

Construction would cause a short-term (16.5 month) increase in local traffic due to employees, material delivery trucks, and dump trucks traveling to and from the hatchery site every day. The total number of vehicle round-trips during construction would range

from a minimum of 20 per day to a maximum of 60 per day. This construction traffic would have a low impact on transportation and traffic in the study area because it would be of short duration and would involve short segments of local and regional roads. Most construction traffic arriving at the site would approach from I-90 using Exit 106 and turning onto US 97. The route would be approximately 2.5 miles on US 97, then approximately 1 mile on SR 10 to Klocke Road. The hatchery site is approximately 0.1 mile south on Klocke Road from the SR 10/Klocke Road intersection. The increased traffic would be relatively unnoticeable by local residents and travelers on I-90 and US 97 and major traffic delays or road closures are not anticipated on these highways.

Daily construction traffic on SR 10 and Klocke Road would likely be noticeable to other travelers on that road because trucks would be slowing to turn into the construction site where there is currently minimal traffic. Construction workers would likely access the site in the morning and depart in the evening, limiting the presence of most construction vehicles on SR 10 and Klocke Road to two short periods during work days. Other travelers on the road would likely adjust to the presence of construction-related vehicles by timing trips accordingly or adjusting to short delays. Although existing users may experience delays, depending on whether or not their timing of use coincides with that of construction vehicles, the use of Klocke Road during construction is not expected to result in roadway maintenance, safety, or operational issues.

Construction of the proposed access road off of Klocke Road would involve work activities within, or connected to, Kittitas County right-of-way, and would therefore require an access permit from Kittitas County Public Works Department. Work activities would need to comply with Kittitas County road standards and access permit conditions.

#### 3.2.2.2 MRS Hatchery Operation and Maintenance

Long-term operation of the project would result in low localized traffic impacts due to increased traffic associated with the new residences and additional employees at the hatchery. Residents, employees, and delivery trucks are estimated to generate between 7 and 10 vehicle trips per day during operation of the hatchery. However, roads in the project area would remain unchanged and traffic would not noticeably increase as a result of the project. There would be no transportation impacts detectable at the regional (Kittitas County) level and no impacts to regional transportation facilities in the study area would be anticipated.

#### 3.2.2.3 Acclimation and Release

Trucks would be used to transport parr and smolts to various acclimation and release sites throughout the upper Yakima and Naches River basins. Approximately one truck per day would travel from the hatchery to the acclimation and release sites between late-February and mid-April. The infrequent and low numbers of vehicle trips to acclimation sites would not result in noticeable traffic increases at the local or regional levels. Impacts to existing transportation facilities are not anticipated.

#### 3.2.2.4 Cumulative Effects

Only one transportation improvement project was identified as currently occurring within the study area road network (WSDOT 2016): WSDOT's US 97/Old Highway 10 Railroad

Crossing Improvements Project. This project proposes to upgrade existing signals with LEDs and install illumination. The project is located approximately 0.8 mile southeast of the hatchery site. Construction began in 2016 and will continue through 2017.

In addition, there are other future transportation improvement projects that are planned for construction between 2016 and 2018 that would affect roads that traverse the study area (WSDOT 2016):

- **US 97/Dolarway Intersection Improvements (WSDOT).** Located approximately 3 miles southeast of the hatchery site, this project would provide several intersection improvements, including a new roundabout at the US 97/Dolarway intersection, adding a right turn lane to the westbound I-90 off ramp, and adding a lane on northbound US 97 between the I-90 off ramp and Dolarway. Construction is planned for 2017.
- **SR 10/SR 970 to US 97 Chip Seal (WSDOT).** This project proposes to chip seal the road along this approximately 16-mile segment, including the segment that would be used by project-related traffic, to repair normal wear and tear and extend the life of the pavement. Construction is planned for 2017.
- **I-90/Thorp Highway Interchange Paving (WSDOT).** This project, located approximately 1.5 miles northwest of the hatchery site, proposes to repave the roadway to repair normal wear and tear. Construction is planned for 2018.
- **McManamy Road Bridge Replacement over Dry Creek (Kittitas County).** This project proposes to replace the McManamy Bridge over Dry Creek. The project is located approximately 0.6 mile east of the hatchery site and construction is planned for 2018.
- **I-90/Yakima River Bridge Deck Rehabilitation West of Ellensburg WB/EB (WSDOT).** This project proposes to repair and resurface the existing bridge deck for the I-90 Bridge over Yakima River. The project is located approximately 0.4 mile west of the hatchery site and construction is generally planned to begin between 2018 and 2020.
- **I-90/US 97 Interchange Paving (WSDOT).** This project proposes to repave the roadway to repair normal wear and tear. Construction is planned for 2018.

Construction of the hatchery is expected to begin in 2017 and would last approximately 16.5 months; therefore, construction schedules for the Proposed Action and the projects listed above could potentially overlap. Having multiple construction projects occurring simultaneously within a short distance of each other could potentially result in cumulative traffic impacts. However, WSDOT and Kittitas County Public Works would be notified by the construction contractor in advance to determine if construction schedules would overlap, and if so, efforts to avoid and minimize traffic impacts would be coordinated with the agencies. Potential solutions might include shifting construction schedules to accommodate one another, or changing planned access routes to construction sites to distribute the construction traffic and prevent congestion on main roads.

Long-term operation of the project would not result in noticeable increases in traffic to and from the site, and continued rural development in the study area is expected to have a minimal impact on transportation and traffic given the low housing and population densities that are characteristic of rural areas. There are no reasonably foreseeable actions that, when combined with the proposed project's operations, would contribute to

a cumulative adverse effect on transportation in the study area. Therefore, the impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions would be low.

#### 3.2.2.5 Mitigation Measures

The following mitigation measure would be implemented to avoid or minimize impacts to transportation during construction at the hatchery site:

Employ traffic control flaggers and post signs warning of construction activity and merging traffic, when necessary for interruptions of traffic.

### 3.2.3 Environmental Consequences of No Action Alternative

Under the No Action Alternative, there would be no construction-related traffic and existing transportation facilities would remain unchanged. No change in traffic patterns or access for local transportation corridors is expected. Trucks would continue to be used to transport parr and smolts to various acclimation and release sites throughout the upper Yakima and Naches basins, including the three new acclimation and release sites.

## 3.3 Geology and Soils

### 3.3.1 Affected Environment

The study area for geology and soils encompasses the Holmes Ranch property and the area of soil disturbance during construction (i.e., the hatchery site), as well as the surrounding geological landscape that may influence, or indicate onsite conditions at the hatchery site and the acclimation sites.

The study area is within the Columbia Basin geologic province, near its western boundary. The Columbia Basin province is an arid, lowland area characterized by steep river canyons, extensive plateaus, and in places, tall and sinuous ridges (WDNR 2016a). The land surface is covered by loess, which consists of fine sediments deposited by the wind, and deposits from cataclysmic glacial floods that occurred 14,000 to 1 million years ago. These deposits are underlain by thousands of feet of Columbia River Basalt Group, which was formed by lava flows between 6 and 16 million years ago. These flows and most of the sediment above them have been deformed by the regional Yakima fold and thrust belt, which is a series of giant folds and faults created by compression forces in the region over the last 3 million years (WDNR 2016a). Many of the faults in the Yakima fold and thrust belt are still active today, creating an earthquake hazard for the region. The study area is located within the northern extent of the Yakima fold and thrust belt; however, the nearest faults occur more than 5 miles from the hatchery site (WDNR 2016b).

Geotechnical investigations were performed at the hatchery site in May 2016 to determine existing subsurface conditions and to inform the design of hatchery facilities (e.g., foundations, retaining walls, drainage, etc.). Results of investigations indicate a relatively thin organic topsoil layer and shallow silty- to clayey-sand strata underlain by native, alluvial sandy-gravel soils at the site (Wallace Group Inc. 2016b). Some areas

near existing building and structures have been filled with silty-sand substrate containing gravel and cobbles. Groundwater occurs at 2.5 to 5.5 feet below ground surface.

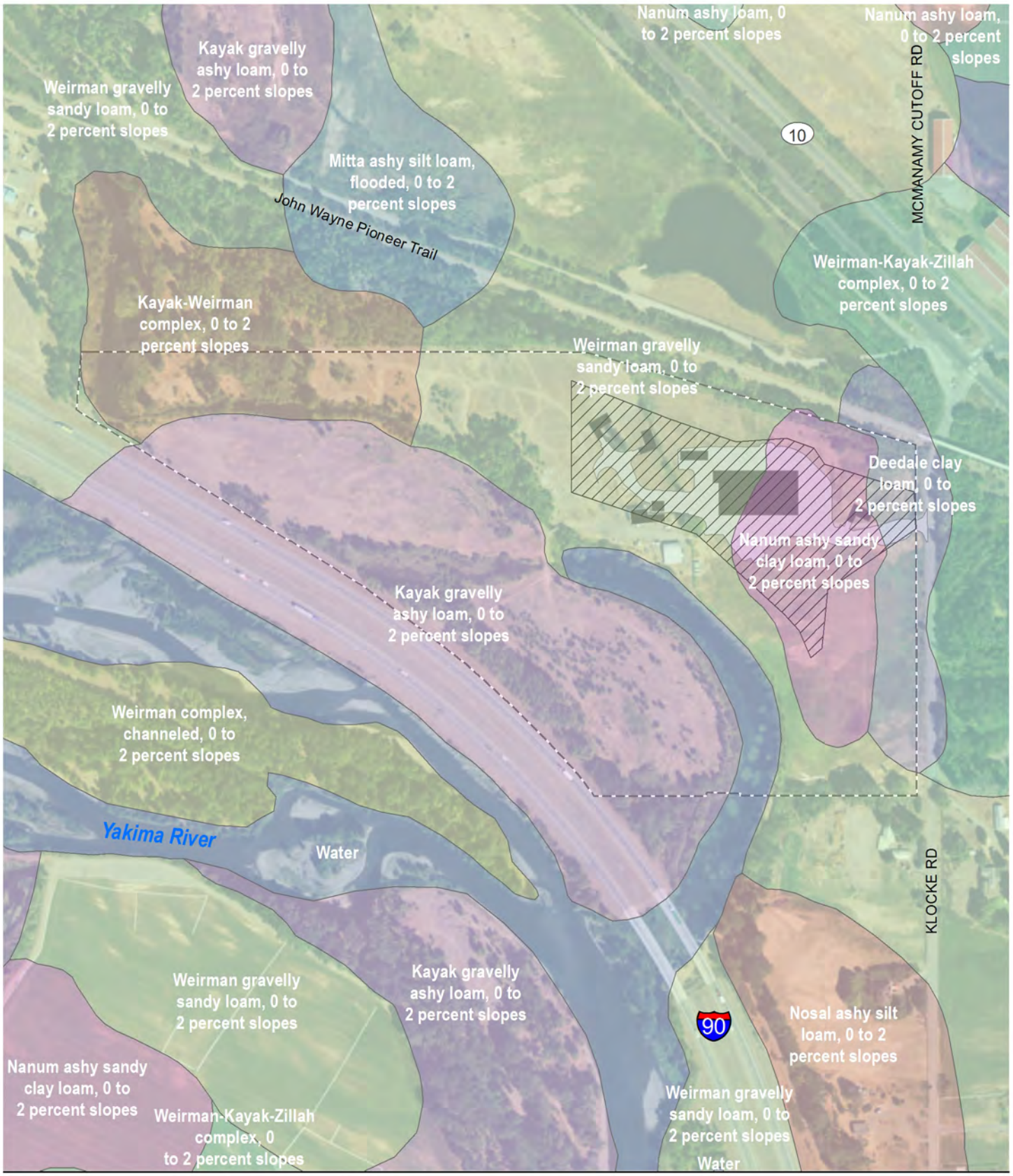
With seismic activity from the Yakima fault and thrust zone (Wallace Group Inc. 2016b), the hatchery site is mapped as having a moderate to high susceptibility for liquefaction, and a National Earthquake Hazard Reduction Program seismic rating of class D or E, which indicates softer soil conditions and an increased risk of ground shaking amplification. Similarly, Kittitas County critical area maps, which are based off Uniform Building Code seismic risk zone maps, classifies the hatchery site as a seismic category C or D, depending on the parcel, which indicates a moderate to high level of seismic risk (Kittitas County 2016b).

Because the Holmes Ranch property is located within a valley and floodplain area, the site is relatively flat (slopes less than 5 percent) and gently slopes southeast toward the Yakima River (U.S. Geological Survey [USGS] 2016; Wallace Group Inc. 2016a; 2016b). According to Kittitas County critical area maps, neither steep slopes (slopes >35 percent) or landslide hazards are mapped within the study area (Kittitas County 2013a).

NRCS mapping shows five soil types within the Holmes Ranch property (Figure 3.3-1). Only three soil types are located within the smaller “development area” shown in Figure 3.3-1, which is the area where direct soil disturbance would occur due to earth moving activities (e.g., excavation or grading) and staging of construction equipment. Characteristics of these soils are included in Table 3.3-1.

About half of the hatchery site that would be developed is classified by NRCS as prime farmland or farmland of statewide importance. NRCS defines prime farmland as land that has the best combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops. Farmland of statewide importance includes areas that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. The remainder of the hatchery site that would be developed is not classified as farmland, meaning it is not considered suitable land for farming.

NRCS mapping shows soil types at mobile acclimation and release sites to include: Patnish-Mippon-Myzel complex, 0 to 3 percent slopes (Williams Creek), Toppenish silt loam (Ahtanum Creek), and Yakima silt loam (Cowiche Creek).




**Legend**

- Holmes Ranch Property
- MRS Hatchery Development Area
- Proposed Building
- Proposed Paved Area

Soil Units

**DATA SOURCE:** Kittatis County 2016, NRCS 2016, ESRI 2016

Bonneville POWER ADMINISTRATION

N

0 100 200 Feet

## NATURAL RESOURCE CONSERVATION SERVICE SOIL TYPES

**FIGURE 3.3-1**

### Table 3.3-1. NRCS Soil Types within the Hatchery Site

| Map Unit | Acres on Hatchery site (Development Area) | Name | Surface Texture | Drainage Class | Parent Material | Erosion Hazard on Roads and Trails | Rutting Hazard | Farmland Classification [a] |
|---|---|---|---|---|---|---|---|---|
| 715 | 4.0 | Weirman gravelly sandy loam, 0 to 2 percent slopes | Gravelly sandy loam | Moderately well drained | alluvium | Slight | Moderate | Not prime farmland |
| 720 | 3.8 | Nanum ashy sandy clay loam, 0 to 2 percent slopes | Ashy sandy clay loam | Somewhat poorly drained | alluvium with an influence of volcanic ash in the upper part | Slight | Severe | Prime farmland if irrigated |
| 789 | 0.5 | Deedale clay loam, 0 to 2 percent slopes | Clay loam | Somewhat poorly drained | alluvium | Slight | Severe | Farmland of statewide importance |

[a] Soils associated with prime farmland as defined under the Farmland Protection Policy Act (7 USC 4201 et seq.) and as designated by NRCS state soil scientists as prime, important, or unique.

## 3.3.2 Environmental Consequences of Proposed Action

### 3.3.2.1 MRS Hatchery Construction

Construction of the hatchery would involve the disturbance of approximately 8.3 acres to support the development of the hatchery building, groundwater wells, access roads, holding ponds, residential facilities, a water pump, and effluent treatment systems. The permanent footprint of project elements would cover 3.7 acres of the 8.3 acres development area that would be disturbed during construction. Site preparation would require clearing and grubbing of existing vegetation and grading to create a level surface. Some existing structures, such as the existing residence, barn, and other outbuildings, would be removed or demolished.

During the construction period, soils that would be exposed, disturbed, or stockpiled could erode and lead to sedimentation in adjacent waterbodies (i.e., Yakima River and historic side channel, New Cascade Canal and Bypass) or wetlands. Vibrations from construction equipment could also cause soil movement at the site, having a low, short-term impact on soils. Erosion and sedimentation impacts would be minimized by using BMPs during the construction period, including but not limited to, the use of silt fences, stabilized construction entrances, sediment barriers, and sandbag check dams. Following construction, remaining exposed soils would be revegetated or stabilized with gravel.

The proposed hydraulic structures and piping and surface diversion structures on the New Cascade Canal would be located on medium dense to very dense sandy alluvial material, which would provide adequate subgrade support for the structures. Excavation and dewatering would be required to construct these structures, resulting in a low loss of riverbed. Erosion and sedimentation could occur in the surrounding area; however, this effect would be minimized by implementation of erosion and sediment control BMPs, including, but not limited to, use of silt fence, cofferdams, and sandbag walls. In addition, the construction contractor would be required to implement a dewatering plan that would include additional erosion and sedimentation control measures.

The study area has moderate to high seismic risk (Kittitas County 2016b); however, as noted in the geotechnical report for the project (Wallace Group Inc. 2016b), seismically-related hazards, including lateral spreading, landslides, and fault rupture are not a concern for this project. Results of the liquefaction analysis indicate that seismic-induced subsidence potential from liquefaction is generally less than ½ inch (Wallace Group Inc. 2016b). As required by the 2016 International Building Code, the hatchery has been designed to sustain the maximum considered earthquake using seismic design criteria for Site Class C areas.

Long-term effects to soils and geology would result from soil and rock excavation and removal, and placement and compaction of fill. These activities would have site-specific minor adverse impacts on soils and geology by permanently altering the natural condition of these resources through human activity. The magnitude and intensity of the effect would be minor because it would occur only within the construction disturbance area and would not directly affect geology and soils outside of that area.

#### 3.3.2.2 MRS Hatchery Operation and Maintenance

The project would not result in long-term impacts to geologic resources. In general, existing slopes and drainage patterns of undisturbed soils would remain intact and erosion and sedimentation would not increase as a result of the project. Some of the existing soils would be permanently replaced with base course, structural fill, or other types of fill.

Farmland soil types are defined under the Farmland Protection Policy Act (7 USC 4201 *et seq*.) and are designated by NRCS soil scientists to include prime farmland, unique farmland, and land of statewide or local importance. Approximately 3.8 acres of prime farmland (if irrigated and drained) and 0.5 acre of farmland of statewide importance would be disturbed during construction and 1.8 acre and 0.2 acre respectively would permanently be unavailable for agricultural use. According to NRCS Web Soil Survey data for Kittitas County, the Holmes Ranch property owned by the Yakama Nation contains 7.0 acres of prime farmland and 5.3 acres of farmland of statewide importance. Therefore, the project's permanent removal of 1.8 acres of prime farmland represents a 26 percent decrease in prime farmland on the Holmes Ranch property and removal of 0.2 acre of farmland of statewide importance represents a 4 percent decrease on the Holmes Ranch property. The county contains approximately 13,754 acres of prime farmland (if irrigated and drained) and 92,684 acres of farmland of statewide importance (NRCS 2016). On the county scale, the removal would be less than a 0.001 percent decrease in each of these categories.

Seismic hazards would remain a threat during operation of the hatchery; however, the project would not increase the project's seismic risk and all new structures would be designed to comply with the International Building Code seismic design criteria. In the event of an earthquake, some of the structures at the hatchery may withstand some damage, depending on the intensity and duration of the earthquake. The risk of fires, explosions, or hazardous material spills resulting from an earthquake would be minimal as the flammable or hazardous materials stored on-site would be limited to common place maintenance/shop materials such as motor oil, and diesel and gas for vehicles.

Hatchery workers would be made aware of the potential for seismic hazards and trained in proper earthquake response, including how to check for spills, leaks, and broken equipment in the aftermath. All equipment would be kept as far away from the shoreline area as possible, and storage areas would be fully contained to prevent the potential for spills and leaks into the Yakima River. Thus, operation and maintenance of the MRS Hatchery would have a low impact on geology and soils.

#### 3.3.2.3 Acclimation and Release

No grading and minimal vegetation removal would be required at acclimation sites to provide a level surface for mobile acclimation tanks. The short-term duration of these tanks at acclimation sites would have a low to no impact on geology or soils.

#### 3.3.2.4 Cumulative Effects

The primary activities that affect soils in the project vicinity are related to farming, grazing, and farmland conversion. According to the U.S. Department of Agriculture's (USDA) 2012 Census of Agriculture, the total acreage of farmland in Kittitas County

decreased by approximately 4 percent between 2007 and 2012 (USDA 2012), which is higher than the national average for the same time period, of a 0.8 percent reduction (USDA 2014). Although farmland conversion is likely to continue in Kittitas County as a result of ongoing urban growth and development, the project's contribution to farmland conversion would be low. In addition, seasonal wildfires can contribute to reduced vegetative cover and an increased risk of erosion. Implementation of erosion control BMPs and stabilization of disturbed areas following construction would ensure that the project would not contribute significantly to cumulative soil impacts. Therefore, the contribution of the project to cumulative soil and geology effects would be minor.

#### 3.3.2.5 Mitigation Measures

To further minimize and mitigate for impacts to geology and soils, the project would incorporate the following measure:

- Minimize the construction disturbance area and removal of vegetation, to the greatest extent possible.
- Locate staging areas in previously disturbed or graveled areas, where practicable, to minimize soil and vegetation disturbance.
- Conduct peak construction activities during the dry season (between June 1 and November 1) as much as possible to minimize erosion, sedimentation, and soil compaction.
- Prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) that would include appropriate Best Management Practices (BMPs), such as delineation of construction limits within 200 feet of streams and wetlands, and installation of silt fences, straw bales, and jute matting.
    - Erect silt fencing per Ecology's BMP C233. Erect silt fencing along the entire building footprint to the south and along the western perimeter. This fencing area includes all potential areas that slope toward the historic side channel/Bypass to preclude entry of sediment into riparian areas and stream channels.
    - Erect sediment barriers per Ecology BMP C235.
- Inspect erosion and sediment controls weekly, maintain them as needed to ensure their continued effectiveness, and remove them from the proposed hatchery site when vegetation is re-established and the area has been stabilized.
- Minimize the area of soils exposed at any one time and use dust abatement measures when necessary
- Prepare and implement a fugitive dust control plan including the use of water trucks or other appropriate methods to control dust during construction, the use of gravel on access road surfaces in areas of sustained wind, and the establishment of a 15-mile-per-hour speed limit for construction vehicle use on unpaved roads and surfaces.

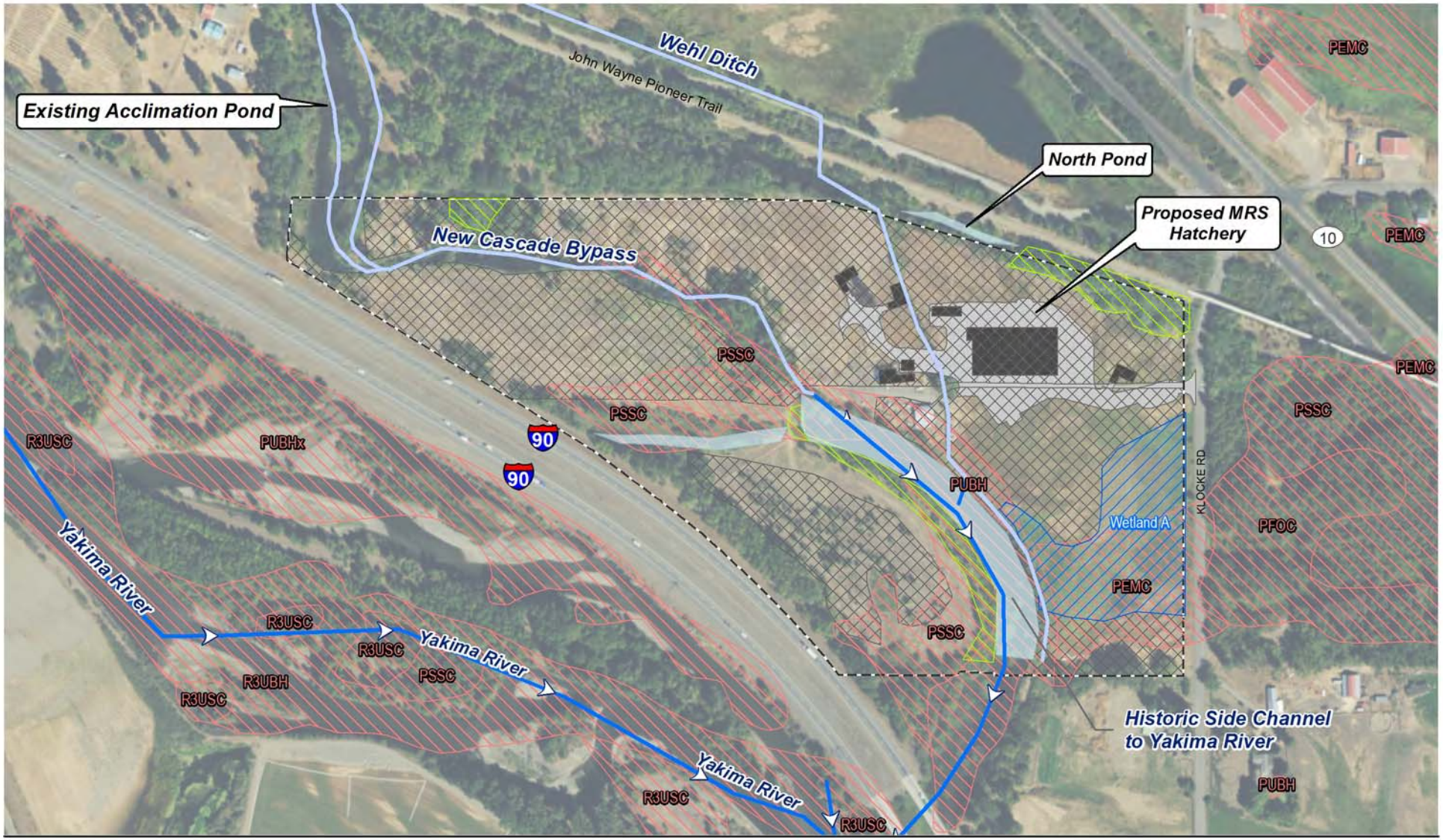
### 3.3.3 Environmental Consequences of No Action Alternative

The No Action alternative would not involve any construction or other ground-disturbing activities; therefore, no disturbance to geologic resources in the study area would occur. Natural geologic processes would continue unaffected, no special topographic features or rare soil types would be affected, and there would be no increased risk of erosion or landslide. No direct or indirect effects to soils or geologic resources would result from this alternative. In addition to the continued use of current acclimation and release sites, the use of the three new sites would be implemented under the larger YKFP. No ground disturbance would be expected.

## 3.4 Vegetation

### 3.4.1 Affected Environment

The study area for the assessment of potential impacts on vegetation includes all vegetation that could be impacted during construction and operation of the proposed project. For the Proposed Action, the study area for vegetation includes lands within 200 feet of the construction limits of the proposed MRS Hatchery, the New Cascade Canal Diversion Structure, and the New Cascade Canal Fish Screening Facility (Figure 3.4-1 and Figure 3.4-2). The study area also includes the area around the acclimation sites.




**LEGEND**

- Holmes Ranch Property
- Proposed Building
- Proposed Paved Area
- Aspen (YN 2015)
- Wetland (YN 2015)
- Wetland (NWI)*
- Aquatic Bed/ Unconsolidated Bottom
- Pasture
- Flow
- Stream/River
- Ditch/Canal/Aqueduct

**DATA SOURCE:** (USFWS 2016, McMillan/Jacobs 2016, ESRI 2016, Yakima Nation 2016)

*PSSC; PFOC -- Freshwater Forested/Shrub Wetland
PUBHx; PUBH -- Freshwater Pond
R3USC; R3UBH -- Riverine
PEMC -- Freshwater Emergent Wetland

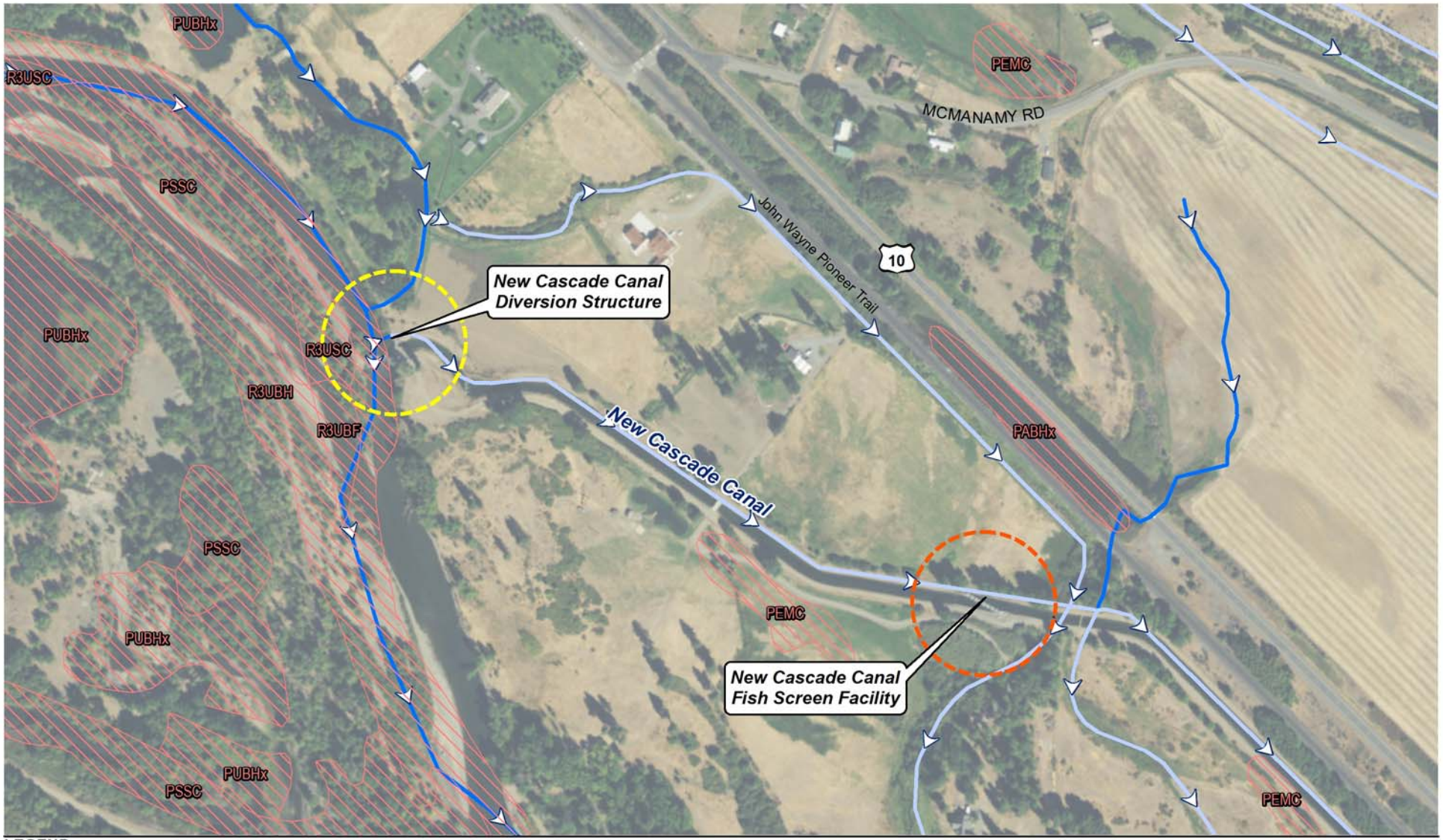
Bonneville POWER ADMINISTRATION

N

0 200 400 Feet

# VEGETATION AND WETLANDS

**FIGURE 3.4-1**




**LEGEND**

- Wetland (NWI)*
- Bureau of Reclamation Yakima River Intake Buffer (200')
- New Cascade Fish Screen Buffer (200')
- Flow
- Stream/River
- Ditch/Canal/Aqueduct

*PSSC -- Freshwater Forested/Shrub Wetland
PUBHx -- Freshwater Pond
R3USC; R3UBH -- Riverine
PEMC -- Freshwater Emergent Wetland

**DATA SOURCE:** (USFWS 2016, McMillan/Jacobs 2016, ESRI 2016, Yakima Nation 2016)

Bonneville POWER ADMINISTRATION

N

0 200 400 Feet

# VEGETATION AND WETLANDS

**FIGURE 3.4-2**

#### 3.4.1.1 Existing Vegetation Communities

The Yakima Basin is part of the larger Columbia River Basin ecological province (Franklin and Dyrness 1988). The basin consists of the slopes of the forested East Cascades down to the dry channeled scablands of the Columbia Plateau ecoregions (Camp et at. 2011). Typical vegetation consists of eastside mixed conifer forest dominated by Douglas-fir and ponderosa pine woodland in the lower elevations. In the shrub steppe lowlands, big sagebrush dominates along stream channels, valley bottoms, and flatlands. Along the Yakima River conifer-riparian habitat includes stands of willow, quaking aspen, and ponderosa pine/Douglas-fir (Johnson and O'Neil 2001).

The study area for the MRS Hatchery site consists of developed agriculture, pasture, and some riparian and herbaceous wetlands along the Yakima River (Johnson and O'Neil 2001). Vegetation on the hatchery site mainly consists of fallow pasture that has not been grazed for approximately 12 years (Figure 3.4-1). Grass and herbaceous species observed in May 2016 included cheatgrass, tansymustard, orchardgrass, common teasel, tall fescue, barley, timothy, bulbous bluegrass, bentgrass, and ryegrass.

Riparian vegetation is present along the New Cascade Bypass and the historic side channel to the Yakima River in the southwest portion of the study area. These riparian corridors have been altered by the bypass diversion and other historic agricultural practices and water resource development. Willow species, black cottonwood, quaking aspen, and other deciduous trees are the dominant species near the New Cascade Bypass. The understory of the New Cascade Bypass riparian area is dominated by reed canarygrass, coyote willow, as well as common horsetail. Second-growth ponderosa pine trees are located in the transition zone between riparian and pasture communities. Vegetation along the historic side channel to the Yakima River consists of a narrow band of willows and roses on the north side and a narrow band of aspen on the south side of the channel. Another aspen stand is located in the northeast portion of the site, adjacent to the John Wayne Pioneer Trail.

The study area for the New Cascade Canal facilities is comprised predominantly of agriculture, pasture, and small inclusions of remnant native vegetation (Johnson and O'Neil 2001), along with limited riparian and herbaceous wetlands (Figure 3.4-2). Lands immediately adjoining the New Cascade Canal are the dirt access roads with limited vegetative cover. Further along the unvegetated canal to the fish bypass there are a limited number of trees and understory vegetation. In the rest of the extent of the study area there are patches of riparian vegetation along the New Cascade Bypass, and agricultural, developed, or pasture lands. The Yakima River riparian corridor west of the canal consists of a large, intact stand of second-growth to mature black cottonwood trees.

The acclimation and release sites are predominantly herbaceous and shrub with limited riparian vegetation along adjacent creeks.

#### 3.4.1.2 Priority Habitats

The WDFW Priority Habitats and Species Program designate individual plant species and/or vegetative composition areas that provide unique or significant value to the state. Priority habitats in the MRS Hatchery study area are wetlands and riparian habitats.

WDFW requires that impacts to priority habitats from the proposed project be avoided, minimized, or mitigated. Wetlands are discussed in Section 3.6.

Riparian areas are defined as “the area adjacent to aquatic systems with flowing water (e.g., rivers, perennial or intermittent streams, seeps, springs) that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other” (Knutson and Naef 1997). Riparian habitats are even more important in dry areas such as the Columbia Plateau, which typically only gets between 8-14 inches of rain a year (Camp et al. 2011).

As described above, riparian habitat in the MRS Hatchery study area occurs along the New Cascade Bypass and historic side channel to the Yakima River located to the southwest of the proposed facility. Historic disturbance to the Yakima River and its floodplains and tributaries has reduced the extent and function of riparian communities over time; however, remnant riparian corridors can still provide critical water quality, wildlife, and fish habitat functions (Knutson and Naef 1997).

Riparian habitat in the immediate vicinity of the New Cascade Canal is very limited and fragmented by bare ground that was likely disturbed during creation of the canal or other infrastructure for nearby agriculture. Riparian habitat occurs along the New Cascade Bypass to the south of the fish screening facility and the large intact riparian corridor along the Yakima River to the west.

#### 3.4.1.3 Rare Plants

WDNR maintains a state list of plants that meet unique criteria as sensitive, threatened, or endangered within the State of Washington and are designated under the Washington Natural Heritage Program. These are provided different protection than federally-listed species, but still need to be taken into consideration for state and local planning. Appendix B has a list of all rare plant species that occur in Kittitas County.

No rare plants were observed or documented to be in the MRS Hatchery study area, although there is suitable habitat for many of the state listed plants (WDNR 2010, WDFW 2016c). A list of potential rare plants that could occur in the project site is provided in Appendix B. This list was created by matching WDNR state and federally listed plant species with the existing habitat conditions in the area.

#### 3.4.1.4 Noxious Weeds

The Washington State Noxious Weed Control Board defines noxious weeds as nonnative species that contribute to the loss of agricultural production or ecological diversity (Washington State Noxious Weed Control Board 2010). Kittitas County maintains a list of plant species considered to be noxious and classifies them as A, B, or C (Appendix C).

- Class A weeds are nonnative species that are limited in distribution in some portions of the state but very abundant in others. State law (Chapter 17.10 RCW and WAC Chapter 16-750) requires these plants be eradicated.
- Class B weeds are either absent or limited in distribution to some portion of the state but abundant in others. These plants should be contained and not allowed to spread to new areas.

- Class C weeds are widespread through Washington State. Counties can choose to enforce control or educate residents about controlling Class C noxious weeds.

Common teasel, which is a class C noxious weed according to Kittitas County (2015), was noted on the MRS Hatchery site during the May 25, 2016 site visit. No other noxious weeds were observed on the MRS Hatchery site or in the vicinity of the New Cascade Canal facilities, although there is a large amount of habitat that could be at risk to be colonized by invasive plant species.

## 3.4.2 Environmental Consequences of Proposed Action

### 3.4.2.1 MRS Hatchery Construction

The Proposed Action would require up to 3.7 acres of permanent vegetation removal for the new MRS Hatchery and appurtenant features. Construction activities would temporarily impact vegetation on up to 4.8 additional acres. Temporary impacts are defined as clearing of vegetation for the duration of construction, after which time disturbed areas would be revegetated. Pasture and grassland is the predominant vegetation group that would be impacted; the removal of a few trees would also occur. Temporarily disturbed areas would be replanted with native vegetation. Temporary impacts would be short term and could be prevented with appropriate BMPs (see section 3.4.2.5).There would be no impacts to federal- or state-listed plants because no such designated species or suitable habitat occur on the MRS Hatchery site.

#### 3.4.2.1.1 New Cascade Canal Diversion and Fish Passage Facility

Construction activities at the canal diversion and fish passage facility would only result in temporary loss of sparse grasses and forbs. Areas that are disturbed during construction would be revegetated after construction with appropriate native vegetation. The impact on vegetation would be low.

### 3.4.2.2 MRS Hatchery Operation and Maintenance

Routine maintenance of the MRS Hatchery would include mowing grass, maintaining trees and shrubs, and removing hazard trees, dead trees, or branches. This process would remove plant materials that would otherwise be mineralized and provide nutrients into surrounding habitats. In addition, vehicles and other human movement into the area could carry invasive species into the study area, which could affect plant community composition. This impact would be low.

#### 3.4.2.2.1 New Cascade Canal Diversion and Fish Screening Facility

Operation and maintenance of the modified New Cascade Canal facilities would have no effect on vegetation communities as operations would be passive and not require substantial vegetation maintenance on the access roads or in the New Cascade Canal.

The project proposes a diversion of an additional 3 to 4 cfs during the nonirrigation season (November-March) from the Yakima River to the New Cascade Canal, which would be returned to the river at the historic side channel of the Yakima River, adjacent to the proposed hatchery. This would reduce flows to a 6,900-foot-long reach of the Yakima River by 3 to 4 cfs. This operation is not anticipated to have a significant impact

on riparian vegetation communities on the Yakima River because the surface water diversions are relatively small compared to overall flows on the river (Section 3.5), and the operation would largely occur outside of the growing season.

#### 3.4.2.3 Acclimation and Release

Acclimation and release activities at other sites within the basin would have no long-term impacts and would result in low to no impacts to vegetation. Any vegetation removal required for mobile acclimation units would be minimal and temporary.

#### 3.4.2.4 Cumulative Effects

The Proposed Action would permanently remove up to 3.7 acres of pasture vegetation. Considered with past, present, and reasonably foreseeable future actions that have resulted in the loss of vegetation in the region, the proposed project would have a low incremental impact loss of pasture vegetation.

#### 3.4.2.5 Mitigation Measures

To further minimize and mitigate for impacts to vegetation and wetlands, the project would incorporate the following measures:

- Inspect equipment to remove vegetation and dirt clods that may contain noxious weeds.
- Dispose of excavated noxious weeds in a manner that prevents reestablishment in wetlands and adjacent areas.
- Implement a revegetation plan to restore native plant communities, provide wildlife habitat, reduce the risk of weed encroachment, and ensure adequate growth.
    - Reseed disturbed areas after construction and regrading are complete, at the appropriate time period for germination.
    - Monitor germination of seeded areas; if vegetative cover is inadequate, implement contingency measures and reseed to ensure adequate revegetation of disturbed soils.

### 3.4.3 Environmental Consequences of No Action Alternative

Under the No Action alternative, no new construction would occur in the project sites, and no vegetation would be removed. Plant composition may change over time due to flood events, natural succession, and fire suppression. Noxious weeds, if not managed, could spread and lower the overall diversity of plant species within the study areas. Continued use of existing acclimation and release sites would have low to no impact on vegetation communities. Any vegetation removal required for mobile acclimation units would be minimal and temporary.

# 3.5 Water Resources

## 3.5.1 Affected Environment

This section describes the groundwater, hydrology, water rights, and water quality of the hatchery site. The proposed MRS Hatchery is located in Water Resource Inventory Area (WRIA) 39 on a historic side channel of the Yakima River near RM 60 (Figure 2.2-1; Figure 3.5-1). Relative to the proposed hatchery site, the study area for water resources includes all surface waterbodies and groundwater that would be directly or indirectly affected by facility construction and operation. The surface waterbodies include:

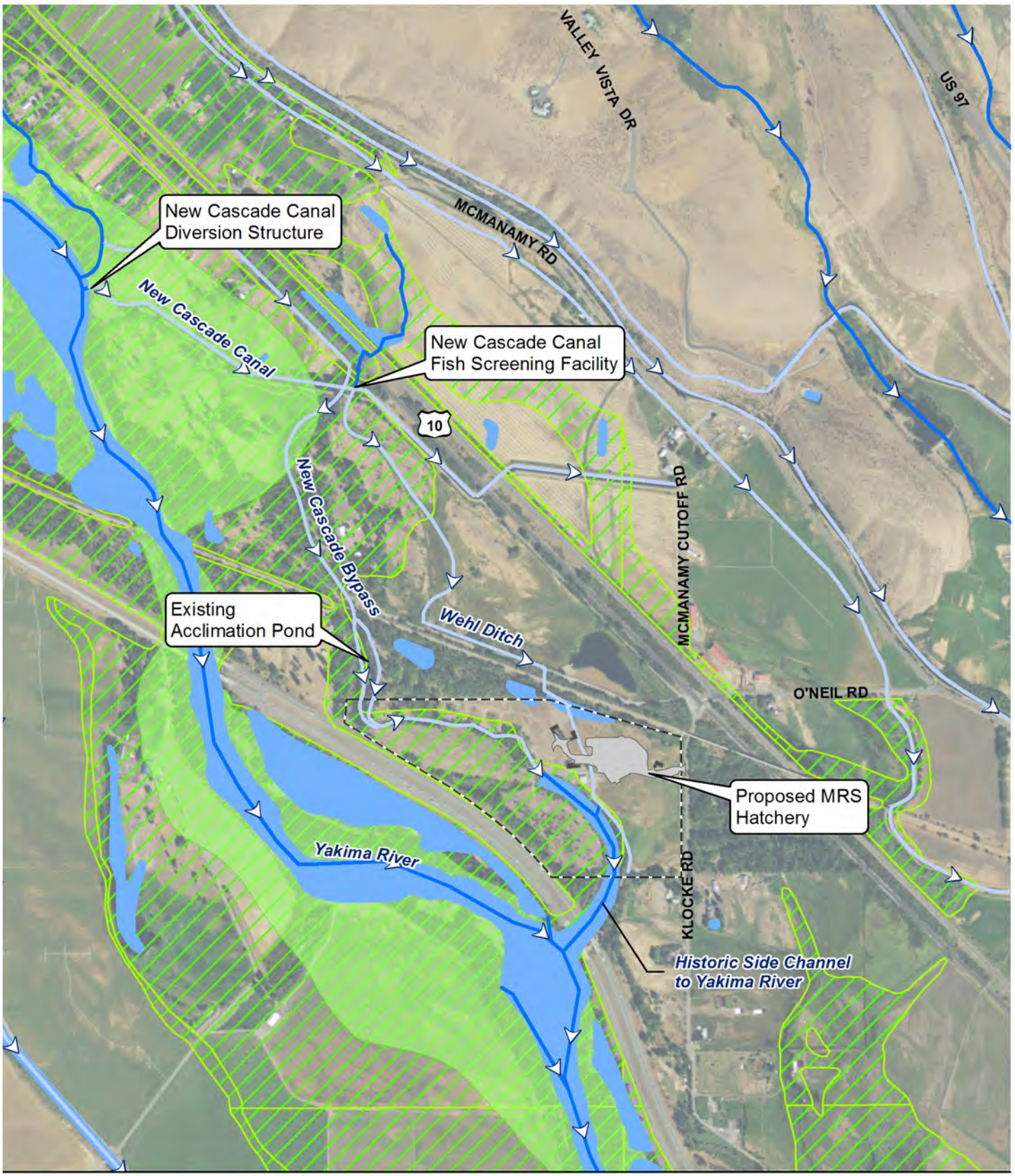
- The reach of the Yakima River just upstream of Reclamation's existing New Cascade Canal diversion to an area approximately 300 feet downstream of the existing side channel confluence with the Yakima River.
- The New Cascade Canal from Reclamation's diversion to the fish screening structure.
- The New Cascade Bypass from the New Cascade Canal fish screen to the historic side channel and confluence with the Yakima River.
- Wehls ditch from the project property boundary to the historic side channel.

Groundwater in the study area includes the aquifers potentially affected by the project. This includes the alluvial aquifer that underlies and is downgradient of the hatchery site.

### 3.5.1.1 Groundwater

The hatchery site is underlain by an alluvial aquifer composed of the silty, clayey-sand and the alluvial sandy silty, clayey-gravel soil strata. The primary water-bearing zone is composed of these two strata. Brown clay with sand and gravel occurs beneath this water bearing zone and likely functions as an aquitard (a zone of the earth restricting the flow of groundwater from one aquifer to another). The aquifer is less than 30 feet deep, highly transmissive, and is heavily influenced by the Yakima River and irrigation water (Wallace Group 2012).

Static water levels in test pits and site monitoring wells indicate typical groundwater depths between a few to several feet below the ground surface (Table 3.5-1; Ecology 2016a). Nearby emergent wetland plant species (outside the buildable area near the southern portion of the property), and standing water to the north of the property also indicate the presence of shallow groundwater levels. Groundwater temperatures are similar to surface water temperatures during the irrigation season (Table 3.5-2), indicating that the alluvial aquifer materials are hydraulically conductive and are connected with the river and irrigation ditch seepage. A geophysical investigation corroborated with these earlier findings, detecting areas of hydraulic conductivity (such as buried stream channels) within the hatchery site (Wallace Group 2016b).




**LEGEND**

- Stream/River
- Ditch/Canal/Aqueduct
- Flow
- Water Body
- FIRM Floodway
- FIRM Floodplains (100 year flood)
- Holmes Ranch Property
- Proposed Building
- Proposed Paved Area

**DATA SOURCE:** (Source DNR 2016, Kittatus County 2016, ESRI Online 2016)

(Floodplain designations reflect FEMA Flood Insurance Rate Map Community-Panel Number 530095 0436B)

Bonneville POWER ADMINISTRATION

N

0 500 1,000 Feet

## SURFACE WATERBODIES NEAR THE HATCHERY SITE

**FIGURE 3.5-1**

Because the aquifer is relatively thin and hydraulically conductive, it is sensitive to recharge and storage. Preliminary pump testing of the aquifer during the irrigation and nonirrigation season suggests that rapid aquifer recharge occurs during the irrigation season (Wallace Group 2012). Muted fluctuations in the water table level and groundwater temperatures also suggest connectivity with seepage from up-gradient irrigation canals. Alluvial groundwater flow direction has not been modeled locally, but is assumed to move south and west, discharging into the historic side channel and Yakima River.

Groundwater use near (within 0.25 mile) and downgradient of the project include domestic use, stock watering, and irrigation (Table 3.5-3). All of these groundwater uses have associated water rights claims.

**Table 3.5-1. Attributes of Groundwater Wells at the Hatchery Site**

| Log ID | Tag ID | Completion Date | Type[b] | Depth (ft) | Static Water Depth (ft) |
|---|---|---|---|---|---|
| 758754 | BHJ063 | 9/29/2011 | Resource | 31 | 8[a] |
| 758752 | BHJ062 | 9/28/2011 | Resource | 80 | 8[a] |
| 758808 | BHJ060 | 9/27/2011 | Water | 26 | 9 |
| 1570048 | BIY880 | 5/11/2016 | Resource | 28 | 2.4 |

[a] Depth indicates the top of the water bearing zone, as indicated on the well log.
[b] Resource = groundwater monitoring well; water = drinking water, irrigation, or industrial uses

**Table 3.5-2. Groundwater (Study Area) and Surface Water Temperature (Yakima River near Horlick)**

| Month | Groundwater Temperature (°F) | Surface Water Temperature (°F) |
|---|---|---|
| January | | 35.6 |
| February | 48.5 | 37.2 |
| March | | 40.1 |
| April | | 44 |
| May | | 48.8 |
| June | | 51.8 |
| July | | 56 |
| August | | 62.4 |
| September | 58.5 | 59.2 |
| October | | 51.7 |
| November | | 41.5 |
| December | | 36.6 |

Source: http://www.usbr.gov/pn/hydromet/yakima/yakwebarcread.html

**Table 3.5-3. Attributes of Groundwater Wells within 0.25 Mile and Downgradient of the Hatchery Site**

| Parcel(s) | Type | Quantity (cfs) | Season | Purpose |
|---|---|---|---|---|
| 29433, 299433, 59433, 21218 | Groundwater | 0.6 | Year Around | Irrigation |
| 21218 | Groundwater | 0.01 | Year Around | Domestic |
| 21218 | Groundwater | 0.02 | Year Around | Domestic |
| 59433, 299433 | Groundwater | Not Reported | Year Around | Domestic, Stock Watering |
| 59433, 299433, 336233 | Groundwater | 0.02 | 6 Months/ year | Irrigation |
| 336233 | Groundwater | 0.02 | Year Around | Domestic |
| 129433 | Groundwater | 0.01 | Year Around | Domestic |

### 3.5.1.2 Surface Water Hydrology

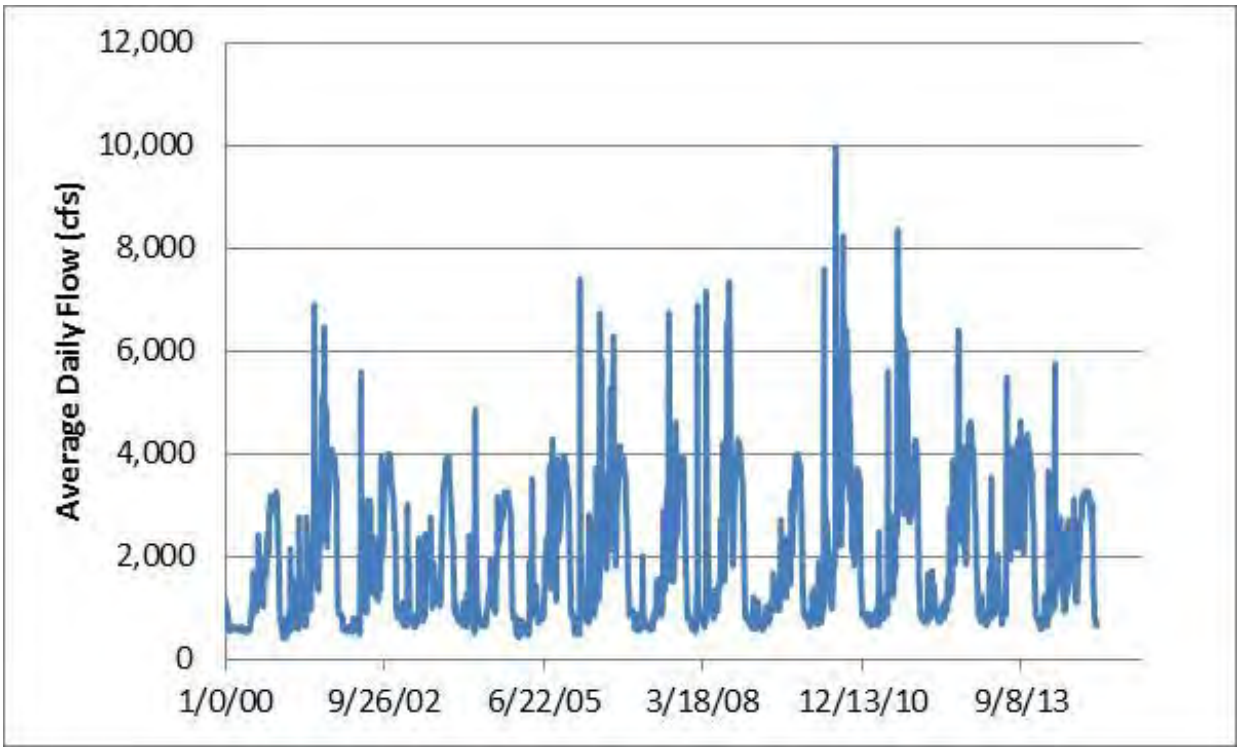
Yakima River flow is not gauged directly adjacent to the hatchery site, but is approximated by the Reclamation gauge at Horlick, 11 RMs upstream. Flow during water years (WY) 2001 through 2015 ranged between 417 and 9,951 cfs and averaged 1,853 cfs (Figure 3.5-2). Typical winter flows are between 800–2,000 cfs. Flow levels in the upper Yakima River flow are managed for multiple uses with three surface storage reservoirs upstream from the project area (Kachess, Keechelus, and Cle Elum Reservoirs). Runoff is stored in the spring and released in early to mid-summer. During the late summer and fall, reservoir releases are much reduced and the upper Yakima River is managed in a low flow condition.

There are no instream flow requirements for the upper Yakima River; however, target flows (enacted by Congress) and instream flow tribal treaty rights (affirmed by the Yakima County Superior Court) are in place in the Yakima Basin. Both target and instream flows are managed by Reclamation. Target winter flows are 980 cfs in November and increase to 1,982 cfs in March (Reclamation 2008). The *Yakima River Basin Integrated Water Resource Management Plan* objectives are to reduce flow by 1,000 cfs beginning July 1, and to reach a flow of 1,000 cfs by August 31 (Reclamation 2012). The *Yakima River Basin Integrated Water Resource Management Plan* does not include objectives for winter flows. Target flows are also defined in the lower Yakima River at Prosser, as enacted in 1994 (108 Stat. 4550, Public Law 103-434; Title XII of the Yakima River Basin Water Enhancement Project).

Increased air temperatures from climate change may reduce the winter snowpack and alter winter/spring runoff cycles and quantities. A decreased snowpack may result in lower stream flows from June through September (ISAB 2007), and associated increased stream temperatures and decreased dissolved oxygen.

Additional surface waterbodies associated with the project area include the New Cascade Canal, the New Cascade Bypass, and the historical side channel. Descriptions of these waterbodies, including their managed hydrology are provided in Section 3.7.1.1.

**Figure 3.5-2. Average Daily Flow on the Yakima River near Horlick, Washington – WY 2001 through WY 2015**




Source: http://www.usbr.gov/pn/hydromet/yakima/yakwebarcread.html

### 3.5.1.3 Water Rights

Surface waters in the Yakima Basin are currently under adjudication, indicating that available water has already been allocated to existing uses (Ecology 1977; Ecology 2014a). Adjudication is intended to review all claimed water rights and to rule on their validity, quantification, and priority. The adjudication has affirmed very early priority date water rights held by the Yakama Nation for both on-reservation irrigation uses and on- and off-reservation instream flows. Several thousand state-issued water rights have also been adjudicated through this process.

When Reclamation developed a water project (The Yakima Project) to expand the available supply of water, water rights were issued for the project with priority dates of May 10, 1905. Irrigation districts are the primary recipients and distributors of this federally developed water. Drought conditions periodically require the regulation of junior surface water entitlements in the basin, and those with priority dates after May 10, 1905 may be prorated or shut off until drought conditions end. Ecology has not issued any new surface water rights for several years in the Yakima Basin, without full mitigation by retiring an equivalent amount of suitable water rights (Ecology 2014a).

Issuance of new water right permits for groundwater use has also been on hold for several years. The USGS has concluded that existing groundwater pumping and consumption, most of it under rights established after 1905, reduces flows in the Yakima River and tributaries by up to 200 cfs at the mouth of the Yakima River (Ely et al. 2011).

Existing water rights near the project are associated with irrigation districts, but also individual domestic, stock watering, and irrigation (Table 3.5-3). No surface water diversions or pumps occur adjacent to the project in the mainstem Yakima River, according to Ecology's water resources database (Ecology 2016b).

#### 3.5.1.4 Water Quality

Preliminary test drilling and pumping at the proposed site indicates that the groundwater supply is high quality and is surface water influenced, with groundwater temperatures ranging from the high 50s during summer months to the high 40s during winter months (Table 3.5-4). Groundwater quality samples were collected in September 2011 and February 2012 for temperature, pH, conductivity, nitrate-N, and metals (Wallace Group 2012). All results met the groundwater quality standards.

Surface water quality of the mainstem Yakima River has been designated by Ecology for 11 freshwater uses, including salmonid spawning and rearing, primary contact recreation, water supply uses, and other miscellaneous uses. Current water quality criteria that support these designated uses are listed in Table 3.5-5, including criteria for water temperature, dissolved oxygen, total dissolved gas, pH, and fecal coliform bacteria. Criteria that support these uses for toxic, radioactive, and deleterious parameters are also defined in Chapter 173-201A WAC (Ecology 2012a).

**Table 3.5-4. Freshwater Use Designations for the Yakima River**

| | Aquatic Life Uses | | | | | | Recreation Uses | | | Water Supply Uses | | | | Misc. Uses | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Use Designations for Fresh Waters by Waterbody | Char Spawning/ Rearing | Core Summer Habitat | Spawning/Rearing | Rearing/Migration Only | Redband Trout | Warm Water Species | Ex Primary Contact | Primary Contact | Secondary Contact | Domestic Water | Industrial Water | Agricultural Water | Stock Water | Wildlife Habitat | Harvesting | Commerce/Navigation | Boating | Aesthetics |
| Yakima River mainstem from mouth to Cle Elum River (RM 185.6) | | | X | | | | | X | | X | X | X | X | X | X | X | X | X |

Source: Chapter 173-201A WAC (Ecology 2012a).

**Table 3.5-5. State Water Quality Standards for the Yakima River**

| Parameter | Ecology Standards |
|---|---|
| | ***Spawning/Rearing*** |
| Temperature | Not to exceed a 1-DMax (1-day maximum temperature) of 70°F due to human activities. |
| Total Dissolved Gas | Not to exceed 110 percent of saturation at any point of sample collection. |
| Turbidity | Not to exceed 5 nephelometric turbidity units (NTU) over background when the background is 50 NTU or less; not to exceed a 10 percent increase in turbidity when the background turbidity is more than 50 NTU. |
| Dissolved oxygen | Must exceed 8.0 milligrams per liter (mg/L). |
| pH | Within 6.5 to 8.5; human-caused variation within the range must be less than 0.5 units. |
| | ***Primary Contact Recreation*** |
| Bacteria | Fecal coliform organism levels must not exceed a geometric mean value of 100 colonies/100 milliliter (ml), with not more than 10 percent of all samples (or any single sample when less than 10 sample points exist) obtained for calculating the geometric mean value exceeding 200 colonies/100 ml |
| | ***Water Supply Uses*** |
| Toxics<br>Radioactive<br>Deleterious Materials | Toxic, radioactive, or deleterious material concentrations must be below those that have the potential, either singularly or cumulatively, to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent on those waters, or adversely affect public health. |
| Aesthetics | Aesthetic values must not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste. |
| | ***Miscellaneous Uses*** |
| Toxics<br>Radioactive<br>Deleterious Materials | Toxic, radioactive, or deleterious material concentrations must be below those that have the potential, either singularly or cumulatively, to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent on those waters, or adversely affect public health. |
| Aesthetics | Aesthetic values must not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste. |

Source: Chapter 173-201A WAC (Ecology 2012a).

In the upper Yakima Basin (WRIA 39), several toxic parameters have been detected in fish tissue at concentrations that exceed criteria (Table 3.5-6). In addition, pH and temperature exceed the surface water quality criteria for the mainstem Yakima River. However, within the project area, the only specific 303(d) listing is for pH in the New Cascade Canal (listing 50704).

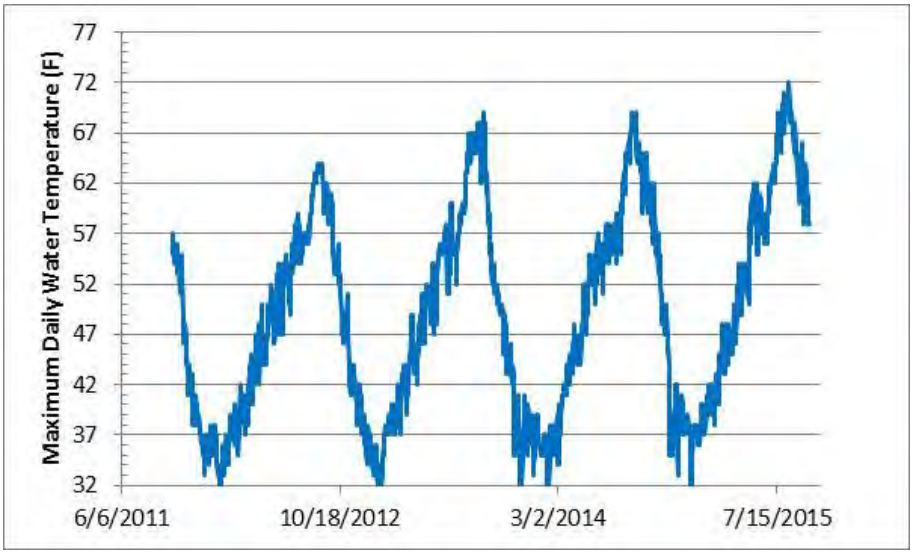
**Table 3.5-6. Water Quality and Fish Tissue 303(d) Listings in WRIA 39 for the 2012 Water Quality Assessment**

| Medium | Parameter | 2012 Category[a] |
|---|---|---|
| Tissue | 4,4'-DDE | 4A |
| Tissue | 4,4'-DDT | 4A |
| Tissue | Chlordane | 5 |
| Tissue | Dieldrin | 4A |
| Tissue | Dioxin | 5 |
| Tissue | PCB | 5 |
| Water | Dissolved Oxygen | 5 |
| Water | pH | 5 |
| Water | Temperature | 5 |

[a] Only category 4 and 5 listings are shown, indicating confirmed pollution exceeding surface water quality standards. Category 5 requires a total maximum daily load. Category 4 is handled using alternative methods.

Maximum daily surface water temperatures near the MRS Hatchery in the November - March surface water right period ranged between 35 to 42°F (Figure 3.5-3). Mean high temperatures during summer months are in the high 50s to low 60s. Groundwater temperatures collected during the irrigation season (September) were very similar to river temperatures, but were warmer than river temperatures during the nonirrigation season (February) (Table 3.5-2). Water flowing through the side channel at the hatchery site contains some groundwater seepage that may moderate water temperatures in the winter (McMillan Jacobs 2016). No other local surface water quality data were identified in the study area. No surface water quality data from the project area are in Ecology's Environmental Information Management database (Ecology 2016c).

**Figure 3.5-3. Maximum Daily Water Temperature in the Yakima River near Horlick, Washington – WY 2012 through WY 2015**




Source: http://www.usbr.gov/pn/hydromet/yakima/yakwebarcread.html

## 3.5.2 Environmental Consequences of Proposed Action

### 3.5.2.1 MRS Hatchery Construction

This section analyzes potential impacts to groundwater, surface water hydrology, floodplains, water rights, and water quality that could occur during construction of the MRS Hatchery.

#### 3.5.2.1.1 Groundwater

Hatchery construction would include the installation of nine new groundwater supply wells. The construction process to install these wells would not impact groundwater elevations, movement, or quality.

#### 3.5.2.1.2 Surface Water

Construction activities would require minimal use of surface water, and would therefore have a low impact on surface water hydrology.

#### 3.5.2.1.3 Water Rights

Construction would not require the use of new water rights, and would therefore have no impact on water rights.

#### 3.5.2.1.4 Water Quality

In-water work would be required to construct the New Cascade Canal fish screen facility modifications and the MRS Hatchery intake structure (in the bypass), and outfall structure (in the historic side channel). These in-water construction activities have the potential to impact turbidity, pH, and introduce hydrocarbons to surface waters. Turbidity could be increased by soil and sediment being disturbed and entrained into the water column. The use of concrete could increase pH if it were in contact with surface waters. Hydrocarbons could be introduced into surface waters from equipment leaking fuel or lubricants. The proposed in-water work at both the New Cascade Canal fish screen and the MRS Hatchery intake facility would occur immediately following the irrigation season shutdown; however, 5 cfs of river water would still be flowing through the bypass for fish attraction flows in the bypass. Water quality impacts from construction would be low, through the use of in-water work area isolation, treatment of seepage water prior to discharge to surface waters, and the use of construction equipment BMPs.

The existing Wehl irrigation ditch that bisects the property would be partly replaced with a covered culvert. However, the work would occur when there is no flow through the ditch, and would therefore not affect water quality.

Facility construction would require clearing, grubbing, and grading that would expose soils to stormwater erosion and transport to the historic side channel and the Yakima River. Hydrocarbons and construction-related contaminants such as solvents and concrete, could be transported to surface water from stormwater and to groundwater from infiltration. These potential water quality impacts would be avoided and minimized by using temporary erosion and sediment control, construction equipment, and construction material BMPs.

Construction and grading activities would disturb upland areas at the site. The majority of construction would occur in areas that are either previously disturbed or dominated by grasses, and have limited riparian vegetation (shrubs and trees adjacent to waterbodies). The permanent project footprint would increase impervious surface areas to approximately 3.7 acres and could result in increased or rerouted runoff and sediment carried into the New Cascade Canal or Bypass, which could impair water quality. Most construction activity would occur away from the New Cascade Canal or Bypass and would be managed by the use of erosion control devices, removal of the least amount of vegetation possible, and revegetation of disturbed areas with native grasses, shrubs, and trees following disturbance. Impacts on water quality are anticipated to be short term, localized, and low. Demolition of existing upland structures (e.g., existing residence) would not result in any effects on water quality.

#### 3.5.2.1.5 Summary of Construction Impacts on Water Resources

Impacts to groundwater, surface water hydrology, floodplains, or water rights are expected to be low during project construction. Minor water quality impacts may occur during in-water work, but are expected to be avoided or minimized by BMPs. Erosion and transport of pollutants from hatchery construction to surface waters and groundwater is expected to be minimized through erosion control and construction BMPs.

### 3.5.2.2 MRS Hatchery Operation and Maintenance

This section analyzes potential impacts to groundwater, surface water hydrology, floodplains, water rights, and water quality that could occur during operation and maintenance of the project.

#### 3.5.2.2.1 Groundwater

Aquifer pumping tests were conducted during the irrigation season (April–October) and the nonirrigation season (November–March) as part of the *Yakama Nation Master Planning Process* (Wallace Group 2012). The tests indicated that pumping groundwater for 10 hours from one well at a maximum rate of 0.27 cfs during the irrigation season resulted in an aquifer drawdown of 2.7 feet, with nearby observation wells (50 feet and 20 feet from the test pumping location) drawing down 0.4 foot over the same period. The aquifer recovered to pre-pumping elevations within 3 minutes. During the nonirrigation season, groundwater pumping over 72 hours from one well at a maximum rate of 0.25 cfs resulted in a maximum aquifer drawdown of 13.5 feet, but remained flat (i.e., no additional drawdown) during the last 50 hours of pumping. Nearby observation wells only drew down 0.5 foot over the same period. Aquifer recovery occurred within a minute of pump shutdown. These pump tests concluded that the thin (30 feet) and highly transmissible aquifer has a muted drawdown during the irrigation season because of up-gradient irrigation water infiltration and movement into the aquifer. Nonirrigation season drawdown is greater, because of the lack of up-gradient irrigation water hydrologic inputs, but appears to have a maximum drawdown elevation at the tested pumping rates.

The project proposes pumping approximately 2 cfs of groundwater during the months of April through December, and 0.2 cfs during January through March (Section 2.2.3.2). Multiple wells distributed throughout the property are proposed to pump continuously to meet these project needs. Groundwater pumping is expected to cause localized

groundwater drawdown near each of the respective wells. Pumping during November and December may have the largest impact, because of the higher rate of pumping (2.0 cfs versus 0.2 cfs) and lack of up-gradient irrigation water infiltration to mitigate groundwater losses. These operations would impact groundwater quantity; however, the aquifer pumping tests (Wallace Group 2012) suggests that the groundwater pumping only caused local effects on groundwater levels (i.e., only 0.5 foot drawdown within 50 feet of the test pumping location). The local aquifer drawdown impacts may be limited in magnitude, as indicated by the lack of additional drawdown during the last 50 hours of test pumping during the non-irrigation season. The test pumping was performed at 0.25 cfs during the non-irrigation season, and may not represent the anticipated 2 cfs of pumping during the non-irrigation season months of November and December. However, the MRS Hatchery proposes eight new wells spaced apart from each other in such a way that the effects may be approximated by the test pumping. Therefore, impacts on groundwater levels are localized and temporary and thus are low. All of the well locations in the 25 percent design plans are more than 50 feet inside of the property boundary. No water wells (other than the well that is in connection with the proposed project) are within 50 feet of the proposed well locations.

Several wells are located on adjacent properties down-gradient of the project (Table 3.5-3), and could be potentially affected by the project. However, groundwater quantity impacts are expected to be localized and would likely not impact those wells. Groundwater elevation drawdown >0.5 foot are likely restricted to the project area.

The three new residences that would be built as part of the proposed project would obtain their potable water through the existing water well that is located on site. The demand for the three residences is expected to be 1,200 gallons per day, assuming an average of 400 gallons per day per home (EPA 2016a). This water demand equates to 0.002 cfs, or 0.1 percent of the hatchery water demand. Therefore, the residential water demand would be a low impact on groundwater.

#### 3.5.2.2.2 Surface Water Hydrology

During the nonirrigation season, a combination of groundwater and river water would be used at the hatchery, with the surface water input ranging between 3 to 6 cfs (Section 2.2.3.2). Surface water would primarily be used for adult holding and grow-out tank makeup water supply. An additional 3 to 4 cfs would be diverted through the bypass channel to provide minimum passage flows for the side channel. The water diverted from the Yakima River at the New Cascade Canal diversion structure would be returned to the river at the historic side channel, adjacent to the proposed hatchery. This proposed diversion and return would result in a 6,900-foot reach of the Yakima River with 6 to 10 cfs less flow during the nonirrigation season. The 6 to 10 cfs would be diverted for nonconsumptive uses and would be returned to the river at the historical side channel (6,900 feet downstream on the Yakima River, from the New Cascade Canal diversion structure). This reduction in instream flow would reduce flow to the 6,900-foot reach; however, considering total flow in the Yakima River, the impact would be low.

#### 3.5.2.2.3 Water Rights

Groundwater rights down-gradient of the project (Table 3.5-3) would likely not be affected by the project, because of the localized impact to groundwater resources described in Section 3.5.1.1 and 3.5.2.2.1.

The proposed surface diversion, diverting from the river bypass reach during the November through March nonirrigation season, would not affect any adjudicated senior water rights because the diverted water would be returned to the river with no consumptive use. There is an existing water right of 4.5 cfs for use during the irrigation season for the hatchery site. Once the new water rights are issued, the Yakama Nation will put the existing water right into permanent trust. The new water rights would be nonconsumptive and no adjudicated senior water rights would be affected in the 6,900-foot reach of the Yakima River. In addition, no surface water diversions or pumps are located in this 6,900-foot reach of the Yakima River, according to Ecology's Water Resources database (2016d). Therefore, no impact to surface water rights would be anticipated to occur.

#### 3.5.2.2.4 Water Quality

Surface and groundwater would be treated, chilled as necessary, and directed through adult holding ponds, incubation tanks, and grow-out tanks. Water-exiting adult holding pond drains (up to 3 cfs) would be routed directly to outfalls at both the historic side channel and the up-gradient wetlands. The flow to the wetlands would occur only during the adult holding period, mid-October through February, and is anticipated to be less than 0.5 cfs. The actual flow to the wetlands would be adaptively managed to maintain wetland water levels. Water from the adult holding ponds would not require treatment as these fish would not be fed and would not generate any waste products.

The water treatment system for the hatchery facilities described in Section 2.2.3.3 is expected to meet the requirements of the the 2015 Upland Fin-Fish Hatching and Rearing NPDES General Permit (Ecology 2015). This permit has limits for the following water quality pollutants:

- Net total suspended solids
- Net settleable solids
- Total residual chlorine

The permit also requires the use of BMPs such as management of disinfectants, and procedures to eliminate the release of polychlorinated biphenyls (PCBs) from any known sources in the hatchery, including feed. These prescribed wastewater treatment technology and discharge limits make it unlikely that the hatchery discharges would impair surface water quality standards.

The Proposed Action would likely have no impact on water temperature because the hatchery process water would be maintained at a temperature much lower than the ambient river temperatures and surface water quality standards. Chilled groundwater supply for late summer incubation and cold surface water supply for winter/spring grow-out (<55°F) would be the same or cooler than typical Yakima River temperatures during the same periods. Therefore, no impacts to river temperature are expected.

The MRS Hatchery has been designed to route stormwater to designated infiltration areas, and the majority of the site would be graded to slope toward vegetative buffers for infiltration. Runoff from areas that would not infiltrate would be routed to discharge into an existing drainage channel via a culvert under Klocke Road. Stormwater would not be expected to impact groundwater or surface water.

#### 3.5.2.2.5 Summary of Operational Impacts on Water Resources

Operational impacts to groundwater quantity are low, because groundwater pumping is expected to cause local drawdown, especially during the months of November and December. However, the impacts would be localized and of limited magnitude. Impacts to surface water hydrology is expected to be low, because surface water diversions are small compared to river flow and are nonconsumptive, being returned to the river 6,900 feet downstream of the diversion. No floodplain impacts are expected to occur. The proposed water rights would not impact any existing water rights. Water quality impacts are expected to be low or avoided through the treatment prior to discharge and compliance with NPDES General Permit conditions. PCB introduction to the Yakima River from breakdown of PCB-containing fish feed is possible, but would be minimized by following NPDES General Permit conditions and mitigative measures.

### 3.5.2.3 Acclimation and Release

Since 2007, the YKFP has been using small-scale mobile acclimation units to reintroduce coho smolts into tributaries of the Naches and upper Yakima Rivers. The operation of new acclimation sites under the Proposed Action would result in similar effects to water resources as those from existing mobile acclimation sites. Tributaries selected for acclimation and release can support coho spawning and rearing and were historically used by native coho.

Potential effects on water resources include temporary disturbance, minor flow reductions associated with surface water diversions to operate the mobile acclimation units, and minor water quality degradation from effluent return to the respective waterbodies, as discussed below.

#### 3.5.2.3.1 Groundwater

No groundwater would be used during mobile acclimation and release activities. Generator fuel used to run the acclimation facility pumps would be contained and managed to minimize the risk of spill and groundwater contamination. Therefore, no impacts to groundwater are expected from mobile acclimation and release activities.

#### 3.5.2.3.2 Surface Water Hydrology

As described in Chapter 2, mobile acclimation units would continue to be used on Cowiche and Ahtanum Creeks and, in the near term, a new site would be established on Williams Creek. In the future, acclimation units could be established on other tributaries (Newsome 2016a). Acclimation tanks would use up to 90 gallons per minute (0.20 cfs) of surface water and the intake pumps would be screened to NMFS criteria for the protection of juvenile salmon. Diverted surface water would be returned to the subject tributary stream a short distance, typically about 50 feet, from the intake. Due to this

limited diversion reach, potential effects on surface water hydrology would be low because only a small quantity of water would be removed for a short duration (about 4-6 weeks) during high flow periods in the spring. For these same reasons, the spatial distribution of fish rearing in the vicinity of the intake and outfall hoses is unlikely to be affected by operation of the mobile acclimation units.

#### 3.5.2.3.3 Water Rights

The surface water diversion for mobile acclimation units would require temporary (5-year) use permits from Ecology. The diversions would not affect the rights of any other water users as water used would be returned to the river in the same vicinity within approximately 50 feet of the acclimation activity. All pertinent permits would be acquired by the Yakama Nation prior to this activity.

#### 3.5.2.3.4 Water Quality

Water quality may be slightly affected by the discharge of fish wastes from mobile acclimation units. However, the number of fish in each acclimation unit (10,000 smolts for each of two to three tanks per site) would be low, and the fish would be present for only 4-6 weeks in the spring when flows are high. The proposed mobile acclimation units would not need NPDES permits because rearing levels would be well below permit minimums for upland finfish rearing. At the request of Ecology, the Yakama Nation collected effluent samples for 2 years at the existing Cowiche Creek mobile acclimation unit and for 1 year at the Rattlesnake Creek mobile acclimation unit; the results showed no impacts on water quality (NMFS 2013; Yakama Nation 2016, unpublished data). Similarly, low to no effects on water quality are expected at any new acclimation sites (NMFS 2013).

Measurable impacts on surface water temperature are unlikely to result from the short-term diversion of 0.2 cfs (90 gallons per minute) of water from creeks proposed for placement of mobile acclimation units. The diversion would occur during spring run-off (April to mid-May) when water temperatures are naturally low and flows are typically high; minimum instream flows would be maintained due to the limited (less than 50 feet, typically) diversion reach. The diversion would not affect fish passage and would be screened to prevent fish from becoming entrained.

#### 3.5.2.3.5 Summary of Acclimation and Release Impacts on Water Resources

Acclimation activities would take place during the winter and spring when stream flows are relatively high. Therefore, surface water diversion would not cause dewatering of any reaches and would not likely be measurable (USFWS 2007a). Similarly, low impacts on water quality are expected at any new acclimation sites (NMFS 2013). Therefore, low impacts on fish rearing habitat are expected on water resources.

### 3.5.2.4 Cumulative Effects

The analysis of cumulative effects on water resources considers the entire Yakima Basin.

Currently, ongoing actions in the basin that are reasonably certain to continue in the future include land management, water development, and irrigation activities. Land

management and water development activities may increase solar heating and pollutant loading in streams. Irrigation diversions and mainstem dams have altered natural flow patterns. The return of irrigation water from agricultural lands back to the Yakima River has reduced water quality in the lower reaches in the river.

Water resources planning by the Yakima River Basin Water Enhancement Project Workgroup (the Integrated Plan) may result in projects that alter surface water storage, groundwater storage, enhanced water conservation, and market reallocation. All of these elements have the potential to affect water quantity and quality in the study area.

When combined with ongoing and reasonably certain foreseeable future activities in the basin, the Proposed Action may have a low incremental impact to a cumulative adverse effect on water resources. The MRS Hatchery would divert surface water from the Yakima River from November through March, reducing flow in 6,900 feet of the Yakima River. This diversion would not occur during the irrigation season, so it would not be cumulative with existing irrigation withdrawals in this part of the Yakima River. No surface withdrawals currently occur in this 6,900-foot reach of the Yakima River. Furthermore, the relatively small diversion is nonconsumptive and would occur during months when instream flows are not generally limited and temperatures are typically low.

The project will have low cumulative impact on groundwater quality (i.e., water table elevation), because the groundwater table draw-downs are localized (< 50 feet). Groundwater elevations at adjacent and downgradient wells is not expected to be affected by more than 0.5 foot in elevation change. Therefore, the effects of project wells and other existing wells are somewhat independent of each other. Cumulatively intercepted groundwater that would otherwise seep into the Yakima River would not change, because the treated hatchery effluent would likely discharge into the same approximate location of likely groundwater flow (though no modeling has been completed to confirm this).

#### 3.5.2.5 Mitigation Measures

If the Proposed Action is implemented, the Yakama Nation would implement the following measures to avoid or minimize impacts on water quality at the hatchery site:

- Implement measures to control erosion (see mitigation measures in Geology and Soils) to eliminate potential sediment discharge into waterways.
- Implement a revegetation plan (see mitigation measures in Vegetation) to ensure stabilization of disturbed soils.
- Design and construct access roads such that drainage from the road surface directly into surface waters is minimized and direct sediment-laden waters are drained into vegetated areas.
- Review water quality mitigation measures, required BMPs, and permit requirements with construction contractors and inspectors during a preconstruction meeting covering environmental requirements.
- Develop and implement a work area isolation/dewatering plan for instream work that includes provisions for erosion and sediment control.
- Operate machinery primarily from the top of the river/creek bank along adjacent upland areas. Do not operate stationary equipment in the flowing water. It may be

necessary to traverse the channel to install the work area isolation structure (cofferdam). Once the cofferdam is constructed, operate all machinery from behind the confines of the cofferdam.

- Stockpile and cover excavated streambed and bank materials away from the stream channel or flank with sediment fencing or fiber wattles to minimize fine sediment being transported into the waterbodies.
- Use a screened diesel or electric sump pumps, if needed, to capture seepage flow from cofferdam areas. Direct all seepage flow to an on-site detention area.
- Wash heavy equipment that may work below the ordinary high water mark (OHWM) elevation before it is delivered to the job site and after it is used to prevent the spread of aquatic invasive species.
- Prepare and implement a Spill Prevention, Control, and Countermeasure (SPCC) plan to address fuel and chemical storage, spill containment and cleanup, construction contractor training, and proper spilled material disposal. SPCC plan should include provisions to store fuel (and potential pollutants) and refuel construction equipment at least 300 feet away from streams or wetlands, and to use of pumps, funnels, absorbent pads, and drip pans when fueling or servicing vehicles.
- Inspect machinery daily for fuel or lubricant leaks and, prior to entering wetlands, waterways, or floodplains, and completely clean off any external petroleum products, hydraulic fluid, coolants, and other pollutants.
- Prohibit discharge of vehicle wash water into any stream, water body, or wetland without pretreatment to meet state water quality standards.
- If dust-abatement additives or stabilization chemicals (typically magnesium chloride, calcium chloride salts, or ligninsulfonate) are used, the following additional measures will be implemented:
    - Do not apply dust-abatement additives and stabilization chemicals within at least 25 feet of surface water (distances might be greater where vegetation is sparse) and apply them so as to minimize the likelihood that they would enter the water.
    - Do not use petroleum-based products for dust abatement.
    - Avoid application of dust abatement chemicals during or just before wet weather, and in areas that could result in unfiltered delivery of the dust abatement materials to surface water.
    - Ensure spill containment equipment is available during application of dust abatement chemicals.
- Comply with the National Pollution Discharge and Elimination System (NPDES) General Permit for effluent discharge.
- Comply with the Total Maximum Daily Load allocations for the Yakima Basin.
- Minimize the storage of hazardous materials on-site. When stored, storage shall consist of designated, enclosed storage areas with full secondary containment provided to fully contain accidental spills of chemicals stored at the proposed facilities.

- Comply with all chemical handling, application, and disposal regulations by USDA and Center for Veterinary Medicine regulations and other state and federal regulations to protect human and environmental health.
- Train all staff in regard to chemical handling and application safety.
- Conduct a pump test on wells at the Holmes Ranch property once pumps are installed and operational to monitor effects on groundwater during periods of peak groundwater demand for fish rearing (April - December).

### 3.5.3 Environmental Consequences of No Action Alternative

Under the No Action alternative, no surface or groundwater resources would be modified. The proposed 10 cfs diversion would not occur, and the 4.5 cfs supplied to the bypass channel by groundwater infiltration during the nonirrigation months would likely continue. Flow in the Yakima River between the proposed point of diversion and return would remain at current levels and management. Continued use of existing acclimation and release sites and the implementation of the new sites under the larger YKFP would have low to no impact on water quantity and quality.

## 3.6 Wetlands and Floodplains

### 3.6.1 Affected Environment

The study area for the assessment of potential impacts on wetlands and floodplains includes all wetlands and floodplains that could be affected by construction and operation of the Proposed Action.

#### 3.6.1.1 Wetlands

For this Proposed Action, the study area for wetlands includes lands within 200 feet of the construction limits of the proposed MRS Hatchery, the New Cascade Canal Diversion Structure, and the New Cascade Canal Fish Screening Facility (Figure 3.4-1 and Figure 3.4-2). The study area also includes the area around the acclimation sites. The study area encompasses Kittitas County's maximum prescribed wetland buffer width for off-site wetlands that may be affected by the project.

The USFWS National Wetland Inventory identified three wetland features within the MRS Hatchery study area (USFWS 2010). These are identified as freshwater pond (PUBH), which generally corresponds to the historic side channel of the Yakima River; freshwater emergent wetland (PEMC); and palustrine scrub shrub wetland (PSSC)(Figure 3.4-1).

The *Wetland Delineation Report* (Yakama Nation Fisheries 2015) mapped Wetland A as a palustrine, emergent, persistent wetland of approximately 6 acres (Figure 3.4-1). The hydrogeomorphic classification of Wetland A is riverine, as wetland hydrology is supplied by creeks and tributaries that outflow into the historic side channel to the Yakima River on the southwest side of the wetland. Alluvial soils on the MRS Hatchery property allow for the exchange of subsurface water between the river, irrigation seepage, and the aquifer under the site (see Section 3.5, Water Resources). This interaction contributes to shallow groundwater in Wetland A. Dominant plant species are reed canarygrass and Baltic rush. Wetland A was classified as a Category III wetland in the *Wetland*

*Delineation Report* (Yakama Nation Fisheries 2015). Wetland A provides moderate water quality, hydrologic, and habitat functions.

The *Wetland Delineation Report* (Yakama Nation Fisheries 2015) also identified two aquatic bed/unconsolidated bottom wetlands on the hatchery site. One of these features is the historic side channel of Yakima River, which generally corresponds to the PUBH wetland feature mapped by National Wetland Inventory ("Historic Side Channel to Yakima River," Figure 3.4-1). The other is a pond on the north MRS Hatchery property boundary, adjoining the south side of John Wayne Trail ("North Pond," Figure 3.4-1). The North Pond likely is a relict excavated feature from gravel mining that frequently occurred in the Yakima River floodplain in the early 20th Century (Kittitas County 2013b). The *Wetland Delineation Report* (Yakama Nation Fisheries 2015) did not formally delineate or rate these two wetlands as they are not within the MRS Hatchery development area. The Historic Side Channel is comprised of aquatic bed vegetation such as pond lily. Common cattails, pond lilies, and willows are dominant in the North Pond. Other wetlands inventoried by National Wetland Inventory were determined to be nonwetland areas in the *Wetland Delineation Report* (Yakama Nation Fisheries 2015) and during the May 25, 2016 site visit.

The Kittitas County Critical Areas Ordinance prescribes wetland buffers and allowable activities within these buffers. Because Wetland A is a Category III wetland, the proposed ordinance update of 2015 requires a buffer of 50 feet. Yakama Nation (Yakama Nation Fisheries 2015) designated 150-foot buffers around the North Pond and the Historic Side Channel.

The National Wetland Inventory does not map any wetlands in the immediate vicinity of the New Cascade Canal facilities, and no wetlands were observed during the May 25, 2016 site visit. The National Wetland Inventory identified one freshwater emergent wetland 150 feet to the southwest of the fish screening facility (Figure 3.4-2). There are no wetlands within 200 feet of the New Cascade Canal diversion.

#### 3.6.1.2 Floodplains

The Yakima River is located west of the MRS Hatchery property (Figure 3.5-1). The regulated floodway and floodplain is defined in the FEMA Flood Insurance Rate Map Community-Panel Number 530095 0436 B. The regulatory floodway means the channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. The floodway does not contain any of the project features other than the New Cascade Canal diversion structure that is not being modified by the project. The 100-year floodplain of the Yakima River (FEMA Zone A) extends into small portions of the hatchery site, including the historic side channel and areas to the west and northwest of the historic side channel. Base flood elevations and flood hazard factors have not been determined for this area. The areas to the north and east of the historic side channel are outside of the 100-year floodplain (FEMA Zone C).

## 3.6.2 Environmental Consequences of Proposed Action

### 3.6.2.1 MRS Hatchery Construction

Construction of the MRS Hatchery would have no direct permanent impacts to any wetlands on the hatchery site. Wetland A would be temporarily impacted to install a well and associated pipes for transmission of groundwater to the MRS Hatchery. Temporarily disturbed areas of Wetland A would be restored to preconstruction elevations and revegetated with native vegetation. Potential impacts to Wetland A, the North Pond, and the Historic Channel to the Yakima River would be from possible erosion, contractor traffic during construction, or accidental fuel and oil leaks from construction equipment. Many of the impacts to these wetlands would be short term and could be prevented with appropriate BMPs.

The development area of the MRS Hatchery is not located within the floodplain; therefore, the development would not impact the floodplain or floodway.

#### 3.6.2.1.1 New Cascade Canal Diversion and Fish Screening Facility

There would be low to no impacts to wetlands due to fish bypass construction work at the New Cascade Canal—the nearest wetland is over 150 feet from the site. Implementation of BMPs would ensure potential erosion/sedimentation type impacts would not occur.

The New Cascade Canal fish screen facility modifications, MRS intake structure (in the bypass), and outfall structure (in the historic side channel) would be constructed within the floodplain. No impact is anticipated to the floodplain because of the short construction duration and small footprint of these structures. In addition, surface water flows through and adjacent to these structures is regulated by the existing New Cascade Canal diversion structure. Flooding through and adjacent to these structures would not be impacted because the fish screen modifications do not further constrict existing facilities. The intake structure and outfall structure would not constrict the existing channel and would not be expected to be large enough to modify local channel hydraulics.

No impacts to the floodplain are anticipated to occur due to occupancy and modification of floodplains (per Executive Order 11988) and flood storage capacity is not expected to be reduced. Flooding during construction may result in the temporary interruption of construction and dewatering activities, but is not anticipated to change flood rise or local hydraulics.

### 3.6.2.2 MRS Hatchery Operation and Maintenance

Proposed groundwater withdrawals on the MRS Hatchery site would provide year-round continuous flow of up to 2.5 cfs to the hatchery. These groundwater withdrawals may affect seasonal patterns of water levels in Wetland A on the hatchery site. The project proposes pumping approximately 2 cfs of groundwater during the months of April through December, and 0.2 cfs during January through March using multiple wells throughout the property (Section 2.2.3.2). Aquifer pumping tests conducted by Wallace Group (2012) suggest that the groundwater pumping would only cause local effects on groundwater levels and recovery would occur within a matter of minutes. Because these localized and temporary groundwater impacts would occur outside of the growing season, the effect on

shallow groundwater tables and available soil moisture that drive wetland hydrology and vegetation communities would be low.

Water from the new adult holding ponds would be discharged at a rate of up to 0.5 cfs to the North Pond up-gradient of the MRS Hatchery facilities. Discharges would only occur mid-October through February, and would not require water quality treatment because adult fish would not be fed and would not generate any waste products. Adult holding pond discharges would have a low impact on the North Pond because the activity would occur outside of the regular growing season; the pond already supports an obligate wetland plant community adapted to prolonged inundation.

The project would also discharge incubation drain and grow-out tank water to the historic side channel of the Yakima River. This operation is anticipated to have a low impact on the historic side channel and vegetation within it because discharge water would be treated to meet the requirements of the NPDES General Permit (see Chapter 3.5, Water Resources) and BMPs would be implemented to reduce water quality impacts. Normal discharges of 2 to 5 cfs from the hatchery building to the historic side channel would not significantly alter vegetation in the historic side channel, as existing vegetation is already adapted to inundated hydrologic conditions.

The fish screen modifications at the New Cascade Canal, the MRS intake structure in the bypass, and the outfall structure in the historic side channel would all operate within the floodplain. In addition, between 6 and 10 cfs would be diverted through the New Cascade Canal and Bypass during the nonirrigation season. Because the flows would be managed through the canal and bypass, no additional flood risk would occur in these watercourses. The slight reduction in flow in Yakima River flows between the New Cascade Canal diversion and the historic side channel would result in a low to no change to floodplain inundation. No change to flow or the floodplain would occur downstream of the outfall at the historic side channel.

#### 3.6.2.3 Acclimation and Release

Acclimation and release activities at other sites within the basin would have no long-term impacts and would result in low to no impacts to wetlands. Typical site requirements and conditions for mobile acclimation facilities and their operations are not anticipated to result in temporary or permanent wetland impacts. Any vegetation removal required for mobile acclimation units would be minimal and temporary.

As described in Section 2.2.5.2, coho smolts would be acclimated before release to tributaries in a combination of existing ponds and mobile acclimation units. Acclimation ponds are within regulated floodway and floodplains, but are already features in the landscape and would therefore not impact floodplain processes. The mobile acclimation units would be placed adjacent to each subject stream in upland areas that have existing disturbance (such as spur roads). The specific locations of these acclimation units are not defined, but would only be located in the floodplain if no other upland locations were feasible. The units are mobile and could be moved to a higher elevation in anticipation of impacts to the floodplain.

Because the mobile acclimation sites would be in operation during the high flow periods in the spring, there is a risk that the units may impact the floodway or floodplain. The mobile acclimation facilities would be located outside of the floodway, but may be located

within the 100-year floodplain. The Yakama Nation would coordinate with the local floodplain administrator (Kittitas County) to minimize impacts from the acclimation and release activities. Therefore, low impacts to floodplains are anticipated from mobile acclimation and release activities.

#### 3.6.2.4 Cumulative Effects

Past development in the Yakima Basin has resulted in wetland losses and modifications due to agricultural, water development, and resource extraction practices. However, recent and continuing efforts by local, state, and federal regulatory agencies are designed to preserve and protect wetlands and ensure no net loss of total wetland acres within a watershed. The Proposed Action would not result in a permanent loss of wetlands and, therefore, would not contribute incrementally to wetland losses in the basin.

Past development in the Yakima Basin has resulted in floodplain modifications and floodplain loss. Current floodplain management practices minimize new development in the floodplain and hydraulic effects, such as flood rise. The Proposed Action would not result in floodplain impacts, and, therefore, would not contribute incrementally to floodplain modifications and loss in the basin.

#### 3.6.2.5 Mitigation Measures

The following mitigation measures would be used to avoid or minimize potential impacts on wetlands and floodplains.

- Implement measures to control erosion and fugitive dust (see mitigation measures in Geology and Soils) to eliminate potential for sediment discharge into wetlands.
- Implement a revegetation plan (see mitigation measures in Vegetation) to ensure stabilization of disturbed soils.
- Install signage, fences, and flagging to restrict work areas and confine vehicles and equipment to designated routes that avoid wetlands and waterways.
- When working next to wetlands and waterways, limit disturbance to the minimum necessary to achieve construction objectives, minimize habitat alteration, and limit the effects of erosion and sedimentation.
- Implement an SPCC plan (see mitigation measures in Water Resources).
- Stockpile wetland soils removed from Wetland A during diversion channel construction and use them to re-fill the channel once construction is completed
- Re-grade disturbed wetlands and vegetated areas to pre-construction contours and revegetate with appropriate native species.
- Locate mobile acclimation units outside of regulated floodways, 100-year flooplains, or at the highest elevation practicable. Monitor mobile acclimation units at risk of flooding and re-locate as appropriate.

### 3.6.3 Environmental Consequences of No Action Alternative

No structures (i.e., effluent discharge structure) would be placed within wetlands, the Yakima River regulated floodway, or 100-year floodplain. Continued use of existing acclimation and release sites as well as the use of the new sites under the larger YKFP would have low to no impact on wetlands and floodplains. As with the Proposed Action, the Yakama Nation would coordinate with the local floodplain administrator (Kittitas County) to minimize impacts from the mobile acclimation and release activities.

## 3.7 Fish

### 3.7.1 Affected Environment

The proposed MRS Hatchery site is located on a historic side channel of the Yakima River near RM 160 (Figure 2.2-1). Relative to the hatchery site, the study area for fish resources includes all aquatic habitats that would be affected by MRS Hatchery construction and operation, as well as areas of release and use by fish reared at the hatchery. Specifically, these habitats include:

- The reach of the Yakima River just upstream of the existing Reclamation mainstem diversion to an area approximately 300 feet downstream of the existing side channel confluence with the Yakima River.
- The New Cascade Canal (canal) and fish screening structure.
- The New Cascade Bypass (bypass) from the canal fish screen to the confluence with the Yakima River.
- Shoreline habitat along all waterbodies subject to construction.
- All waterbodies in the Yakima Basin that would be accessible to juvenile coho reared at the MRS Hatchery.
- Areas where returning MRS-origin adults could be outplanted.
- Existing acclimation sites and adult broodstock collection facilities (i.e., Roza, Prosser, Cowiche, and Wapatox Dams).

#### 3.7.1.1 Aquatic Habitat

##### 3.7.1.1.1 Yakima Basin Overview

The headwaters of the Yakima River emerge from the crest of the Cascade Mountains above Keechelus Lake and flow 215 miles to the confluence with the Columbia River near Richland, Washington. Along its path, numerous tributaries enter the Yakima River, including the Cle Elum and Teanaway Rivers, and Swauk, Taneum, Naneum, Wilson, Manastash, and Umtanum Creeks above Roza Dam. The Naches River enters the Yakima River below Roza Dam. Major tributaries to the Naches River include the Little Naches, American, Bumping, and Tieton Rivers, and Rattlesnake and Cowiche Creeks. Major tributaries to the Yakima River below the Naches River confluence include Ahtanum, Toppenish, and Satus Creeks (NMFS 2013). The Yakama Nation proposes to release coho juveniles into many of these waterbodies over the life of Phase 3 of the

coho reintroduction program with a goal of achieving natural, self-sustained runs in the basin.

Although many smaller tributaries in the Yakima Basin display relatively natural flow patterns, the mainstem Yakima River and larger tributaries, including the Naches and Cle Elum Rivers, display altered flows due in part to the operation of numerous small dams and irrigation diversions. These facilities, as well as road crossings and culverts, farming practices, riparian habitat removal, and development, have resulted in degraded water quality, altered flows in the spring and summer, and degraded channel conditions.

The Yakima River provides habitat for two fish species that are listed as threatened under the ESA: bull trout (64 FR 58910-58933) and Middle Columbia River (MCR) steelhead (79 FR 20802). NMFS and the USFWS designate critical habitat for species listed under the ESA. Both NMFS and USFWS determine the range-wide status of critical habitat by examining the physical and biological features needed for life and successful reproduction of each species. The Yakima River mainstem in the vicinity of the proposed MRS Hatchery is designated as critical habitat for both species, and many proposed juvenile and adult release streams are also designated as critical habitat.

The Yakima Basin, which defines the study area, has also been designated as Essential Fish Habitat (EFH) for coho and Chinook salmon under the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267). EFH for coho and Chinook salmon is defined as the bodies of water and substrate required for fish spawning, breeding, and feeding, and habitat where they can grow to maturity. EFH includes all freshwater habitats used by spring-run Chinook salmon in the Yakima Basin.

An assessment of existing conditions and anticipated project-related effects on designated critical habitat and EFH has been developed for the Section 7 ESA consultation document prepared for this project.

#### 3.7.1.1.2 New Cascade Canal and Diversion

The New Cascade Canal Diversion (Figure 2.2-1) is located on the left bank of the Yakima River approximately 7 miles northwest of Ellensburg, Washington. The diversion is owned and operated by Reclamation and diverts about 150 cfs of surface water into the canal, which is operated for irrigation. About 0.4 mile downstream of the diversion the canal's fish screen facility currently bypasses 8 cfs of surface water, as well as fish, into the bypass during the irrigation season (April–October). The bypass flows south through the proposed MRS Hatchery project site (see next section) before discharging to a historic side channel of the Yakima River (Figure 2.2-1). Bypass water from the canal, in addition to groundwater, supports a series of large, deep ponds that are currently used to acclimate coho from mid-March to May. From the ponds, the bypass flows for about 1,400 feet along the southwest portion of the proposed MRS Hatchery property and discharges into the historic side channel of the Yakima River (Figure 2.2-1).

About 2,000 feet upstream of the New Cascade Canal Diversion structure, the Yakima River splits into two channels and flows around a vegetated island. The diversion is on the east (left) bank of the eastern channel, which is about 100 feet wide (Washington Department of Natural Resources (WDNR) 2016c). The split channels converge into one single channel about 200 feet downstream of the diversion (Figure 2.2-1). At the

diversion, large boulders armor the left bank upstream of the intake. Substrates near the diversion consist mostly of large cobbles and gravels; both Chinook salmon (limited) and coho have been observed spawning just upstream of the diversion (Newsome 2016b). A constructed boulder rock weir spans the channel immediately downstream of the diversion. The weir slows the river and slightly backwaters the channel upstream to help route water into the diversion structure during lower flow periods. Yakima River flow is not gaged directly adjacent to the proposed MRS Hatchery site, but is approximated by the Reclamation gage at Horlick, 11 river miles (RM) upstream. Flow during WY 2001 through 2015 ranged between 417 and 9,951 cfs and averaged 1,853 cfs (Reclamation 2015a) at the Horlick gage. Typical winter flows are between 800-2,000 cfs, but flow has been as low at 500 cfs in some months.

The diversion structure contains trash racks that would prevent water-borne debris from blocking or entering the structure, but is not screened. Instead, during the irrigation season, water diverted from the Yakima River flows into the canal for about 0.4 mile before being screened at the canal's fish screening structure. Fish screened from the canal are routed into the bypass, which eventually discharges to the historic side channel of the Yakima River.

The predominantly silty canal provides off-channel fish-rearing habitat during the irrigation season. The canal lacks instream habitat features (e.g., large wood, vegetation) and, with the exception of grasses, its banks are devoid of riparian vegetation. No salmonid spawning has been observed in the canal, which contains water year-round due to groundwater seepage. The canal reportedly conveys about 3-5 cfs of flow (groundwater seepage) from November through March following closure of the diversion after the irrigation season (Newsome 2016b).

As described in Section 3.5.1.4, the only specific 303(d) listing for water quality impairment is for elevated pH in the canal (listing 50704). The reach of the Yakima River at the diversion is not currently 303(d)-listed for any pollutant (Ecology 2012b).

The historic side channel of the Yakima River is designated as critical habitat for both bull trout and MCR steelhead, the canal and bypass are not designated as critical habitat for MCR steelhead (Turner 2016) or bull trout (Halupka 2016a). Neither the canal nor the bypass are considered EFH for coho or Chinook salmon (Turner 2016).

#### 3.7.1.1.3 Proposed Hatchery Site

The proposed MRS Hatchery would be located along a historic, low-gradient side channel of the Yakima River. During the irrigation season, the side channel receives water from the bypass, which connects to a historic side channel of the Yakima River. From November through March, the canal is closed and flow in the bypass is limited to that provided by groundwater seepage. During the irrigation season (April–October), the bypass receives surface water routed from the canal's fish screen.

The proposed MRS Hatchery would require a surface water intake, which would be constructed on the east (left) bank of the bypass. In the vicinity of the proposed intake, the bypass is about 13 feet wide; the width decreases slightly from November–April when flow is limited to about 5 cfs of groundwater seepage. Substrates in the bypass near the proposed intake location consist of clean gravels and cobbles that have recently provided spawning habitat for adult coho. Both banks are relatively stable and support

deciduous riparian shrubs and trees along the majority of the bypass reach. Habitat in the bypass and its riparian corridor has been enhanced over the past decade through the addition of large woody debris, gravel augmentation, and riparian plantings. Habitat is similar downstream in the historic side channel, where the facility outfall is proposed.

The WDNR (2016a) indicates that the bypass is non-fish bearing; however, it currently supports spawning and rearing coho salmon (Newsome 2016b). In addition, resident species (e.g., sculpin) occupy the bypass, and "very few" spring Chinook salmon and juvenile *O. mykiss* (likely rainbow trout) have been collected from smolt traps installed in the acclimation ponds near the proposed hatchery site (NMFS 2013).

#### 3.7.1.1.4 Wehl Ditch

In addition to the bypass and side channel, a small irrigation ditch bisects the proposed MRS Hatchery site just west of an existing ranch house. This ditch, called the "Wehl Ditch" is permitted to convey 4.62 cfs of flow during the irrigation season from a small pond north of the canal through a series of pipes and concrete-lined ditches. The ditch is piped under the canal near the fish screening structure. It has no flow from November through March, and does not provide aquatic habitat for fish.

The Wehl Ditch is mapped as non-fish bearing (WDNR 2016c); no fish have been observed in the portion of the concrete ditch that traverses through the proposed hatchery site (Newsome 2016b).

### 3.7.1.2 Fish Populations

The Yakima Basin supports anadromous and resident fish populations. Currently, the basin provides habitat for 38 fish species, including 24 that are native, and 14 that were introduced (Table 3.7-1). Because of their declining numbers, several native fish are state- or federally-listed under the ESA.

## Table 3.7-1. Fish Species in the Yakima Basin

| Common Name | Scientific Name | Federal Status | State Status | Native (N) or Introduced (I) |
|---|---|---|---|---|
| Pacific lamprey | *Entosphenus tridentatus* | Species of Concern | | N |
| Western brook lamprey | *Lampetra richardsoni* | | | N |
| Cutthroat trout | *Oncorhynchus clarkii* | | | N[a] |
| Coho | *Oncorhynchus kisutch* | | | N[a] |
| Rainbow trout | *Oncorhynchus mykiss* | | | N |
| Middle Columbia River steelhead (winter and summer) | *Oncorhynchus mykiss* | Threatened | Candidate | N |
| Kokanee/Sockeye salmon | *Oncorhynchus nerka* | | | N[a] |
| Chinook salmon (fall and spring) | *Oncorhynchus tshawytscha* | | | N |
| Mountain whitefish | *Prosopium williamsoni* | | | N |
| Bull trout | *Salvelinus confluentus* | Threatened | Candidate | N |
| Brook trout | *Salvelinus fontinalis* | | | I |
| Brown trout | *Salmo trutta* | | | I |
| Carp | *Cyprinus carpio* | | | I |
| Chiselmouth | *Acrocheilus alutaceus* | | | N |
| Peamouth | *Mylocheilus caurinus* | | | N |
| Northern pikeminnow | *Ptychocheilus oregonensis* | | | N |
| Longnose dace | *Rhinichthys cataractae* | | | N |
| Leopard dace | *Rhinichthys falcatus* | | Candidate | N |
| Speckled dace | *Rhinichthys osculus* | | | N |
| Redside shiner | *Richardsonius balteatus* | | | N |
| Bridgelip sucker | *Catostomus columbianus* | | | N |
| Largescale sucker | *Catostomus macrocheilus* | | | N |
| Mountain sucker | *Catostomus platyrhynchus* | | Candidate | N |
| Channel catfish | *Ictalurus punctatus* | | | I |
| Brown bullhead | *Ictalurus nebulosus* | | | I |
| Black bullhead | *Ictalurus melas* | | | I |
| Mosquitofish | *Gambusia affinis* | | | I |
| Three-spine stickleback | *Gasterosteus aculeatus* | | | N |
| Largemouth bass | *Micropterus salmoides* | | | I |
| Smallmouth bass | *Micropterus dolomieui* | | | I |
| Black crappie | *Pomoxis nigromaculatus* | | | I |
| Bluegill | *Lepomis macrochirus* | | | I |
| Pumpkinseed | *Lepomis gibbosus* | | | I |
| Walleye | *Stizostedion vitreum* | | | I |
| Yellow perch | *Iperca flavescens* | | | I |
| Piute sculpin | *Cottus beldingi* | | | N |
| Torrent sculpin | *Cottus rhotheus* | | | N |
| Mottled sculpin | *Cottus bairdi* | | | N |

[a] Previously extirpated (eliminated) native species currently undergoing reintroduction

Sources: Yakama Nation 2012a; Tri-County Water Resource Agency 2001 WDFW 2016a

#### 3.7.1.2.1 Anadromous Fish

As presented above (Table 3.7-1), the Yakima Basin supports several important anadromous fish stocks, including fall and spring Chinook salmon, coho, steelhead, and Pacific lamprey. Native Yakima River sockeye salmon were extirpated from the basin (BPA 1996); however, sockeye reintroduction efforts are currently underway and adults are returning to the basin (WDFW 2016d). The typical timing of adult migration, holding, spawning, juvenile rearing, and migration varies among the anadromous salmonids in the Yakima Basin (Table 3.7-2).

##### 3.7.1.2.1.1 Coho Salmon

Coho salmon were once native to the Yakima Basin (Wydoski and Whitney 2003) and historic returns of adults are estimated to have ranged from 44,000 (Kreeger and McNeil 1993 as cited in Yakama Nation 2012b) to more than 100,000 fish annually. Virtually all major upper Yakima River tributaries, the mainstem Yakima upstream of the Teanaway River confluence, and the Naches River and its tributaries, are believed to have once supported native coho (BPA 1996). Due in large part to overfishing, instream flow reductions, habitat degradation, and the presence of fish passage barriers, natural-origin coho were extirpated from the basin in the early 1980s (Dunnigan et al. 2002). However, because of ongoing reintroduction efforts initiated in the mid-1980s, hatchery-produced coho are now naturally reproducing in the basin.

**Table 3.7-2. Typical and Approximate Timing of Anadromous Salmonid Life Stages in the Yakima Basin**

| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Summer Steelhead (native) | Adult Migration [a] | | | | | | | | | | | | |
| | Holding [b] | | | | | | | | | | | | |
| | Spawning [c] | | | | | | | | | | | | |
| | Juvenile Migration | | | | | | | | | | | | |
| | Juvenile Rearing | | | | | | | | | | | | |
| Spring Chinook (native) | Adult Migration | | | | | | | | | | | | |
| | Holding | | | | | | | | | | | | |
| | Spawning | | | | | | | | | | | | |
| | Juvenile Migration | | | | | | | | | | | | |
| | Juvenile Rearing | | | | | | | | | | | | |
| Fall Chinook (native) | Adult Migration | | | | | | | | | | | | |
| | Holding | | | | | | | | | | | | |
| | Spawning | | | | | | | | | | | | |
| | Juvenile Migration | | | | | | | | | | | | |
| | Juvenile Rearing | | | | | | | | | | | | |
| Coho (re-introduced) | Adult Migration | | | | | | | | | | | | |
| | Holding | | | | | | | | | | | | |
| | Spawning | | | | | | | | | | | | |
| | Juvenile Migration | | | | | | | | | | | | |
| | Juvenile Rearing | | | | | | | | | | | | |
| Sockeye Salmon(re-introduced) | Adult Migration | | | | | | | | | | | | |
| | Holding | | | | | | | | | | | | |
| | Spawning | | | | | | | | | | | | |
| | Juvenile Migration | | | | | | | | | | | | |
| | Juvenile Rearing | | | | | | | | | | | | |

[a] Adult summer steelhead may move upstream during any month of the year; run timing is extensive.
[b] Holding is the stage when adults are waiting for the right conditions for movement up to the spawning area.
[c] Summer steelhead spawn timing is dependent on water temperature and elevation of spawning tributary.
Source: Yakama Nation 2012a; YSFWRB 2005; NMFS 2013; BPA 1996; BPA 2007

Over 90 percent of coho redds are located in the mainstem Naches and Yakima Rivers (BPA 2007). The upper Yakima River tends to have relatively stable flows in the fall, but the Naches River has unregulated fall flows that tend to scour coho redds. In the middle and upper reaches of the Yakima River, coho typically spawn near groundwater seepages (Newsome 2016b) that may act to flush fine sediment from substrates and provide more consistent incubation temperatures (Lorenz and Eiler 1989).

Coho salmon currently use the reach of the Yakima River adjacent to the proposed hatchery site solely for migration (WDFW 2016b, Streamnet 2016). However, coho have been observed spawning along the stream margins in the mainstem Yakima River near the canal diversion, just north of the proposed MRS Hatchery site. Since the initiation of coho acclimation at the proposed hatchery site, coho adults have returned regularly to spawn throughout the bypass (Newsome 2016b).

From 2000 to 2012, annual abundance estimates of juvenile smolts migrating downstream at Prosser Dam averaged 25,390 wild/natural-origin coho, and 264,000 hatchery-origin coho (Sampson et al. 2013). Since the Yakama Nation began

outplanting hatchery coho smolts in the 1990s, the number of adults returning to the Yakima River basin has steadily increased. In 2014, a record 21,000 coho passed above Prosser Dam, and adult coho returns to Prosser Dam averaged about 4,800 fish from 1997-2014, including estimated returns of natural coho averaging about 1,000 fish since 2001 (Sampson et al. 2015). Less than 1 percent of returning adults are estimated to be harvested in the basin (Yakama Nation 2012a).

#### 3.7.1.2.1.2 Summer-Run Steelhead

Steelhead are the anadromous form of the species *Oncorhynchus mykiss*; rainbow trout are the resident form. Anadromous *O. mykiss* in the Yakima Basin are part of the ESA-threatened MCR Distinct Population Segment of steelhead, but resident rainbow trout are not listed and are managed separately (NMFS 2013). The Yakima Basin supports four populations of summer steelhead: Satus Creek, Toppenish Creek, Naches River, and upper Yakima River. Although the historical steelhead run size is believed to have ranged from 20,800 to 100,000 fish (HSRG 2009), numerous factors have contributed to the decline of steelhead in the Yakima Basin, including damming of spawning tributaries, habitat degradation, and the construction of mainstem dams. Despite these factors, all four populations of Yakima River summer steelhead have increased in abundance since 2000 (Yakama Nation 2012a).

In the fish resources study area, summer steelhead from the MCR Distinct Population Segment are reported to spawn in the mainstem Yakima River adjacent to the proposed MRS Hatchery site (WDFW 2016c, Streamnet 2016); however, Yakama Nation biologists have not observed steelhead spawning in the vicinity of the diversion and spawning is believed to be limited (Newsome 2016b). Individuals from the upper Yakima population spawn in most of the accessible tributaries in the upper Yakima River, particularly the Teanaway River and its tributaries, Taneum, Swauk and Umtanum Creeks. The Naches River population spawns in nearly all accessible tributaries in the Naches watershed, though spawning in the Tieton and American Rivers is very limited. The Toppenish Creek population currently spawns in the upper watershed in Simcoe Creek and Toppenish Creek above the Simcoe confluence. Satus Creek steelhead spawn in almost all reaches and tributaries of Satus Creek, including intermittent tributaries (Yakama Nation 2012a). Coho juveniles from the Yakima Basin reintroduction program currently are, or are planned to be, released into many of these tributaries.

Summer-run steelhead spawn timing varies throughout the basin. In the lower elevations like Satus Creek, spawning begins in February and may continue into June at higher elevations like the Naches and upper Yakima watersheds (YSFWPB 2005; Yakama Nation 2012a). In Satus Creek, the lowest and warmest watershed in the basin, summer steelhead spawning begins in February. Steelhead fry typically emerge from April through mid-June. After spending 2 to 3 years rearing in freshwater, steelhead smolts outmigrate from the basin from early spring through June.

The Yakima Basin is currently closed to steelhead harvest; however, illegal and/or inadvertent harvest is likely (Yakama Nation 2012a). The estimated in-basin harvest rate is 8 percent (HSRG 2009).

#### 3.7.1.2.1.3 Spring Chinook Salmon

Yakima River spring Chinook salmon are part of the MCR spring Chinook Evolutionarily Significant Unit (ESU), which includes all naturally spawning spring-run Chinook from the Klickitat River upstream to and including the Yakima River. The spring Chinook MCR ESU is not listed under the ESA.

The Yakima Basin supports three distinct stocks of spring Chinook salmon: American River, Naches River, and upper Yakima River. The proposed MRS Hatchery would be located adjacent to a reach of the Yakima River that is used by migrating upper Yakima River spring Chinook. Although WDFW (2016a) and Streamnet (2016) report that the reach is used for spawning and rearing, Yakama Nation biologists have observed very few spring Chinook spawning in the immediate vicinity of the diversion (Newsome 2016b). The upper Yakima River stock spawns in the mainstem from just below Roza Dam (RM 128) to Keechelus Dam (RM 214), though most spawning takes place between the Cle Elum River confluence (RM 186) and Easton Dam (RM 202). Some spawning also occurs in the Teanaway and Cle Elum Rivers. The Naches River stock spawns in the mainstem Naches River from the confluence of the Tieton River (RM 17.5) to the confluence of the Little Naches and Bumping rivers (RM 44.6). Additional spawning occurs in Rattlesnake Creek, the Little Naches River, and in the Bumping River downstream of Bumping Lake Reservoir. The American River stock spawns almost exclusively in the American River, primarily between RM 1 and RM 15 (Yakama Nation 2012a). Coho juveniles from the Yakama Nation's coho reintroduction program under Phase 3 are, or are planned to be, released into many of these tributaries.

Spring Chinook migrate past Prosser Dam from late April through July (BPA 1996). The American River stock begins spawning in late July, and the Naches River stock begins spawning in late August/early September. The upper Yakima River stock begins spawning in early September. All stocks typically complete spawning by mid-October. Fry emerge from late March to early June and rear in freshwater for 1 year before migrating to the ocean as smolts. Smolts typically outmigrate from late March through early June, peaking in late April (BPA 1996).

From 2000 to 2012, annual abundance estimates of juvenile smolts migrating downstream at Prosser Dam averaged 202,550 wild/natural spring Chinook and 305,130 hatchery-origin spring Chinook (Sampson et al. 2013). From 1984 to 2012, the estimated mean number of adults that returned to the upper Yakima River to spawn was 4,114. During that same period, the average number of adults returning to the Naches River was 1,825 (Sampson et al. 2013). From 2000 to 2007 an average of 869 adults returned to the American River to spawn. In-basin harvest of natural-origin (i.e., nonhatchery) fish ranged from 25 to 2,806 adults from 1982 to 2007. Since 2001, harvest of hatchery origin spring Chinook ranged from 12 to 1,865 fish (Yakama Nation 2012a).

#### 3.7.1.2.1.4 Fall Chinook Salmon

Yakima River fall Chinook salmon are part of the upper Columbia River summer/fall Chinook ESU, which is not listed under the ESA. Fall Chinook were once abundant in the basin, but the population has declined significantly from historic levels. Summer Chinook salmon were extirpated from the Yakima Basin in the 1970s (Yakama Nation 2012a).

In the Yakima River mainstem, fall Chinook salmon spawn from Sunnyside Dam (RM 103.8) downstream to about the confluence with the Columbia River. Spawning upstream of Prosser Dam (RM 47) begins in mid-October, peaks in the first week of November, and ends by the third week of November. Fish in the lower mainstem may continue spawning into December, and spawning has been observed as late as early January (Yakama Nation 2012a). Fry emerge from late March through April.

The number of adult fall Chinook salmon that returned to the mainstem Yakima River to spawn from 1998 to 2006 ranged from 1,940 to 13,846 (HSRG 2009). Prior to 1999, there was little, if any harvest of fall Chinook salmon in the Yakima Basin. From 1999 through 2012, in-basin harvest ranged from 34 to 2,300 fall Chinook (Yakama Nation 2012a).

#### 3.7.1.2.1.5 Sockeye

Four lakes in the Yakima Basin historically supported sockeye salmon production. However, the lakes were no longer accessible following the construction of irrigation storage dams and native sockeye were extirpated from the basin in the 1990s (Yakama Nation 2012a). Recent sockeye reintroduction efforts have proven successful and sockeye juveniles released into the basin since 2009 are now returning as adults (Brownlee 2016). The reintroduced population is not listed under the ESA (WDFW 2016d).

Sockeye salmon restoration feasibility studies conducted by NMFS concluded that sockeye salmon reintroduction was likely to be successful if passage improvements were made at Cle Elum Dam. Following the installation of temporary downstream passage facilities, in 2009, the Yakama Nation began transferring adult sockeye salmon collected at Priest Rapids Dam to Cle Elum Lake. These adults were from two stocks of sockeye salmon in the upper Columbia River–the Okanagan River and Wenatchee Lake. Transferred adults successfully spawned in tributaries above Cle Elum Lake and juveniles were observed migrating downstream through passage facilities at Roza and Prosser Dams in 2011 (WDFW 2016c).

In 2014, over 2,500 adult sockeye were counted at Prosser Dam (WDFW 2016d). These adults returned to the Yakima Basin as a result of Yakama Nation reintroduction efforts. Adults transferred to Cle Elum Lake remain in the lake in July and August, and spawn in the Cle Elum River from September through November (Yakama Nation 2015). Juveniles rear in the lake for about 2 years and outmigrate through a wooden flume in the Cle Elum Dam spillway (WDFW 2016a).

In an effort to continue these successful efforts, the Yakama Nation is working with Reclamation to restore upstream and downstream fish passage to and from the historic sockeye salmon lakes. Initial efforts are targeting passage facility improvements and construction on the Cle Elum Dam where fish passage facilities have been designed. The initial stages of construction for these facilities are currently underway.

#### 3.7.1.2.1.6 Pacific Lamprey

Pacific lamprey are an important traditional food source for the Yakama Nation and other tribes. From 2002 through 2014, counts at Prosser Dam have ranged from 0 in 2010 to 87 in 2003 (Grote 2015). The Pacific lamprey is considered a species of concern by the USFWS, and is a monitored species in the State of Washington.

The Pacific lamprey has declined across much of its range in the Pacific Northwest, including the Yakima River. Adult lamprey migrate to freshwater from March through October and overwinter before spawning in gravel substrates the following April through July. Pacific lamprey hatch as larvae called ammocoetes, and filter feed in fine silts and mud for up to 7 years before becoming young adults. As young adults, they outmigrate to the Pacific Ocean from March through July, typically at night during high flows (Grote 2015).

Adult lamprey can pass over rocks or dam walls by clinging to surfaces with their sucker-like mouths; however, radio-telemetry studies conducted in the Yakima Basin indicate that the overall passage efficiency at Roza Dam was 0 percent (Grote et al. 2016). These results indicate that, as currently built and operated, Roza Dam is a barrier to adult Pacific lamprey migration. Overall passage efficiency at other dams in the basin, including the Cowiche (Naches River), Wannawish, Prosser, Sunnyside, and Wapato dams ranged from 48 to 82 percent (Grote 2015).

### 3.7.1.2.2 Resident Fish

The upper Yakima Basin supports a number of important resident fish species, including bull trout, rainbow trout, cutthroat trout, whitefish, and several species of dace, sculpins, and suckers. The lower Yakima Basin supports rainbow trout, whitefish, northern pikeminnow, redside shiner, chiselmouth and peamouth chubs, largescale, bridgelip and longnose suckers, and several species of sculpins and dace. In addition to these native species, three salmonid species (brook trout, lake trout, and brown trout) have been introduced, along with a variety of sunfish, perch, catfish, and minnows. Managed species or those with federal or state status are discussed below.

#### 3.7.1.2.2.1 Bull Trout

Bull trout are a species of char (related to salmon and trout) that prefer cold, clean water. They were listed as threatened under the ESA in 1998 (63FR 31647) and spawn and rear in the upper portions of the Yakima Basin. Bull trout use the lower mainstem as a migratory corridor. The Yakima River “core area” is designated as critical habitat for bull trout (75 FR 63898). Critical habitat in the core area includes the mainstem Yakima River from its confluence with the Columbia River upstream to the uppermost point of bull trout distribution, including most tributaries in the basin. The canal and bypass are not designated critical habitat for bull trout (Halupka 2016a) The Yakima River core area is part of the Mid-Columbia Recovery Unit (USFWS 2015a).

The USFWS (2015a) identified 15 “local” bull trout populations in the Yakima River core area, including: Ahtanum Creek; Naches River tributaries (American River, Rattlesnake Creek, and Crow Creek); Rimrock Lake tributaries (Indian Creek, South Fork Tieton River and North Fork Tieton River); Bumping Lake tributaries (Deep Creek and Bumping River); Cle Elum Lake tributaries (Cle Elum River and Waptus); Kachess Lake tributaries

(Box Canyon Creek and the upper Kachess River), Keechelus Lake (Gold Creek), and the Yakima River (upper Yakima).The Teanaway River population is potentially extirpated and not currently included as a local population. These 15 local bull trout populations spawn in headwater streams and also use lower reaches of the stream and larger rivers and/or connected lakes as foraging, migratory, and overwintering areas.

Known bull trout presence extends downstream to the confluence of the Yakima and Naches Rivers, with presumed presence to the mouth of the Yakima River at the confluence with the mainstem Columbia River (Reiss et al. 2012). In the Naches River Basin, a stable bull trout population occupies the North and South Forks of the Tieton River; spawning occurs above RM 5 of the South Fork Tieton, and about 5 miles above Clear Lake in the North Fork Tieton (Newsome 2016c). Within the Yakima core area, some populations have access to reservoirs, but many are restricted to habitats upstream or downstream of dams due to a lack of fish passage facilities. Bull trout throughout the basin often face poor summer habitat conditions due to low flows and high instream temperatures resulting from irrigation withdrawals. Downstream of the confluence with the Cle Elum River, the Yakima River mainstem functions primarily as foraging, migratory, and overwintering habitat for bull trout.

Bull trout are a fish-eating species and need an abundant supply of forage fish to maintain healthy populations. They require cool water and temperatures: between 44 and 46°F are optimal; sustained temperatures above 59°F begin to stress fish (Bjornn and Reiser 1991, Yakama Nation 2012a). Bull trout exhibit several life-history strategies in the Yakima Basin. Those populations isolated above dams exhibit resident or adfluvial (migrating between tributary and reservoir/lake) life histories. Those populations below dams are typically fluvial (migrating between mainstem river and tributaries). Most populations spawn from mid-September to mid-October but several spawn between August and early September or late October to early November (USFWS 2015a). Juveniles typically remain in their natal tributaries, and begin migratory movements as subadults.

#### 3.7.1.2.2.2 Westslope Cutthroat Trout

Westslope cutthroat trout occur in the Yakima Basin in areas higher than 3,000 feet in elevation (Yakama Nation 2012a). Ten populations of westslope cutthroat trout have been identified in the upper Yakima Basin (Wydoski and Whitney 2003), although hybridization with other trout species has reduced the number of genetically pure populations. Westslope cutthroat trout spawn from March through July and exhibit several life history strategies (Yakama Nation 2012a). They may reside in tributary streams, lakes, larger rivers, and headwater streams. Generally, in streams, they occupy shoreline areas in the summer and move to deeper pools in the winter.

### 3.7.1.3 Ecological Interactions

In the Yakima Basin, ongoing ecological interactions between and among aquatic species are highly complex and can take the form of species-on-species predation and competition for food (prey) or space (habitat niches such as pools and undercut banks). Interactions can also occur on a genetic level. Breeding between stocks of fish from differing genetic origin can change the genetic structure or reproductive success of native populations.

Although interactions between and among naturally-occurring fish species is a common phenomenon in any fish-bearing waterbody, it is particularly important, in the context of the Proposed Action, to establish a baseline relative to ecological interactions between reintroduced coho salmon and nontarget fish species in the Yakima Basin. Hatchery-produced coho were first introduced into the Yakima Basin for harvest augmentation in 1983 with the release of 324,000 Little White Salmon Hatchery smolts. This program was modified when it was incorporated into the BPA-funded YKFP in 1996, with a goal of using hatchery production to reestablish or increase natural production of anadromous salmonids and to increase harvest opportunities (McMillen Jacobs Associates 2016). Since 1997, the Yakama Nation has annually released between about 600,000 and 1.4 million hatchery coho into the basin, most of which are smolts (Yakama Nation unpubl. data 2016; see Table 2.3-1).

Ongoing concerns about the potential for reintroduced coho to negatively impact nontarget fish in the Yakima Basin prompted stakeholders to develop and implement a risk containment monitoring program (BPA 1996; Busack et al. 1997; Ham and Pearsons 2001 as cited in BPA et al. 2012). This program continues today and includes ongoing MR&E studies in tributaries where reintroduced coho are released throughout the basin. Research has indicated that negative ecological interactions due to coho reintroduction efforts are minimal (Dunnigan 1999, Dunnigan et al. 2002, Pearsons et al. 2007, Temple et al. 2014), and that positive effects on fish growth might occur from restoring lost marine-derived nutrients (Bilby et al. 1998, Wipfli et al. 2003).

Baseline ecological interactions between hatchery-released coho and nontarget fish species in the Yakima Basin are summarized below, with an emphasis on ESA-listed species in the study area.

#### 3.7.1.3.1 Residualism

Residualism is the failure of some hatchery-reared juveniles to outmigrate from freshwater as smolts (Sharpe et al. 2011). Residual fish remain in freshwater throughout their lives, and may therefore compete with and prey on other species (Dunnigan 1999, Dunnigan et al. 2002). Murdock and Dunnigan (2001) conducted an investigation to estimate baseline levels of hatchery coho residuals in the Methow and Wenatchee Rivers and found 0.1 to 0.7 residual coho per kilometer per 50,000 coho released. This compares to estimates of 2.9 and 13.6 residual coho per kilometer per 50,000 smolts released into the upper Yakima and Naches Rivers, respectively (Sampson and Fast 2000). These studies indicated that current coho residualism is relatively low.

Temple et al. (2012) also evaluated the presence and abundance of residualized hatchery smolts in the North Fork Teanaway River, below the Jack Creek acclimation pond, and in the mainstem Yakima River above Roza Dam. They found that some spring Chinook salmon smolts did not outmigrate, but very few coho smolts residualized. No coho residuals have been observed since 2007. Because of the low number of observed residualized hatchery coho, existing impacts on nontarget fish species from competitive interactions with residual hatchery coho are estimated to be low. In an effort to reduce the amount of residual coho, the Yakama Nation currently releases smolts that are ready to migrate. Reducing residualism reduces the potential for competition with and predation on other species (Ecology/BPA 1999).

#### 3.7.1.3.2 Competition

Supplementation and conservation efforts such as the Yakama Nation's ongoing Yakima Basin coho reintroduction program could result in competition for previously occupied habitat and resources. This may lead to displacement and reduced survival or abundance of one or both of the competitors (Glova 1984; Young 2004). Competition between and among fish species occurs when two or more individuals use the same resources, particularly when the resource is limited (YSFWPB 2005). In the Yakima Basin, reintroduced coho that are released as fry may currently compete with other fish species for rearing habitat and feeding opportunities. Juvenile coho salmon are thought to be more aggressive relative to other juvenile salmonids; thus, they may compete with other hatchery or naturally-produced salmonids under certain conditions. However, Groot and Margolis (1991) suggest there is little habitat overlap between coho and other salmonids, and that this habitat segregation provides a possible mechanism for reducing ecological interactions between the species.

Several studies have evaluated the existing growth and abundance of nontarget fish species (i.e., non-coho) following years of ongoing juvenile coho releases in the Yakima Basin. Dunnigan (1999) found no evidence that ongoing coho fry releases influenced the abundance or growth of rainbow or cutthroat trout in the Naches River watershed. The researchers acknowledged that low sample size could have biased the results, but speculated that spatial segregation, resource partitioning, and differences in diet minimize the potential for competition between coho and trout.

Temple et al. (2011) reported that reintroduced coho rarely occupy habitat that overlaps with cutthroat trout in tributaries, though some overlap occurs in higher elevations of the mainstem. Study findings indicate that considerable overlap between coho and rainbow trout currently occurs in tributaries and the mainstem. Coho also appear to overlap with mountain whitefish and sucker species in the mainstem, and dace and sculpin species in tributaries. However, other studies in the Yakima and nearby basins (Dunnigan et al. 1999; Spaulding et al. 1989 as cited in BPA et al. 2012) suggest that ongoing competition between coho and other species may not be significant. Although mountain whitefish are ubiquitous in the upper Yakima and Naches systems, they use different habitat than coho (BPA 2007).

Some level of competition likely exists between reintroduced coho and other native fish species in the basin; however, given that coho were once native to the basin, spatial segregation and use of habitats within individual tributaries might reduce competitive interactions. Potential impacts on other salmonids from coho adults spawning in tributaries is likely low because bull trout (discussed below) are the only species that spawns at the same time as coho.

##### 3.7.1.3.2.1 Steelhead

Coho and rainbow trout/steelhead occupy similar habitats in the Yakima River and its tributaries (Pearsons and Temple 2007). Although researchers have observed some reduction in the mean size of rainbow trout and steelhead since the start of coho reintroduction (and spring Chinook supplementation), further analysis determined that this trend was not related to coho reintroduction activities (Pearsons and Temple 2007). Further, Pearsons and Temple (2007) found that the current level of salmon

supplementation in the basin has not impacted steelhead in the upper Yakima Basin beyond "acceptable limits." Acceptable levels of impact on nontarget fish of concern (e.g., ESA-listed steelhead) were defined as a significant change in abundance, size structure, and distribution of nontarget fish when compared to presupplementation conditions (Pearsons 1998; Temple and Pearsons 2012). In the *Biological Opinion for the Yakima River Spring Chinook Salmon, Summer/Fall Chinook Salmon, and Coho Salmon Hatchery Programs*, NMFS (2013) recognized that these "acceptable limits" provide a sufficient means to measure the impact of coho reintroduction on ESA-listed steelhead. These limits are monitored by the Chinook/Cle Elum Supplementation and Research Facility, as part of the overall ongoing MR&E program of the YKFP. The Chinook/Cle Elum Supplementation and Research Facility was incorporated into the Yakima River hatchery programs "to test the assumption that new artificial production can be used to increase harvest and natural production while maintaining the long-term fitness for the fish population being supplemented and keeping adverse genetic and ecological interactions with nontarget species or stocks within acceptable limits" (BPA 1996).

Temple et al. (2014) evaluated ecological interactions between naturally produced coho and rearing juvenile rainbow/steelhead trout following 5 years of coho reintroduction in Taneum Creek in the Yakima Basin. During the study, they observed coho and trout rearing together in all habitats sampled (e.g., pool, riffle, and glide), which confirmed that both species occupy similar habitats and therefore may compete for resources. By comparing rainbow/steelhead trout data from decades of previous study to post-coho reintroduction data, they found that increased natural coho production did not reduce rainbow trout abundance, size, condition, or growth. These findings suggest that ongoing reestablishment of natural coho densities has not resulted in negative ecological interactions for rainbow/steelhead trout. Further, Temple et al. (2014) did not detect impacts on rainbow trout abundance where adult coho were stocked during studies conducted in Taneum Creek.

The MCR steelhead recovery plan (NMFS 2009) does not identify the reintroduction of coho salmon as a factor limiting the productivity of the Yakima River MCR steelhead (NMFS 2009). The Yakima Recovery Plan (YBFWRB 2005) supported the continued reintroduction of coho salmon in the Yakima River Basin, and indicated that such programs could potentially increase the flow of marine-derived nutrients into salmon and steelhead rearing areas (NMFS 2013). Further, NMFS (2013) states that "the presence of hatchery fish and the progeny of naturally spawning hatchery fish in the juvenile steelhead rearing areas is likely to result in competition between rebuilding coho salmon and ESA-listed steelhead, but this competition is expected to have a negligible effect on ESA-listed steelhead."

#### 3.7.1.3.2.2 Bull Trout

Introduced species such as brook trout compete with bull trout for resources (Dambacher et al. 1992) but reintroduced coho salmon in the Yakima Basin rarely overlap with bull trout in tributaries (Pearsons and Temple 2007). Spawning coho adults are spatially separated from bull trout, which spawn in higher elevation tributaries than coho. Ongoing releases of juvenile coho downstream of the upper Yakima River reaches are far downstream of areas where bull trout spawn and rear and therefore do not likely affect

bull trout (USFWS 2007a). However, the expansion of coho release sites further upstream in the upper Yakima Basin may result in some level of interactions. Several years of ecological interactions studies conducted in the Yakima Basin have not detected adverse effects on bull trout (Temple et al. 2006). However, the USFWS (2007a) notes that the number of bull trout collected in these studies was small and therefore make it difficult to detect possible effects.

#### 3.7.1.3.3 Predation

Predation by hatchery fish on wild fish can occur anywhere the two stocks exist in the same space and time, and risks to wild fish are increased when hatchery fish, particularly larger smolts, are released during periods when vulnerable newly emergent fry are present. In general, hatchery fish can consume fish that are 50 percent of their body size; however, studies reviewed by Busack et al. (2006) indicated that the range may extend from approximately 38 percent (steelhead) to 75 percent (coho). In a number of documents, NMFS and the USFWS (USFWS 1994, NMFS 1999) concluded that juvenile salmonids can consume prey up to 33 percent (one-third) of their body length and smaller.

Some studies speculate that hatchery fish may be less efficient predators than their natural-origin counterparts of the same species, thus reducing the potential for predation (Bachman 1984, as cited in NMFS 2013; Olla et al. 1998). Still, in the Yakima Basin, hatchery-released coho smolts have been shown to prey on several species of salmonids (including spring Chinook fry) at very low frequencies. Because most salmonid fry emerge in mid-summer after coho smolts migrate, the risk of predation on other fish species by parr and by second generation coho spawned in the wild is low. This is also the case for predation on resident juveniles due to spatial and temporal separation between coho and other salmonid species (BPA 2007).

In an effort to establish a baseline for the ecological risk of re-establishing coho in the Yakima Basin, the Yakama Nation has conducted a number of field studies as part of Phase 1 and Phase 2 of the coho reintroduction program. Dunnigan (1999) conducted a 2-year coho smolt predation study investigating the predation of newly emergent spring Chinook fry in the upper Yakima Basin (Dunnigan 1999). The study reported that, of nearly 1,100 coho smolts trapped in 1998, only 5 had consumed fish, and of those fish, only 1 individual had consumed an anadromous salmon (spring Chinook). The study concluded that ongoing hatchery coho smolt releases had no significant impact on the wild spring Chinook population. Similarly, in 1999, only 2 coho out of 993 collected smolts had consumed fish, and none of them were salmonids. Researchers investigating coho smolt predation on fall Chinook salmon found that the two most abundant fish species in coho stomachs were carp and sculpin, and the coho smolt diet consisted overwhelmingly of invertebrates. Based on these results, researchers estimated that coho predation on fall Chinook salmon was no higher than 0.1 percent and was likely much lower (McMichael and Pearsons 1998; Dunnigan et al. 2002).

##### 3.7.1.3.3.1 Steelhead

Hatchery coho salmon smolts are currently released into the Yakima Basin in the spring and typically average 150 mm in length (NMFS 2013). Based on the assumption that coho smolts can eat fish smaller than one-third their length, steelhead juveniles smaller

than 50 mm could be consumed by hatchery coho smolts. Steelhead spawn timing in the Yakima Basin varies by elevation and water temperature, but generally occurs from March through mid-June (see Section 3.7.1.2). Based on this spawn timing and the subsequent incubation period, steelhead fry do not emerge from the gravel until after the majority of the hatchery coho smolts have outmigrated from the Yakima Basin, thus reducing the potential for predation. The low likelihood of predation of salmonid fry by hatchery salmon smolts is supported by coho predation studies conducted in the Yakima Basin. As presented in the preceding section, stomach analyses conducted on coho smolts collected from the Yakima Basin found little evidence of coho smolt predation on other fish (Dunnigan 1999). Therefore, the ongoing risk of steelhead fry predation by hatchery-released coho smolts in the Yakima Basin appears to be low.

#### 3.7.1.3.3.2 Bull Trout

As discussed above, Pearsons and Temple (2007) evaluated the impacts of coho salmon reintroduction in the Yakima Basin on several trout species, including bull trout. They found very little if any spatial overlap of coho and bull trout in Yakima River tributaries, including those in the upper Yakima River (e.g., North Fork Teanaway River at Jack Creek). Further, they did not capture any coho (or Chinook salmon) during electrofishing of areas where bull trout were present (Pearsons and Temple 2007).

Although it is possible that some overlap occurred at times and places when/where sampling did not occur, substantial overlap was unlikely because sampled areas were selected based on the likelihood of overlap. Pearsons and Temple (2007) speculated that some overlap between coho and bull trout is likely in unsampled areas, including the Naches Subbasin. However, because bull trout spawn in headwater tributaries, typically well upstream of coho spawning areas, the potential overlap of bull trout juveniles and coho salmon large enough to prey on them is likely very low. Salmon typically occupy streams of lower gradient, lower elevation, and warmer water temperatures than bull trout (Glova 1984; Dunham and Rieman 1999). Predation on bull trout juveniles by released coho salmon juveniles is therefore likely low.

### 3.7.1.3.4 Genetic Interactions

Hatchery fish pose a threat to natural population rebuilding and recovery when they interbreed with fish from natural populations (NMFS 2013). Native Yakima River coho were extirpated from the basin in the early 1980s, but reintroduction efforts began in 1983 using broodstock from the Little White Salmon Hatchery; the YKFP coho project began in 1996 using broodstock from the Eagle Creek National Fish Hatchery (Yakama Nation 2012a). Broodstock for the ongoing coho reintroduction program are now adults returning to the Yakima River that are largely naturally-produced fish of hatchery ancestry. There are no differences between the hatchery and natural coho populations in the Yakima Basin because the natural population was extirpated and the current hatchery population is being used to develop the natural stock.

With regard to ESA-listed steelhead and bull trout, coho do not interbreed with either species and, therefore, neither species is currently susceptible to genetic interactions from the ongoing coho reintroduction program.

#### 3.7.1.3.5 Beneficial Effects

Hatchery-origin as well as natural-origin fish contribute marine-derived nutrients stored in their bodies to freshwater and terrestrial ecosystems (Bilby et al. 1996). This transfer of marine-derived nutrients is occurring as a result of the coho reintroduction program. Another positive benefit may come from the disturbance of gravels by spawning adult coho (and other salmonids), which removes fine materials from the riverbed and increases flow exchange (NMFS 2013; Montgomery et al. 1996). The act of gravel churning by spawning coho salmon, the last spawners of the year in the Yakima Basin, may also bring macroinvertebrates to the surface and thereby increase the availability of this juvenile salmonid food source (Newsome 2016b). Finally, in areas where they overlap, juvenile coho might also provide another prey source for larger trout and sculpin (BPA 2007).

### 3.7.1.4 Monitoring, Research, and Evaluation Activities

MR&E activities related to the Yakama Nation's coho reintroduction program are ongoing as part of the overall YKFP project and were included in the overall YKFP EIS (BPA 1996). These MR&E activities have the potential to affect nontarget fish, including ESA-listed steelhead and bull trout. However, the level of impact depends on the activity. For example, mobile adults observed during spawning ground surveys are not negatively impacted–the adults temporarily move away from the observers. Whereas, juvenile trapping and density surveys that require electroshocking temporarily impact small fish, resulting in some limited injury and mortality of nontarget species.

Impacts on nontarget fish associated with MR&E activities are considered part of the baseline for fish resources. Ongoing MR&E activities and a summary of potential ongoing effects on fish are summarized below.

- **Coho Spawning Surveys.** Redd surveys and activities associated with tracking radio-tagged adult coho salmon are conducted on an annual basis in various tributaries of the basin, but because coho do not spawn at the same time as most fish, there are typically no impacts on spawning habitat or salmonid eggs. Coho and bull trout spawning may overlap temporally, but do not typically overlap spatially. The presence of researchers in any stream channel may displace fish from occupied habitats, but this impact is temporary. All surveys are conducted in a manner that avoids touching, capturing, or intentionally displacing fish.
- **Screw Trapping.** The Yakama Nation and WDFW operate several screw traps in the Yakima Basin to monitor outmigration of coho smolts. Nontarget fish are sometimes incidentally collected in these traps and are subject to stress due to collection and holding. These traps, however, are monitored every 24 hours and nontarget fish are released with minimal handling.
- **Tributary Juvenile Monitoring.** The Yakama Nation and WDFW snorkel various waterbodies to observe coho in reintroduction streams. Snorkelers merely observe fish and do not touch, capture, or intentionally displace individuals from occupied habitat. Therefore, impacts to fish due to this action are minimal.

  Although snorkeling is preferred for tributary monitoring, an electrofisher is sometimes used during these surveys. If electrofishing is conducted, nontarget fish

can be subjected to stress, and in the most severe case, mortality. However, fish are held in oxygenated buckets for minimal times, and released back into waterbodies soon after they are collected, which reduces stress. This measure, as well as the requirement that only experienced biologists operate the electrofishers, minimizes the risk to fish during these surveys. Further, operational protocols developed by the YKFP call for ESA-listed fish (e.g., bull trout) to immediately be released unharmed back to the river if encountered during electrofishing surveys anywhere in the basin.

- **Adult Coho Release.** Ongoing adult coho release into seeding tributaries is also an MR&E activity. The release of adult coho into tributaries for natural spawning may displace fish on the spawning grounds; however, aside from bull trout, salmonids do not spawn at the same time as coho. Coho are not currently released into bull trout spawning areas. Coho adults do not prey on fish during spawning and die shortly after; therefore, impacts to nontarget fish are negligible.

Impacts on ESA-listed species or critical habitat from the interrelated MR&E action have been previously authorized under Sections 7 and 10 of the ESA (NMFS 2013; USFWS 2007a; USFWS 2016a). As the coho reintroduction project continues in future phases, MR&E activities will be subject to future ESA consultations.

#### 3.7.1.5 Adult Collection Activities

As part of the overall YKFP program, spring Chinook salmon are currently collected for broodstock at Roza Dam and both spring Chinook and coho are collected at Prosser Dam. Coho adults could also be collected at Cowiche and Wapatox in the future. These ongoing adult collection activities are part of the baseline for fish resources. Nontarget species, including ESA-listed bull trout and steelhead, are occasionally encountered during adult broodstock collection activities at these sites. Potential impacts to nontarget fish associated with ongoing coho broodstock collection include potential stress during handling at fishways; lethal impacts are not common. Broodstock sorting and holding also results in minor migration delays to nontarget fish; however, long-term impacts on fish viability do not likely occur. All nontarget fish intercepted during broodstock collection at Cowiche and Roza Dams are immediately passed back to the river to minimize stress and potential mortality.

#### 3.7.1.6 Climate Change

Climate change has negatively impacted aquatic habitats, including those that are designated as critical habitat for ESA-listed fish in the Pacific Northwest (ISAB 2007). East of the Cascades, the primary climate-related concerns are an increased likelihood for wildfires, reduced availability of habitat for salmon and steelhead due to warming stream temperatures and altered flow regimes, and the long-term impact of reduced water supply on the agricultural industry (Lawler and Mathias 2007, Littell et al. 2009).

Climate change models indicate significant changes in runoff in the Yakima River basin. Modeling conducted by Vano et al. (2009) suggests that, as the 21$^{st}$ Century progresses, basin transitions to earlier and reduced spring snowmelt would increase the curtailment of water deliveries, especially to junior water right holders. The projected increased air temperatures would cause some precipitation to fall as rain instead of snow, which would increase winter and early spring runoff and reduce the volume of runoff from snowpack

that occurs in the late spring and early summer. The net effect is anticipated to be a shift in the peak runoff period to earlier in the season, with a corresponding decrease in spring and summer (projected at 12 to 71 percent of existing runoff) and increase in fall and winter runoff (projected at an increase of 4 to 74 percent of existing runoff) (Reclamation 2015b).

## 3.7.2 Environmental Consequences of Proposed Action

The potential impacts of the alternatives on fish and fish habitat fall into three general categories:

- Facility impacts, caused by construction of the MRS Hatchery.
- Impacts caused by operation and maintenance of the MRS Hatchery and acclimation facilities.
- Ecological impacts resulting from the acclimation and release of MRS Hatchery coho into Yakima Basin streams, resulting in released coho interacting with fish already present in and outside of the area. Ongoing MR&E activities associated with ecological interactions are also included in this category.

Each of these types of effects is described below relative to each alternative.

### 3.7.2.1 MRS Hatchery Construction

This section analyzes potential changes to riparian and riverine habitats that are directly related to the construction/installation and maintenance of facility-related structures, including mobile acclimation sites.

Under the Proposed Action, a new hatchery would be constructed at the Holmes Ranch property (Figure 2.2-1). Construction of the MRS Hatchery would include work in and adjacent to the canal and bypass. To minimize impacts on fish, BPA would require all contractors to adhere to applicable conservation measures of the Habitat Improvement Program III BA (BPA 2012) for general construction and in-water work. These measures include sedimentation and turbidity minimization measures and operational measures during construction to minimize impacts on aquatic habitat and species. Given the short duration of construction activities and the mitigation measures implemented as part of the Proposed Action (Section 3.7.2.4), construction impacts on fish and their habitat would be low.

The effects of construction activities on fish habitat and fish are described below.

#### 3.7.2.1.1 Upland and Riparian Actions

Construction and grading activities would disturb upland areas at the site. The majority of construction would occur in areas that are either previously disturbed or dominated by grasses, and have limited riparian vegetation (shrubs and trees adjacent to waterbodies). Construction would increase the impervious surface area and could result in increased or rerouted runoff and sediment carried into the canal or bypass, which could disturb or displace fish, or impair their ability to feed. However, most construction activity would occur away from the canal or bypass and would be managed by the use of erosion control devices, removal of the least amount of vegetation possible, and revegetation of

disturbed areas with native grasses, shrubs, and trees following disturbance (see Section 3.7.2.4). Impacts on fish or their habitat are anticipated to be localized to the hatchery site and short term and would thus be low. Demolition of existing upland structures (e.g., existing residence) would not result in any effects on fish or other aquatic resources.

Construction and grading activities at the proposed intake and outfall locations on the bypass would result in the removal of some riparian vegetation. The riparian corridor at these locations contains grasses, willows, black cottonwood, quaking aspen, and other deciduous trees. While these species provide shade in the spring and summer, vegetation gaps are common along the narrow (about 25 feet wide) riparian corridor. Loss of riparian vegetation would result in a minor decrease in local nutrient recruitment to adjacent waterbodies; however, this loss would be low on a watershed scale and impacts on fish would be low.

The removal of future large woody debris is anticipated to be low as recruitment trees for large woody debris are sparse at the intake site. Any existing large woody debris that interferes with facility installation would be relocated either upstream or downstream of the construction area, but would not be removed from the bypass channel.

#### 3.7.2.1.2 In-Channel Actions

In-water construction may alter water quality and negatively impact fish that are present near the activity. Impacts may range from behavioral modifications to injury or mortality of eggs or juvenile and adult fish. In-water construction can also degrade habitat function and reduce or block access to spawning and rearing habitats.

As described in Chapter 2, construction of the proposed MRS Hatchery and associated infrastructure would require the following in-water work in the canal, bypass, and historic side channel:

- Canal
    - Conversion of trash rack on canal diversion HDPE structure with fiberglass reinforcement to minimize the formation of ice.
        - This would occur during the in-water work period and dewatering would not be necessary.
    - Modifications to the canal fish screening facility, including a low-lying concrete sill and two stoplog bays.
- Bypass
    - Addition of MRS Hatchery intake and two sheetpile sills to backwater the intake screen.
- Side Channel
    - Addition of the MRS Hatchery outfall.
    - Addition of the fire suppression intake.

- Wehl Ditch Conversion
    - The existing Wehl irrigation ditch that bisects the property would be partly replaced with a covered culvert. Because the ditch is non-fish bearing and work would occur when it is not operating, no impacts on fish habitat would occur.

As described in Chapter 2, although the recommended in-water work window for Yakima River tributaries is July 15–August 31, an alternate low-flow work window would be required because the canal diversion must operate to provide irrigation water from April through October. Considering this and onsite conditions, the proposed in-water work period for both the canal and the bypass would be November–December.

This work window has been approved by the USFWS (Halupka 2016b) and NMFS (Turner 2016) through the ESA Section 7 consultation for this project.

During the November–December in-water construction period, fish that inhabit the canal or bypass may be disturbed or displaced. Salmonids that may be present include coho and likely few juvenile *O. mykiss* and spring Chinook salmon (NMFS 2013). Lamprey ammocoetes may also be present in locations with suitable substrate (silt and sand). Resident fish such as sculpin would likely be present in both the canal and bypass.

The November–December in-water work window would overlap with the coho spawning period. Because coho are known to spawn in the bypass reach near the proposed intake, a temporary picket fish barrier would be erected across the mouth of the channel downstream of in-water work sites prior to construction. This would prevent adults from moving up the channel and spawning. Therefore, coho spawning habitat would be slightly reduced during the in-water construction year in the bypass, requiring coho to find other suitable habitat in the general project area. However, this approach would avoid direct, negative impacts on incubating redds near the in-water construction sites. The canal is not used by spawning coho, and the diversion would be closed in November, prohibiting fish access into the canal.

All seepage water pumped from the in-water work areas would be routed to settling basins prior to discharge. For this reason, no impacts on water quality and fish habitat downstream of the in-water construction sites are anticipated.

#### 3.7.2.1.2.1 Fish Salvage

In-water work in both the canal and bypass is proposed to occur in the fall/early winter when the diversion is not operating. Despite the lack of surface water, groundwater seepage provides year-round flow in these channels, and therefore provides some fish habitat. Thus, dewatering of the in-water work areas would be necessary to isolate the construction areas. To facilitate dewatering, gravel- or water-filled supersack cofferdams would be placed in each channel to isolate work areas from active flow, thus allowing work to occur “in the dry.”

During cofferdam placement, the presence of construction workers may displace some fish to sites upstream or downstream of the work area. However, some fish would likely remain in the work area, particularly in the bypass. Therefore, prior to dewatering of in-water construction areas, qualified fish biologists would remove all remaining fish from areas behind the cofferdams. Remaining fish would be flushed from the area behind the cofferdams, typically by seining or herding and, if necessary, by use of a conventional

backpack electrofisher (or other methods as determined by USFWS, NMFS, and/or WDFW). If capture is necessary, fish would be placed into a 5-gallon bucket using small dip-nets. Captured fish would be released back into the stream channel a safe distance upstream of the work area.

During the proposed in-water construction period (November–December) rearing coho and resident fish are the most likely species to be encountered during fish salvage activities. Salvage efforts would temporarily displace fish from occupied habitats and would stress fish during salvage and for a short duration after fish are relocated to unaffected reaches. Little, if any, direct mortality is anticipated from handling of fish during salvage operations. As previously discussed, a picket barrier would prohibit adult coho from entering the bypass during the construction period.

#### 3.7.2.1.2.2 Displacement and Disturbance

Following in-water isolation for the November-December in-water work period, the quantity of available habitat for fish that are present in the canal or bypass would be temporarily reduced due to the presence of cofferdams. This habitat reduction would be minor and limited to the period of construction. Further, affected habitat represents a small fraction of available habitat in the study area for each waterbody. Due to the low quality of habitat at the canal's fish screen facility, impacts on fish are expected to be negligible. At the intake location on the bypass, rearing juvenile salmonids and other resident fish would be temporarily displaced from about 600 square feet of habitat (assuming a 50-foot construction reach). In addition, for the construction year, the availability of spawning habitat for adult coho would be reduced because the temporary upstream passage barrier would limit access to the lower portions of the bypass. The single season duration of this impact on spawning habitat would minimize the effect on coho spawning productivity in the bypass, and impacts would be low.

### 3.7.2.1.3 Physical Habitat Alteration

The physical disturbance of in-water habitat has the potential to affect fish spawning, feeding, and rearing. At the canal's fish screening facility, habitat is of low quality and the proposed concrete sill would not impact features such as holding pools, spawning habitat, migratory pathways, or rearing areas. Therefore, no measurable impacts on fish or fish habitat would occur. At the bypass intake location, the channel-spanning sills would permanently remove a minor amount of habitat that is currently used for coho spawning, incubation, and rearing. Ample spawning and rearing habitat would remain available both upstream and downstream of this structure. Salmonids would continue to be able to access this habitat after intake construction because the concrete sills would be passable to all life stages.

Sedimentation and turbidity would occur during the placement and removal of cofferdams. However, due to the low-flow conditions in both waterbodies during the November-December in-water work period because groundwater is the only source of flow in the channels, measurable impacts on fish, including gills damage, foraging disruption, or habitat displacement are unlikely. Construction-related sedimentation impacts on fish in the canal and bypass would be temporary and daily monitoring for turbidity during in-water work would ensure that construction impacts on the aquatic environment would be low. Considering that any sedimentation generated during in-

stream work would be a temporary rather than a chronic condition, and that most fish can avoid sediment plumes that would likely be distributed over relatively short distances, the potential for effects to fish species due to construction-related sediment and turbidity would be low. At the bypass intake location, cobbles and gravels would be restored as close to the original location as possible following in-water construction.

#### 3.7.2.1.4 Prey Species

Benthic macroinvertebrates are an important component in the diet of juvenile salmonids. Benthic invertebrates within the in-water work areas isolated by cofferdams would be lost during streambed and bank excavation. In addition, increased turbidity and sedimentation downstream of the in-water work areas are likely to negatively affect benthic invertebrates through alteration of water quality and substrate conditions. Benthic macroinvertebrate communities within the areas isolated by cofferdams and areas immediately downstream are expected to recolonize rapidly following construction. Full recovery of benthic invertebrate communities usually requires 6 months to 1 year after in-water work associated with excavation (Tsui and McCart 1981; Young and Mackie 1991; Vinikour and Schubert 1987; Anderson et al. 1998). Because of the small amount of habitat that would be affected by instream construction and isolation in the canal and bypass, low to no effects on the growth or survival of fish, particularly juvenile salmonids, are anticipated.

#### 3.7.2.1.5 Release of Construction Fluids

There is some risk to rearing fish associated with potential accidental releases of fuel or oil into the canal or bypass from equipment and machinery used during in-water activities. Site-specific pollution control measures would be developed for construction of the MRS Hatchery as part of the National Pollution Discharge and Elimination System (NPDES) construction general permit. In the event of a spill, fish could be adversely affected by released chemicals or contaminants; effects could range from death to behavioral changes resulting in abandonment of the area of the spill. However, mitigation measures such as storing fuel away from waterbodies, and inspecting equipment for fuel leaks prior to use near waterbodies would minimize this risk. Further, as described in Section 3.7.2.4, spill prevention plans would be developed for the project and implemented as required.

#### 3.7.2.1.6 Mobile Acclimation Facility Set Up and Removal

As described in Chapter 2, proposed mobile acclimation units would be similar to those that have been used at Toppenish and Easton Creeks. Each unit would be set up upland of the ordinary high water line in upland areas that have existing disturbance (such as spur roads). The Yakama Nation would not place acclimation units in sensitive areas (i.e., wetlands) or remove riparian vegetation, including trees, to set up the facilities. Little, if any, grading and site preparation would be required, and no mechanical grading would occur. Upland work required to set up the mobile acclimation units would therefore not impact aquatic habitats or fish.

A screened surface water pump with aboveground piping would be set up to deliver surface water from subject creeks to up to two tanks at each location. Water would be returned to the creek using a single outlet hose. The surface water intake and outlet

would be removed following each acclimation season. Installation of the intake and outlet would not require any disturbance to the riverbank or bed, and would be completed in less than a few hours. Therefore, due to the short duration of in-water work and the limited area of potential impact, there would be a low impact on fish during these activities. If present along the stream margins during surface water intake or outlet installation (or removal), fish may be temporarily displaced from holding habitats, but would return to the area immediately after human activity has ceased. Following the acclimation season, if desired by the landowner, the Yakama Nation would remove each unit from the riverbank. Removal efforts would have low impact on fish or aquatic habitats.

#### 3.7.2.1.7 Construction Impacts on ESA Resources

##### 3.7.2.1.7.1 MRS Hatchery

During the November–December in-water construction period, fish that inhabit the canal or bypass may be disturbed or displaced. ESA-listed MCR steelhead are highly unlikely to be encountered in the dewatered canal (Turner 2016), and rearing bull trout would not be present in the canal or bypass. In the unlikely event that juvenile steelhead are present at either in-water work location, construction of in-water elements for the MRS Hatchery may temporarily displace individuals from habitat. No lethal impacts are anticipated, and individuals would have access to ample suitable habitat for rearing. Adult steelhead should not be affected by construction of the MRS Hatchery. Because the canal and bypass are not designated as critical habitat for bull trout or MCR steelhead (Halupka 2016a; Turner 2016), there would be no construction-related impacts on designated critical habitat. During the proposed in-water work window (November-December), each waterbody contains about 3-5 cfs of groundwater seepage. The low flow and low velocity conditions related to this seepage are unlikely to carry construction-related sedimentation from installation/removal of cofferdams to critical habitat in the mainstem Yakima River.

##### 3.7.2.1.7.2 Mobile Acclimation Facilities

Impacts on ESA-listed fish or their designated critical habitat would be low during set up of the mobile acclimation units and associated surface water delivery/return systems.

### 3.7.2.2 MRS Hatchery Operation and Maintenance

The primary potential impact of proposed MRS Hatchery operations would be anticipated to be related to the diversion and return of surface water for rearing coho in the hatchery. This action would not affect the spatial distribution of fish, including ESA-listed steelhead and bull trout.

The following MRS Hatchery operations could impact fish resources in the project study area:

- Diversion of up to 10 cfs from Yakima River at Reclamation's canal diversion from November through March.
- Operation of a new surface water diversion in the bypass.
- Groundwater use.

- Discharge of hatchery effluent to the Yakima River.
- Operation of intake for fire suppression.
- Stormwater runoff from the site.
- Routine maintenance of in-water project elements (e.g., intake and outfall).

#### 3.7.2.2.1 Surface Water Diversion

##### 3.7.2.2.1.1 New Cascade Canal Diversion

As part of proposed MRS Hatchery operations, from November through March up to 10 cfs would be diverted from the Yakima River at the New Cascade canal diversion. Diverted surface water would be returned to the Yakima River side channel, and eventually flow back into the mainstem Yakima River approximately 6,900 feet downstream of the diversion. Based on flow data from Reclamation's Horlick gage (see Section 3.7.1.1), the 10 cfs represents less than 2 percent of average Yakima River flows during the lowest flow period of proposed use (February). For this reason, measurable impacts on instream flows and temperatures within the diversion reach are unlikely, and impacts on fish in the mainstem Yakima River would be low.

The Proposed Action would not change current operations of the canal diversion during the irrigation season (April–October) as existing diversions would continue.

##### 3.7.2.2.1.2 New Cascade Bypass

The proposed bypass intake would divert 6 to 7 cfs of surface water to the MRS Hatchery from the bypass from November through March when irrigation water flows are shut off. The remaining 3 to 4 cfs of the 10 cfs surface water right would continue to flow through the bypass and side channel, supplementing groundwater seepage and effectively increasing instream flows for fish. During the irrigation season (April–October), the bypass intake would be shut off because the hatchery would not have a surface water right for those months and would operate solely on groundwater. Based on the analysis presented in Section 3.5.3, there would be no impact on baseline aquatic habitat conditions in the bypass or historic side channel. No impact is anticipated from groundwater use during the irrigation season.

The proposed bypass intake structure would be screened to meet NMFS criteria to prevent the entrainment or impingement of fish, particularly juvenile salmonids. A mechanical brush would periodically clean the screen. This action could startle and displace fish if present in the immediate vicinity of the screen structure. The two proposed concrete intake sills would be designed to accommodate upstream and downstream passage for all salmonid life stages. Therefore, operation of the bypass diversion would not impede passage in the channel and the impacts on fish would be low. The fire suppression intake would be screened to meet NMFS criteria. Operation of the fire suppression system would not contribute impacts on fish.

#### 3.7.2.2.2 Groundwater Use

Groundwater would be used to support MRS Hatchery operations (see discussion in Section 3.5). It would be discharged to the historic side channel after use in the hatchery. This discharge location would mitigate for any reduction in natural seepage of water to the historic side channel from reduced groundwater elevations. Therefore, groundwater use would result in low impacts on instream flow volumes and available fish habitat in the bypass or side channel.

#### 3.7.2.2.3 Effluent Releases

There are no known water quality violations on the Yakima River in the vicinity of the proposed MRS Hatchery; the canal is 303(d) listed for pH (listing 50704; Ecology 2012a). As described in Chapter 2, a clarifier would remove a large percentage of aquaculture pollutants from the hatchery drain system prior to discharge through the proposed hatchery outfall. Effluent from the proposed MRS Hatchery has the potential to alter water temperature, pH, suspended solids, ammonia, organic nitrogen, total phosphorus, and chemical oxygen demand in the Yakima River mixing zone (within about 300 feet of the MRS Hatchery outfall). If not properly treated, excessive amounts of discharged substances could combine with other conditions to impact the aquatic environment. For example, large loads of discharged phosphorous may contribute to eutrophication, which is an excessive increase in nutrient loading that can result in dense algal growth and a reduction in dissolved oxygen, which may adversely impact fish. Water quality changes due to discharges from the hatchery could disrupt the behavior and distribution of individual fish immediately adjacent to and downstream of the outfall structure; impacts on fish would be low.

According to NMFS (1999), although “the level of impact [of hatchery effluent] or the exact effect on fish survival is unknown, it is assumed to be very small and is probably localized at outfall areas as effluent is rapidly diluted in the receiving streams and rivers.” The clarifier would settle solids and cleaning waste from the rearing units to reduce potential impacts.

Formalin is the only chemical that may be used to treat fish in the MRS Hatchery. Formalin would be added to the water in the adult holding ponds as a disinfectant to control the growth of fungus on the bodies and gills of adults, which could lead to increased mortality. It may also be used on incubating eggs. Use of formalin is regulated under EPA’s Effluent Limitations Guidelines and New Source Performance Standards for the concentrated Aquatic Animal Production Point Source category, which establishes narrative limitations for aquaculture treatment chemicals. The Yakama Nation would monitor the discharges in compliance with the NPDES General Permit and ensure that the facility complies with the NPDES discharge limitation as stipulated in the permit. In consideration of this, formalin use would have for a low impact on fish and their habitat in the Yakima Basin.

Overall, the water use for MRS Hatchery fish holding and rearing is not anticipated to result in a measureable change in the water quality of the Yakima River (see Section 3.5.3 for analysis of effluent). By complying with acceptable effluent discharge values in accordance with the 2015 Upland Fin-Fish Hatching and Rearing NPDES General Permit (Ecology 2015) and BMPs, the impact of effluent on receiving waters, the aquatic

environment, and fish is expected to be low. Water quality changes due to discharges from the facilities could disrupt the behavior and distribution of individual fish immediately adjacent to and downstream of the outfall structure, but the overall impact is expected to be low. NMFS (2013) stated that existing Yakima River hatchery diversions and their discharges pose only a negligible effect on designated critical habitat in the basin. Further, the USFWS (2007a) stated that the lack of water quality violations in the reaches of the Yakima River downstream of existing YKFP hatchery facilities in the basin suggests that hatchery effluent from newer facilities does not impair fish habitat.

If MRS Hatchery production shifts to an "all smolt" production program, additional effluent would be produced. Potential effects on aquatic habitat from higher pollutant loadings would likely be subject to pollutant discharge monitoring requirements of the 2015 NPDES Upland Fin-Fish Hatching and Rearing General Permit for the State of Washington, administered by Ecology (see Section 3.5.2 for a discussion of water quality impacts).

#### 3.7.2.2.4 Site Runoff

The MRS Hatchery has been designed to route stormwater to designated infiltration areas, and the majority of the site would be graded to slope toward vegetative buffers for infiltration. Runoff from areas that do not infiltrate would be routed to discharge into an existing drainage channel via a culvert under Klocke Road. Fish are not known to occupy this drainage (Newsome 2016b). However, in the unlikely event that fish are present, because the hatchery runoff would not contain high amounts of copper and zinc (known to be toxic to fish), no impacts on aquatic habitat are anticipated from the discharge of filtered stormwater runoff. Copper and zinc, shed from automotive brake pads, are associated with stormwater runoff from heavily used roads and highways. Such pollutants are unlikely to be associated with stormwater discharged from the MRS Hatchery.

#### 3.7.2.2.5 MRS Hatchery Maintenance

Occasional maintenance may be necessary throughout the life of the MRS Hatchery to remove debris from screens/outfall bars, check or replace stoplogs at the New Cascade Canal fish screen and check or perform minor repairs on sills/screens at the proposed Bypass intake. Minor replacement of armoring adjacent to the new intake and outfall structures may be necessary. Periodic dewatering of infrastructure could be required to conduct inspections or minor maintenance for the life of the MRS Hatchery. To minimize impacts on fish, all in-water maintenance activities would occur during the standard in-water work window for Yakima River tributaries, July 15–August 31. With implementation of the measures described in Section 3.7.2.4, impacts on fish and their habitat would be low.

#### 3.7.2.2.6 Mobile Acclimation Facility Operations

As an extension of MRS Hatchery operations, a portion of the coho smolts reared at the hatchery would be transported to mobile acclimation sites throughout the Yakima Basin (see Chapter 2). The operation of these acclimation sites would result in similar effects to aquatic habitat, and fish species, as those from existing mobile acclimation sites. Since 2007, the YKFP has been using small-scale mobile acclimation units to reintroduce coho

smolts into tributaries of the Naches and upper Yakima Rivers. Tributaries selected for acclimation can support coho spawning and rearing and were historically used by native coho.

Potential effects on aquatic habitat and fish species would be low and include: temporary disturbance, minor flow reductions associated with surface water diversions to operate the mobile acclimation units, and minor water quality degradation from effluent return to the respective waterbodies.

#### 3.7.2.2.6.1 Surface Water Diversion

The Proposed Action would include acclimation and release of some coho smolts from mobile acclimation units in the spring. The surface water diversion for mobile acclimation units would require temporary (5-year) use permits from Ecology. The diversions would not affect the rights of any other water users. All pertinent permits would be acquired by the Yakama Nation prior to this activity.

As described in Chapter 2 (Section 2.2.5.2), mobile acclimation units would continue to be used on Cowiche and Ahtanum Creeks, and, in the near term, a new one would be established on Williams Creek. In the future, acclimation units could be established on other tributaries (Newsome 2016b). Acclimation tanks would use up to 90 gallons per minute (0.20 cfs) of surface water and the intake pumps would be screened to NMFS criteria for the protection of juvenile salmon. Diverted surface water would be returned to the subject tributary stream a short distance, typically about 50 feet, from the intake. Due to this limited diversion reach, potential effects on fish and their habitat would be low because only a small quantity of water would be removed for a short duration (about 4-6 weeks) during high flow periods in the spring. For these same reasons, the spatial distribution of fish rearing in the vicinity of the intake and outfall hoses is unlikely to be affected by operation of the mobile acclimation units.

#### 3.7.2.2.6.2 Effluent Releases and Water Quality

The discharge of fish wastes from mobile acclimation units may have a low impact on water quality. However, the number of fish in each acclimation unit (10,000 smolts for each of two to three tanks per site) would be low, and the fish would be present for only 4 to 6 weeks in the spring when flows are high. The proposed mobile acclimation units would not need NPDES permits because rearing levels would be well below permit minimums for upland fin-fish rearing. At the request of Ecology, the Yakama Nation collected effluent samples for 2 years at the existing Cowiche Creek mobile acclimation unit under for the YKFP and for 1 year at the Rattlesnake Creek mobile acclimation unit and the results showed no impacts on water quality (NMFS 2013; Yakama Nation 2016, unpublished data). Similarly low effects on water quality would be expected at any new acclimation sites (NMFS 2013).

Impacts on surface water temperature are unlikely to result from the short-term diversion of 0.2 cfs (90 gallons per minute) of water from creeks proposed for placement of mobile acclimation units (see Table 2.3-1). The diversion would occur during spring runoff (April to mid-May) when water temperatures are naturally low and flows are typically high; minimum instream flows would be maintained due to the limited (less than 50 feet, typically) diversion reach. The diversion would have no impact on fish passage and would be screened to prevent fish from becoming entrained.

#### 3.7.2.2.7 Operational Impacts on ESA Resources

##### 3.7.2.2.7.1 MRS Hatchery

ESA-listed bull trout are unlikely to be present in the bypass at any time of the year. ESA-listed steelhead juveniles may be present, though very few *O. mykiss* have been collected in the existing Holmes acclimation ponds in the bypass (NMFS 2013). The proposed MRS Hatchery would use groundwater during the irrigation season that would be returned to the historic side channel. The hatchery would not divert water from the bypass from April through October and would therefore not impact ESA fish resources, including designated critical habitat for bull trout and steelhead in the side channel. On completion of construction, operation of the project would result in an increase in flow in the side channel during the November–March operational period. This flow increase would maintain instream habitat, and enhance the quantity of side channel habitat available in the side channel.

From November through March, diversion of Yakima River water is unlikely to result in impacts to the mainstem Yakima River, which is designated as critical habitat for both species. However, during this period, if ESA-listed juveniles enter the canal diversion, they would be delayed from their mainstem residency or migration until they make their way back to the Yakima River side channel. Impacts from migratory delay would be low.

From November through March, 10 cfs of surface water would be routed into the bypass. Compared to existing conditions, this 10 cfs would supplement groundwater to maintain instream flows for fish upstream of the bypass intake; 3-4 cfs would remain in the bypass to flow past the intake. If ESA-listed fish resources are present in the bypass, operational diversion of surface water in the bypass would therefore not interfere with usage of the channel for rearing or passage. Thus, the operation of the proposed MRS Hatchery would have no impacts on designated critical habitat for both ESA-listed species.

##### 3.7.2.2.7.2 Acclimation Facilities

While operation of acclimation units may reduce flows to a small portion of each subject creek, acclimation activities would take place during the winter and spring when stream flows are relatively high. Therefore, surface water diversion would not cause dewatering of any reaches, and impacts on bull trout and their critical habitat, if any, would likely be low (USFWS 2007a). Similarly, NMFS (2013) stated that, although acclimation facilities can reduce flow in small sections of the stream, due to the short duration of operations during high flow periods, no impacts on ESA-listed steelhead distribution would occur. Similarly low effects on water quality are expected at any new acclimation sites as discussed above in Section 2.2.5.2 (NMFS 2013). No chemicals or prophylactic drug treatments would be used on juveniles during acclimation. Therefore, no impacts on water quality or fish-rearing habitat in adjacent streams are expected from the mobile acclimation units, including impacts on critical habitat for ESA-listed steelhead and bull trout.

In addition to mobile acclimation facilities, several existing, permanent facilities would be used to acclimate MRS coho smolts. These include the Yakima River ponds at Boone and Easton, Lost and Stiles in the Naches River, and Jack Creek (Teanaway River tributary). Impacts from the use of these sites are ongoing and include temporary dewatering during use. Impacts to water usage from acclimating MRS coho smolts would

be the same as presently occurring with smolts from other hatcheries. Smolts from the MRS Hatchery would acclimate in place of smolts from existing out-of-basin hatcheries. Impacts on ESA-listed fish include possible juvenile interactions (see Appendix A for bull trout impact summary).

#### 3.7.2.3 Acclimation and Release

This section addresses potential ecological interactions between MRS Hatchery coho juveniles released into the Yakima Basin and nontarget fish species, including ESA-listed steelhead and bull trout. Potential program impacts on nontarget species would be minimized by transitioning to local broodstock and operating the program consistent with HSRG principles (Yakama Nation 2012a).

The proposed hatchery would produce and release coho parr and smolts as part of the overall YKFP Phase 3 coho reintroduction program. Numbers of hatchery coho released in the Yakima Basin would not increase under the Proposed Action compared to the current annual release totals for the overall coho reintroduction program (Table 2.3-1). Proposed MRS Hatchery parr releases would replace approximately half of the existing smolt releases so that the total number of hatchery coho released per year would be about one million fish.

As part of Phase 2 of the coho reintroduction project initiated in 2007, the YKFP has direct-released coho parr into several sites within a number of tributaries throughout the Upper Yakima, Naches, and mid-Yakima River tributaries. In addition, Phase 2 initiated the use of mobile acclimation sites for the release of smolts in several tributaries throughout the basin, and continued the volitional release of smolts from mainstem, permanent acclimation sites. Coho parr and smolts produced at the MRS Hatchery would similarly be released into Yakima Basin tributaries, either through scatter-planting (parr) or volitional release with acclimation (smolts). The vast majority of ecological impacts associated with the release of coho reared at the proposed MRS Hatchery would be low and similar to ongoing impacts associated with the coho reintroduction program (see Chapter 2).

Although existing ecological interactions between released juvenile coho and nontarget fish species are considered part of the baseline (Section 3.7.1.3), this section considers the following changes to existing release protocols that are proposed under MRS Hatchery operations and how they might impact ecological interactions compared to baseline conditions:

- **Increase in the Number of Parr Releases and Decrease in the Number of Smolt Releases.** Since 1998, juvenile coho releases have ranged from about 600,000 to just over 1 million fish (Table 2.3-1). Parr releases were initiated in 2007. The Proposed Action includes the release of in-basin juveniles reared at the MRS Hatchery and would substantially reduce (with the eventual goal to eliminate) out-of-basin coho transfers and releases so that the overall number of juvenile coho released into the Yakima Basin would not change. However, instead of an average of 27,000 parr released under current protocols, the Proposed Action would release 500,000 parr as part of the overall Yakima Basin coho program. The Proposed Action would also significantly reduce the number of coho smolt releases so that the

total release of coho juveniles (parr + smolt) would remain the same as existing releases (i.e., 1-1.3 million fish).

- **Acclimation and Release of MRS Hatchery-propagated Coho into New Tributaries.** Juvenile coho propagated at the MRS Hatchery would be released into tributaries that are not currently subject to coho releases, with a goal of seeding more habitats throughout the basin (see Table 2.3-1). Coho juveniles and adults are currently, and would under the proposed project, be outplanted into areas that are either not occupied by bull trout, or are downstream of areas where bull trout are documented to spawn and rear. However, there may be the potential for overlap with rearing juvenile coho and bull trout. Ongoing and future MR&E activities would continue to study potential species interactions, and releases would be adaptively managed if negative impacts on bull trout are observed.
- **Potential Adaptive Management of the Hatchery Coho Production Program.** As discussed in Chapter 2, although the overall net number of juvenile coho released is expected to remain relatively static (1-1.3 million juveniles), the Yakama Nation would plan to have the flexibility to adjust the proportions to ensure that releases meet objectives for survival or adult return. Over time, such adjustments may include releasing more smolts and less parr, or switching to a full smolt-release protocol, which is similar to existing protocols.

#### 3.7.2.3.1 Residualism

##### 3.7.2.3.1.1 Increase in Parr Releases into More Tributaries

As discussed in Section 3.7.1.3.1, residualism occurs when smolts released from a hatchery do not migrate to the ocean but rather set up permanent stream residence in the vicinity of the release point. This is an undesirable behavior because these non-migratory smolts may directly compete for food and space with natural origin fish.

Compared to existing conditions, the Proposed Action would release more MRS Hatchery-reared parr into the Yakima Basin. Because residualism is typically expressed when hatchery-released smolts fail to outmigrate to the ocean, it is a phenomenon more associated with smolt releases, not parr. Parr would be expected to reside in the vicinity of their release point for one year prior to outmigration; however, decreases in residualism, if any, would be low as rates of smolt coho residualism are already low.

##### 3.7.2.3.1.2 Adaptive Management–Shift Back to More Smolt Releases

If monitoring determines that the program would benefit from increased smolt releases, residualism may increase. However, as presented in Section 3.7.1.3, studies of coho residualism in the Yakima Basin indicate that only a small fraction of the hatchery juvenile releases tend to residualize (Murdock and Dunnigan 2001; Temple et al. 2012). Therefore, the potential for residualism associated with juvenile coho released from the MRS Hatchery is anticipated to be low.

#### 3.7.2.3.2 Competition

##### 3.7.2.3.2.1 Increase in Parr Releases into More Tributaries

Juvenile hatchery fish released en-masse may displace naturally produced rearing juveniles from occupied stream areas, leading to abandonment of advantageous feeding stations, or premature out-migration (Pearsons 1998). Under the Proposed Action, 500,000 parr would replace 500,000 of current smolt releases into various tributaries throughout the Yakima Basin. Compared to baseline conditions, the shift to more parr releases into more tributaries could result in increased competitive interactions between MRS Hatchery-reared coho parr and nontarget fish in the basin. Because parr spend more time in freshwater than smolts, and therefore more time interacting with nontarget fish, it is assumed that releasing parr poses more competitive risk than releasing smolts (Pearsons and Temple 2007). Therefore, an increase in parr releases would have the potential to increase competitive interactions between coho and nontarget species compared to baseline conditions. The potential for this impact is moderate.

However, as described in Section 3.7.1.3, Dunnigan (1999) found no evidence that released coho fry (smaller than parr) influenced the abundance or growth of rainbow/steelhead trout or cutthroat trout in the Naches River watershed and that spatial segregation, resource partitioning, and differences in diet minimize the potential for competition between coho and trout. As described in Chapter 2, as part of the ongoing MR&E program, the Yakama Nation and WDFW would continue to monitor competitive interactions between released coho juveniles and nontarget fish species.

##### 3.7.2.3.2.2 Adaptive Management–Shift Back to More Smolt Releases

Under the Proposed Action, after several years of parr releases, the Yakama Nation would determine if the parr release strategy is meeting program objectives for survival or adult return. If objectives are not being met, the Yakama Nation may adaptively manage the release strategy by replacing parr releases with smolts. As shown in Table 2.3-1, since 1997 the majority of coho juvenile releases in the Yakima Basin have been smolts. Therefore, reverting back to a smolt-dominated release strategy would result in competitive impacts on nontarget fish species that are similar to baseline conditions that have taken place over the last 20 years (see Section 3.7.1.3). Because substantially fewer parr would be released into the basin under this adaptive management scenario, there would be less potential for competition for food and space between nontarget fish and coho smolts that are actively outmigrating from the basin.

The ongoing practice of volitionally releasing hatchery smolts when they are ready to migrate reduces the potential for competition with naturally-occurring juvenile fish in freshwater (Steward and Bjornn 1990; California HSRG 2012). However, Pearsons and Temple (2007) argue that hatchery smolts can also interact with wild fish during downstream migration and some hatchery-released yearlings swim upstream of release locations into areas containing ESA-listed species (McMichael and Pearsons 1998). Still, if competition occurs between smolts and nontarget fish, it is likely of short duration and low impact because hatchery smolts generally move downstream quickly (Coutant and Whitney 2006).

#### 3.7.2.3.2.3 Steelhead

Temple et al. (2014) and others (Dunnigan 1999) suggest that increased natural coho production resulting from coho reintroduction in the Yakima Basin is unlikely to impact sensitive fish species (i.e., juvenile rainbow/steelhead trout) beyond acceptable levels in tributary systems (see Section 3.7.1.2; Pearsons and Temple 2007). Acceptable levels of impact on nontarget fish of concern (e.g., ESA-listed steelhead) are defined as significant changes in abundance, size structure, and distribution of nontarget fish when compared to pre-reintroduction conditions (Pearsons 1998; Temple and Pearsons 2012).

In the BiOp issued for the Yakima River Spring Chinook Salmon, Summer/Fall Chinook Salmon, and Coho Salmon Hatchery Programs, which included the in-basin rearing and release of coho under the Proposed Action, NMFS (2013) considered potential impacts on ESA-listed steelhead from juvenile and adult releases of coho into the Yakima Basin. NMFS (2013) concluded that although competitive interactions between juvenile *O. mykiss* and coho parr would increase compared to what would result from the release of smolts, impacts would be similar to those resulting from interactions with the progeny of naturally spawning hatchery coho. Further, coho parr releases have and would continue to focus on tributaries where steelhead are not present, or are present in low abundance (NMFS 2013). However, there may be potential for habitat overlap between coho and steelhead.

Where species overlap in occurrence, competition between juveniles of the same species would be expected to be greater than competition between different species (Species Interactions Working Group 1984). The effect of interspecies competition (between hatchery coho and juvenile *O. mykiss*) is expected to be low because the different species tend to have different habitat preferences (Species Interactions Working Group 1984). In a comparative study of the monthly diets of juvenile coho and steelhead in the same stream, Johnson and Ringler (1980) found that the diet overlap between juvenile coho and steelhead was not significant and that coho typically consumed drift fauna while steelhead were closely associated with benthic invertebrates.

Studies conducted by the Yakama Nation and WDFW have not found any detectable impacts on rainbow trout (the resident form of ESA-listed steelhead) from the coho reintroduction program, even though the abundance of coho has increased substantially in recent years (Temple et al. 2011; 2012). Similar results were observed in Taneum Creek where natural coho production has been established after 4 years of adult outplanting. Studies have shown that rainbow trout abundance, average size, and condition have not been negatively affected by coho production in the study area (Temple et al. 2011, 2012, 2014). NMFS (2013) determined that “these studies support the assertion that the juvenile *O. mykiss* in the Yakima River Basin are not being negatively impacted through competitive interactions with hatchery juveniles, and with the progeny of naturally spawning hatchery salmon.” Further, because coho salmon and steelhead spawn at different times (see Table 3.7-2) in the Yakima Basin, coho spawning would not interfere with winter/spring steelhead spawning, nor would coho spawning disturb steelhead redds.

NMFS (2013) acknowledged that WDFW and the Yakama Nation have been evaluating the potential for coho reintroduction actions to negatively impact fish that are not the target of the enhancement–in this case, ESA-listed steelhead in the Yakima River basin

(Temple et al. 2012). These MR&E projects are ongoing (see MR&E and Chapter 2.2.6) and are included as part of the Proposed Action for the MRS Hatchery (as well as the No Action alternative).

#### 3.7.2.3.2.4 Bull Trout

For the majority of the proposed program, coho parr releases have and would continue to focus on tributaries where bull trout are not present, or are present in low abundance (NMFS 2013). Coho are not released into high elevation streams because such habitats are not representative of preferred, historic habitat (Newsome 2016c). Given the limited, if any, spatial overlap between coho and bull trout (Pearsons and Temple 2007; see Section 3.7.1.3), competitive interactions between the species are likely low. Coho parr releases have and would continue to focus on tributaries where bull trout are not present or are at low abundance (NMFS 2013). Although bull trout and coho spawn at similar times, spawning areas are spatially separated, as bull trout spawn much higher in the tributaries than coho (BPA 2007). Therefore, potential competitive risks to bull trout from coho reared at the MRS Hatchery would be low. One exception to this is the North and South Forks of the Tieton River where the Yakama Nation proposes to outplant adult and release parr. These waterbodies provide bull trout spawning and rearing habitat; however, releases would occur downstream of known bull trout spawning areas. These releases would be monitored extensively given the potential overlap with rearing juveniles. Appendix A provides a breakdown of all release waterbodies relative to bull trout habitat and occurrence, and potential impacts on bull trout from these releases.

### 3.7.2.3.3 Predation

#### 3.7.2.3.3.1 Increase in Parr Releases into More Tributaries

Under the Proposed Action, 500,000 parr would replace 500,000 current smolt releases into various tributaries throughout the Yakima Basin. Compared to baseline conditions, the shift to more parr releases into more tributaries could initially reduce the potential for coho predation on nontarget fish because parr are small and primarily consume invertebrates. The risk of predation on other fish species by parr and by second generation coho spawned in the wild is low, also due to spatial and temporal separation between them and other salmonid species (BPA 2007). Further, in their freshwater stage, coho primarily feed on plankton and insects (NMFS 2016), including terrestrial drift and benthic aquatic invertebrates (Gonzales 2006; Dill et al. 1981; Johnson and Ringler 1980). However, as parr eventually grow and mature into smolts, the potential for predation of nontarget fish by coho smolts would be similar to baseline conditions.

#### 3.7.2.3.3.2 Adaptive Management–Shift Back to More Smolt Releases

If post-parr release monitoring indicates that a shift back to more smolt releases is likely to achieve optimal survival and return objectives, or if future drought conditions preclude summer parr releases, the release strategy would shift to an all-smolt release (700,000 smolts). The release of more smolts would increase the potential for predation on nontarget fish species. As presented in Section 3.7.1.3, however, past and ongoing predation studies indicate that predation on fish by released coho hatchery smolts is low. Therefore, any adaptive management of release protocols that results in a higher

proportion of released smolts is unlikely to impact predation of nontarget fish, and would be similar to baseline conditions.

#### 3.7.2.3.3.3 Steelhead

In the BiOp for the Yakima River hatchery programs, NMFS (2013) concluded that although predation by hatchery coho on ESA-listed steelhead juveniles may occur in the Yakima River and its tributaries where the two species co-occur, predation is expected to affect only a few individuals and would have a low impact on the listed population. Released hatchery coho parr would not prey on ESA-listed steelhead because freshwater coho life stages typically consume insects and plankton (NMFS 2016). The risk of coho smolt predation on steelhead juveniles is low, due to the lack of temporal and spatial overlap between the period of coho smolt outmigration and age-0 steelhead emergence. Yakama Nation field work has indicated that young-of-the-year steelhead emerge from the gravel after the coho have migrated through the Yakima system. Yearling rainbow/steelhead are too large to be readily consumed by coho smolts (BPA 2007).

#### 3.7.2.3.3.4 Bull Trout

As described in Section 3.7.1.3, stomach-content analysis has revealed that coho smolts consume very few fish and no bull trout have been identified as prey items (Dunnigan 1999). The impact to bull trout is low due to the limited spatial and temporal overlap between coho smolt emigration corridors and bull trout spawning areas (BPA 2007; WDFW 1998). Although coho parr releases would occur downstream of bull trout spawning and rearing tributaries, if overlap did inadvertently occur, the potential for predation of juvenile bull trout by coho parr is unlikely given parr consume insects and plankton, not fish (NMFS 2016). Further, as previously stated, coho juveniles and adults are outplanted into areas that are either not occupied by bull trout, or are well downstream of the headwater areas where bull trout spawn and rear. Foraging adult and subadult bull trout could benefit from increased prey availability following coho releases into the Yakima Basin.

### 3.7.2.3.4 Disease Transmission

As described in the *Yakima Basin Coho Hatchery and Genetic Management Plan* (Yakama Nation 2012b) that covers the proposed MRS Hatchery, the USFWS would screen adult broodstock for routine bacteria and viruses at the time of spawning. All life stages would be monitored for disease, and Integrated Hatchery Operations Team fish health guidelines would be followed to prevent disease transmission between fish on site and disease transmission or amplification to or within the watershed. The juvenile rearing density and loading guidelines used at the facility would be based on standardized agency guidelines. Juveniles would be screened monthly for routine bacteria, viruses, and parasites by USFWS. All fish would be examined for the presence of “reportable pathogens” as defined in the Pacific Northwest Fish Health Protection Committee disease control guidelines, within 3 weeks prior to release by USFWS pathologist under contract. Fish transfers into the basin have been inspected and accompanied by notifications as described in Integrated Hatchery Operations Team and Pacific Northwest Fish Health Protection Committee guidelines. Using these protocols, the potential for

disease transmission from the proposed MRS Hatchery into the Yakima River is highly unlikely and therefore discountable.

#### 3.7.2.3.5 Genetic Interactions

The release of coho reared at the proposed MRS Hatchery, and the subsequent return of coho adults to the Yakima Basin would not impact the genetic integrity of coho in the basin. As stated in Section 3.7.1.3, there are no differences between the hatchery and natural coho populations in the Yakima Basin because the natural population was extirpated and the current hatchery population is being used to develop the natural stock.

#### 3.7.2.3.6 Beneficial Effects

An increase in coho parr releases and release locations compared to existing conditions would increase the availability of prey items for larger fish. If MRS Hatchery production were modified to an all-smolt release, this benefit would be reduced. If successful, over time, more MRS Hatchery-reared coho would return to the Yakima Basin to spawn as adults. The return of more coho to the Yakima Basin would result in increased marine derived nutrients, and natural spawning to improve streambed morphology (NMFS 2013), and overall would have a moderate impact.

#### 3.7.2.3.7 Monitoring, Research, and Evaluation Activities

The Proposed Action is part of the overall YKFP coho reintroduction program. The MR&E activities associated with fish reared and released from the MRS Hatchery have been ongoing for many years. As such, potential impacts on nontarget species from MR&E, discussed in Section 3.7.1.4, are considered an existing condition for fish resources. However, because MRS Hatchery-reared coho would be introduced into several new tributaries, the Proposed Action would expand ongoing impacts (see Section 3.7.1.4) on nontarget fish species into more waterbodies of the Yakima Basin. Conducting these MR&E activities is anticipated to benefit nontarget fish, including ESA-listed steelhead and bull trout through enhanced, incidental data collection in tributaries throughout the basin. However, individual fish could be disturbed during certain MR&E activities, including juvenile trapping surveys. The impact from MR&E activities would thus be low. See Appendix A for a summary of anticipated impacts on bull trout from the proposed project prepared for the ongoing ESA consultation.

Under the Proposed Action, the Yakama Nation and WDFW would analyze the results of ongoing (and future) MR&E activities (see Section 3.7.1.4) to determine if modifications to the proposed juvenile coho release scenarios would be warranted. Potential impacts on fish resources due to the adaptive management scenarios presented in Chapter 2 are related to the possible future shift from a mixed life-stage release program (500,000 parr releases and up to 200,000 smolts) to an all-smolt release program (700,000 smolts). Potential impacts on fish from this shift would primarily be ecological interactions, which are discussed in the following section. Any future modifications to the coho release program, including shifting from parr to smolts or the addition of new release tributaries, would be determined by management criteria determined through the MIPT. Any changes to the coho release strategy would be reported to both NMFS and the USFWS to track and, if required, consult on potential impacts on ESA-listed species (bull trout and MCR steelhead).

#### 3.7.2.3.8 Adult Collection Activities

Up to 1,000 coho adults would be collected at Roza Dam for broodstock for the integrated program to be conducted at the proposed MRS Hatchery. Adults may also be collected at Prosser Dam as a backup source, and possibly in the future at the Cowiche or Wapatox Dams. The collection of coho broodstock at existing dam facilities could impact nontarget fish species by delaying their upstream passage and causing stress during potential handling. These effects would be similar to ongoing migration delays from the operation of adult salmonid collection facilities at Roza and Prosser Dams. To minimize stress and the potential for handling related mortality, the Yakama Nation would immediately release all nontarget fish intercepted during broodstock collection at Roza and Prosser Dams. Relative to ESA-listed species, the collection of adult coho at both dams has been previously consulted on for both bull trout (USFWS 2007a) and steelhead (NMFS 2013). The ESA Section 7 consultation prepared for the construction and operation of the MRS Hatchery would include adult collection at both sites as part of ancillary facility operations.

#### 3.7.2.3.9 Climate Change

Construction and operation of the proposed MRS Hatchery is not expected to impact modeled effects of climate change on streams in the Yakima River Basin. The proposed MRS Hatchery would divert surface water of the Yakima River from November through February. Under modeled climate change scenarios (Vano et al. 2009; Reclamation 2015b), more instream flow would be available during the winter and early spring in the form of rain or as a result of runoff from an earlier shift in snowpack melt. This, combined with the low volume of water proposed for diversion from the Yakima River (10 cfs), would have low impacts on fish, and their habitat, from climate change. Relative to the use of up to 2.5 cfs of groundwater, use would only have a low impact on groundwater. This is because pumping would only cause localized effects to groundwater (Wallace Group 2012, 2016b), and because the majority of groundwater use would occur from April through early October when groundwater is most plentiful (i.e., because of irrigation water seepage). The intercepted groundwater would be discharged to the historic side channel after use in the hatchery and treatment. This discharge location would mitigate for any reduction in natural seepage of water to the historic side channel from reduced groundwater elevations.

In addition, a goal of the project is to develop a local population of naturally-spawning coho. Local adaptation enables populations to adjust to changing environmental conditions like climate change (HSRG 2014). Further, the inclusive species monitoring conducted by the Yakama Nation and WDFW for the Yakima River should aid efforts to track changes in fish populations and abundance as the area experiences global climate change.

Relative to juvenile releases, if climate change contributes to dewatering of rearing tributaries, released coho parr would be forced to seek out watered reaches. This could increase fish densities, and therefore competition for food and space, in habitats that remain suitable for rearing. Such scenarios would likely result in the modification of coho release strategies, and a shift to more smolt releases.

### 3.7.2.4 Cumulative Effects

For the purpose of this analysis, cumulative effects on fish resources consider the Yakima Basin and do not extend to the Columbia River (see Section 3.7.1 for a definition of the study area for fish resources). To the extent ongoing activities have occurred in the past and are currently occurring in the basin, their impacts on fish resources are considered in the baseline (Section 3.7.1). To the extent those same activities are reasonably certain to occur in the future, their future effects are included in the cumulative effects analysis.

Currently ongoing actions in the basin that have impacted fish resources and that are reasonably foreseeable include:

- Human activities, including land management and water development activities that have reduced the connection between river and riparian habitats, increased sedimentation in streams, and altered floodplain function. Land development has resulted in the straightening of rivers and creeks in some areas, particularly associated with road construction, bank armoring, and modification and irrigation diversions. This has caused some waterbodies to become straighter, wider and shallower, and increased solar heating in streams.
- Irrigation diversions and mainstem dams have altered natural flow patterns and blocked some fish from their historic spawning grounds (including coho). The return of irrigation water from agricultural lands back to the Yakima River has reduced water quality in the lower reaches in the river.
- Hatchery construction and operation, including operation of adult and juvenile collection facilities. At Roza Dam, all adult collection facilities have been designed to meet NMFS standards; therefore, injury or mortality to nontarget species during fish handling and sorting procedures are likely low to moderate. Reasonably certain new adult collection facilities, including a new facility at Sunnyside Dam, would also contribute to cumulative impacts on fish.
- Recreational, commercial, and tribal fish harvest of fish that are not listed under the ESA, as well as incidental catch of ESA-listed fish in the basin.

Ongoing actions that contribute to beneficial effects on fisheries resources include those actions aimed at protecting, enhancing, or restoring aquatic and riparian habitat in the Yakima Basin. The Yakama Nation's YKFP is a comprehensive fish habitat rehabilitation program for the basin. Ongoing and proposed future projects include increasing streamflows, improving fish passage, screening diversions, reducing sediment loads, and restoring stream channel and riparian habitats. These programs, in combination with numerous state, federal, and local plans (described below) are anticipated to result in a beneficial effect on aquatic resources in the Yakima Basin.

- Salmon Recovery Funding Board Projects

  Projects funded by the Washington State Salmon Recovery Funding Board are aimed at protecting intact functioning salmonid habitats through acquisition or restoration of impaired salmon habitats. Several ongoing salmon/habitat recovery projects are proposed in the Yakima Basin, including riparian habitat restoration; these projects would benefit fish species and their habitats.

- Yakima Basin Fish and Wildlife Planning Board and Yakima Basin Plan

  The mission of the Yakima Basin Fish and Wildlife Planning Board and the Yakima Basin Plan is to restore sustainable and harvestable populations of salmon, steelhead, and other at-risk species through collaborative, economically-sensitive efforts, combined resources, and wise resource management of the Yakima Basin (Yakima Basin Fish and Wildlife Planning Board 2005).

- Washington State Salmon Recovery Planning Process and Yakima Basin Salmon Recovery Plan

  The goal of the State Salmon Recovery Planning process is to "restore salmon, steelhead, and trout populations to healthy harvestable levels and improve those habitats on which the fish rely" (Joint Natural Resources Cabinet 2002). Actions associated with the Yakima Basin Salmon Recovery Plan (Freudenthal et al. 2005) contribute to beneficial planning processes in the region.

- Implementation of the Yakima River Basin Integrated Water Resource Management Plan

  Developed by Ecology and Reclamation in coordination with the Yakima River Basin Water Enhancement Project Workgroup, the Integrated Plan is a comprehensive approach to address a variety of water resource and ecosystem problems affecting fish passage and habitat in the Yakima Basin. The Integrated Plan includes seven elements: reservoir fish passage, structural and operational changes to existing facilities, surface water storage, groundwater storage, habitat/watershed protection and enhancement, enhanced water conservation, and market reallocation. All elements are geared toward the recovery of fish resources in the basin.

- Yakima-Klickitat Fisheries Project

  The Yakama Nation, as the Lead Agency, in coordination with the co-manager, WDFW, is testing the principles of supplementation and coho reintroduction as a means to rebuild fish populations through the use of locally-adapted broodstock in an artificial production program (the Prosser Hatchery and proposed MRS Hatchery), in compliance with the principles of the HSRG. The goal is to increase the numbers of naturally spawning fish.

  As part of the larger YKFP, BPA has funded numerous habitat improvement projects in the Yakima Basin, including bank stabilization, habitat complexity, levee set-back, riparian plantings and fencing, barrier removal, and side channel restoration efforts (Yakama Reservation Watersheds Project 2012; NMFS 2013).

- MR&E Actions–Component of Yakima-Klickitat Fisheries Project

  Under the YKFP, smolt trapping is, and will continue to be used to monitor migration of hatchery summer steelhead juveniles. Some nontarget fish species may be captured and handled at the trapping facilities, or displaced during snorkeling surveys. These evaluations have the potential to stress or injure fish if they are handled; however, these activities are necessary to determine the success of reintroduction/supplementation efforts, as well as the impact of supplementation on nontarget fish species.

- MCR Steelhead Recovery Plan and Bull Trout Recovery Plan

  Federal, state, tribal, and local governments have developed plans and initiatives to benefit fish, particularly native salmonids, in the basin. Two such plans include the MCR Steelhead Recovery Plan (NMFS 2009) and the Recovery Plan for the Coterminous U.S. Population of Bull Trout (USFWS 2015a), which describe ongoing and Proposed Actions that are targeted to reduce known threats to listed steelhead and bull trout in the Yakima Basin.

In summary, the Proposed Action is compatible with other aquatic habitat and fish management programs in the region. When added to past, present, and reasonably foreseeable future activities in the basin, the Proposed Action would have low cumulative impacts on fish resources. Because the purpose of the proposed MRS Hatchery is to facilitate in-basin rearing of coho that have been reintroduced into the basin for nearly 20 years, no significant cumulative effects on fish resources are anticipated beyond existing levels. While the MRS Hatchery would divert surface water from the Yakima River from November through March, the use is non-consumptive and would not further degrade surface water flows in the 6,900 feet diversion reach. This is due to the relatively small diversion (10 cfs) during months when instream flows are not generally limited and temperatures are typically low.

#### 3.7.2.5 Mitigation Measures

BPA would require all contractors to adhere to applicable conservation measures of the Habitat Improvement Program III BA (BPA 2012b) for general construction and in-water work. These measures are part of the Proposed Action and are incorporated herein by reference.

- Implement measures to control erosion (see mitigation measures in Geology and Soils) and potential spills of hazardous materials (see mitigation measures in Water Resources) to minimize potential for impacting water bodies.
- Implement an SPCC plan and comply with NPDES General Permit (see mitigation measures in Water Resources).
- Screen the proposed Bypass intake structure to meet NMFS criteria. Equip the outfall with a bar rack to prevent entry of adult fish.
- Construct all in-water work during the negotiated agency-approved work window of November 1 through December 31.
- Install and remove cofferdams during the appropriate work window for each waterbody.
- In October, place a picket weir downstream of the proposed outfall location to prevent adult fish from entering during the in-water work period. The Yakama Nation would seine the Bypass and historic side channel to herd adult fish from the affected reach prior to installation of the picket barrier.
- Operate equipment in the active channel only if necessary to install and remove cofferdams. Install the cofferdam from the top of bank to the extent possible.

- Experienced fisheries biologists would remove all fish species from the immediate area where the cofferdams would be installed. Fish salvage would adhere to the following protocol:
    - Flush adult fish that do not disperse from the construction area from the area behind the cofferdams. As part of any dewatering process, use beach seines and sanctuary nets to herd all fish from the area of capture or release.
    - Capture by seining juveniles that do not displace voluntarily, and if necessary, use a backpack electrofisher. Once captured, place fish into a 5-gallon bucket using small dip-nets. Captured fish would be released back into the stream channel a safe distance (about 150 feet) upstream of the work area. Qualified Yakama Nation and/or WDFW biologists would conduct work by following NMFS guidelines (NMFS 2000).
    - Do not use seining or electrofishing if water temperatures exceed 64°F.
    - Transport fish in aerated buckets or tanks and release as quickly as possible and as near capture sites upstream as possible.
    - Notify USFWS and NMFS in the highly unlikely event that an ESA-listed fish is injured or killed during the salvage operation. Fish salvage biologists would prepare a report for the Services that summarizes the number of fish handled, species, and individual lengths.
- To minimize pulses of sediment downstream, remove the cofferdams incrementally.
- Dewatere and actively pump in-water work areas prior to pouring concrete forms. Fully cure all poured on-site concrete structures prior to contact with surface waters to prevent concrete leachate from entering live waters.
- Create sumps as necessary within the work area to capture any seepage flow. Pump all seepage flow to an on-site temporary settling pond, Baker tank, or other facility as determined by the contractor. Seepage flow would percolate into the ground or alluvial material prior to entry back into the water.
- Install a fish screen that would meet NMFS screening criteria, on pumps used for cofferdam dewatering.
- Adaptively manage juvenile coho releases based on studies on non-target fish via MRS Hatchery-specific MR&E activities.
- Conduct all MR&E activities in accordance with the terms and conditions of the existing Section 7 ESA consultation for MCR steelhead (NMFS 2013).
- Comply with all applicable terms and conditions of the existing USFWS Section 10 permit issued for the overall Yakama Nation Fisheries program (TE-05166B-0; incorporated herein by reference), and future ESA Section 7 consultations terms and conditions.
- Screen all surface water pumps for acclimation units (one per site, to be used for all tanks) according to NMFS juvenile salmonid criteria.

### 3.7.3 Environmental Consequences of No Action Alternative

Under the No Action alternative, construction of the MRS Hatchery would not be funded by BPA and the majority of coho juveniles would continue to be reared out-of-basin for release in the Yakima Basin. Development of a locally-derived, naturally-sustaining in-basin coho population using an integrated facility would not be fully achieved. The use of localized broodstock is required to meet the goal of providing a self-sustaining coho run throughout the species' historic range in the Yakima Basin (see Section 2.1). The use of out-of-basin broodstock may result in reduced fitness and spawning success and would not further the goal of establishing a self-sustaining coho run.

Under the No Action alternative, fish would not be impacted by construction or operation of the proposed MRS Hatchery, but ongoing acclimation and release would continue under the larger YKFP as well as the establishment of the new acclimation sites. Ongoing MR&E activities would continue at current levels in the basin, as would adult broodstock collection and outplanting.

Under this alternative, impacts on nontarget fish species from continuing coho reintroduction activities (e.g., ecological interactions from juvenile releases, MR&E activities) would remain at current levels.

## 3.8 Wildlife

### 3.8.1 Affected Environment

The defined project study area for impacts on wildlife includes the proposed MRS Hatchery site, the New Cascade Canal Fish Screening facility, Reclamation's New Cascade Canal Diversion Structure, staging and access areas for construction, and areas potentially affected by construction noise. Project-related construction noise extends about 2,000 feet from construction work at the MRS Hatchery site and the New Cascade Canal Fish Screening facility site. Proposed modifications at Reclamation's New Cascade Canal Diversion Structure would likely to be limited to hand-held equipment, thus a 2,000-foot noise buffer is not applied to this project element. The new mobile acclimation sites would also not have a 2,000-foot buffer because of the short amount of time (hours) the set-up would take. Potential impacts on wildlife are described relative to impacts on USFWS threatened and endangered species, WDFW priority species, and common species.

Terrestrial wildlife in the study area was evaluated based on wildlife studies conducted by Johnson and O'Neil (2001) and information in the *Yakima Subbasin Summer-and Fall-Run Chinook and Coho Salmon Hatchery Master Plan* (Yakama Nation 2012a). Information from WDFW, the Yakama Nation, the Washington State Gap Analysis Final Report, as well as the USFWS, was used to evaluate the occurrence of general, priority, and threatened or endangered terrestrial wildlife species (Johnson and Cassidy 1997; Smith et al. 1997, Dvornich et al. 1997, Yakama Nation 2012a, USFWS 2016b, WDFW 2016c).

A site visit was conducted on May 25, 2016 to document general observations as well as habitat resources within the study area. No species-specific wildlife surveys or habitat

surveys were conducted for this project. General habitat and species observations were noted during the site visit and transferred onto recent aerial images.

#### 3.8.1.1 General Habitat and Wildlife Conditions

The project study area occurs in the Yakima Basin and comprises predominately habitats defined by Johnson and O'Neil (2001) as agricultural, pasture, and mixed environs, urban and mixed environs, riparian woodlands, and herbaceous wetlands.

The *Yakima Subbasin Summer and Fall Run Chinook and Coho Salmon Hatchery Master Plan* (Yakama Nation 2012a) identified 384 wildlife species occurring in the Yakima Basin. These include birds, mammals, reptiles, and amphibians (Yakama Nation 2012a). Of the species that occur in Kittitas County, WDFW Gap Analysis project data identified 219 potential wildlife species occurring within the vicinity of the project study area. Some species identified in the analysis have adapted to human activity, especially species like migratory birds suited to smaller patches of forested riparian habitat along corridors associated with the canals and tributaries of the Yakima River.

##### 3.8.1.1.1 MRS Hatchery Property

Most of the MRS Hatchery property is composed of fallow pasture that has not been grazed for approximately 12 years and some residential and agricultural buildings. Pastures provide foraging habitat and open area between habitats for numerous species, including foraging raptors, shrews, moles, and rodents, and some native frog and lizard species (Johnson and O'Neil 2001). Woody vegetation communities located next to pastures may provide nesting sites for some bird and small mammal species, and shelter for mammals, reptiles, and amphibians.

Riparian habitat located along the New Cascade Bypass and historic side channel to the Yakima River in the southwest portion of the MRS Hatchery property is composed of deciduous tree stands and second-growth ponderosa pine. Although fragmented, riparian corridors on the site offer foraging and suitable habitat to numerous species, including many avian species that traverse the region during the spring and fall migratory period (Yakama Nation 2012a).

Infrastructure in the study area potentially disrupts migratory corridors for land-bound sensitive species. Klocke Road to the east and the John Wayne Pioneer Trail to the north, as well as Highway 10 to the north, could also act as a barrier to movement of wildlife or contribute to wildlife mortality. In the larger surrounding area, agriculture and I-90 could also disrupt wildlife movement through the study area.

##### 3.8.1.1.2 New Cascade Canal Diversion and Fish Screening Facility

The New Cascade Canal facilities are existing structures within the New Cascade Canal. Access roads adjoin the canal and provide negligible wildlife habitat. Habitats adjacent to the hatchery include agricultural land, open pastures, herbaceous wetlands, and limited woody riparian habitat. Residential and transportation development in the surrounding study area could also potentially act as barriers to wildlife movement or disrupt migratory corridors of sensitive species.

During the May 2016 site visit, red-winged blackbirds, marsh wrens, barn swallows, belted kingfishers, red-tailed hawk flyover, one frog, one turtle that could not be identified

to species, and signs of beaver and deer activity were observed on the MRS Hatchery site. No wildlife was detected in the immediate vicinity of the New Cascade Canal facilities. Appendix D provides a summary of wildlife species that may occur in the project study area.

#### 3.8.1.2 Bald Eagle

One bald eagle nest is documented on the south side of the Yakima River approximately 1,760 feet south of the MRS Hatchery property and 6,000 feet south of the New Cascade Canal facilities (WDFW 2016a). WDFW (2016b) last surveyed the nest in 2006 and confirmed that it was active; however, no offspring were detected.

#### 3.8.1.3 Threatened and Endangered Species under the ESA

Although there are no aquatic species in Kittitas County that are listed as threatened or endangered under the ESA (other than fish discussed in Section 3.7), the USFWS has identified several terrestrial threatened and endangered species that may occur in Kittitas County (USFWS 2016b). An IPaC (Information for Planning and Conservation) trust resource report was generated on January 29, 2016 for the overall project study area. The purpose of the IPaC report is to identify a list of species managed by the Endangered Species Program that may be affected by construction activities. The potential occurrence of each species is discussed in detail below for the project study area.

##### 3.8.1.3.1 Grizzly Bear

The grizzly bear is listed as endangered in Kittitas County. The Western Cascades population has been reduced to less than 20 individuals. The last grizzly bear siting was near the U.S.–Canadian border in 2002 (USFWS 2011). While there is suitable habitat in Kittitas County, research suggests work is needed to restore a population to take advantage of that habitat (USFWS 2015b). It is very unlikely grizzly bears would occur near the MRS Hatchery property or New Cascade Canal facilities due to the open lowland topography, human disturbance, human-made barriers such as roads and development and other current unsuitable natural conditions for feeding, reproduction, or denning. Due to the low likelihood of occurrence and poor quality of habitat, it is unlikely that grizzly bears occur in the study area.

##### 3.8.1.3.2 Gray Wolf

Gray wolves are federally listed as endangered in the western two-thirds of Washington State, including Kittitas County. Although there is a pack of gray wolves in the northwestern corner of Kittitas County in the Teanaway watershed, it is unlikely they would be found near the study area, as it is outside of the pack's current home range (WDFW 2015). There is also a significant amount of human activity in the study area, and barriers to movement such as Highway 10 and I-90 make the area less likely to be incorporated into home ranges for future packs of gray wolves. For these reasons, the occurrence of gray wolves in the project study area is unlikely.

#### 3.8.1.3.3 Canada Lynx

Canada lynx are listed as threatened by federal and state resource agencies. Within the State of Washington, Canada lynx are mostly found in subalpine fir habitat above 4,000 feet in elevation (Stinson 2001). While subalpine fir habitat is present within Kittitas County (Yakama Nation 2012a), the habitat conditions of the site make it unlikely that Canada lynx would occur within the study area. The nearest critical habitat for the Canada Lynx is over 60 miles away to the north in the Cascades (USFWS 2014).

#### 3.8.1.3.4 Northern Spotted Owl

Northern spotted owl is state listed as endangered and federally listed as a threatened species. Although the northern spotted owl does occur in Kittitas County, the study area does not meet WSDOT specifications for nesting, roosting, or foraging (WSDOT 2014a). Noise from the construction site would not reach the nearest spotted owl critical habitat approximately 10 miles away (USFWS 2012a). Therefore, it is unlikely that northern spotted owls occur in the study area.

#### 3.8.1.3.5 Yellow-billed Cuckoo

The yellow-billed cuckoo is listed as threatened for the entire State of Washington. The yellow-billed cuckoo has made very rare appearances for the past two decades in Washington, and is considered for the most part to be extirpated from Washington in terms of a breeding population. The species prefer wooded habitat near rivers; in Washington, the lower Columbia River has been specifically referenced by the WDFW as a potential area for colonization of vagrant individuals (WDFW 2012). An eBird query, which documents the presence or absence of species using a real-time, online checklist, showed no reported sightings of this species in Kittitas County (eBird 2012). Due to their near extirpated status and rarity in Washington, it is very unlikely this species occurs in the study area.

#### 3.8.1.3.6 Marbled Murrelet

Marbled murrelets typically nest no more than 50 miles from the coast (USFWS 1997) and are therefore highly unlikely to occur in the study area. WDFW's Priority Habitats and Species data (2016e) did not identify any marbled murrelet breeding areas in the project study area.

The study area does not meet WSDOT's standard for marbled murrelet suitable nesting habitat because the area is located more than 70 miles from marine water (WSDOT 2014b). An eBird query also showed no recorded sightings of this species in Kittitas County (eBird 2012). Due to the failure of the study area to meet the conditions of livable habitat for this species, the species is unlikely to occur in the study area.

### 3.8.1.4 WDFW Priority Species

There are 55 priority species identified by the WDFW on its Priority Habitats and Species List that could occur within Kittitas County (WDFW 2008). These species are peer-reviewed, updated periodically, and are considered to be priorities for conservation and management. Of these species, 41 are potentially present in the vicinity of the project study area. Appendix E lists these species and associated habitats. Priority species likely

to be present in the MRS Hatchery study area are those species that have a primary association with riparian areas, pastures, shallow ponds, freshwater wetlands, and species that are found in nearly flat terrain at low to mid elevations. WDFW requires impacts to these species be avoided, minimized, or mitigated.

In addition to listing potential species occurrence, WDFW identifies areas that priority species occupy for important aspects of their life cycle (e.g., breeding areas) or areas that support relatively high numbers of individuals (e.g., regular large concentrations). The project study area includes areas mapped as bald eagle winter range and Ellensburg mule deer winter range.

#### 3.8.1.4.1 Bald Eagle Winter Range

There is a regular concentration of bald eagles inventoried along the riparian corridor of the Yakima River that is located approximately 1,600 feet northwest of the MRS Hatchery property and immediately adjoins the New Cascade Canal facilities (WDFW 2016a). Approximately 25 to 35 bald eagles use this area for foraging in the winter. There are no known communal roosts present in this study area.

#### 3.8.1.4.2 Ellensburg Mule Deer Winter Range

A small portion of the Ellensburg mule deer winter range intersects the north part of the project study area, north of the New Cascade Canal (WDFW 2016a). Ninety percent of the WDFW tracked Ellensburg population traverse through this range in the winter. Mule deer are generally known to move to lowland dry-forest and shrub-steppe during winter to avoid harsh weather and also search for forage. During winter mule deer are known to experience nutrient deficiencies, which could make them vulnerable to disturbance (WDFW 2016f).

### 3.8.2 Environmental Consequences of Proposed Action

Impacts to wildlife and habitat would be due to project construction (facility footprint and construction disturbance) and operation (human presence).

#### 3.8.2.1 MRS Hatchery Construction

Proposed construction would not impact ESA-listed wildlife species or potential suitable habitat because neither are known to occur in the project study area. Impacts to WDFW priority species known to occur within the project study area, as well as common species in the study area, are discussed below.

Construction of the new MRS Hatchery would permanently remove up to 3.5 acres of habitat that consist primarily of pasture grasses and forbs. This could create low, long-term impacts on wildlife that currently use the area. Although this disturbance would further contribute to habitat fragmentation, these impacts may be limited as the land was previously disturbed when it was developed for agricultural and residential use.

Temporary impacts from construction of the MRS Hatchery would include increased noise, temporary vegetation removal, and human activity. The duration of hatchery construction would be approximately 16.5 months. Accidental fuel and oil leaks or improperly disposed stormwater during construction could also create low, short-term

impacts on wildlife. This potential temporary impact would be minimized by implementation of a Stormwater Pollution Prevention Plan.

Highly mobile wildlife would likely avoid the site during construction, while less mobile species such as reptiles, small mammals, and amphibians could potentially experience mortality from construction. The overall impact due to construction would be expected to be low because similar suitable habitat for breeding, rearing, and foraging is available in the immediate project vicinity and greater Yakima River watershed. The new facilities would be designed to preclude potential attraction of animals that may prey on juvenile or adult coho. The new rearing area and grow-out tanks would be located in the enclosed hatchery facility, and the new adult holding and spawning ponds would be recessed, covered by a shed roof, and cordoned off by railing to prevent access by birds or animals of prey.

The peak noise associated with the MRS Hatchery construction could be detected by breeding bald eagles south of the hatchery site or wintering eagles on the Yakima River. However, temporary disturbance during construction is anticipated to be low because construction activity would not be within 660 feet of known active nests, which is the threshold where human disturbance may cause eagles to become agitated, and potentially result in inadequate nest repair, expenditure of energy defending the nest rather than tending to their young, or abandonment of the nest altogether (USFWS 2007b). Wintering bald eagles on the Yakima River may avoid perches that are located near the MRS Hatchery during construction; however, this effect would be low as there is abundant wintering grounds north of the hatchery site along the Yakima River, birds are attracted to the area for winter food resources that would not be affected, and temporarily displaced birds would likely return to the area after construction.

#### 3.8.2.1.1 New Cascade Canal Diversion and Fish Screening Facility

At the New Cascade Canal facilities, low, temporary impacts due to construction staging, access, and noise associated with modifications to the diversion and fish screening facility would be 4-6 weeks in duration and would likely generate less noise than construction on the MRS Hatchery site. No vegetation would be permanently removed, but some may be temporarily removed for staging and access, which would lead to a small decrease in available habitat in the immediate vicinity. Wildlife that is highly mobile would most likely leave the site during construction, while less mobile species would be directly impacted by disturbance of lands used for staging and access.

Noise from construction could temporarily affect nearby bald eagle winter range, as well as the nearby Ellensburg mule deer winter range, as they are both within the 2,000-foot noise buffer zone from the construction site. Any displaced wildlife from noise would likely return to the project area at the end of the construction period.

### 3.8.2.2 MRS Hatchery Operation and Maintenance

Operation of the MRS hatchery would increase daily human activity and noise over existing conditions, which could directly impact the ability of local wildlife to forage, roost, or nest. However, the impact of this would likely be minor as species that currently use this area may already be adjusted to human presence on site as well as the noise associated with the existing roads within the study area. During operations, wildlife

sensitive to human disturbance would likely avoid the site due to the added operational noise. The potential project effects described for common species would be similar for priority species. Based on the overall analysis, project operations at the MRS hatchery would have a low effect on wildlife species.

Impacts during operations may include accidental fuel and oil leaks, which could be detrimental to vegetated areas and hazardous to wildlife. Implementing BMPs would minimize these affects.

At the New Cascade Canal facilities, occasional maintenance may be necessary to remove debris from screens/outfall bars, or check stoplogs at the New Cascade Canal fish screen. Impacts from operations and maintenance activities would have low effects on wildlife because actions would be brief and sporadic, and are not anticipated to cause the displacement of species.

#### 3.8.2.3 Acclimation and Release

The proposed acclimation and release of coho at other sites within the basin would have low impacts to wildlife at those locations because there would be negligible vegetation removal and negligible disturbance or mortality due to vehicle noise, human activity at release sites, or vehicle strikes. Acclimation and release activities would be infrequent and temporary in nature, and thus are not likely to result in wildlife abandoning breeding habitat that may occur in the vicinity. Acclimation and release activities are not likely to impact ESA-listed terrestrial wildlife species.

#### 3.8.2.4 Cumulative Effects

Currently, ongoing actions in the basin that have contributed to negative cumulative impacts and that are reasonably certain to continue in the future, include agricultural land management, infrastructure and commercial development, and water resource development. These actions have resulted in the loss of native habitat such as shrub-steppe and native grassland communities, as well as fragmentation and reduction of connectivity between river and riparian habitats and other vegetation communities. This has caused an overall loss in extent and connectivity of native vegetation communities that are necessary to sustain native wildlife species.

Permanent impacts to vegetation and corresponding habitat from the proposed project are expected to be localized and are would be low with the implementation of minimization measures and BMPs. Permanent loss of wildlife is also anticipated to be low and would not significantly contribute to a cumulative loss of any species. Construction and operation impacts to sensitive species are anticipated to be low because no breeding habitat would be altered and temporary construction disturbance is unlikely to impact individual species. Likewise, the impact to populations of nonsensitive species would be expected to be low. Overall, the cumulative impacts of the Proposed Action on wildlife when added to past, present, and reasonably foreseeable future actions would be low.

#### 3.8.2.5 Mitigation Measures

The following mitigation measures would be implemented to avoid or minimize impacts on wildlife during construction at the hatchery site:

- Clean work areas would be maintained with proper litter control and sanitation to prevent wildlife attraction.
- Minimize lighting and use lighting fixtures that direct light downward and not towards off-site areas to minimize disturbance to wildlife.
- Develop and implement a plan to minimize and manage predatory wildlife being attracted to fish and other potential food sources available at the facility.
- Implement measures to control erosion (see mitigation measures in Geology and Soils) and potential spills of hazardous materials (see mitigation measures in Water Resources) to minimize potential for impacting habitat.
- Implement a revegetation plan (see mitigation measures in Vegetation) to ensure stabilization of disturbed soils.

### 3.8.3 Environmental Consequences of No Action Alternative

Under the No Action alternative, the proposed construction would not occur at the MRS Hatchery property or at the New Cascade Canal facilities. Habitats in these sites would not be altered, and existing human disturbance would continue. Species adapted to current conditions at the site would continue to use the study areas. New mobile acclimation and release sites would still be established under the larger YKFP, existing sites would continue to be used. As with the Proposed Action, the use of new acclimation and release sites would have low impacts to wildlife.

## 3.9 Cultural Resources

Cultural resources are resources associated with human occupation or activity related to history, architecture, archaeology, engineering, and culture. Historic properties, as defined by 36 CFR (Code of Federal Regulations) 800, the implementing regulations of Section 106 of the National Historic Preservation Act (54 USC § 300101 *et seq*.), are cultural resources that are eligible for inclusion in the National Register of Historic Places (referred to as the National Register or NRHP). Historic properties may be districts, sites, buildings, structures, artifacts, ruins, objects, works of art, natural features important in human history at the national, state, or local level or properties of traditional religious and cultural importance to an Indian tribe.

### 3.9.1 Affected Environment

This section describes the study area related to the proposed project, the cultural chronology of precontact and historic human activity in the project area, the known cultural resources in the study area, and the potential for undiscovered or undocumented cultural resources in the study area.

Background research for the Proposed Action included review of the Washington Department of Archaeology and Historic Preservation's (DAHP) online database for

archaeological site records, cultural resource survey reports, cemetery records, Historic Property Inventory forms, and nominations to the NRHP and the Washington Heritage Register. The Washington DAHP's statewide predictive model was also analyzed for probability estimates for precontact cultural resources. General Land Office plats available online through the U.S. Department of the Interior's Bureau of Land Management website were examined for historical features in the study area. The Yakama Nation Cultural Site Atlas as well as Yakama Nation Cultural Specialists who possess knowledge of Yakama culture, were also consulted on resources significant to the Yakama Nation. The Kittitas County Property Assessor's online parcel records database was used to identify buildings and structures over 45 years of age within the study area.

#### 3.9.1.1 Study Area

The study area for the proposed project encompasses the location where impacts from construction and operation of the MRS Hatchery could occur. It includes the proposed development area for the hatchery building and related facilities, construction staging area, and areas where access activities would occur, including acclimation sites.

#### 3.9.1.2 Cultural Setting

Located along the Columbia Plateau of central Washington, the Kittitas Valley has been occupied by Native American groups for thousands of years as the area is rich in natural resources. Over the last two centuries, these same resources have drawn the attention of nonnative farmers, ranchers, and others to settle in the area. The discovery of gold at Swauk Creek in 1873 brought the first large numbers of nonnative immigrants to Kittitas County. Native and nonnative peoples have cohabitated in the region to the present day.

##### 3.9.1.2.1 Precontact Overview

Precontact cultural phases are developed from evidence researched through the archaeological record. Phases represent similar technologies, subsistence, and settlement patterns identified and grouped together in broad terms. The Kittitas Valley region is associated with five broad cultural phases over the last eleven millennia.

The earliest identified occupation in the region is from the Paleo-Indian period known as the Clovis cultural phase. This phase dates from 11,500 to 10,500 Before Present (BP) and is characterized by small groups of highly mobile hunters and foragers (Shellenberger and Kiona 2016). This phase is named for the Clovis point, a large base fluted spear point. These points were part of larger tool kit that included scrapers, blades, drills and needles. The classic image of this phase is a band of hunters spearing megafauna, like mammoths. In reality, the Clovis people primarily subsisted on foraging plants, hunting small mammals and, most likely, fishing (Mann 2013).

Following the Clovis is the Windust cultural phase that dates from approximately 10,500 to 8,000 BP. Like the previous Clovis people, the Windust phase saw a utilization of a primarily hunter and gather-based subsistence practice (Shellenberger and Kiona 2016). The Windust phase is represented by a well developed lithic technology that produced lanceolate knives and short shouldered stemmed projectile points (Army 1990).

The Vantage phase dates from approximately 8,000 BP to 4,500 BP (Shellenberger and Kiona 2016). The Vantage phase peoples were still primarily nomadic and adapted to utilizing river and creek margins (Army 1990). Although nomadic, this phase has the introduction of subterranean housepits, used for seasonal or temporary occupation.

The Frenchman Springs cultural phase ranged from 4,500 to 2,500 BP and is dominated by several forms of contracting stem projectile points. At this time, there was an increase in precipitation that altered natural habitats and changed the distribution of land use to include more nonriverine environments (BPA 2012a). This phase sees the continued transition into a more sedentary lifestyle with the expanded use of pithouses begun during the Vantage phase. Settlements range from isolated pithouses with associated camps along riverine systems and later transitioning into larger winter villages (Army 1990). Researchers believe that the ethnographic Plateau pattern began to develop toward the end of this phase (Shellenberger and Kiona 2016).

The Cayuse phase existed from 2,500 BP until contact and includes full development of the ethnographic Plateau pattern. The phase is represented by large winter villages of up to 50 pithouses with smaller varying seasonal camps for root crops and fishing and hunting activities. Widespread trade with coastal groups is also identifiable in the archaeological record (Shellenberger and Kiona 2016). During this time, the region sees the introduction of the bow and arrow, represented by smaller projectile points. The end of the Cayuse phase brings the introduction of the horse and the devastating impact of European diseases (FERC 2006).

#### 3.9.1.2.2 Historic Overview

The beginning of the nineteenth century saw the expansion of the fur trade industry and expeditions such as Lewis and Clark in 1805-1806 traveling into the Columbia Plateau region (BPA 2012a). One of the earliest nonnatives to record a description of Kittitas region was the fur trader Alex Ross. In 1814, he described an encounter with a massive tribal gathering that included thousands of people engaged in “councils, root gathering, hunting, horse racing, gambling, singing, dancing, drumming, yelling, and a thousand other things…”(Becker 2005).

In 1855, the Yakama peoples and other neighboring bands of the Kittitas region signed a treaty with the governor of the newly established Washington Territory (1853). This treaty officially created what is known today as the Yakama Nation and ceded approximately 10 million acres of land to the U.S. government (Hoyt, Wilson, and Johnson 2011). The Yakima Indian Wars (1855-1858) ultimately ended with the forcible placement of the Yakama onto their present day reservation and opened the way for nonnative settlement in the Kittitas region. Kittitas County was officially formed in 1883 in the Washington Territory from a section of northern Yakima County. The territory became the 42nd U.S. state in 1889 (Becker 2005).

The Homestead Act of 1862 spurred a migration of settlement in the west and eventually brought immigrants into the Kittitas Valley region. The ample grasses and abundant water of the Kittitas Valley were ideal for ranching and other agricultural endeavors. With the introduction of the horse to the region by the 1700s, local natives raised and traded them with other area tribes and later with early white explorers passing through the area

(Ochran n.d.). It has been estimated that the area supported as many as 3,000 head of horses at its peak (Shellenberger and Kiona 2016).

The same environment that supported the horses attracted cattle ranchers to establish land claims by the late 1860s (Ochran n.d.). Over-grazing by the late nineteenth century led to changes in ranching practices, including fenced pastures and the production of hay and grains for feed. Irrigation development projects in the 1930s improved ranching production and the growth of row crops. At its peak in the 1960s, there were approximately 70,000 head of cattle in the county.

In 1906, construction began on the Chicago-Milwaukee-St. Paul-Pacific Railroad line, sometimes referred to as The Milwaukee Road (Chicago, Milwaukee, St. Paul, Pacific Railroad Company, 1950). The line was completed in 1908 and its route runs through the northeast corner of the study area. The line was in operation until the company bankrupted in 1980. Currently, the former railroad route is used as a recreational trail (John Wayne Pioneer Trail) managed by Washington State Parks (Washington State Parks 2016).

The prominence of the ranching activities helped establish a strong hay production industry in the region. Beyond the local demand for hay, production also supported the Seattle and Tacoma regions with feed needed for draft horses. The need for hay began to taper off by the 1920s as the use of the draft horse was supplanted by the automobile (Ochran n.d.).

Coal mining has been a part of the regional industry since the early 1870s (Saunders 1914). The coal deposits are primarily located around the Yakima Valley and helped to spur the development of major railway lines through the county. By the 1930s, coal mining began to decline due to the rise of the oil industry. Other mining efforts for the region included silver, lead, copper, chromium, mercury, manganese, nickel, and gold. Several gold rush booms spurred migration to the Kittitas Valley from the 1870s to the 1930s (Ochran n.d.). The Swauk Mining District in the mountains of north central Kittitas County still attracts gold seekers from tourists to professional miners (Engstrom 2006).

The logging industry was primarily located in the western portion of the county along the Cascade Mountains and large lakes in that area. The first sawmill was established near Ellensburg in the early 1870s. Logging in the late nineteenth century supported not only settlement construction but the vast amount of ties needed for the developing railway systems (Ochran n.d.).

#### 3.9.1.3 Cultural Resources within the Study Area

In 2016, Yakama Nation Cultural Resources Specialists conducted a pedestrian survey of 1.5 acres within the study area (Shellenberger and Kiona 2016). The Yakama Nation conducted previous cultural resources surveys in the study area in 2008 and 2009, though information from those surveys is currently unavailable.

Based on the background research and the 2016 cultural resources survey, four buildings were identified in the study area dating to 1940, including the single family residence on the property. Furthermore, the John Wayne Pioneer Trail was identified within the study area. As previously mentioned, the trail is the now defunct Chicago-Milwaukee-St. Paul-Pacific Railroad line, which traverses the northeast corner of the study area. Additionally, review of an 1878 General Land Office plat indicated that there

is potentially a historic road in the study area. The Washington DAHP database also indicated that three previously recorded cultural resources are located within 0.5 mile from the study area. No traditional cultural properties or sacred sites have been identified in the study area.

## 3.9.2 Environmental Consequences of Proposed Action

### 3.9.2.1 MRS Hatchery Construction

Construction of the hatchery would involve the permanent disturbance of approximately 3.7 acres for the development of hatchery buildings, groundwater wells, holding ponds, residential facilities, access road and driveways, and other hatchery-related facilities. Site preparation would also require clearing vegetation and grading of 8.3 acres that make up the development area of the hatchery site. This would require significant ground disturbance. The existing four historic structures on the property would also be razed. As such, construction of the hatchery would impact a known cultural resource within the study area. Construction would also have a visual impact on the Chicago-Milwaukee-St. Paul-Pacific Railroad line, which is now the John Wayne Pioneer Trail (see Section 3.12.2.1). These visual impacts would be low. Washington DAHP's statewide predictive model indicated that the study area was located in an area that would be categorized as an area of high potential for archaeological resources, indicating that a survey is highly advised; therefore, there is a potential for construction of the hatchery to have an impact on yet-to-be-discovered cultural resources.

BPA would conduct additional "on the ground" cultural resources survey of portions of the study area that have not been previously surveyed to identify any cultural resources that may be affected by the Proposed Action. The survey would be completed before any construction is started. To date, four known cultural resources are located within the study area. BPA will also evaluate resources identified in the study area for NRHP eligibility that will be affected by the project.

### 3.9.2.2 MRS Hatchery Operation and Maintenance

Operation and production at the hatchery would not impact cultural resources as the area would have been surveyed before project construction and any impacts to the resources would have been previously determined and mitigated as needed. Maintenance of facilities would not affect known resources. If any ground disturbing maintenance activities need to occur outside of facility locations, a review of sensitive areas would be required to avoid disturbing cultural resources.

There is the potential for water flow from the outfall to impact downstream shoreline archaeological sites through erosional processes. However, the contribution to downstream erosion from the proposed project is expected to be minimal, if not the same as it is currently; as such, impacts on archaeological resources due to erosion are expected to be low.

### 3.9.2.3 Acclimation and Release

Acclimation and release would not have the potential to affect cultural resources because there would be no ground disturbance. Acclimation structures are not expected to create noticeable visual obstructions and they would only be operated for a period of

three months (Feb-April) (see Section 3.12.2.3); therefore, visual impacts to cultural resources, if present, would be temporary and low. There would be low impacts to cultural resources at existing acclimation sites.

#### 3.9.2.4 Cumulative Effects

Historic, ongoing, and future development of the region for agriculture, housing, transportation, and utilities has affected and will continue to affect cultural resources. The loss of individual historic resources because of development in a region results in a cumulative loss of elements of the historic record for the area. The loss of a historic structure under the Proposed Action (i.e., the residence on the hatchery site), when combined with past, present, and reasonably foreseeable future actions in the study area, contributes to the cumulative loss to the historic record. Implementation of project mitigation measures would reduce potential impacts to known historic properties. While the potential exists for previously unidentified historic properties to be affected as part of project operations, no negative cumulative effects to historic properties are anticipated. Conversely, the MRS Hatchery would help increase populations of coho salmon, a culturally important resource. Cultural resource investigations conducted as part of this project contribute cumulatively to the body of knowledge of history of the project area.

The former railroad line that is now the John Wayne Pioneer Trail has seen significant impacts due to trail construction and maintenance. The Proposed Action would have only temporary low visual impacts on the railroad line and, therefore, would not contribute to the cumulative effects of other actions on that resource.

#### 3.9.2.5 Mitigation Measures

The following mitigation measures would be implemented to avoid or minimize impacts on cultural resources during construction at the hatchery site:

- Prepare an Archaeological/Cultural Resource Inadvertent Discovery Plan.
- Protect any unanticipated cultural resources discovered during construction as follows:
    - Stop work in the immediate vicinity of the discovery and protect find in place.
    - Notify Yakama Nation Project Manager, BPA Archaeologist, and BPA Environmental Compliance Lead immediately.
    - Implement mitigation or other measures as instructed by BPA.

### 3.9.3 Environmental Consequences of No Action Alternative

If the No Action alternative is selected, no new facilities would be constructed, nor would existing facilities be modified; therefore, there would be no impact to cultural resources. The new acclimation and release sites would be used under the No Action alternative and, like the Proposed Action, no ground disturbance is expected so there would be no impact to cultural resources. There would be no new impacts at existing acclimation sites.

# 3.10 Socioeconomics and Environmental Justice

## 3.10.1 Affected Environment

The socioeconomic environment potentially affected by the proposed project includes the regional economy as it relates to sport, commercial, and subsistence fisheries; county and Tribal communities; and established economic mainstays. Other socioeconomic factors include the local tax base, local employment, community services (e.g., fire, county sheriff, roads, and utilities), and local businesses (e.g., hotels and restaurants).

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Supporting environmental justice, Executive Order 12898 directs federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects on minority and low-income populations. Census data at the state, county, and census tract levels were used to determine the potential presence of minority or low income populations in the study area.

The study area includes Kittitas County for socioeconomic elements and the Yakima Basin for impacts related to fisheries.

### 3.10.1.1 Economic Characteristics

#### 3.10.1.1.1 Fisheries

Fisheries resources, at one time abundant throughout the Yakima Basin, have been adversely affected by the creation of reservoirs and storage dams over the last century. Dams present migration barriers to native anadromous and resident fish populations and have resulted in historic and ongoing habitat degradation in the basin (USFWS 2012b, Ecology 2012a). However, portions of the Yakima and Naches Rivers and several tributaries and reservoirs still support fish populations and provide opportunities for harvest thanks to fish passage structures at dams, and human-assisted release and reintroduction efforts (USFWS 2012b, Ecology 2012a).

Salmon fishing regulations established and enforced by WDFW change year-to-year, or even weekly if in-season updates indicate a particular run is weaker or stronger than anticipated. Recreational or sport fishing for salmon in the Yakima River can be open to non-tribal members, with restrictions on timing and catch limits. In the 2016–2017 season, for example, salmon fishing for sport was allowed September 1–October 22 below Prosser Dam, with a catch limit of six (WDFW 2016g).

Subsistence fishing by the Yakama Nation is authorized in the Yakima River, roughly between Roza Dam, 10 miles north of Yakima, and Horn Rapids Dam, just north of Richland. This stretch of the river in which subsistence fishing is authorized begins approximately 30 miles downstream of the hatchery site. Fishing regulations set forth by the Yakama Tribal Council (2016) place further restrictions on the season, timing, methods, and location of subsistence fishing that is allowed and which species can be targeted. The Yakama Nation's subsistence fishing provisions generally only apply to the harvesting of fish for traditional, noncommercial use; occasionally, however, commercial

fishing periods are authorized by the Yakama Tribal Council and fishing regulations specific to commercial activities are issued.

Opportunities for tribal fishing of coho salmon do not currently exist in the Yakima basin since coho have been extirpated. The majority of tribal coho harvest for the region occurs in the Columbia River Zone 6 Fishery.

#### 3.10.1.1.2 Population and Housing

As of July 2015, Kittitas County had an estimated population of 43,269; less than 1 percent of the statewide population of 7,170,351 (U.S. Census Bureau 2015). From 2010 to 2015, the growth rate of Kittitas County was 5.8 percent, which is below the statewide growth during the same period (6.6 percent) (U.S. Census Bureau 2015). In 2014, the total number of housing units in Kittitas County was 22,188, with a vacancy rate of 24.5 percent, which is much higher than the statewide average of 9.4 percent (U.S. Census Bureau 2014a).

#### 3.10.1.1.3 Local Tax Base

Approximately 74 percent of Kittitas County is exempt from taxation as federal, state, county, city, and other miscellaneous exemptions. The local tax base in Kittitas County for 2015-2016 was $59,900,839, plus a $59,888 timber tax (Kittitas County Assessor 2015), representing an increase from $56,810,378 in 2014-2015. New construction added $116,981,735 of value to parcels in Kittitas County in 2015, increasing the tax base. The tax base is used to fund cemetery districts, Veterans assistance, community services, flood district, hospital districts, cities, county roads, fire districts, county, and local and state schools.

#### 3.10.1.1.4 Local Employment

The leading industries within Kittitas County include educational services, and health care and social assistance (28.3 percent of total county-wide employment); arts, entertainment, and recreation, and accommodation and food services (15.7 percent); and retail trade (13.5 percent) (U.S. Census Bureau 2014a).

The nearest communities to the hatchery site include Thorp, a census designated place, and the City of Ellensburg, the Kittitas County Seat.

The leading industries within Thorp include retail trade (27.4 percent of total city-wide employment); construction (23.0 percent); and educational services, and health care and social assistance (15.9 percent) (U.S. Census Bureau 2014a).

The leading industries within Ellensburg include educational services, and health care and social assistance (33.1 percent of total city-wide employment); arts, entertainment, and recreation, and accommodation and food services (18.8 percent); and retail trade (14.1 percent) (U.S. Census Bureau 2014a). The top five employers in Ellensburg are Central Washington University, Kittitas Valley Community Hospital, Ellensburg School District, Kittitas County, and Anderson Hay and Grain (Ellensburg Downtown Association 2015).

Kittitas County's economy has generally been recovering from a substantial downturn experienced during the Great Recession (December 2007 through February 2010). In

2009, nonfarm employment dropped by 680 jobs (about 4.5 percent of all nonfarm jobs in the County) (Meseck 2016). From 2010 through 2015, average annual nonfarm employment has generally increased. Between 2014 and 2015, Kittitas County's economy provided 710 new nonfarm jobs as total nonfarm employment rose from 15,270 in 2014 to 15,980 in 2015, an average annual increase of 4.6 percent (Meseck 2016). Official, long-term (10-year) nonfarm employment projections produced by the Employment Security Department are for a 1.6 percent average annual growth rate from 2013-2023 for the four-county South Central Workforce Development Area (i.e., Kittitas, Klickitat, Skamania, and Yakima Counties).

Recent or potential economic developments that will improve employment prospects in Kittitas County include Suncadia Resort approximately 25 miles northwest of Ellensburg with a valuation of over $2 billion, a restaurant boom in Ellensburg, and the Surf City Water Park development in 2016 (Meseck 2016).

#### 3.10.1.1.5 Community Services

The nearest schools are located in Thorp and Ellensburg. Other community services, including a library, a post office, grocery stores, hotels, and emergency and medical services are available in Ellensburg. Emergency service departments include Kittitas County Fire Marshall, Kittitas Valley Fire and Rescue, Ellensburg Police Department, Public Safety and Police Services, and State Patrol Office. Medical facilities include Family Health Care Ellensburg, Community Health of Central Washington – Ellensburg, and Kittitas Valley Community Hospital.

#### 3.10.1.1.6 Local Businesses

Business types and number of establishments in Kittitas County are provided in Table 3.10-1.

**Table 3.10-1. Local Business Establishments**

| Business Type | Number |
|---|---|
| Agriculture, Forestry, Fishing, and Hunting | 15 |
| Mining, Quarrying, and Oil and Gas Extraction | 2 |
| Utilities | 9 |
| Construction | 191 |
| Manufacturing | 35 |
| Wholesale Trade | 43 |
| Retail Trade | 165 |
| Transportation and Warehousing | 51 |
| Information | 14 |
| Finance and Insurance | 46 |
| Real Estate, Rental, and Leasing | 64 |
| Professional, Scientific, and Technical Services | 70 |
| Management of Companies and Enterprises | 2 |
| Administrative and Support, and Waste Management and Remediation Services | 57 |
| Educational Services | 12 |
| Health Care and Social Assistance | 97 |
| Arts, Entertainment, and Recreation | 30 |
| Accommodation and Food Services | 161 |
| Others Services | 96 |

Source: U.S. Census Bureau 2014b – County Business Patterns

### 3.10.1.2 Environmental Justice

To characterize the potential for the proposed project to have environmental justice affects, minority and low-income populations were identified within the census tracts of the project area.

#### 3.10.1.2.1 Minority Populations

The EPA Office of Environmental Justice has defined the term “minority” to include Hispanics, Asian-Americans and Pacific Islanders, African-Americans, American Indians, and Alaskan natives. Guidelines provided by the Council on Environmental Quality (CEQ 1997) and EPA (1998) indicate that a minority population may be defined where either 1) the minority population comprises more than 50 percent of the total population, or 2) the minority population of the affected area is meaningfully greater than the minority population of an appropriate benchmark region used for comparison. For this analysis, the total percentage of minorities in the study area census tracts was compared to the minority populations of the State of Washington and Kittitas County to determine whether the study area populations are 50 percent greater.

Minority populations within the state, county, and census tracts included in the project study area are provided in Table 3.10-2. Census Tract 9755 primarily includes the city of Ellensburg, whereas census tract 9753 primarily includes rural lands.

**Table 3.10-2. Minority Population**

| | Washington | Kittitas County | Census Tract 9753 | Census Tract 9755 |
|---|---|---|---|---|
| **Total Population** | **6,899,123** | **41,705** | **4,594** | **5,737** |
| White (%) | 71.3 | 85.0 | 95.0 | 81.5 |
| Black or African American (%) | 3.5 | 0.9 | 0.4 | 0.0 |
| American Indian and Alaska Native (%) | 1.2 | 0.9 | 0.5 | 0.0 |
| Aisan (%) | 7.4 | 2.2 | 0.2 | 5.3 |
| Native Hawaiian and Other Pacific Island (%) | 0.6 | 0.0 | 0.0 | 0.0 |
| Other Race (%) | 0.1 | 0.1 | 0.6 | 0.0 |
| Two or More Races (%) | 4.1 | 2.7 | 0.7 | 5.6 |
| Hispanic or Latino (%) | 11.7 | 8.3 | 2.5 | 7.6 |
| Total Minority Population (%) | 28.7 | 15.0 | 5.0 | 18.5 |

Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

In sum, the overall minority population (i.e., all minorities combined) of the study area is comparable to that of the state and county and is not meaningfully greater. However, there are a few individual minority populations that are meaningfully greater than those at county level. Therefore, Asian-Americans and minorities who identify as an “other race” or “two or more races” constitute minority populations within the study area for purposes of an environmental justice analysis.

Additionally, members of the Yakama Nation are also considered a potentially affected minority population.

#### 3.10.1.2.2 Low-income Populations

Low-income populations are defined as a community, or group of individuals, in geographic proximity to one another, who are living below the federal poverty level (CEQ 1997). Low-income populations are identified using annual statistical poverty thresholds from the U.S. Census Bureau’s *Current Population Reports in Income and Poverty* (CEQ 1997, EPA 1998).

Low-income populations within the state, county, and study area census tracts are provided in Table 3.10-3.

**Table 3.10-3. Low-Income Population**

| Area | Total Population | Low-Income Population (%) |
|---|---|---|
| Washington | 6,765,200 | 13.5 |
| Kittitas County | 39,287 | 22.1 |
| Census Tract 9753 | 4,575 | 10.3 |
| Census Tract 9755 | 5,594 | 36.2 |

Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

## 3.10.2 Environmental Consequences of Proposed Action

### 3.10.2.1 MRS Hatchery Construction

Construction would provide short-term employment opportunities for local and nonlocal labor, based on the location of the contractors and the need for skilled and general laborers. The construction work force would consist of approximately 30 full time workers employed for an estimated construction period of 16.5 months. The majority of workers are expected to commute from within 50 miles or less. Construction would result in a short-term, low impact on employment in the region.

It is assumed that construction workers would travel from their homes within 50 miles or less of the site and any new housing needs for workers more than 50 miles away would be met by temporary housing such as hotels.

Spending by construction workers in the study area would have a short-term, low impact on the local economy. Construction workers would patronize hotels and restaurants and may also purchase personal and small construction-related supplies from local commercial enterprises. The short-term duration of the impact would result in a low impact on the local economy.

The presence of minority and low-income populations in the study area is generally consistent with the benchmark region. Construction activities would be limited to the site and immediate surroundings, which are removed from population centers. Construction effects on water resources, fisheries, air quality, noise, visual resources, land use, transportation, vegetation and wildlife, and other resources would be of short duration and low intensity. There would be no high and adverse human health or environmental effects as a result of construction. Any minor impacts would not be disproportionately borne by minority or low-income populations. No environmental justice impacts would result from construction of the proposed project.

### 3.10.2.2 MRS Hatchery Operation and Maintenance

Operation of the new hatchery facilities would result in the addition of up to five new full time hatchery workers, increasing the population of the project area by the number of resident hatchery workers hired to maintain the hatchery and their families (3 to 12 individuals). Additional housing would be required to allow hatchery workers and their families to live on site. The additional demand would be met by the construction of three additional residences at the hatchery site. The additional workers would likely be hired from somewhere within the study area, having a low impact on the regional economy.

Spending by the added workforce in the community would result in a long-term, low impact to employment and the local tax base.

Operation of the hatchery would have a low impact on adjacent properties in terms of disruptive traffic, air emissions, visual impacts or noise. See Sections 3.2, 3.11, 3.12, 3.13. Based on the limited potential for traffic, air, visual, and noise impacts on nearby residences, the project is not expected to impact adjacent property values or increase the demand for community services.

Opportunities for recreational fishing of coho likely would improve if stocks increased. The proposed project would support returning coho to a level where the potential for predictable ceremonial and subsistence fisheries for the Yakama Nation would be possible and would continue to support coho harvest. The availability of fisheries resources for tribal members would ultimately increase, resulting in long-term, moderate impacts to subsistence fisheries. The project would not only support continued harvest in the Columbia River, but would also provide new opportunities for harvest of coho in the Yakima basin. Tribal fishing in the Yakima basin would most likely occur at Horn Rapids, Prosser, and Wapato Dams where tribal members currently fish for spring Chinook salmon. Tribal fishing of coho in the Yakima would predominantly occur for ceremonial and subsistence purposes, using long handled dip nets and angling.

Operation of the hatchery would have no population level impacts on minority or low-income groups with the exception of long-term impacts for Yakama Nation tribal members. The availability of fisheries resources for tribal members would ultimately increase, resulting in low impacts to subsistence fisheries, which would benefit Yakama Nation tribal members over the long term.

There would be no high and adverse human health or environmental effects as a result of operation and maintenance of the hatchery. Any low impacts would not be disproportionately borne by minority or low-income populations. No environmental justice impacts would result from operation and maintenance of the proposed project.

#### 3.10.2.3 Acclimation and Release

Acclimation and release sites would have no socioeconomic impacts beyond the impacts associated with operation of the hatchery. The same employees that would operate the hatchery would also operate the acclimation and release sites.

Ongoing fishing operations in the streams proposed for coho release could be affected by the acclimation and release activities. As described in Section 3.7.2.3, the impact of proposed coho releases on nontarget fish species, such as bull trout or rainbow/steelhead trout, depends on a number of factors, including the timing of release, the life stage of release (parr vs. smolt), the presence and abundance of nontarget fish species at each release site, whether or not the nontarget fish species have similar dietary and habitat preferences to coho, or whether or not they share similar timing of emergence or outmigration with coho.

There would be no high and adverse human health or environmental effects as a result of acclimation and release activities. Any minor impacts would not be disproportionately borne by minority or low-income populations. No environmental justice impacts would result from acclimation and release activities.

#### 3.10.2.4 Cumulative Effects

Section 3.10.1.1 describes the existing state of socioeconomic elements. The official, long-term (10-year) nonfarm employment projections produced by the Employment Security Department are for a 1.6 percent average annual growth rate from 2013-2023 for the four-county South Central Workforce Development Area (i.e., Kittitas, Klickitat, Skamania, and Yakima Counties). There are no major commercial or residential developments planned in Kittitas County in the foreseeable future. Operation of the hatchery would result in minor, long-term increases to the population and local tax base from new employees and residences at the hatchery site; however, when compared with the ongoing impact of continued population growth and development in the area, this low increase of three new families would not contribute to a cumulative socioeconomic impact. The effect of the project, when combined with the effects of other past, present, and reasonably foreseeable future basin-wide restoration projects, hatchery facilities, and monitoring efforts aimed at increasing salmon returns, could have a long-term beneficial cumulative impact of subsistence fisheries and tribal families over time, depending on the success of these efforts. Considering the components that make up socioeconomics, when the incremental impact of the Proposed Action is combined with past, present, and reasonably foreseeable future activities, cumulative socioeconomic impacts would be low.

#### 3.10.2.5 Mitigation Measures

Because of the low magnitude of impacts on socioeconomic and environmental justice resources, no mitigation measures are recommended.

### 3.10.3 Environmental Consequences of No Action Alternative

Under the No Action alternative, economic conditions in the region would not change from the existing conditions described above. No new construction would be undertaken and no additional jobs would be created. Because there would be no change in local economic conditions, there would be no impacts to low-income and minority populations from the No Action Alternative. The use of the new acclimation and release sites under the larger YKFP would not result in socioeconomic impacts.

## 3.11 Air Quality and Climate Change

The U.S. Environmental Protection Agency (EPA) and Ecology are both responsible for the enforcement of air quality and emissions standards in the State of Washington. The EPA has established National Ambient Air Quality Standards (NAAQS) to protect the public from air pollution under the Clean Air Act (42 USC 741 et seq.). The NAAQS focus on “criteria pollutants,” which are pollutants of particular concern for human health. The criteria pollutants are: carbon monoxide (CO), lead (Pb), ozone ($O_3$), nitrogen dioxide ($NO_2$), sulfur dioxide ($SO_2$), course particulate matter ($PM_{10}$), and fine particulate matter ($PM_{2.5}$). In addition to the NAAQS, Ecology has adopted current NAAQS in its state regulations, Washington Ambient Air Quality Standards (WAAQS; Chapter 173-476 WAC), that are at least as stringent as the NAAQS.

Although greenhouse gasses (GHGs) are not considered a direct cause of health effects, evidence shows that GHGs contribute to rising global temperatures that accompany

changes in weather and climate (EPA 2016b). Ecology has adopted a new rule (Chapter 173-422 WAC, Clean Air rule) and amended another (Chapter 173-441 WAC, Reporting of Emissions of Greenhouse Gases) to regulate GHG emissions in Washington. Chapter 173-442 WAC provides emissions standards for GHGs from stationary sources located in Washington State, petroleum fuel producers or importers distributing fuel in Washington State, and natural gas distributors in Washington State. Ecology stipulates that parties covered under this program will have an obligation to reduce their GHG emissions over time and a wide variety of options will be available to do so.

Ecology amended Chapter 173-441 WAC to change the emissions covered by the reporting program, modify reporting requirements, and update administrative procedures. For projects that are expected to annually produce at least 10,000 but less than 25,000 metric tons of $CO_2e$ (carbon dioxide equivalent), Ecology requires a qualitative analysis of GHG emissions. For projects that are expected to annually produce 25,000 metric tons of $CO_2e$ or greater, a quantitative analysis is required. Projects with GHG emissions less than 25,000 metric tons of $CO_2e$ per year are not considered significant in terms of GHG emissions and therefore, do not require mitigation.

## 3.11.1 Affected Environment

### 3.11.1.1 Air Quality

The study area for air quality includes the airshed of Kittitas County, Washington. This area represents the maximum geographic extent of air quality impacts that may result from sources of combustion, dust, or other air pollutant emissions during construction and operation and maintenance of the project. Because air quality monitoring data is lacking for the airshed of Kittitas County, air quality data from nearby cities (Seattle, Wenatchee, Mount Vernon, and Mount Rainier, Washington) is also considered in this analysis.

The most common sources of criteria pollutants in Kittitas County include emissions from vehicular and rail traffic, residential home heating (particularly wood burning), seasonal wildfires, and agricultural practices (particularly outdoor burning and resuspension of dust and fine particles). The county is situated in a valley, which creates optimal conditions for air inversions that can trap air in the low atmosphere for long periods of time. This is especially problematic during the winter months, when residents utilize their wood burning furnaces and the resulting smoke emissions linger in the area for weeks. The airshed of Kittitas County is currently in attainment[3] with the NAAQS, which means that the concentrations of criteria pollutants in the area are below the thresholds described in the NAAQS. However, Kittitas County is considered a high risk community that is in danger of violating federal air standards due to an increasing trend of unhealthy fine particulate pollution caused by ongoing use of home, wood-burning furnaces, and an increased occurrence of large wildfires over the past 4 years (Kittitas County Public Health Department 2015).

[3] Attainment status is a federal designation determined by the EPA based on the NAAQS. Ecology does not determine or define attainment for areas based on the WAAQS. [CITATION?]

The closest air quality monitoring station is in Ellensburg, Washington (Site ID 530370002), approximately 2 miles south of the hatchery site. This monitoring station monitors only for $PM_{2.5}$ and does not have a complete record of recent years; i.e., monitoring at this site was discontinued in 2008 and restarted in 2015. In 2015, the air quality index rating for this site was predominantly rated “good”; however, it occasionally dropped down to “moderate” and was rated as “unhealthy” or “unhealthy for sensitive groups” for a total of 4 days in 2015 (EPA 2015).

The hatchery site is undeveloped, with the exception of a single residence. Electricity generated offsite is used for water and space heating in the residence. The only existing source of air pollutants at the hatchery site is exhaust emissions from residents traveling to and from the site, and from travelers on adjacent roadways. Existing residents generate 0 to 3 trips per day. The acclimation and release sites are also undeveloped and therefore have no emissions.

#### 3.11.1.2 Climate and Climate Change

##### 3.11.1.2.1 Climate

The hatchery site lies within the Central Basin of Washington, east of the Cascade Mountains, which is considered the lowest and driest section of eastern Washington. The climate is largely influenced by prevailing westerly winds and dry, continental air masses coming from the north and east. In the summer season this air from over the continent results in low relative humidity and high temperatures, while in winter clear, cold weather prevails. In the Central Basin, annual precipitation typically ranges from 7 to 15 inches and snowfall ranges between 10 and 35 inches. Summer precipitation is usually associated with thunderstorms. During July and August, it is not unusual for 4 to 6 weeks to pass without measurable rainfall. In January, average maximum temperatures are usually between 30° to 40°F, and minimum temperatures are between 15° to 25°F. In July, the average maximum temperature is typically in the lower 90’s, and the minimum temperature is in the upper 50’s. Maximum temperatures typically reach 100° to 105°F on a few afternoons each summer. The Central Basin is subject to “chinook” winds, which produce a rapid rise in temperature. A few damaging hailstorms are reported in the agricultural areas each summer (WRCC 2016).

##### 3.11.1.2.2 Climate Change

The EPA (2014b) defines climate change as any substantial change in measures of climate (such as temperature or precipitation) lasting for an extended period of time (decades or longer). Because climate change is a global concern, the affected environment for climate change is considered at a larger scale, specifically at the state and national scale.

In recent decades, climate change has had widespread impacts on human and natural systems, including rising sea levels, an increased frequency of extreme weather events (e.g., floods, drought, wildlife, heat waves), acidification of the ocean, shrinking glaciers and sea-ice retreat, reduced crop yields, and shifting geographic ranges or migration patterns for wildlife species (IPCC 2014).

According to the U.S. Global Change Research Program, U.S. average temperature has increased by 1.3° to 1.9°F since recordkeeping began in 1895; most of this increase has occurred since 1970 and the most recent decade was the nation's warmest on record (Walsh, et al. 2014). The resulting impacts of rising temperatures in the U.S. include an increased length of the growing (frost-free) season, increased average precipitation (with localized examples of increases and decreases), and an increase in the frequency and intensity of extreme weather events (e.g., heavy downpours, heat waves, hurricanes, droughts). In the interior Pacific Northwest, the most notable impacts of climate change have been changes in the timing of spring snowmelt and streamflow, widespread forest mortality due to increased wildfire, insect outbreaks and tree diseases, and an increasing vulnerability of the agricultural industry as a result of reduced water supply (Mote et al. 2014).

As average temperatures in the U.S. are expected to continue to rise, the resulting impacts are also expected to continue into the future. Although there is uncertainty about the specific magnitude and timing of future changes, regional climate models for the Pacific Northwest generally predict continued increases in air temperature, stream temperature, and likelihood of wildfire, reductions in spring snowmelt and the supply of freshwater, and a shift in the timing of seasonal streamflow. East of the Cascades, the primary climate-related concerns are an increased likelihood for wildfires and mountain pine beetle outbreaks, reduced availability of habitat for salmon and steelhead due to warming stream temperatures and altered flow regimes, and the long-term impact of reduced water supply on the agricultural industry (Lawler and Mathias 2007, Littell et al. 2009).

Climate change may result from natural factors and processes or from human activities. GHG emissions caused by human activities represent the most significant driver of climate change since the mid-20th century (EPA 2014a, IPCC 2014). GHGs are chemical compounds found in the earth's atmosphere that absorb and trap infrared radiation or heat in the lower part of the atmosphere. The principle GHGs emitted into the atmosphere through human activities are carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), and fluorinated gases (EPA 2014a). Of these four gases, $CO_2$ is the major GHG emitted (EPA 2016b).

Currently, the main source of emissions in Washington is the transportation sector, which produces almost half of the state's GHG emissions. The next largest contributor is the residential, commercial and industrial sector, followed by the electricity consumption-based sector (Ecology 2014b). As noted earlier, the only existing source of GHG emissions at the hatchery site is exhaust emissions from residents traveling to and from the site, and from travelers on adjacent roadways.

## 3.11.2 Environmental Consequences of Proposed Action

### 3.11.2.1 MRS Hatchery Construction

Construction activities at the Holmes Ranch property may cause minor short-term increases in criteria air pollutant emissions. Ground-disturbing activities at the hatchery site would occur, potentially generating fugitive dust, a common pollutant introduced during clearing and grading. State regulations (WAC 173-400-040) require that reasonable precautions be taken to prevent fugitive dust from becoming airborne.

The use of heavy equipment and machinery during construction would also be a source of exhaust emissions. Emissions from vehicle exhaust would increase the amount of airborne particulates and other pollutants in the immediate vicinity of the construction activity. In addition, material truck deliveries, dump trucks, and construction workers traveling to and from the hatchery site would generate approximately 20-60 vehicle trips per day, further contributing to vehicle emissions in the region. However, the number of additional construction workers and vehicle trips is low when compared to the existing workforce and vehicular traffic of the region; therefore, the degree of the impact is low and there would be no significant reductions in the air quality of the surrounding region.

The construction contractor would be required to comply with all local, state, and federal regulations concerning air pollution abatement related to construction activities. Construction effects on air quality are expected to be low because they would be short term, local, and would cease when construction is complete. Appropriate BMPs would be used for the control of fugitive dust.

The use of heavy equipment during construction and additional vehicle trips for construction workers and truck deliveries would temporarily increase GHG emissions in the project vicinity. However, the temporary increases would not be significant—increases have been estimated to be approximately 3,073 metric tons of $CO_2e$, which would be less than Ecology's threshold for significance of 25,000 metric tons of $CO_2e$ annually. Thus, the construction impacts on GHG would be low. See Appendix F for details on construction GHG emissions.

#### 3.11.2.2 MRS Hatchery Operation and Maintenance

During operation of the hatchery, the number of employee or delivery trips to and from the site would increase from 0-3 trips per day, under existing conditions, to an average of 7-10 trips per day, which would slightly increase air pollutant and GHG emissions in those areas. Most of these trips would be generated by employee personal vehicles (up to 5 per day) and the remainder would be for deliveries and maintenance or support vehicles (1 per day each). This increase in the vehicle trips would result in low impacts to air quality emissions when compared to existing vehicular activity in the surrounding area.

All mechanical equipment at the hatchery site (e.g., pumps, chillers, water treatment) and residential units would be electric powered and, therefore, would not result in on-site air pollutant emissions. An emergency backup diesel generator would be located on site that would result in emissions of criteria air pollutants when operated. WAC 173-110 requires that portable generators in excess of 500 brake horsepower undergo "New Source Review." However, the project generator would be rated at 500 brake horsepower or less, and is exempt from WAC 173-400-110. Operational emissions from the hatchery would result in low, short-term impacts to air quality in the immediate vicinity of the site and along travel routes for vehicle trips. Air quality in the study area would remain in compliance with air quality standards and GHG emissions is estimated as 42.9 metric tons of $CO_2e$ annually, which would not exceed Ecology's threshold for significance (25,000 metric tons of $CO_2e$ annually). See Appendix F for details on operational GHG emissions.

As described in Section 3.11.1.2, while there is some uncertainty about the specific magnitude and timing of future changes in climate, regional climate models for the Pacific Northwest generally predict that existing trends of warming air and stream temperatures, increased wildfires, reduced snowmelt and water supply, and altered streamflow regimes are expected to continue into the future. In the coming years, the effects of regional climate change on water resources, aquatic ecosystems, and salmon habitat in the Pacific Northwest may impact hatchery operations. Specific concerns related to salmon stem from increased summertime water temperatures, reduced summer low flows, and increased flooding frequency and magnitude (Mantua et al. 2009). Should future changes in salmon habitat, stream temperatures, and summer flows occur as predicted, hatchery operations may need to adjust to these changing environmental conditions. For example, water intake structures and pumps may need to be modified (e.g., extend deeper or relocated) in response to seasonal changes in streamflow; additional measures to protect the hatchery from flooding may be necessary in response to potential for increased flooding in the Yakima River; changes in the mixing ratio of groundwater and surface water may need to be modified in response to increased summertime water temperatures; stocks being reared may need to change to those that are more resilient to warm water temperatures.

GHG emissions associated with the project would be well below Ecology's threshold for significance; therefore, additional mitigation of GHG emissions from the project would have negligible influence on climate change.

#### 3.11.2.3 Acclimation and Release

Trucks would be used to transport parr and smolts from the hatchery to the acclimation and release sites between late February and mid-April. Vehicle emissions could slightly increase the amount of airborne particulates and other pollutants, including GHG, along the travel routes. However, these additional trips would have a low impact on existing traffic levels and resulting emissions. Mobile acclimation sites would require the use of a portable diesel generator for a period of about 4 weeks per year, which would slightly increase emissions of air pollutants in the immediate vicinity of these sites. Some of the areas are fairly remote but all are accessible by existing roads. Air emissions resulting from additional truck trips and generators at acclimation sites would be low and would not significantly reduce the air quality of the surrounding region.

Should future climate-related changes in salmon habitat, stream temperatures, and summer flows occur as predicted, acclimation sites may need to be relocated to ensure appropriate water temperatures, or the timing of fish releases may need to be shifted in response to seasonal changes in streamflow and temperature.

#### 3.11.2.4 Cumulative Effects

Over the next 50 years (i.e., the useful life of the hatchery), ongoing vehicular traffic, seasonal wildfires, agricultural activities, and residential wood burning would continue to be the main sources of air pollutants. There is a number of minor transportation improvement projects planned in the project vicinity; however, these projects are geared toward rehabilitation of degraded roadways, and are not expected to facilitate increased traffic volumes or result in long-term impacts to air quality or climate change. Current activities in the study area do not violate air quality standards and the Proposed Action is

not expected to cause significant increases of air pollutant emissions; therefore, the cumulative effect to air quality from the Proposed Action and ongoing rural land uses is expected to be low.

In terms of cumulative impacts to the atmospheric levels of GHG, any addition, when considered globally, could contribute to long-term significant effects to climate change. However, the concentrations estimated for the Proposed Project, when compared to the regional, national, and global rates, are low and comparatively insignificant.

#### 3.11.2.5 Mitigation Measures

The following mitigation measures would be implemented to avoid or minimize impacts on air quality during construction and operation at the hatchery site:

- Sequence and schedule construction work to minimize the amount of bare soil exposed to wind erosion.
- Implement measures to control fugitive dust (see mitigation measures in Geology and Soils).
- Do not burn vegetation or other debris associated with construction clearing.
- Ensure that all vehicle engines are maintained in good operating condition to minimize exhaust emissions.
- Handle and dispose of all potentially odorous waste during operation in a manner that does not generate odorous emissions.
- Implement vehicle idling restrictions.
- Encourage carpooling and the use of shuttle vans among construction workers to minimize construction-related traffic and associated emissions.
- Encourage the use of the proper size of equipment for each job because larger equipment requires the use of additional fuel.
- Use alternative fuels, such as propane, for stationary equipment at the construction sites or use electrical power where practicable.
- Reduce electricity use in the construction office and during facility operation by using compact fluorescent or LED bulbs and turning off computers and other electronic equipment every night.
- Recycle or salvage nonhazardous construction and demolition debris, as well as waste generated during facility operation, where practicable.

### 3.11.3 Environmental Consequences of No Action Alternative

No new sources of air pollutants or GHG emissions would be added under the No Action alternative. In addition, there would be no construction activities causing temporary, localized increases in air pollutants or dust. The ongoing adult broodstock collection and outplanting would continue. Trucks would continue to visit ongoing acclimation and release sites as well as the new acclimation sites under the larger YKFP. Therefore, the No Action alternative would have a low impact on air quality in the study area and would contribute a low amount to climate change through increased GHG emissions.

# 3.12 Visual Resources

## 3.12.1 Affected Environment

The study area for visual resources includes the Holmes Ranch property, areas within one half mile of the Holmes Ranch property, and the area immediately surrounding the new acclimation and release sites. These areas represent the maximum geographic extent of visual impacts that may result from the presence of construction vehicles and equipment, increased human presence during construction, the permanent addition of structures and removal of structures or natural features, and long-term operation and maintenance of the proposed project.

The study area at the Holmes Ranch property is rural in character with very few residences or structures (Figure 3.12-1). The study area within half a mile of the Holmes Ranch property is typified by a combination of natural and manmade features include I-90, local paved and dirt roads, approximately 19 residences, agricultural fields, wooded areas, vegetated open space, and waterbodies, including the Yakima River, ponds, canals, and wetlands.

The Holmes Ranch property itself is mostly characterized by open space containing natural features such as a historic side channel of the Yakima River, streams, riparian vegetation, and aspen stands. There are only a few structures at the center of the site, including one residence, a barn, and some holding tanks.

Two major transportation corridors (I-90, SR-10) and three local routes (Klocke Road, O'Neil Road, and McManamy Road) are present within the study area. The John Wayne Pioneer Trail, which is managed by the Washington State Parks and Recreation Commission, runs along the northern boundary of the Holmes Ranch property, within the former Milwaukee Road railway corridor. The trail is used by hikers, bicyclists, and horseback riders.

Public views of the site are available from portions of the John Wayne Pioneer Trail, I-90, and Klocke Road. Figure 3.12-2 shows the viewpoints from which Photo 3-1 through Photo 3-4 were taken. Views of the existing structures on the Holmes Ranch property are generally limited by the presence of vegetation. Photo 3-2 shows an existing view of the hatchery site from the John Wayne Pioneer Trail, which represents the most sensitive potentially affected by the Proposed Action. The sensitivity is related to the recreational use of the trail and presence of sensitive viewer groups (i.e., recreational trail users). The view of the hatchery site from the trail is possible because of breaks in the vegetation, presenting the viewer with unobstructed views of the hatchery site and surrounding natural features.

Similar to the hatchery site, acclimation and release sites would be located in rural areas with limited development. Sites would generally be open and clear of structures, with the exception of some nearby residential and agricultural buildings.


LEGEND

- Holmes Ranch Property
- Proposed Building
- Proposed Paved Area
- Visual Study Area
- Photo Point
- Photo Point And Visual Simulation

**DATA SOURCE:** (Source: Kittatis County 2016, ESRI 2016

Bonneville POWER ADMINISTRATION

N

0 200 400 600 800 Feet

1,000

# STUDY AREA FOR VISUAL RESOURCES

**FIGURE 3.12-1**


**LEGEND**

- Holmes Ranch Property
- Proposed Building
- Proposed Paved Area
- Photo Direction
- Photo Point
- Photo Point And Visual Simulation

**DATA SOURCE:** (Source: Kittatis County 2016, ESRI 2016

Bonneville POWER ADMINISTRATION

N

0 100 200 Feet

# VIEWPOINTS

**FIGURE 3.12-2**

### Photo 3-1. Hatchery Site Overview

### Photo 3-2. View of Hatchery Site from John Wayne Pioneer Trail

### Photo 3-3. View of Hatchery Site from John Wayne Pioneer Trail at Klocke Road

### Photo 3-4. View of Hatchery Site from Klocke Road

## 3.12.2 Environmental Consequences of Proposed Action

### 3.12.2.1 MRS Hatchery Construction

Construction-related activities at the Holmes Ranch property, including heavy equipment operation, clearing and grading, material stockpiles, and worker presence would be visible from existing viewpoints throughout construction. Construction activities would last approximately 16.5 months and take place almost year-round until completion.

Construction of the hatchery facilities would attract attention of sensitive viewers (trail users) and alter the existing viewscape in areas where construction equipment and personnel are visible. Sensitive viewers would experience a negative effect locally from construction activities; however, this effect would only occur for a temporary period of time. Existing views are partially screened by vegetation along the John Wayne Pioneer Trail and by riparian vegetation surrounding waterbodies within and around the hatchery site. This vegetation would not be removed during construction; therefore, the visibility of the construction activities from existing views would continue to be partially screened and would constitute a short-term moderate impact to visual resources.

### 3.12.2.2 MRS Hatchery Operation and Maintenance

The Project Action would add new structures to the hatchery site, including a new hatchery building, new shop/maintenance building, two new holding ponds, three new residences, and miscellaneous outdoor equipment (e.g., surface water pump station and effluent treatment system). The new hatchery building would be the largest new structure (approximately 27,000 square feet and 25 feet tall) and would be the most visible feature from existing viewpoints. All other structures, including the new residences and shop building, would be smaller (approximately 800-3,000 square feet and between 18 and 25 feet tall) and less visible from the surrounding views. The new structures would be similar in appearance (i.e., materials, color, and style) to existing structures and would be compatible with the existing rural character of the area.

The number of visible structures and duration of visibility would depend on the viewer's location, rate of motion through the area, and the extent of vegetative screening. New structures would be intermittently visible for a short period of time, to users of the John Wayne Pioneer Trail beginning at the trail's crossing of Klocke Road, and ending approximately 1,600 feet west of Klocke Road. Photo 3-5 includes a photo simulation of the proposed facilities as viewed from the John Wayne Pioneer Trail; for comparison, the simulation viewpoint shown in Photo 3-5 is in the same location of the existing viewpoint shown in Photo 3-2. Views of the facilities would be short and intermittent due to the traveling, mobile nature of viewers, and vegetative screening along the John Wayne Pioneer Trail.

Given that the new structures would be larger and slightly taller than the existing built features, it is anticipated that they would attract attention and contribute to the viewscape of the immediate surrounding area. The changes to existing views, as depicted in Photo 3-5, represent a long-term impact to visual resources. The new structures would have a moderate impact on the viewer experience as they travel through the rural landscape because the buildings would take up a large portion of the view to the south in

an area that was previously occupied by a small residence and open space similar other properties in the study area.

**Photo 3-5. Simulation of Proposed Facilities, Viewed from John Wayne Pioneer Trail (at same location as Photo 3-2)**

### 3.12.2.3 Acclimation and Release

Activities at acclimation and release sites would not require construction activities. Operation of mobile acclimation sites would require temporary set-up of acclimation tanks and water pumps. The acclimation tanks and water pumps would be small (each tank would occupy approximately 100 square feet) and would be approximately 4 feet in height; therefore, acclimation structures are not expected to create noticeable visual obstructions. In addition, acclimation and release sites would only be operated for a period of three months (Feb-April) so visual impacts would be short term and low. There would be no new impacts at existing acclimation sites.

### 3.12.2.4 Cumulative Effects

Historic development activities within the vicinity of the project, primarily agricultural, have created the visual features that are present today. Additional development in the study area would need to be consistent with zoning for agricultural land use, and is somewhat constrained by the presence of the Yakima River and I-90. The open, rural, and natural character of the area would be expected to continue. There are no reasonably foreseeable future actions that, when combined with the proposed project, would contribute to a cumulative impact on visual resources in the study area.

### 3.12.2.5 Mitigation Measures

The following mitigation measures would reduce the temporary visual impacts during and after construction.

- Avoid removing vegetation along the John Wayne Pioneer Trail or waterbodies within and around the hatchery site.
- Limit areas of disturbance to those necessary for construction and operation.
- Implement a revegetation plan (see mitigation measures in Vegetation).

### 3.12.3 Environmental Consequences of No Action Alternative

Under the No Action alternative there would be no construction, ground-disturbing activities, or alteration of the hatchery site; therefore, existing views and viewer groups would not experience a change in site aesthetics. No long-term impacts to visual resources would result from the No Action alternative. Existing and new acclimation and release sites would be used under the larger YKFP and would create annual, short-term low impacts.

## 3.13 Noise, Hazardous Waste, Public Health, and Safety

### 3.13.1 Affected Environment

The study area for noise, hazardous waste, and public health and safety includes the hatchery site and surrounding areas within one half mile. This area represents the assumed potential geographic extent of noise, hazardous waste, and public health and safety impacts that may result from construction, operation, and maintenance of the Proposed Action.

#### 3.13.1.1 Noise

Sound is typically described using the decibel (dB) scale, a logarithmic rating system that accounts for large differences in audible sound intensities. Using this scale to describe how humans perceive noise, a doubling of loudness is represented as an increase of 10 A-weighted decibels (dBA). A 70 dBA sound level, for example, sounds twice as loud as a 60 dBA sound level. Noise levels expressed in dBA for various common sources are presented in Table 3.13-1. Factors affecting potential noise impacts include distance from the source, frequency of the sound, absorbency of the ground, the presence of obstructions, and the duration of the sound.

**Table 3.13-1. Typical Noise Levels**

| Noise Source or Effect | Sound Level (dBA) |
|---|---|
| Threshold of pain | 140 |
| Jet taking off (200 feet away) | 130 |
| Night Club (with music) | 110 |
| Construction site | 100 |
| Freight train (100 feet away) | 80 |
| Classroom chatter | 70 |
| Conversation (3 feet away) | 60 |
| Urban residence | 50 |
| Soft whisper (5 feet away) | 40 |
| Silent study room | 20 |
| Hearing threshold | 0 |

Source: OSHA 2013

Noise-sensitive land uses include residences and other areas (e.g., parks, outdoor eating areas, or sports fields) where noise can affect how outdoor areas are used or enjoyed. Based on review of aerial photography, parcel boundaries, and land use data, there are

approximately 19 noise sensitive land uses within a half mile of the hatchery site, including 18 residences that are scattered throughout the study area and the John Wayne Pioneer Trail, which runs along the northern boundary of the hatchery site. The nearest residences are located approximately 900 feet (approximately 0.17 mile) from the hatchery site.

The primary existing noise sources in the study area are vehicles traveling on I-90, the Yakima River, agricultural operations (intermittent use of loud equipment and machinery), and light traffic on local roads. According to the Federal Transit Administration (FTA 2006) typical highway noise levels in the study area are likely to be between 70 dBA $L_{eq}$ (A-weighted decibels at equivalent continuous levels) at 50 to 100 feet and 55 dBA $L_{eq}$ at distances out to 800 feet during the day; nighttime highway noise levels would typically be 10 dBA lower. For areas close to the Yakima River (e.g., the New Cascade Canal Diversion), sound levels would be in the mid-60's dBA $L_{eq}$.

#### 3.13.1.1.1 Regulatory Environment

Allowable noise levels are established by local and state regulations. The Kittitas County Noise Ordinance prohibits excessive and disruptive noise that is plainly audible within a dwelling unit, or generated within 200 feet of a dwelling unit, and is considered a detriment to public health, comfort, peace, and safety (Kittitas County 2016c, Chapter 9.45). Construction activities between the hours of 6:00 a.m. and 10:00 p.m. are exempt from this rule, along with sounds created by aircraft, emergency equipment, garden equipment, and many other reasonable and/or necessary activities.

WAC 173-60, *Maximum Environmental Noise Levels,* establishes maximum permissible noise levels based on the type of land uses being affected. Land uses are grouped into 3 classes of "environmental designations for noise abatements," or EDNAs, which are defined in Table 3.13-2. Maximum noise levels, as outlined in Table 3.13-3, are determined by the EDNA of the noise source and the receiving property. Construction activities between the hours of 7:00 a.m. and 10:00 p.m. are exempt from this rule, along with sounds created by aircraft, emergency equipment, silvicultural activities, discharge of firearms, and many other reasonable and/or necessary activities.

**Table 3.13-2. Environmental Designations for Noise Abatement**

| EDNA Class | Description |
|---|---|
| Class A | Lands where human beings reside and sleep. Typically includes residential and recreational land uses. |
| Class B | Lands involving uses requiring protection against noise interference with speech. Typically includes commercial land uses. |
| Class C | Lands involving economic activities of such a nature that higher noise levels than experienced in other areas is normally to be anticipated. Persons working in these areas are normally covered by noise control regulations of the Department of Labor and Industries. Typically includes industrial and agricultural land uses. |

Source: WAC 173-60-030

**Table 3.13-3. Washington Maximum Permissible Noise Levels**

| EDNA of Source | EDNA of Receiving Property (dBA) | | |
|---|---|---|---|
| | Class A | Class B | Class C |
| Class A | 55 | 57 | 60 |
| Class B | 57 | 60 | 65 |
| Class C | 60 | 65 | 70 |

Noise limitations for Class A receivers are reduced by 10 dBA between the hours of 10:00 p.m. and 7:00 a.m.
Source: WAC 173-60-040

### 3.13.1.2 Hazardous Waste

Historic and current uses of the Holmes Ranch property do not indicate a likely presence of hazardous wastes on the property. Typical household materials may be stored at the existing residence on the property in small quantities, including cleaning supplies, paint, solvents, and gasoline for vehicles. When the Yakama Nation took ownership of the property, there was no formal documentation of a known or likely presence of hazardous wastes on the property. A detailed Environmental Site Assessment has not been completed to determine if hazardous substances occur within the study area; however, a records search of federal and state databases (Ecology 2016d, EPA 2016c) found no hazardous wastes or toxic substances documented as occurring within the study area.

### 3.13.1.3 Public Health and Safety

A combination of tribal, state, and county agencies provide public health and safety resources in the study area. Most of these resources can be accessed through the Kittitas County Sheriff's office or the Yakama Nation Tribal Police Department, depending on the location. The Kittitas County Sheriff's office and the Yakama Nation Tribal Police Department serve as a communication link between other public and emergency service providers. Local law enforcement departments coordinate emergency 911 calls and dispatch for fire districts, police, and emergency medical services for Kittitas County and the Yakama Nation Reservation.

Fire protection at the hatchery site is served by the Kittitas County Fire District No. 2, which serves the City of Ellensburg and surrounding rural areas. The closest hospitals to the hatchery site are located approximately 2 miles south of the hatchery site in Ellensburg, Washington. They include the Kittitas Valley Healthcare Hospital and Community Health of Central-Washington.

According to the Kittitas County Community Health Improvement Plan 2013-2017, some of the main public health concerns for the county relate to the quality and affordability of health care, lack of coordination between local public health system stakeholders, and a high level of familial stress reported by residents (Kittitas County 2012). In addition, recent increases in particulate matter pollution have raised some concerns regarding respiratory and health impacts.

There are no existing public health or safety concerns at the hatchery site.

## 3.13.2 Environmental Consequences of Proposed Action

### 3.13.2.1 MRS Hatchery Construction

Construction of the Proposed Action can be expected to cause moderate short-term noise impacts in areas directly adjacent to construction activity. Noise sources during construction would include employee vehicles, portable diesel generators, a temporary air conditioner used for the office trailer, construction equipment, and other small tools. The specific types of construction equipment anticipated for use include dozers, excavators, dump trucks, air wrenches, hammers, circular saws, vibratory rollers, jumping jacks, plate compactors, and concrete pump trucks. Construction equipment noise levels are usually measured at 50 feet from the source; some typical levels are listed in Table 3.13-4.

**Table 3.13-4. Typical Construction Equipment Noise**

| Activity Type | Equipment Type | Noise Level Range at 50 Feet (dBA) |
|---|---|---|
| Materials Handling | Concrete mixers | 75-87 |
| | Concrete pumps | 81-83 |
| | Cranes (movable) | 76-87 |
| | Cranes (derrick) | 86-88 |
| Stationary Equipment | Pumps | 69-71 |
| | Generators | 71-82 |
| | Compressors | 74-87 |
| Impact Equipment | Pneumatic wrenches | 83-88 |
| | Rock drills | 81-98 |
| Land Clearing | Bulldozer | 77-96 |
| | Dump truck | 82-94 |
| Grading | Scraper | 80-93 |
| | Bulldozer | 77-96 |
| Paving | Paver | 86-88 |
| | Dump truck | 82-94 |

Source: U. S. Environmental Protection Agency, 1971.

The nearest residences are located approximately 900 feet (0.17 mile) from the hatchery site and may experience some temporary moderate impacts from construction noise. Noise from construction activities is exempt from the WAC regulations, except for nighttime (10 p.m. to 7 a.m.) impacts to EDNA Class A properties. No nighttime construction is anticipated at the hatchery site and construction activities would only occur during permitted construction hours per the local zoning ordinance.

During construction, hazardous materials storage on the hatchery site would be limited to designated, enclosed storage areas with full secondary containment provided. Materials that would likely be stored on the hatchery site include diesel and gas fuel for the equipment, lubricant and motor oil for construction equipment, and paint used for

buildings. A fuel truck would be used to refuel construction equipment. When not in use for refueling, the truck would be parked in a confined area with full secondary equipment provided. There would also be concrete wash-out containment areas.

During construction, the potential for public health and safety impacts would be short term, localized, and minor. The construction areas would be controlled by the construction contractor and access to the hatchery site during construction would be limited to construction and other approved personnel. Public health and safety in the surrounding study area would be impacted at a low level by construction at the hatchery site, other than the potential impacts related to air quality (see Section 3.11.2.1) and construction traffic on local roads (see Section 3.2.2.1).

#### 3.13.2.2 MRS Hatchery Operation and Maintenance

Operational noise sources at the hatchery would include employee and visitor vehicles, truck deliveries, and HVAC system outdoor equipment (heat pumps, etc.) for the hatchery building, residences, and shop building. Additional pieces of equipment would operate indoors and would not lead to noticeable outdoor noise. The dominant ambient background noise sources at the hatchery site would continue to be from adjacent local roads (Klocke Road, SR-10, and I-90).

Assuming low volume vehicle use (between 7 and 10 vehicle trips per day), typical HVAC systems for facilities of this size, and distance to sensitive receptors, these noise sources combined would not generate noise levels that would exceed WAC thresholds at on-site residences, or at the nearest off-site receptors. Operational noise impacts would therefore be characterized as low at the hatchery facility.

During operation of the hatchery, storage of hazardous materials on-site would be limited to lubricant and motor oil for maintenance equipment, diesel and gas for hatchery vehicles, formalin, cleaning supplies, and paint. Formalin and paint would be stored in a designated storage room designed to contain the chemical in the event of a spill. All other materials would be stored in a designated enclosed storage area with full secondary containment provided.

Operational impacts to public health and safety are not expected to occur because the Proposed Action would have no impact on public and emergency service providers. Hatchery operations would largely occur within the hatchery building, which would only be accessible to hatchery employees and other approved personnel who would be trained on standard worker health and safety measures. The hatchery, located on private property, would not introduce an additional risk to public health in the area.

#### 3.13.2.3 Acclimation and Release

Operational noise sources at acclimation and release sites would include trucks, water pumps, and emergency generators. These sources of noise would only be present on a seasonal basis (February through April), and noises from trucks would only occur intermittently, when employees come to maintain the facilities or release smolts into the stream. It is not anticipated that noise levels at the acclimation and release sites would cause noise impacts in exceedance of the WAC maximum environmental noise levels for nearby receptors. Operational noise impacts would therefore be characterized as low at new and existing acclimation and release sites.

Activities at the acclimation and release sites would not result in releases of hazardous wastes or materials. Chemicals would not be used at mobile acclimation and release sites. Acclimation and release activities would pose a low risk to public health and safety.

#### 3.13.2.4 Cumulative Effects

Noise levels in the project study area would continue to be cumulatively affected by the Yakima River, agricultural operations, and existing roads and vehicular traffic. There are no major commercial or residential developments or transportation projects planned within 1 mile of the hatchery site in the reasonably foreseeable future. Although the Proposed Action would create new sources of noise and a minor increase in noise levels, these impacts would be low and localized and would not contribute significantly to cumulative noise impacts. When combined with the ongoing influence of agricultural operations and roads and vehicular traffic, the cumulative impact on noise, hazardous waste, public health and safety would be low.

#### 3.13.2.5 Mitigation Measures

To reduce the potential for noise, hazardous waste, and public health and safety impacts, the following mitigation measures would be used:

- Schedule construction work during daylight hours between 7:00 a.m. and 9:00 p.m.
- Locate stationary construction equipment as far away from noise-sensitive receptors as possible.
- Require sound-control devices that are at least as effective as those originally provided by the manufacturer on all construction equipment powered by gasoline or diesel engines.
- Select pumps and backup generators that do not generate excessively high noise levels.
- Implement an SPCC plan (see mitigation measures in Water Resources).

### 3.13.3 Environmental Consequences of No Action Alternative

Implementation of the No Action alternative would result in no new sources of noise or hazardous wastes at the hatchery site. Existing noise levels would continue and the hatchery site would remain undeveloped. Normal ambient background noise would continue to originate from the Yakima River, I-90, and traffic on local roads. Existing and new acclimation and release sites would be used with occasional vehicles accessing the sites. Impacts from the use of acclimation and release sites would be the same as those for the Proposed Action (see Section 3.13.2.3),

## 3.14 Adverse Effects That Cannot Be Avoided and Irreversible and Irretrievable Commitments of Resources

- Reduction of flows between 6 and 10 cfs (November to March) in a 6,900-foot reach of the Yakima River.
- Short-term minor increases in sediment in the Yakima River.
- Minor decrease in local nutrient recruitment to the bypass due to loss of riparian vegetation.
- Minor increases in nutrient levels from hatchery discharges.
- Potential interaction between released coho and nontarget fish species.
- Potential impact to nontarget fish species from trapping for coho broodstock.
- Low potential to spread noxious weeds to and from the construction site
- Short-term avoidance by wildlife of the hatchery site due to construction activity.
- Emissions of GHG during construction and hatchery operations, which would minimally contribute to GHG concentrations.
- Irreversible uses of fuel, office supplies, petroleum products, chemicals, and other operational supplies. Some building materials and equipment might be re-usable, but much of it would not.

## 3.15 Short –Term Use of Environmental and Effects on Long-Term Productivity

The proposed MRS Hatchery Program is expected to enhance productivity of the aquatic environment through coho population increases, from which other aquatic and terrestrial species including humans may derive benefits. The lands developed for the hatchery facilities would be permanently taken out of vegetative productivity. Construction activities would temporarily affect more land than would be permanently developed, but long-term productivity would not likely be adversely affected because of the measures that would be taken to restore disturbed, undeveloped areas to pre-existing condition or better (replanting with native species, weed control, standard construction BMPs, etc.).

# 4 Consultation, Review, and Permit Requirements

Numerous federal, state, and local environmental laws and administrative requirements must be satisfied prior to initiation of the proposed project. Compliance with these regulatory requirements is examined in this chapter. The intent of each law, regulation, ordinance, or guideline is described, followed by an assessment of the proposed project's compliance/consistency.

## 4.1 Federal Compliance Requirements

### 4.1.1 National Environmental Policy Act

The National Environmental Policy Act of 1969 as amended (42 USC 4321 et seq.) requires federal agencies to assess and disclose the effects of Proposed Actions on the environment. This EIS has been compiled to meet NEPA requirements, enabling BPA, the Yakama Nation, and Ecology to consider and disclose the potential environmental consequences of and mitigation for the Proposed Action. BPA conducted formal scoping meetings and informal outreach efforts with interested and potentially affected parties. The identified key issues were used to guide the environmental analysis. Copies of the draft EIS will be sent to the relevant agencies, organizations, and interested parties for review and comment. After a formal public comment period on the draft EIS, a final EIS will be prepared to include responses to comments, corrections, or clarifications to the analysis and, if necessary, additional analyses. BPA will document its final decision in a Record of Decision after the final EIS has been issued.

### 4.1.2 Heritage Conservation and Cultural Resources Protection

Section 106 of the National Historic Preservation Act of 1966 as amended (54 USC 300101) requires federal agencies with land management or permitting authority to take into account the potential effects of their undertakings on properties that are listed or eligible for listing on the National Register of Historic Places. Consultation must occur with the State Historic Preservation Office, Tribal Historic Preservation Officer, Indian tribes that attach religious and cultural significance to historic properties that may be affected by an undertaking, and additional consulting parties regarding the inventory and evaluation of properties potentially eligible for National Register nomination and to determine whether the project undertaking would adversely affect them. Yakama Nation archaeologists and cultural specialists conducted cultural resource surveys at the hatchery site where ground disturbance may occur (Section 3.9.2). Consultation among BPA, the Yakama Nation, the Washington State Historic Preservation Office, and Yakama Tribes' Tribal Historic Preservation Officer is ongoing to document the finding of effect and resolve adverse effects through mitigation requirements.

The Archaeological Resource Protection Act (16 USC 470aa-mm) was enacted to protect archaeological resources on federal and tribal lands. The Archaeological Resource Protection Act governs the excavation of archaeological sites on federal and

tribal lands and the removal and disposition of the archaeological collections removed from those sites. As the proposed hatchery is on land owned by the Yakama Nation, The Archaeological Resource Protection Act would apply to the Proposed Action.

The Archaeological and Historic Preservation Act (16 USC 469 *et seq.*) directs federal agencies to notify the Secretary of the Interior if they find that a federal action might cause the destruction of significant scientific, prehistoric or archaeological data.

The Native American Graves Protection and Repatriation Act (25 USC 3001 *et seq.*) and its implementing regulations (43 CFR 10.4) provide protection for Native American graves and cultural materials of federal and tribal lands. The regulations also affect treatment and disposition of burials and funerary objects encountered through notification and consultation procedures for the lead federal agency.

Executive Order 13175, Consultation and Coordination with Indian Tribes, states that the U.S. government will continue to work with Indian Tribes on a government-to-government basis to address issues concerning tribal self-government, trust resources, and Indian tribal treaty and other rights.

BPA also complies with other laws and directives for the management of cultural resources, including, but not limited to:

- Antiquities Act of 1906 (16 USC § 431-433)
- Historic Sites Act of 1935 (16 USC § 461-467)
- Executive Order 13007, Indian Sacred Sites
- American Indian Religious Freedom Act of 1978 (42 USC § 1996, 1996a).

## 4.1.3 Wetlands, Floodplains, and Water Resources

### 4.1.3.1 Clean Water Act

Uncontrolled water pollution led to enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the Clean Water Act. It is the principal federal law governing water pollution control and establishes the basic structure for regulating discharges of pollutants into the waters of the U.S. It gave the EPA the authority to implement pollution control programs such as setting wastewater standards for industry. The Clean Water Act also contains requirements to set water quality standards for all contaminants in surface waters and makes it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit is obtained under its provisions. The Corps was given the authority to regulate and issue permits for the discharge of dredged or fill material into waters of the U.S. Some provisions of the Clean Water Act have been delegated by the EPA to the states, including the issuance of wastewater discharge permits and stormwater permits for construction.

#### 4.1.3.1.1 Section 401 (Water Quality Certification)

Section 401 of the Clean Water Act includes the State Water Quality Certification program requiring that the state certify compliance of federal permits and licenses with

state water quality requirements. Application would need to be made to Washington Department of Ecology when final facility design is complete and prior to construction.

#### 4.1.3.1.2 Section 402 (National Pollutant Discharge Elimination System)

This section authorizes stormwater discharges associated with construction activities greater than one acre. An NPDES permit authorizes construction projects, provided notice is given to the authorizing agency and appropriate erosion control plans and measures are implemented. The action agency is responsible for preparing and implementing a Stormwater Pollution Prevention Plan that would be overseen by Ecology. Application would need to be made to Ecology when final facility design is complete and prior to construction. Pertinent information will include construction schedules and quantities and quality of potential discharge.

#### 4.1.3.1.3 Section 404

Authorization from the Corps is required under this section when there is a discharge of dredged or fill material into waters of the U.S., including wetlands. When design is finalized, a permit application would need to be submitted to the Corps at which time the Corps will determine if this project would be evaluated under the Nationwide Permit process or if an Individual Permit would be required.

### 4.1.3.2 Executive Orders on Floodplain Management and Protection of Wetlands

The U.S. Department of Energy mandates that impacts to floodplains and wetlands be assessed and alternatives for protection of these resources be evaluated in accordance with Executive Orders 11988 and 11990, along with the Compliance with Floodplain/Wetlands Environmental Review Requirements (10 CFR 1022.12). Section 0 describes the effects of the Proposed Action on wetlands and FEMA mapped floodplains.

## 4.1.4 Fish and Wildlife

### 4.1.4.1 Endangered Species Act

The Endangered Species Act of 1973 and its amendments (ESA, 16 USC 1531 et seq.) require federal agencies ensure their actions do not jeopardize endangered or threatened species or their critical habitats. Sources of information for the potential occurrence of endangered or threatened species and their habitats in the project area include the Yakama Nation, NMFS, USFWS, and WDFW. Each was consulted during formulation of this draft EIS for lists of threatened, endangered, or candidate species and presence of habitat. Potentially affected species and their habitat are discussed and analyzed in Sections 3.7 and 3.8. Based on this information, BPA is preparing a BA for consultation in accordance with ESA Section 7. The Yakama Nation has also submitted Hatchery and Genetic Management Plans to NMFS to address the fish production aspects of the project. The final EIS will summarize the outcome of these consultation efforts and no decision on the Proposed Action will be reached by BPA until this consultation is complete.

#### 4.1.4.2 Fish and Wildlife Conservation Act/Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act of 1934 (16 USC 661 *et seq.*) requires federal agencies consult with the USFWS and state fish and wildlife agencies when "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted . . . or otherwise controlled or modified" by permit or license. Other federal acts and laws, such as the Fish and Wildlife Conservation Act of 1980 (16 USC 2901 et seq.), encourage federal agencies to conserve and promote conservation of game and nongame species and their habitats.

The proposed project would divert waters of the Yakima River from November through March to rear and acclimate coho salmon. This use would not consume the water, but would use it briefly and then discharge it back into the river. This use represents less than 2 percent of average Yakima River flows during the lowest flow period of proposed use (February). For this reason, measurable impacts on instream flows and temperatures within the diversion reach would be unlikely, and impacts on fish in the mainstem Yakima River would be low. Sections 3.7 and 3.8 describe the potential effects to fish and wildlife resources. USFWS and WDFW will be sent a copy of this draft EIS and their comments will be included in the final EIS.

#### 4.1.4.3 Magnuson-Stevens Fishery Conservation and Management Act

NMFS is responsible for ensuring compliance with the Magnuson-Stevens Fishery Conservation and Management Act of 1976. Public Law 104-297, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fishery Conservation and Management Act to establish new requirements for evaluating and consulting on adverse effects to EFH. EFH includes all streams, lakes, ponds, wetlands, and other viable waterbodies, and most of the habitat historically accessible to salmon necessary for spawning, breeding, feeding, or growth to maturity. The Yakima River is designated as EFH for Chinook (*Oncorhynchus tshawytscha*) and coho salmon (*O. kisutch*).

Compliance with the Magnuson-Stevens Fishery Conservation and Management Act is consolidated with ESA Section 7 consultation. The BA will include an effects analysis and determination of effect on EFH. In addition, the BA will contain any conservation measures intended to appropriately avoid and minimize impacts to essential fish habitat of federally-managed fish species.

#### 4.1.4.4 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (16 USC sections 703-712) prohibits the taking, killing, or possessing migratory birds or their eggs or nests except as allowed by the Secretary of the Interior. The list of migratory birds is found in 50 CFR 10, and permit regulations are found in 50 CFR 21. Due to the project's proximity to waterbodies, wetlands, and riparian corridors, migratory bird species are likely to occur within or near to the hatchery site; however, impacts to migratory bird species resulting from construction and operation of the hatchery are expected to be minimal and limited to avoidance of the project site due to increased human activity and noise.

#### 4.1.4.5 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC 668-668d) prohibits the taking of, possession of, and commerce in bald and golden eagles, with limited exceptions. Information from Section 3.8 reveals there is one bald eagle nest reported within 2,000 feet of the proposed hatchery site (WDFW 2016e). There is also designated WDFW Bald Eagle Winter Range located approximately 1,600 feet west of the hatchery site (WDFW 2016e). The type of disturbance that would occur in the project area would not interfere with or prevent bald or golden eagles from completing any portion of their life cycle. Because this Act covers only intentional acts, or acts in "wanton disregard" of the safety of golden or bald eagles, this project is viewed as compliant.

### 4.1.5 Farmland Protection Policy Act

The Farmland Protection Policy Act (7 USC 4201 *et seq.*) directs federal agencies to identify and quantify adverse effects of federal programs on farmlands. The purpose of the act is to minimize the number of programs that unnecessarily contribute to the conversion of agricultural land to non-agricultural purposes. The location and aerial extent of Prime and other important farmlands as designated by the Natural Resource Conservation Service were obtained from Natural Resource Conservation Service soil surveys for Kittitas County. The hatchery site contains some areas of prime farmland (if irrigated and drained) and farmland of statewide importance (NRCS 2010, 2016). As described in Section 3.1, approximately 3.8 acres of prime farmland and 0.5 acre of farmland of statewide importance would be temporarily disturbed as a result of facility construction. Of that, 1.8 acres of prime farmland and 0.2 acre of farmland of statewide importance would be permanently covered by impervious surfaces (i.e., buildings or pavement).

### 4.1.6 Noise Control Act

The Noise Control Act of 1972 (42 USC 490 et seq.) promotes an environment free from noise that jeopardizes human health and welfare. Federal and state regulations establish guidelines that implement the intent of the act. Additional local noise standards exist for Kittitas County in their local noise ordinance. No noise in excess of state, federal, and local standards is expected from this project (Section 3.13). Temporary construction noise during daylight hours is exempt from state and federal standards.

### 4.1.7 Clean Air Act

Emissions produced by construction and operation of the proposed project facilities must meet standards of the Clean Air Act and the amendments of 1970 (42 USC 741 et seq.). In Washington, the authority for ensuring compliance with this act is delegated to Ecology. The Proposed Action would not violate current clean air standards, as described in Section 3.11.

### 4.1.8 Executive Order on Environmental Justice

Executive Order 12898 directs federal agencies to consider the effects of their programs, policies, and activities on minority and low-income populations. Federal agencies are required to assess environmental justice concerns in the NEPA analysis. The potential

for the MRS Hatchery to affect low-income communities and minority populations is summarized in Section 3.10.1.2.

### 4.1.9 Resource Conservation and Recovery Act; Toxic Substances Control Act; and Federal Insecticide, Fungicide, and Rodenticide Act

The Resource Conservation and Recovery Act (42 USC 692 et seq.) regulates the disposal of hazardous wastes. The Toxic Substances Control Act (15 USC 2601) gives authority to the EPA to regulate substances that present unreasonable risks to public health and the environment. The federal Insecticide, Fungicide, and Rodenticide Act (7 USC 136 et seq.) authorizes the EPA to prescribe conditions for use of pesticides. Construction, operation, and maintenance of the proposed facilities would meet the guidelines for use, handling, storage, and disposal of such hazardous substances. Necessary permits would be obtained if regulated pesticide products are used.

All chemical handling, application, and disposal would comply with applicable federal, state, and other regulations to protect human and environmental health.

### 4.1.10 Executive Order on Federal Leadership in Environmental, Energy, and Economic Performance

Executive Order 13514 states that federal agencies should identify and analyze impacts from energy usage and alternative energy sources in all EIS's and Environmental Assessments for proposals for new or expanded federal facilities under NEPA, as amended (42 USC 4321 et seq). BPA may fund the construction, operation, and maintenance of portions of the facilities proposed under the MRS Hatchery. The final designs have not yet been completed for these facilities; however, BPA has made the following general assessment of energy usage and the potential for using alternative energy sources.

Ground and surface water pumps would require the majority of the energy usage for this project. Energy requirements have been minimized in the conceptual design of the project through the use of gravity flow water supplies where possible. Where pumps would be needed, the primary power source would be nearby power lines, with generators to be used for emergency backup. Energy sources other than electrical power are not likely to be feasible due to the size of the requirement and the constant demand cycle. The use of propane rather than diesel fuel for the generators is being considered, as propane would emit fewer greenhouse gases that would contribute to climate change. Energy efficiency would also be considered in the sizing of the pumps and pipelines. BPA would also encourage the Yakama Nation to use and promote energy-efficient design and operations in the new hatchery buildings, utilize incentives for energy conservation from the local Public Utility District wherever feasible, and, where practical, to supply their power needs from existing renewable sources or install on-site renewable power generation, such as solar panels.

The Yakama Nation will own and operate the facilities, so the tribe would ultimately make final decisions for the hatchery designs and operations. However, BPA will use contractual mechanisms through the funding agreement to encourage design and operation practices in the manner described in Executive Order 13514.

## 4.2 Other Compliance Requirements

### 4.2.1 State Environmental Policy Act

SEPA, Washington State's most fundamental environmental law, was enacted in 1971 as chapter 43.21C, Revised Code of Washington. Much like the federal NEPA, SEPA is designed to provide decision makers and the public with impartial information about a project and analyze alternatives to the proposal, including ways to avoid or minimize adverse impacts or to enhance environmental quality. The purpose of SEPA is to encourage harmony between the citizenry and the environment, to promote efforts that will prevent or eliminate damage to the environment, to stimulate human health and welfare, and to enrich understanding of the ecological systems and natural resources that are important to Washington State. Information provided during the SEPA review process helps decision makers understand how a proposal will affect the environment and identify measures to reduce likely effects, or deny a proposal when adverse effects are identified. This EIS may be adopted by Ecology as the lead state agency to fulfill the SEPA requirement.

### 4.2.2 Water Rights and Wells

The hatchery and acclimation ponds are water-dependent uses, so water rights and in-water work permits are required. Elements would be incorporated into project design to ensure consistency with the appropriate authorizations once they are known.

### 4.2.3 Hydraulic Project Approval

In-stream construction (below the ordinary high water mark) requires a Hydraulic Project Approval from Washington State, which would specify when in-water work can occur and what measures would be needed to protect channels, riparian zones, and water quality.

### 4.2.4 Floodplain Approval

Kittitas County may also require an approval to allow construction within a designated floodplain to ensure that appropriate design measures are included.

### 4.2.5 Shoreline Permit

On February 22, 2016, Ecology approved Kittitas County's updated Shoreline Master Program and it became effective March 7, 2016. Construction activities within 200 feet of a body of water and/or associated floodway and wetlands under the jurisdiction of the Kittitas County Shoreline Master Program require a Shoreline Permit from the County.

### 4.2.6 Land Use/Building Permits

Kittitas County is currently updating its Critical Areas Ordinance. A Critical Areas Permit likely would be required from the County for any activities that may impact a wetland, stream, or associated buffers. Kittitas County may also require building permits such as: Grading, Access and Address, Adequate Water Supply Determination, and On-Site Sewage Installation Permits.

# 5 List of Preparers

| Name | EIS Section | Experience and Education |
|---|---|---|
| Black, Carrie<br>HDR | Project Coordinator | Seven years of experience in project support, editing, and administration. Three years of experience technical editing environmental documents.<br>B.S., Communication<br>B.A., Visual Communication |
| Brown, Molly<br>HDR | QA/QC | More than 20 years' experience managing, writing, and reviewing NEPA documents<br>B.S., Environmental Studies |
| Buffington, Lori<br>HDR | Technical Editor | More than 25 years of experience in technical editing and document design; responsible for editorial review of EIS', BAs, and other large-scale studies. |
| Danieleski, Lisa<br>HDR | Wildlife, Vegetation and Wetlands | Fifteen years of experience in wetland and stream science botanical and wildlife studies in support of NEPA documents<br>B.A., Biology |
| Goodman, Dave<br>BPA | Purpose and Need, Alternatives | Eight years experience in development and review of NEPA documents<br>B.S., Economics<br>J.D., Environmental Studies |
| Holloway, Becky<br>HDR | Fish | More than 18 years of environmental consulting experience, including development of NEPA documentation for project-related impacts on aquatic species, with an emphasis on federally-listed species and their habitat.<br>B.S., Marine Biology<br>M.S., Biology |
| LaRue, Nicholas<br>HDR | GIS Analysis, EIS Figures | Fourteen years of Geospatial experience in GIS and Remote Sensing<br>B.A. Geography and Natural Resource Management |
| Noel, Scott<br>HDR | Air Quality, Noise, Hazardous Waste, and Public Health and Safety | Sixteen years' experience conducting air quality noise analysis.<br>B.A., Geography and Environmental Planning |
| Ramsey, Dawn<br>HDR | Cultural Resources | Twenty years' experience conducting archaeological and historic built environment studies and contributing to Section 106 and NEPA documents.<br>B.A., History and Anthropology<br>M.A., Anthropology |
| Takieddine, Malda<br>HDR | Visual Resources (Visual Simulation) | More than 8 years' experience in landscape design and visual simulation<br>Bachelor of Fine Arts<br>Master of Landscape Architecture |
| Sahatjian, Brittany<br>HDR | Socioeconomics, Transportation, Visual Resources, Land Use and Recreation | More than 3 years' experience writing NEPA documents and evaluating potential impacts to the built environment.<br>B.S., Environmental Science and Resource Management<br>M.S., Environmental Management |

| Name | EIS Section | Experience and Education |
|---|---|---|
| Snead, Carol<br>HDR | Project Manager;<br>Geology and Soils | More than 25 years' experience managing and writing NEPA documents.<br>B.S., Geology<br>M.S., Geological Sciences |
| Wiseman, Chad<br>HDR | Water Resources | Ten years' experience writing NEPA documents<br>M.S., Environmental Science |

# 6 Persons, Tribes, and Agencies Receiving Notice of Availability of this EIS

The project mailing list contains stakeholders, including 17 potentially interested or affected landowners; tribes; local, state, and federal agencies; public officials; non-governmental organizations; businesses; and libraries. They have directly received or have been given instructions on how to receive all project information made available so far. Information distributed to these stakeholders includes scoping notifications, comment submission forms and website addresses, and review opportunities for the draft EIS. Specific entities (other than private persons) receiving or consulted during the preparation of this EIS are listed below by category.

## 6.1 Federal Agencies and Officials

U.S. Forest Service

U.S. Fish and Wildlife Service

U.S. Environmental Protection Agency

National Marine Fisheries Service

Senator Patty Murray

Senator Maria Cantwell

Representative Dave Reichert

## 6.2 Tribes

Yakama Nation

## 6.3 State Agencies and Officials

Washington Office of the Governor

Washington Department of Fish and Wildlife

Washington Department of Transportation

Washington Department of Ecology

## 6.4 Local Governments and Utilities

Kittitas County, Washington

Kittitas County Public Works Department

Kittitas County PUD No. 1

Kittitas County Commissioner

City of Ellensburg, Washington

City of Milton-Freewater, Oregon

Yakama Basin Fish and Wildlife Recovery Board

## 6.5 Non-governmental Organizations

American Rivers

Idaho Conservation League

Native Fish Societies of Oregon and Washington

Northwest Sportfishing Industry Association

NW Guides and Anglers Association

Pacific Coast Federation of Fishermans Association

RedFish BlueFish

River Network

Salmon for All

Save Our Wild Salmon Coalition

Sierra Club

Snake River Alliance

Trout Unlimited

Walla Walla Watershed Management Partnership

Washington Wildlife Federation

## 6.6 Libraries

Carpenter Memorial Library, Cle Elum, WA

City of Ellensburg Public Library, Ellensburg, WA

Kittitas Public Library, Kittitas, WA

Roslyn Public Library, Roslyn, WA

Wapato City Library, Wapato, WA

Washington State Library

Yakima Valley Regional Library, Yakima, WA

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# 8 Index

# Appendix A. Effects of Coho Release on Bull Trout in Yakima River Basin under the YKFP, Including Proposed Action

NOTE: Key to acronyms at end of table; Justification for proposed outplanting numbers is presented after the table.

| Location | River/Stream River mile | Bull Trout Presence | Critical Habitat | Action | Applicable Coho Life-Stage and Release # | Ongoing? | Potential Impact/Interaction and ESA Section 7 Effect Determination |
|---|---|---|---|---|---|---|---|
| ***Juvenile and Adult Outplantings*** | | | | | | | |
| ***Mainstem Yakima River*** | | | | | | | |
| Ahtanum Creek | Ahtanum Creek RM 4-12 All releases would occur below the forks | Ahtanum Creek from its confluence with the Yakima River upstream to its confluence with the N Fork and S Forks is occupied and provides foraging, migration, and overwintering FMO habitat and connectivity (USFWS 2010). Ahtanum Creek bull trout are isolated from fish in the lower Yakima River due to thermal barriers and total dewatering of lower Ahtanum Creek below RM 19.7 at Wapato Irrigation Diversion by irrigation water withdrawals (WDFW 1998). Although bull trout are present in the mainstem Ahtanum Creek (above RM 19.7) they are probably more abundant in the upper portion of the drainage, particularly in the North, Middle and South forks where habitat conditions are more favorable The population is mostly above the forks (North and South) where spawning habitat and gradient are too steep for coho to spawn.<br>Spawning areas are documented in the upper reaches of all three forks and Shell Neck Creek, a tributary to the North Fork. A falls at RM 2.5 on the South Fork is believed to be a barrier to upstream migration. Juvenile rearing occurs in the upper reaches and may extend all the way to the confluence of the forks. | Yes | • Summer parr plants, mid-late July | Parr – 20,450 | Yes | Some interaction possible between winter pre-smolts and adult and juvenile bull trout; however, spatial separation within the creek would limit any interactions. All releases would occur below the forks. Any additional production farther up river should benefit any bull trout that venture into the lower stretches of Ahtanum Creek.<br>LAA |
| | | | | • Adult plants – October–November | Adults – 279 | | |
| | | | | • Smolt release | 20,000 | | |
| ***Naches River Watershed*** | | | | | | | |
| Naches River mainstem<br>• Stiles Pond<br>• Lost Creek Pond | RM 3.5<br>~RM 37-38 | Naches River from its confluence with the Yakima River upstream 71.8 km (44.6 mi) to its confluence with the Little Naches and Bumping Rivers is occupied and provides FMO habitat and connectivity (USFWS 2010). | Yes | Smolt acclimation and release | 20,000 each site | Yes | Naches River used as a migratory corridor; FMO habitat. Limited interaction with adults and subadults possible from smolt releases. Potential for competition with subadults if smolts residualize, but discountable.<br>NLAA |
| Lower Tieton River | Tieton River RM 1–21.3 | Occupied by low number of adults/subadults downstream of dam (likely entrained through dam); no spawning downstream. Tieton River from its confluence with the Naches River upstream to Tieton Dam provides FMO habitat and connectivity between Naches and Yakima Rivers (USFWS 2010). | Yes | Adult plants | Adults – 834 | No[1] (new activity under Proposed Action) | If present, limited potential for overlap because bull trout spawn and rear upstream of Rimrock Dam, limited occurrence downstream in mainstem Tieton River.<br>LAA |
| North Fork Tieton River | NF Tieton River – Clear Lake RM 7.3–10 | From its confluence with Rimrock Reservoir to Clear Lake Dam NF is occupied FMO habitat; from its confluence with Clear Lake Reservoir upstream 21.0 km (13.0 mi) to a natural barrier is occupied SR habitat (USFWS 2010). Spawning occurs 5 miles above Clear Lake, about 1 mile above Rimrock Lake; Spawning surveys are conducted in an index reach approximately 2.3 miles in length, which ends at the barrier waterfall. An average of 16 redds have been observed since 2001, with a range of 1 to 37 redds (Reiss et al. 2012). | Yes | Following implementation of fish passage at Tieton Dam:<br>• Adult plants | Adults – 555 | No[1] | Although outplants and releases would occur downstream of known bull trout spawning areas, there is potential for overlap with rearing juveniles.<br>LAA |
| | | | | • Parr plants into Clear Lake | Parr – 10,000 | | |
| South Fork Tieton River | SF Tieton River RM 1–5 | From its confluence with Rimrock Reservoir upstream 26.8 km (16.6 mi) to a natural barrier, SF provides SR habitat (USFWS 2010).The most downstream extent of bull trout spawning occurs at RM 5 (Newsome 2016); migratory habitat throughout. Very stable bull trout population in the subbasin. | Yes | Following implementation of fish passage at Tieton Dam:<br>• Adult plants | Adults – 628 | No[1] | Although outplants and releases would occur downstream of known bull trout spawning areas, there is potential for overlap with rearing juveniles.<br>LAA |

| Location | River/Stream River mile | Bull Trout Presence | Critical Habitat | Action | Applicable Coho Life-Stage and Release # | Ongoing? | Potential Impact/Interaction and ESA Section 7 Effect Determination |
|---|---|---|---|---|---|---|---|
| Little Naches River | Little Naches River RM 9 | Adult and subadult presence possible; FMO habitat from confluence with Naches River upstream to confluence with SF (USFWS 2010); not known to be used for spawning or rearing (Mizell and Anderson 2010). Little Naches tributary, Crow Creek, provides SR habitat (USFWS 2010). | Yes | • Summer parr plants, mid-late July | Parr – 15,767 | No[1] | If present, some juveniles may have direct interactions. Interactions will be limited due to the small number of coho and large amount of habitat.<br>LAA |
| | | | | • Adult plants | Adults – 277 | | |
| Rattlesnake Creek | Rattlesnake Creek RM 1–5 | Bull trout have recently been documented in Rattlesnake Creek. Adults, subadults and juveniles may be present. SR habitat provided (USFWS 2010). Coho parr would be scatter-planted from RM 1-5; adults would be released downstream of RM 2, which is well downstream of habitat used for spawning bull trout. The primary spawning area for this population is located in the South fork above the wilderness boundary at RM 14 and extends about seven miles upstream; it includes Little Wildcat and Shell Creeks. Juvenile bull trout are assumed to rear in Rattlesnake Creek all the way down to the mouth; adult FMO habitat is primarily the Naches River below the Rattlesnake confluence but some adults also utilize FMO habitat upstream (Mizell and Anderson 2010). | Yes | • Adult plants | Adults – 186 | No[1] | Interactions may be possible; however, due to the low numbers of coho and bull trout, negative interactions are unlikely.<br>NLAA |
| | | | | • Parr summer plants | 26,538 | | |
| Nile Creek | Nile Creek RM 3–6 | No confirmed bull trout in Nile Creek. An occasional adult or juvenile may swim in the winter, summer temperatures are low 60s (°F; around 16°C). | No | • Summer parr plants, mid-late July | Parr – 15,470 | Yes | Interactions may be possible; however, due to the low numbers of coho and bull trout, negative interactions are unlikely.<br>NLAA |
| Cowiche Creek | Cowiche Creek above RM 6 | Cowiche Creek from its confluence with the Naches River upstream to its confluence with N. Fork Cowiche Creek and S. Fork Cowiche Creek is occupied and provides FMO habitat (USFWS 2010). Bull Trout have not been documented in Cowiche Creek since 2002 (Reclamation 2015a). Juvenile bull trout would most likely be above the Cowiche Creek forks. | Yes | • Summer parr plants, mid-late July | Parr – 11,708 | Yes | Due to the low occurrence of bull trout in Cowiche, there is little likelihood of direct interactions. However, likely discountable.<br>NLAA |
| | | | | • Adult plants – October–November | Adults – 262 | | |
| South Fork Cowiche | South Fork Cowiche RM 7.5–17 | Possible, though unconfirmed bull trout presence in Reynolds Creek (tributary to SF). No confirmed bull trout in SF Cowiche (Newsome 2016). South Fork Cowiche Creek from its confluence with the Naches River upstream to its confluence with N. Fork Cowiche Creek and S. Fork Cowiche Creek is occupied by bull trout and provides FMO habitat (USFWS 2010). | Yes | • Spring smolt plants, early April | Smolts – 20,000 | No[1] | Due to potential though unconfirmed occurrence of bull trout in tributary to SF Cowiche, there is potential for direct interactions. However, likely discountable.<br>NLAA |
| Rock Creek | Rock Creek RM 1–2 | No confirmed bull trout in Rock Creek. However, Rock Creek from its confluence with S. Fork Cowiche Creek upstream 4.4 km (2.8 mi) is occupied and provides SR habitat (USFWS 2010). | Yes | • Summer parr plants, mid-late July | 1,561 | No[1] | No interaction anticipated.<br>NE |
| North Fork Little Naches | North Fork Little Naches RM 13–14 | North Fork Little Naches River from its confluence with the Little Naches River upstream 12.5 km (7.8 mi) provides SR habitat for the Little Naches potential local population (USFWS 2010); FMO habitat provided. | Yes | • Summer parr plants, mid-late July | Adults – 94 | Yes | If present, some juveniles may have direct interactions. Interactions will be limited due to the small number of coho and large amount of habitat.<br>LAA |
| Bumping Lake/ Bumping River | Bumping River (base of dam) RM 19 Bumping River (top of lake) RM 21.1 | Bumping River from its confluence with the Naches River upstream to Bumping Dam is occupied and provides FMO habitat connecting upstream populations to the Naches River (USFWS 2010). Deep Creek has a fairly stable but fluctuating bull trout population and appears to be the only tributary of Bumping Lake where bull trout spawn from late August to mid-September. (WDFW 1998). Juveniles likely spend several years in Deep Creek before migrating to Bumping Lake. Upper Bumping River has only had an occasional adult found in it; SR habitat reported (USFWS 2010). | Yes | • Adult plants | Adults – 939 | Yes | Interactions may be possible; however, due to the low numbers of coho and bull trout, negative interactions are unlikely.<br>LAA |

| Location | River/Stream River mile | Bull Trout Presence | Critical Habitat | Action | Applicable Coho Life-Stage and Release # | Ongoing? | Potential Impact/Interaction and ESA Section 7 Effect Determination |
|---|---|---|---|---|---|---|---|
| Quartz Creek | Quartz Creek RM 1–4 | Quartz Creek from its confluence with the Little Naches River upstream 9.7 km (6.0 mi) provides FMO habitat (USFWS 2010). Subadults and adults may be present. | Yes | • Summer parr plants, mid-late July | Parr – 5,776 | Yes, but more parr releases proposed | Interactions may be possible; however, due to the low numbers of coho and bull trout, negative interactions are unlikely.<br>NLAA |
| American River | American River RM 1–16 | American River from its confluence with the Bumping River upstream to its confluence with Morris Creek is occupied and provides SR habitat (USFWS 2010). Known spawning includes the American River beginning just below the confluence with Kettle Creek (about RM 9) extending about 8.5 miles upstream. Adults and subadults in lower reaches (FMO), all life stages in upper reaches. | Yes | • Adult plants | Adults – 329 | No | Interactions may be possible; however, adult outplanting would be restricted to lower reaches where bull trout are not known to spawn or rear.<br>LAA |
| | | | | • Parr summer plants | Parr – 26,538 | | |
| ***Upper Yakima River*** | | | | | | | |
| Wilson Creek | Wilson Creek RM 3–20 (adult releases RM 3–8; juvenile 6–20) | No bull trout residing in Wilson Creek (USFWS 2007; BPA et al. 2006). | No | • Summer parr plants, mid-late July | Parr – 31,221 | Yes | No interaction anticipated.<br>NE |
| | | | | • Adult Plants – October–November | Adults – 335 | | |
| Reecer Creek | Reecer Creek RM 0–3 | No bull trout have been found or documented in Reecer Creek. | No | • Summer parr plants, mid-late July | Parr – 15,298 | Yes | No interaction.<br>NE |
| | | | | • Adult plants – October–December | Adults – 380 | | |
| Taneum Creek | Taneum Creek RM 3–12 | No bull trout documented in lower reaches of Taneum Creek. Upper reaches may be occupied by all life stages. Taneum Creek from confluence with Yakima River upstream to its confluence with the N. Fork Taneum Creek and S. Fork Taneum Creek likely provides FMO habitat (USFWS 2010). | Yes | • Adult plants – October–November | Adults – 602 | Yes – outplanting of adult coho has occurred | Limited interaction anticipated in areas where adults would be outplanted.<br>NLAA |
| Swauk Creek | Swauk Creek RM 0–18 | Swauk Creek from confluence with Yakima River upstream 4.8 km (3.0 mi) provides FMO habitat for populations below the Reclamation dams in the Upper Yakima (USFWS 2010). Occurrence rare; one adult in Swauk Creek in 1993 (Reiss et al. 2012). | Yes | • Summer parr plants, mid-late July | Parr – 26,966 | Yes | No interaction.<br>NE |
| | | | | • Adult plants | Adults - 204 | | |
| First Creek | First Creek RM 0-1 | No documented presence or use of habitat (Streamnet 2016). Not included in Yakima River Critical Habitat Unit. | No | • Summer parr plants, mid-late July | Part of overall Swauk Creek parr outplanting | No[1] | No interaction.<br>NE |
| Blue Creek | Blue Creek RM 0-1 | No documented presence or use of habitat (Streamnet 2016). Not included in Yakima River Critical Habitat Unit. | No | • Summer parr plants, mid-late July | Part of overall Swauk Creek parr outplanting | No[1] | No interaction.<br>NE |
| Iron Creek | Iron Creek RM 0–2 | Not present. | No | • Summer parr plants, mid-late July | Parr – 3,122 | No[1] | No interaction.<br>NE |
| Williams Creek | Williams Creek RM 1 | Not present. | No | • Mobile acclimation site (smolts, April–May) | Smolts – 20,000 | No[1] | No interaction.<br>NE |
| Lower Cle Elum River (below dam) | Cle Elum River RM 0–8.2 | Cle Elum River from its confluence with the Yakima River upstream to Cle Elum Dam is occupied and provides FMO habitat (USFWS 2010). | Yes | • Summer parr plants, mid-late July | Parr – 12,801 | No[1] | Interactions may be possible; however, due to the low numbers of coho and bull trout, negative interactions are unlikely.<br>NLAA |
| | | | | • Adult plants – October–December | Adults - 125 | | |
| Upper Cle Elum River | Cle Elum River RM 20–30 | Cle Elum River from its confluence with the Cle Elum Reservoir upstream 33.4 km (20.7 mi) to its headwaters is occupied and provides SR habitat for the Cle Elum populations (USFWS 2010). Bull trout in the Lake Cle Elum System are very rare. Small numbers of juveniles have been observed in the upper Cle Elum River and one hybrid was observed and captured in the upper Waptus River. (Reiss et al. 2012). | Yes | • Summer parr plants, mid-late July | Parr – 48,393 | Yes | Interactions may be possible; however, due to the low numbers of coho and bull trout, negative interactions are unlikely.<br>NLAA |
| | | | | • Adult plants, October–December | Adults – 1,091 | | |
| Big Creek | Big Creek RM 1–3 | No bull trout residing in Big Creek. | No | • Adult plants, October–December | Adult - 597 | Yes, parr plants. | No interaction.<br>NE |

| Location | River/Stream River mile | Bull Trout Presence | Critical Habitat | Action | Applicable Coho Life-Stage and Release # | Ongoing? | Potential Impact/Interaction and ESA Section 7 Effect Determination |
|---|---|---|---|---|---|---|---|
| Mainstem Upper Yakima River – Keechulus to Easton | Yakima River RM 202–215.5 | Yakima River from the confluence with the Columbia River to Easton Dam is currently occupied FMO habitat (USFWS 2010). Areas downstream of the dams, including the Keechelus Reach of the upper Yakima River, provide FMO habitat. The upper Yakima River above Easton Dam may provide SR habitat for bull trout entrained out of project reservoirs. Very limited spawning reported over past decade (i.e., <1 redd/year on average) (Reiss et al. 2012). | Yes | • Adult plants, October–December | Adults - 1,621 | Yes | Interactions may be possible; however, due to the low numbers of coho and bull trout, negative interactions are unlikely.<br>NLAA |
| Manastash Creek | Manastash Creek RM 1–8.5 | Not present | No | • Summer parr plants, mid-late July<br>• Adult plants, October–December | Parr – 30,207<br>Adults - 256 | No[1] | No interaction.<br>NE |
| Mercer Creek | Mercer Creek RM 0–8 | Not present. | No | • Summer parr plants, mid-late July | Parr – 15,611 | No[1] | No interaction.<br>NE |
| Cherry Creek | Cherry Creek RM 0–1.6 | Not present. | No | • Summer parr plants, mid-late July | Parr – 4,215 | No[1] | No interaction.<br>NE |
| Coleman Creek | Coleman Creek RM 0–16 | Not present. | No | • Summer parr plants, mid-late July<br>• Adult plants, October–December | Parr – 24,977<br>Adults – 146 | No[1] | No interaction anticipated.<br>NE |
| Nanuem Creek | Naneum Creek RM 0–8 | Not present. | No | • Summer parr plants, mid-late July | Parr – 20,294 | No[1] | No interaction.<br>NE |
| Little Creek | Little Creek RM 0–3.6 | Not present. | No | • Summer parr plants, mid-late July | Parr - 5,620 | No[1] | No interaction anticipated.<br>NE |
| Teanaway River | Teanaway River RM 0–10.6 | Very limited spawning documented via redd surveys – only in the North Fork (see below); population may be extirpated. However, few individuals of all life stages present in the upper headwaters; adults and subadults may be present in lower reaches. USFWS (2010) reports that Teanaway River from its confluence with the Yakima River upstream to its confluence with the Middle Fork and W. Fork is occupied, and provides FMO and connectivity for the Yakima Core Area. | Yes | • Summer parr plants, mid-late July<br>• Adult plants, October–December | Parr – 16,547<br>Adults – 182 | No[1] | Some interaction possible between winter pre-smolts and adult and juvenile bull trout; however, spatial separation within the creek would limit any interactions. Any additional production farther up river should benefit any bull trout that venture into the lower stretches of the Teanaway River.<br>LAA |
| South Fork Teanaway River | SF Teanaway RM 0–2 | Not likely present; possibly extirpated. | Yes | • Summer parr plants, mid-late July | Parr – 15,611 | No[1] | Bull trout not documented to be present; suitable habitat exists. However, potential for interactions likely discountable.<br>NLAA |
| Middle Fork Teanaway River | MF Teanaway RM 0–2 | Not likely present; possibly extirpated. The Forest Service conducted extensive snorkel surveys in the Middle Fork Teanaway River in 2003 and encountered no bull trout (Haskins 2003 as cited in Reiss et al. 2012).USFWS (2010) reports MF from its confluence with the Teanaway River upstream 25.5 km (15.9 mi) provides FMO and connectivity for the Yakima River. | Yes | • Summer parr plants, mid-late July | Parr – 28,099 | No[1] | Bull trout not documented to be present; suitable habitat exists. However, potential for interactions likely discountable.<br>NLAA |

| Location | River/Stream River mile | Bull Trout Presence | Critical Habitat | Action | Applicable Coho Life-Stage and Release # | Ongoing? | Potential Impact/Interaction and ESA Section 7 Effect Determination |
|---|---|---|---|---|---|---|---|
| North Fork Teanaway River | NF Teanaway RM 0–11 | Possibly extirpated. Six bull trout were captured in the North Fork Teanaway River in 1990 and 1992, and 17 bull trout in traps from 1991-1995 (Reiss et al. 2012). Five bull trout were seen by snorkelers in 2006 (Reiss 2006); none in 2007-2008 surveys. None in 2005 surveys by USFWS (Morgan 2005 as cited in Reiss et al. 2012). The five juveniles in 2006 were the last confirmed bull trout sightings in the Teanaway system. Night snorkel surveys conducted in the North Fork in 2009, 2010, and 2011 produced no bull trout observations (USFWS 2009; Reiss 2010; Reiss 2011). From 1997-2008, crews surveyed designated reaches on the mainstem North Fork Teanaway in August or September and recorded information about all species seen. When bull trout were not found in the three years after 2005, this survey was subsequently dropped from the EIT sampling scheme in 2009 (G. Temple, WDFW, pers comm 2012).USFWS (2010) reports that NF upstream to 29.7 km (18.4 mi) to a barrier falls near its headwaters is occupied and provides SR Habitat. | Yes | • Summer parr plants, mid-late July | Parr – 26,538 | No[1] | Bull trout not documented to be present for nearly a decade; suitable habitat exists. However, potential for interactions likely discountable.<br>NLAA<br>If passage conditions continue to improve, potential for interaction could increase – LAA. |
| Jack Creek | Jack Creek RM 5.9 | One juvenile bull trout was captured in traps in 1994 (Reiss et al. 2012). None observed during surveys in 2006 (Reiss et al. 2006). Jack Creek from its confluence with the N. Fork Teanaway River upstream 11.0 km (6.8 mi) to its headwaters is occupied; headwaters provides SR habitat (USFWS 2010). | Yes | • Smolt acclimation (at existing permanent acclimation site used since 1999 for spring Chinook) | Smolts – 20,000. | No[1] (however, ongoing for spring Chinook) | NLAA |
| Indian Creek | Indian Creek RM 0-2.8; steelhead access limit | No record of occurrence; however, Salmonscape (WDFW 2016) indicates “presumed presence” in lower three river miles. This tributary to the North Fork Teanaway is not designated as critical habitat for bull trout (USFWS 2010). | No | • Summer parr plants, mid-late July | Parr (part of overall Teanaway River estimate) | No[1] | Bull trout not documented to be present; suitable habitat exists. However, potential for interactions likely discountable.<br>NLAA |
| Stafford Creek | Stafford Creek RM 0-6; steelhead access limit | Yakima Species Interaction Team conducts annual electrofishing surveys in reaches of this stream, but have never detected bull trout (Reiss 2006). Probably extirpated. No bull trout observed during surveys in 1993, 1994, 1998, or 1999 (Reiss et al. 2012), or 2006 (Reiss 2006). Stafford Creek from its confluence with N. Fork Teanaway River upstream 8.0 km (5.0 mi) to its headwaters provides SR habitat (USFWS 2010). | Yes | • Summer parr plants, mid-late July | Parr (part of overall Teanaway River estimate) | Yes (e-fishing for monitoring of Chinook releases) | Bull trout not documented to be present; suitable habitat exists. However, potential for interactions likely discountable.<br>NLAA |
| Jungle Creek | Jungle Creek RM 0-1; steelhead access limit | Jungle Creek from its confluence with the N. Fork Teanaway River upstream 6.4 km (4.0 mi) to its headwaters is occupied and provides SR habitat (USFWS 2010). Two juvenile bull trout were observed in Jungle Creek in 1994 and 1 in Jack Creek in 1995 (Reiss et al. 2012). The lower part of the stream is open and heavily grazed. One bull trout was captured in a trap by the Yakima Species Interaction Team in 1999, but overall conditions made this stream a low priority for bull trout surveys (Reiss 2006). No bull trout in 2006 surveys (Reiss 2006). | Yes | • Summer parr plants, mid-late July | Parr (part of overall Teanaway River estimate) | Yes (e-fishing for monitoring of Chinook releases) | Bull trout not documented to be present; suitable habitat exists. However, potential for interactions likely discountable.<br>NLAA |
| Yakima River Ponds – Easton to Cle Elum Reach<br>• Boone<br>• Easton | RM 183 RM 202 | Juvenile, subadults, and adults may be present. | Yes | • Smolt acclimation and release (existing, permanent sites, February– April) | Smolts – 20,000. | Yes (Easton currently acclimates Chinook, not coho) | Most likely the only interaction will be positive; however, some juveniles may have direct interactions.<br>LAA |

| Location | River/Stream River mile | Bull Trout Presence | Critical Habitat | Action | Applicable Coho Life-Stage and Release # | Ongoing? | Potential Impact/Interaction and ESA Section 7 Effect Determination |
|---|---|---|---|---|---|---|---|
| Cabin Creek | Cabin Creek RM 0-3.3 | Bull trout not present (USFWS 2007). | No | • Summer parr plants, mid-late July | TBD | Yes (e-fishing for monitoring of Chinook releases) | No interaction anticipated.<br>NE |

[1] Under Ongoing, a "No" indicates that the activity is not currently ongoing as part of YKFP Phase 2 of the Yakima River coho reintroduction program; it is a new activity proposed under Phase 3 as part of the Proposed Action.

**Legend:**

FMO = foraging, migratory, and overwintering
LAA = likely to adversely affect
NLAA = not likely to adversely affect
RM = River mile
SR = spawning and rearing.

Sources: WDFW 1998; USFWS 2007; BPA et al. 2012; YN unpubl. data 2016; Mizell and Anderson (2010); Reiss et al. (2012); Newsome (2016)

## Justification for Release Numbers in Table B-2

Artificial production strategies for Phase 3 of the Yakima Subbasin coho reintroduction program would include adult coho outplants, summer parr outplants, and smolt outplants for selected tributaries within the Naches River and upper Yakima River watersheds. The selection of one or more strategies for individual tributaries considered both abiotic and biotic factors, including the size and quality of available habitat, presence or absence of other sensitive species, and logistical constraints (i.e., accessibility). The foundation and biological justification for generating optimal release numbers are based on natural production estimates from the Ecosystem Diagnosis and Treatment (EDT) model. The EDT model is a scientifically based habitat model that estimates the natural production potential in the form of adult carrying capacity and equilibrium abundance (e.g., an adult recruitment ratio of 1 to 1). Estimates produced from the EDT model assume a fully fit, naturally adapted population of coho. Additional adjustments were made to release numbers to account for a reduced fitness factor of hatchery fish that lack the natural productivity and relative fitness of a fully adapted natural population.

In a review of relative fitness of hatchery and natural salmon, Berejikain and Ford (2004) cited studies that have demonstrated the relative fitness of hatchery salmon ranges from approximately 20 percent to as high as 100 percent depending on the species, brood source, and number of generations the hatchery line has experienced. For our purposes, we assume a 50 percent relative fitness factor for hatchery origin coho adults released into the selected tributaries.

For tributaries utilizing hatchery coho adult outplants as a release strategy, the 50 percent relative fitness factor was applied to the EDT equilibrium adult abundance estimate. For example, the corresponding hatchery adult outplant estimate for a tributary that has an estimated equilibrium adult abundance of 50 natural origin coho adult will require 100 hatchery-origin adult coho to seed the habitat at equilibrium. To estimate the number of smolts produced from the adult outplants and, furthermore, the number of natural origin adults returning from the hatchery adult outplants, empirically based survival estimates from previous work were applied to numerous life-stages. The number of wild smolts produced from the adult outplants was estimated by applying a 1.5 percent egg to smolt survival (Reclamation 2007) to the estimated potential egg deposition, which is based on the number of females multiplied by the average fecundity of an adult female coho. The number of natural-origin adult coho returning from the hatchery adult outplants calculations was estimated by applying a range of empirically based smolt-to-adult return rates (SARs) to the smolt production estimates (ranged from 3.0 to 6.0 percent).

Other methods were needed to estimate summer parr release numbers for several tributaries where EDT estimates were not generated. Reclamation (2007) published a document investigating the coho production potential above Lake Cle Elum Dam. This was done as part of the Lake Cle Elum Fish Passage Study. The study estimated the number of summer parr per linear stream kilometer of available habitat. The number of accessible kilometers of linear habitat available for coho was estimated from EDT reach delineations. The upper extremities of anadromous fish distributions are limited by documented or assumed natural fish passage barriers. In the Reclamation study, a 0.97

coho per meter factor, was applied to the overall to the river (Reclamation 2007) This gave each tributary a parr population minimum. This same method and percent were used to estimate minimum numbers of coho in individual tributaries. The parr were then given an average estimate of 13 percent survival estimate to be conservative. A 3 percent average SAR was applied to the smolts, and a total adult number was then produced. These were also assumed to be all female. The two female estimates were then added together and given a 50 percent male population.

Some tributaries were not analyzed in the EDT model. For these tributaries, best professional judgment based on specific knowledge of each tributary was used to estimate what population size the tributary could support. In areas where only coho adults would be outplanted, parr estimates for adult populations were substituted with additional adults by back-calculating the adults produced by the parr-to-adult stage. These estimates were brought together and assigned to individual tributaries.

Tributaries would be prioritized for up to 6-year treatments. Following the initial 6 years, all releases would cease, and monitoring would continue in tributaries where reintroduction was done. A new set of tributaries would then be selected for reintroduction efforts.

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USFWS
2007 Biological Opinion for the Yakima Fisheries Project 2006 through 2011. FWS Reference Number 13260-2008-F-0004.

USFWS
2010 Bull Trout Final Critical Habitat Justification: Rationale for Why Habitat is Essential, and Documentation of Occupancy.

WDFW
1998 1998 Washington Salmonid Stock Inventory. Appendix Bull Trout and Dolly Varden. Washington Department of Fish and Wildlife, Olympia, Washington.

Yakama Nation. 2016. Unpublished data received from T. Newsome, YN Fish Biologist. June 8, 2016.

# Appendix B. State/Federal Listed Rare Plant Species

## State/Federal Listed Rare Plant Species that May be Present in the Study Area

| Common Name | Scientific Name | Federal Status | State Status | Typical Habitat |
|---|---|---|---|---|
| Bristly sedge | *Carex comosa* | | Sensitive | Marshes, lakeshores, and wet meadows. |
| Large-awned sedge | *Carex macrochaeta* | | Threatened | Moist open places such as seeps, meadows, or around streams, lakes, and waterfalls. |
| Few-flowered sedge | *Carex pauciflora* | | Sensitive | Wet acidic environments such as sphagnum bogs and acidic peat. |
| Wenatchee larkspur | *Delphinium viridescens* | Species of concern | Threatened | Moist meadows, seasonally wet openings in aspen groves and hardwood thickets, moist microsites in open coniferous forests, springs, seeps, and riparian areas. |
| Piper's daisy | *Erigeron piperianus* | | Sensitive | Dry, open places on level ground to moderate slopes. |
| Suksdorf's monkeyflower | *Erythranthe suksdorfii* | | Sensitive | Open, moist or dry places, from valleys to foothills. |
| Oregon goldenaster | *Heterotheca oregona* | | Threatened | Sand and gravel bars along rivers and streams. |
| Adder's-tongue | *Ophioglossum pusillum* | | Threatened | Seasonally wet areas in pastures, old fields, roadside ditches, bogs, fens, wet meadows, flood planes, moist woods, grassy swales, dry or damp sand, dry hillsides, and in seasonally wet, acidic soil. |
| Orthotrichum moss | *Orthotrichum praemorsum* | Species of concern | Endangered | On rock, often dry areas, at higher elevations. |
| Sticky goldenweed | *Pyrrocoma hirta var. sonchifolia* | | Sensitive | Meadows, rocky vernally wet places, open or sparsely wood slopes at moderate mountain elevations. |
| Marginate splashzone moss | *Scouleria marginata* | | Threatened | On bedrock or large boulders at the waterline of perennial rivers and streams. |

Source: WDNR 2010

# Appendix C. Kittitas County Noxious Weeds

**2015 KITTITAS COUNTY NOXIOUS WEED LIST**

| Common Name | Scientific Name | Common Name | Scientific Name |
|---|---|---|---|
| **CLASS A NOXIOUS WEEDS** | | **CLASS B NOXIOUS WEEDS** | |
| common crupina | *Crupina vulgaris* | knotweed, Japanese | *Polygonum cuspidatum* |
| cordgrass, common | *Spartina anglica* | kochia | *Kochia scoparia* |
| cordgrass, dense-flowered | *Spartina densiflora* | lesser celandine | *Ficaria verna* |
| cordgrass, saltmeadow | *Spartina patens* | loosestrife, garden | *Lysimachia vulgaris* |
| cordgrass, smooth | *Spartina alterniflora* | loosestrife, purple | *Lythrum salicaria* |
| dyer's woad | *Isatis tinctoria* | loosestrife, wand | *Lythrum virgatum* |
| eggleaf spurge | *Euphorbia oblongata* | parrotfeather | *Myriophyllum aquaticum* |
| false-brome | *Brachypodium sylvaticum* | perennial pepperweed | *Lepidium latifolium* |
| floating primrose-willow | *Ludwigia peploides* | poison hemlock | *Conium maculatum* |
| flowering rush | *Butomus umbellatus* | policeman's helmet | *Impatiens glandulifera* |
| French broom | *Genista monspessulana* | puncturevine | *Tribulus terrestris* |
| garlic mustard | *Alliaria petiolata* | rush skeletonweed | *Chondrilla juncea* |
| giant hogweed | *Heracleum mantegazzianum* | saltcedar* | *Tamarix ramosissima* |
| goatsrue | *Galega officinalis* | Scotch broom | *Cytisus scoparius* |
| hydrilla | *Hydrilla verticillata* | shiny geranium | *Geranium lucidum* |
| johnsongrass | *Sorghum halepense* | spurge laurel | *Daphne laureola* |
| knapweed, bighead | *Centaurea macrocephala* | spurge, leafy | *Euphorbia esula* |
| knapweed, Vochin | *Centaurea nigrescens* | spurge, myrtle* | *Euphorbia myrsinites* |
| kudzu | *Pueraria montana* var. *lobata* | sulfur cinquefoil | *Potentilla recta* |
| meadow clary | *Salvia pratensis* | tansy ragwort | *Senecio jacobaea* |
| oriental clematis | *Clematis vitalba* | thistle, musk | *Carduus nutans* |
| purple starthistle | *Centaurea calcitrapa* | thistle, plumeless | *Carduus acanthoides* |
| Ravenna grass | *Saccharum ravennae* | thistle, Scotch | *Onopordum acanthium* |
| reed sweetgrass | *Glyceria maxima* | velvetleaf | *Abutilon theophrasti* |
| ricefield bulrush | *Schoenoplectus mucronatus* | water primrose | *Ludwigia hexapetala* |
| sage, clary | *Salvia sclarea* | white bryony | *Bryonia alba* |
| sage, Mediterranean | *Salvia aethiopis* | wild chervil | *Anthriscus sylvestris* |
| silverleaf nightshade | *Solanum elaeagnifolium* | yellow archangel | *Lamiastrum galeobdolon* |
| Spanish broom | *Spartium junceum* | yellow floatingheart | *Nymphoides peltata* |
| spurge flax | *Thymelaea passerina* | yellow nutsedge | *Cyperus esculentus* |
| Syrian beancaper | *Zygophyllum fabago* | yellow starthistle | *Centaurea solstitialis* |
| Texas blueweed | *Helianthus ciliaris* | | |
| thistle, Italian | *Carduus pycnocephalus* | **CLASS C NOXIOUS WEEDS** | |
| thistle, milk | *Silybum marianum* | absinth wormwood | *Artemisia absinthium* |
| thistle, slenderflower | *Carduus tenuiflorus* | Austrian fieldcress | *Rorippa austriaca* |
| variable-leaf milfoil | *Myriophyllum heterophyllum* | babysbreath | *Gypsophila paniculata* |
| wild four-o'clock | *Mirabilis nyctaginea* | black henbane | *Hyoscyamus niger* |
| | | blackgrass | *Alopecurus myosuroides* |
| | | buffalobur | *Solanum rostratum* |
| **CLASS B NOXIOUS WEEDS** | | cereal rye | *Secale cereale* |
| blueweed | *Echium vulgare* | common barberry | *Berberis vulgaris* |
| Brazilian elodea | *Egeria densa* | common catsear | *Hypochaeris radicata* |
| bugloss, annual | *Anchusa arvensis* | common groundsel | *Senecio vulgaris* |
| bugloss, common | *Anchusa officinalis* | common St. Johnswort | *Hypericum perforatum* |
| butterfly bush* | *Buddleja davidii* | common tansy | *Tanacetum vulgare* |
| camelthorn | *Alhagi maurorum* | common teasel | *Dipsacus fullonum* |
| common fennel | *Foeniculum vulgare* | field bindweed | *Convolvulus arvensis* |
| common reed (nonnative genotypes) | *Phragmites australis* | fragrant waterlily | *Nymphaea odorata* |
| Dalmatian toadflax | *Linaria dalmatica* | hairy whitetop | *Cardaria pubescens* |
| Eurasian watermilfoil* | *Myriophyllum spicatum* | hoary cress | *Cardaria draba* |
| fanwort | *Cabomba caroliniana* | jointed goatgrass | *Aegilops cylindrica* |
| gorse | *Ulex europaeus* | lawnweed | *Soliva sessilis* |
| grass-leaved arrowhead | *Sagittaria graminea* | lepyrodiclis | *Lepyrodiclis holosteoides* |
| hairy willowherb | *Epilobium hirsutum* | longspine sandbur | *Cenchrus longispinus* |
| hawkweed oxtongue | *Picris hieracioides* | old-man's-beard | *Clematis vitalba* |
| hawkweed, orange | *Hieracium aurantiacum* | oxeye daisy | *Leucanthemum vulgare* |
| hawkweeds: all nonnative yellow-flowered | *Hieracium, subgenus Hieracium* | perennial sowthistle | *Sonchus arvensis spp. arvensis* |
| hawkweeds: all nonnative yellow-flowered | *Hieracium, subgenus Pilosella* | scentless mayweed | *Matricaria perforata* |
| herb-Robert | *Geranium robertianum* | smoothseed alfalfa dodder | *Cuscuta approximata* |
| hoary alyssum | *Berteroa incana* | spikeweed | *Hemizonia pungens* |
| houndstongue | *Cynoglossum officinale* | spiny cocklebur | *Xanthium spinosum* |
| indigobush | *Amorpha fruticosa* | Swainsonpea | *Sphaerophysa salsula* |
| knapweed, black | *Centaurea nigra* | thistle, bull | *Cirsium vulgare* |
| knapweed, brown | *Centaurea jacea* | thistle, Canada | *Cirsium arvense* |
| knapweed, diffuse | *Centaurea diffusa* | white cockle | *Silene latifolia* ssp. *alba* |
| knapweed, meadow | *Centaurea x moncktonii* | wild carrot | *Daucus carota* |
| knapweed, Russian | *Acroptilon repens* | yellowflag iris* | *Iris pseudacorus* |
| knapweed, spotted | *Centaurea stoebe* | yellow toadflax | *Linaria vulgaris* |
| knotweed, Bohemian | *Polygonum bohemicum* | cornflower (bachelor's button)* | *Centaurea cyanus* |
| knotweed, giant | *Polygonum sachalinense* | horseweed (marestail)* | *Conyza canadensis* |
| knotweed, Himalayan | *Polygonum polystachyum* | russian thistle* | *Salsola iberica* |

Highlight indicates known presence in Kittitas County
* Control required in designated areas
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| oriental clematis | *Clematis vitalba* | thistle, musk | *Carduus nutans* |
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| | | blackgrass | *Alopecurus myosuroides* |
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# Appendix D. General Wildlife Species Likely to Occur in Project Area

| Common Name | Scientific Name | Observed (O) or Potential to Occur (P) in Proposed Project Site Study Area |
|---|---|---|
| ***Amphibians*** | | |
| Bullfrog | *Rana catesbeiana* | P |
| Columbia spotted frog | *Rana luteiventris* | P |
| Great basin spadefoot | *Spea intermontana* | P |
| Long-toed salamander | *Ambystoma macrodactylum* | P |
| Pacific treefrog (Chorus frog) | *Hyla regilla* | P |
| Roughskin newt | *Taricha granulosa* | P |
| Western toad | *Bufo boreas* | P |
| ***Birds*** | | |
| American coot | *Fulica americana* | P |
| American crow | *Corvus brachyrhynchosCorvus brachyrhynchos* | O |
| American dipper | *Cinclus mexicanus* | P |
| American goldfinch | *Carduelis tristis* | P |
| American kestrel | *Falco sparverius* | P |
| American robin | *Turdus migratorius* | O |
| Bank swallow | *Riparia riparia* | P |
| Barn swallow | *Hirundo rustica*<br>*Riparia riparia* | O |
| Barred owl | *Strix varia* | P |
| Belted kingfisher | *Megaceryle alcyon*<br>*Ceryle alcyon* | P |
| Black billed magpie | *Pica hudsonia* | P |
| Black-capped chickadee | *Poecile atricapillus* | P |
| Black-chinned hummingbird | *Archilochus alexandri* | P |
| Black-headed grosbeak | *Pheucticus melanocephalus* | P |
| Brewer's blackbird | *Euphagus cyanocephalus*<br>*Euphagus cyanocephalus* | P |
| Brewer’s sparrow | *Spizella breweri* | P |
| Brown-headed cowbird | *Molothrus ater* | P |
| California quail | *Callipepla californica* | P |
| Calliope hummingbird | *Selasphorus calliope* | P |
| Canada goose | *Branta canadensis*<br>*Branta canadensis* | P |
| Cassin’s finch | *Haemorhous cassinii* | P |

| Common Name | Scientific Name | Observed (O) or Potential to Occur (P) in Proposed Project Site Study Area |
|---|---|---|
| Cassin's vireo (Solitary vireo) | *Vireo cassinii*<br>*Vireo solitarius* | P |
| Cedar waxwing | *Bombycilla cedrorum* | P |
| Chukar | *Alectoris chukar* | P |
| Cinnamon teal | *Anas cyanoptera* | P |
| Cliff swallow | *Hirundo pyrrhonota* | P |
| Common barn-owl | *Tyto alba*<br>*Tyto alba* | P |
| Common merganser | *Mergus merganser* | P |
| Common nighthawk | *Chordeiles minor* | P |
| Common poorwill | *Phalaenoptilus nuttallii* | P |
| Common raven | *Corvus corax* | P |
| Common snipe | *Gallinago gallinago* | P |
| Common yellowthroat | *Geothlypis trichas*<br>*Geothlypis trichas* | P |
| Dark-eyed (Oregon) junco | *Junco hyemalis* | P |
| Downy woodpecker | *Picoides pubescens*<br>*Picoides pubescens* | P |
| Eastern kingbird | *Tyrannus tyrannus* | P |
| European starling | *Sturnus vulgaris*<br>*Sturnus vulgaris* | P |
| Gray catbird | *Dumetella carolinensis* | P |
| Grey flycatcher | *Empidonax wrightii* | P |
| Gray partridge | *Perdix perdix* | P |
| Great blue heron | *Ardea herodias* | P |
| Great horned owl | *Bubo virginianus* | P |
| Green winged teal | *Anas crecca* | P |
| Hairy woodpecker | *Picoides villosus* | P |
| Hammond’s flycatcher | *Empidonax hammondii* | P |
| Hooded merganser | *Lophodytes cucullatus* | P |
| Horned lark | *Eremophila alpestris* | P |
| House finch | *Carpodacus mexicanus* | P |
| House sparrow | *Passer domesticus*<br>*Passer domesticus* | P |
| House wren | *Troglodytes aedon* | P |
| Killdeer | *Charadrius vociferus* | P |
| Lazuli bunting | *Passerina amoena* | P |
| Lewis’ woodpecker | *Melanerpes lewis* | P |
| Loggerhead shrike | *Lanius ludovicianus* | P |

| Common Name | Scientific Name | Observed (O) or Potential to Occur (P) in Proposed Project Site Study Area |
|---|---|---|
| Long-billed curlew | *Numenius americanus* | P |
| Long-eared owl | *Asio otus* | P |
| MacGillivray's warbler | *Oporornis tolmiei* | P |
| Mallard | *Anas platyrhynchos* | P |
| Mountain bluebird | *Sialia currucoides* | P |
| Mourning dove | *Zenaida macroura* | P |
| Nashville warbler | *Oreothlypis ruficapilla* | P |
| Northern flicker | *Colaptes auratus* | P |
| Northern harrier | *Circus cyaneus* | P |
| Northern rough-winged swallow | *Stelgidopteryx serripenni* | P |
| Olive-sided flycatcher | *Contopus borealis* | P |
| Osprey | *Pandion haliaetus*<br>*Pandion haliaetus* | P |
| Pacific slope flycatcher (Western) | *Empidonax difficilis* | P |
| Pine siskin | *Carduelis pinus* | P |
| Prairie falcon | *Falco mexicanus* | P |
| Purple finch | *Carpodacus purpureus* | P |
| Red-breasted nuthatch | *Sitta canadensis* | O |
| Red-tailed hawk | *Buteo jamaicensis* | O |
| Red-winged blackbird | *Agelaius phoeniceus* | P |
| Ring-necked pheasant | *Phasianus colchicus* | P |
| Rock dove | *Columba livia* | P |
| Ruffed grouse | *Bonasa umbellus* | P |
| Rufous hummingbird | *Selasphorus rufus* | P |
| Savannah sparrow | *Amphispiza belli* | P |
| Say’s phoebe | *Sayornis saya* | P |
| Sharp-shinned hawk | *Accipiter striatus* | P |
| Song sparrow | *Melospiza melodia* | P |
| Sora | *Porzana carolina* | P |
| Spotted sandpiper | *Actitis macularius* | P |
| Spotted towhee (Rufous-sided) | *Pipilo maculatus* | P |
| Steller's jay | *Cyanocitta stelleri* | P |
| Swainson’s hawk | *Buteo swainsoni* | P |
| Swainson's thrush | *Catharus ustulatus* | P |
| Tree swallow | *Tachycineta bicolor* | P |
| Turkey vulture | *Cathartes aura* | P |
| Vaux's swift | *Chaetura vauxi* | P |

| Common Name | Scientific Name | Observed (O) or Potential to Occur (P) in Proposed Project Site Study Area |
|---|---|---|
| Veery | *Catharus fuscescens* | P |
| Vesper sparrow | *Pooecetes gramineus* | P |
| Violet-green swallow | *Tachycineta thalassina* | P |
| Virginia rail | *Rallus limicola* | P |
| Warbling vireo | *Vireo gilvus* | P |
| Western bluebird | *Sialia mexicana* | P |
| Western kingbird | *Tyrannus verticalis* | P |
| Western meadowlark | *Sturnella neglecta* | P |
| Western screech-owl | *Otus kennicottii* | P |
| Western tanager | *Piranga ludoviciana* | P |
| Western wood-pewee | *Contopus sordidulus* | P |
| White-crowned sparrow | *Zonotrichia leucophrys* | P |
| Willow flycatcher | *Empidonax traillii* | P |
| Wilson's warbler | *Wilsonia pusilla* | P |
| Wood duck | *Aix sponsa* | P |
| Yellow warbler | *Setophaga petechia* | P |
| Yellow-breasted chat | *Icteria virens* | P |
| Yellow-headed blackbird | *Xanthocephalus xanthocephalus* | P |
| Yellow-rumped warbler | *Dendroica coronata* | P |
| ***Mammals*** | | |
| Badger | *Taxidea taxus* | P |
| Beaver | *Castor canadensis* | P |
| Big brown bat | *Eptesicus fuscus* | P |
| Black-tailed jack rabbit | *LepusCalifornicus* | P |
| Bobcat | *Lynx rufus* | P |
| Bushy-tailed woodrat | *Neotoma cinerea* | P |
| California ground squirrel | *Otospermophilus beecheyi* | P |
| California myotis | *Myotis californicus* | P |
| Cascade golden-mantled ground squirrel | *Callospermophilus saturatus* | P |
| Coast mole | *Scapanus orarius* | P |
| Coyote | *Canis latrans* | P |
| Deer mouse | *Peromyscus maniculatus* | P |
| Douglas' squirrel | *Tamiasciurus douglasii* | P |
| Eastern cottontail | *Sylvilagus floridanus* | P |
| Elk | *Cervus elaphus* | P |
| Great basin pocket mouse | *Perognathus parvus* | P |
| Hoary bat | *Lasiurus cinereus* | P |

| Common Name | Scientific Name | Observed (O) or Potential to Occur (P) in Proposed Project Site Study Area |
|---|---|---|
| House mouse | *Mus musculus* | P |
| Least chipmunk | *Neotamias minimus* | P |
| Little brown myotis | *Myotis lucifugus* | P |
| Long-eared myotis | *Myotis evotis* | P |
| Long-legged myotis | *Myotis volans* | P |
| Long-tailed vole | *Microtus longicaudus* | P |
| Long-tailed weasel | *Mustela frenata* | P |
| Mink | *Mustela vison* | P |
| Montane vole | *Microtus montanus* | P |
| Mountain lion | *Felis concolor* | P |
| Mule deer | *Odocoileus hemionus*<br>*Odocoileus hemionus*<br>*Odocoileus hemionus* | P |
| Muskrat | *Ondatra zibethicus* | P |
| Northern flying squirrel | *Glaucomys sabrinus* | P |
| Northern grasshopper mouse | *Onychomys leucogaster* | P |
| Northern pocket gopher | *Thomomys talpoides* | P |
| Nuttall's cottontail | *Sylvilagus nuttallii nuttallii* | P |
| Pallid bat | *Antrozous pallidus* | P |
| Porcupine | *Erethizon dorsatum* | P |
| Raccoon | *Procyon lotor* | P |
| Red fox | *Vulpes vulpes* | P |
| River otter | *Lutra canadensis* | P |
| Sagebrush vole | *Lemmiscus curtatus* | P |
| Silver-haired bat | *Lasionycteris noctivagans* | P |
| Striped skunk | *Mephitis mephitis* | P |
| Townsend's big-eared bat | *Plecotus townsendii* | P |
| Western red-backed vole | *Myodes californicus* | P |
| White-tailed deer | *Odocoileus virginianus* | P |
| White-tailed jack rabbit | *Lepus townsendii* | P |
| Yellow-bellied marmot | *Marmota flaviventris* | P |
| Yellow-pine chipmunk | *Neotamias amoenus* | P |
| Yuma myotis | *Myotis yumanensis* | P |
| ***Reptiles*** | | |
| Common garter snake | *Thamnophis sirtalis* | P |
| Gopher snake | *Pituophis catenifer* | P |
| Night snake | *Hypsiglena chlorophaea* | P |
| Painted turtle | *Chrysemys picta* | P |

| Common Name | Scientific Name | Observed (O) or Potential to Occur (P) in Proposed Project Site Study Area |
|---|---|---|
| Racer | *Coluber constrictor* | P |
| Rubber boa | *Charina bottae* | P |
| Sagebrush lizard | *Sceloporus graciosus* | P |
| Sharp-tailed snake | *Contia tenuis* | P |
| Side-blotched lizard | *Uta stansburiana* | P |
| Southern alligator lizard | *Elgaria multicarinata* | P |
| Western fence lizard | *Sceloporus occidentalis* | P |
| Western rattlesnake | *Crotalus oreganus* | P |
| Western skink | *Plestiodon skiltonianus* | P |
| Western terrestrial garter snake | *Thamnophis elegans* | P |

Potential occurrence based on data from Cassidy 1997, Johnson and Cassidy 1997, Smith 1997, and Washington NatureMapping Program (2007)

# Appendix E. State and Federal Listed Wildlife in the Study Area

| Common Name[a] | Scientific Name | Federal Status | State Status | Habitat Association |
|---|---|---|---|---|
| | | ***Amphibians*** | | |
| Columbia Spotted Frog | *Rana pipiens* | — | C | Inhabits marshes, edges of ponds, streams, lakes and moist, and in dry areas deep pools within the main portions of watercourses.[b] |
| Western Toad | *Anaxyrus boreas* | SOC | C | Found in a wide variety of habitats ranging from desert springs to mountain wetlands; and ranges into various upland habitats around ponds, lakes, reservoirs, and slow-moving rivers and streams.[c] |
| | | ***Reptiles*** | | |
| Sharptail Snake | *Contia tenuis* | SOC | C | Moist situations in pastures, meadows, oak woodlands, broken chaparral, and the edges of coniferous or hardwood forests; also shrubby rabbitbrush-sagebrush.[c] |
| Sagebrush Lizard | *Sceloporus graciosus* | SOC | C | Sagebrush and other types of shrublands, also pinyon-juniper woodland and open pine and Douglas-fir forests.[c] |
| | | ***Birds*** | | |
| American White Pelican | *Pelecanus erythrorhynchos* | — | E | Isolated islands on freshwater lakes and rivers.[d] |
| Western grebe | *Aechmophorus occidentalis* | — | C | Marshes, lakes, and bays; in migration and winter also sheltered seacoasts, less frequently along rivers.[c] |
| Eastern WA breeding concentrations of: Grebes, Cormorants | | — | — | Marshes, lakes, and bays.[d] |
| Eastern WA breeding: Terns | | — | — | Marshes, lakes, and bays.[d] |
| Black-crowned Night-heron | *Nycticorax nycticorax* | — | — | Marshes, swamps, wooded streams, mangroves, shores of lakes, ponds, lagoons; salt water, brackish, and freshwater situations.[c] |

| Common Name[a] | Scientific Name | Federal Status | State Status | Habitat Association |
|---|---|---|---|---|
| Great Blue Heron | *Ardea herodias* | — | — | Fresh and saltwater wetlands, including seashores, rivers, swamps, marshes, and ditches.[d] |
| Cavity-nesting ducks: Wood Duck, Barrow's Goldeneye, Common Goldeneye, Bufflehead , and Hooded Merganser | | — | — | Nest primarily in late successional forests and riparian areas adjacent to low gradient rivers, sloughs, lakes, and beaver ponds.[d] |
| Harlequin Duck | *Histrionicus histrionicus* | — | — | Fast-flowing water with loafing sites nearby. Streams usually have substrate that ranges from cobble to boulder, with adjacent vegetated banks.[d] |
| Tundra Swan | *Cygnus columbianus* | — | — | Shallow ponds, lakes, riverine marshes [c] |
| Bald Eagle | *Haliaeetus leucocephalus* | SOC | S | Breeding territories include upland woodlands and lowland riparian stands with a mature conifer or hardwood component; roosting trees vary.[d] |
| Ferruginous Hawk | *Buteo regalis* | SOC | T | Obligate grassland or desert-shrub nesters.[d] |
| Golden Eagle | *Aquila chrysaetos* | — | C | Open, arid plateaus deeply cut by streams and canyons, western shrub steppe and grassland communities and transition zones between shrub, grassland, and forested habitat.[d] |
| Northern Goshawk | *Accipiter gentilis* | SOC | C | Generally prefer mature or old forest habitat with a high density of large trees.[d] |
| Peregrine Falcon | *Falco peregrinus* | SOC | S | Nest on cliffs, off-shore islands and ledges on vegetated slopes; winter and fall, forage in areas with large shorebird or waterfowl concentrations.[d] |
| Dusky Grouse | Dendragapus obscurus | — | — | Deciduous and mixed forests in summer, conifer forest in winter, sagebrush flats in summer. [c] |

| Common Name[a] | Scientific Name | Federal Status | State Status | Habitat Association |
|---|---|---|---|---|
| Sooty Grouse | *Dendragapus fuliginosus* | C | T | Open foothills closely associated with streams, springs, and meadows; primarily in mountainous areas wherever open coniferous forests are present.[d] |
| Wild Turkey | *Meleagris gallopavo* | — | — | Nonnative species; habitat generalists, adapting to a variety of conditions across their range.[d] |
| Marbled Murrelet | | T | T | Lakes and rivers, costal areas, costal. Old growth forests.[c] |
| Yellow-billed Cuckoo | | T | C | Open woodland with rich undergrowth, parks, cottonwood and willow riparian woodland.[c] |
| Flammulated Owl | *Otus flammeolus* | — | C | Mid-elevation coniferous forests containing mature to old, open canopy yellow pine, ponderosa pine, Jeffrey pine, Douglas fir, and grand fir.[d] |
| Vaux's Swift | *Chaetura vauxi* | — | C | Strongly associated with old-growth forests.[d] |
| Black-backed Woodpecker | *Picoides arcticus* | — | C | Standing dead lodgepole pine, ponderosa pine, western larch and mixed coniferous forests.[d] |
| Lewis' Woodpecker | *Melanerpes lewis* | — | C | Forested habitat with an open canopy and a shrubby understory, with snags available for nest sites and hawking perches.[d] |
| Pileated Woodpecker | *Dryocopus pileatus* | — | C | Inhabit mature and old-growth forests, and second-growth forests with large snags and fallen trees.[d] |
| White-headed Woodpecker | *Picoides albolarvatus* | — | C | Open-canopied, mature and old-growth ponderosa pine forests.[d] |
| Loggerhead Shrike | *Lanius ludovicianus* | SOC | C | Open habitat during both breeding and nonbreeding seasons. Grasslands or pastures with short or patchy grasses are usually used for foraging. Scattered trees, shrubs, or hedgerows are most often used for nesting and perching.[d] |

| Common Name[a] | Scientific Name | Federal Status | State Status | Habitat Association |
|---|---|---|---|---|
| | | ***Mammals*** | | |
| Merriam's Shrew | *Sorex merriami* | — | C | Sagebrush-steppe, semi-arid grasslands, pinyon-juniper woodlands, high elevation brushlands, and mixed woodlands of ponderosa pine, Douglas-fir, and cottonwood.[f] |
| Roosting Concentrations of: Big-brown Bat, Myotis bats, Pallid Bat | | — | — | Ponderosa pine forest and woodlands, mixed conifer forests, shrub steppe, lowland conifer-hardwood forests, and riparian wetlands. Pallid bats prefer roosting in substrates in or around grasslands and dry shrub or forested habitat near water.[f] |
| Townsend's Big-eared Bat | *Corynorhinus townsendii* | SOC | C | Ponderosa pine forest and woodlands, mixed conifer forests, shrub steppe, lowland conifer-hardwood forests, and riparian wetlands. Roost in old buildings, caves, barns, and mines.[g] |
| Black-tailed Jackrabbit | *Lepus californicus* | — | C | Inhabits open plains, fields and deserts; open country with scattered thickets or patches of shrubs.[c] |
| Western Gray Squirrel | *Sciurus griseus* | C | T | Areas where oak woodlands and pine forests converge, particularly near riparian areas.[h] |
| Townsend's Ground Squirrel | *Spermophilus townsendii* | SOC | C | Open sagebrush and grass but also includes large patches of sagebrush at the lower edges of forest, as well as pastures and abandoned fields.[c] |
| Canada Lynx | | T | T | Lodgepole pine forests, mixed forests with thick undergrowth, travels through open areas for prey.[c] |
| Gray Wolf | | E | E | Alpine, Desert, Forest, Savanna, Shrubland/chaparral, Tundra, Woodland.[c] |
| Grizzly Bear | | T | E | Subalpine mountain forests artic tundra, alpine tundra. Historic habitat of open prairies, brush lands, riparian woodlands, and semi desert scrub. c |

| Common Name[a] | Scientific Name | Federal Status | State Status | Habitat Association |
|---|---|---|---|---|
| Marten | Martes americana | — | — | Dense deciduous, mixed, or (especially) coniferous upland and lowland forest.[c] |
| Columbian Black-tailed Deer | *Odocoileus hemionus columbianus* | — | — | Coniferous forests, desert shrub, chaparral, grasslands with shrubs.[c] |
| Elk | *Cervus elaphus* | — | — | Uses open areas such as alpine pastures, marshy meadows, river flats, and aspen parkland, as well as coniferous forests, brushy clear cuts or forest edges, and semi-desert areas.[c] |
| Rocky Mountain Mule Deer | *Odocoileus hemionus hemionus* | — | — | Coniferous forests, desert shrub, chaparral, grasslands with shrubs.[c] |

**Legend:**
C=Candidate
E=Endangered
S=Sensitive
SOC=Species of Concern
T=Threatened

**Sources:**
[a] WDFW 2008
[b] Larsen, Eric M. 1997.
[c] Nature Serve Explorer. 2015.
[d] Larsen, Eric M et al. 2004.
[e] USFWS. 2007
[f] Azerrad, Jeff. 2004.
[g] Woodruff, Kent 2005.
[h] Linders and Stinson 2007.

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# Appendix F. Assumptions Used to Calculate Greenhouse Gas Emissions and Detailed Results

Implementation of the Melvin R. Sampson Hatchery could contribute to an increase in greenhouse gas concentrations through the activities described in this appendix. The assumptions and methods used to determine the Hatchery's contribution to greenhouse gas levels, as well as detailed results, are described in the following sections.

## Assumptions

The assumptions and methods used to calculate greenhouse gas emissions for construction and operation of the Hatchery are described in the sections that follow.

### Construction

Project construction for the Proposed Action would take approximately 16.5 months, including the construction of the hatchery facilities and in-water work associated with the New Cascade Canal Fish Screen and the MRS Hatchery Intake and Outfall Structures (see Section 2.1.4).

The transportation components of greenhouse gas emissions were estimated based on the approximate number of vehicles that would be used during project construction and the approximate distance those vehicles would travel. Greenhouse gas emissions were calculated for the 16.5 month construction period.

Overestimating the number of round trips ensures that greenhouse gas emissions estimates are conservatively high. The number of round trips was deliberately overestimated using the following assumptions:

- All workers would travel in separate vehicles to the project area each day.
- A maximum number of workers would be required to construct the Hatchery.
- Fuel consumption is based on the average fuel economy for standard pickup trucks of 17 miles per gallon (EPA 2014b). Again, this is likely an overestimation as more efficient vehicles may be occasionally used.

Up to 30 construction workers would work on the hatchery facilities during the construction period. For purposes of estimation, these construction workers will be assumed to be traveling from Yakima (80 miles roundtrip).

Tribal staff would travel to the MRS hatchery for various purposes, such as road inspection, work inspection, staff meetings, and environmental compliance monitoring. One staff member in Cle Elum (50 miles roundtrip) would be on site approximately 5 days a week during the 16.5 month-long construction period; two other staff members, one in Ellensburg (10 miles roundtrip) and one in the Tri-Cities (200 miles roundtrip) would travel on average once a week to the hatchery site.

Fuel consumption and greenhouse gas emissions would also result from operation of on-site heavy construction equipment. Heavy construction equipment may include bulldozers, excavators, vibratory rollers, dump trucks, forklifts, and cranes.

Greenhouse gas emissions associated with equipment operation were overestimated to account for all potential construction activities and associated material deliveries to and from the construction site. Although it is difficult to develop an accurate estimation of total fuel consumption associated with heavy construction equipment operation, the following assumptions were used:

- A maximum of 6 pieces of equipment would be in operation during construction.
- The average size of the equipment would not exceed 250 horsepower. All equipment would operate at maximum power for 8 hours per day and 5 days per week throughout the construction phase. This is an overestimation because equipment commonly operates in idle or at reduced power.
- Equipment would operate at approximately 35% efficiency, representing the percentage of productive energy extracted from the diesel fuel relative to the maximum potential energy within the fuel (i.e., 128,450 British thermal units per gallon of diesel) (AFDC 2013).

### Operation

Normal hatchery operations would include three on-site employees who would live on the property and would therefore not need to drive to and from the hatchery. It is assumed that hatchery employees would drive off-site once per day for supplies (10 miles round trip to Ellensburg). Coho releases would occur in various tributaries over the course of the year. It is assumed that direct releases of juvenile parr would occur at approximately 10 tributaries a year. These outplantings would occur once a year, and would require approximately three trucks driving an average of 100 miles roundtrip. Mobile acclimation of smolts would be used at approximately five tributaries per year (assumed 100 miles roundtrip from the hatchery). Initially, three trucks would be needed to install the unit, followed by one staff member visiting each mobile acclimation unit twice a day over the 4-6 week period of acclimation. Because this staff member is able to visit multiple units without going back to the hatchery after each visit, it is assumed that to visit each of the mobile acclimation units twice daily would require 200 miles of driving per day.

## Detailed Results

The greenhouse gas emissions, or storage loss, are quantified below for each type of activity described above.

### Construction Emissions

Table F-1 displays the results of calculations for the construction activities that would contribute to greenhouse gas emissions. Construction of the Hatchery would result in an estimated 3,073.2 metric tons of CO2e[4] emissions for the 16.5-month construction period, or 2,235.1 metric tons of CO2e in the first year of construction.

[4] $CO_2e$ is a unit of measure used by the Intergovernmental Panel on Climate Change that takes into account the global warming potential of each of the emitted greenhouse gases using global warming potential factors. See Table F-1.

**Table F1. Estimated Greenhouse Gas Emissions from Construction Activities**

| Estimated Greenhouse Gas Emissions from Construction Activities | $CO_2$ (metric tons) | $CH_4$ ($CO_2e$)[a,b] (metric tons) | N2O ($CO_2e$)[b] (metric tons) | Total $CO_2e$ (metric tons)c |
|---|---|---|---|---|
| Construction transportation | 89.7 | 72.5 | 337.5 | **499.7** |
| Tribal employee transportation | 0.4 | 0.3 | 1.4 | **2.1** |
| Construction equipment operation | 2,479.5 | 3.1 | 15.9 | **2,498.5** |
| **Total[c]** | **2,582.6** | **86.5** | **404.0** | **3,073.2** |

Notes:
$CO_2$ = carbon dioxide
$CH_4$ = methane
$N_2O$ = nitrous oxide
$CO_2e$ = units of equivalent carbon dioxide

a. Carbon dioxide emissions factors calculated from The Climate Registry (2014).

b. Methane and nitrous oxide emissions have been converted into units of equivalent carbon dioxide (CO2e ) using the Intergovernmental Panel on Climate Change global warming potential (GWP) factors of 25 GWP for methane and 298 GWP for nitrous oxide (The Climate Registry 2014).

c. The sum of the individual entries may not sum to the total depicted due to rounding.

## Operation Emissions

Table F-2 displays the contribution to greenhouse gas emissions that would result from operation of the new hatchery and weir facilities through the life of the Hatchery (assumed 50 years). Facility operation would result in an estimated 42.9 metric tons of CO2e emissions annually.

**Table F-2. Estimated Greenhouse Gas Emissions from Operation of New Hatchery, Acclimation, and Release Activities**

| Type of Activity | $CO_2$ (metric tons) | $CH_4$ ($CO_2e$) (metric tons) | $N_2O$ ($CO_2e$) (metric tons) | Total $CO_2e$ (metric tons)[a] |
|---|---|---|---|---|
| Worker supply runs | 95.3 | 30.1 | 358.9 | **484.4** |
| Parr releases | 78.4 | 24.8 | 295.0 | **398.1** |
| Smolt acclimation installation | 39.2 | 12.4 | 147.5 | **199.1** |
| Smolt acclimation operations and releases | 209.0 | 66.0 | 786.7 | **1,061.7** |
| **Total[a]** | **421.9** | **133.2** | **1,588.2** | **2,143.3** |

Notes:
$CO_2$ = carbon dioxide
$CH_4$ = methane
$N_2O$ = nitrous oxide
$CO_2e$ = units of equivalent carbon dioxide

a. The sum of the individual entries may not sum to the total depicted due to rounding.

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