

Upper Columbia Spring Chinook and Steelhead Acclimation Program

Draft Environmental Assessment



November 2016

DOE/EA-1998



Table of Contents

CHAPTER 1.	PURPOSE AND NEED FOR ACTION	1
1.1	Introduction	1
1.2	Need for Action	1
1.3	Purposes.....	1
1.4	Background	2
1.5	Public Involvement.....	3
CHAPTER 2.	PROPOSED ACTION AND ALTERNATIVES.....	5
2.1	Proposed Action.....	5
2.1.1	Acclimation Sites	5
2.1.2	Acclimation Operations	10
2.1.3	Monitoring, Evaluation and Adaptive Management	14
2.2	No Action Alternative	14
2.3	Comparison of Alternatives	14
2.4	Mitigation Measures	19
CHAPTER 3.	AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	23
3.1	Geology and Soils.....	23
3.1.1	Affected Environment	23
3.1.2	Environmental Consequences for Geology and Soils – Proposed Action.....	24
3.1.3	Environmental Consequences for Geology and Soils – No Action	24
3.2	Water Resources.....	25
3.2.1	Affected Environment	25
3.2.2	Environmental Consequences for Water Resources – Proposed Action.....	27
3.2.3	Environmental Consequences for Water Resources – No Action	31
3.3	Vegetation	31
3.3.1	Affected Environment	31
3.3.2	Environmental Consequences for Vegetation – Proposed Action	32
3.3.3	Environmental Consequences for Vegetation – No Action.....	33
3.4	Wetlands and Floodplains	33
3.4.1	Affected Environment	33
3.4.2	Environmental Consequences for Wetlands and Floodplains – Proposed Action	34
3.4.3	Environmental Consequences for Wetlands and Floodplains – No Action.....	35
3.5	Fish	35
3.5.1	Affected Environment	35
3.5.2	Environmental Consequences for Fish – Proposed Action	36
3.5.3	Environmental Consequences for Fish – No Action.....	48
3.6	Wildlife	49
3.6.1	Affected Environment	49
3.6.2	Environmental Consequences for Wildlife – Proposed Action	53
3.6.3	Environmental Consequences for Wildlife – No Action	55

3.7	Transportation.....	56
3.7.1	Affected Environment.....	56
3.7.2	Environmental Consequences for Transportation – Proposed Action.....	57
3.7.3	Environmental Consequences for Transportation – No Action.....	57
3.8	Land Use and Recreation	58
3.8.1	Affected Environment.....	58
3.8.2	Environmental Consequences for Land Use and Recreation – Proposed Action	61
3.8.3	Environmental Consequences for Land Use and Recreation – No Action.....	63
3.9	Visual Resources.....	63
3.9.1	Affected Environment.....	63
3.9.2	Environmental Consequences for Visual Resources – Proposed Action.....	66
3.9.3	Environmental Consequences for Visual Resources – No Action	67
3.10	Air, Noise, and Public Health and Safety	67
3.10.1	Affected Environment.....	67
3.10.2	Environmental Consequences for Air, Noise, and Public Health and Safety – Proposed Action	70
3.10.3	Environmental Consequences for Air, Noise, and Public Health and Safety – No Action	72
3.11	Cultural Resources.....	72
3.11.1	Affected Environment.....	72
3.11.2	Environmental Consequences for Cultural Resources – Proposed Action	73
3.11.3	Environmental Consequences for Cultural Resources – No Action.....	73
3.12	Socioeconomics.....	73
3.12.1	Affected Environment.....	73
3.12.2	Environmental Consequences for Socioeconomics – Proposed Action	75
3.12.3	Environmental Consequences for Socioeconomics – No Action.....	77
3.13	Climate Change	77
3.14	Cumulative Effects.....	78
3.14.1	Geology and Soils.....	79
3.14.2	Water Resources	79
3.14.3	Vegetation	79
3.14.4	Wetlands and Floodplains	80
3.14.5	Fish	80
3.14.6	Wildlife.....	81
3.14.7	Transportation	81
3.14.8	Land Use and Recreation	81
3.14.9	Visual Resources.....	82
3.14.10	Air, Noise, and Public Health and Safety.....	82
3.14.11	Cultural Resources	82
3.14.12	Socioeconomics	82
3.14.13	Climate Change.....	82

CHAPTER 4. ENVIRONMENTAL CONSULTATION, REVIEW, AND PERMIT REQUIREMENTS	83
4.1 Environmental Policy	83
4.1.1 National Environmental Policy Act	83
4.1.2 State Environmental Policy Act	83
4.2 Fish and Wildlife	83
4.2.1 Endangered Species Act	83
4.2.2 Fish and Wildlife Conservation Act and Fish and Wildlife Coordination Act	84
4.2.3 Magnuson-Stevens Fishery Conservation and Management Act of 1976	84
4.2.4 Migratory Bird Treaty Act	84
4.2.5 Responsibilities of Federal Agencies to Protect Migratory Birds	84
4.2.6 Bald and Golden Eagle Protection Act	85
4.3 Wetlands, Floodplains, and Water Resources	85
4.3.1 Clean Water Act Section 401	85
4.3.2 Clean Water Act Section 402	85
4.3.3 Clean Water Act Section 404	85
4.4 Heritage Conservation and Cultural Resources Protection	86
4.5 State, Area-Wide, and Local Plan Consistency	86
4.6 Noise and Public Health and Safety	88
4.7 Executive Order on Environmental Justice	88
4.8 Air Quality	88
4.9 Climate Change	88
4.10 Farmland Protection Policy Act	89
4.11 Resource Conservation and Recovery Act, Toxic Substances Control Act, and Federal Insecticide, Fungicide and Rodenticide Act	89
CHAPTER 5. REFERENCES	91
CHAPTER 6. AGENCIES, TRIBES, ORGANIZATIONS, AND PERSONS RECEIVING THE ENVIRONMENTAL ASSESSMENT	99
CHAPTER 7. GLOSSARY	103

Appendices

APPENDIX A - Description of Acclimation Facilities

APPENDIX B - BPA Easement Conditions for Construction of the Powerline Acclimation Facility

List of Figures

Figure 1 Acclimation pond locations	6
Figure 2 Location of proposed Powerline acclimation facility	7
Figure 3 Powerline acclimation facility site layout.....	8
Figure 4 Cross section of berm forming inlet and outlet.....	9
Figure 5 Barrier net example.....	13
Figure 6 Seine net example.....	13

List of Tables

Table 2-1 Proposed spring Chinook and steelhead acclimation sites.....	5
Table 2-2 Acclimation pond species, production source, capacity, and acclimation period	11
Table 2-3 Types of Pond and Enclosure Systems for Acclimation Facilities	12
Table 2-4 Comparison of Alternatives by BPA Purposes.....	15
Table 2-5 Comparison of alternatives by resource impact.....	16
Table 2-6 Mitigation Measures.....	19
Table 3-1 Summary of Soil Conditions	23
Table 3-2 Designated Uses and Select Criteria of Waters in Vicinity of Acclimation Sites	25
Table 3-3 Summary of Stream Flows at Proposed Acclimation Sites	27
Table 3-4 Acclimation Site Water Sources and Quantities	30
Table 3-5 Floodplain Designations for Proposed Acclimation Sites.....	34
Table 3-6 Fish Species with Special Federal or State Status within the Methow and Wenatchee Basins	35
Table 3-7 Life Stages of ESA-listed Fish Species Likely to be Present in Streams at the Proposed Acclimation Sites.....	39
Table 3-8 Wildlife Species with ESA Listing Status or PHS status ^{1/2/}	51
Table 3-9 Maximum Permissible Noise Levels (dBA) at Three Classes of Property ^{1/}	69
Table 3-10 Economic Characteristics	74
Table 3-11 Percent of Population by Race and Ethnicity	75
Table 4-1 Okanogan County Land Use Zoning and Shoreline Zone by Acclimation Site	87
Table 4-2 Chelan County Land Use Zoning and Shoreline by Acclimation Site	87

Acronyms and Abbreviations

Accords	2008 Columbia Fish Accords
BNSF	Burlington Northern Santa Fe (Railway)
BPA	Bonneville Power Administration
CCPUD	Chelan County Public Utility District
CEQ	Council on Environmental Quality
cfs	cubic feet per second
CFR	Code of Federal Regulations
DCPUD	Douglas County Public Utility District
dB	decibel
dBA	A-weighted decibel
DPS	Distinct Population Segment
EA	Environmental Assessment
EDNA	Environmental Designation for Noise Abatement
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species List
ESU	Evolutionarily Significant Unit
FC	Commercial Forest
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIRM	Flood Insurance Rate Map
g/d	grams per day
GHG	greenhouse gas
GCPUD	Grant County Public Utility District
HSRG	Hatchery Scientific Review Group
ISRP	Independent Scientific Review Panel
Mid-C Coho Program	Mid-Columbia Coho Restoration Program

mg/L	milligram per liter
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFS	National Forest System
NHPA	National Historic Preservation Act
NOAA Fisheries	National Oceanic and Atmospheric Administration National Marine Fisheries Service
OHW	ordinary high water
pHOS	proportion of hatchery origin spawners in the escapement
PHS	Priority Habitat and Species
PIT	passive integrated transponder
PNI	Proportion of Natural Influence
pNOB	proportion of natural-origin fish in the hatchery brood stock
Proposed Action	Upper Columbia Spring Chinook and Steelhead Acclimation Program
SA	supplemental analysis
SAAQS	State Ambient Air Quality Standards
SAR	smolt to adult return ratio
SEPA	State Environmental Policy Act
SHPO	State Historic Preservation Office
SMP	Shoreline Master Program
SR	State Route
TMDL	Total Maximum Daily Load
U.S.C.	United States Code
US 2	U.S. Highway 2
US 97	U.S. Highway 97
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGCRP	United States Global Climate Research Program
WAC	Washington Administrative Code

WDFW	Washington Department of Fish and Wildlife
WDAHP	Washington Department of Archaeology and Historic Preservation
WDNR	Washington Department of Resources
WHNP	Washington Natural Heritage Program
WDOE	Washington Department of Ecology
Yakama Nation	The Confederated Tribes and Bands of the Yakama Nation

This page left blank intentionally

Chapter 1. Purpose and Need for Action

1.1 Introduction

The Bonneville Power Administration (BPA) proposes to provide funding for the Confederated Tribes and Bands of the Yakama Nation's (Yakima Nation) Upper Columbia Spring Chinook and Steelhead Acclimation Program. The Yakama Nation's program would involve placing existing hatchery-raised spring Chinook and steelhead into acclimation ponds before their release into the Methow and Wenatchee river basins in Okanogan and Chelan Counties, Washington. This proposal would include construction of a new acclimation pond, as well as the co-use of six ponds—four existing ponds and two ponds currently under environmental review—used to acclimate coho salmon.

This Environmental Assessment (EA) was prepared under the National Environmental Policy Act (NEPA) and the Council on Environmental Quality implementing regulations, which require federal agencies to assess the impacts that their actions may have on the environment and make this impact analysis available to the public.

1.2 Need for Action

BPA needs to respond to the Yakama Nation's request for funding to acclimate hatchery-raised spring Chinook and steelhead in ponds adjacent to rivers and streams in the Methow and Wenatchee River basins prior to their release into those waterbodies. More specifically, the funding would respond to the Yakama Nation's request to construct and operate a new steelhead acclimation pond in the Wenatchee River basin and to expand operations at six coho acclimation pond sites¹ in the Wenatchee and Methow basins to include acclimation of spring Chinook and steelhead.

Currently, spring Chinook and steelhead are imprinted on waters of the hatchery where they are raised, which are usually located far from natural spawning habitats. When released, their spawning instinct ultimately returns them to those hatchery waters or they stray into nearby waterbodies unsuitable for spawning. This hatchery imprinting limits the species' ability to expand throughout available habitat in their native watershed, handicapping species recovery. Acclimating fish to suitable spawning habitat in differing locations within their native watersheds would help ensure the adult fish return to those suitable habitats and thereby pioneer natural spawning throughout those watersheds.

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 (FCRPS) on fish and wildlife in the mainstem Columbia River

¹ For communication efficiency in this document, the six coho acclimation pond sites will usually be referenced with no distinction between the four existing acclimation ponds and the two, Trinity and Early Winters that are currently being analyzed under the Mid-Columbia Coho Restoration Program NEPA process. These six sites are generally referred to in this Environmental Assessment as the "coho acclimation sites".

and its tributaries under the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) (16 U.S.C. § 839n(h)(10)(A).

- Assist in carrying out commitments related to proposed hatchery actions 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 Environmental Impact Statement and Record of Decision policy direction, which call for protecting weak stocks, like the Upper Columbia spring Chinook and steelhead, while sustaining overall populations of fish for their economic and cultural value (BPA 2003).
- Minimize harm to natural or human resources, including species listed under the Endangered Species Act (16 U.S.C. § 1531 *et seq.*).

In addition to purposes that BPA seeks to achieve, the Yakama Nation seeks to achieve the following purposes:

- Increase the abundance of Upper Columbia spring Chinook and steelhead to assist in meeting fish stock management goals.
- Expand distribution of spawning Upper Columbia spring Chinook and steelhead throughout available spawning habitat in the Wenatchee and Methow basins.
- Shift homing fidelity of spawning Upper Columbia spring Chinook and steelhead from natal hatcheries to upstream natural habitats.
- Maintain consistency with the spring Chinook and steelhead production objectives specified in the 2008-2017 United States v. Oregon Fish Management Agreement for the Wenatchee and Methow subbasins.

1.4 Background

BPA is a federal power marketing agency within the United States 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 Northwest Power and Conservation Council (Council). The Council in turn gives deference to proposals developed by state and tribal fishery managers.

In addition to its responsibilities under the Northwest Power Act, on May 2, 2008, BPA, Bureau of Reclamation, and U.S. Army Corps of Engineers signed the 2008 "Columbia Basin Fish Accords Memorandum of Agreement between the Three Treaty Tribes and FCRPS Action Agencies" (2008 Fish Accords). The Three Treaty Tribes are the Yakama Nation, the Confederated Tribes of the Warm Springs Reservation, and the Confederated Tribes of the Umatilla Indian Reservation. This agreement includes funding for the Yakama Nation's Upper Columbia Spring Chinook and Steelhead Acclimation Program. BPA conditioned its funding commitment on securing a favorable recommendation from the Council (which it received on January 13, 2010) and on compliance with all its other mandates, including NEPA.

The spring Chinook and steelhead proposed for acclimation are being produced at multiple hatcheries by various entities in the region that also have obligations or responsibilities that contribute to the production and release of spring Chinook and steelhead. The Chelan County Public Utility District (PUD) and Douglas County PUD operate hydroelectric projects in the upper Columbia basin and run hatchery programs to achieve the No-Net-Impact standard for upper Columbia spring Chinook and steelhead set out in their Habitat Conservation Plans.² The Grant County PUD also operates hydroelectric projects in the upper Columbia basin and runs hatchery programs to meet mitigation obligations specified in the Priest Rapids Salmon and Steelhead Settlement Agreement (2005). The Douglas County PUD funds the Methow Hatchery in Winthrop, Washington in the Methow basin, which is dedicated to the enhancement of natural production of spring Chinook salmon. The Chelan County and Grant County PUDs fund the Carlton Overwinter Acclimation Facility in Twisp, Washington, in the Methow basin, and the Chelan County PUD also funds the Eastbank Hatchery in Wenatchee, Washington, along the Columbia River, and the Chiwawa Rearing Facilities near the confluence of the Chiwawa and Wenatchee Rivers. These four hatcheries are operated by the Washington Department of Fish and Wildlife (WDFW).

Under a different program, BPA provides funding to the Yakama Nation to expand its efforts to reintroduce coho salmon into the Wenatchee and Methow basins through the Mid-Columbia Coho Restoration Program (Mid-C Coho Program). In 2012, BPA prepared an Environmental Impact Statement (EIS) (DOE/EIS-0425, March 2012) and associated Supplement Analyses (SAs)³ under NEPA to analyze the effects of the construction and operation of the Mid-C Coho Program. This funding supports activities that provide sufficient numbers of coho smolts to be released in multiple tributaries throughout both basins to disperse returning coho adults in suitable habitat and to encourage establishment of a self-sustaining, naturally reproducing population with tribal and non-tribal harvest in most years. The Yakama Nation is currently operating four acclimation facilities for coho salmon under the Mid-C Coho Program, and planning construction of another two (Early Winters and Trinity) being addressed in separate NEPA analyses. These six coho acclimation sites are proposed here for co-use to also acclimate spring Chinook and steelhead.

1.5 Public Involvement

To help determine issues to be addressed in the EA, BPA conducted public scoping outreach. BPA mailed letters on April 2, 2015 to landowners, Tribes, government agencies, and other potentially affected or concerned citizens and interest groups. The public letter provided information about the Proposed Action and EA scoping period, requested comments on issues to be addressed in the EA, and described how to comment (mail, fax, telephone, the BPA website, and at scoping meetings). The public letter was posted on a project website established by BPA to provide information about the program and the EA process: www.bpa.gov/goto/ChinookSteelheadAcclimation. The public

² Douglas County PUD's Habitat Conservation Plan is the Anadromous Fish Agreement and Habitat Conservation Plan, The Wells Hydroelectric Project, FERC License No. 2149. Chelan County PUD's Habitat Conservation Plans are the Anadromous Fish Agreement and Habitat Conservation Plan, The Rocky Reach Hydroelectric Project, FERC License No. 2145 and the Anadromous Fish Agreement and Habitat Conservation Plan, The Rock Island Hydroelectric Project, FERC License No. 943.

³ Available at <https://www.bpa.gov/efw/Analysis/NEPADocuments/Pages/Mid-Columbia-Coho-Restoration-Project.aspx>.

comment period began on April 2, 2015, and BPA accepted comments on the program from the public until May 4, 2015.

BPA held two public scoping meetings to describe the program and to solicit comments. Public meetings were held the evenings of April 22, 2015, in Leavenworth, Washington, and April 23, 2015, in Winthrop, Washington. Four people attended the meetings. During these meetings, attendees had the opportunity to learn more about the EA process and the Proposed Action and were able to submit EA scoping comments.

BPA determined that two Tribes have a potential interest in this program – the Confederated Tribes of the Colville Reservation (Colville Tribes) and the Yakama Nation. BPA requested information from the Tribes on cultural resources to help shape the cultural resource field investigation.

BPA considered comments it received during the scoping period in the development of the draft EA. Comments were received from the Colville Tribes and five individuals. The full text of the comments, including copies of any letters received, is available on BPA's website at: www.bpa.gov/goto/ChinookSteelheadAcclimation. None of the comments received in scoping resulted in the development of additional alternatives. The issues raised during scoping include the following:

- Concerns about the differences in Tribal fishing rights in the Methow and Wenatchee basins and a request to consider impacts to fishing rights.
- A reservation from the Colville Tribes to comment on the proposal's cultural resource reports.
- Questions regarding the number of acclimated smolts that would be released, the duration of their acclimation, the timing of their release, the areas chosen for these releases, and the conduct of the acclimation activities over time.
- Concerns about potential displacement effects acclimation activities could have on native fish currently occupying the habitat in the location of these facilities.
- Concerns about genetic effects that hatchery-reared fish would have on native-origin spring Chinook and steelhead when released into habitats they would both share over time.
- Question as to whether hatchery production would increase with the program and if existing hatchery production programs in the Wenatchee and Methow basins would be used.
- A request to analyze the relationship between the proposed program and the restoration efforts being conducted in the program area.
- Concerns about the effectiveness of the program to achieve its stated goals.
- A request to change the name of the proposed Powerline pond to "Merrit" or "Powerline pond at Merrit."
- A request to keep momentum going for improving watersheds and fish habitat.
- A request to clean out the logs, debris, and beaver dams from the Methow River.

These topics are addressed in the relevant sections of the EA.

Chapter 2. Proposed Action and Alternatives

This chapter describes the Proposed Action and the No Action Alternative. It also compares the alternatives by program purposes and potential environmental consequences.

2.1 Proposed Action

Under the Proposed Action, BPA would fund the Yakama Nation to acclimate hatchery-raised spring Chinook and steelhead in ponds adjacent to rivers and streams prior to their release into those waterbodies. The acclimation program would include the following:

- Use of six acclimation sites that the Yakama Nation currently uses, or is currently analyzing for construction and use, for acclimating coho salmon
- Construction of one new pond to be named the Powerline Acclimation site
- Acclimation operations (numbers of fish, time of holding, timing and locations of release, etc.)
- Routine pond maintenance
- Monitoring and evaluation

The acclimation ponds would help spring Chinook and steelhead raised at numerous hatcheries in the region acclimate to the natural environment and imprint on waters to which they would be expected to return as adults to spawn. The Proposed Action would not change the number of spring Chinook and steelhead that are currently being produced and released into the Methow and Wenatchee watersheds, it would just provide for acclimation of those fish prior to release.

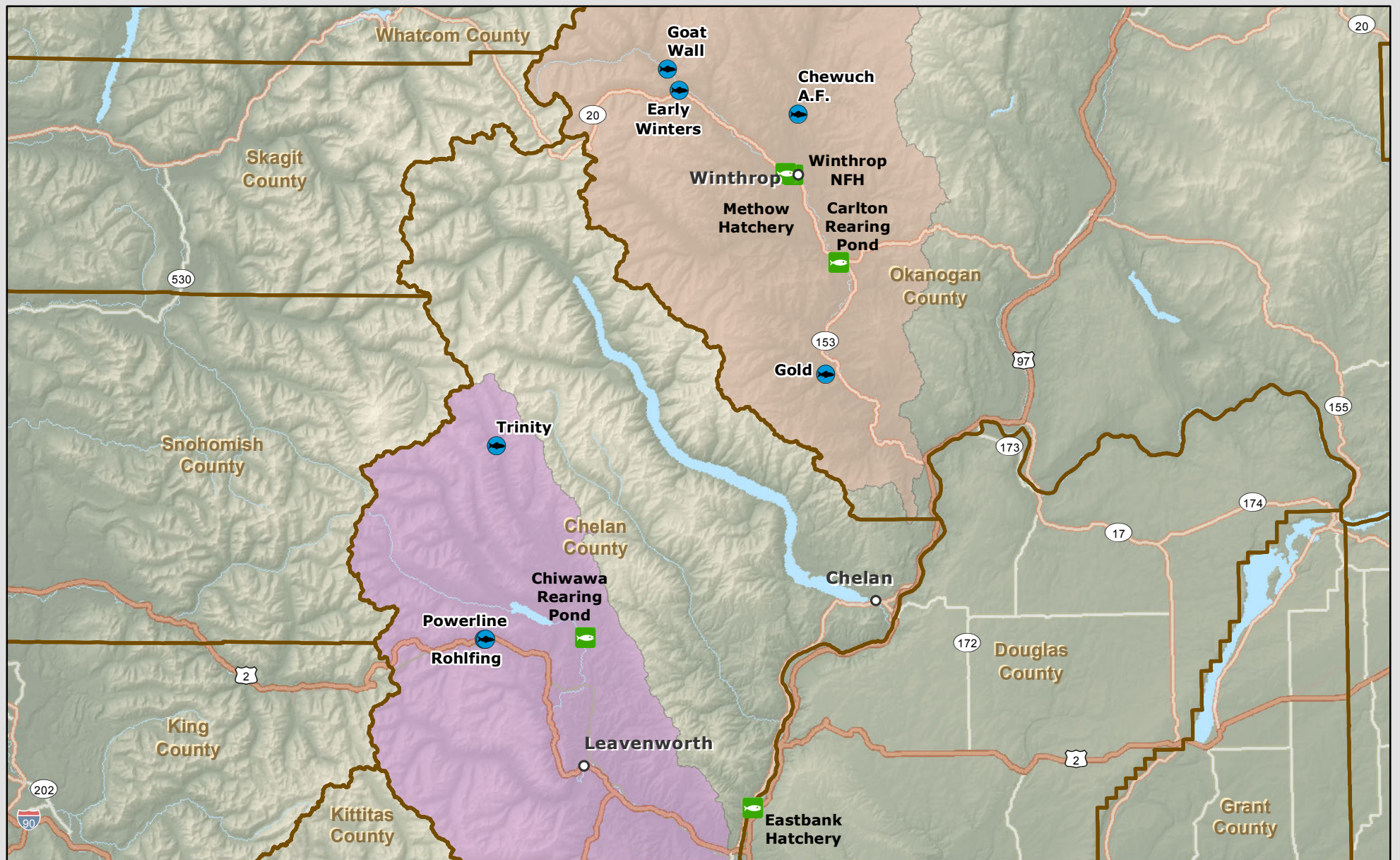
2.1.1 Acclimation Sites

Acclimation of spring Chinook and steelhead would occur at seven sites - one new site and six coho acclimation sites, as shown in Table 2-1 and Figure 1. Appendix A includes descriptions of the sites and facilities.





Table 2-1 Proposed spring Chinook and steelhead acclimation sites

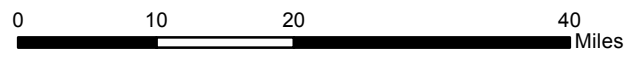
Acclimation Site	Watershed	River or Stream	Species
Early Winters*	Methow	Early Winters Creek	spring Chinook
Chewuch Acclimation Facility	Methow	Chewuch River	spring Chinook
Goat Wall	Methow	Upper Methow River	spring Chinook
Gold Creek	Methow	Gold Creek	steelhead
Rohlfing	Wenatchee	Nason Creek	steelhead
Trinity*	Wenatchee	Chiwawa River	spring Chinook
Powerline (new)	Wenatchee	Nason Creek	steelhead
* not yet constructed or operating for coho salmon acclimation; currently under separate NEPA analysis			

Figure 1 Acclimation pond locations



Upper Columbia Spring Chinook and Steelhead Acclimation

-  Fish Hatchery Facility
-  Acclimation Ponds
-  Methow Basin
-  Wenatchee Basin



Map Date: 5/23/2016



2.1.1.1 Powerline Acclimation Pond

The Powerline acclimation pond would be constructed in Chelan County, Washington, along Whitepine Road, approximately 0.8 mile from U.S. Highway 2 (Figure 2). The site is undeveloped and in a rural area of Chelan County. The pond would be constructed on privately owned land within the 275-foot wide right-of-way for BPA's Chief Joseph-Snohomish Nos. 3 and 4 transmission lines. The pond would be adjacent and connected to a small unnamed creek that flows into Nason Creek (Figure 3).

Figure 2 Location of proposed Powerline acclimation facility



Construction of the Powerline acclimation pond would entail the following (see Figure 3):

- Excavation of a 5,900 square-foot earthen pond
- Construction of a 70-foot by 10-foot access road
- Constructing a rock berm at the edge of the pond to divert flow from the unnamed tributary of Nason Creek and release water back to the source creek
- Removal of about 0.15 acres of low-growing vegetation
- Revegetation of disturbed areas

- Creation of roughened channels for both inlet and outlet (see below)

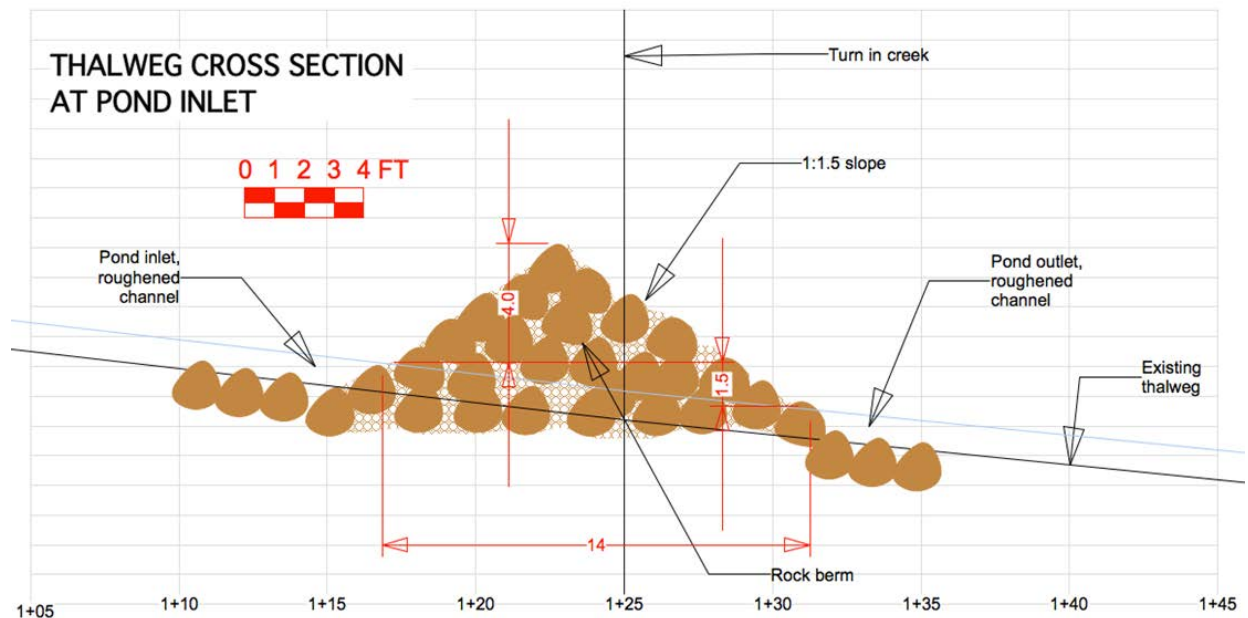
Figure 3 Powerline acclimation facility site layout



The 5,900 square-foot pond would be constructed with an average depth of 4 feet. It would be roughly perpendicular to the creek channel with an inlet and outlet close to one another (see Figure 3). The berm to the south of the pond would be constructed entirely from material excavated from the pond. No off-site disposal of excavated material would be needed.

A rock berm would divert water from an unnamed tributary of Nason Creek into the pond, where the flow would turn 180 degrees in the pond and then exit back into the existing creek channel (Figures 3 and 4). The design is intended to allow existing adult and juvenile fish that may be present unobstructed passage up and down the creek. All water would come from the unnamed tributary by gravity feed (no groundwater or pumps would be used) and would flow back into the tributary.

Figure 4 Cross section of berm forming inlet and outlet



The existing creek channel at both the inlet and outlet would be roughened to keep flow gradients to less than three percent (the existing stream gradient averages nine percent). A three percent slope would allow upstream and downstream passage by all life stages of fish.

The rock berm and roughened channel would be constructed of imported rock, gravel, and sand. Roughened channels would be constructed with an immobile framework of large rock mixed with smaller natural substrates such as cobbles, gravels, and fines. The roughened channel and rock berm would be designed so that:

- Roughened channel would be perpendicular to the unnamed creek and be constructed to appear as a natural extension of it.
- Existing flow capacities of the unnamed creek would be maintained.
- Material sizing would be based on existing rock in the creek bed.
- Armor-layer rock would be larger than stable rock in the creek bed to provide stability during flood flows.
- The roughened channel would extend to the 100-year flood elevation to limit bank line scour.
- The depth of the roughened channel would be 1.5 times the size of the largest rock to ensure adequate fish passage at various flows.
- Clean fines would be washed into the pond bed to seal it after rock and gravel placement to increase its water-holding capability.

The pond design includes a bottom comprised of existing material. Its sides would be sloped to prevent erosion and to minimize human safety concerns (e.g., 50% slopes). A seine would be installed during the acclimation period to encompass 4,500 square feet of area for confining smolts.

To access the pond from Whitepine Road, a new 70-foot-long access road would be constructed. It would be 10 feet wide and would be surfaced with 4 inches of gravel.

Both the road and pond construction would occur within the easement for BPA's Chief Joseph-Snohomish transmission line. Conditions required by BPA for working in this easement are listed in Appendix B.

Areas of the site disturbed during construction would be re-vegetated using native vegetation. Riparian vegetation would be used along the creek and pond shorelines. Mitigation measures would be applied for Vegetation as identified in Table 2-6.

2.1.1.2 Existing and Planned Coho Acclimation Sites

Under the Proposed Action, four existing and two planned coho acclimation sites would also be used to acclimate spring Chinook and steelhead. The four existing sites are the Chewuch Acclimation Facility (hereinafter 'Chewuch AF'), Goat Wall, Gold Creek, and Rohlfing. The Yakama Nation is currently operating the Chewuch AF, Gold Creek, and Rohlfing sites for acclimating coho salmon under the Mid-C Coho Program. Goat Wall has been constructed, but coho acclimation operations there have not yet begun. No construction, excavation, or changes would be required to use these ponds for spring Chinook and steelhead acclimation, and they would continue to be used for coho acclimation. The construction and operation of these four ponds were analyzed as part of the Mid-C Coho Program EIS. The EIS analyzed the environmental impacts of constructing and operating these ponds for coho acclimation, and is incorporated by reference into this EA as allowed under NEPA at 40 Code of Federal Regulations § 1502.21.

The two planned coho acclimation sites are Trinity and Early Winters. These sites are currently under environmental review as supplement analyses to the Mid-C Coho Program EIS for use to acclimate coho salmon. The supplement analyses (SAs) are considering the potential environmental effects of the construction and operation of the Trinity and Early Winters sites for coho acclimation to determine if the impacts are consistent with those considered in the Mid-C Coho Program EIS. Under the Proposed Action for the Upper Columbia Spring Chinook and Steelhead Acclimation Program, Trinity and Early Winters acclimation sites (if constructed) would also be used for spring Chinook and steelhead acclimation, though their primary function would be for coho acclimation. This EA describes and considers the impacts of adding spring Chinook and steelhead to these existing and planned coho acclimation ponds—including any additional operational needs at the sites.

See Appendix A for a description of all acclimation ponds.

2.1.2 Acclimation Operations

Under the Proposed Action, spring Chinook salmon and steelhead smolts would be transported by truck from the hatcheries where they are produced to acclimation sites within the same watershed as the rearing hatchery. Coho salmon, spring Chinook salmon, and steelhead may all be acclimated at the same site, though not commingled (see Table 2-2). These juvenile salmon would be held in

the acclimation ponds over winter or for a few weeks between March and May, depending on the pond and seasonal accessibility.

Following the acclimation period, the fish would be released directly into the stream near where the ponds are located. Juvenile fish would be released by removing/opening the pond's seines or screens. These seines or screens would be removed or opened at the end of the acclimation period to allow volitional migration (fish leaving the pond on their own) and would not be replaced or closed until the beginning of the next acclimation period. Fish would have passive integrated transponder (PIT) tags. Detection systems at each pond site would help monitor which and how many fish leave the pond. It could take up to one month for all smolts to leave the pond volitionally.

Table 2-2 Acclimation pond species, production source, capacity, and acclimation period

Acclimation Facility	Species	Production Source	Pond capacity	Acclimation Period (same for all species)
Early Winters (two ponds; one for each species)	Spring Chinook/ Steelhead	Methow Hatchery ^{1/} /Winthrop National Fish Hatchery ^{2/}	50,000 spring Chinook/steelhead and 75,000 coho	Spring
Chewuch AF (one pond separated by a seine net, parallel to flow)	Spring Chinook	Carlton Overwinter Acc. Facility ^{3/}	61,000 spring Chinook and up to 150,000 coho	Spring
Goat Wall (one pond)	Spring Chinook	Methow Hatchery ^{1/}	34,000 Spring Chinook or 50,000 coho	Spring
Gold Creek (one pond)	Steelhead	Winthrop National Fish Hatchery ^{2/}	25,000 steelhead or 50,000 coho	Spring
Rohlfing (one pond)	Steelhead	Eastbank/Chiwawa Rearing Facilities ^{3/}	65,000 steelhead or 105,000 coho	spring
Trinity (three tanks, two ponds)	Spring Chinook	Eastbank/Chiwawa Rearing Facilities ^{3/}	50,000 spring Chinook/steelhead and 100,000 coho	Winter in tanks, spring in ponds
Powerline (<i>new</i>)	Steelhead	Chiwawa Rearing Facilities ^{3/}	75,000 steelhead	spring
1/ Owned by Douglas County PUD, operated by Washington Department of Fish and Wildlife (WDFW).				
2/ Owned and operated by U.S. Fish and Wildlife Service.				
3/ Owned by Chelan County PUD and cooperatively operated and funded with WDFW				

Five primary activities would occur while smolts are present in the acclimation ponds:

- Set up and removal of site enclosure systems at beginning and end of acclimation period
- Daily feeding
- Predation deterrence
- Pond maintenance
- Release monitoring

These activities are already occurring for coho acclimation at the Chewuch AF, Gold Creek, and Rohlfing acclimation sites. Goat Wall has been constructed, but has not yet been operating.

Feeding would occur one to three times each day for 10 to 15 minutes at each feeding - approximately 40-50 pounds of food per 25,000 fish per day.

Predation deterrence would be accomplished primarily by the presence of Yakama Nation staff in the immediate vicinity of the acclimation site, with the majority of predation deterrence needed near dawn and dusk. Depending on the frequency or intensity of predation, predator decoys, scent, and sprinklers connected to sensors may be used as well. No lethal methods of predator removal are proposed.

Release monitoring would include daily readings of the automatic PIT tag detection systems that are present at each site.

Acclimation **pond maintenance** would entail periodic maintenance dredging, likely every 3 to 5 years, though it may not be needed at all sites.

Acclimation Site Enclosure Systems

For most acclimation ponds, net systems are used to confine fish during the acclimation period. Some ponds have permanently installed outlet screens, rather than nets, to control the release of fish. Table 2-3 lists the type of pond and enclosure system at each acclimation facility.

Table 2-3 Types of Pond and Enclosure Systems for Acclimation Facilities

Acclimation Facility	Type of Pond	Type of Enclosure System
Early Winters	Artificially constructed earthen pond	Outlet screens
Chewuch AF	Artificially constructed earthen pond	Outlet screens
Goat Wall	“Ponds” are a disconnected side channel of the creek.	Seine nets within creek
Gold Creek	‘Ponds’ are a side channel to the creek	Seine nets within creek
Rohlfing	Earthen pond built adjacent to existing stream	Seine nets within pond; barrier net across outlet
Trinity	Three circular tanks, two earthen ponds	Seine net in one pond; screened intake and outlet in the other;
Powerline (<i>new</i>)	Earthen pond built adjacent to existing stream	Seine nets within pond

There are two types of net configurations: barrier nets and seine nets. Both types are temporary and are only in place during acclimation. The nets are designed to minimize premature escape, and include jump barriers and weighted bottoms to maintain a sealed barrier across the bottom of the pond.

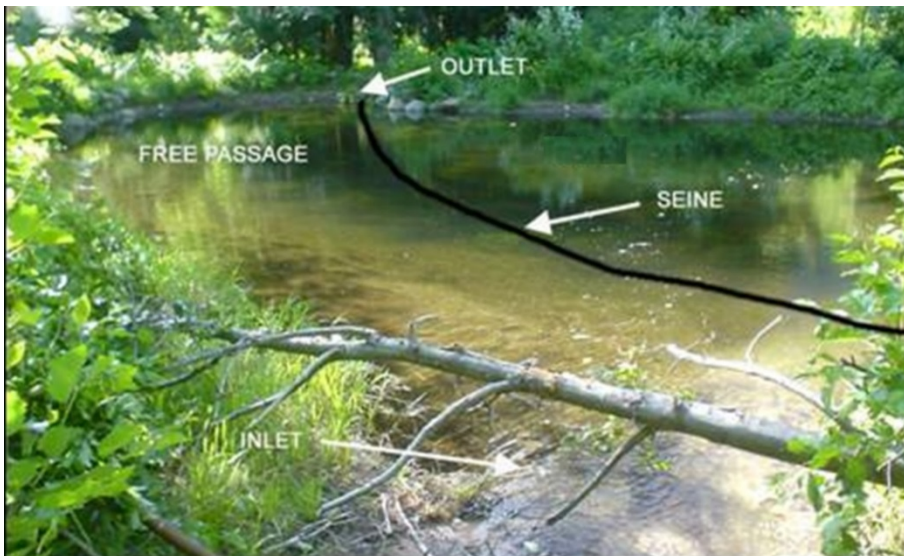
Barrier nets (Figure 5) are placed perpendicular to the flow of a stream and would be installed based on stream-specific considerations to minimize impacts on ESA-listed fish. Barrier nets generally create a complete blockage to fish passage, so they are used only in waterbodies that are not fish bearing.

Figure 5 Barrier net example



Seine nets (Figure 6) would be used at acclimation sites to partition off a portion of a waterbody while allowing free upstream and downstream passage of all life stages of non-confined ESA-listed fish. In waterbodies where existing young spring Chinook could be present, the seine nets would be made of a fine mesh to prevent fry from entering enclosed areas and becoming prey for the acclimating Chinook or steelhead.

Figure 6 Seine net example



Sines would be installed in a manner that would remove fish possibly present in the acclimation area by moving the net out from the bank to encapsulate the acclimation area. The enclosed areas would be snorkeled to verify that no ESA-listed fish are present before Chinook or steelhead would be added. If necessary, seining would continue until all native fish are excluded from the work area.

2.1.3 Monitoring, Evaluation and Adaptive Management

A monitoring, evaluation, and adaptive management plan would be developed to collect data to evaluate the efficacy of the acclimation program—to help verify that acclimation increases the return of adults to suitable habitats. In addition, monitoring would help ascertain potential interactions between released fish and native ESA-listed species with adaptive management to ensure the protection of native fish⁴. A pre-release evaluation of the release sites to assess the use of those sites by native ESA-listed fish is currently being conducted. Monitoring and evaluation would include observation and analysis of critical measures such as smolt-to-adult return ratios (SAR), Proportion of Natural Influence⁵ (PNI), and the proportion of hatchery-origin spawners in the escapement.

2.2 No Action Alternative

Under the No Action Alternative, BPA would not fund the Yakama Nation for its proposed program for acclimation of hatchery-reared spring Chinook or steelhead, nor would BPA fund construction of a new acclimation facility at the Powerline site in the Wenatchee watershed. However, the Yakama Nation could seek funding from other sources to implement the program. Under the No Action Alternative, the use of the existing ponds for coho acclimation under the Mid-C Coho Program would continue unchanged.

2.3 Comparison of Alternatives

The following two tables compare the Proposed Action and the No Action Alternative. Table 2-4 compares the alternatives by the purposes of this project. Table 2-6 displays a summary of the impacts of implementing each alternative; the information is condensed from the discussions in Chapter 3, and the reader is referred there for more detail.

⁴ This will be in concert with the Public Utility District's Monitoring and Evaluation Plan. This plan has been agreed upon by the various co-managers of GCPUD, CCPUD, DCPUD, Confederated Tribes of the Colville Reservation, Yakama Nation, WDFW, USFWS, and NOAA Fisheries.

⁵ PNI is the proportion of genetic influence between hatchery and native fish. See discussions in Chapters 1 and 3.

Table 2-4 Comparison of Alternatives by BPA Purposes

Purposes	Proposed Action	No Action Alternative
Support efforts to mitigate for effects of the development and operation of the FCRPS on fish and wildlife in the mainstem Columbia River and its tributaries under the Northwest Power Act.	Would help support mitigation efforts called for in the Northwest Power Act by increasing spring Chinook and steelhead spawning return rates and distribution within the Methow and Wenatchee River watersheds.	Would not further support BPA’s FCRPS mitigation efforts regarding spring Chinook and steelhead survival and distribution.
Assist in carrying out commitments related to proposed hatchery actions contained in the 2008 Columbia Basin Fish Accords Memorandum of Agreement with the Yakama Nation and others.	Would assist in fulfilling Fish Accords’ commitments regarding releases of spring Chinook and steelhead.	Would continue to fund the existing hatchery programs for spring Chinook and steelhead in the Wenatchee and Methow watersheds as agreed to in the Accords, but would not further those commitments regarding acclimation.
Implement BPA’s Fish and Wildlife Implementation Plan EIS and ROD policy direction, which call for protecting weak stocks, like the Upper Columbia spring Chinook and steelhead, while sustaining overall populations of fish for their economic and cultural value.	Would contribute to establishing self-sustaining populations of spring Chinook and steelhead in the upper Wenatchee and Methow River watersheds, which is of cultural value and may provide economic benefits while at the same time protecting ESA-listed fish.	Would not further actions to help protect Upper Columbia spring Chinook and steelhead, or sustain populations for economic and cultural values.
Minimize harm to natural or human resources, including species listed under the Endangered Species Act.	Proposed mitigation measures would minimize harm to natural and human resources. Approvals by, and reporting, to regulatory agencies would minimize the risk of adverse effects to ESA-listed species. (See Table 2-5 for a summary of impacts.)	With no construction of new facilities, there would no potential to affect natural and human resources or short-term impacts to native ESA-listed species; there would also be no additional potential for long-term spring Chinook and steelhead recovery benefits. (See Table 2-5 for a summary of impacts.)

Table 2-5 Comparison of alternatives by resource impact

Resource Affected	Proposed Action	No Action
Geology and Soils	Disturbance of about 1650 cubic yards of soil over 0.28 acres with some short-term erosion potential from construction of Powerline pond, with low long-term impacts. Impacts would be minimized by implementation of mitigation measures in Table 2-6. No-to-low impact expected on the geologic and soil resources at the coho acclimation sites from additional acclimation activity.	No new impacts to geology and soils near the Powerline site. Geology and soil conditions at the six coho acclimation sites and proposed new site would likely continue similar to present conditions, as analyzed in the Mid-C Program EIS (and associated SAs).
Water Resources	Potential sedimentation impacts on water quality due to erosion or accidental equipment spills or leakage during construction at the Powerline site; impacts minimized through implementation of mitigation measures listed in Table 2-6. No-to-low impact to water quality from phosphorus loads associated with operation of the acclimation facilities. Water use for acclimation facilities not expected to affect other water users.	No new impacts to water resources near the Powerline site. Hydrologic conditions at the six coho acclimation sites would likely continue similar to present conditions as analyzed in the Mid-C Program EIS (and associated SAs).
Vegetation	Low impact to vegetation communities from construction at the Powerline site—conversion of 0.25 acre of forest/shrub community (currently managed as powerline right-of-way) to an open water/pond and road; no special-status plant habitat present. No mature trees would be removed. 0.05 acres of riparian habitat affected. Low impact of acclimation operations on vegetation, and minimal potential to contribute to spread of noxious weeds.	No new impacts to vegetation at Powerline site. Vegetation conditions at the six coho acclimation sites would likely continue similar to present conditions as analyzed in the Mid-C Program EIS (and associated SAs).
Wetlands and Floodplains	No impacts to wetland or floodplains from construction at the Powerline site, or from acclimation operations at any/all of the sites.	No impacts to wetlands or floodplains at Powerline site or at the six coho acclimation sites.
Fish	Potential turbidity effects on fish due to erosion during construction at the Powerline site would be temporary and limited by the implementation of mitigation measures in Table 2-6; no spawning areas would be impacted. Acclimation operations would have no impact on fish or fish habitat through surface water withdrawals or stranding of fish in de-watered areas; and minimal impacts though predation, competition or seasonally reduced access to rearing habitat. With monitoring and adaptive management, the proportion of natural influence and related genetic status conditions expected to be improved over current conditions.	No new impacts to fish near the Powerline site. Habitat conditions for fish at the six coho acclimation sites would likely continue similar to present conditions as analyzed in the Mid-C Program EIS (and associated SAs). Escapement of wild spring Chinook salmon and steelhead and corresponding utilization of suitable spawning and rearing habitat in the upper portions of these basins would presumably remain low, as would overall fish production for these two stocks.

Resource Affected	Proposed Action	No Action
Wildlife	Minor loss of low-quality habitat and temporary local wildlife disturbance from construction at the Powerline site. No impacts to critical habitat for listed species or identified priority habitats. Low impacts to wildlife from human disturbance associated with acclimation operations. Impacts will be limited by implementation of mitigation measures in Table 2-6,	No new impacts to wildlife near the Powerline site. Habitat conditions for wildlife at the six coho acclimation sites would likely continue similar to present conditions as analyzed in the Mid-C Program EIS (and associated SAs).
Transportation	Low, temporary interference with existing transportation activity from construction at the Powerline site. Low to no impacts on existing traffic or transportation facilities from operation activities at the acclimation sites. Impacts will be limited by implementation of mitigation measures in Table 2-6.	No new impacts to transportation near the new Powerline site. Transportation conditions at the six coho acclimation sites would likely continue similar to present conditions as analyzed in the Mid-C Program EIS (and associated SAs).
Land Use and Recreation	The use of the Powerline acclimation facilities would be compatible with existing land uses and consistent with right-of-way requirements. No expected impacts on other land uses from acclimation operations. Minimal disturbance of recreational traffic along Whitepine road from construction at the Powerline site. Low potential for disturbance effects of acclimation operation activities on nearby recreational uses.	No changes to land use or potential disturbance to recreational traffic near the Powerline site. Land use and recreation patterns at the six coho acclimation sites would likely continue similar to the present as analyzed in the Mid-C Program EIS (and associated SAs).
Visual Resources	Low impacts to visual resources from development of an acclimation facility at the Powerline site or from acclimation operations at any/all of the proposed sites.	No visual changes at the Powerline site and no visual changes to seasonal operations at the six coho acclimation sites.
Air Quality, Noise, and Public Health and Safety	Limited temporary fugitive dust, vehicle/equipment emissions, and noise impacts from construction at the Powerline site. Low impacts on air quality or noise conditions from acclimation operations at any/all of the sites. Low impacts on public safety conditions at any/all of the sites. Impacts will be limited by implementation of mitigation measures in Table 2-6.	No new impacts to air quality; noise; or public health and safety near the new site (Powerline). Air quality, noise, and public health and safety conditions at the six coho acclimation sites would likely continue similar to present conditions as analyzed in the Mid-C Program EIS (and associated SAs).
Cultural Resources	No cultural resources found at Powerline site during site surveys. No additional potential to impact to cultural resources at any of the coho acclimation sites. Potential impacts if inadvertent discoveries are found during construction or operations would be minimized through implementation of mitigation measures in Table 2-6.	No impacts to cultural resources.

Resource Affected	Proposed Action	No Action
Socioeconomics	No construction workers are expected to temporarily relocate for construction at the Powerline site; therefore, no impacts on local population, infrastructure, or community services. Small, temporary economic benefits from purchases for construction expenditures, and from ongoing acclimation operations. No human-health or environmental impacts on nearby communities; to the extent the Proposed Action is successful, it would have positive effects on Native American communities with interests in these basins.	No socioeconomic impact changes.
Climate Change	Low impact on greenhouse gas (GHG) emissions associated with climate change.	Existing conditions relative to GHG emissions near all of the proposed and acclimation sites would likely continue as analyzed in the Mid-C Program EIS (and associated SAs).

2.4 Mitigation Measures

Table 2-6 lists the mitigation measures that would lessen or avoid potential impact of constructing the new Powerline acclimation pond and operating the acclimation program. Appendix B provides additional conditions required for specific elements of the construction process.

Table 2-6 Mitigation Measures

Environmental Resource	Mitigation Measure
Geology and Soils	Install and maintain all temporary erosion controls downslope of applicable project activities until construction actions are complete.
	Segregate topsoil from subsoil and store during excavation for use in site reclamation.
	Grade and cover disturbed areas and areas of excavated soils with at least 2 inches of compost.
	Restore damaged banks to a natural slope pattern and profile that is suitable for establishment of permanent woody vegetation.
	Implement Best Management Practice erosion and sediment control measures during construction.
Water Resources	Follow project-specific Clean Water Act permit protection measures.
	Use sediment barriers such as fences, weed-free straw matting/bales, or fiber wattles, as necessary, in all work areas sloping toward Nason Creek to intercept any surface flow that might transport sediment to the creek.
	Limit or prevent discharge of sediment during pond construction by installing a temporary barrier to prevent backwater from entering the work area.
	Pump any sediment-laden water from the pond construction work area through a filter medium prior to release of water into the new pond.
	Line new water channels for the Powerline site with gravel and rock, installed to withstand peak flows of unnamed tributary.
	Fill the Powerline pond slowly to avoid suspending and mobilizing sediments, such that when flow is returned to the active channel, the sediment plume would not be visible above background turbidity 150 feet downstream of the project.
	Pump sediment-laden waters that accumulate on the construction site onto upland sites, not into new pond, streams, or riparian areas to discharge such water.
	Ensure materials for spill containment and cleanup are available onsite during pre-construction, construction and restoration phases of the project.
	Use only hydraulic fluids certified as non-toxic to aquatic organisms in equipment used to work in the water.
	Locate vehicle staging, cleaning, maintenance, refueling, and fuel storage areas a minimum of 150 feet from waterbodies.
	Apply ‘diapers’ to all stationary power equipment such as generators, cranes, or stationary drilling equipment operated within 150 feet of waterbodies to prevent leaks, unless suitable containment is provided to prevent potential spills from entering the water.
	Implement methods to re-use water during pond operations to maintain minimum instream flows during extreme low-flow periods, including the use of portable pumps to recirculate the pond water.
	Wash heavy equipment before delivery to project site to remove oils, fluids, grease, etc.; inspect and clean equipment regularly.
Inspect machinery daily for fuel or lubricant leaks.	

Environmental Resource	Mitigation Measure
	Perform all non-emergency maintenance of equipment off site.
Vegetation	<p>Develop a detailed revegetation plan for the site to restore native riparian vegetation along shorelines of the creek and pond and prevent establishment of invasive plants.</p> <p>Cover all temporarily disturbed areas with at least 2 inches of compost and replant with native vegetation.</p> <p>Seed disturbed areas with a native erosion control grass seed mix to prevent future erosion, stem the invasion of noxious weeds, and provide wildlife benefit.</p> <p>Install only clean, angular, certified weed-free rock when importing bank stabilization material.</p> <p>Pull noxious weeds by hand or treat with herbicide approved for application in wetlands.</p> <p>Protect plantings from deer, beaver, rodents, etc.</p> <p>Water and weed plantings regularly, with proper maintenance, until they are established. Replace plantings as necessary for a period of at least 3 years to achieve a minimum of 80 percent survival by the end</p>
Fish	<p>Apply protective measures resulting from consultation with USFWS and NMFS and permit actions of other agencies.</p> <p>Coordinate timing and methods of construction with resource agencies to minimize disturbance to ESA-listed species and life stages.</p> <p>Follow established protocols (legal or scientific) for handling ESA-listed species.</p> <p>Follow the USFWS (2010) Best Management Practices to Minimize Adverse Effects to Pacific Lamprey.</p> <p>Isolate the construction area by the placement of cofferdams at the inlet and outlet using gravel-filled bags and plastic sheeting to prevent water and fish from entering the work area.</p> <p>Immediately re-install any in-stream habitat structures that must be moved (large rocks or large woody debris) up or downstream of the disturbance, at a similar depth and location such that it would continue to provide comparable aquatic habitat function in the new location.</p> <p>Use barrier nets for containment purposes at acclimation sites where ESA-listed fish are present to prevent premature escape of hatchery spring Chinook and steelhead and competition with native fish during acclimation period.</p> <p>Use seine nets at acclimation sites to partition off a portion of a waterbody while allowing free upstream and downstream passage of native ESA-listed fish to available habitat.</p> <p>Use fine seine mesh to exclude fry from enclosed areas to minimize predation in areas where emergent spring Chinook or bull trout fry could be present.</p> <p>Install seines in a manner that excludes fry from the acclimation area by moving out from the bank to encapsulate the rearing area</p> <p>Snorkel enclosed areas to verify that no ESA-listed fish are present before hatchery spring Chinook or steelhead are added by snorkeling the enclosed area.</p> <p>Remove seine or barrier nets when spring Chinook salmon and steelhead reach a size that ensures most are ready to migrate (typically when 90 percent show signs of smolt color).</p> <p>Monitor populations of native ESA-listed fish species to establish baseline conditions and continue to monitor to determine if their numbers are decreasing. If they are decreasing, due to competition from acclimated and released spring Chinook and steelhead, assess and adjust program and operations to avoid this impact.</p>
Wildlife	<p>Coordinate timing and methods of construction with resource agencies to minimize disturbance to ESA-listed species and life stages.</p> <p>Apply protective measures resulting from consultation with USFWS, if any.</p>

Environmental Resource	Mitigation Measure
Transportation	Repair damage to roads and trails that may occur through project construction.
Land Use and Recreation	Limit construction activity to normal workday hours or 8:00 Am to 5:00 PM to minimize impacts to nearby landowners and recreationists
Visual Resources	Remove all temporary structures, devices, materials or equipment from the site upon completion of all construction activities, and dispose of all excess spoils and waste materials in compliance with federal, state, and local regulations.
Air, Noise, Public Health, and Safety	Use flaggers and safety signage as necessary to avoid vehicle and other conflicts.
	Use the least noise-generating equipment and methods for operations at facilities where noise might intrude into recreation and residential areas. Comply with environmental noise regulations (Washington Administrative Code Chapter 173- 60 of the Noise Control Act of 1974).
	Apply dust control measures (e.g. watering trucks, low speeds, apply gravel to access roads, etc.) as needed. Minimize dust generation during excavation of the pond and construction of the short access road by watering and using dust suppression equipment. Sequence and schedule work to reduce the amount of bare soil exposed to wind erosion and potential fugitive dust production.
	Dispose of cleared vegetation and other debris in a manner other than burning, to avoid or minimize air quality impacts. Transport all such material to an approved composting or landfill facility, as appropriate.
	Prepare a Spill Prevention, Containment and Control Plan prior to construction start-- include measures to reduce/recycle hazardous and non-hazardous wastes, notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures, proposed methods of disposal of spilled materials, and employee training on spill containment.
	Develop and follow the protocol for dealing with hazardous substances inadvertently discovered during project activities. Conduct all project-related activities in compliance with regulations and guidelines for use, handling, storage, and disposal of toxic and hazardous substances.
	Dispose of non-hazardous wastes in approved landfills.
	Dispose of hazardous wastes according to applicable federal and state laws.
Cultural Resources	Conduct all project-related activities in compliance with regulations and guidelines for use, handling, storage, and disposal of toxic and hazardous substances.
	Mark known cultural resource sites as avoidance areas on construction drawings and flag as no-work areas in the field prior to construction. Protect any unanticipated cultural resources discovered during construction as follows: <ul style="list-style-type: none"> • Stop all work; cover and protect find in place. • Notify Project Manager and agency cultural resources specialist immediately. • Implement mitigation or other measures as instructed by agency cultural resource specialist.
Climate Change	Maintain motorized equipment used for construction and operation to minimize emissions.
	Regularly inspect, maintain, and replace (if defective) mufflers and other emission control devices on all construction equipment.

This page left blank intentionally

Chapter 3. Affected Environment and Environmental Consequences

This chapter includes an analysis of the potential impacts of the Proposed Action and the No Action Alternative on human and natural resources. Each section of the chapter includes a description of the potentially affected environment for a specific resource and an analysis of the impacts on that resource. Mitigation measures that would help reduce impacts are presented in Chapter 2, Table 2-6. Cumulative impacts are considered in Section 3.15.

Based on the analysis in this EA, impacts on specific resources were characterized as high, moderate, low, or no impact. In addition, beneficial impacts are noted where applicable.

Where applicable, potential impacts are presented for construction and operation of the Powerline acclimation pond; the use of the six coho acclimation ponds to also acclimate spring Chinook and steelhead; and the expected return of adult spring Chinook and steelhead to spawning habitats near the acclimation sites. As noted in Chapters 1 and 2, construction and operation of the coho acclimation ponds were or are being analyzed as part of the Mid-C Coho Program. These analyses are incorporated by reference into this EA as allowed under NEPA at 40 CFR 1502.21.

3.1 Geology and Soils

3.1.1 Affected Environment

The acclimation sites occur along or adjacent to valley bottom streams and tributaries. These valleys have been carved into the surrounding geology through erosion by running water, wind, and ice. Bedrock may be exposed in places, but is generally buried by surface deposits. Surface deposits consist of soils, recent or ancient alluvium, glacial deposits (drift or till), landslide deposits, colluvium, or a combination of these. Alluvium and colluvium are unconsolidated sediments transported and deposited by running water or gravity, respectively.

Soils in the vicinity of the proposed acclimation sites are described in the Natural Resource Conservation Service (NRCS) soils maps for the Okanogan County Area (WA649), Okanogan National Forest Area (WA749), and Cashmere Area (WA608); these maps are available online through the NRCS Web Soil Survey (NRCS 2015). Table 3-1 provides summary information about key soil conditions for each site.

Table 3-1 Summary of Soil Conditions

Site	Setting	Prime Farmland	Erosion Hazard
Goat Wall	Mountain slopes	No	Severe
Early Winters	Floodplains and alluvial terrace	No	Slight
Chewuch AF	Glacial outwash terrace	No	Severe
Gold Creek	Glacial outwash terrace	No	Moderate
Rohlfing	Mountain slopes	No	Moderate
Trinity	Floodplains/ Alluvium	No	Slight
Powerline	Alluvium	No	Slight

Source: NRCS 2015

More detailed soil information was investigated for the Powerline site, as it is the only proposed acclimation site where new construction and associated ground disturbance would occur. According to the soil survey for the Cashmere Area, soils at the Powerline site are mapped as nearly level (flat) aeric fluvaquents. These soils can be associated with floodplains consisting of deep, somewhat poorly drained soils and are a mix of alluvium and volcanic ash. Erosion hazard for unsurfaced roads is characterized as slight, indicating that little or no erosion is likely if the soils are disturbed.

3.1.2 Environmental Consequences for Geology and Soils – Proposed Action

During construction of the acclimation pond at the Powerline site, vegetation would be cleared and the underlying soils would be excavated and contoured to create the new pond. In addition, a 70-foot-long and 10-foot-wide strip would be graded and graveled to create an access road to link the new pond to the existing Whitepine Road. There are no steep or potentially unstable slopes within or adjacent to the proposed construction footprint, and the construction activity would not disturb the underlying geology or increase risks associated with existing landslide or other geologic hazard areas. Construction of the pond and road would permanently disturb about 12,500 square feet of ground (0.3 acre), and about 1,647 cubic yards of soil would be disturbed. Construction best management practices would be used to control soil movement (erosion) off-site. The temporarily disturbed areas would be restored and revegetated following construction to reduce erosion and runoff. All excavated soil would be used to create the berm on the downslope side of the pond so there would be no excess soil needing off-site disposal. All vegetation needing removal would be disposed of in compliance with federal, state, and local regulations.

Acclimation operations at the Powerline site, which would take place between March and May each year, would involve minimal vehicle traffic on the existing Whitepine Road and the new on-site access road, along with low-intensity pedestrian activity around the pond. Erosion potential from motor vehicle use and foot traffic is thus minimal.

The use of the coho acclimation ponds for spring Chinook and steelhead would not require any construction actions or soil disturbances and would not substantially increase the scope, intensity or duration of operational activities at these sites such that soils or geology would be impacted.

Because impacts to geology and soil resources in the affected area would be temporary and mitigated, impacts of the Proposed Action on geology and soil resources would be low.

3.1.3 Environmental Consequences for Geology and Soils – No Action

Under the No Action Alternative, the Powerline acclimation pond would not be constructed and the coho acclimation sites would not be used for acclimation of spring Chinook and steelhead. Therefore, there would be no new impacts to geologic or soil resources near the Powerline site under the No Action Alternative. Geologic and soil conditions at the coho acclimation sites would likely continue generally as at present.

3.2 Water Resources

3.2.1 Affected Environment

The proposed acclimation sites are situated within the Methow and Wenatchee River basins of Washington State. The Methow basin is within Okanogan County in north central Washington. It consists of five sub-watersheds (the Methow, Twisp, Chewuch and Lost Rivers and Early Winters Creek), which drain a combined total of approximately 1,825 square miles (NPCC 2004a). The Wenatchee basin is located within Chelan County in north central Washington. It consists of five sub-watersheds (the Chiwawa, White, Little Wenatchee, and Wenatchee rivers, and Nason Creek), which drain a combined total of approximately 1,300 square miles (NPCC 2004b).

3.2.1.1 Water Quality

Washington has developed water quality standards as the basis for protecting and regulating the quality of the state's surface waters, including standards that identify designated and potential uses of water bodies, such as aquatic life, swimming, fishing, and domestic and agricultural water supplies, and set water quality criteria to protect those uses (WDOE 2015). Designated uses and select criteria of waters in the vicinity of program sites are provided in Table 3-2.

Table 3-2 Designated uses and select criteria of waters in vicinity of acclimation sites

Site	Waterbody	Designated Uses	Select Criteria
Goat Wall	Methow River and Unnamed Tributary	Core Summer Habitat; Extraordinary Primary Contact; Domestic Water	Temp: 16°C (60.8°F) DO: 9.5 mg/L pH: 6.5 to 8.5 ^{1/}
Early Winters	Early Winters Creek	Char Spawning/Rearing; Extraordinary Primary Contact; Domestic Water	Temp: 12°C (53.6°F) DO: 9.5 mg/L pH: 6.5 to 8.5 ^{1/}
Chewuch AF	Chewuch River	Core Summer Habitat; Extraordinary Primary Contact; Domestic Water	Temp: 16°C (60.8°F) DO: 9.5 mg/L pH: 6.5 to 8.5 ^{1/}
Gold Creek	Gold Creek	Char Spawning/Rearing; Primary Contact; Domestic Water	Temp: 12°C (53.6°F) DO: 9.5 mg/L pH: 6.5 to 8.5 ^{1/}
Powerline and Rohlfing	Nason Creek	Char Spawning/Rearing; Extraordinary Primary Contact; Domestic Water	Temp: 12°C (53.6°F) DO: 9.5 mg/L pH: 6.5 to 8.5 ^{1/}
Trinity	Chiwawa River and Phelps Creek	Char Spawning/Rearing; Extraordinary Primary Contact; Domestic Water	Temp: 12°C (53.6°F) DO: 9.5 mg/L pH: 6.5 to 8.5 ^{1/}

^{1/} pH shall be within the range of 6.5 to 8.5, with a human-caused variation within the above range of less than 0.2 units.
DO = dissolved oxygen; mg/L = milligram per liter

Under the federal Clean Water Act, states are required to identify and clean up polluted waters. Washington's approved Water Quality Assessment divides the state's waters into five categories:

- Category 1 waters meet tested clean water standards (though untested contaminants could be present);

- Category 2 waters include waters where there is some evidence of a water quality problem, but not enough to warrant further protection and continued testing recommended;
- Category 3 waters have not been tested enough for ranking;
- Category 4 waters include impaired waters; however, no Total Maximum Daily Load (TMDL) is required (a TMDL or pollution control program may already be in place (4a or 4b) or impairment is a non-pollutant (4c), such as low stream flow). TMDLs limit the amount of a pollutant that a waterbody can receive; any amount over the TMDL needs to be reduced or eliminated; and
- Category 5 waters, also known as 303(d) listed waters, are known to be polluted and require a TMDL or other improvement program.

There are no Category 5 or 303(d)-listed stream segments within 0.5 mile of any of the seven sites proposed for spring Chinook and steelhead acclimation (WDOE 2012a), though there are two streams listed under Category 4c. Early Winters Creek has been listed for insufficient stream flows, due primarily to its natural geology but also exacerbated by irrigation withdrawals just upstream of the Early Winters site (BOR 2011, Hanron 2000). Nason Creek is also listed under Category 4C, but for temperature concerns. Elevated instream temperatures in upper Nason Creek are driven by the loss of shade-providing riparian vegetation and degraded riparian conditions caused by stream channeling and riprap associated with past highway and railway construction (Andonaegui 2001).

Methow Basin

Portions of the Methow River basin are 303(d) listed for water temperature and toxins in fish tissue, as well as impaired for instream flow. There is also concern for pH and dissolved oxygen conditions (Mugunthan 2015a). However, none of these impairments affect waterbodies adjacent to or within a few miles downstream of program sites. There are no TMDL allocations to address 303(d) impairments. The Methow watershed is phosphorus-limited (i.e., algal growth is limited by phosphorus; BPA 2012); hence, the primary water quality parameter of interest from acclimation activity is the total phosphorus loading to the receiving waterbody (Mugunthan 2015a).

Wenatchee Basin

In the Wenatchee watershed, the lower section of the Wenatchee River below the city of Leavenworth and portions of some tributaries are identified as Category 5 or 303(d)-listed water bodies for dissolved oxygen, acidity/alkalinity (pH), and temperature. In other words, at times, especially during the low-flow summer and fall period, these waters have too little dissolved oxygen, have high pH levels, and are too warm for designated uses including aquatic life. However, in the vicinity of the Powerline and Rolfing sites, Nason Creek is listed under category 4(c) for temperature impairment. The impairments typically occur during periods of seasonally low streamflow. Most water quality violations for dissolved oxygen and pH occur in August and September, although impairments also occur during the pre-runoff period in the spring (Carroll and Anderson 2009).

To improve water quality in the lower Wenatchee River as required by the Clean Water Act, the Washington Department of Ecology (WDOE) developed a TMDL for dissolved oxygen and pH. This TMDL applies to the entire watershed, including Nason Creek. Phosphorus is the limiting nutrient in

the lower Wenatchee, and phosphorus affects dissolved oxygen and pH levels. Upstream sources of phosphorus could include mineral weathering, biological deposition, natural runoff loading, on-site septic systems, fish-rearing facilities, and other land and water uses. WDOE determined that upstream phosphorus loading should be reduced from 1.24 kilograms/day (about 2.5 percent of the total phosphorus load in the lower Wenatchee River) to 0.93 kilogram/day (Carroll and Anderson 2009).

3.2.1.2 Water Quantity

Available water quantity (flow) data applicable to the seven acclimation sites are summarized in Table 3-3. In some cases the flows indicated are averages for the March-May period when acclimation would typically occur, while flows reported for other locations represent annual or instantaneous volumes. Peak flows on Nason Creek near the Powerline and Rohlfing sites commonly reach approximately 1,700 cfs. The Methow River, Early Winters Creek and the Chewuch River also see relatively large flow volumes. At the low end of the range, flows in the unnamed creeks at the Powerline and Rohlfing sites are approximately 2 cfs or less.

Table 3-3 Stream flows at proposed acclimation sites

Site	Waterbody	Flow (cfs)	Recording Period
Goat Wall	Methow River	900	March through May (1990-2010)
	Gate Creek	Not recorded	
Early Winters	Early Winters Creek	961	March through May (2004-2012)
Chewuch AF	Chewuch River	700 ^{1/}	March through May (1990-2010)
Gold Creek	South Fork Gold Creek	4.1–57 ^{2/}	instantaneous flow (2001, 2002)
Rohlfing	Unnamed seasonal creek	2	Not recorded annually
Trinity	Phelps Creek	54	Not recorded annually
Powerline	Unnamed creek	1.6	Not recorded
	Nason Creek	1,400–1,700 ^{3/}	Annually

^{1/} The long-term (1991 through 2010) average flow for March through May reported at the USGS Gage in Winthrop is about 700 cfs, which is lower than but comparable to the upper Methow River flows (BPA 2012).
^{2/} Konrad et al. (2005) does not provide drainage area or mean annual flow for Gold Creek, however, the report provides several instantaneous flow measurements taken during 2001 and 2002 that ranged between 4.1 cfs and 57 cfs.
^{3/} Bankfull flows (1.5 to 2 year recurrence) range between 1,400 and 1,700 cfs, while 100 year flow events are estimated to be around 6,700 cfs (USFS TEAMS and Inter-Fluve 2013)
Sources: BPA 2012, (Konrad et al. 2005, Mugunthan 2015a, Montgomery Water Group 2003, USFS TEAMS and Inter-Fluve 2013

3.2.2 Environmental Consequences for Water Resources – Proposed Action

The water quality issues to be considered include the potential for construction activity at the Powerline site to adversely affect water quality in nearby waters, and the potential for fish acclimation activities at all seven sites to contribute pollutants to nearby waters. With respect to water quantity, the applicable concern is the potential for operation of the acclimation facilities to result in changes in flow conditions that would adversely affect nearby waters or water users.

3.2.2.1 Water Quality

Construction

Construction of the acclimation pond and access road at the Powerline site could increase the potential for sediment to reach the adjacent unnamed creek through rain runoff from temporarily

disturbed and exposed soils. Also, construction of the pond's inlet from the creek could temporarily disturb soils and introduce sediment into the stream as the first connection is made with flowing water in order to fill the pond. Best management practices would be used to limit effects of these activities and control the potential for sedimentation to reach the stream and Nason Creek. The disturbed areas would be restoratively contoured and revegetated at the end of the construction process.

Construction activity also could potentially affect water quality in other ways, such as spills or leakage of petroleum products and other pollutants from construction equipment operating near the stream. The potential for such discharges would be minimized by following standard spill prevention, control and containment measures. These include proper equipment maintenance, use of barriers and absorbents, and conducting refueling activity away from water bodies.

Operations

BPA evaluated water quality impacts from operation of acclimation facilities in the Mid-C Coho Program EIS (see Sections 3.5.2 and 3.5.3 in the FEIS [BPA 2012] and Appendices 6 and 7 in the DEIS [BPA 2011]). Water discharged from acclimation ponds contains various forms of nutrients, primarily including phosphorus that is introduced in the feed provided to the acclimating fish. These discharges have the potential to stimulate algal growth and lead to larger daily fluctuations in dissolved oxygen and pH in the receiving waters and, consequently, could exacerbate existing water quality concerns. To minimize phosphorus levels in the pond discharge, the Yakama Nation would use fish foods that are low in phosphorus content or have highly-digestible phosphorus content.

In support of the Upper Columbia Spring Chinook and Steelhead Acclimation Program, the Yakama Nation conducted water quality evaluations for the Powerline and Trinity sites in the Wenatchee basin and the Early Winters site in the Methow basin. Those evaluations, which are summarized by site below, provide results that can also be applied to operations at the remaining acclimation sites.

Powerline: Mugunthan (2015a) evaluated water quality impacts for acclimating steelhead at the Powerline acclimation site relative to the background conditions prevalent downstream in nearby Nason Creek. The total phosphorus loads from the proposed acclimation of 75,000 steelhead at the Powerline site was estimated to be 60 grams per day (g/d), which represents approximately 1 percent of the background loads carried by Nason Creek. Previous studies indicated that coho acclimation activity at the Rohlfing site introduced total phosphorus to the system at comparable levels that did not produce any water quality violations (BPA 2012; Mugunthan 2015a). While the active Nason Creek sites in the Mid-C Coho Program would be used as primary coho acclimation sites when steelhead acclimation would begin at the Powerline site, the combined loading would still be a small proportion (less than 5 percent) of the background loads in Nason Creek.

Based on past measurements, dissolved oxygen levels in Nason Creek during this period were typically above 12 mg/L (BPA 2012), well above the most stringent DO standard of 9.5 mg/L (Mugunthan 2015a). Similarly, pH levels during this period were typically between 6.5 and 8.5, with minimal changes downstream of active pond discharges (BPA 2012, Mugunthan 2015a). Thus, even if there was an incremental increase in algal growth as a result of the increase in total phosphorus loading from the acclimation facility, that algal growth would have little effect on minimum dissolved oxygen levels or pH ranges. Based on these findings, water quality impacts on Nason

Creek and the Wenatchee River resulting from the proposed steelhead acclimation at the Powerline site would be low (Mugunthan 2015a).

Trinity: Mugunthan (2015b) also evaluated local impacts in the Chiwawa River relative to the background conditions prevalent in the stream. The total phosphorus loads from the proposed acclimation of 50,000 spring Chinook at the Trinity site was estimated to be 17 g/d, which is much less than 1 percent of the background loads carried by the Chiwawa River at its mouth. Considering that the Chiwawa River is largely forested with little or no anthropogenic influences, there are no major tributaries draining into the Chiwawa, and much of its spring flow (i.e., over the acclimation period) is derived from either snowmelt or precipitation, the total phosphorus concentrations measured near its mouth during the Mid-C Coho Program analysis were considered representative of the conditions farther upstream. Even under a scenario where the background loads near the Trinity site are roughly half of the loading near the mouth, the relative contribution from the Trinity site would still be significantly lower than 1 percent of the total load. Thus, it is unlikely that total phosphorus loading from the proposed activity would lead to sufficiently large algal blooms to produce a measurable impact on dissolved oxygen and pH levels. Therefore, the local impacts on Chiwawa River water quality would be low.

Early Winters: Mugunthan (2015c) assessed water quality impacts based on the propensity of the nutrient loads to produce a measurable change in dissolved oxygen and pH in the Methow River basin beyond the immediate vicinity of the discharge. Washington State regulations define measurable change in dissolved oxygen and pH as a decrease of 0.2 milligram per liter (mg/L) or more and a change of 0.1 units or greater, respectively.

Water quality impacts were evaluated for acclimating spring Chinook at the Early Winters site. The evaluations indicated that impacts in the upper Methow River in the vicinity of the discharge would be negligible because those inputs would be so small relative to the background total phosphorus loads carried by the river during the acclimation period (March through May). For an average flow of 961 cfs during the acclimation period (calculated from 2004 through 2012), the increase in phosphorus loads over background levels translated to an increase in total phosphorus concentration of 0.007 micrograms per liter, which is smaller than the precision limits of typical analytical methods used for measuring phosphorus concentrations in surface water samples. Hence, corresponding changes in dissolved oxygen and pH resulting from any algal growth stimulated by increased total phosphorus loading would likely be much less than the limits of measurable change. Therefore, local water quality impacts of the Early Winters acclimation site operation on the upper Methow River would be low (Mugunthan 2015a).

Goat Wall, Gold Creek, and Rohlfing: A detailed analysis for the effects of these and other acclimation sites on total phosphorous, dissolved oxygen (DO) and pH in the Wenatchee and Methow rivers was conducted for the Mid-C Coho Program. The conclusion there was that TP loads from the operation of all project sites (which includes these three facilities) “are not expected to produce a measurable change in DO and pH” in the Wenatchee or Methow basins, and that water quality concerns in those rivers would not be exacerbated (BPA 2012). The effects of the spring Chinook and steelhead acclimation program are expected to be the same for these sites since there is no additional fish being added here. These sites will be acclimating either coho or Chinook and steelhead, but not both (see Table 2-2), thus the water quality effects are expected to be within the range of those analyzed in the Mid-C Coho Program EIS.

Chewuch AF: The water quality effects of acclimation facilities on the Chewuch River were assessed in the Mid-C Coho Program EIS; Chewuch AF was then considered a backup facility, which replaced two ponds (Mason and Pete Creek) that were originally proposed. Total numbers of fish (212,500) between Mason and Pete Creek ponds that were analyzed for water quality impact in the Mid-C Coho Program EIS exceeded the total numbers of fish now proposed for the Chewuch AF (211,000, see Table 2-2). The water quality effects of using Chewuch AF for spring Chinook acclimation are thus expected to fall well within those calculated for the coho program EIS, which were determined to produce “no measurable change in DO and pH” in the Methow river.

An additional potential impact to water quality would be the carcasses of returning spring chinook and steelhead following spawning. Carcasses of adult spring Chinook and steelhead returning to waters near the acclimation sites would decompose and could thereby increase the nutrient content of the waters in which they spawn. A study assessing the effects of salmon carcass addition on streams determined that phosphorous concentrations did not significantly change (Cleason et al, 2006). Carcass nutrient cycling is a natural part of the salmon and steelhead life cycle, and provides inputs of carbon that are necessary for maintaining aquatic and terrestrial life forms associated with the streams. Reintroducing Chinook and steelhead in the upper parts of these basins could help restore the ecological balance of the system; carcasses from spawned fish could add ocean-derived nutrients to the system at a critical period, i.e., the onset of winter. Carcasses could provide an important winter food resource for aquatic organisms and wildlife (BPA 2012, Section 3.7.3). Therefore, BPA previously determined this nutrient cycling activity is not considered to be an adverse effect on water quality (BPA 2012, Section 3.5.2).

Because any impacts to water quality from construction of the Powerline acclimation pond and access road would be mitigated and impacts from operations at the seven acclimation ponds would be low, impacts of the Proposed Action on water quality would be low.

3.2.2.2 Water Quantity

Operation of acclimation facilities requires an ongoing supply of water—through diversions from nearby surface water sources and/or by groundwater withdrawals—during the acclimation period. Water sources and flow rates for each acclimation pond are provided in Table 3-4.

Table 3-4 Acclimation site water sources and quantities

Site	Water Source	Estimated Flow to Pond
Goat Wall	Surface: Gate Creek Groundwater: Cold Creek (groundwater seep)	1.11 cfs
Early Winters	Surface: Diversion from Early Winters Creek Groundwater: Two new wells in alluvial aquifer	4.0 cfs from creek 4.0 cfs from well (proven)
Chewuch AF	Surface: Irrigation diversion from Chewuch River	6.0 cfs maximum
Gold Creek	Surface: South Fork Gold Creek	2.0 cfs
Rohlfing	Surface: flow-through from unnamed seasonal creek Groundwater: Alluvial aquifer	2.0 cfs 0.3 cfs
Trinity	Surface: Diversion from hydroelectric facility tailrace and upstream bypass; Groundwater: Alluvial aquifer (backup)	3.5 cfs maximum 1.25 cfs (well not yet tested)
Powerline	Surface: Flow-through from spring-fed creek	1.6 cfs

The Powerline operation would require about 1.6 cfs of flow into the pond. The water would come from an unnamed, spring-fed creek. The proposed use is basically a flow-through diversion, or reroute, of the creek through the constructed pond, and there would be no consumptive water use (i.e., 100 percent of the flow would return to the creek; see Figure 3). There would be no change to water quantity in Nason Creek except for the initial period when the pond is filled, during which there would be a minor decrease. As indicated in Table 3-4, the flow in the unnamed creek is less than 0.1 percent of the typical peak flow of Nason Creek.

No increases in flow requirements for acclimation use at the coho sites would be required to accommodate spring Chinook and steelhead acclimation. Thus, there would be no new water quantity effect as a result of the project and the water quantity impacts would be as described in the Mid-C Coho Program EIS and related Supplement Analyses.

Based on the limited water quantities needed for the acclimation operations, as shown in Table 3-4, and because of the seasonal timing of this use relative to existing water uses, the impacts of acclimation operations on water quantity and current water uses would be low.

3.2.3 Environmental Consequences for Water Resources – No Action

Under the No Action Alternative, the Powerline acclimation pond would not be constructed and the coho acclimation sites would not be used for acclimation of spring Chinook and steelhead. Therefore, there would be no new impacts to water quality or quantity near the Powerline site under the No Action Alternative. Water resource conditions at the coho acclimation sites would continue generally as at present, including the impacts from the coho acclimation under the Mid-C Coho Program.

3.3 Vegetation

3.3.1 Affected Environment

Vegetation community types within the Methow and Wenatchee basins vary considerably, depending on the community's elevation and distance from the Cascade crest. Vegetation communities within these basins includes coniferous forests, lodgepole and ponderosa pine woodlands, upland aspen forest, grasslands, shrub-steppe, herbaceous and coniferous wetlands, riparian vegetation, agriculture crops and orchards, and urban landscape vegetation.

At the Powerline site, surrounding vegetation consists primarily of forested and shrub habitat dominated by grand fir, vine maple, and Sitka alder. The proposed location of the pond itself is within the existing Chief Joseph-Snohomish Nos. 3 and 4 transmission line rights-of-way, so the vegetation is managed for low-growing species, and native trees are kept short in order to provide safety clearances for the transmission lines. In spring 2015, tree cover at the pond location consisted of seedling-sized deciduous trees less than five feet tall and downed sapling-sized deciduous trees remaining from the previous vegetation maintenance activity along the right-of-way.

The six coho acclimation sites are, or are proposed to be, located on properties that have been developed for residential or recreational use. These ponds have surrounding vegetation consistent with the areas in which they are located as described generally in the Mid-C Coho Program EIS (BPA

2012) and Supplement Analyses (in draft). Sections 3.7, 3.9, and 3.10 of this EA also include descriptions of land cover and vegetation at the acclimation sites.

Although numerous special-status plant species identified for protection under the federal ESA (16 U.S.C. § 1531 *et seq.*) or through the state Washington Natural Heritage Program (WHNP) are known to occur in Chelan and Okanogan counties, no special-status plant species or suitable habitat were observed during surveys of the Powerline site (Grette Associates 2014a). In addition, no ESA-listed or state-listed special-status plants are present at the Goat Wall, Chewuch AF, Gold Creek, Early Winters, and Rohlfing acclimation sites, as documented in the Mid-C Coho Program EIS (BPA 2012; and Corey Kamphaus, YN, personal comm.) or at Trinity (Grette and Assoc 2014), and Early Winters (Grette and Assoc. 2016).

Noxious weeds are invasive, non-native plant species that threaten agricultural crops, local ecosystems, or fish and wildlife habitat (WSNWCB 2015). The Washington Administrative Code (WAC Chapter 16-750) identifies 160 plant species that are designated as noxious weeds. Past disturbance from right-of-way clearing and open public use of White Pine road makes noxious weeds a potential at the Powerline site, but none were found during field surveys of the site. There are no noxious weed issues at the six coho acclimation sites as documented in the Mid-C Coho Program EA and associated SAs.

3.3.2 Environmental Consequences for Vegetation – Proposed Action

Potential impacts to vegetation communities, special-status plant species, and of possible introduction and spread of noxious weeds from the Proposed Action are discussed below.

During the construction of the Powerline acclimation facility's pond and access road, about 0.28 acres of vegetation (11,830 square feet of upland and 830 square feet of riparian) would be cleared and the underlying soils would be disturbed for construction of the access road and pond. Clearing and grading would involve removal of the managed, early seral-stage, shrub-dominated vegetation community within the transmission line right-of-way. No mature trees would be removed. Within this 0.28 acre of temporary construction impact, approximately 6,600 square feet of ground (.15 acre) would be permanently converted to non-vegetated road surface and pond.

Pond construction would also temporarily impact some riparian vegetation along the banks of the unnamed tributary that runs through the site. All temporarily disturbed areas would be replanted with native vegetation following construction (see Table 2-6, Mitigation measures).

Construction of the pond and access road at the Powerline site has the potential to introduce and spread noxious weeds through ground disturbance and movement of construction equipment and personnel. Areas disturbed by construction would be seeded with a native grass seed mix to help reduce introduction and spread of noxious weeds resulting from construction activities at the Powerline site.

Because the Powerline site does not contain suitable habitat for any of the special-status plant species with the potential to occur in the area (Grette Associates 2014), there would be no impact to special-status plant species or their habitat there.

Operational activities—including transporting fish in vehicles along access roads, transferring fish from vehicles into acclimation ponds, daily feeding of fish, predator control, and fish release

monitoring—could result in trampling of vegetation adjacent to the ponds and access roads. Because proposed operation and maintenance activities would be confined to the immediate areas of the acclimation ponds and would involve a very limited level of human and vehicle circulation, they have low potential to introduce and spread noxious weeds.

Since there are no special-status plant species or habitat present at any pond sites, special-status plant-species would not be impacted through operation and maintenance activities.

Overall, impacts to vegetation resources due to the Proposed Action would be low because the permanent loss of vegetation communities from construction at the Powerline site would be limited to approximately 0.15 acre and all other disturbed areas would be replanted. Mitigation measures to reduce impacts to vegetation include revegetating all disturbed areas and treatment of noxious weeds during the 3-year establishment period.

3.3.3 Environmental Consequences for Vegetation – No Action

Under the No Action Alternative, the Powerline acclimation pond would not be constructed and the coho acclimation sites would not be used for acclimation of spring Chinook and steelhead. Therefore, there would be no new impacts on vegetation communities or noxious weeds within the Powerline site under the No Action Alternative. Vegetation resource conditions at the remaining coho acclimation sites would likely continue generally as at present.

3.4 Wetlands and Floodplains

3.4.1 Affected Environment

3.4.1.1 Wetlands

No wetlands are present at the Powerline site based on wetland surveys conducted May 2013 (Grette Associates 2014a). Wetland surveys conducted within the Trinity and Early Winters sites in 2015 revealed no wetlands within the construction or operational areas of those facilities.

The Mid-C Coho Program EIS (at Section 3.9) addressed existing conditions and impacts to wetlands at coho acclimation sites requiring construction activity in that proposed action. These included the Chewuch AF and Gold Creek sites, but no wetlands were observed within the construction or operational areas at either of those sites. No additional construction was required at the pre-existing Goat Wall or Rohlfling sites for the Mid-C Coho Program so wetland surveys to support the Mid-C Coho Program were not conducted for that analysis.

The Rohlfling site, a constructed pond on private property, was analyzed in 2002 (then known as the Mahar Creek Pond) for expansion (BPA 2002). No wetlands were identified in that analysis.

3.4.1.2 Floodplains

Executive Order 11988, Floodplain Management, requires federal agencies to evaluate and avoid, to the extent possible, potential long and short-term adverse impacts of their actions in 100-year flood hazard zones as shown on Federal Emergency Management Agency (FEMA) flood insurance rate maps. Special flood hazard areas, designated as Zone A on FEMA's Flood Insurance Rate Maps (FIRM), include the areas with a 1 percent or greater chance of flooding during a given year (i.e., the 100-year floodplain).

A floodplain assessment of the Powerline site did not determine flood elevations for the unnamed tributary within the site, but did determine that the site lies well above the Nason Creek floodplain boundaries (Yakama Nation 2014).

Table 3-5 displays the flood designation for each acclimation site. Only three of the seven acclimation sites—Chewuch, Goat Wall, and Early Winters—are mapped as within the 100-year flood hazard zone. Two of the sites, Gold Creek and Rohlfing, lie outside the mapped flood hazard zone. FEMA has not produced FIRM maps for two of the sites, Powerline and Trinity. The Trinity site, however, likely lies in the Phelps Creek floodplain (Yakama Nation Fisheries 2015).

Table 3-5 Floodplain Designations for Proposed Acclimation Sites

Site Name	Stream	Location (PLS)	FEMA Flood Designation
Methow Basin			
Chewuch AF	Chewuch River	T35N, R21E, Sec. 2, NW 1/4	100-year flood hazard zone ^{1/}
Goat Wall	Methow River	T36N, R19E, Sec. 9, SE 1/4	100-year flood hazard zone ^{1/}
Gold Creek	SF Gold Creek	T31N, R22E, Sec. 20, NW 1/4	Not in identified flood hazard zone ^{1/}
Early Winters	Early Winters Creek	T36N, R19E, Sec. 27, NE 1/4	Zone AO and Zone B ^{2/}
Wenatchee Basin			
Rohlfing	Nason Creek	T26N, R16E, Sec. 5, NE 1/4	Not in identified flood hazard zone ^{1/}
Trinity	Chiwawa River	T30N, R16E, Sec. 28, NE 1/4	Not mapped ^{4/}
Powerline	Nason Creek	T26N, R16E, Sec. 5, NE 1/4	Not mapped ^{3/}
^{1/} Flood designation obtained from the <i>Mid-Columbia Coho Restoration Project Flood Impact Analysis</i> (Anchor QEA, LLC 2010) ^{2/} Flood designation from FEMA FIRM maps (FEMA 1999). Zone designations: Zone AO - Areas of 100-year shallow flooding where depths are between 1 and 3 feet Zone B - Areas between the limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than 1 foot or where the contributing Drainage area is less than 1 square mile; or areas protected by levees from the base flood. ^{3/} Flood designation obtained from the <i>Powerline Acclimation Site Project Description</i> (Yakama Nation Fisheries 2013) ^{4/} Flood designation obtained from the <i>Trinity Acclimation Site Project Description</i> (Yakama Nation Fisheries 2015)			

3.4.2 Environmental Consequences for Wetlands and Floodplains – Proposed Action

Impacts to wetlands and floodplains from the Proposed Action are discussed below.

3.4.2.1 Wetlands

No wetlands were observed within the Powerline site; therefore, no impacts to wetland resources would occur due to construction or operation of the acclimation pond and access road at this site.

Since, under the Proposed Action, no construction activities would be required at the coho acclimation sites, there would be no potential construction impacts to wetlands at those sites.

Operation activities for the Proposed Action would include transporting fish to each acclimation site using existing roads, transferring fish from vehicles into acclimation ponds, daily feeding of fish, predator control, and fish release monitoring. Operation and maintenance activities would not result in impacts to wetlands at any of the acclimation sites.

Thus, the Proposed Action would have no impacts to wetlands.

3.4.2.2 Floodplains

The proposed Powerline pond and access road lay well above the Nason Creek floodplain (Yakama Nation 2014). The channels designed to divert water from the unnamed tributary into and out of the pond will have a larger hydraulic capacity than the existing tributary channel and, therefore, will pass water without increasing flood flow elevations upstream of the pond (Yakama Nation 2014). Therefore, properties upstream and downstream of the proposed pond would not experience differences in water flow or elevations due to the Powerline pond.

Since, under the Proposed Action, no construction would occur, there would be no impacts to floodplains. Operation activities—transporting fish, transferring fish from vehicles into acclimation ponds, daily feeding of fish, predator control, and fish release monitoring—would not result in impacts to floodplains.

Because the Powerline site lies above the floodplain and operational activities would not affect the floodplain, there would be no impacts of the Proposed Action on floodplains.

3.4.3 Environmental Consequences for Wetlands and Floodplains – No Action

Under the No Action Alternative, the Powerline acclimation pond would not be constructed and the coho acclimation sites would not be used for acclimation of spring Chinook and steelhead; there would be no impacts on wetlands or floodplains.

3.5 Fish

3.5.1 Affected Environment

Important fish resources are common to both the Methow and Wenatchee River systems in which the proposed Powerline pond and six coho acclimation sites would be located. These resources include a variety of resident and anadromous fish species, some of which are listed under the federal ESA. ESA-listed species and their designated critical habitat present in both the Methow and Wenatchee basins are identified in Table 3-6. The specific fish designations under the ESA include the Upper Columbia River spring-run Chinook salmon Evolutionarily Significant Unit (ESU), Upper Columbia River steelhead Distinct Population Segment (DPS) and bull trout DPS. Critical habitat for these three ESU/DPS is present in both basins.

Table 3-6 Fish Species with Special Federal or State Status within the Methow and Wenatchee Basins

Species	Federal Status	State Status	Wenatchee Basin	Methow Basin
Upper Columbia River Spring Chinook Salmon	Endangered	PHS Criterion 1, 2 and 3 Candidate	Yes/Critical Habitat ^{1/}	Yes /Critical Habitat ^{1/}
Upper Columbia River Steelhead	Threatened	PHS Criterion 1 and 3 Candidate	Yes/Critical Habitat ^{1/}	Yes/Critical Habitat ^{1/}
Coho Salmon	None	PHS Criterion 2 and 3	Yes	Yes
Sockeye Salmon	None ^{1/}	PHS Criterion 1 ^{2/} , 2 and 3 Candidate	Yes	Yes
Westslope Cutthroat Trout	None	PHS Criterion 3	Yes	Yes

Species	Federal Status	State Status	Wenatchee Basin	Methow Basin
Rainbow/Redband Trout	None	PHS Criterion 3	Yes	Yes
Bull Trout	Threatened	PHS 1, 2 and 3 Candidate	Yes/Critical Habitat ^{1/}	Yes/Critical Habitat ^{1/}
Pacific Lamprey	Species of Concern	PHS Criterion 3	Yes	
Umatilla Dace	None	PHS Criterion 1 Candidate	Yes	Yes
Mountain Sucker	None	PHS Criterion 1 Candidate	Yes	
Pygmy Whitefish	Species of Concern	PHS Criterion 1 and 2 Sensitive	Yes	Yes

^{1/} Federally designated critical habitat present for ESA species in basin
^{2/} No federally listed or state candidate species in either basin

The WDFW has established Priority Habitat and Species (PHS) designations that apply to some additional species in the two basins. State PHS designations are defined by the following three categories:

Criterion 1 State-Listed and Candidate Species

State-listed species are native fish and wildlife species legally designated as endangered, threatened, or sensitive at the state level. State candidate species are fish and wildlife species that will be reviewed by WDFW for possible listing as endangered, threatened, or sensitive.

Criterion 2 Vulnerable Aggregations

Vulnerable aggregations include species or groups of animals susceptible to significant population declines, within a specific area or statewide, by virtue of their inclination to aggregate. Examples include heron rookeries, seabird concentrations, marine mammal haul-outs, shellfish beds, and fish spawning and rearing areas.

Criterion 3 Species of Recreational, Commercial, and/or Tribal Importance

Species listed under this criterion are native and non-native fish and wildlife species of recreational or commercial importance, and recognized species used for tribal ceremonial and subsistence purposes, whose biological or ecological characteristics make them vulnerable to decline in Washington or that are dependent on habitats that are highly vulnerable or are in limited availability.

Other common species without specific regulatory designations that are likely to be present in some portions of the project area include coastal cutthroat trout, brook trout, mountain whitefish, peamouth, dace, northern pikeminnow, and various sucker and sculpin species.

3.5.2 Environmental Consequences for Fish – Proposed Action

The following discussion of potential impacts focuses on effects to ESA-listed fish, because they are considered to be the most at risk due to their low numbers and regulatory status. The analysis assumes that program effects on ESA-listed fish represent the worst-case potential for effects on all fish species. Effects to other fish species are addressed only if similar previous analyses have indicated those impacts would be notably different from those to ESA-listed species.

The discussion of potential effects to fish resources and habitat is organized according to the respective sources of potential impacts. In general terms, those include effects associated with (1) construction of the Powerline acclimation facility, (2) operation of the acclimation facilities, and (3) the presence of increased numbers of spring Chinook and/or steelhead within the affected aquatic habitats.

3.5.2.1 Construction Effects

The only new construction occurring under the Proposed Action would be construction of a new acclimation pond and access road at the Powerline site. Proposed acclimation of spring Chinook and steelhead at the coho sites would use either natural or existing ponds requiring no additional construction or new construction being analyzed separately.

Construction of the proposed 5,900-square-foot pond at the Powerline site would primarily entail work conducted outside of any flowing surface water system. Construction activity would likely occur during the low-flow period of the year (June through September) and would likely be complete in less than 60 days. In-water work would occur in less than 2 weeks between mid-July and late September.

Excavation of the new Powerline pond connected to the existing unnamed tributary to Nason Creek would result in some short-term increase of suspended sediment within this stream that flows about 400 feet before entering Nason Creek. Elevated levels of suspended sediment and turbidity can directly affect fish survival and can indirectly affect primary production and other fish food sources (e.g., benthic insects). Salmonids, including the ESA-listed species in the Wenatchee basin, are very sensitive to changes in both substrate composition and suspended sediment (Spence et al. 1996; Meehan 1991; Anderson 1996; Lloyd et al. 1987; Newcombe and Jensen 1996; Hicks et al. 1991; Bisson and Bilby 1982). Suspended sediment can reduce fish feeding and growth, cause respiratory impairment, reduce tolerance to disease and toxicants, produce physiological stress, and can cause stream avoidance and thereby reduce fish distribution (Waters 1995). If the quantity of sediment is high enough the sediment can cover spawning gravels, resulting in reduced interstitial flow and dissolved oxygen and reduced egg and alevin survival (Koski 1966; Meehan and Swanston 1977; Everest et al. 1987). The level of effect is a function of both concentration and duration; various life stages of fish can be only minimally impacted at higher concentrations of suspended sediment if the duration of exposure is short (Newcombe and Jensen 1996).

Periods of elevated suspended sediment and turbidity in stream areas near the Powerline site would usually occur during high flow periods, May through July, with some events in the fall. Construction, however, is expected to occur within the low-flow period (mid-July through September) when the least vulnerable life stages of fish may be present. The expected pattern of suspended sediment elevation would likely involve short spurts of elevated concentrations associated with short-term activities such as initial connecting and filling of the proposed pond with the tributary stream water. Much lighter sediment contributions would be expected during in-stream bank stabilization activity near the diversion. Standard erosion control methods employed during clearing, grading and access road surfacing would prevent entrance of sediment to the stream from road construction activities. Sediment concentrations would be rapidly dissipated and reduced, particularly when the tributary flows enter Nason Creek. The period of elevated turbidity would likely be limited to a few hours, or a few days at most. The resulting effects to ESA-listed fish

rearing in the vicinity, including spring Chinook, steelhead, and bull trout in Nason Creek and steelhead in the unnamed tributary, would likely include a local reduction in benthic food sources, a short-term reduction in feeding rate, and avoidance of the limited areas of higher sediment concentrations. Sediment-related effects to spawning areas would not occur because the sediment contributions would be limited in amount, elevated sediment concentrations would occur over only a brief period, and in-stream work windows take into account timing of spring Chinook and bull trout spawning.

Because the construction impacts at the Powerline site would be temporary and would be mitigated, impacts on fish from the Proposed Action construction activity would be low.

3.5.2.2 Effects from Operation of Acclimation Facilities

Several of the physical aspects of operating the proposed acclimation facilities have the potential to affect existing fish resources present at and near the sites. These include fish entrainment from water intakes, changes associated with withdrawals of surface water to support the acclimation operation, and reduced access to habitat that is currently used by fish.

Entrainment

Juvenile fish in the stream reach adjacent to an acclimation pond could conceivably become entrained (pass through the pond intake screens) if they were of small enough size. If this occurred, these native juveniles could be subjected to predation by fish in the acclimation ponds. In addition, free migration from the pond by all entrained fish could be delayed by the pond discharge fish screens. However, the program sponsor would employ the most recent NMFS guidelines for all intake and discharge screens, which require use of screening that does not pass or injure fish (NMFS 2011). Therefore, entrainment of ESA-listed species and other species is not expected and no impacts would occur.

Surface Water Withdrawal

The proposed water supply sources for the acclimation ponds would not result in any additional water being removed from streams used by fish. For all of the acclimation sites, the proposed operation would use existing water diversion sources or existing spring water sources, or would require no dedicated water supply (e.g., Goat Wall). Therefore, the Proposed Action would cause no habitat reduction resulting from water removal for the acclimation operation and have no impact on surface water withdrawal.

Reduced Access to Habitat

Barrier nets or seines used to enclose acclimating juvenile fish during the rearing and acclimation period could temporarily exclude native fish from existing habitat that would otherwise be available for their use, or could prevent some adult fish from migrating upstream. Some rearing habitat at the respective acclimation sites would be excluded from use by native fish during the spring or winter acclimation periods. Table 3-7 shows the life stages of ESA-listed fish that are likely to be present in the area near the acclimation facilities. For most of the sites, the entries for life stages present are based on data reported for these sites in the Mid-C Coho Program EIS (BPA 2012). The life stages present for the Powerline and Trinity sites are based on recent snorkel survey results for these sites (Yakama Nation 2015) and known site characteristics.

Table 3-7 Life Stages of ESA-listed Fish Species Likely to be Present in Streams at the Proposed Acclimation Sites

Site	Affected Streams	Proposed Acclimation Period	ESA Species and Life Stages Present During Acclimation ^{1/}												
			Spring Chinook				Steelhead				Bull Trout				
			Eggs	Fry	Parr/smolt	Adult	Eggs	Fry	Parr/smolt	Adult	Eggs	Fry	Sub-adult	Adult	
Methow Basin															
Chewuch AF	Chewuch R.	Winter (Nov-May)	X	X	X				X	X	X			X	X
Goat Wall	Unnamed	Spring (Mar-May)			X				X					X	X
Early Winters	Early Winters Creek	Spring (Mar-May)			X				X					X	X
Gold Creek	S. Fork Gold Cr.	Spring (Mar-May)						X	X	X				X	X
Wenatchee Basin															
Rohlfing	Unnamed	Spring (Mar-May)							X						
Trinity	Unnamed	Winter (Nov-May)												X	X
Powerline	Unnamed	Spring (Mar-May)							X						
^{1/} Life stages indicated are primarily based on recent snorkel surveys (Yakama Nation unpublished data) and data reported in BPA (2012).															

The use of barrier/seine nets in natural systems at the Goat Wall, Gold Creek, Rohlfing, and Trinity acclimation sites would temporarily exclude potential use of these sites by native species that may be present. The period of exclusion would vary from about 3 months to about 7 months for spring and winter acclimation sites, respectively. The Chewuch AF is on a pond system that is not accessible to native fish, so no exclusion would occur as a result of the program. In addition, the same type of habitat exclusion would already be occurring at the four existing ponds as a result of coho acclimation activities, which has been analyzed under the Mid-C Coho Program EIS.

The potential for temporary displacement of rearing fish can be quantified by applying estimates of rearing density for the ESA-listed fish that would be representative of the respective acclimation sites. Values reported in the Mid-C Coho Program EIS (BPA 2012, Section 3.7.3 and BPA 2011, Appendix 9) were used for this estimate. These include a value for rearing Chinook density of 291 parr/acre, based on data from Hillman et al. (2008) for the Chiwawa watershed; a rearing steelhead density of 162 parr/acre, based on data from Oregon (Johnson et al. 1993 as cited in BPA 2012); and a bull trout sub-adult or adult density of 7.6 fish/acre, again based on values from the Chiwawa watershed (Hillman et al. 2008). The resulting estimates of potential fish displacement assume that usable replacement habitat could not be located by displaced fish in these systems, and therefore fish would be lost from the system production. These estimates are highly simplified, as they do not consider whether habitat is limiting or at carrying capacity, or whether the applied density value is

truly representative of each specific location. Nevertheless, the estimates provide a reasonable approximation of the potential magnitude of habitat exclusion effects to ESA-listed species rearing near the acclimation sites.

The estimates of total fish displaced annually as a result of the acclimation operations would be very small, with a total of only 80 juvenile-stage fish displaced at the seven sites. All of these potentially displaced juvenile fish, except two (one steelhead at the Powerline site and one bull trout at the Trinity site), would be displaced as a result of actions within the Mid-C Coho Program (BPA 2012, Section 3.7.3) and not the result of the proposed spring Chinook and steelhead acclimation actions. The estimated total includes 27 steelhead, 23 spring Chinook salmon, and 2 bull trout. These numbers are very small relative to the total numbers of wild out-migrating spring Chinook salmon and steelhead smolts, which typically are well over 10,000 smolts yearly for each species for both the Wenatchee and Methow basins (BPA 2012). Hillman et al. (2014) reported that spring Chinook salmon production from the Wenatchee basin ranged from 55,619 to 302,160 outmigrants from 2002 to 2013. Likewise, steelhead outmigrants from this basin from 2002 to 2007 ranged from 17,499 to 85,443 smolts (Hillman et al. 2008). Snow et al. (2014) reported Methow outmigrants of spring Chinook salmon of 8,111 to 60,022 during 2004 to 2013, and steelhead numbered 10,718 to 31,256 during 2007 to 2013. Considering the relatively high number of outmigrants from these basins, the few fish potentially displaced would have low impacts on the status of these species. Estimates of bull trout numbers for the Methow and Wenatchee basins are not available, but potential impacts to this DPS should be similar considering the low number of fish potentially displaced and the temporary duration of the displacement.

Site-specific Operation Effects

The following discussion summarizes the key existing conditions, operational activities and expected operational effects on fish species for the proposed Methow and Wenatchee basin at specific acclimation sites. Further details of acclimation facility characteristics are included in Appendix A.

Goat Wall: The Goat Wall site is located in a portion of the Methow River that has no surface flow during some fall and winter months, and has designated critical habitat only for bull trout. No ESA-listed fish have been documented spawning in this stream. Based on an on-site snorkel survey, steelhead parr/smolts, and bull trout sub-adult and adult migrants are expected to be present during the spring acclimation period. About 13 percent (0.08 acre) of the currently accessible 0.63 acre site would be excluded from use by other fish. The effects of this potential habitat exclusion were addressed Section 3.7.3 in the Mid-C Coho Program EIS (BPA 2012) and include the short-term displacement of 23 juvenile Chinook salmon, 13 juvenile steelhead, and 1 bull trout.

Early Winters: Water at this site would be diverted from the Early Winters Creek by pipe to a pond constructed in an adjacent flat area about 50 to 100 yards from the creek. (Effects of the construction activity are addressed in a draft Supplement Analysis for the Mid-C Coho Program expected to be completed in summer 2016.) The pond would not be accessible for use by native fish and would not displace any natural rearing fish habitat. Spring Chinook salmon, steelhead and bull trout all utilize the adjacent Early Winters Creek and there is the potential for juveniles of these species to be present near the project intake and discharge. Water would be diverted and returned

to the Early Winters Creek in close proximity, resulting in no modification or reduction in stream habitat as a result of this project.

Chewuch AF: The Chewuch AF site is an existing pond 150 long by 50 wide and 3.5 feet deep that is downstream of another existing pond currently used to acclimate Chinook salmon (Snow et al. 2014). For the Proposed Action, Chewuch River surface water would be delivered from an existing screened irrigation diversion through a pipeline, and return flow would leave the pond 150 feet downstream. No ESA-listed native fish have access to the pond, and the Proposed Action would have no effects on native fish in the Chewuch River.

Gold Creek: At Gold Creek, a portion of water flow is diverted from River Mile 1.6 (of South Fork Gold Creek) into a series of man-made ponds during the spring acclimation period. USGS sampling confirmed the presence of rainbow/steelhead adults and juveniles in South Fork Gold Creek near the acclimation site (BPA 2012). Recent snorkel surveys also confirm the presence of juvenile rainbow/steelhead in the entire pond system (Yakama Nation 2015). South Fork Gold Creek is designated critical habitat for steelhead and bull trout. Based on available data, steelhead adults, eggs, parr, and smolts, and bull trout sub-adult and adult migrants, are expected to be present during the acclimation period. Approximately 0.08 acre of the 0.10-acre existing pond would be enclosed by a temporary seine net during steelhead acclimation, as is currently done for coho acclimation at this site. The Proposed Action would have the same effects on native fish as the coho acclimation analyzed under the Mid-C Coho Program EIS (BPA 2012, Section 3.7.3), which would include the short term displacement of about 13 juvenile steelhead.

Powerline: The proposed Powerline site is on an unnamed tributary that flows about 400 feet from the project site before entering Nason Creek. A steep cascading falls at the mouth of the tributary likely restricts fish access from Nason Creek. Steelhead/rainbow parr were observed in the existing stream during one snorkel survey, and no fish were observed in multiple other surveys over 2 years. It is assumed, based on the presence of steelhead/rainbow parr in one survey, that some juvenile steelhead may be affected by the diversion of the stream to the new pond, with the loss estimated at about 0.002 acre of stream habitat. This habitat loss would result in the estimated displacement of about one juvenile steelhead annually. A seine would be used at the proposed pond to exclude native fish during the rearing and acclimation period. Because the pond would be new constructed habitat, excluding native fish use of the pond during the acclimation period would not represent an additional habitat loss. The new pond would supply additional rearing habitat (0.14 acre) for native fish in this system during the 9 months when acclimated fish were not using the site.

Rohlfing: The existing pond (90 feet long by 50 feet wide by 6 feet deep) on a seasonally flowing creek at the Rohlfing site is currently used for coho acclimation during spring, the effects of which have been analyzed under the Mid-C Coho Program EIS (BPA 2012, Section 3.7.3). Chinook salmon are not known to be present, and steelhead presence is unlikely (Table 3-7). While juvenile steelhead/rainbow have been observed in the tributary below the pond, their absence in the pond or in the tributary above the pond indicates it is unlikely the pond is accessible to ESA-listed fish. The site is not in designated critical habitat for either species. Although the Rohlfing site is in designated critical habitat for bull trout, species presence has not been documented (Table 3-7). In addition, the stream adjacent to the Rohlfing pond is dry during summer and early fall, so it is not considered accessible to fish during most of the off-season. Recent snorkel surveys did not observe

any fish in the channel. While the Mid-C Coho Program EIS considered the possibility of some native steelhead would be excluded from the pond habitat during acclimation, this appears unlikely based on available information and displacement effects are not expected for the Proposed Action. The Proposed Action is expected to have no impact on ESA-listed fish.

Trinity: Acclimation facilities proposed for the Trinity site include a combination of three tanks, each 30 feet in diameter, and two ponds, one 90 feet long by 60 feet wide (upper pond - existing) and one 125 feet long by 36 feet wide by 4 feet deep (lower pond - to be constructed). The three tanks and the lower pond would not be accessible to native fish. The upper pond would be accessible to native fish and 0.08 acre of habitat in this pond would be excluded from rearing use by native fish during the 6-7 month winter-spring acclimation period. The only fish found in snorkel surveys at this site were sub-adult and adult bull trout in nearby Phelps Creek; outside the project area (Yakama Nation unpublished data). Therefore, it is assumed that some bull trout-rearing habitat would be excluded annually during the acclimation period. Because coho salmon acclimation would occur in all facilities, effects of this habitat exclusion would be attributable to the Mid-C Coho Program and do not represent effects specifically associated with spring Chinook and steelhead acclimation of the Proposed Action.

As previously discussed, operational impacts on fish from the six coho ponds have been analyzed under the Mid-C Coho Program EIS (BPA 2012, Section 3.7.3) and related Supplement Analyses (in draft); they primarily involve the exclusion of rearing habitat on a temporary basis, possibly affecting an estimated 52 native ESA-listed fish. Because the operation of the acclimation ponds would have no entrainment impacts to fish, no impacts to surface water withdrawals, and a limited reduction in access to habitat, impacts on fish from operation of the Proposed Action would be low.

3.5.2.3 Inter- and Intra-Species Effects

There are several potential adverse effects from the Proposed Action that are related to the fish species interactions that could result from the acclimation operations within the two basins. These interactions could involve the presence of additional juvenile fish and associated adult returns, both of which could cause various effects within and between fish species in these systems.

Predation

The steelhead and spring Chinook smolts from the acclimation program would be larger than the fry of native fish in the affected stream areas and might prey on other fish in the system once released. The greatest risk of predation by the acclimated stocks would pertain to native spring Chinook. A juvenile salmonid is generally considered able to consume another salmonid that is up to 50 percent of their length (Sharpe et al. 2008; Riley et al 2004). The likelihood that such predation would occur is a function of many factors, including the propensity for fish consumption (piscivorous behavior), overlap of habitat use, duration of overlap, complexity of habitat, and energetics, including water temperature and the level of fish activity. Steelhead fry may be present but they are likely too large to be at risk of predation. Bull trout fry would likely not be present due to incubation timing that would place their emergence around mid-April to mid-May, with likely minimal overlap between their emergence and Spring Chinook and steelhead acclimation.

Applicable conditions for several of these factors would reduce the likelihood of predation by acclimated steelhead and spring Chinook salmon on native salmonid species in the Wenatchee and

Methow basins. Habitat use differs between smolt-size fish and fry. Fry of all salmonid species tend to stay in shallow, low-velocity water areas of streams, while age-one-plus and older steelhead and spring Chinook smolts generally stay in deeper, faster water. Therefore, the overlap of habitat use and the corresponding encounter rate would be relatively low. The duration of habitat use overlap is also likely to be brief. Because the acclimated fish under the Proposed Action would not be released until they are ready to out-migrate, most of these fish would move rapidly downstream and away from juvenile salmonid rearing areas, which tend to be in the smaller stream environment. In addition, the spring out-migrating acclimated fish would be in the stream systems at a time when water temperatures are relatively low, which would reduce their energy demands and correspondingly reduce their predation rates.

Acclimated steelhead smolts would be the largest fish released and the most likely to prey on juvenile native fish. A review of studies on predation by hatchery-released steelhead smolts in Washington found very little predation on Chinook salmon fry (Sharpe et al. 2008). Nine of the 12 studies reviewed found no predation of Chinook fry before June 1. One study, by Naman and Sharpe (2011), found that early (mid-April) release of steelhead encountered high predation due to the small size of fry at that time and slower outmigration of steelhead. Sharpe et al. (2008) conducted a study in a system with abundant Chinook fry and found an overall predation rate of 0.002 Chinook fry per stomach of hatchery-released steelhead; the predation rate was highest after June 1, when water temperatures were also higher. Because the predation rates cited above were estimated in stream systems with extensive numbers of Chinook fry present, they are not likely to be representative of what could occur in streams near the proposed acclimation sites. The expected release period for the acclimated fish would be early May or somewhat later. Therefore, the acclimated fish would be released during periods when predation rates were found to be low, rather than the periods around mid-April and after June 1 when higher predation rates were observed. This suggests that predation by the acclimated fish on salmonid fry would likely to be very low or nonexistent.

Release of smolt-size fish in upper portions of the basin may also increase predation by larger bull trout on released fish. Bull trout are adept at utilizing seasonal resources and are known to be heavy predators of juvenile salmonids in Northwest river systems where these species coexist (Lowery and Beauchamp 2015). The acclimated spring Chinook and steelhead smolts would be of suitable size for consumption by the larger, piscivorous bull trout. As a result, the proposed acclimation activity may be beneficial to bull trout in areas near the acclimation sites. The abundance of bull trout in the Methow and Wenatchee basins is relatively low, however, which indicates that bull trout predation would likely result in minimal reduction in the survival of smolts released from the proposed acclimation facilities.

Competition

The seasonal presence of additional acclimated fish in the affected stream systems could cause them to compete for food resources and preferred habitat with other fish present in these systems. Competition between native fish and acclimated hatchery-released fish is influenced by many factors including fish size, duration of cohabitation, density, and developmental stage (Tatara and Berejikian 2012). Competition for habitat would be greatest among fish within the same species, because they have the same habitat and food requirements (Tatara and Berejikian 2012). As noted above, the duration of cohabitation would be brief because the acclimated fish would be volitionally

released when most of them are ready to migrate, and they would spend brief periods in the streams near the acclimation sites. In addition, existing population numbers for spring Chinook salmon and steelhead in these systems are low and are below the carrying capacity (Peven Consulting 2004; HSRG 2009a, b, c, and d), so indicating that overlap of habitat and competition for food would also be low when the acclimated fish would be released. Because the acclimated fish released under the Proposed Action would be from existing hatchery production that is currently released further downstream in the basins, total numbers of hatchery-origin fish in each basin and competition in downstream areas would be unchanged from current conditions. Volitional releases could be a lower impact than current release practices into Nason Creek. Hatchery steelhead are currently released directly into Nason Creek creating a high potential for interaction with native fish at the release site. More gradual volitional releases from the proposed Powerline pond could potentially reduce impacts on native fish.

Finally, there would be little competition between the acclimated fish and other native species such as bull trout, because spring Chinook and steelhead have minimal overlap of habitat and food preferences relative to bull trout (Tatara and Berejikian 2012).

Harvest Effects

The proposed acclimation activities are expected to result in increased and improved distribution of returning adults from hatchery stocks of steelhead and spring Chinook and potentially additional numbers of returning fish over time. Results from monitoring of adult returns from the proposed acclimation of spring Chinook and steelhead would be used to evaluate potential implications for harvest and identify needs for coordination among fish management agencies. A sufficient sample of the fish released from the acclimation ponds would have PIT tags, to allow active monitoring for all life stages and calculation of survival and return rates for each local population. Monitoring results can be used to determine what actions would be needed in the future to ensure that harvest does not substantially affect returns of acclimated and naturally-produced fish.

Because the acclimation program would use part of the existing hatchery production currently used for smolt releases in the two basins, the number of hatchery fish that could be harvested would likely be similar to the current level, unless a change in survival rates occurred. If future adult return conditions indicated there was a need to control escapement of hatchery fish to the upper parts of the basins, then ongoing management of adult fish at downstream facilities (e.g. Wells Dam, Tumwater Canyon) could be adjusted as necessary.

Any in-basin sport fishing harvest of returning spring Chinook and steelhead would be managed under WDFW ESA permits that would specify restrictions to minimize incidental mortality of native fish (e.g., incidental hooking mortality). Therefore, wild stocks would be protected from overharvest should the numbers of returning acclimated fish increase to a level that would support in-basin sport fishing. In summary, active monitoring of returns of acclimated fish to the basins would help to maintain current harvest practices and ensure that harvest is not detrimental to the proposed acclimation program, and that the program would be consistent with other Columbia Basin fish management priorities.

Genetic Effects

Redistribution of acclimated hatchery fish to the river systems could affect the relative composition of the hatchery and wild fish distribution and composition in the basins, which could in turn have adverse effects to the overall viability of the ESA-listed ESU/DPS. The goal of the Proposed Action is based on the premise that acclimation of spring Chinook salmon and summer steelhead in the upper stream areas of the two basins would simulate natural conditions for the acclimated fish. In addition, this program is intended to increase the effectiveness of integrating hatchery programs by enhancing directed homing of adult fish returning to these upper river reach areas (Murdoch 2014). Over the last decade, similar acclimation actions for coho salmon in these basins have shown high survival of acclimated coho smolts with strong affinity of returning adults to areas where they were acclimated. These results suggest similar actions should be effective for other basin stocks, specifically spring Chinook salmon and steelhead. The current hatchery programs have resulted in limited distribution of returning adults within the basins, with few fish entering upper basin areas (Murdoch 2014).

The proposed approach does entail some risk for the genetic composition of the native stocks, however. The Hatchery Scientific Review Group (HSRG) has recommended guidelines for the mix of hatchery and wild stocks in both the hatchery and spawning habitat (HSRG/WDFW/ NWIFC 2004). This is estimated using two measures, the proportion of natural-origin fish in the hatchery brood stock (pNOB) and the proportion of hatchery origin fish in the natural spawning population (pHOS). The ratio of these two measures is called the Proportionate Natural Influence, (PNI = $pNOB/pHOS+pNOB$). In general, a higher PNI ratio represents greater selection for the natural environment relative to the hatchery environment, and a high PNI is most desirable for preservation of naturally adapted native fish stocks. Lower PNI ratios are acceptable when environmental and historical conditions do not allow for a higher degree of natural influence, however. The PNI ratio that is considered acceptable depends on a variety of factors such system-specific conditions, availability of native stocks, historical actions, current conditions, and hatchery stock suitable for the location.

The HSRG developed some generally recommended guidelines for these systems and stocks, with specific targets updated in 2013 (Hillman et al 2013, Appendix 3). The PNI ratios for the four ESU/DPS of steelhead and spring Chinook in the Wenatchee and Methow systems have varied by species and system. The PNI should be greater than 0.50 in order for the natural environment to dominate, and it should be at least 0.67 for important integrated populations (Hillman et al. 2014). The PNI for Wenatchee system summer steelhead has been less than 0.67 during the 2001-2013 period, ranging from 0.42 to 0.57 and averaging 0.50. For the Chiwawa River (a Wenatchee tributary), the spring Chinook PNI has been in the desirable range (greater than or equal to 0.67) from 1989-1994, but less than 0.67 from 1995-2012 and has an overall average of 0.50. Only 1 year of data is available for the Nason Creek tributary, indicating a less than desired PNI of 0.55. Similar estimates have been made for the Methow system (Snow et al. 2014) with all PNI values less than desired. Spring Chinook salmon PNI for the Methow has averaged 0.16 (range 0.02- 0.36) from 2003-2013. Summer steelhead PNI values are similar, averaging 0.15 (range 0.05- 0.23). The low number of potential spawning fish of natural origin is a major factor in these low ratios.

The HSRG also evaluated the current status of wild and hatchery fish in the Methow and Wenatchee basins and concluded they are not currently meeting their desired PNI (HSRG 2009a, b, c and d).

The HSRG acknowledged that in the short term some sliding scale of actions may be needed to bridge the current period of low PNI, which results from the many factors affecting these basin stocks and management capability. The group noted the ultimate goal was to have the four ESUs/DPSs achieve the desired PNI of greater than 0.50 or 0.67, depending on the stock. Partly because of the proportions of hatchery and wild fish spawners in the Methow and Wenatchee basins, smolt releases from most conservation hatchery programs was to be significantly reduced beginning in 2014 (Murdoch 2014). Adult management, including fish removal, is now occurring as an additional measure to control the numbers of adult hatchery fish in spawning areas as proposed in Murdoch, 2014.

The Proposed Action is intended to more evenly distribute hatchery-origin spawners within the basin while still helping to improve the desired PNI ratio in the basins (Murdoch 2014). A retrospective analysis, based on past estimates of smolt-to-adult returns (SAR) of hatchery fish and estimates of the portion of hatchery fish allowed to spawn, indicates that acclimation and release of 25,000 spring Chinook smolts in the Methow basin would result in a PNI greater than 0.67 for spring Chinook salmon. This assumes no other hatchery spring Chinook would be released into the upper basin area and no substantial number of additional hatchery fish would spawn in the system. These effects on PNI ratios would be greatly influenced by number of acclimated smolts actually released in the basin and future numbers of wild spawners. The seven acclimation facilities being evaluated in this EA have the potential to acclimate a combined total of up to 624,000 juvenile salmon (coho and Chinook) and steelhead in the Wenatchee and Methow River systems. This may include a maximum of 109,000 Methow system summer steelhead or up to 145,000 spring Chinook salmon, depending on what species is selected for which facilities. However, the current proposal only includes acclimation and release of 25,000 spring Chinook salmon in the Methow system (Murdoch 2014) and there are no current plans to increase overall hatchery releases to the system.

The proposed facilities in the Wenatchee system have the capacity for acclimating up to 165,000 summer steelhead or 50,000 spring Chinook salmon. Should these facilities be fully utilized for acclimation, the PNI ratio may remain below the desired ratio of 0.50 or 0.67, considering that most areas are already at PNI ratio less than desired. The retrospective analysis of the effects on PNI of acclimating just 25,000 spring Chinook salmon in the Methow system suggest that some acclimation level at less than full capacity may result in desirable PNI ratios, however (Murdoch 2014). In addition, if survival values of hatchery released fish worsen from current estimates, a greater number of acclimated and released hatchery fish may still maintain the desired PNI values. The overall effect of the Proposed Action on the desired genetic status (the PNI ratio) in these basins would be partly dependent on how much of the total capacity of the proposed acclimation facilities would be used in any given year, and on future survival to returning adult and any removal of adult fish prior to spawning. Because future plans for these basins include an overall reduction in total hatchery releases, future PNI and associated genetic status conditions should be improved relative to current conditions.

The Proposed Action includes active monitoring to evaluate the overall effects of the program on spawner distribution and escapement levels, and to identify the effects of hatchery smolt release locations used over a 5-year period (Scribner 2009a). The Yakama Nation, in consultation with other resource management agencies, would evaluate the monitoring results to determine whether any changes to the acclimation program should be made. No specific changes have been proposed or suggested at this time.

Although a goal of the acclimation program is to increase homing of returning adult fish to the release areas, there is the potential for fish to stray to other areas, which could affect genetic integrity in other stream regions. However, several studies of salmonids have found that use of acclimation sites has resulted in reduced straying rates of returning adults relative to those for truck-released salmonid smolts (Castle et al. 2002; Johnson et al. 1990; Vander Haegen and Doty 1995; Slaney et al. 1993). Part of the monitoring and evaluation program for the Proposed Action is to use fish tagging to determine stray rates, which would be evaluated to consider whether additional measures should be taken to reduce straying (Scribner 2009a). Check-in points during the study have been identified for evaluating monitoring results and making decisions on means to reduce potential impacts of straying and other potential adverse outcomes.

Acclimation Pond Multi-Species Interaction Effects

Rearing or acclimating more than one species together in a single pond could affect growth and survival of the acclimated species through competition and agnostic behaviors, and has rarely been attempted. To maximize the use of the available acclimation facilities in the Methow and Wenatchee basins, however, the Proposed Action includes acclimating multiple species in some of the ponds (see Table 2-2). Though sharing the pond, they would be separated by seine nets and not comingled until volitional release.

The current proposal incorporates information from a review by the Independent Scientific Review Panel (ISRP) of the plan for multi-species acclimation facilities (Loudenslager 2009; Scribner 2009a, b; Yakama Nation 2012). In addition, having multiple species in the same location also increases the risk of disease transfer between species. Size variation between the species can also affect interactions concerning feeding and aggression. Even when fish from multiple species are of similar sizes, there can be varied behaviors that can affect feeding, growth and other parameters (Hafen and Budy 2015; Gunckel et al. 2002; Krueger and May 1991).

Initial tests of multi-species rearing in the Methow and Wenatchee basins has shown some promise, but these tests were limited in scale (Kamphaus 2011). WDFW has implemented some successful multispecies (spring Chinook and steelhead) rearing at the Twisp Acclimation Facility (Yakama Nation 2009). The Proposed Action includes monitoring programs to help determine the effects of rearing multiple species. Monitoring elements would assess growth and survival rates for smolts in the ponds and in the rivers (outmigration), survival for adult returns, and return distribution in and outside of the basins. Although there would be some increased risks to the success of the program from multi-species rearing, they would be balanced against benefits from acclimating multiple species at the same sites. In addition, the monitoring program would provide tools needed to determine whether multispecies acclimation was adversely affecting overall species conditions and support the ability to make mid-program alterations if they appear to be needed.

Intra- and inter-species impacts would be mitigated through a monitoring and evaluation program. Moreover, the adverse impacts, if any, would be to fish used in the Mid-C Coho Program and proposed spring Chinook and steelhead acclimation program. Therefore, the Proposed Action's impacts on intra- and inter-species issues would be low.

3.5.2.4 Effects to Priority Habitat and Species⁶ and Other Fish Species

The Mid-C Coho Program EIS (BPA 2012, Section 3.7.3) included a thorough review of the effects of the proposed coho acclimation actions on Priority Habitat and Species and other fish species. BPA anticipates that effects from the proposed spring Chinook and steelhead acclimation would be similar as those identified in the Mid-C Coho EIS, and are summarized as follows:

- **Pacific Lamprey** (*Lampetra tridentata*) is an anadromous species present in the Wenatchee system that spawns in riffles with young residing primarily in soft bottoms. Potential program level impacts would be restricted to possible rearing habitat in soft bottom pond areas. Some minor, unsubstantial, highly localized effects to a few rearing individuals could occur as a result of soft bottom disturbance.
- **Mountain Sucker** (*Catostomus platyrhynchus*) is a resident species that is a near bottom dwelling fish found in the Wenatchee system that prefers clear, cold, small to large sand to gravel bottom streams. Few if any fish would be present in areas of potential program affected areas (pond habitat) although some turbidity levels to mainstem areas may cause some disturbance but these would be brief and have no substantial effects to individuals.
- **Pygmy Whitefish** (*Prosopium coulterii*) is primarily a lake species found in both systems. Since this fish would likely not be near any project area in these basins, no impacts related to program actions would occur to individuals or populations.
- **Sockeye Salmon** (*Oncorhynchus nerka*) is an anadromous species that spawns in streams and lake shore with juveniles primarily rearing in lakes. It is found in the Wenatchee Lake system and may be present rarely in the lower Methow. Individuals would not be present near any program facility during construction although individuals may encounter interactions during outmigration downstream of acclimation facilities. Predation of sockeye by acclimated Chinook salmon or steelhead would not occur due to similar sizes and population-level effects are not expected due to limited interactions and habitat disruption.
- **Westslope Cutthroat Trout** (*O. clarki lewisi*) is typically present in clear cold mountain streams with good cover, and may be present in both systems. Effects to individuals would be similar to those of other native Chinook salmon and steelhead as discussed above and would not reach population level effects due to limited interaction and small area affected.

Because the impacts to Priority Habitat and Species and other species would be temporary and limited, impacts of the Proposed Action on Priority Habitat and Species and other species would be low.

3.5.3 Environmental Consequences for Fish – No Action

Under the No Action Alternative, the Powerline acclimation pond would not be constructed and the coho acclimation sites would not be used for acclimation of spring Chinook and steelhead. The proposed new acclimation pond and access road at the Powerline site would not be constructed and there would be no new potential impacts to fish species or their habitat near those sites.

⁶ The “Priority Habitat and Species” program is Washington Department of Fish and Wildlife’s program for identifying and listing species that are priorities for protection and conservation in Washington State.

Potential competition, predation and genetic effects associated with introduction of acclimated spring Chinook and steelhead in the upper portions of the Methow and Wenatchee basins would not occur. Fish resource conditions near all the acclimation sites discussed in this EA would likely continue generally as at present, reflecting the influence of development activities in the vicinity and the ongoing fishery management programs. The number of adult wild spring Chinook and steelhead returning and using suitable spawning and rearing habitat in the upper portions of these basins would presumably remain low, as would overall fish production for these two stocks.

3.6 Wildlife

3.6.1 Affected Environment

3.6.1.1 General Habitat Characteristics

Wildlife habitats associated with the acclimation sites vary by site and by basin. The majority of the Wenatchee basin is forested, although habitat composition changes with distance from the Cascade crest. Habitat types in the Methow basin consist of mixed coniferous forests (upper-montane and mid-montane), lodgepole and ponderosa pine woodlands, upland aspen forests, grasslands, shrub-steppe, herbaceous wetlands, montane coniferous wetlands, riparian wetlands, agriculture and urban/mixed use (NPCC 2004b). Sections 3.3 and 3.4 provide additional details on the vegetation communities and habitats found in these areas.

All of the proposed acclimation sites contain past and ongoing activities that have and will continue to result in disturbances to wildlife species and their habitats (see Section 3.14), including residences, vacation homes, commercial lodging, ranch buildings, and transmission lines. In addition, the four existing coho acclimation sites considered in this EA (Rohlfing, Goat Wall, Chewuch AF, and Gold Creek) are currently exposed to the ongoing seasonal activities associated with the Mid-C Coho Program; these activities result in a degree of wildlife disturbance associated with human presence in the area as well as predator hazing operations.

The area proposed for the new Powerline acclimation pond site is surrounded by habitat currently classified as a forested/shrub habitat type, which typically contains a mix of grand fir, vine maple, western trillium, field horsetail, as well as other plant components. However, the site of the acclimation pond is area is within encompassed by the BPA's Chief Joseph-Snohomish Nos. 3 and 4 transmission line right-of-way, where vegetation is managed for low-growing species that will not threaten safety clearances between vegetation and the existing transmission lines. Therefore, the vegetation and habitats in this area have been transformed into a low shrub and herbaceous community, and the wildlife in this area currently experience ongoing and periodic disturbances associated with the right-of-way maintenance.

3.6.1.2 Special-Status Species

Wildlife species that have federal or state protected status (i.e., are listed under the federal or state ESA) and species identified under the Washington's Priority Habitat and Species Program are considered in this EA. Table 3-8 identifies the ESA and PHS status for the species that could potentially occur at each of the proposed acclimation sites. (Note that aquatic species and their ESA-designated critical habitats are addressed in Section 3.5). The species listed under the federal ESA that could potentially occur in the general vicinity of one or more of the proposed acclimation

sites include the Oregon spotted frog, marbled murrelet, northern spotted owl, yellow-billed cuckoo, Canada lynx, gray wolf, and grizzly bear. The remaining species listed in this table are either state-listed species or species identified under the Priority Habitat and Species program.

The USFWS has designated critical habitat for the northern spotted owl near the Powerline, Rohlring, Trinity, and Goat Wall sites; however, these critical habitat designations do not overlap with any of the proposed acclimation sites.

Table 3-8 Wildlife Species with ESA Listing Status or PHS status ^{1/;2/}

Common Name	Scientific Name	Federal ESA Status	State ESA Status	State PHS	Presence in the Area	Potential Occurrences based on PHS database					
						Wenatchee Basin			Methow Basin		
						Powerline / Rohlffing	Trinity	Goat Wall	Early Winters	Chewuch AF	Gold Creek
Amphibian											
Columbia spotted frog	<i>Rana luteiventris</i>	N/A	N/A	yes	occurrences				x	x	
Oregon spotted frog ³	<i>Rana pretiosa</i>	Threatened	Endangered	yes	N/A						
Bird											
bald eagle	<i>Haliaeetus leucocephalus</i>	species of concern	Sensitive	yes	regular concentration				x	x	x
golden eagle	<i>Aquila chrysaetos</i>	N/A	Candidate	yes	breeding areas		x	x	x	x	x
Harlequin duck	<i>Histrionicus</i>	N/A	N/A	yes	regular concentration				x	x	x
marbled murrelet ²	<i>Brachyramphus marmoratus</i>	Threatened	Threatened	yes	N/A						
northern goshawk	<i>Accipiter gentilis</i>	N/A	Candidate	yes	breeding areas	x		x	x	x	
northern spotted owl	<i>Strix occidentalis</i>	Threatened	Endangered	yes	breeding areas	x	x	x	x	x	
yellow-billed cuckoo ³	<i>Coccyzus americanus</i>	Threatened	Candidate	yes	N/A						
Mammal											
big brown bat	<i>Eptesicus fuscus</i>	N/A	N/A	yes	communal roost						x
Canada lynx	<i>Lynx canadensis</i>	Threatened	Threatened	yes	occurrence		x	x			
gray wolf	<i>Canis lupus</i>	Endangered	Endangered	yes	occurrence	x	x	x	x	x	

Table 3-8 Wildlife Species with ESA Listing Status or PHS Status ^{1/2/} (continued)

Common Name	Scientific Name	Federal ESA Status	State ESA Status	State PHS	Presence in the Area	Potential Occurrences based on PHS database					
						Wenatchee Basin			Methow Basin		
						Powerline / Rohlifing	Trinity	Goat Wall	Early Winters	Chewuch AF	Gold Creek
grizzly bear	<i>Ursus arctos</i>	Threatened	Endangered	yes	occurrence		x	x			
little brown myotis	<i>Myotis lucifugus</i>	N/A	N/A	yes	communal roost			x	x	x	x
marten	<i>Martes americana</i>	N/A	N/A	yes	occurrence			x			
Mountain goat	<i>Oreamnos americanus</i>	N/A	N/A	yes	regular concentration	x	x	x			
mule deer	<i>Odocoileus hemionus</i>	N/A	N/A	yes	migration and breeding area	x		x	x	x	x
northwest white-tailed deer	<i>Odocoileus virginianus ochrourus</i>	N/A	N/A	yes	regular concentration				x	x	
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	N/A	Candidate	yes	communal roost			x	x	x	
western grey squirrel	<i>Sciurus griseus</i>	federal species of concern	Threatened	yes	occurrence				x	x	
wolverine	<i>Gulo gulo</i>	Candidate	Candidate	yes	occurrence		x	x	x	x	x
Yuma myotis	<i>Myotis yumanensis</i>	N/A	N/A	yes	communal roost			x	x	x	x

^{1/} ESA = Endangered Species Act; PHS = Washington Priority Habitat and Species program
^{2/} Based on data obtained from the WDFW PHS database in July of 2015 (available online at <http://wdfw.wa.gov/mapping/phs/>); and the USFWS ESA listing database (database available online at <http://www.fws.gov/angered>)
^{3/} Species Western Distinct Population Segment (DPS) listed as occurring in Chelan or Okanogan County by the USFWS (database available online at <http://www.fws.gov/angered>), but not known to occur near the proposed program areas based on the WDFW PHS database.

3.6.2 Environmental Consequences for Wildlife – Proposed Action

3.6.2.1 Construction

Construction of the pond and access road at the Powerline site would result in a total of approximately 0.28 acre of ground disturbance and shrub habitat reduction. The temporarily disturbed areas would be restored and revegetated (i.e., the reduction of habitat would be short-term in these areas). The areas encompassed by the new acclimation pond would be transformed into an aquatic habitat type, which would provide a new diversified habitat component to the area in the form of expanded riparian and aquatic environments. The habitats encompassed by the new access road would be covered in four inches of gravel and unresponsive to vegetation; however, this would constitute a very minor reduction of shrub habitat and is not expected to adversely affect local wildlife species. The impact to wildlife habitats as a result of the construction of the pond and access road at the Powerline site would be low.

Noise generated by construction equipment and the presence of construction workers and equipment could disturb wildlife near the Powerline site during the construction period. Existing background noise levels at the proposed site for the Powerline acclimation pond could be comparatively high for a site in a rural area because of the proximity to US 2 (0.8 mile away), the mainline Burlington Northern Santa Fe railroad track (300 feet southeast of the proposed pond location), and the three high-voltage transmission lines that cross the Powerline site.

Construction of the pond and access road would take place during summer months (May through September) and would be of limited duration (likely no more than two months), with construction limited to normal workday hours (8:00 a.m. to 5:00 p.m., Monday through Friday). The sound produced by conventional construction equipment used for earthwork typically ranges from about 79 to 103 decibels (dB), with averages as follows: 96 dB for a truck, 88 dB for a front end loader, 86.5 dB for a backhoe, and 96 dB for a bulldozer (LHSFNA 2015). These elevated noise levels during construction could disturb some wildlife and result in their temporary avoidance of the area around the sites, although both sites are currently subject to noise from various types of human activity.

As shown in Table 3-8, the WDFW PHS database indicates that northern goshawk, northern spotted owl, gray wolf, mountain goat, and mule deer could potentially occur near the proposed Powerline acclimation pond. However, the habitats near the proposed Powerline acclimation pond were determined to be unsuitable for these species during previous site reconnaissance efforts (Grette Associates 2014), thereby reducing the likelihood that these species use the habitats near the Powerline site.

State data for actual locations of spotted owls show that the nearest surveyed spotted owl location is over 0.8 miles from the Powerline site and distances to the edges of any designated protection area (e.g. core area) are over 1.25 miles away.

Wildlife using habitats near the project area during construction would likely experience temporary disturbance that could include disruption of typical behaviors and avoidance of the construction area. They would also experience some habitat modification if they previously occupied the habitats found in the area (see discussion above) and may find the new conditions unsuitable for their use. Direct mortality is unlikely to occur to any but the smallest and least mobile of species (if present prior to construction). Larger, more mobile, species would likely avoid the area during

construction. The habitat modifications this project provides (changes from shrub habitat to pond habitat) will likely attract some species (e.g. amphibians, songbirds, and some species of waterfowl such as wood duck, teal, or mallards) to the site that had not occupied it before.

The pond will attract waterfowl, though it is not designed to maximize waterfowl use or attraction: it's too deep for waterfowl feeding, its slopes are too steep to support much emergent vegetation, and its shoreline is simple, not irregular, minimizing shoreline habitats. Nonetheless, it is large enough and will be visible enough within the cleared powerline right-of-way that some waterfowl can be expected to be drawn in. This may create a risk of powerline strikes given the proximity of the high voltage (345kv and 500kv) powerlines.

The powerlines are high in this area, approximately 100' above the creek, and 80' above the pond site. This is well above the typical 'on-the-water' flight patterns of mergansers and harlequin ducks most typical of this reach of Nason Creek, but other waterfowl such as puddle ducks⁷, geese, and herons are higher flyers and risk striking the powerlines. Their use in the area is low and primarily associated with Nason Creek and a wetland 0.5 miles to the east. Their routine, non-migratory, flight patterns are likely along Nason Creek which crosses the powerlines at the location of this pond. Geese and herons, being larger birds, slower and less maneuverable in flight, are likely at most risk, though their attraction to this pond might be low. Puddle ducks are more agile flyers with less risk of strike yet likely more attracted to the pond. None-the-less, flight paths into this pond by any route other than from Nason Creek require the birds to fly over the trees adjacent to the right-of-way clearing, and then down through the powerlines to the pond. Some strikes are likely, but the numbers are expected to be low since most bird flights are believed to be along Nason Creek, and below the powerlines.

No Priority Habitats identified by WDFW would be impacted by the construction of the proposed Powerline acclimation pond. The closest Priority Habitats to the Powerline site include aspen stands located approximately 0.5 miles northeast of the project area and palustrine wetlands located approximately 0.2 miles east of the project area.

No impacts to designated critical habitat for ESA-listed terrestrial species are anticipated. Designated critical habitat for the northern spotted owl is located near the site; however, this designated critical habitat type is located approximately 300 feet from the Powerline site. As a result, project-related construction activity is not expected to impact these ESA-designated habitats.

For the reasons discussed above, impacts on wildlife from construction at the Powerline site under the Proposed Action would be low.

3.6.2.2 Operation

Daily human presence would be required at the Powerline site during the acclimation period (as well as at the other sites with existing ponds, as noted above), likely averaging approximately 2-3 hours per day per site during daylight hours. This daily duration represents 1.4 percent of the year for spring-only acclimation and 4.8 percent of the year for winter acclimation. Two-person crews

⁷ Puddle ducks is a classification of ducks that inhabit fresh shallow marshes, rivers, and smaller ponds and streams rather than larger bodies of water. Puddle ducks along Nason Creek could include mallards, teal, wigeon, and wood ducks.

would be responsible for operations at multiple sites and would drive between them during the course of the day. These activities would be consistent with average ambient noise levels (thereby reducing the risk of noise related disturbances to wildlife); however, the increased presence of humans at the site during a time of the year when relatively little human activity is present could result in disturbance to wildlife.

A Powerline acclimation pond would create new naturally appearing open water habitats, new riparian habitat, and a food and water source that would likely attract wildlife to the area. While this can be a benefit to many species, the attraction of wildlife that prey on fish create a problem.

There is a need at all the acclimation sites to prevent fish predators from preying on the dense populations of confined smolts in the ponds. No lethal methods would be used, but all sites would apply non-lethal hazing of potential predators to protect acclimating fish. Hazing would involve discouraging wildlife from preying on these fish by having humans on the site at key times (mornings and evenings). Techniques could also include use of paper coyote decoys and scent, electric owls, and automated use of sprinklers on motion sensors (where power and water sources make it feasible). Although these actions would result in disturbances to wildlife (by their design and purpose), they have not been shown to threaten the overall health or survival of any species (Kamphous, personal comm.).

In general, the expanded use of the six coho ponds to include spring Chinook and steelhead acclimation would not have an increased effect on terrestrial wildlife species beyond the existing background conditions. The existing pond sites already experience human activities that can disturb and disrupt wildlife including the residential, ranching, utility, and transportation facilities and activities. In addition, these sites are included in the ongoing Mid-C Coho Program, which results in disturbances to wildlife and their habitats as a result of operational activities at the sites and an ongoing predator hazing program. The addition of spring Chinook and steelhead acclimation activities to those occurring for coho acclimation at the six coho ponds would not be expected to substantially increase the scope or duration of any of these activities or disturbances. Wildlife that uses the existing ponds and surrounding areas would already be exposed to these activities and their associated impacts. As a result, the addition of spring Chinook and and/or steelhead acclimation at the Rohlfig, Goat Wall, Chewuch AF, Early Winters, Trinity, and Gold Creek sites would have a low impact on terrestrial wildlife species in the area.

Because the construction of a new pond at the Powerline site and the operation of the new and existing ponds for acclimation would have limited impacts on wildlife or their habitats, impacts of the Proposed Action on wildlife would be low.

3.6.3 Environmental Consequences for Wildlife – No Action

Under the No Action Alternative, the Powerline acclimation pond would not be constructed and the coho acclimation sites would not be used for acclimation of spring Chinook and steelhead. Potential disturbance impacts to wildlife species at and near the coho sites of these existing ponds would continue to occur as a result of the ongoing residential, ranching, transportation and other current uses at these sites as well as the incremental human presence associated with coho acclimation activities. The proposed new acclimation pond at the Powerline site would not be constructed, and no project-related impacts to wildlife species would occur in these areas. Wildlife species and habitat near the Powerline site would continue to be affected by the presence of a lightly-used

national forest system road, a busy rail line, and three major transmission lines and their ongoing vegetation maintenance.

3.7 Transportation

3.7.1 Affected Environment

3.7.1.1 Methow Basin

The primary transportation corridor through the Methow Basin is State Route (SR) 20: a paved, two-lane highway that travels west over Loup Loup Summit from the Okanogan River Valley. Smaller county roads also follow the valley floor in places, as well as providing access to rural residences and recreation opportunities in adjacent upland areas. Forest roads maintained by the U.S. Forest Service (USFS) also provide access to surrounding public lands.

The following paragraphs provide a general overview of transportation access to the four sites located on privately-owned parcels in the Methow Basin.

Goat Wall: The Goat Wall site is located approximately 3 miles northwest of Mazama on the Lost River Road, a paved road maintained by Okanogan County. The Lost River Road is plowed during the winter.

Early Winters: The Early Winters site is located approximately 2 miles west of Mazama, just to the south of SR 20. Access to the site is via the Wilson Ranch Road, a privately-maintained paved road serving the Freestone Inn and Early Winters Cabins. The Wilson Ranch Road is plowed during the winter.

Chewuch AF: The Chewuch AF site is located on the east side of the Chewuch River, approximately 6.5 miles north of Winthrop. Access is via the county-maintained Eastside-Chewuch Road, which extends north from SR 20 at Winthrop and is plowed during winter.

Gold Creek: The Gold Creek site is located adjacent to the South Fork Gold Creek, approximately 9 miles south and southwest of Carlton. Access to the site is via SR 153 (3.5 miles), Gold Creek Loop Road (1.6 miles), Gold Creek Road (1.0 mile), and South Fork Gold Creek Road (2.5 miles). Gold Creek Loop and Gold Creek Roads are county roads. South Fork Gold Creek Road is a Forest Service road (USFS Road 4330) that receives intermittent maintenance and is not plowed in the winter.

3.7.1.2 Wenatchee Basin

U.S. 2 is the primary transportation corridor in the Wenatchee Basin, extending west from the city of Wenatchee and passing through the basin and across the Cascade Mountains via Stevens Pass. Other important transportation corridors in the basin include US 97, which intersects with US 2 near the small, unincorporated community of Peshastin, southeast of Leavenworth; SR 207, which provides access to the north shore of Lake Wenatchee; and SR 209, which extends from SR 207 through Plain and south to Leavenworth.

The following paragraphs provide a general overview of transportation access to the three acclimation sites located in the Wenatchee Basin.

Powerline: Located approximately 0.8 mile from US 2, the Powerline site is accessed via Whitepine Road (USFS Road 6950). Whitepine Road is an unpaved road maintained by the USFS that is plowed in the winter, providing adequate access throughout the year. A new, 70-foot-long access road would be built from Whitepine Road to the proposed acclimation pond as part of the Proposed Action.

Rohlfing: The Rohlfing site is located a short distance beyond the Powerline site, less than 1 mile from US 2 and also accessed via Whitepine Road.

Trinity: The Trinity acclimation site is located near the confluence of the Chiwawa River and Phelps Creek, approximately 28 miles northwest of US 2. Access from US 2 is via SR 207 for 4.3 miles and the Chiwawa River Road (USFS Road 6200) for 24 miles. These roads are plowed during the winter. Access to the host property for the acclimation site is via a short access road from the Chiwawa River Road.

3.7.2 Environmental Consequences for Transportation – Proposed Action

At the proposed Powerline site, the construction period for the pond and access road would be of limited duration (likely no more than 2 months), with construction limited to normal workday hours (8:00 a.m. to 5:00 p.m., Monday through Friday). Heavy equipment required to clear vegetation and grade and excavate the road and pond would likely remain onsite for the duration of its use, reducing the number of slow moving vehicle trips on the Whitepine Road or other public roads, primarily US 2. Based on the limited scope and short duration of this construction activity, it is expected that the work would be accomplished by a locally based construction contractor and would require only two to three construction workers. The addition of construction-worker vehicle trips to the existing roads that provide access to the site would have minimal effects on existing traffic.

Operation activities at the seven acclimation sites for the Proposed Action would include transporting fish to each acclimation site using existing roads (up to five loads of fish depending on size of truck, size of fish, and stocking amount), transferring fish from vehicles into acclimation ponds, daily feeding of fish, predator control, and fish release monitoring. Traffic associated with site operations would typically consist of one or two standard-size pick-up trucks per day.

Because of the limited nature of the transportation activities related to the construction of the new pond at the Powerline site and the operation of all seven acclimation sites, there would be low impacts from the Proposed Action on transportation.

3.7.3 Environmental Consequences for Transportation – No Action

Under the No Action Alternative, the Powerline acclimation pond would not be constructed and the coho acclimation sites would not be used for acclimation of spring Chinook and steelhead. The proposed acclimation pond and access road at the Powerline site would not be constructed, and no program-related impacts to transportation would occur.

3.8 Land Use and Recreation

3.8.1 Affected Environment

Affected environment conditions for land use include existing land use patterns and consistency with land use plans. Recreation attributes of interest include existing recreation sites or facilities and recreation use characteristics. These land use and recreation characteristics are summarized below for the Methow and Wenatchee basins and for the respective acclimation sites.

3.8.1.1 Land Use

Methow Basin

The four acclimation sites in the Methow Basin are on private or state lands under the jurisdiction of Okanogan County. Land uses are governed by the Okanogan County Comprehensive Plan of 2014 and the Okanogan County Shoreline Master Program in accordance with Washington State's Shoreline Management Act.

The Methow River Basin occupies the western portion of Okanogan County, accounting for 1,805 square miles, approximately 34 percent of the total county area (Methow Basin Planning Unit 2005; U.S. Census Bureau 2015). Land use patterns within the basin are primarily a result of land ownership patterns and natural landforms (Okanogan County 2014a). Privately owned lands comprise just 14 percent of the total area of the basin and are largely limited to the valley floor along the Methow River and key tributaries (Methow Basin Planning Unit 2005). The rest of the basin – the valley walls and the adjacent hills and mountains – is either federal or state land. Most of the public land in the basin is within the Okanogan-Wenatchee National Forest, which is managed by the USFS.

All four of the sites in the Methow Basin for spring Chinook and steelhead acclimation are on privately owned parcels that have varying types of low-intensity existing uses. The following paragraphs provide a general overview of land use at the four sites located in the Methow Basin.

Goat Wall: The Goat Wall site is located approximately 3 miles northwest of Mazama on the Lost River Road. An existing pond at the end of a disconnected side channel of the Methow River is used for acclimation of coho under the Mid-C Coho Program and would be expanded for steelhead and spring Chinook use. The host property includes a main residence and a secondary residence, both located adjacent to the pond. The Methow Conservancy holds a conservation easement that applies to the property, and has a signed partnership agreement with the YN to execute acclimation activities at this site through 2020.

Early Winters: The Early Winters site is located approximately 2 miles west of Mazama. The host property includes commercial lodging (the Freestone Inn and Early Winters Cabins) and associated recreational and support facilities. The acclimation pond site is within a relatively open Ponderosa pine stand located approximately 50-100 yards east of Early Winters Creek and south of SR 20.

Chewuch AF: The Chewuch AF site is located on private lands along the east bank of the Chewuch River immediately north of the Eastside Chewuch Road Bridge approximately 6.5 miles north of the town of Winthrop. The site is bounded by private lands to the south, state lands to the north and

west, and federally-managed lands to the east. The state and federal lands are managed for wildlife habitat objectives, and nearby private land uses are primarily farming and ranching.

Gold Creek: This site contains a series of small, man-made ponds adjacent to the South Fork of Gold Creek. The host property is privately-owned land located in a rural residential area, approximately 9 miles south of Carlton. Several homes are adjacent to the acclimation site. Property owners have constructed walking trails and benches along the ponds and the creek. State land managed by the Washington Department of Resources (WDNR) is adjacent to the property on the east, and National Forest System (NFS) land managed by the USFS is located to the west across the creek and the South Fork Gold Creek Road.

Wenatchee Basin

The three acclimation sites in the Wenatchee Basin are on private lands under the jurisdiction of Chelan County. Land uses are governed by the Chelan County Comprehensive Plan (Chelan County 2014) and the Chelan County Shoreline Master Program (Chelan County 1975) in accordance with Washington State's Shoreline Management Act.

The Wenatchee Basin occupies most of the southern portion of Chelan County, accounting for 1,300 square miles, approximately 43 percent of the total county area (NPCC 2004b; U.S. Census Bureau 2015). Land use patterns within the basin reflect land ownership and topographic factors similar to those discussed above for the Methow Basin. Privately owned lands comprise 19 percent of the total area of the basin and are mostly confined to the valley floor areas and immediately adjacent hillsides. The rest of the basin is either federal or state land (NPCC 2004b). Approximately 76 percent of the basin is within the Okanogan-Wenatchee National Forest and managed by the USFS (NPCC 2004b). Land use and cover on these lands varies with elevation and site conditions.

The following paragraphs provide a general overview of land use at the three acclimation sites in the Wenatchee Basin.

Powerline: The site would be located approximately 0.8 mile from US 2 within a 14-acre undeveloped parcel of privately owned land downslope of Whitepine Road. This parcel is part of approximately 60 acres of private land in various ownerships along Whitepine Road and Nason Creek. National Forest System lands surround these private parcels. The acclimation pond for this site would be constructed on a portion of this 14-acre parcel that lies within BPA's Chief Joseph-Snohomish transmission line right-of-way. Nason Creek and BNSF railroad tracks also cross the southeastern part of the property. Private land uses are residential and recreation oriented.

Rohlfing: The Rohlfing site is also less than a mile from US 2 and is on a 19.6-acre parcel of privately owned land that includes a vacation home. The east side of the parcel abuts the Powerline site property; NFS land is adjacent to the north, south, and west. An existing BPA transmission corridor occupies the northern part of the parcel, and BNSF railroad tracks pass less than 1,000 feet to the southeast.

Trinity: The Trinity acclimation site is located approximately 25 miles northwest of the unincorporated community of Plain. The site is located on a 22-acre private inholding surrounded by public lands. The area to be used for acclimation facilities is adjacent to a 7.5-acre parcel under the licensing jurisdiction of the Federal Energy Regulatory Commission (FERC), which includes a small hydroelectric generating project. The remaining surrounding lands are part of the Okanogan-

Wenatchee National Forest. The Glacier Peak Wilderness boundary extends to the west bank of the Chiwawa River directly across from the acclimation site.

3.8.1.2 Recreation

Methow Basin

Residents of the Methow Valley and visitors to the region place a high value on outdoor recreation, including snowmobiling, cross-country and Nordic skiing, hiking, mountain biking, and equestrian trails. Federal and state agencies, who manage more than 80 percent of the basin, manage their lands to provide recreation opportunities. There are five state parks in Okanogan County and eight recreation sites operated by the WDNR, with numerous access points for rivers, lakes, and hunting areas managed by WDFW. National Forest System lands provide opportunities for dispersed recreation activities in the basin, as well as trailheads and campgrounds.

The following paragraphs summarize recreation use on and around the four sites located in the Methow Basin:

Goat Wall: Accessed via Lost River Road, this property includes a main residence and a secondary residence. The Yellowjacket Sno-Park, maintained by the USFS, is located approximately two miles to the northwest of the acclimation site, via a short spur road from the Lost River Road; it provides access for snow play and snowmobiling (USFS 2015a).

Early Winters: The Wilson Ranch property where the Early Winters site is located includes commercial lodging and recreational facilities. A summer trail within the Methow Valley trail system ends at the Freestone Inn on the property; a trailhead parking facility for the winter trail system is located at the Freestone Inn, and provides direct connections to two trails for Nordic skiing and several snowshoe trails (MVSTA 2015). The USFS Early Winters Campground is located on the west side of the creek approximately ½ mile from the pond site, but is not noticeable in views from the site.

Chewuch AF: The Chewuch AF site is on the east side of the Chewuch River on private lands near the Methow Wildlife Area, near an area used for dispersed camping. The WDFW maintains the Boulder Creek access site, located approximately ½ mile to the north of the acclimation site, via USFS Road 37 (WDFW 2015; USFS 2015a). The Boulder Creek site provides fishing access and camping, and is used as a Sno-Park in the winter. Public lands to the north, east, and west of this facility are popular for hunting and dispersed recreation activities.

Gold Creek: The Gold Creek site is in a rural residential area, with several homes adjacent to the acclimation site. Walking trails and benches are located on the site along the ponds and the creek. The South Fork Gold Creek Sno-Park, maintained by the USFS, is located approximately 2 miles to the southwest of the acclimation site, via USFS Road 4330 (USFS 2015a).

Wenatchee Basin

Recreation in the Wenatchee Basin occurs throughout the year but is heaviest during the summer months and includes, hiking, equestrian riding, mountain biking, skiing and river rafting. Scenic highways and forest roads provide opportunities for driving for pleasure, and NFS lands offer

opportunities for dispersed recreation activities as well as trailheads and campgrounds (USFS 1990).

The following paragraphs summarize recreation use on and around the three sites located in the Wenatchee Basin:

Powerline: The undeveloped Powerline site is within a 60 acre block of private land which is nearly surrounded by NFS lands. The five-site Whitepine campground is an old campground 0.25 miles east of the Powerline site, and ½ mile south of US Highway 2 on the north side of Whitepine road. It is no longer managed by the US Forest Service as a developed campground, but is available for dispersed camping. Cascade Meadows Camp, located approximately 1.5 mile to the southwest via Whitepine Road, is a private retreat facility operated by the American Baptist Churches of the Northwest. Camp facilities include a lodge and six cabins that each sleep from 6 to 8 visitors. The USFS Whitepine Creek Trail #1582 begins at the end of the Whitepine Road, approximately 3.25 miles southwest of the Powerline site. The trail extends for about 10 miles up the Whitepine Creek drainage to a junction with the Icicle Creek Trail #1551. The Merit Lake trailhead is approximately 0.5 mile straight-line distance (4 miles by road) upslope to the northwest of the pond site.

Rohlfing: The Rohlfing site is located within a privately owned parcel adjacent to the parcel on which the Powerline site is located. A vacation home is situated on this site. Recreation-related resources in the vicinity include the Whitepine Campground, the Cascade Meadows Camp and the Whitepine Creek Trail.

Trinity: Located near the confluence of the Chiwawa River and Phelps Creek, the Trinity site includes a FERC-licensed small hydro plant within a 7.5-acre parcel, and is surrounded by NFS lands, with the Glacier Park Wilderness located across the Chiwawa River from the site. The USFS Phelps Creek Campground/Horse Camp is located about 0.5 miles south of the site (USFS 2015b). Located on NFS lands and operated by a concessionaire, this campground includes seven tent and six equestrian sites. The USFS Trinity Trailhead, located along the Chiwawa River Road about 0.25 miles north of the Trinity property, provides access to Buck Creek Trail #1513 and Chiwawa River Trail #1550.

3.8.2 Environmental Consequences for Land Use and Recreation – Proposed Action

3.8.2.1 Land Use

Proposed use of part of the Powerline site as an acclimation pond would be compatible with the existing land uses of a BPA transmission line right-of-way and BNSF railroad tracks. The Powerline site is adjacent to the existing Rohlfing acclimation site that would also be used for this program, with the same zoning (RR5) and shoreline zone (Conservancy) designations. This suggests that construction and operation of the new Powerline site would also be consistent with the applicable comprehensive plan, zoning designation, and shoreline zone.

Chapter 11.04 of the Chelan County Code provides a district use chart that identifies the specific uses allowed or not allowed in each zoning use district. “Acclimation site” is not identified in the list of specific uses. Based on use similarities, however, fish acclimation could be considered as either

an Isolated Nonresidential Use or a Water-Dependent Use/Structure (Commercial Use). Both uses are allowed in RR5 zoned areas.

The Chelan County Shoreline Master Program (SMP) identifies use activities, including agriculture, aquaculture, forest management, mining, and dredging, and provides regulations for the four types of shoreline managed under the program: Urban, Rural, Conservancy, and Natural. The 17 use activities identified in the Chelan County SMP do not include fish acclimation or any other term that is clearly equivalent. Aquaculture is generally permitted in Conservancy shoreline zones, and fish acclimation is a similar use. In addition, SMP Policy 23.3 states that dredging operations necessary for a project defined as a water-dependent use may be permitted on Conservancy shorelines, subject to the general requirements for dredging activity. Based on these SMP provisions, BPA anticipates that the proposed acclimation use at the Powerline site could be determined to be consistent with the management regulations for the Conservancy shoreline zones.

During construction of the Powerline acclimation access road, travel along the Whitepine road might be temporarily delayed by the maneuverings of heavy equipment as the intersection is being constructed. This inconvenience should last only a couple of days. Because impacts to land use would be limited and short-term, impacts from the Proposed Action's construction of the Powerline site would be low.

There would be no change under the Proposed Action to the land uses at the coho acclimation sites or the compatibility of those land uses with the applicable comprehensive plans, zoning designations, and shoreline zones.

Operational activities for the Proposed Action at these sites for spring Chinook and steelhead would not change substantially from the coho acclimation activities and would not result in conflicts with other land uses.

Because any impacts to land use at the seven acclimation sites would be limited, short-term, and highly localized, impacts of the Proposed Action on land use would be low.

3.8.2.2 Recreation

Construction at the proposed Powerline acclimation site could potentially affect recreational visitors to the surrounding area. Slow-moving construction vehicles and equipment could potentially delay recreationists traveling along Whitepine Road and might also cause a temporary increase in noise and dust in the immediate areas along this road. These impacts would be very limited and short in duration. Heavy equipment would presumably remain onsite in both locations for the duration of its use, reducing the number of slow moving vehicle trips on public roads.

Intermittent noise associated with construction might be heard by visitors to the area, but would be primarily limited to areas immediately surrounding the site. As discussed in the Air Quality and Noise section of this document, noise from construction activities could extend 600 feet to 1,000 feet from the source before diminishing to ambient levels. Noise produced by construction of the Powerline acclimation pond might be noticeable at the vacation home located on the adjacent Rohlfing acclimation site and at Cascade Meadows Camp. Construction noise would occur intermittently during a construction period of limited duration (likely no more than 2 months), with construction limited to normal workday hours (8:00 a.m. to 5:00 p.m., Monday through

Friday). Noise impacts to recreationists from project construction at the Powerline acclimation site are, therefore, expected to be low.

Operational activities at the seven acclimation sites could potentially be noticed (heard and/or seen) by recreationists visiting the affected sites or nearby recreation facilities, but would not displace users or constrain access to recreation resources. In addition, the acclimation operations would occur at a time of year (late winter and early spring) when use volumes are relatively low. Based on the nature of the activity and the timing characteristics, the impacts of operational activities on nearby recreational uses would be low.

The Proposed Action is intended to increase the abundance of adult spring Chinook and steelhead returning to spawn in the Methow and Wenatchee basins, and thereby promote the recovery of these species. If the Proposed Action is successful in meeting those objectives, it is possible that long-term future numbers of adult fish could help to support recreational fisheries within these basins and in downstream areas and provide increased recreational fishing opportunities. Related increases in predator species attracted by spawning adults in the fall could increase wildlife viewing options in the affected areas. There is no forecast of future adult returns, however, and it is not possible to provide estimates of additional fish that could be available for harvest under the Proposed Action. The potential for increased adult returns would require multiple generations to be realized, so any potential benefits to recreation would occur well into the future.

3.8.3 Environmental Consequences for Land Use and Recreation – No Action

Under the No Action Alternative, the Powerline acclimation pond would not be constructed and the coho acclimation sites would not be used for acclimation of spring Chinook and steelhead. No project-related impacts to land use and recreation would occur.

3.9 Visual Resources

3.9.1 Affected Environment

Visual resource attributes of interest for the assessment include the existing landscape character, viewer groups who might be exposed to changes in the landscape, and applicable visual resource management direction. These characteristics are summarized below for the Methow and Wenatchee basins and for the respective acclimation sites.

3.9.1.1 Methow Basin Overview

Landscape Character

Most of the Methow River basin is within the North Cascades Level-III ecoregion, although the lower part of the basin is within a sub-region of the Columbia Plateau ecoregion (EPA 2010, 2013). The terrain in this ecoregion consists of high, rugged mountains underlain by sedimentary and metamorphic rocks. The Methow Valley from approximately the Winthrop area downstream is within the Okanogan Valley Level-IV ecoregion, a drier area with relatively wide river valleys bordered by more rolling low mountains and foothills.

Viewer Groups

Visual resource assessment considers landscape conditions as they are seen by key viewer groups, which typically include residents, recreational users, and people using important travel routes. Many residential viewers in the Methow Basin are concentrated within communities such as Winthrop and Twisp, although other residents are distributed at low densities within the private-land areas of the basin. Viewers are also found on the primary travel routes of SR 20 and SR 153 and a variety of other travel routes, including secondary roads maintained by Okanogan County and the USFS, trails, and water bodies including the Methow River. Residents of the Methow Valley and visitors to the region place a high value on outdoor recreation (Okanogan County 2012).

Resource Management Direction

Most of the public lands within the Methow Basin are National Forest System lands subject to the USFS scenery management system. Under current plans, approximately 60 percent of the former Okanogan National Forest is managed to maintain natural-appearing landscapes, and the USFS has identified scenic viewsheds (including the North Cascades Scenic Highway [SR 20]) that would be managed to maintain high visual levels (USFS 1989).

Non-federal lands within the Methow Basin are subject to the land use and development regulations adopted by Okanogan County. The Okanogan County (2014a) Comprehensive Plan does not specifically address visual resources as a countywide planning consideration. The County's adopted plan for the upper Methow Valley above Winthrop (Sub-unit A) states that "Fields, meadows, scenic views and open space areas must also be preserved to maintain the open, rural density and pastoral setting of the area; adequate minimum lot sizes, at or above current zoning are crucial to achieve this goal" (Okanogan County 2014b). The land use element of this plan identifies a goal to encourage preservation, protection, enhancement and restoration of open space and view corridors within the planning area; an associated policy is to "establish a program to identify, prioritize and protect valuable open space areas and view corridors" (Okanogan County 2014b).

3.9.1.2 Methow Acclimation Site Conditions

The following paragraphs provide a general overview of visual resource conditions at the four acclimation sites located in the Methow Basin.

Goat Wall: The Goat Wall site, located approximately 3 miles northwest of Mazama, is in a valley-floor area at the upper extent of the Okanogan Pine/Fir Hills ecoregion, and is closely flanked by mountains within the Pasayten/Sawtooth Highlands ecoregion. The acclimation site itself has a rural character, with residential structures and outbuildings set within maintained lawn area. The residential site is bordered by riparian vegetation toward the river, open valley floor terrain to the northwest (upstream), and predominantly conifer forest to the northeast and east. Potential viewers at this site include the residents of the property and people traveling past on the Lost River Road adjacent to the property.

Early Winters: The Early Winters site, located approximately 2 miles west of Mazama, is also in a valley-floor area at the upper extent of the Okanogan Pine/Fir Hills ecoregion, and is closely flanked by mountains within the Pasayten/Sawtooth Highlands ecoregion. The acclimation site itself has a rural character, with dispersed cabin structures set within a somewhat open forested area. The site is bordered by riparian vegetation along the creek, the SR 20 corridor to the north, and

predominantly conifer forest to the south and east. Potential viewers at this site include guests staying at the Freestone Inn and Early Winters Cabins, people traveling past on SR 20, and users of the nearby trails.

Chewuch AF: The Chewuch AF site is also in a valley-floor area at the upper extent of the Okanogan Valley ecoregion, adjacent to areas within the Okanogan Pine/Fir Hills ecoregion. Patchy tree cover is present on the valley floor in the immediate vicinity of the site, while the slopes on the east side of the Chewuch River are forested and those to the west are generally open. The natural landscape has been modified by development of WDFW structures and access roads, and the Eastside-Chewuch Road and the Chewuch River Road on the west side of the river. Potential viewers at this site include users of the WDFW Methow Wildlife Area, residents of developed properties nearby, and people traveling past the site.

Gold Creek: This site is within the Okanogan Pine/Fir Hills ecoregion. The South Fork of Gold Creek flows through a narrow valley, with limited areas of relatively flat land near the stream. Forest cover is present along the creek and on the slopes to the east, except where property owners have cleared areas adjacent to homes and outbuildings. The natural landscape has been modified by development the South Fork Gold Creek Road (USFS Road 4330), a handful of rural residences, and an access road east of the creek. Potential viewers at this site include residents of the developed properties nearby and people traveling past the site.

3.9.1.3 Wenatchee Basin Overview

Landscape Character

Similar to the Methow River basin as described above, all but a small portion of the Wenatchee Basin is within the North Cascades Level-III ecoregion (EPA 2013). Again, much of the higher-elevation land in the basin is within the Okanogan-Wenatchee National Forest, managed by the USFS, and most of the Forest has a natural-appearing visual condition (USFS 1990).

Viewer Groups

Many residential viewers in the Wenatchee Basin are concentrated within river-valley communities such as Leavenworth, Peshastin, Cashmere and Wenatchee. Viewers are also found along the major travel routes of US 2, US 97, SR 207, and SR 209 and on a variety of other routes, including secondary roads maintained by Chelan County and the USFS, trails, and water bodies including the lower part of the Wenatchee River.

Resource Management Direction

Most of the public lands within the Wenatchee Basin are NFS lands subject to the USFS scenery management system. Under current plans, more than 80 percent of the former Wenatchee National Forest is managed to maintain natural-appearing landscapes, and the USFS has identified numerous travel routes and water bodies as important viewsheds with high visual sensitivities (USFS 1990).

Non-federal lands within the Wenatchee Basin are subject to the land use and development regulations adopted by Chelan County. The Chelan County (2014) Comprehensive Plan does not specifically or directly address visual resources as a countywide planning consideration. However, there are land use goals that encourage natural and scenic character and retention of open space.

3.9.1.4 Wenatchee Acclimation Site Conditions

The following paragraphs provide a general overview of visual resource conditions at the three acclimation sites located in the Wenatchee Basin.

Powerline: The Powerline site is in a valley-floor area of Nason Creek within the Wenatchee/Chelan Highlands ecoregion. The valley floor is generally rolling and narrow in this area, and forested slopes rise steeply to the north and south of the creek. The landscape around the acclimation site has a substantially modified character, because it is situated within a major utility and transportation corridor. The acclimation pond at this site would be constructed on a portion of the parcel that lies within an existing BPA transmission right-of-way. BNSF mainline railroad tracks cross the southeastern part of the property and the unpaved Whitepine Road is adjacent to the pond location. Because the site is within the cleared transmission right-of-way, it provides open, expansive views of the mountains framing the Nason Creek valley. Potential viewers at this site are primarily people traveling past on the Whitepine Road, the Cascade Meadows church camp (see Section 3.8), and the trailhead for the Whitepine Creek Trail #1582 at the end of the road (USFS 2015c).

Rohlfing: Visual resource conditions in the vicinity of the Rohlfing site are similar to those described above for the adjacent Powerline site. The site character is not as highly modified, however, because the BPA transmission right-of-way occupies the northern part of the Rohlfing parcel and the acclimation pond is not within the right-of-way. Views at the acclimation pond are largely enclosed by the surrounding forest. Potential viewers at this site are the owners of the vacation home that is less than 100 feet from the pond, plus people traveling past the site on the Whitepine Road.

Trinity: The Trinity acclimation site is also within the Wenatchee/Chelan Highlands ecoregion, in a valley-floor area of the Chiwawa River. The valley floor is relatively flat and narrow in this area, and forested slopes rise steeply to either side of the river. The landscape around the acclimation site itself has a combined rural and industrial character, because it is within a small clearing occupied by a cluster of structures associated with past mining and hydroelectric facility development on the Trinity Village property. The unpaved USFS Chiwawa River Road passes along the east side of the developed area at the site. Natural-appearing forest lands surround the developed area. Potential viewers at the Trinity site are primarily the owners or users of the Trinity Village property and people traveling past the site on the Chiwawa River Road.

3.9.2 Environmental Consequences for Visual Resources – Proposed Action

Potential impacts to visual resources, based on the expected visibility of program activities to potentially sensitive viewers, are discussed below. The consistency of program-related visual changes with applicable visual resource management direction is also addressed.

3.9.2.1 Visibility and Visual Change

For the proposed Powerline site, construction of the pond and access road would require clearing of vegetation and excavation and grading of soil. The surface disturbances and the associated construction equipment would be visible during the construction period to people in the immediate

vicinity of the site. Following construction, the existing landscape in the vicinity of the site would be modified by the addition of a small pond and adjacent riparian vegetation.

The existing visual environment at the Powerline site includes a portion of the Whitepine Road, an existing BPA right-of-way with two lattice-steel transmission lines and associated maintenance roadways, and BNSF railroad tracks with frequent train traffic. Based on the degree of existing landscape modification and the limited level of human activity evident at the site during the acclimation period, construction and operation of an acclimation pond on the Powerline site would represent a minimal change to the existing visual environment. Operational activities at the coho sites would create no change to the visual environment. Therefore, impacts to visual resources at the proposed Powerline acclimation site would be low.

For the four existing coho ponds, the Proposed Action would not require any new construction and there would be no construction-related changes to the existing landscape. There would also be minimal change to the level of human activity at these sites during the acclimation period because of the already existing coho acclimation activities. Therefore, impacts to visual resources at the existing acclimation sites would be low.

3.9.2.2 Consistency with Management Direction

The proposed Powerline acclimation site is on private property and actions on the sites are not subject to USFS visual resource management direction. The Chelan County Comprehensive Plan does not specifically address visual resources as a countywide planning consideration, nor do associated land use regulations (i.e., zoning and shoreline management provisions) address visual resources. Per the discussion of land use consistency provided in Section 3.8.2, the visual changes resulting from construction and operation of the new Powerline acclimation pond would be consistent with the applicable zoning and shoreline management direction for the site.

There would be no change to the current land uses or visual character from operational activities at the coho acclimation sites. There would thus be no issues related to the consistency of program-related visual changes with applicable visual resource management direction incorporated in applicable land use plans and regulations.

There is no effect to the visual resources as a result of the Powerline site construction or the additional operational activities at the coho acclimation sites.

3.9.3 Environmental Consequences for Visual Resources – No Action

Under the No Action Alternative, the Powerline acclimation pond would not be constructed and the coho acclimation sites would not be used for acclimation of spring Chinook and steelhead. No project-related impacts to visual resources at those sites would occur.

3.10 Air, Noise, and Public Health and Safety

3.10.1 Affected Environment

3.10.1.1 Air Quality

The EPA and the WDOE both have responsibility for regulating air quality in the State of Washington. The EPA has established National Ambient Air Quality Standards (NAAQS) to protect

the public from air pollution (42 U.S.C. 7401 *et seq.*). The NAAQS focus on “criteria pollutants,” which are pollutants of particular concern for human health. The criteria pollutants include carbon monoxide, lead, ozone, nitrogen dioxide, sulfur dioxide, and particulates (EPA 2015). In addition to the NAAQS, the WDOE has established State Ambient Air Quality Standards (SAAQS) that are at least as stringent as the NAAQS (WDOE 2015b).

Air quality in the Methow Basin is considered generally high, with seasonal degradation from local use of wood stoves, forest fires, and slash burning conducted on federal lands (Okanogan County 2014). Air quality in the Wenatchee Basin is also typically high, with intermittent lower quality or hazardous air quality days due to wildfires in the vicinity (WDOE 2012b).

All of the seven acclimation sites are in areas that are in attainment with the NAAQS (WDOE 2015). This means that the concentrations of criteria pollutants in the area are historically below (in attainment with) the thresholds described in the NAAQS. Attainment status is a federal designation determined by the EPA based on the NAAQS. Washington does not determine or define attainment for areas based on the SAAQS. Sources of criteria pollutants in the vicinity of the program sites include vehicles on state and local highways, residential home heating (particularly wood burning), recreation activities (campfires), and re-suspension of road dust from traffic on roadways (particularly from unpaved roads).

3.10.1.2 Noise

The Washington Administrative Code defines categories of properties based on their sensitivity to noise. “EDNA” stands for the Environmental Designation for Noise Abatement: an area or zone (environment) within which maximum permissible noise levels are established (WAC 173-60-020). Table 3-9 shows permissible noise levels for the three classes of property defined in the code. Classes of property are defined below (not all examples from the code are listed) (WAC 173-60-030).

Class A EDNAs are lands where human beings reside and sleep. Typically, Class A properties include single- and multiple-family residences and recreational and entertainment properties where people sleep, such as camps, parks, camping facilities, and resorts.

Table 3-9 Maximum Permissible Noise Levels (dBA) at Three Classes of Property ^{1/}

EDNA of Noise Source	EDNA of Receiving Property		
	Class A	Class B	Class C
Class A (Residential)	55 dBA	57 dBA	60 dBA
Class B (Commercial)	57 dBA	60 dBA	65 dBA
Class C (Industrial)	60 dBA	65 dBA	70 dBA

^{1/}“dBA” – the sound pressure level in decibels measured using the “A” weighting network on a sound level meter. Decibels are usually measured with a filter that emphasizes sounds in certain frequencies. The “A” filter (dBA) is the one most frequently used. The “C” filter (dBC) puts more weight on low-frequency sounds such as the bass in amplified music.

Class B EDNAs have uses requiring protection against noise interference with speech— generally commercial establishments such as office buildings, restaurants, and entertainment facilities not designed for human habitation, fairgrounds and amusement parks, or community services property not used for human habitation (e.g., educational, religious, governmental, cultural and recreational facilities).

Class C EDNAs are lands involving economic activities for which higher noise levels than experienced in other areas would normally be expected, including warehouses and distribution centers, agricultural lands used for raising crops or livestock, timber lands, and manufacturing facilities.

The noise limits shown in Table 3-9 have the following modifications or exceptions that are relevant to this project:

- In general, between the hours of 10:00 p.m. and 7:00 a.m. the noise limitations shown in the table must be reduced by 10 A-weighted decibels (dBA) for receiving properties within Class A EDNAs.
- Noise limits may be exceeded at any time during the day or night for brief periods of from 1.5 to 15 minutes, depending on the decibel level.
- Construction noise from temporary construction sites may exceed noise limits except between the hours of 10 p.m. and 7 a.m. at Class A EDNAs.

All seven acclimation sites would likely be considered Class A EDNAs, although all of the sites are in rural settings with light residential and/or recreational use. The nearest structures at the Powerline site are over 500 feet from the proposed acclimation pond location. Existing structures are located within approximately 200 to 300 feet at the other six sites.

3.10.1.3 Public Health and Safety

The Proposed Action includes spring Chinook and steelhead acclimation at seven sites in rural settings on private properties on which the owners conduct residential, ranching and other activities that are not typically regarded as likely sources of toxic or hazardous substances. Public health and safety risks present at and near the sites are typical of those for rural areas with limited development, including events such as traffic accidents, weather-related travel hazards, wildfires, and medical emergencies. Numerous federal, state and local government jurisdictions provide law enforcement, fire protection, emergency medical and related public health and safety services within the Methow and Wenatchee basins.

3.10.2 Environmental Consequences for Air, Noise, and Public Health and Safety – Proposed Action

Construction activities would occur at the Powerline site and potential air quality and noise impacts associated with that construction is discussed below. Spring Chinook and steelhead acclimation at the four existing coho acclimation sites would use existing ponds and facilities, so only air quality and noise impacts associated with operations at those sites are addressed.

3.10.2.1 Air Quality

Construction: Emissions from vehicles and equipment used during the construction period at the Powerline site (likely no more than 2 months in duration at either site) are not expected to add substantially to existing emissions generated by traffic along nearby US 2. Transport vehicles would be active a short distance (approximately 0.8 mile) on the unpaved Whitepine Road when approaching or leaving the Powerline site, which would limit the potential for dust emissions associated with transportation activity. Fugitive dust would also be created from clearing and grading for pond and access road construction at the Powerline site. Dust abatement measures would be used during construction as necessary (see mitigation discussion below). Exhaust emissions from operation of equipment such as excavators would be limited to short, intermittent periods of activity and would result in low, temporary air impacts.

Operation: Three of the seven proposed acclimation sites (Rohlfing, Powerline, and Trinity) are accessed via unpaved roads. Project vehicles would travel to and from each site at least twice a day during the acclimation period, which would occur during late winter and spring. Roads are likely to be relatively wet (and potentially snow-covered at times) at this time of year, and dust generation is expected to be minimal. With a limited number of visits to each site, airborne dust is not expected to impact air quality or be a nuisance to humans that may be present in the vicinity of these three sites. Dust generation is not an issue for the other four sites (Goat Wall, Early Winters, Chewuch AF and Gold Greek), which are accessed from paved roads. For all seven sites, vehicle usage during operation would be so limited that vehicle emissions are likewise not an issue.

Because of the limited nature of the air quality impacts and mitigation measures that would be implemented, impacts to air quality from the Proposed Action would be low.

3.10.2.2 Noise

Construction: The sound produced by conventional construction equipment used for earthwork typically ranges from about 79 to 103 dB, with averages as follows: 96 dB for a truck, 88 dB for a front end loader, 86.5 dB for a backhoe, and 96 dB for a bulldozer (LHSFNA 2015). The intensity of sound diminishes by about 7.5 dB as distance doubles, where vegetation is present to absorb noise, as at the Powerline site. Atmospheric conditions and topography also strongly influence the reach of noise. Given the typical sound levels at the source, noise from heavy machinery could extend approximately 600 to 1,000 feet outward from the construction locations before diminishing to ambient levels.

Ambient noise levels at the Powerline site are unknown, but could be comparatively high for a site in a rural area because of its proximity to US 2, the mainline BNSF railroad track, and the high-voltage transmission lines. Construction noise at the Powerline site may be noticeable at the

residence on the Powerline property, at the vacation home located on the property of the Rohlfling acclimation site, and possibly at a church camp located farther to the south. However, noise produced by construction of the Powerline acclimation pond would occur intermittently during a construction period of limited duration (likely no more than 2 months). Based on those attributes and the distance from the site to potential receptors, noise impacts from construction of the Powerline acclimation site would be low.

Operation: Potential noise sources during operation at the seven acclimation sites would primarily include vehicle noise associated with crews accessing the sites. Each of the sites would require regular, daily human presence during the acclimation period (6 weeks to 7 months, depending on the site). Crews of at least two people would be responsible for operations at multiple acclimation sites and would drive between them during the course of the day, visiting each site at least twice a day. These types of operation activities would be consistent with ongoing human activities at the acclimations sites, and would not result in a noticeable change to the average ambient noise levels at the sites.

Acclimation operations may require the use of portable generators for primary or backup electrical power during operation. The generators would operate either continuously or only during power outages, depending on the capacity and presence of existing electrical service. Noise-muffling enclosures would be used to ensure that generator noise does not exceed permissible noise limits at noise-sensitive properties such as residential areas or developed recreation sites in accordance with state law⁸.

Because the noise from construction of the Powerline site would be temporary and operations at the seven acclimation sites would result in minimal additional noise and mitigated when necessary, impacts to noise from the Proposed Action would be low.

3.10.2.3 Public Health and Safety

Construction activity at the Powerline site would be conducted subject to standard BPA contract requirements for worker safety, including procedures for working near transmission lines. Access to the site and travel on Whitepine Road would be managed to minimize safety risks for non-project human activity in the vicinity of the site. Operations at the acclimation sites would involve limited regular vehicle use and human activities that do not entail inherent health or safety risks for people in the vicinity. Future needs for law enforcement, fire protection, emergency medical, and related public health and safety services would remain within the capacity of the existing service providers.

Construction at the Powerline site and operation of the six coho acclimation sites would meet the guidelines for use, handling, storage, and disposal of hazardous substances. Regulated pesticide products would either not be used or necessary permits would be obtained prior to application.

Because project activities would be conducted in compliance with applicable laws, regulations, and guidelines, potential risks of the Proposed Action on public health and safety would be low.

⁸ Washington Administrative Code Chapter 173- 60 of the Noise Control Act of 1974

3.10.3 Environmental Consequences for Air, Noise, and Public Health and Safety – No Action

Under the No Action Alternative, the Powerline acclimation pond would not be constructed and the coho acclimation sites would not be used for acclimation of spring Chinook and steelhead. Potential air quality and noise conditions at and near the sites of these existing ponds would continue to occur as a result of the ongoing residential, ranching and other current uses near these sites and the incremental human presence associated with the ongoing coho acclimation program. The proposed new acclimation pond at the Powerline site would not be constructed, and no project-related construction air quality or noise impacts would occur in these areas. Noise receptors near the Powerline site would continue to be affected by the presence of a lightly-used national forest road, three major transmission lines, a major highway and a busy rail line. Existing conditions related to public health and safety risks at all of the proposed acclimation sites would continue as at present, based on the ongoing uses near these sites.

3.11 Cultural Resources

3.11.1 Affected Environment

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 Part 800, the implementing regulations of the National Historic Preservation Act (NHPA) (54 U.S.C. § 300101 *et seq.*), are a subset of cultural resources that are eligible for inclusion in the National Register of Historic Places (referred to as the National Register). 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.

BPA investigated cultural resource conditions and evaluated potential impacts for the existing coho acclimation sites through the Mid-C Coho Program (BPA 2012) and associated SAs. BPA engaged a cultural resources consultant to review the Washington Department of Archaeology and Historic Preservation's (WDAHP) online database for archaeological site records, cultural resource survey reports, cemetery records, Historic Property Inventory forms, and nominations to the National Register and Washington Heritage Register. The WDAHP statewide predictive model was analyzed for probability estimates for prehistoric cultural resources, and to aid in developing the field strategy. The consultants also reviewed relevant environmental, archaeological, ethnohistoric, and historical reports at the Spokane Public Library's Northwest Room. In addition, staff examined General Land Office plats available online through the BLM's website to locate nearby historical features that might have left archaeological remains. On-site surveys for Mid-C Coho Program action sites that required ground disturbance were conducted in 2011. The surveys found that no cultural resources would be affected at any of the acclimation (or hatchery) sites. Therefore, BPA (2012) determined that implementation of the Mid-C Coho Program in those locations would have no effect on cultural resources, and the Washington State Historic Preservation Office (SHPO) concurred with that determination (please see the Mid-C Coho Program EIS, Section 3.13.2 [BPA 2012]).

The area proposed for the new Powerline acclimation pond is encompassed by a large existing BPA transmission line right-of-way. Therefore, the site has already experienced surface disturbance associated with construction of the existing transmission lines and clearing of the right-of-way, as well as from historical logging activity. A cultural survey of the Powerline site was conducted by the YN for BPA. No cultural resources were identified.

3.11.2 Environmental Consequences for Cultural Resources – Proposed Action

Construction of the Powerline pond and access road has the potential to impact cultural resources, however, no sites were found during surveys of the area. Though the potential for undiscovered sites to be found is low due to previous disturbance, an inadvertent discovery protocol would be followed that would lessen potential impacts to sites if discovered during construction activities.

The expanded use of the six coho ponds to include spring Chinook and steelhead acclimation would not have an increased potential to effect cultural resources at those sites as the operational activities would be the same as is used for the coho acclimation.

3.11.3 Environmental Consequences for Cultural Resources – No Action

Under the No Action Alternative, the Powerline acclimation pond would not be constructed so there would be no potential for project-related impacts to cultural resources; and the coho acclimation sites would not be used for acclimation of spring Chinook and steelhead so no impacts to cultural resources would occur at those sites.

3.12 Socioeconomics

3.12.1 Affected Environment

The general area of interest for socioeconomic effects includes Chelan and Okanogan counties. The acclimation sites in both basins are primarily rural and widely distributed in the Wenatchee and Methow watersheds. The four acclimation sites in Okanogan County are located on private or state lands in the Methow Basin, near the communities of Mazama, Winthrop, and Carlton. The three acclimation sites in Chelan County are located on private inholdings in the Okanogan-Wenatchee National Forest. The city of Leavenworth is the closest community to the sites in Chelan County.

3.12.1.1 Economic Characteristics

Per capita income in Okanogan County in 2013 was \$20,735, which was equivalent to 67.4 percent of per capita income for the state as a whole. In Chelan County, per capita income in 2013 was \$25,893, approximately 84.2 percent of the statewide (Table 3-10). Median household income in 2013 was \$40,368 and \$51,354, respectively, in Okanogan and Chelan counties, equivalent to 67.9 percent and 86.3 percent of the state median. The share of the population below the poverty level was higher than the state average in both Okanogan and Chelan counties in 2013, 21.7 percent and 16.0 percent, respectively, versus 14.1 percent statewide (Table 3-10).

Average annual unemployment rates in 2014 were 7.4 percent in Okanogan County, 6.3 percent in Chelan County, and 6.2 percent statewide (Table 3-10). Previous discussions with farmers have suggested that unemployment rates may be higher than corresponding county rates in smaller communities that are heavily dependent on the agricultural sector, with lower unemployment rates

and more diverse opportunities available in larger communities elsewhere in the study area counties (BPA 2012).

Table 3-10 Economic Characteristics

Economic Indicator	Chelan	Okanogan	Washington
Employment (2014)	38,360	19,690	3,270,360
Unemployment Rate (%) (2014)	6.3	7.4	6.2
Per Capita Income (2013)	25,893	20,735	30,742
As Percent of State Per Capita	84.2	67.4	100.0
Median Household Income	51,354	40,368	59,478
As Percent of State Median	86.3	67.9	100.0
Persons in Poverty (%) (2013)	16.0	21.7	14.1
Sources: U.S. Census Bureau 2015; Washington Employment Security Department 2015			

3.12.1.2 Environmental Justice Populations

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations was signed by President Clinton on February 11, 1994. This Executive Order directs federal agencies to take the appropriate and necessary steps to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of federal programs, policies, and activities on the health or environment of minority populations and low-income populations (collectively, the environmental justice populations) to the greatest extent practicable and permitted by law.

Guidelines provided by the CEQ (1997) and EPA (1998) indicate that a minority community 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 in the general population of an appropriate benchmark region used for comparison. The population in the study area counties and the communities located near the proposed acclimation sites primarily identified as White in the 2010 census. American Indians made up a relatively large share of the population in Okanogan County, accounting for 11 percent of the total population versus 1 percent statewide (Table 3-11). People identifying as Hispanic or Latino also comprised relatively large shares of the population in Chelan and Okanogan counties, with other minority populations (grouped as “Other Race” in Table 3-11) relatively underrepresented.

Low-income populations may be defined based on the U.S. Department of Health and Human Services poverty guidelines; for 2013, this was \$23,550 for a family of four (U.S. Department of Health and Human Services 2013). In Chelan and Okanogan counties, respectively, 16.0 percent and 21.7 percent of the populations had incomes below the poverty level, compared to 14.1 percent statewide (Table 3-11).

Table 3-11 Percent of Population by Race and Ethnicity

Geographic Area	Total Population	Percent of Total Population				
		White ^{1/}	American Indian and Alaska Native ^{1/}	Hispanic or Latino	Other Race ^{1/, 2/}	Two or More Races ^{1/}
Chelan County	72,453	71%	1%	26%	1%	2%
Okanogan County	41,120	68%	11%	18%	1%	2%
Washington	6,724,540	73%	1%	11%	11%	4%

Notes:
^{1/} Non-Hispanic only. The federal government considers race and Hispanic/Latino origin (ethnicity) to be two separate and distinct concepts. People identifying as Hispanic or Latino origin may be of any race. The data summarized in this table present Hispanic/Latino as a separate category.
^{2/} The “Other Race” category presented here includes census respondents identified as Black or African American, Asian, Native Hawaiian and Other Pacific Islander, or Some Other Race.
 Source: U.S. Census Bureau 2010

3.12.2 Environmental Consequences for Socioeconomics – Proposed Action

3.12.2.1 Construction

Population

Construction activity to support the Proposed Action would be limited to the Powerline site in Chelan County. Based on the limited scope and short duration of these construction activities, it is expected that the work would be accomplished by a locally-based construction contractor. Therefore, no construction workers would be expected to temporarily relocate as a result of the project and there would be no effect on the local population.

Employment and the Economy

Construction at the Powerline site would provide short-term employment opportunities for labor categories that are present in the local labor market. Acclimation site capital costs include construction activities for pond and road development and modification, site facilities, and water supply development. Expenditures for construction-related labor, materials, and services would likely occur within the local area and elsewhere in the state. These expenditures would have a small, temporary, positive impact on the local economy.

Infrastructure and Community Services

Potential impacts to transportation are discussed in Section 3.7, Transportation, of this EA. Because no construction workers are expected to temporarily relocate to the local area, no effect on local infrastructure or the provision of community services is expected.

Fishing Rights

The Colville Tribes provided comments during the EA scoping process about the respective roles in the Methow and Wenatchee river basins of the Yakama Nation and the Colville Tribes. The Yakama Nation and federal agencies understand that the Yakama Nation’s fishing rights are based on their treaty from 1855 and the judicial decisions interpreting it. This EA does not affect that treaty or its judicial decisions. Fishing rights can in no way be inferred legally based on participation in this

environmental assessment process to examine construction and use of acclimation ponds for steelhead and spring Chinook salmon. BPA contracted with the Yakama Nation to help reintroduce these fish species into the Methow and Wenatchee river basins, and that contract does not affect tribal treaty fishing rights.

Environmental Justice

The Proposed Action would have a small but positive impact on local economic conditions in Chelan and Okanogan counties. Construction of the Proposed Action is not expected to have high and adverse human-health or environmental effects on nearby communities.

3.12.2.2 Operations

Population

Operation of the acclimation ponds would require a small seasonal workforce, with most of the positions filled by workers already employed by the Mid-C Coho Program. There would be no impact on the population of nearby communities.

Employment and the Economy

As noted above, operation of the acclimation ponds would employ a small seasonal workforce that would mostly consist of workers already employed in the Mid-C Coho Program. Operating costs, including labor, supplies, and travel-related expenditures would make a very small, positive impact on the local economy.

The Proposed Action is intended to increase the abundance of adult spring Chinook and steelhead returning to spawn in the Methow and Wenatchee basins, and thereby promote the recovery of these species and support desires for future harvest. If the Proposed Action is successful in meeting those objectives, it is possible that future numbers of adult fish could help to support tribal subsistence and commercial fisheries and non-tribal commercial and recreational fisheries within these basins and in downstream areas. To the extent this would occur, any fisheries supported by the Proposed Action would generate additional expenditures and income within the region. To date, there is no available forecast of future adult returns with the Proposed Action, and no estimate of how many fish might be available for harvest at specific points in the future. Moreover, the potential for increased adult returns would require multiple generations to be realized, so any benefits to regional economies would occur well into the future. As a result, sufficient information to support a more definitive statement about fisheries-related impacts on regional economies is not currently available.

Infrastructure and Community Services

Potential impacts to transportation are discussed in Section 3.7, Transportation, of this EA. Operation of the acclimation ponds is not expected to affect local infrastructure or the provision of community services.

Environmental Justice

Operation of the Proposed Action is not expected to have disproportionate adverse human-health or environmental effects on nearby communities. To the extent the Proposed Action is successful in

promoting the recovery of spring Chinook and steelhead stocks in the Methow and Wenatchee basins, it would have positive effects on the Native American communities with interests in these basins.

Therefore, the Proposed Action through the construction of the Powerline site and the operation of all seven acclimation sites would have a low impact on socioeconomics.

3.12.3 Environmental Consequences for Socioeconomics – No Action

Under the No Action Alternative, the Powerline acclimation pond would not be constructed and the coho acclimation sites would not be used for acclimation of spring Chinook and steelhead. The proposed new acclimation pond at the Powerline site would not be constructed, and no project-related socioeconomic impacts associated with the construction activity would occur.

3.13 Climate Change

Greenhouse gases (GHGs) are chemical compounds in the earth's atmosphere that absorb and trap infrared radiation (heat) that is reflected or emitted from the surface of the earth. The trapping and subsequent buildup of heat in the atmosphere creates a greenhouse-like effect that maintains a global temperature warm enough to sustain life (EIA 2009). Some forms of GHGs can be produced either by natural processes or as a result of human activities. However, the current scientific consensus is that human-made sources are increasing atmospheric GHG concentrations to levels that would raise the earth's average temperature. The United States Global Climate Research Program (USGCRP) found that since the 1970s, average U.S. temperatures and sea levels have risen and precipitation patterns have changed (USGCRP 2009). The Intergovernmental Panel on Climate Change found similar patterns on a global climate scale (IPCC 2007). Models predict that, by 2100, the average temperature in the United States would increase by about 4 to 11 degrees Fahrenheit depending on the emissions scenarios and climate models used (Meehl et al. 2007).

The Mid-C Coho Program EIS (BPA 2012) documented a comprehensive evaluation of the environmental impacts of the Mid-C Coho Program, which included development of hatchery facilities and the construction and operation of acclimation ponds for coho. As noted in Section 3.14.3.1 of the EIS, BPA determined that the primary contribution of the Mid-C Coho Program to climate change was related to the potential minor emission of GHGs as a result of construction equipment and personal vehicle use. GHG emissions were calculated based on methodology provided by the EPA, the Intergovernmental Panel on Climate Change, and the Energy Information Administration. The methods used estimates of multiple variables including, but not limited to, the number of project vehicles, number of trips per day, distance traveled, other sources of fossil fuel combustion (e.g., generators), and duration of activities. The EIS concluded that construction and operation of the hatcheries and the associated acclimation facilities would have a minor adverse impact on atmospheric GHG concentrations and an unquantifiable, likely insignificant, impact on climate change (BPA 2012).

By extension, the Proposed Action to construct a new acclimation facility at the Powerline site and conduct spring Chinook and steelhead acclimation operations at this site and six coho acclimation sites would result in GHG emissions at a fraction of the level estimated for the Mid-C Coho Program. As a result, the impacts of the Proposed Action on climate change would similarly be low.

3.14 Cumulative Effects

Cumulative effects are the incremental effects of a project or program when added to effects of other past, present, and reasonably foreseeable future actions. Sections 3.1 through 3.13 of this chapter present information about current environmental conditions and the environmental and socioeconomic consequences of implementing the Proposed Action. This section addresses the cumulative impacts of the Proposed Action when combined with other past, present, and reasonably foreseeable actions.

Past Actions/Events

- Road and railroad construction;
- Forest management, including harvest;
- Development of ranches, vacation homes, permanent residences, and campgrounds;
- Construction of transmission lines;
- Construction of a small-scale hydroelectric generation facility; and
- Establishment of U.S. national forests and state wildlife management areas.

Present (Ongoing) Actions

- Maintenance and use of local roads, highways and railroads;
- Dispersed recreation activity; operation and use of campgrounds;
- Ranching;
- Occupancy of vacation homes and residences;
- Operation of a small hydroelectric facility;
- Right-of-way maintenance along existing transmission lines;
- Coho salmon acclimation and release; and
- USFS and WDFW land management practices (e.g., timber and mineral management, road construction and decommissioning, weed management, stream restoration projects, fishing pressure (both local and downstream), and fuel management).

Reasonably Foreseeable Future Actions

- Ongoing use of roads, highways, railroads, dispersed recreation resources, campgrounds, vacation homes, residences, ranches and a hydroelectric facility;
- Potential future development of additional residences and/or vacation homes on private lands near the acclimation sites;
- Ongoing operation and maintenance of transmission lines;
- Ongoing implementation of the Mid-C Coho Program; and

- Ongoing management of Okanogan-Wenatchee National Forest System lands and state wildlife area lands according to adopted agency management plans, and implementation of the USFS Nason Creek Upper White Pine Reach Aquatic Habitat Restoration Project.

3.14.1 Geology and Soils

Past and ongoing land use activities near sites addressed in the Proposed Action include residential development, BPA vegetation management activities, and use of roads, highways, railroads, recreation resources and a hydroelectric facility. The amount of soil that would be affected by the Proposed Action through construction of the proposed new acclimation pond at the Powerline site is small compared to the area affected by other past, present and reasonably foreseeable future actions in the area. Therefore, the Proposed Action would have a low cumulative impact on geology and soils.

3.14.2 Water Resources

3.14.2.1 Water Quality

The Mid-C Coho Program is ongoing in the Wenatchee and Methow basins, including acclimation of coho at six of the seven sites under the Proposed Action. The timing of phosphorus discharges associated with acclimation, in relation to annual flow patterns, is important to the evaluation of cumulative impacts on water quality. The Wenatchee and Methow rivers have peak average flows in early June. Acclimation ends in late May, just as spring runoff begins. The total phosphorus loads from the additional acclimation activity from the Proposed Action are unlikely to cause a measurable change in dissolved oxygen and pH in the Wenatchee and Methow Rivers. There would be a low incremental effect of the additional acclimation activity from the Proposed Action when added to the ongoing Mid-C Coho Program and past and reasonably foreseeable future actions. Thus, cumulative impacts of the Proposed Action would be low.

3.14.2.2 Water Quantity

The construction and operation of the proposed Powerline acclimation site will require no withdrawal of surface or ground water, nor will the operation of the existing coho acclimation sites for acclimating spring Chinook and steelhead. There will thus be no cumulative effect on water quantity.

3.14.3 Vegetation

Vegetation management activities, transportation, ranching, residential development, and the development of the Mid-C Coho Program are responsible for most of the past and present vegetation impacts in the area of the Proposed Action. Vegetation management occurs every three to five years along the BPA transmission right-of-way where the proposed Powerline site would be. Contributions to cumulative impacts from the Proposed Action on vegetation would include the permanent removal and temporary disturbance of vegetation community at the Powerline site for pond and access road construction. Through the implementation of mitigation measures identified in Section 2.4, vegetation losses and damage would be minimized; thus, when combined with other past, present, and reasonably foreseeable future actions, the Proposed Action would have a low cumulative impact on vegetation.

3.14.4 Wetlands and Floodplains

Wetland and floodplain cumulative impacts could result if past, present and reasonably foreseeable future actions were to affect wetland and floodplain functions (i.e., water quality, hydrology, and wildlife habitat). Construction activities associated with the proposed new facilities at the Powerline site would not impact wetland habitat or floodplains. Further, the proposed Powerline pond site would provide minor additional floodplain storage. Thus, when combined with other past, present, and reasonably foreseeable future actions, the Proposed Action would have no cumulative impact on wetlands and floodplains.

3.14.5 Fish

As discussed in Section 3.5, the sites proposed for acclimation of spring Chinook and steelhead would temporarily displace steelhead, spring Chinook, and bull trout from approximately 0.24 acre of aquatic habitat in both basins. Most of this habitat normally is not preferred by spring Chinook, steelhead, and bull trout. Moreover, because virtually all of this small area is already temporarily unavailable as a result of coho acclimation, the impacts from the proposed seasonal use for spring Chinook and steelhead acclimation purposes would not be additive to cumulative effects of past, present, and anticipated future human-caused adverse impacts to habitat.

The Mid-C Coho Program is ongoing, with associated influences on in-stream habitat conditions and coho salmon populations. The Eightmile Ranch Coho Acclimation Project, to be implemented summer of 2017, involves the construction of a new acclimation pond in the Methow basin as a replacement for sites on the Chewuch River that were evaluated in the Mid-C Coho Program EIS but later became unavailable for development (BPA 2014). The USFS is expected to implement the Nason Creek Upper White Pine Reach Aquatic Habitat Restoration Project, which is planned to provide improved aquatic habitat in the affected portion of Nason Creek (USFS 2015c). Actions that may be implemented as part of this plan include a levee breach or partial levee breach in targeted areas; in-stream actions such as installation of large wood and/or boulders; culvert replacements; and side-channel habitat enhancements. Implementation of this plan could result in positive impacts to stream conditions, fish habitat, and fish populations. The area for this plan overlaps with the area affected by the proposed Powerline and Rohlring acclimation sites, as both sites are on unnamed tributaries that flow into Nason Creek.

Considered collectively, the past, ongoing, and reasonably foreseeable future actions discussed above have resulted or would result in cumulative impacts that are much larger in scale and intensity than the environmental effects that would occur under the Proposed Action. In addition, expected future actions include plans and individual projects proposed by state and federal agencies that are aimed at habitat restoration and recovery of ESA-listed species. If the proposed acclimation program is successful it could contribute positively to the cumulative impacts of multiple other actions that are also intended to improve habitat and population conditions for ESA-listed fish species in the Methow and Wenatchee basins.

Therefore, the cumulative impact of the Proposed Action when combined with impacts of other past, present, and reasonably foreseeable future actions on fish would be low.

3.14.6 Wildlife

Proposed clearing and construction at the Powerline site would contribute in very minor ways to cumulative regional fragmentation and net loss of native vegetation and habitats. Impacts from continued development in the region would occur regardless of whether the Proposed Action is implemented, and will continue to contribute to loss of habitat.

Operation of the program would result in an increase in human activities at the sites. While the sites are primarily located in rural areas, most of the sites are associated with residential property and with existing human activity and vehicle traffic, including from the Mid-C Coho Program acclimation activities.

Therefore, the cumulative impact of the Proposed Action when combined with impacts of other past, present, and reasonably foreseeable future actions on wildlife would be low.

3.14.7 Transportation

The development of transportation infrastructure has resulted in a network of roads near all of the acclimation sites, and a major railroad line that is near two of the sites. Construction of the transportation system has affected the environment around the acclimation sites through removal of native vegetation/habitat, soil compaction, erosion/stormwater inputs and landscape modification during construction, while operation and maintenance of the facilities entail ongoing noise, air quality, drainage and visual impacts associated with roads and railroads. In addition, the transportation infrastructure has facilitated residential development and other human activity in areas along this network. However, the increased traffic associated with the Proposed Action would be limited to the construction period. The Proposed Action when combined with impacts of other past, present, and reasonably foreseeable future actions would be expected to have a low cumulative impact on transportation.

3.14.8 Land Use and Recreation

The acclimation sites of the Proposed Action are located in rural settings with limited development, although residential and/or recreational use is present near all of the sites. Permanent residences or vacation homes are found near the proposed Goat Wall, Gold Creek, Rohlfing, Trinity and Powerline acclimation sites. The Early Winters site is located on a property that has been developed for commercial lodging facilities. Camping and/or day-use recreation facilities are located near the Goat Wall, Early Winters, Chewuch AF, Trinity, Rohlfing, and Powerline sites. These developed uses resulted in a degree of natural landscape disturbance and an ongoing level of human activity within the vicinity of the acclimation sites.

The Proposed Action would remove approximately 0.3 acre of managed vegetation within a transmission-right-of-way at the Powerline site. It would also expand the level of use of the ponds used for coho acclimation under the Mid-C Coho Program for spring Chinook and steelhead acclimation, but the development footprint at these sites would not change. The Proposed Action would not have an incremental effect on land use or recreation at the seven acclimation sites when combined with impacts of other past, present, and reasonably foreseeable future actions on land use and recreation. Therefore, the Proposed Action would have no cumulative effects on land use or recreation on or near the acclimation sites.

3.14.9 Visual Resources

The Proposed Action would not noticeably change visual quality, so it would not contribute to other visual quality impacts occurring in the basins. Therefore, the Proposed Action would be expected to have no cumulative impacts on visual resources.

3.14.10 Air, Noise, and Public Health and Safety

The largely minor and short-term increases in fugitive dust and construction noise would not add to the cumulative long-term impacts to air quality and noise from transportation infrastructure, developed land uses and population levels in the two basins. The Proposed Action would not change conditions related to public health and safety. Therefore, the Proposed Action would be expected to have no cumulative impacts on air, noise, and public health and safety.

3.14.11 Cultural Resources

The Proposed Action would not affect cultural resources, so would not contribute to cumulative effects on those resources that might be caused by other ongoing development in the basins.

3.14.12 Socioeconomics

The Proposed Action would not directly add permanent jobs to the region, so there would be no incremental effects on area population and income and no need to change infrastructure and services to accommodate new residents. Forecasts of future returns of adult spring Chinook and steelhead are not available; therefore, expenditures and income associated with their potential contribution to future fisheries cannot be predicted but are not foreseeably expected to measurably affect local or regional economies. The numerous federal, state, local and tribal efforts to improve fish populations, river flow, and aquatic habitat in the region, of which this program is a small part, should result in salmon population increases, which together, should provide economic and cultural benefits. Also, the Proposed Action is not anticipated to disproportionately affect environmental justice populations. Therefore, the Proposed Action would have low cumulative impacts on socioeconomics and no cumulative impacts on environmental justice populations.

3.14.13 Climate Change

Vehicular and railroad traffic, ranching activities, and residential facilities in the cumulative effects analysis area all contributed to past GHG emissions. These sources of GHG emissions would continue to occur. In terms of cumulative impacts to the atmospheric levels of greenhouse gasses, any addition, when considered globally, could contribute to long-term impacts to climate change. The Proposed Action would contribute incremental amounts of greenhouse gases through construction of the Powerline site and seasonal operations; contributions to climate change would be low.

Chapter 4. Environmental Consultation, Review, and Permit Requirements

This chapter addresses statutes, implementing regulations, and executive orders applicable to the Proposed Action. This EA is being sent to tribes, federal agencies, state agencies, and state and local governments as part of the consultation process for the Proposed Action. Persons, tribes, and agencies consulted are included in the list in Chapter 6, Agencies, Tribes, Organizations, and Persons Contacted.

4.1 Environmental Policy

4.1.1 National Environmental Policy Act

This EA was prepared pursuant to regulations implementing NEPA (42 U.S.C. 4321 *et seq.*), which requires federal agencies to assess the impacts that their actions may have on the environment. NEPA requires preparation of an EIS for major federal actions significantly affecting the quality of the human environment. BPA prepared this EA to determine if the Proposed Action would create any significant environmental impacts that would warrant preparing an EIS, or if a Finding of No Significant Impact is justified.

4.1.2 State Environmental Policy Act

SEPA, Washington State's most fundamental environmental decision-making 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 would 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 would affect the environment and identify measures to reduce likely effects, or deny a proposal when adverse effects are identified. Under the Proposed Action, WDFW would consider issuing a hydraulic project approval for construction at the Powerline site and WDFW would be the lead state agency to fulfill the SEPA requirement.

4.2 Fish and Wildlife

4.2.1 Endangered Species Act

The ESA and its amendments (16 U.S.C. 1531 *et seq.*) require federal agencies to ensure that the actions they authorize, fund, and carry out do not jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat. The effects on species listed under the ESA are discussed in Chapter 3 of this EA, specifically in Section 3.3, Vegetation, Section 3.5, Fish, and Section 3.6, Wildlife.

Pursuant to the requirements of Section 7(c) of the ESA, BPA is preparing Biological Assessments that address effects of the Proposed Action on spring Chinook, steelhead, bull trout, and other species for consultation with NMFS and the USFWS.

4.2.2 Fish and Wildlife Conservation Act and Fish and Wildlife Coordination Act

The Fish and Wildlife Conservation Act of 1980 (16 U.S.C. 2901 *et seq.*) encourages federal agencies to conserve and promote conservation of non-game fish and wildlife and their habitats. The Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*) requires federal agencies with projects affecting water resources to consult with USFWS and the state agency responsible for fish and wildlife resources. The analysis in Section 3.5, Fish, and 3.6, Wildlife, of this EA indicates that the alternatives would have limited impacts on fish and wildlife, with implementation of appropriate mitigation.

4.2.3 Magnuson-Stevens Fishery Conservation and Management Act of 1976

The NOAA Fisheries is responsible for ensuring compliance with the Magnuson-Stevens Fishery Conservation and Management Act of 1975. 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 essential fish habitat (EFH). Under Section 305(b) (4) of the act, BPA is required to consult with NOAA Fisheries for actions that adversely affect EFH; in turn, NOAA Fisheries is required to provide EFH conservation and enhancement recommendations. As discussed in Section 3.5, Fish, the Proposed Action would not result in any direct or indirect effects on EFH. BPA has prepared an EFH assessment and is in consultation with NMFS.

4.2.4 Migratory Bird Treaty Act

The Migratory Bird Treaty Act, as amended, implements various treaties and conventions between the United States and other countries, including Canada, Japan, Mexico, and the former Soviet Union, for the protection of migratory birds (16 U.S.C. 703–712). Under the act, taking, killing, or possessing migratory birds, or their eggs or nests, is unlawful. The act classifies most species of birds as migratory, except for upland and non-native birds such as pheasant, chukar, gray partridge, house sparrow, European starling, and rock dove.

As discussed in Section 3.6.2 there would be changes in habitat types with pond and road construction at the Powerline site, and short-term disturbance to birds during its construction. The addition of the pond is likely a long-term benefit to many species of migratory songbirds for both nesting and foraging. Operational activities at all ponds will have few effects to nesting or foraging migratory birds, though harassment of predatory wildlife to protect acclimating fish may be temporarily disruptive to local resident migratory birds. The level of effect on these species is low and not in violation of the Migratory Bird Treaty Act.

4.2.5 Responsibilities of Federal Agencies to Protect Migratory Birds

Executive Order 13186 directs federal agencies whose actions may negatively affect migratory bird populations to work with USFWS to develop an agreement to conserve migratory birds. Construction, operation, and maintenance of the Proposed Action would not result in any impacts on migratory birds from loss of habitat or direct mortality, as discussed in Section 3.6, Wildlife.

4.2.6 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. 668–668d) addresses “take” of eagles, which includes both the disturbance of eagles or killing eagles. Bald eagles would not be taken or otherwise harmed as a result of the Proposed Action, and could benefit in the long term from an increased source of food in the form of salmon and steelhead.

4.3 Wetlands, Floodplains, and Water Resources

As part of the NEPA review, U.S. Department of Energy NEPA regulations require that impacts on floodplains and wetlands be assessed and alternatives for protection of these resources be evaluated in accordance with Compliance with Floodplain/Wetlands Environmental Review Requirements (10 CFR 1022.12), Executive Order 11988, Floodplain Management, and Executive Order 11990, Protection of Wetlands. Evaluation of impacts of the Proposed Action on floodplains and wetlands is discussed in detail in Section 3.4, Wetlands and Floodplains, of this EA. The evaluation determined that the Proposed Action would not result in adverse impacts to wetlands or floodplains.

Wetland and waterway management, regulation, and protection are addressed in several sections of the Clean Water Act, including Sections 401, 402, and 404.

4.3.1 Clean Water Act Section 401

A federal permit to conduct an activity that causes discharges into navigable waters is issued only after the affected state certifies that existing water quality standards would not be violated if the permit were issued. WDOE would review the project’s Section 402 and Section 404 permit applications for compliance with Washington’s water quality standards and grant certification if the permits comply with these standards.

4.3.2 Clean Water Act Section 402

This section authorizes National Pollutant Discharge Elimination System (NPDES) permits for the discharge of pollutants, such as stormwater or hatchery effluent discharges. WDOE has a Construction Stormwater General Permit for discharges from construction activities that disturb one or more acres and discharge stormwater to surface waters of the state or for smaller sites if they are part of a larger common plan of development to disturb one acre or more. This action is less than one acre and will not require a NPDES permit.

4.3.3 Clean Water Act Section 404

Authorization from the US Army Corps of Engineers (Corps) is required in accordance with the provisions of Section 404 of the Clean Water Act when dredged or fill material is discharged into waters of the United States. Though there would be no impact on wetlands, there is need to coordinate with the Corps to obtain a Section 404 permit for the disruptions to the unnamed creek at the Powerline site and work with WDOE to obtain Section 401 water quality certification. Potential impacts on the creek are described in Section 3.2, Water Resources, and in Section 3.4, Wetlands and Floodplains.

4.4 Heritage Conservation and Cultural Resources Protection

Laws and regulations governing the management of cultural resources include:

- Antiquities Act of 1906 (16 U.S.C. 431–433),
- Historic Sites Act of 1935 (16 U.S.C. 461–467),
- Section 106 of the NHPA (54 U.S.C. § 300108), as amended,
- Archaeological Data Preservation Act of 1974 (16 U.S.C. 469 a–c),
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470 *et seq.*), as amended,
- Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 *et seq.*),
- Executive Order 13007 Indian Sacred Sites, and
- American Indian Religious Freedom Act of 1978 (PL 95-341, 92 Stat. 469, 42 U.S.C. 1996, 1996a).

Section 106 of the NHPA requires federal agencies to consider the effects of their actions on historic properties and provides a process for assessing impacts on historic properties. BPA consulted with the Washington SHPO, the Yakama Nation, and Colville Tribes by providing information about the Proposed Action’s “Area of Potential Effect” to cultural resources and requesting their recommendations on the proposed level and type of evaluation efforts, and for available information regarding pre-historic resources. Following field surveys where no sites were found, BPA completed the review and consultation requirement of Section 106 with formal filings to the above parties. BPA received concurrence with its determination of no adverse effect from the Washington SHPO on July 16, 2014. The results of the process conclude there will be no effect to cultural resources and the requirements of these laws have been met.

4.5 State, Area-Wide, and Local Plan Consistency

Okanogan County

Okanogan County Comprehensive Plan: The Okanogan County Comprehensive Plan (Okanogan County 2014a) provides overall planning direction for all private lands within the county and also defines four areas of the Methow Basin, identified as Sub-Units A, B, C and D, as “more completely planned areas” that are also subject to sub-area plans.

The Methow Valley floor area up valley of Winthrop comprises Sub-Unit A, which has a separate sub-area plan also adopted in 2014 (Okanogan County 2014b). Sub-Unit A includes the Goat Wall and Early Winters acclimation sites; the Goat Wall site has an RRD (Rural Residential District, with a 5-acre minimum lot size) interim zoning designation, and the Early Winters site is within the Wilson Ranch Planned Development (Okanogan County 2014c). The Methow Valley floor area adjacent to Winthrop and in the lower part of the tributary Chewuch basin comprises Sub-Unit B. Sub-Unit B includes the Chewuch acclimation site, which has a VF, MRD5 (Valley Floor, Methow Review District 5, with a 5-acre minimum lot size) zoning designation. The Gold Creek acclimation site, which is not within a defined sub-area, is covered by the county-wide comprehensive plan, and has an R1 (Rural 1, with a 1-acre minimum lot size) interim zoning designation (Table 4-1)

Okanogan County Shoreline Master Program: The Goat Wall and Chewuch locations both are located within shoreline zones designated as Natural per the 2015 Draft Shoreline Designation Map book (Okanogan County 2015a: Table 1). According to the Okanogan County SMP (2015b), the purpose of the Natural Designation is to protect shoreline areas that are relatively free of human influence or include intact or minimally degraded shoreline functions intolerant of human use.

Table 4-1 Okanogan County Land Use Zoning and Shoreline Zone by Acclimation Site

Acclimation Site	Land Use Zoning	Shoreline Zone
Goat Wall	RRD	Natural
Early Winters	PD	N/A
Chewuch	VF, MRD5	Natural
Gold Creek	R1	N/A

Notes:
^{1/} Zoning designations:
 RRD – Rural Residential District, with a 5-acre minimum lot size
 VF, MRD5 – Valley Floor, Methow Review District 5, with a 5-acre minimum lot size
 R1 – Rural 1, with a 1-acre minimum lot size
 PD – Planned Development
^{2/} Shoreline zone designation:
 N/A – not applicable, the site is not located within a designated shoreline zone
 Natural – the purpose of the Natural Designation is to protect shoreline areas that are relatively free of human influence or include intact or minimally degraded shoreline functions intolerant of human use.
 Sources: Okanogan County 2014b, 2014c; Okanogan County 2015a, 2015b

Chelan County

Chelan County Comprehensive Plan: The Powerline, Rohlfing, and Trinity acclimation sites are all within rural areas subject to the land use element of the Chelan County Comprehensive Plan (Chelan County 2014). The properties on which the Powerline and Rohlfing sites are located are designated as rural lands with an RR5 (Rural Residential/Resource, with a 5-acre minimum lot size) zoning designation (Table 3-11). The property on which the Trinity site is located is designated as Commercial Forest (FC; Table 3-11).

Table 4-2 Chelan County Land Use Zoning and Shoreline by Acclimation Site

Acclimation Site	Land Use Zoning	Shoreline Zone
Powerline	RR5	Conservancy
Rohlfing	RR5	Conservancy
Trinity	FC	Natural

^{1/} Zoning designations:
 RR5 – Rural Residential/Resource, with a 5-acre minimum lot size
 FC – Commercial Forest
^{2/} Shoreline zone designation:
 Conservancy – an area characterized by a potential for diffuse outdoor recreation activities, timber harvesting on a sustained yield basis, passive agricultural uses such as pasture and range lands and other related development.
 Natural – an area containing some unique natural or cultural features considered valuable in a natural or original condition that are relatively intolerant of intensive human uses.
 Sources: Chelan County 1975, 2015

Chelan County Shoreline Master Program: Under the current Shoreline Master Program for Chelan County, the Powerline and Rohlfing sites are included within Nason Creek shoreline zones designated as Conservancy (Chelan County 1975; Table 2). The property on which the Trinity site is

located is included within a Chiwawa River shoreline zone designated as Natural (Chelan County 1975; Table 2).

As discussed in Section 3.8, Land Use and Recreation, implementation of the Proposed Action is consistent with applicable local land use plans and regulations in Okanogan and Chelan Counties.

National Forest Land and Resource Management Plans

NFS lands located adjacent or close to all of the acclimation sites are presently managed by the USFS in accordance with the Okanogan and Wenatchee Land and Resource Management Plans. These plans direct management activities for NFS lands in the vicinity of the proposed acclimation sites, but are not directly applicable to the proposed sites themselves.

4.6 Noise and Public Health and Safety

The Federal Noise Control Act of 1972 (42 U.S.C. 4901 *et seq.*) requires that federal actions, such as the Proposed Action, comply with state and local noise requirements. The analysis in Section 3.10, Air, Noise, and Public Health and Safety, of this EA indicates that the Proposed Action would have low potential for temporary noise impacts during construction, and would meet applicable noise requirements.

4.7 Executive Order on Environmental Justice

In February 1994, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, was released to federal agencies. This order states that federal agencies shall identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. As discussed in Section 3.12, Socioeconomics of this EA, the Proposed Action would not cause disproportionately high and adverse impacts on minority and low-income populations. To the extent the Proposed Action is successful, it would have positive effects on Native American communities with interests in the Methow and Wenatchee basins.

4.8 Air Quality

The federal Clean Air Act, as amended (42 U.S.C. 7401 *et seq.*), requires the EPA and individual states to carry out a wide range of regulatory programs intended to assure attainment of the NAAQS. Air quality impacts would include limited temporary fugitive dust and vehicle emissions from construction, and negligible effects from operation, as discussed in Section 3.10, Air, Noise, and Public Health and Safety.

4.9 Climate Change

Gases that absorb infrared radiation and prevent heat loss to space are called greenhouse gases (GHGs). As a response to concerns over the predicted increase of global GHG levels, various federal and state mandates address the need to reduce GHG emissions. Executive Orders 13423 and 13514 require federal agencies to measure, manage, and reduce GHG emissions by agency-defined target amounts and dates. Proposed Action activities that would produce GHG emissions include “soil carbon” emissions produced through the removal and/or disturbance of natural vegetation and soils during construction; the use of gasoline and diesel powered vehicles and equipment during

construction; and the use of gasoline and diesel powered vehicles for employee commuting, supply deliveries, and transport of smolts to the receiving waters during operation and maintenance. These activities would make minimal contributions to the GHG emissions associated with climate change, as discussed in Section 3.13 of this EA.

4.10 Farmland Protection Policy Act

The Farmland Protection Policy Act (7 U.S.C. 4201 *et seq.*) directs federal agencies to identify and quantify adverse impacts of federal programs on farmlands. The purpose of this Act is to minimize the number of federal programs that contribute to the unnecessary and irreversible conversion of agricultural land to non-agricultural uses. Three types of farmland are recognized by the Act: prime farmlands, unique farmlands, and farmland of statewide or local importance. The entire Powerline project site is located on an *aeric fluvaquent* soil type which is not classified as prime farmland, and the area is classified neither as “unique farmland” nor farmland of statewide or local significance.

4.11 Resource Conservation and Recovery Act, Toxic Substances Control Act, and Federal Insecticide, Fungicide and Rodenticide Act

The Resource Conservation and Recovery Act (42 U.S.C. 6901 *et seq.*) regulates the disposal of hazardous wastes. The Toxic Substances Control Act (15 U.S.C. 2601-2692) gives authority to the Environmental Protection Agency to regulate substances that present unreasonable risks to public health and the environment. The Federal Insecticide, Fungicide and Rodenticide Act (7 U.S.C. 136(a-y)) authorizes the Environmental Protection Agency to prescribe conditions for use of pesticides.

Construction, operation, and maintenance of the facilities under the Proposed Action would meet the guidelines for use, handling, storage, and disposal of hazardous substances. Regulated pesticide products would not be used.

Chapter 5. References

- Anchor QEA, LLC. 2010. Flood Impact Analysis, Appendix 8.2 Mid-Columbia Coho Restoration Project. Prepared for Bonneville Power Administration.
- Anderson, P.G. 1996. Sediment Generation from Forestry Operations and Associated Effects on Aquatic Ecosystems. Proceedings of the Forest-Fish Conference: Land Management Practices Affecting Aquatic Ecosystems, May 1-4, 1996. Calgary, Alberta.
- Avian Power Line Interaction Committee (APLIC). 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute and APLIC. Washington, D.C.
- Bisson, P.A., and R.E. Bilby. 1982. Avoidance of Suspended Sediment by Juvenile Coho Salmon. *North American Journal of Fisheries Management* 4: 371-374.
- BPA (Bonneville Power Administration). 2002. Mid-Columbia Coho Reintroduction Feasibility Project, Supplement Analysis, New Acclimation Sites. DOE/EA 1282 SA-03, October 2002.
- BPA. 2003. Fish and Wildlife Implementation Plan Environmental Impact Statement. Available at http://efw.bpa.gov/environmental_services/Document_Library/Implementation_Plan/. Website accessed March 3, 2016.
- BPA. 2011. Mid-Columbia Coho Restoration Program. Draft Environmental Impact Statement. DOE/EIS-0425. June 2011.
- BPA. 2012. Mid-Columbia Coho Restoration Program. Final Environmental Impact Statement. DOE/EIS-0425. March 2012.
- BPA. 2014. Eightmile Ranch Coho Acclimation Site Draft Environmental Assessment DOE/EA-1959. Portland, Oregon.
- Carroll, J., and R. Anderson, 2009. Wenatchee River Watershed Dissolved Oxygen and pH Total Maximum Daily Load, Water Quality Improvement Report. Publication No. 08-10-062, Water Quality Program, Central Regional Office, Washington Department of Ecology, Yakima, Washington.
- Castle, P, N. Currence, A. Chapman, D. Huddle, and D. Griggs. 2002. Potential Modifications to Kendall Hatchery Chinook Program. Unpublished manuscript cited in HSRG Hatchery Reform: Principles and Recommendations, April 2002, Using Acclimation Ponds in the Rearing of Salmon, Prepared by J. Tipping, WDFW, Olympia, WA.
- Chelan County. 1975. Chelan County Shoreline Master Program (as updated in 1979). Available online at: <http://www.co.chelan.wa.us/natural-resources/pages/shoreline-master-program-update?parent=planning>. Website accessed March 3, 2016.
- Chelan County. 2014. Chelan County Comprehensive Plan February 1, 2000, Last Amended by Resolution 2014-135, effective January 1, 2015. Available online at: http://www.co.chelan.wa.us/files/community-development/documents/comps_plan/Chelan-County-Comprehensive-Plan_Res-2014-135_eff-01JAN15.pdf. Website accessed August 2015.

- Chelan County. 2015. Chelan County Online GIS (Geographic Information System). Available online at: <http://atlas2013.co.chelan.wa.us/flexviewers/ChelanCountyGIS/>. Website accessed March 3, 2016.
- Cleason, Shannon; Judith Li, Jana Compton, and Peter Bisson. 2006. Response of Nutrients, Biofilm, and Benthic Insects to Salmon Carcass Addition. *Canadian Journal of Fisheries and Aquatic Sciences* 63(6):1230–1241.
- EIA (Energy Information Administration). 2009. Energy and the Environment. Greenhouse Gases Basics. Available at: http://tonto.eia.doe.gov/energyexplained/index.cfm?page=environment_about_ghg. Website accessed March 3, 2016.
- EPA (U.S. Environmental Protection Agency). 2010. Level III and IV Ecoregions of Washington. Available online at: ftp://newftp.epa.gov/EPADataCommons/ORD/Ecoregions/wa/wa_eco_l3.htm. Website accessed March 3, 2016.
- EPA. 2013. Level III Ecoregions of the Continental United States. Available online at: http://archive.epa.gov/wed/ecoregions/web/html/level_iii_iv-2.html. Website accessed March 3, 2016.
- EPA. 2015. National Ambient Air Quality Standards (NAAQS). Available online at: <https://www3.epa.gov/ttn/naaqs/criteria.html>. Website accessed March 3, 2016.
- Everest, F.H., R.L. Beschta, J.C. Schrivener, K.V. Koski, J.R. Sedell, and C.J. Cederholm. 1987. Chapter 4. Fine sediment and salmonid production: A paradox. In: Salo, E.O., T.W. Cundy, editors. *Streamside Management. Forestry and Fishery Interactions*. University of Washington, Institute of Forest Resources. Contribution No. 57. P. 98-142.
- FEMA (Federal Emergency Management Agency). 1999. Flood Insurance Rate Map (FIRM); Okanogan County, Washington (Unincorporated Areas), Panel 632 of 1425. Community-Panel Number: 530117 0632D. Map Revised January 20, 1999.
- Grette Associates. 2014a. Technical Memorandum: Powerline Priority Habitat, Species and Plant Analysis. Grette Associates Environmental Consultants. Wenatchee, WA.
- Grette Associates. 2014b. Technical Memorandum: Powerline Parcel Wetland Review, Tax Parcel Number xxxxxx-xxx-xxx, Chelan County, WA. Grette Associates Environmental Consultants, Wenatchee, WA.
- Grette and Associates, Technical Memorandum, Trinity Parcel Wetland Review, February 2014
- Grette Associates. January 5, 2016. Technical Memorandum: Mid-Columbia Coho Restoration Project Early Winters Priority Habitat, Species and Plant Analysis.
- Gunckel, S., A. Hemmingsen, and J. Li. 2002. Effect of Bull Trout and Brook Trout interactions on Foraging Habitat, Feeding Behavior, and Growth. *Transactions of the American Fisheries Society* 131: 1119-1130.

- Hafen, K., and P. Budy. 2015. Agnostic Behavior among Three Stocked Trout Species. *North American Journal of Fisheries Management* 35: 551-556.
- Hicks, L.L., D.R. Herter, and R. Early. 2001. Northern Spotted Owl Demographic Monitoring and Modeling – 5 Year Summary Report. Plum Creek Cascades Habitat Conservation Plan, May 21, 2002.
- Hillman, T., M. Miller, C. Peven, M. Tonseth, K. Truscott, and A. Murdoch. 2008. Monitoring and evaluation of the Chelan County PUD hatchery programs: 2007 annual report. Report to the HCP Hatchery Committee. Wenatchee, WA.
- Hillman, T., and 12 others. 2014. Monitoring and Evaluation of the Chelan and Grant County PUDs Hatchery Programs. 2013 Annual Report. Report to the HCP and PRCC Hatchery Committees, Wenatchee, WA.
- Hillman T, and 7 others, 2013. Monitoring and Evaluation Plan for PUD Hatchery Programs. 2013 Update. Report to the HCP and PRCC Hatchery Committees, Wenatchee, WA.
- HSRG (Hatchery Scientific Review Group). 2009a. Appendix E. Hatchery Scientific Review Group Review and Recommendations. Wenatchee River Summer Steelhead Population and Related Hatchery Programs. Available at: http://www.hatcheryreform.us/hrp_downloads/reports/columbia_river/system-wide/4_appendix_e_population_reports/cascade-wenatchee_summer_steelhead_01-31-09.pdf. Website accessed March 3, 2016.
- HSRG. 2009b. Appendix E. Hatchery Scientific Review Group Review and Recommendations. Wenatchee River Spring Chinook Population and Related Hatchery Programs. Available at: http://www.hatcheryreform.us/hrp_downloads/reports/columbia_river/system-wide/4_appendix_e_population_reports/cascade-wenatchee_spring_chinook_01-31-09.pdf. Website accessed on March 3, 2016.
- HSRG. 2009c. Appendix E. Hatchery Scientific Review Group Review and Recommendations. Methow Summer Steelhead Population and Related Hatchery Programs. http://www.hatcheryreform.us/hrp_downloads/reports/columbia_river/system-wide/4_appendix_e_population_reports/cascade-methow_summer_steelhead_01-31-09.pdf. Website accessed March 3, 2016.
- HSRG. 2009d. Appendix E. Hatchery Scientific Review Group Review and Recommendations. Methow Spring Chinook Population and Related Hatchery Programs. http://www.hatcheryreform.us/hrp_downloads/reports/columbia_river/system-wide/4_appendix_e_population_reports/cascade-methow_spring_chinook_01-31-09.pdf. Website accessed March 3, 2016.
- HSRG/WDFW (Washington Department of Fish and Wildlife)/NWIFC (Northwest Indian Fisheries Commission). 2004. Technical Discussion Paper #1: Integrated Hatchery Programs, June 21, 2004.
- IPCC (Intergovernmental Panel on Climate Change). 2007. Climate Change 2007, Working Group I: The Physical Science Basis. Chapter 2: Changes in Atmospheric Constituents and Radioactive

Forcing: Atmospheric Carbon Dioxide. Available at:
http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2.html. Accessed March 3, 2016

- Johnson, S.L., M.F. Solazzi, and T.E. Nickelson. 1990. Effects on Survival and Homing of Trucking Hatchery Yearling Coho Salmon to Release Sites. *North American Journal of Fisheries Management* 10:427-433.
- Johnson, S. L., M. F. Solazzi, and J. D. Rodgers. 1993. Development and evaluation of techniques to rehabilitate Oregon's wild salmonids. Oregon Department of Fish and Wildlife, Fish Research Project F-125-R, Annual Progress Report. Portland, OR.
- Kamphaus, Cory. 2011. Expanded Multispecies Acclimation in the Methow and Wenatchee: 2011 Draft Results. Yakama Nation, Toppenish WA
- Konrad, C.P., B.W. Drost, and R.J. Wagner. 2003. Hydrogeology of the unconsolidated sediments, water quality, and ground-water/surface-water exchanges in the Methow River Basin, Okanogan County, Washington: U.S. Geological Survey Water-Resources Investigations Report 03-4244, 137 p.
- Koski, K.V. 1966. The survival of coho salmon from egg deposition to emergence in three Oregon coastal streams. Master's Thesis. Oregon State University, Corvallis.
- Krueger, C., and B. May. 1991. Ecological and Genetic Effects of Salmonid Introduction in North America. *Canadian Journal of Fisheries and Aquatic Sciences* 48: 66-77.
- LHSFNA (Laborer's Health and Safety Fund for North America). 2015. LHSFNA website. Available online at <http://www.lhsfna.org/index.cfm>. Website accessed March 3, 2016.
- Lloyd, D.S., J.P. Koenings, and J.D. LaPerriere. 1987. Effects of Turbidity in Fresh Waters of Alaska. *North American Journal of Fisheries Management* 7:18-33.
- Loudenslager, E. 2009. Review of Two Columbia River Basin Fish Accord Proposals. Memorandum (ISRP 2009-10). Independent Scientific Review Panel. Northwest Power and Conservation Council. Portland, OR.
- Lowery, E., and D. Beauchamp. 2015. Trophic Ontogeny of Fluvial Bull Trout and Seasonal Predation on Pacific Salmon in a Riverine Food Web. *Transactions of the American Fisheries Society* 144: 724-741
- Meehan, W.R., editor. 1991. Influences of forest and rangeland management on salmonid fishes and their habitat. Special Publication 19. American Fisheries Society, Bethesda, Maryland.
- Meehan, W.R., and D.N. Swanston. 1977. Effects of gravel morphology on fine sediment accumulation and survival of incubating salmon eggs. U.S. Forest Service Research Paper PNW-220.
- Meehl, G.A., T.F. Stocker, W.D. Collins, P. Friedlingstein, A.T. Gaye, J.M. Gregory, A. Kitoh, R. Knutti, J.M. Murphy, A. Noda, S.C.B. Raper, I.G. Watterson, A.J. Weaver, and Z.-C. Zhao. 2007. Global Climate Projections. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate*

- Change*. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- Methow Basin Planning Unit. 2005. Methow Basin (WRIA 48) Watershed Plan. Approved by the Okanogan County Board of County Commissioners June 20, 2005. Available online at: <http://www.methowwatershed.com/documents/MethowBasinplan-Original.pdf>
- Montgomery Water Group. 2013. Wenatchee River Basin Watershed Assessment. Prepared for Wenatchee Watershed Planning Unit and Chelan County Natural Resource Program. Murdoch, K. 2014. Upper Methow Spring Chinook Acclimation Proposal. Upper Columbia Spring Chinook and Steelhead Acclimation Project (BPA Project #200900100). Yakama Nation Fisheries Resource Management. August 2013.
- Mugunthan, Pradeep. 2015a. Memorandum: Evaluation of Water Quality Impacts from Acclimation of Spring Chinook at Powerline Acclimation Site.
- Mugunthan, Pradeep. 2015b. Memorandum: Evaluation of Water Quality Impacts from Acclimation of Steelhead at Trinity Acclimation Site.
- Mugunthan, Pradeep. 2015c. Memorandum: Evaluation of Water Quality Impacts from Acclimation of Steelhead at Early Winters Acclimation Site.
- Murdoch, Keely. 2014. Upper Methow Spring Chinook Acclimation Proposal. Upper Columbia Spring Chinook and Steelhead Acclimation Project (BPA Project #200900100). Yakama Nation Fisheries Resource Management. December 3, 2014.
- MVSTA (Methow Valley Sport Trails Association). 2015. Methow Community Trail Map. Available online at: http://www.methowtrails.org/winthrop_2015.pdf
- Naman, S., and C. Sharpe. 2012. Predation by Hatchery Yearling Salmonids on Wild Subyearling salmonids in the Freshwater Environment: A review of Studies, Two Case Histories, and Implications for Management. *Environmental Biology and Fisheries* 94:21-28.
- Newcombe, C.P., and J.O.T. Jensen. 1996. Channel Suspended Sediment and Fisheries: A synthesis for Quantitative Assessment of Risk and Impact. *North American Journal of Fisheries Management* 16(4):693-727.
- NMFS (National Marine Fisheries Service). 2011. Anadromous Salmonid Passage Facility Design. NMFS Northwest Region. Portland Oregon.
- NPCC (Northwest Power and Conservation Council). 2004a. Wenatchee Subbasin Plan. Prepared for the Northwest Power and Conservation Council. May 2004. 427 pp.
- NPCC. 2004b. Methow Subbasin Plan. Prepared for the Northwest Power and Conservation Council. November 2004. NRCS (Natural Resources Conservation Service). 2015. Web Soil Survey. Available online at: <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. Accessed 12/7/2015.
- Okanogan County. 2012. Okanogan County Outdoor Recreation Plan. February. Available online at: <http://www.okanogancounty.org/planning/>. Accessed March 3, 2016.

- Okanogan County. 2014a. Okanogan County Comprehensive Plan of 2014. May 9, 2014 Review Edition, adopted by Resolution 119-2014. Available online at: <http://www.okanogancounty.org/planning/>. Accessed March 3, 2016.
- Okanogan County. 2014b. Methow Valley More Completely Planned Area: An Update of the Community Master Plan Methow Valley Sub Unit A. Adopted to the Okanogan County Comprehensive Plan of 2014 by Resolution 120-2014. Available online at: <http://www.okanogancounty.org/planning/>. Accessed March 3, 2016.
- Okanogan County. 2014c. Okanogan County 2014-12-22 Interim Zone Township Maps. Available online at: <http://www.okanogancounty.org/planning/>. Accessed March 3, 2016.
- Okanogan County. 2015a. Draft Shoreline Designations Mapbook. June 15. Available online at: <http://www.okanogancounty.org/planning/>. Accessed March 3, 2016.
- Okanogan County. 2015b. Okanogan County Shoreline Master Program. Final Draft. June 30. Available online at: <http://www.okanogancounty.org/planning/>. Accessed March 3, 2016.
- Peven Consulting, Inc. 2004. Population Delineation and Characteristics. Wenatchee, WA.
- Riley, S., J. Scheurer, C. Mahnken and L. Blankenship. 2004. Assessing the Potential for Predation on Wild Salmonid Fry by Hatchery-Reared Salmonids in Washington. Hatchery Scientific Review Group, Hatchery Reform: Principles and Recommendations.
- Scribner, T. 2009a. Fish Accords (MOA) Proposal for Expanded Multi-Species Acclimation in the Wenatchee and Methow Basins. Project Number 2009-001-11. Columbia River Basin Fish Accords –Narrative Proposal Form. Yakima Nation Fisheries Resource Management.
- Scribner, T. 2009b. FY 2008-2009 F&W Program Accords (MOA) Proposal Review. Project Number 2009-001-11. Columbia River Basin Fish Accords –Narrative Proposal Form. Yakima Nation Fisheries Resource Management.
- Sharpe, C., P. Topping, T. Pearsons, J. Dixon, and H. Full. 2008. Predation on Naturally-Produced Subyearling Chinook by Hatchery Steelhead Juveniles in Western Washington Rivers. Washington Department of Fish and Wildlife, Fish Program Science Division.
- Slaney, P.A., L. Berg, and A.F. Tautz. 1993. Returns of Hatchery Steelhead Relative to Site of Release below an Upper-River hatchery. *North American Journal of Fisheries Management* 13:558-566.
- Snow, C., C. Frady, A. Repp, B. Goodman, and A. Murdoch. 2014. Monitoring and Evaluation of the Wells Hatchery and Methow Hatchery Program. 2013 Annual Report. Report to Douglas PUD, and the Wells HCP Hatchery Committee, East Wenatchee, WA.
- Spence, B.C., T.C. Wainwright, and E.P. Bjorkstedt. 2005. Southern Oregon/Northern California Coast Coho Salmon ESU. Pages 339-363 in T.P. Good, R.S. Waples, and P. Adams (editors). Updated Status of Federally Listed ESUs of West Coast Salmon and Steelhead. NOAA Technical Memorandum NMFS-NWFSC-66. National Marine Fisheries Service, Northwest Fisheries Science Center, Seattle, WA and Southwest Fisheries Science Center, Santa Cruz, CA.
- Spence, B., G. Lomnicky, R. Hughes, and R. Novitzki. 1996. An Ecosystem Approach to Salmonid Conservation. 21TR-4501-96-6057. ManTech Environmental Research Services Corp.,

Corvallis, OR.

http://www.westcoast.fisheries.noaa.gov/publications/reference_documents/the_mantech_report.html. Accessed May 3, 2016.

Tatara, C., and B. Berejikian. 2012. Mechanisms Influencing Competition between Hatchery and Wild Juvenile Anadromous Pacific Salmonids in Fresh Water and their Relative Competitive Abilities. *Environmental Biology and Fisheries* 94:7-19.

U.S. Census Bureau. 2010. P2: Hispanic or Latino, and Not Hispanic or Latino by Race – Universe: Total Population. 2010 Census Redistricting Data (Public Law 94-171). Available online at: <http://factfinder.census.gov/>. Accessed on July 29, 2015.

U.S. Census Bureau. 2015. State and County QuickFacts. Available online at: <http://quickfacts.census.gov/qfd/index.html>. Accessed on March 3, 2016.

U.S. Department of Health and Human Services. 2013. 2013 Poverty Guidelines. Available online at: <http://aspe.hhs.gov/poverty/13poverty.cfm>. Accessed on March 3, 2016.

USFS (U.S. Department of Agriculture, Forest Service). 1989. Okanogan National Forest Land and Resource Management Plan. Available online at: <http://www.fs.usda.gov/detail/okawen/landmanagement/planning/?cid=STELPRDB5335612>. Accessed on March 3, 2016.

USFS. 1990. Wenatchee National Forest Land and Resource Management Plan. Available online at: <http://www.fs.usda.gov/detail/okawen/landmanagement/planning/?cid=STELPRDB5335612>. Accessed on March 3, 2016.

USFS. TEAMS and Inter-Fluve, Inc. 2013. Nason Creek: Upper Whitepine Reach Restoration Plan. As cited in USFS 2015.

USFS. 2015a. Methow Valley Ranger District, Motorized Vehicle Use Proposed Action, 1/6/2015. USDA Forest Service, Okanogan-Wenatchee National Forest Land and Resource Management Plan. Available online at: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3825886.pdf. Accessed on March 3, 2016.

USFS. 2015b. Recreation. USDA Forest Service, Okanogan-Wenatchee National Forest. Available online at: <http://www.fs.usda.gov/recmain/okawen/recreation>. Accessed on March 3, 2016.

USFS. 2015c. Environmental Assessment: Nason Creek, Upper White Pine Reach Aquatic Habitat Restoration Project. Okanogan-Wenatchee National Forest, Wenatchee River Ranger District. June 2015.

USFWS (U.S. Fish and Wildlife Service). 2010. Best Management Practices to Minimize Adverse Effects to Pacific Lamprey (*Entosphenus tridentatus*). U.S Fish and Wildlife Service. 25 pages. Available online at: http://www.fws.gov/columbiariver/publications/BMP_Lamprey_2010.pdf. Accessed on March 3, 2016.

USGCRP (United States Global Change Research Program). 2009. Global Climate Change Impacts in the United States. National Oceanic and Atmospheric Administration (Lead Agency),

- Washington, D.C., 2009. Available: <http://www.globalchange.gov/usimpacts>. Accessed on March 3, 2016.
- Vander Haegen, G., and D. Doty. 1995. Homing of coho and fall Chinook salmon in Washington. Wash. Dept. Fish. Wild. Rept. H95-08, 68 pp.
- Washington Employment Security Department. 2015. 2014 Annual Average Washington State Resident Civilian Labor and Employment. Labor Market and Economic Analysis Branch. June 17.
- Waters, T.F., 1995. Sediment in Streams: Sources, Biological Effects, and Control. American Fisheries Society Monograph 7. Bethesda, Maryland.
- WDFW (Washington Department of Fish and Wildlife). 2015. Methow Unit – Methow Wildlife Area. Available online at: http://wdfw.wa.gov/lands/wildlife_areas/methow/access_sites.php. Accessed on March 3, 2016.
- WDOE (Washington Department of Ecology). 2012a. Washington State Water Quality Assessment 303(d)/305(b) Integrated Report. Available online at: <http://www.ecy.wa.gov/programs/wq/303d/currentassessmt.html>. Accessed on March 3, 2016.
- WDOE. 2012b. Wenatchee still showing ‘hazardous’ air quality. Department of Ecology News Release, September 22, 2012.
- WDOE. 2015a. Surface Water Quality Standards. Available online at: <http://www.ecy.wa.gov/programs/wq/swqs/index.html>. Accessed 12/7/2015.
- WDOE. 2015b. National and State Ambient Air Quality Standards. Available online at: <http://www.ecy.wa.gov/programs/air/sips/pollutants/naaqs.htm>. Accessed on March 3, 2016.
- WSNWCB (Washington State Noxious Weed Control Board). 2015. Noxious Weed Control Board website. Available online at: <http://www.nwcb.wa.gov/default.asp>. Accessed on March 3, 2016.
- Yakama Nation. 2009. FY 2008-2009 Program Accords (MOA) Proposal Review. Expanded Multi-Species Acclimation Wenatchee/Methow. Proposer: Yakama Nation Fisheries Resource Management.
- Yakama Nation. 2010. Mid-Columbia Coho Restoration Master Plan. Prepared for: Northwest Power and Conservation Council, Portland OR.
- Yakama Nation. 2012. Expanded Acclimation Plan. Yakama Nation Fisheries Resource Management. December 6, 2012.
- Yakama Nation Fisheries. 2013. Powerline Acclimation Site Project Description. Unpublished. November 27, 2013.
- Yakama Nation. 2014. Powerline Acclimation Site Floodplain Assessment.
- Yakama Nation. 2015. Unpublished data. Snorkel Survey Results.
- Yakama Nation Fisheries. 2015. Trinity Acclimation Site Floodplain Assessment.

Chapter 6. Agencies, Tribes, Organizations, and Persons Receiving the Environmental Assessment

The project mailing list contains about 93 stakeholders, including tribes; local, state, and federal agencies; local governments; interest groups; libraries; and potentially interested or affected landowners. They have directly received or have been given instructions on how to receive project information made available, and will have the opportunity to review and comment on the draft EA.

The entities are listed below.

Tribes or Tribal Groups

- Confederated Tribes and Bands of the Yakama Nation
- Confederated Tribes of the Colville Reservation
- Columbia River Inter-Tribal Fish Commission

Federal Agencies

- Environmental Protection Agency, Region 10, Environmental Review; Seattle, WA
- National Marine Fisheries Service
- USDA Forest Service
- U.S. Fish and Wildlife Service

Washington State Agencies

- Washington Department of Ecology, Yakima, WA (Sean M. Hopkins)
- Washington Department Fish and Wildlife, Twisp, WA (Lynda Hoffman)
- Washington Department of Natural Resources/Forest Health Policy, Olympia, WA (Aaron Everett)

Local Government

- Chelan County PUD
- Chelan County Commissioners, Wenatchee, WA
- Douglas County PUD
- Okanogan County Commissioners, Okanogan, WA
- Okanogan County PUD

Libraries

- Brewster Community Library
- Okanogan Community Library
- Omak Community Library

- Oroville Community Library
- Pateros Community Library
- Tonasket Community Library
- Twisp Community Library
- Winthrop Community Library

Business, Special Interests and Organizations

- American Rivers
- Columbia Riverkeepers
- Conservation Northwest, Bellingham, WA
- Lloyd Logging, Inc.
- Loup Loup Ski Education Foundation
- Methow Valley News
- Methow Valley Sport Trails Association, Winthrop, WA
- National Wildlife Federation
- Native Fish Society
- Natural Resource Defense Coalition
- Northwest Guides and Anglers Association
- Northwest Sportfishing Industry Association
- Okanogan County Electric Coop
- Oregon Wild
- Pacific Northwest 4 Wheel Drive Association, Auburn, WA
- Rendezvous Huts Inc., Winthrop, WA
- Save Our Salmon Coalition
- Sierra Club Cascade Chapter, Seattle, WA
- Sierra Pacific Industries
- The Wilderness Society, Seattle, WA
- Trout Unlimited
- VHE, LLC
- Washington Wilderness Coalition, Seattle, WA

- Washington Wildlife Federation
- Western Rivers Conservancy
- Wild Salmon Center

Individuals and respondents to April 2015 public scoping

- Eighty three landowners near acclimation sites
- Michael Radich
- John O'Halloran
- Charles Pace
- Susan Crampton
- Bill Bakke

This page left blank intentionally

Chapter 7. Glossary

Acclimation Facility: A facility that allows artificially-produced fish that are raised elsewhere to be acclimated to a waterbody prior to release with the intention that, as adults, those fish would return to the waters in which they were released.

Alevin: The third stage of the salmonid life cycle, between eyed eggs and fry. Alevin are larval salmonids, typically about one inch long, that have hatched from the egg but have not yet fully absorbed their yolk sac, and generally have not emerged from the spawning gravel (redd). Alevins remain in the redd for approximately one month until their yolk sac is completely digested, and then emerge from the gravel as fry to hunt for food on their own.

Escapement: The proportion of an anadromous fish population that escapes the commercial and recreational fisheries and reaches the freshwater spawning grounds.

Fry: The fourth stage of a salmonid life cycle, between alevin and parr. Fry move in schools and actively feed in the river on zooplankton until they grow large enough to eat aquatic insects and other larger food. Some species begin their downstream migration to the ocean as fry, while other species stay in the freshwater for up to three years.

Integrated Hatchery Program: A hatchery program that manages wild and hatchery fish as one gene pool where natural-origin fish are included in the broodstock and hatchery-origin fish are allowed to spawn in the wild. Integrated hatchery methods are most appropriate for programs with conservation goals or when the risks of naturally spawning hatchery origin fish need to be minimized.

Local adaptation: The process of naturalization that addresses the loss of fitness that occurs with hatchery stocks by emphasizing selection in the natural environment; the population becomes adapted to habitats within each basin.

Montane: A category of biogeographic zones for regions located in the highlands below the sub-alpine zone. Montane regions are typically forested and have cooler temperatures and higher rainfall than the adjacent lowland regions, and support distinct communities of plants and animals.

Non-Target Taxa of Concern (NTTOC): These are species that are not the species targeted by the program—in this case coho—but are of concern due to potential impacts to them from program activities.

Parr: The fifth stage of the salmonid life cycle, between fry and smolt. Parr have distinct markings (parr marks) to camouflage them from predators as they feed on aquatic insects and other larger prey in a stream environment.

pH: The level of acidity/alkalinity of a solution, on a scale from 0 (most acidic) to 14 (most alkaline or basic), with 7 being neutral. Each point on the scale equals a 10-fold change in the magnitude of acidity or alkalinity.

Redd: The nest dug in the gravel substrate of streams for egg deposition during spawning by salmonids.

Recruits: Fish that have survived long enough to become part of (i.e., recruited into) a population at a defined age (e.g., a natural-origin fish that survives to spawn in the wild is a natural-origin recruit). The number of recruits per spawner is a method of analyzing population productivity.

Riparian: Adjacent to or living on river banks.

Salmonid: A fish belonging to the family Salmonidae, which includes salmon, trout and chars. Some species of salmonids are anadromous (e.g., coho salmon, Chinook salmon, steelhead trout), and some species remain in freshwater throughout their life cycle (e.g., rainbow trout, bull trout).

Smolt: The sixth stage of the salmonid life cycle, between parr and ocean-stage adult. Smolts undergo physiological and behavioral transformations as they migrate downstream that prepare them for the transition to the saltwater environment.

Appendix A

DESCRIPTION OF ACCLIMATION FACILITIES

Methow Basin Sites

Chewuch Acclimation Facility

- Location: At the Eastside Chewuch Road bridge over the Chewuch River.
- Dimensions: The pond is a constructed earthen pond 110 feet long, 70 feet wide and 4 feet deep.
- Enclosure type: Fish would be confined to pond with outlet screens. Natural-origin fish would be excluded through screens on intake diversions. Currently, fish are reared at the Methow Fish Hatchery; goal is to use an existing pond for juvenile rearing and acclimation.
- Planned numbers of fish: Maximum capacity is up to 250,000 yearling smolts at 15 fish per pound. Up to 61,000 smolts are planned for spring Chinook acclimation. This represents the spring Chinook mitigation obligation that the program would be rearing for Chelan PUD.
- Acclimation timing: Spring.
- Water source: the pond is fed by Chewuch River water diverted through an irrigation intake from the Chewuch River. 300 foot water pipeline.
- Power Source: 50 foot power line.
- Access: Roads to the site are plowed all winter.

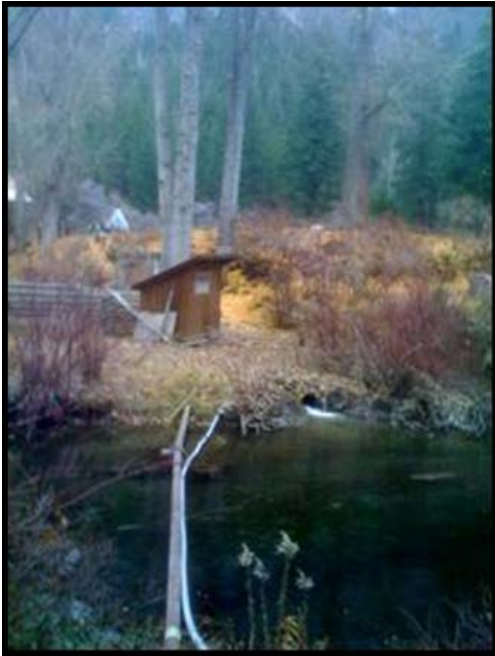
Figure A-1. Chewuch Acclimation Facility



Goat Wall

- Location: The Goat Wall acclimation site is a disconnected side channel system on the upper Methow River, located near of the mouth of the Lost River (Methow river mile 69.6). There is a pond at the downstream end of a disconnected side channel. The pond is fed by both surface water and ground water.
- Dimensions: 0.08 acres of stream habitat would be isolated during the acclimation period.
- Enclosure type: a temporary seine net system is used to enclose fish in the pond.
- Planned numbers of fish: 34,000 juvenile fish planned for acclimation of coho salmon, but future operations would include a combination of coho salmon, spring Chinook, and/or steelhead.
- Acclimation timing: Spring.
- Water source: Surface water is provided by a diversion on the adjacent Gate Creek and groundwater is supplied by Cold Creek (a groundwater seep). Goat Wall site has an approximate volume of 7,000 cu ft. with a flow rate of approximately 1.11 cfs.
- Power source: None.
- Access: The Lost River road is used for access, and is plowed in the winter.

Figure A-2. Goat Wall Acclimation Facility



Early Winters

- Location: The Early Winters site would be located on private land next to Early Winters Creek, approximately 2000 feet upstream of its confluence with the Methow River. Construction would start in 2017 for use by the Mid-C Coho Program.
- Dimensions: Two ponds would be constructed. One is 105 feet long by 33 feet wide and 4 feet deep, with a volume of about 13,100 cubic feet. The second pond would measure about 92 feet long by 29 feet wide by 4 feet deep, and with a volume of about 9,100 cubic feet.
- Enclosure type: Screens over outlets and inlets
- Planned numbers of fish: 75,000 coho smolts, or 50,000 spring Chinook in the smaller pond (they would not be acclimated concurrently)
- Acclimation timing: Spring
- Water source: Two sources of water are proposed, surface water and groundwater. Surface water from Early Winters Creek is preferred because it provides strong, local olfactory cues to returning adults. However, the surface water supply is subject to interruption when in-stream flow minimums are reached and when creek debris loads prevent operation of the intake. Groundwater (two wells to be drilled) would provide a back-up supply at these times.
- Power source: On-site generator. Three-phase power from a line across Highway 20 is being considered pending necessary permits and approvals
- Access: Early Winters Drive off of State Route 20, to short private access road.

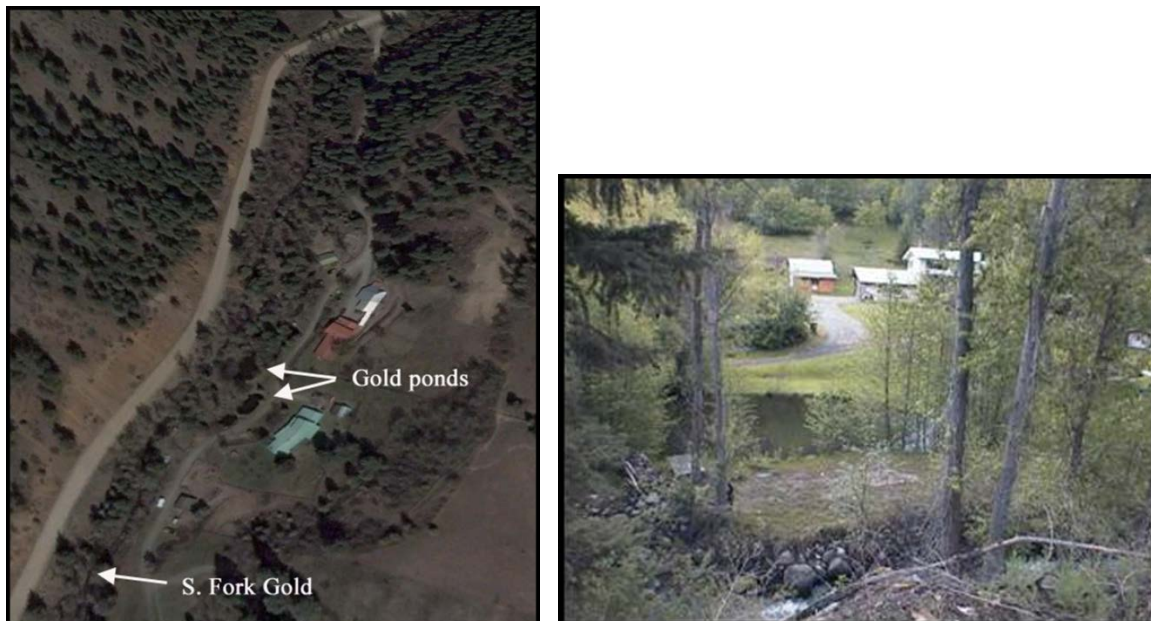
Figure A-3. Early Winters Acclimation Site



Gold Creek

- Location: Currently being used by the Mid-C Coho Program and is comprised of a series of four, man-made ponds on private property adjacent to South Fork Gold Creek, located 0.6 river mile from the confluence with Gold Creek.
- Dimensions: 0.15 acre of stream habitat would be isolated during the acclimation period. Total volume of the ponds is 20,685 cubic feet, with an average depth of approximately 4 feet. Silt, sand, and gravel deposits were excavated in 2012 to provide adequate water depths for acclimation. Future (3-5 years) excavation would likely be required.
- Enclosure type: seine nets are used in each pond during acclimation to contain the hatchery population and provide a migration corridor for wild fish through the pond system.
- Planned numbers of fish: Up to 25,000. Currently used for coho program; also planned for steelhead acclimation.
- Acclimation timing: Spring.
- Water source: Water supply is 100% surface water diverted from South Fork Gold Creek via a diversion structure at the inlet of the first pond, with flow rates of approximately 2 cfs during the spring months.
- Power source: None.
- Access: South Fork Gold Creek Road (USFS Road 4330).

Figure A-4. Gold Creek Acclimation Facility



Wenatchee Basin Sites

Rohlfing Pond

- Location: Rohlfing Pond is located south of US 2 on an unnamed seasonal creek that feeds into Nason Creek.
- Dimensions: The existing pond was expanded in 2004 and again in 2009. It now measures approximately 90 feet long by 50 feet wide with an average depth of 6 feet, and was reconfigured to have two, separate channels leading to a common outlet. It encloses approximately 0.17 acre of habitat that would be isolated during the acclimation period.
- Enclosure type: a barrier net is installed across the right channel leading to the outlet while the main division occurs through a pond seine, which allows for active movement of wild fish during acclimation using the left channel.
- Planned numbers of fish: Up to 90,000 juvenile fish. Currently being used for coho, but would also be used for steelhead acclimation.
- Acclimation timing: Spring only now. Overwintering is planned, but delayed considering high amount of predator pressure likely.
- Water source: The seasonal creek provides 2 cfs of water during the spring months.
- Groundwater supply is provided by a 130 gallon-per -minute well. Piping and a degassing tower were recently installed and could allow for this water supply to be used for overwinter acclimation.
- Power source: single-phase underground power is currently in place, with generator backup for supplemental well water.
- Access: Whitepine Road is an unpaved U.S. Forest Service system road that is plowed in the winter, providing adequate access throughout the year. It is 1 mile from US 2 to the Rohlfing Pond.

Trinity

- Location: Near the Chiwawa River at approximate RM 31, near its confluence with Phelps Creek, (see maps and drawings in Chapter 2).
- Dimensions: Acclimation facilities would include two 30-foot diameter circular tanks (for both coho and spring Chinook), one constructed pond (125 feet in length and 36 feet across), and one existing pond. Plan is to move the Chinook out of the circular tanks into an existing earthen pond while the coho in circulars would be moved out into a constructed earthen pond. The proposed overwinter units would be three partially buried circular fiberglass tanks with inlet piping and screened outlets. The existing pond at the site measures 60 feet wide by 90 feet long (5,400 square feet).
- Enclosure type: Approximately 3,500 square feet of the existing pond would be enclosed with a seine net to contain juvenile fish during the acclimation period. The new pond would be fitted with a steel outlet structure and a screen to enclose juvenile fish for acclimation.

- Planned numbers of fish: Up to 100,000 juvenile fish is maximum capacity.
- Acclimation timing: winter and spring for both coho and Chinook. Fall is the only time hatchery staff can reliably get fish into the site. Overwintering would occur in the circular tanks, and fish would be moved to the ponds for spring acclimation prior to volitional release.
- Water source: a pipeline would be constructed to divert water from the tailrace of an existing hydroelectric facility that is located on the same parcel. A new well and aerator would provide a back-up water supply in case of emergency or disruption.
- Power source: A propane generator would be installed in the existing power plant to power the well pump.
- Access: USFS spur road to the site from the Chiwawa River Road (USFS Road 6200).

Powerline (New Construction)

- Location: The Powerline site is located south of US 2 along Whitepine Road beneath the BPA Chief Joseph – Snohomish 3 & 4 transmission line. It is located along an unnamed creek that flows into Nason Creek (see maps and drawings in Chapter 2).
- Dimensions: 5,900 square feet with an average depth of 4 feet.
- Enclosure type: Seine used to enclose 4,500 square feet of pond during acclimation
- Planned numbers of fish: up to 75,000 juvenile steelhead, but could also accommodate coho.
- Acclimation timing: Spring
- Water source: small, unnamed tributary to Nason Creek.
- Power source: none proposed (gravity flow for water).
- Access: This pond is accessed from Whitepine Road by a 70-footlong access road. Whitepine Road is an unpaved U.S. Forest Service system road that is plowed in the winter, providing adequate access throughout the year. It is three quarters of a mile from US 2 to the Powerline site.

This page left blank intentionally

Appendix B

**BPA EASEMENT CONDITIONS FOR CONSTRUCTION OF THE
POWERLINE ACCLIMATION FACILITY**

BPA Easement Conditions for Construction of the Powerline Acclimation Facility

A Bonneville Power Administration (BPA) right-of-way for transmission lines exists on the property. BPA has issued a land use agreement to the Yakama Nation⁹ that allows the construction, installation, use, and maintenance of the proposed salmon acclimation pond within the right-of-way. The following conditions are included as part of the agreement:

1. Inform BPA 10 days prior to start of construction.
2. The construction/installation of applicant's approved use must be completed by December 31, 2016. If applicant has not completed the project by the above date, the applicant must inform BPA 5 working days in advance to receive an extension.
3. Maintain a minimum distance of at least 20 feet between applicant's construction equipment and the transmission line conductors (wires).
4. Water areas that are less than 20 acres shall maintain a minimum vertical clearance of 31 feet to the transmission line conductors (wires).
5. Maintain a minimum distance of at least 50 feet between applicant's acclimation pond and the transmission line structures.
6. Electrostatically non-conductive (ENC) fencing or fiberglass fencing should be installed in the chain link fence every 50 feet in order to prevent conductivity. The ENC fencing or fiberglass security panels should be a minimum of 10 feet in width.
7. To ensure safety of workers and uninterrupted operation of transmission lines, applicant will employ a BPA approved safety watcher during construction activities occurring 25 feet or less under conductors (wires) or lifting of equipment that may come in contact with the conductors (wires). Please contact BPA for a current list of BPA approved safety watchers.
8. Equipment, machinery. Any vehicles traveling on BPA's right-of-way shall come no closer than 25 feet to any BPA structure or guy anchor ground attachment point.
9. No storage of flammable materials or refueling of vehicles or equipment is permitted on BPA property.
10. No grade changes to facilitate construction or disposal of overburden shall be allowed. Any damage to BPA property resulting from the proposed right-of-way use shall be repaired at the applicant's expense.
11. Access to BPA transmission line system by BPA and/or its contractors shall not be obstructed at any time.
12. Nuisance shocks may occur within the right-of-way. Grounding metal objects helps reduce the level of shock.

⁹ BPA Case No. 20130431

