Umatilla Hatchery Programs
Final Environmental Assessment

Umatilla River Fall Chinook
Umatilla River Spring Chinook
Umatilla River Coho

U.S. Department of Energy - Bonneville Power Administration
April 2024

DOE/EA-2249

Table of Contents

Figures

Tables

Chapter 1. Purpose and Need for Action

1.1 Introduction

Bonneville Power Administration (BPA) prepared this Environmental Assessment (EA) to evaluate the effects of continued funding for the ongoing operations of the Umatilla River Fall Chinook (*Oncorhynchus tshawytscha*), Umatilla River Spring Chinook, and Umatilla River Coho (*Oncorhynchus kisutch*) production programs (production programs) at the Umatilla Hatchery (Hatchery), associated satellite facilities, and direct release sites.[1] BPA proposes to provide funding to the Oregon Department of Fish and Wildlife (ODFW), the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), and the Westland Irrigation District for the ongoing production and release of Umatilla River spring Chinook and Umatilla River fall Chinook, and the adult trapping and broodstock collection, spawning, holding, transportation and release of Umatilla River coho salmon (coho incubation and rearing are funded by the National Marine Fisheries Service (NMFS) using Mitchell Act funding[2]); routine facility maintenance; site and facility upgrades and additions; new water source development; and research, monitoring, and evaluation (RM&E) of the hatchery programs.

BPA has prepared this draft EA pursuant to the National Environmental Policy Act, as amended (NEPA) (42 United States Code [USC] 4321 *et seq*.) and its 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 is a federal power marketing administration that is part of the U.S. Department of Energy. Multiple statutes govern BPA's actions, including the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) (16 U.S.C. 839 §§ *et seq*.), which directs BPA to protect, mitigate, and enhance fish and wildlife affected by the development and operation of the Federal Columbia River Power System (FCRPS). To assist in accomplishing this, the Northwest Power Act requires BPA to fund fish and wildlife protection, mitigation, and enhancement actions consistent with the Northwest Power and Conservation Council's (Council) Columbia River Basin Fish and Wildlife Program and other purposes of the Act. The Council makes recommendations to

[1] This EA evaluates operations at the Umatilla Hatchery incubation and rearing facility located on the Columbia River; trapping and holding facilities at Three Mile Falls Dam and the Walla Wall Hatchery; acclimation and release facilities at Pendleton, Thornhollow, and Imeques C-mem-ini-kem; the direct release site at Rieth Bridge, the Westland Irrigation District's Fish By-Pass and Sampling Area; and the Westland Juvenile Sampling Facility. Bonneville and Cascade Hatcheries are also used for the Umatilla River Fall Chinook and Coho Programs' incubation and rearing needs, but their environmental effects are evaluated elsewhere. The term "satellite facilities" is used to refer to the facilities and locations other than the Umatilla, Walla Walla, Bonneville and Cascade fish hatcheries that are used by these programs and funded by BPA.

[2] The Umatilla Hatchery also supports the Umatilla River Summer Steelhead Program, but that program was evaluated in the 2020 Columbia River Hatcheries Environmental Assessment (DOE/EA-2132) prepared by NMFS (NMFS 2020) and adopted by BPA in a Finding of No Significant Impact (FONSI) dated March 2022. No changes to the Umatilla River Summer Steelhead Program are proposed in this EA.

BPA concerning which fish and wildlife mitigation measures to implement. The Hatchery actions assessed in this EA are included in the Council's Columbia River Basin Fish and Wildlife Program.

BPA needs to respond to funding requests by ODFW, the CTUIR, and the Westland Irrigation District for the Chinook and coho salmon production programs at the Hatchery and the satellite facilities. In meeting the need for action, BPA seeks to achieve the following purposes:

- Support ongoing efforts to mitigate the effects of development and operation of the FCRPS on fish and wildlife in the mainstem Columbia River and its tributaries pursuant to the Northwest Power Act.
- Support conservation of Endangered Species Act (ESA)-listed species considered in the 2020 ESA consultations with (NMFS) and U.S. Fish and Wildlife Service (USFWS) on the operations and maintenance of the Columbia River System.
- Assist in carrying out commitments in the 2008 Columbia Basin Fish Accords Memorandum of Agreements (Accords) that were reaffirmed in the subsequent amendments to the Columbia River Fish Accord Extension Agreement with CTUIR and others.
- Minimize adverse impacts to the human environment, avoid jeopardizing the continued existence of ESA-listed species, and avoid adverse modification or destruction of designated critical habitat.

1.3 Background

1.3.1 Bonneville Power Administration

BPA is a federal power marketing agency within the United States Department of Energy (DOE). BPA's actions are governed by several statutes, including the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) (16 U.S.C. §§ 839 et seq.). Under the Northwest Power Act, BPA must protect, mitigate, and enhance fish and wildlife affected by the development and operation of the Federal Columbia River Power System (FCRPS) on the Columbia River and its tributaries in a manner consistent with the Council's Columbia River Basin Fish and Wildlife Program (Program).

1.3.2 Mitchell Act

Congress passed the Mitchell Act in 1938 to advance the conservation of salmon and steelhead fishery resources in the Columbia River Basin and funds hatchery facilities, RM&E of hatchery programs, irrigation intake screening, and fish passage improvements in Oregon, Washington, and Idaho. Congress has appropriated Mitchell Act funds annually since 1946, and NMFS has administered it since 1970 with appropriations to tribes and the states to produce hatchery salmon and steelhead to support tribal, sport, and commercial fisheries.

1.3.3 Umatilla River Chinook and Coho Salmon Production Programs

The Council authorized the Umatilla Hatchery in 1984 and approved the Umatilla Hatchery Master Plan in 1989[3] as part of its Columbia River Basin Fish and Wildlife Program to produce juvenile Chinook salmon and steelhead (*Oncorhynchus mykiss*) smolts for acclimation and release in the

[3] The satellite facilities were approved in subsequent years.

Umatilla River Basin. Umatilla Hatchery operations began in 1991 with the goal of supporting the Umatilla River Spring Chinook Program, the Umatilla River Fall Chinook Program (*Oncorhynchus tshawytscha*), the Umatilla River Coho Program , and the Umatilla Summer Steelhead Program for increasing returns of these fish to the Umatilla River basin to partially mitigate the loss of fishing and harvest opportunities due to habitat loss and migration blockage resulting from operations of the Columbia Basin hydropower system. The actions also provide for the restoration of fish populations in available, but currently unused, spawning habitat in the upper reaches of the Umatilla River basin.

1.3.4 Umatilla River Fall Chinook Program

The primary purpose of the program is to meet harvest mitigation goals with a secondary purpose to supplement natural production. The Hatchery and Genetics Management Plan (HGMP) and Program Management Plan for the Umatilla River Fall Chinook Program describe how the program would collect fall Chinook broodstock at Three Mile Falls Dam adult trapping facility from September through November; hold them there and spawn or transfer them to the Walla Walla Hatchery[4] for holding and spawning. The spawned eggs are reared at the Umatilla Hatchery to produce its targeted 600,000 smolts.[5]

The current BPA production and release goals for Umatilla River Fall Chinook are 600,000 sub-yearlings. The sub-yearling fish from the Hatchery would transferred from the Umatilla Hatchery and released evenly into two ponds at the Pendleton facility for two weeks of acclimation prior to release into the Umatilla River. For the purposes of this EA, when 'Umatilla River Fall Chinook Program' or fall Chinook generally is referenced, the BPA-funded sub-yearling fall Chinook production is being discussed.

1.3.4.1 Umatilla River Spring Chinook Program

The purpose of the spring Chinook Program is to provide for both harvest needs and for reestablishing natural production in the Umatilla River. The HGMP and Program Management Plan for the Umatilla River Spring Chinook Program describes how the program would collect spring Chinook broodstock at Three Mile Falls Dam adult trapping facility from May through June, transfer them to the Walla Walla Hatchery for holding and spawning, and then transport the eggs to the Hatchery for incubation and rearing. Most smolts from this production (about 75%) would be transferred to the Imeques C-mem-ini-kem facility (hereinafter "Imeques") for acclimation and release (some in December, some in April), while the remainder would be transported to the

[4] The Walla Walla Hatchery is not discussed further in this EA because its fish-rearing effects on resources has already been analyzed in the Walla Walla Basin Spring Chinook Hatchery Program Final Environmental Impact Statement (BPA 2018a).

[5] A separate yearling program (about 60% of the eggs collected) are hatched and reared at the Bonneville Hatchery by the US Army Corps of Engineers (COE) to produce 900,000 smolts to be released in the Umatilla River. These actions are not analyzed in this EA because the yearling program is funded by the COE under the John Day Dam/The Dalles Dam Mitigation Agreement, not by BPA. Further, the fish-rearing effects on resources has already been analyzed in prior EAs for other programs, most relevantly in the "*Final Environmental Assessment to Analyze Impacts of a NOAA's National Marine Fisheries Service Determination to Issue Section 10 Permits for the Continued Operation of Eight Hatchery Programs within the Tucannon, Grande Ronde, and Imnaha River Basins*" which was produced by NMFS in 2013 (NMFS 2013) and adopted by BPA in its FONSI in December 2016 (BPA 2016).

Thornhollow Acclimation Facility for final rearing and release. (ODFW and CTUIR 2011c and ODFW 2023a).

The current production and release goal for Umatilla River Spring Chinook is 810,000 smolts.

1.3.4.2 Umatilla River Coho Program

The purposes of the Umatilla River Coho Program are to provide ocean and in-river harvest opportunities as well as supplement natural spawning. Coho broodstock would be collected at the Three Mile Falls Dam adult trapping facility then held and spawned at the adult holding and spawning facilities there. If broodstock goals are not met at the Three Mile Falls facility, then additional broodstock would be acquired from the Bonneville Dam collection facilities. Fertilized eggs from Three Mile Falls Dam would be transferred to the Irrigon Hatchery for incubation up to the eyed stage before transfer to Cascade Hatchery at Bonneville Dam where they would be hatched and reared using NMFS Mitchell Act funds, not BPA's (thus not included in this Proposed Action) (ODFW and CTUIR 2011a and ODFW 2023a).

When reared, coho salmon smolts would be transferred (mid-March) to the Pendleton Acclimation facility where they would be acclimated for release into the Umatilla River in early April.

The current production and release goal for Umatilla River Coho is 500,000 smolts.

1.3.5 Umatilla Hatchery and Satellite Facilities

The Umatilla River Spring Chinook, Umatilla River Fall Chinook, and Umatilla River Coho programs use the Umatilla, Bonneville, Cascade and Walla Walla Fish hatcheries and several satellite facilities for fish production and release. The Umatilla Hatchery is the primary hatchery for these programs. It produces all of the spring Chinook and fall Chinook sub yearlings. The Walla Walla Hatchery is only used for its trapping and holding facility. The Cascade Hatchery rears all of the coho salmon.

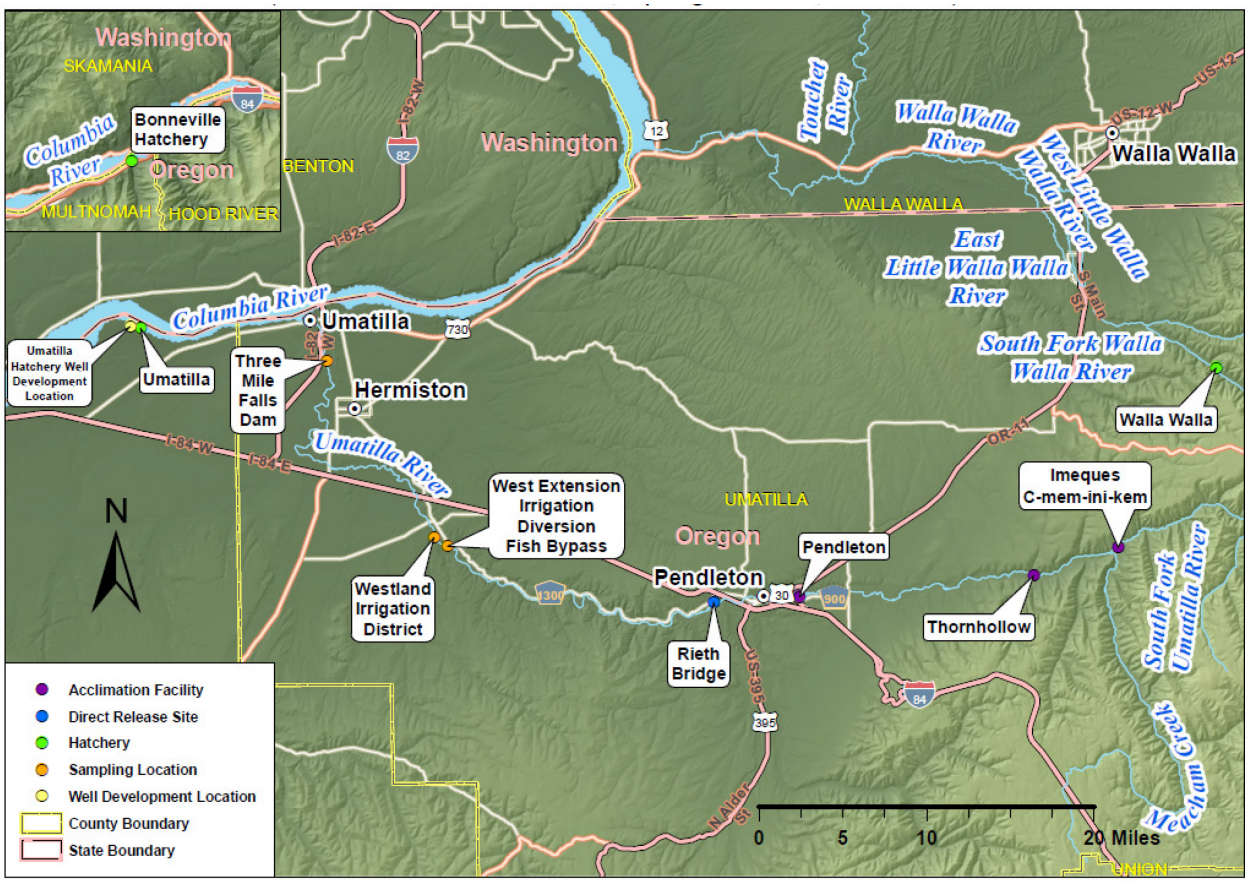
The Umatilla Hatchery is located adjacent to the Columbia River, 3.5 miles west of Irrigon, Oregon (Figure 1), on a 23-acre site managed by the COE with its water supply from wells located on adjacent lands.

Figure 1 Bonneville, Cascade and Umatilla Hatchery locations with Umatilla Hatchery location detail and facility layout

The hatchery began operation in 1991 and its complex now includes the following facilities as described in the HGMPs for the Umatilla River Spring Chinook Program (ODFW and CTUIR 2011c), the Umatilla River Fall Chinook Program (ODFW and CTUIR 2011b), and the Umatilla River Coho Program (ODFW and CTUIR 2011a) (see Figure 2).

- One central incubation and rearing facility at Umatilla Hatchery
- Two trapping and adult holding facilities at Three Mile Falls Dam and the Walla Walla Hatchery
- Smolt acclimation and release facilities at Pendleton, Thornhollow, and Imeques
- One juvenile trapping and sampling facility at Westland Juvenile Sampling Facility
- One fish by-pass and sampling area at Westland Diversion

Figure 2 Location of Umatilla Hatchery Complex satellite facilities

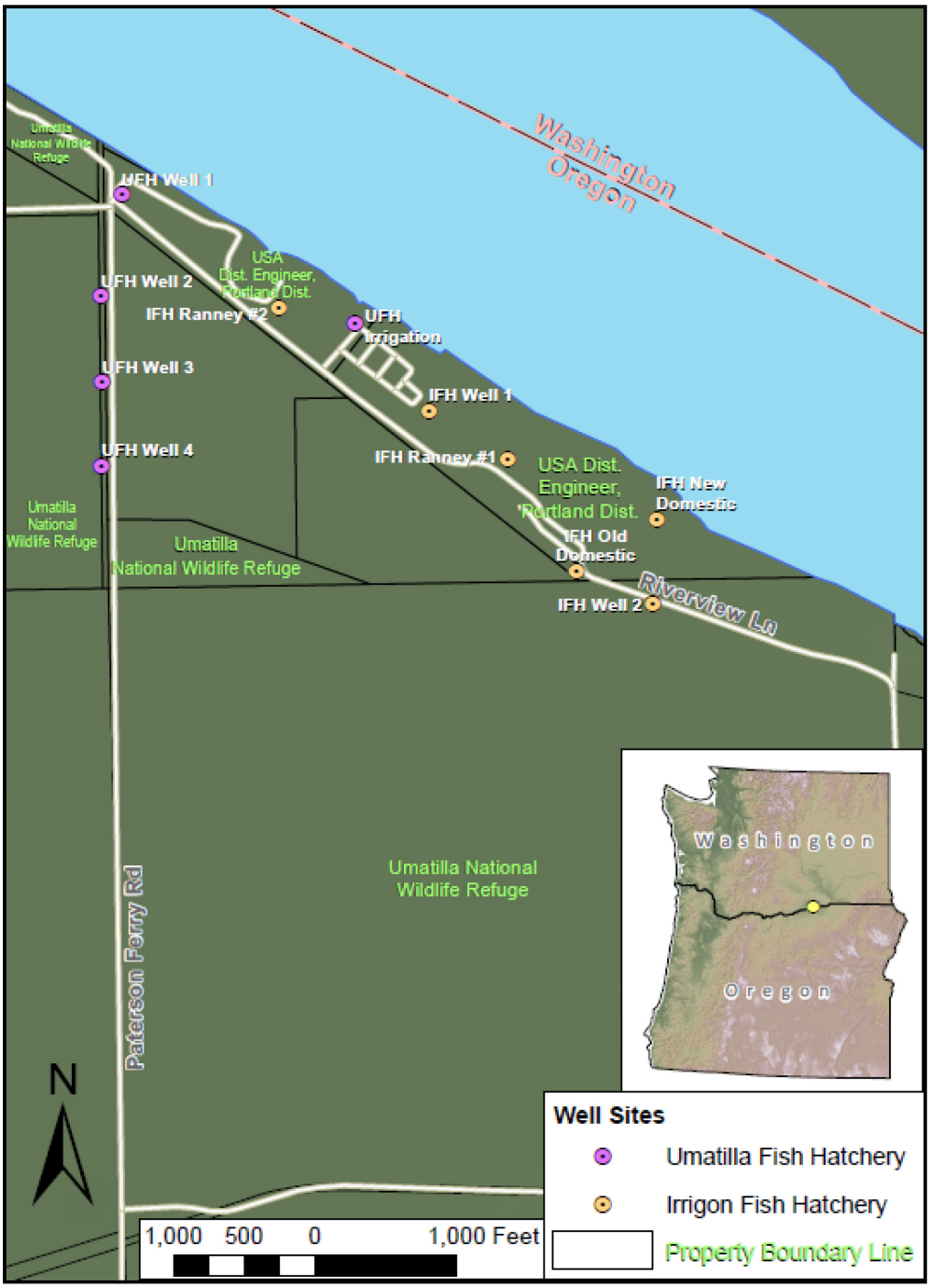


ODFW is funded by BPA to operate the Umatilla Hatchery to produce the fish consistent with the Council's Fish and Wildlife Program. CTUIR is funded by BPA to operate the acclimation and release facilities in the upper reaches of the Umatilla River for the fish produced by ODFW. BPA funds the Westland Irrigation District to operate the trapping and sampling facilities in the lower reaches of the river to trap broodstock for the hatchery programs and to monitor and evaluate out-migration of juvenile fish from both the release facilities and natural production.

1.3.6 Umatilla Hatchery Water Supply and Fish Production Issues

Water for the Umatilla Hatchery comes from the Columbia River through a Ranney well system, and four separate wells. The Ranney well system is located on COE-managed land and provides the majority of the hatchery water supply. One vertical well (well #1) is located on lands managed by COE. Four vertical wells are located on USFWS refuge lands (wells #2, 3, and 5 are operational and well #4 has been decommissioned). All wells are managed by ODFW.

Figure 3 Location of wells serving Umatilla Hatchery



The system was initially designed and constructed to produce a maximum of 15,000 gallons per minute (gpm) of water. Since well construction, several wells have failed (ODFW and CTUIR 2011c) and water production in the remaining wells have declined. Water capacity was at 5,500 gpm in 2015 and has declined to 3,800 gpm as of late October 2022 (ODFW and CTUIR 2022).

The Umatilla Hatchery was originally designed to produce 40,000 pounds of summer steelhead smolts (about 200,000 smolts at 5 fish per pound) and 120,000 pounds of fall and spring Chinook salmon smolts (about 1.8 million smolts at 15 fish per pound as per current release practices) all for release in the Umatilla River basin as analyzed in the 1987 Umatilla Hatchery EA (BPA 1987). Water shortages and water temperature issues, however, have limited the production programs to a current production level of 1.56 million (810,000 spring Chinook smolts, 600,000 juvenile fall Chinook, and 150,000 summer steelhead).

Table 1 Fish Production - Hatchery Design vs. Current Goals

Species	Hatchery design capability[1] (smolts)	Current Production Goals
Fall Chinook	1,800,000	600,000
Spring Chinook	1,800,00	810,000
Steelhead[2]	200,000	150,000
totals	2,000,000	1,560,000

[1] BPA 1987

[2] Steelhead, though not included in this Proposed Action, are included here as they affect the Hatchery's water needs.

Electrical issues and water shortages in December 2016 forced the early release of over 143,000 summer steelhead, and over 248,000 spring Chinook. In 2019, water shortages again forced the early transfer of two groups of spring Chinook to the Imeques acclimation facility where they were released into the Umatilla River one month early due to icing conditions.

Water temperatures at the Umatilla Hatchery range from 50°F to 58°F, with an average of 54°F, which is near the highest limits for smolt production (53.6 °F to 59°F)(Richter and Kolmes 2005).

1.4 Public Involvement

1.4.1 Scoping and Scoping Comments

To help determine issues to be addressed in the EA, BPA conducted public scoping outreach. BPA mailed letters on October 2, 2023, 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, and the BPA website). The public letter was posted on a project website established by BPA to provide information about the program and the EA process, which is available at: http://www.bpa.gov/nepa/umatilla-hatchery. The public comment period began on October 2, 2023, and BPA accepted comments on the program from the public until November 1, 2023.

BPA received one comment during the public-scoping comment period, which is posted at the project website provided above. This comment requested that BPA include a no-action alternative in its environmental review and documentation. Accordingly, consistent with NEPA and the applicable implementing regulations, BPA analyzed the environmental effects of a no-action alternative throughout this draft EA.

1.4.2 Public Comments on the Draft EA

On February 13, 2024, BPA sent a letter to affected persons, agencies, Tribes, and organizations announcing draft EA availability. The letter requested comments on the draft EA. Upon mailing that letter, BPA opened a draft EA comment period on February 13, 2023, which ran until March 14, 2024. BPA received comment submissions from a representative of the CTUIR Fisheries Program, the U.S. Environmental Protection Agency, and one individual. These comments and BPA's responses are included in the final EA in Appendix 4.

Chapter 2. Proposed Action and Alternatives

This chapter describes the Proposed Action and the No Action alternative.

2.1 Proposed Action

BPA's Proposed Action is to continue funding the following Umatilla production program and hatchery facility actions:

1. The ongoing collection, spawning, transport, production, acclimation and release of Umatilla River Spring Chinook salmon, Umatilla River Fall Chinook subyearling salmon, and the collection, spawning, acclimation and release of Umatilla River Coho Salmon.
2. Maintenance of the Umatilla Hatchery and satellite facilities and grounds.
3. Site and facility upgrades and additions beyond routine annual maintenance requiring site disturbance, facility reconstruction, or new construction within the program's existing facilities and site boundaries.
4. Additional water source development at Umatilla Hatchery.
5. The ongoing RM&E of the programs' production and release actions; and of adult returns and out-migration of hatchery-produced and naturally-produced smolts.

The Proposed Action also includes continued funding of operation and maintenance of the following facilities in support of the programs listed in Table 2.

Table 2 Facilities used in the BPA-funded Umatilla Hatchery Programs

Facility/site[1]	Program	Location	Functions
Umatilla Hatchery	Umatilla River Fall Chinook Umatilla River Spring Chinook	RM 278.5 on Columbia River, approx. 3.5 miles downstream of Irrigon, Oregon	incubation and rearing
Three Mile Falls Dam	Umatilla River Fall Chinook Umatilla River Spring Chinook Umatilla River Coho	RM 4 on Umatilla River	adult trapping and holding
Walla Walla Hatchery	Umatilla River Spring Chinook	RM 7 on the South Fork of the Walla Walla River	adult holding and spawning
Westland Irrigation District Juvenile Sampling Facility	Umatilla River Spring Chinook Umatilla River Coho	RM 26.3 on Umatilla River near Echo, OR	juvenile trapping at large irrigation diversion across Umatilla River
West Extension Irrigation District Irrigation Diversion Fish Bypass and Sampling Area	Umatilla River Fall Chinook Umatilla River Spring Chinook Umatilla River Coho	RM 27.3 on Umatilla River	juvenile trapping at large irrigation diversion across Umatilla River
Rieth Bridge Direct Release Site	Umatilla River Fall Chinook	RM 48 on Umatilla River	smolt direct release; no facility
Pendleton Acclimation Facility	Umatilla River Fall Chinook Umatilla River Coho	RM 56 on Umatilla River	smolt acclimation and release - a four-pond facility
Thornhollow Acclimation Facility	Umatilla River Spring Chinook	RM 73.5 on Umatilla River	smolt acclimation and release - a two-pond facility

Facility/site[1]	Program	Location	Functions
Imeques C-mem-ini-kem Acclimation Facility	Umatilla River Spring Chinook	RM 79.5 on Umatilla River	smolt acclimation and release - a four-pond facility

2.1.1 Chinook and Coho Production and Release

The proposed Umatilla production programs for producing Chinook salmon includes broodstock collection where adult fish would be trapped, collected, and anesthetized. PIT tag data from these fish would be recorded, and fish not collected for broodstock would be transferred to recovery tanks prior to release back into the Umatilla River. Selected broodstock would be spawned (males milked for sperm; females opened for egg retrieval; then mixing the sperm with the eggs for fertilization). These fertilized eggs would be delivered to the Umatilla (Chinook) or Cascade (coho) Hatcheries where they are incubated and hatched, and where the hatched juvenile fish are reared to smolt and pre-smolt sizes that are then transported to direct-release locations or to acclimation facilities (see Table 3) where they are held for a period of time before release. The proposed Umatilla program for coho salmon includes only collection, spawning, acclimation, and release as described in Section 1.3.2 "*Umatilla Hatchery Program.*" Their production and rearing would continue to be funded by NMFS using Mitchell Act funding as discussed in Sections 1.3.2 "*Mitchell Act*" and 1.3.3.3 "*Umatilla River Coho Program*."

The proposed programs' broodstock collection, smolt release, and return goals are displayed in the table below.

Table 3 Proposed Collection, Production/Release, and Adult Return goals.

Production Program	Broodstock collection goals	Smolt production goals at Umatilla Hatchery[1]	Smolt production goals elsewhere[2]	Smolt release goals	Release locations	Adult return goals
Umatilla River Fall Chinook Program	600 pairs and 50 jacks (for Umatilla Hatchery production)	600,000 sub yearling smolts	900,000 smolts from Bonneville Hatchery	1,500,000	600,000 sub-yearling smolts direct release at Rieth Bridge. 900,000 smolts at Thornhollow and Pendleton acclimation facilities.[2]	12,000
Umatilla River Spring Chinook Program	524 pairs and 26 jacks	810,000 smolts	0	810,000	Imeques and Thornhollow acclimation facilities	8,000
Umatilla River Coho Program	300 pairs	0	500,000 from Cascade Hatchery	500,000	Pendleton acclimation Facility	6,000

[1] Production numbers are adaptively managed and reviewed annually under the Annual Operating Plan (AOP) (ODFW 2023a).

[2] These actions are part of the fish production programs, but their rearing (coho) or any portion of their production (fall Chinook yearlings) is not included in the Proposed Action for this EA because they are conducted and funded by other agencies.

This EA analyzes the production and release of up to 810,000 spring Chinook; production and release of up to 600,000 fall Chinook; and acclimation and release of up to 500,000 Umatilla River Coho salmon.

The purposes of the Umatilla River Coho Program are to provide ocean and in-river harvest opportunities as well as supplement natural spawning. Coho broodstock would be collected at the Three Mile Falls Dam's east bank adult trapping facility then held and spawned at the adult holding and spawning facilities there. If broodstock goals are not met at the Three Mile Falls facility, then additional broodstock would be acquired from the Bonneville Dam collection facilities. Fertilized eggs from Three Mile Falls Dam would be transferred to the Irrigon Hatchery for incubation up to the eyed stage before transfer to Cascade Hatchery at Bonneville Dam where they would be hatched and reared using funds other than BPA's (thus not included in this Proposed Action).

When reared, coho salmon smolts would be transferred (mid-March) to the Pendleton Acclimation facility where they would be acclimated for release into the Umatilla River in early April.

2.1.2 Routine Maintenance of the Hatchery Facilities

Regular routine maintenance is essential to the productivity of the facilities and to ensure the optimal health of young fish being grown in captivity. This action covers routine activities at the site (lawns, grounds, roadways, fences, etc.), on the structures (hatchery buildings, outbuildings, residences, etc.), and on the infrastructure essential for fish production (water supply intakes, feeding equipment, habitats and their support equipment, and biosecurity systems). All of the actions described below would occur within the existing footprint of the facility, require no new native ground or vegetation disturbance, have no potential to affect cultural resources, and would have no effect on ESA-listed species. The actions described below are representative of the actions proposed, but not an exhaustive list.

Routine maintenance of the facilities' grounds would include tasks such as landscape maintenance and lawn mowing; fence and gate repair; roadway and other flat surface maintenance such as gravel placement, paving, hole filling, asphalt sealing; and sign placement, repair, and replacement.

Facility maintenance would include painting; structure and roofing repairs; maintenance of power, lighting, heating/cooling and plumbing systems; and in-kind structure replacements that would maintain or improve the efficiency of the facilities' capability to support the programs described above.

Maintenance of structures and equipment directly involved in fish production and acclimation is essential to the hatchery program's success. Routine maintenance of the facilities' water systems would include water supply intake debris and silt cleanout, maintaining, replacing or upgrading water monitoring and testing equipment to ensure water parameters such as temperature, pH levels, dissolved oxygen, and ammonia levels are within the suitable range for the salmon's growth and development. The structural integrity of the water systems' flow, treatment, pressure, and temperature control systems would be maintained, replaced or upgraded as needed to ensure optimal conditions for fish. Rehabilitation of the existing water wells may be applied periodically to restore diminished flows. The facilities' effluent and effluent systems would be routinely tested and inspected with maintenance and repairs applied as needed.

Feeding equipment would be inspected, cleaned, and maintained to ensure accurate and efficient feeding. The various components of the rearing infrastructure, such as incubation equipment, rearing tanks, raceways, ponds, and predator control systems would be inspected, maintained, replaced, or upgraded as needed. Various equipment and machinery such as pumps, filters,

aerators, and monitoring/alarm systems would be maintained (inspecting, cleaning, and lubricating) and malfunctioning equipment would be repaired or replaced to avoid disruptions in hatchery operations.

Biosecurity is critical to prevent the introduction and spread of diseases within the hatchery. Routine maintenance includes sanitization of equipment and the maintenance of tanks, raceways, ponds, and other equipment needed for isolation and quarantine.

2.1.3 Site and Facility Upgrades and Additions

This action includes facility and infrastructure upgrades and additions beyond routine maintenance that would require site disturbance, facility reconstruction, or new construction within areas already impacted by the initial facility construction and its ongoing operation and maintenance. The proposed action would not impact lands not already affected by ongoing hatchery operations, would not produce effects to fish that would require reinitiation of consultation under ESA, would not have the potential for disturbance of cultural resources for which cultural resource consultation has not been completed and would therefore be required, and would not result in fish production level changes (e.g., equipment upgrades or replacement with all activity and effects confined within existing buildings).

The following list of current proposals demonstrate the types of actions this proposal includes.

- Replace and upgrade chiller system (four chillers, 50-ton).

  A chiller is a critical system for the incubation process and must operate, without disruption, for 10 months of the year. BPA proposes to provide funding to ODFW to install a new water chilling system at the Umatilla Hatchery as the well water currently used to supply the hatchery is not cold enough to properly incubate eggs. The current chiller also has insufficient cooling capacity, has reached the end of its service life, and lacks the appropriate level of redundancy for a system critical to hatchery operations.

  To accommodate a chiller upgrade with increased capacity, a 1,500-square-foot addition would be constructed on the northwest corner of the hatchery building. The addition's exterior façade would match the existing building. The proposed addition would be of similar construction as the existing structure, which is reinforced concrete masonry block construction with conventional reinforced concrete foundations and a slab-on-grade floor. Grading of the site would be needed for construction of the planned new addition, with cut and fill thicknesses of less than about two feet, except where installation of new utilities may require larger cuts. The location is adjacent to the existing chiller room, facilitating connecting the upgrade system to the existing chilled water mains. Equipment installed in the addition would include 2 or 3 chillers, a 1,000-gallon buffer tank, redundant chilled water heat exchangers, piping, condensers, pumps, and electrical systems. A control, monitoring and alarm system would also be installed. The new system would be fully operational and commissioned prior to connecting it to the chilled water distribution piping. The existing system would be removed once the new system is online and reliably operating.

  Access to the site for the geotechnical work and later for construction would be by existing paved roads. Construction staging would occur within the bounds of the existing hatchery facility on previously paved or graveled surfaces, or possibly within areas that were landscaped as part of the original hatchery construction.

This action would not require reinitiation of ESA consultation, and consultation on its effects to cultural resources is nearing completion.

- Retrofit river water intake fish screens at Thornhollow, Pendleton, Imeques, and Three Mile Falls Dam to address gaps that allow fish and debris to enter intake structures and to resolve drum cleaning mechanism inadequacies. This would be limited to work on existing structures (concrete structures, piping, etc.) with no need for excavation or potential for new soil or vegetation disturbance. Some in-water work would be necessary to access existing structures, but there would be no streambed or streambank modifications and it was determined that no consultation for effects on ESA-listed species or cultural resources is needed.

2.1.4 Additional Water Source Development

The Umatilla Hatchery's water supply is slowly declining and additional water is needed to meet program goals. A detailed assessment evaluating alternatives to remedy the declining water supply was completed in May 2019 (Miller et al 2019). This assessment evaluated a number of options, including:

- **Development of new wells to replace day-to-day use of the existing vertical wells**. One and possibly two collector wells would likely be needed to meet water supply needs. New vertical wells would be constructed with a 20-inch borehole up to 100 feet deep and 20 to 30 feet of 16-inch diameter wire-wrap. This well size could accommodate well production up to 1,500 gpm and wells would be constructed to meet a total water production capacity (including existing water supplies) of approximately 6,800 gpm. New wells would be considered in the vicinity of the existing wells along Patterson Ferry Road (the Umatilla Hatchery access road), immediately south of the existing wells along Patterson Ferry Road, east of the neighboring Irrigon Fish Hatchery on lands managed by COE property, and south of the neighboring U.S. Fish and Wildlife Refuge access road along Patterson Ferry Road. New wells would require new pipelines to convey that water to existing distribution lines supplying water from existing wells to the hatchery.
- **Use of existing irrigation wells on the U.S. Fish and Wildlife Refuge** to lease existing water production capacity during periods when these irrigation wells are not being used. This would require the agreement and cooperation of the U.S. Fish and Wildlife Service and their agricultural lessee to enter into a lease agreement that would define the time period(s) and flow rate available for delivery to the Umatilla Hatchery and provide certainty in how the leased capacity can be used to augment its other water supply sources. This concept focuses on Wells 2 and 4 in the U.S. Fish and Wildlife Refuge, which are within one mile of the Umatilla Hatchery.
- **Develop systems for reuse of hatchery water** to reduce demand for additional water. This would entail adding pump-back capability to the hatchery's existing rectangular raceways and adding new circular raceways. The pump-back system would entail construction of a sump at the downstream end of the raceways in which fine screens would be installed to remove solids and a pump installed to move water from those screens through an aeration process back to the head of the raceways. Eighteen circular raceways (18 feet in diameter and 5 feet deep) would be installed in the location of two existing raceway systems that are not currently in use. These tanks would be provided with a reuse system that would include drum screens for solids removal, pumping, and aeration. This re-

use option would require an additional 1,520 gpm water to what is already available, so new wells would need to be constructed as described in the first option, above.

- **Moving juvenile spring Chinook** (the program with the highest water demand when supplies are taxed) to the Thornhollow and Imeques acclimation facilities in early November (rather than in December and April as is the current schedule) to reduce water demands at the Hatchery during fall and winter. This alternative entails holding juvenile Chinook at these facilities overwinter, which would require improvements in those facilities' water supplies to address winter-time icing issues. These issues arise 6 to 12 days each year, lasting only a few to several hours each day but severe enough to block all flow to the acclimation ponds. Solutions could involve heating intake screens, replacing surface water with groundwater, mechanically removing ice, or aeration of the ponds to maintain minimum dissolved oxygen levels. Aeration or switching to groundwater would likely be the most feasible.

The evaluation identified three workable alternative combinations of these approaches and compared them considering their effects on the water budget; the complexity of the approaches for facility operations; the timelines for planning and construction; operational and maintenance costs; capital and lifecycle costs; electrical supply reliability; effects on juvenile post-release performance; and regulatory compliance, safety concerns, and long-term equipment reliability.

The 2019 report did not recommend a preferred combined-approach alternative to be advanced into this EA. As such, this EA will evaluate a water supply solution that incorporates all four approaches for the purposes of evaluating their effects on the human environment in Chapter 3.

2.1.5 Research, Monitoring, and Evaluation of the Hatchery Programs

2.1.5.1 Hatchery Monitoring and Evaluation

The focus of the Umatilla Hatchery RM&E Project is on evaluation of release sizes; acclimation and release locations; release timing and strategies on juvenile survival; and adult production to evaluate hatchery rearing techniques and juvenile and adult production goals. To achieve this, smolt production is monitored, as is their physical condition at release (length, weight, and condition factor); out-migration performance is evaluated; and adult returns are assessed.

Marking and tagging is used to monitor smolt production, out-migration performance, calculate smolt-to-adult survival, adult production, and harvest and spawning contributions of hatchery-reared Chinook salmon to evaluate artificial production strategies. A subset of smolts from each rearing group would be Passive Integrated Transponder (PIT)-tagged[6] to assess smolt survival and migration performance to Three Mile Falls, John Day, and Bonneville dams and other detection sites. For fall Chinook, a portion of the production is direct-released, and a portion is acclimated prior to release. Comparisons of adult returns from each release strategy is assessed.

Adult returns are then evaluated to determine smolt-to-adult survival, stray rates, and the contributions to salmon harvest and spawning by production group. The Three Mile Falls Dam

[6] A PIT tag is a small electronic tag approximately 12 mm long and 2.1 mm in diameter that is injected into the body cavity of juvenile or adult fish. The tags can be automatically detected and recorded at detection "arrays" at various locations within a river system. The tag can be coded with up to 35 billion unique codes that allow the tracking of individual fish as they move through a river system.

adult collection facility (and other fish-return data sources[7]) is used to evaluate adult returns. It is operated daily from mid-August through December 1st to collect fall Chinook broodstock and to enumerate, record PIT tag data, and record biological data on all returning salmonids, including coho.

Fish health is also monitored. Adult salmonids collected for broodstock are held for health evaluation at satellite facilities prior to spawning. The health of natural smolts is monitored through disease testing and mortalities encountered during smolt outmigration sampling. The health of juvenile hatchery fish health is monitored throughout rearing, acclimation, and release.

For adult fish health monitoring, a minimum of 20 adult mortalities (if available) would be sampled for bacteria that would be cultured. Kidneys of all female spring and fall Chinook salmon that are spawned would be examined for bacterial kidney disease (BKD). Family groups are tracked to assess for aggressive BKD which would be managed by culling eggs from infected groups. A minimum of 60 spring and fall Chinook spawners would be examined for culturable viruses as per the American Fisheries Society, Fish Health Section Blue Book methods (AFS 2020).

For juvenile fish, a minimum of ten fresh-morbid or moribund juvenile fish (if available) would be sampled monthly from each rearing strategy group. At acclimation, a pre-release examination would be conducted if a fish health examination has not been conducted within six weeks of the release date. Sixty fish would be tested annually from the Hatchery annually for *Myxobolus cerebralis*, the causative agent of Whirling Disease.

2.1.5.2 Natural production Monitoring and Evaluation

The RM&E program would monitor tribal harvest, juvenile outmigration, water temperatures, age and growth, adult salmon passage, and natural spawning of salmon in the Umatilla Basin to assess the contributions to adult returns and harvest of each fish production program group. Spawning surveys would be conducted; creel surveys and post-season interviews of fishers would be conducted; rotary fish traps would be used to PIT-tag naturally produced juvenile fish; and monitoring of stream flows and water temperature would be conducted as part of this program.

2.1.5.3 Umatilla Juvenile Outmigration Monitoring and Evaluation

This RM&E action is focused on evaluating the outmigration of anadromous salmonids to assess the effectiveness of rearing and release strategies of the production programs. The program would operate PIT tag detection system at Three Mile Falls Dam to monitor movement of tagged fish; operate smolt traps to estimate smolt abundance (see Table 4) and mark smolts for survival and migration characteristics assessment; conduct spawning surveys to determine the distribution of spawning fish; conduct juvenile fish surveys to determine rearing distribution and density; and conduct habitat surveys to characterize the quantity, quality, and distribution of habitat in the Umatilla River Subbasin. Data analyses will integrate life stage specific survival and life history information to derive and assess the key performance metrics.

[7] Including data on adults harvested in and out of the Umatilla Subbasin, strays, spawning escapement monitored by the Umatilla Passage Operations Project, and contribution to natural spawners reported by the Umatilla Natural Production Project. Data is also used from coded-wire tags recovered by fishers, fish collected at other terminal locations (hatcheries, dams, weirs, etc.), and from carcasses recovered on the spawning grounds.

Table 4 Trapping Facilities and Sites

Trap location	Broodstock collection	Outmigration smolt trapping
Meacham Creek smolt trap		X
Three Mile Falls Dam	X	X
Westland Irrigation District Juvenile Sampling Facility		X
West Extension Irrigation District Irrigation Diversion Fish Bypass and Sampling Area	X	X
Fyke net at river mile 0.5		X
Feed Canal smolt trap		X
Maxwell Canal smolt trap		X
Westland Canal smolt trap		X

2.2 No Action Alternative

Under the No Action Alternative, BPA would not fund ODFW, CTUIR, or Westland Irrigation District for any of the elements of the Proposed Action described above. ODFW, CTUIR, and Westland Irrigation District could acquire funding from other sources and proceed with these actions. For the purposes of this EA, however, the No Action Alternative describes the effects if there were a decision to not proceed with these actions and hatchery production of all stocks at the hatchery and the satellite facilities would cease.

Under this alternative, BPA would not fund broodstock capture, hatchery production, or juvenile acclimation and release of Chinook salmon. There would also be no funding for coho capture, transportation, acclimation, or release. Production supporting RM&E activities would not occur. Routine maintenance of the Umatilla Hatchery Complex would cease.

There would be no facility upgrades or additions and no additional water sources would be developed.

This No Action Alternative does not include the removal of existing facilities.

2.3 Mitigation Measures

The table below lists the mitigation measures that would reduce or avoid the impact of the Proposed Action.

Table 5 Mitigation Measures

Environmental Resource	Mitigation Measure	Applicable Proposed Action element / timing	Responsible party
Geology and Soils	Install and maintain all temporary erosion controls downslope of applicable project activities until construction actions are complete.	Site and Facility Upgrades and Additions / Before and during construction	Contractor
	Segregate topsoil from subsoil and store during excavation for use in site reclamation.	Site and Facility Upgrades and Additions / During construction	Contractor
	Grade and cover disturbed areas and areas of excavated soils with at least two inches of compost upon completion of construction.	Site and Facility Upgrades and Additions / During construction	Contractor
	Implement Best Management Practices (BMPs) for erosion and sediment control measures during construction.	Site and Facility Upgrades and Additions / Before and during construction	Contractor
Water Resources	Follow project-specific Clean Water Act permit requirements.	Site and Facility Upgrades and Additions / Before, during, and after construction; and during acclimation/release operations	Contractor, ODFW, and CTUIR
	Comply with Umatilla Hatchery Complex National Pollutant Discharge Elimination System Permit Waste Management Plans	Chinook and coho production and release / During hatchery operations	ODFW, CTUIR, and Westland Irrigation District
	Use sediment barriers such as fences, weed-free straw matting/bales, or fiber wattles, as necessary, in all work areas to intercept any surface flow that might transport sediment to the Columbia River.	Site and Facility Upgrades and Additions / Before and during construction / Contractor	Contractor

Environmental Resource	Mitigation Measure	Applicable Proposed Action element / timing	Responsible party
	Inspect erosion and sediment controls weekly, maintain them as needed to ensure their continued effectiveness, and remove them from the proposed hatchery site when vegetation is re-established, and the area has been stabilized.	Site and Facility Upgrades and Additions / Before and during construction / Contractor	Contractor
	Maintain materials for spill containment and cleanup on site during pre-construction, construction and restoration phases of the project.	Site and Facility Upgrades and Additions / Before and during construction / Contractor	Contractor
	Locate vehicle staging, cleaning, maintenance, refueling, and fuel storage areas a minimum of 150 feet from the Umatilla River.	Site and Facility Upgrades and Additions / Before and during construction / Contractor	Contractor
	Wash heavy equipment before delivery to the project site to remove oils, fluids, grease, etc. Inspect and clean equipment regularly. Prohibit discharge of vehicle wash water into any stream, water body, or wetland without pretreatment to meet applicable water quality standards.	Site and Facility Upgrades and Additions / During construction / Contractor	Contractor
	Inspect machinery daily for fuel or lubricant leaks.	Site and Facility Upgrades and Additions / Before during and after construction / Contractor	Contractor
	Design and operate on-site chemical storage buildings to fully contain accidental spills of chemicals stored at the proposed facilities.	Site and Facility Upgrades and Additions / Before during and after construction / Contractor	Contractor
	Inspect and maintain access roads and other facilities after construction to ensure proper function and nominal erosion rates.	Site and Facility Upgrades and Additions / After construction	ODFW and CTUIR
	Perform all non-emergency maintenance of equipment off-site.	Site and Facility Upgrades and Additions / Before and during construction / Contractor	Contractor
Vegetation	Seed disturbed areas with a native erosion-control grass seed mix to prevent future erosion, stem the invasion of noxious weeds, and provide wildlife benefits.	Site and Facility Upgrades and Additions / During and after construction / Contractor	Contractor

Environmental Resource	Mitigation Measure	Applicable Proposed Action element / timing	Responsible party
	Cover all temporarily disturbed areas with at least two inches of compost and replant with native vegetation.	Site and Facility Upgrades and Additions / During construction	Contractor
	Implement a noxious weed control program that includes the following elements: • Treat known infestations before ground disturbance begins by scheduling appropriate weed treatments, such as mowing, hand pulling, and use of approved herbicides. • Map and flag areas of noxious weed populations so these populations can be avoided when possible. • Ensure equipment brought into the project area is free of weeds and weed seeds. • Work from relatively weed-free areas into the infested areas rather than vice-versa. • Clean equipment and vehicles of mud, dirt, and plant parts after working in infested areas. • Maintain weed-free staging areas. • Apply herbicides according to labeled rates and recommendations to ensure protection of surface water, ecological integrity, and public health and safety. • Implement and periodically schedule post-project control of noxious weeds on an as-needed basis.	Site and Facility Upgrades and Additions / After construction	Contractor, ODFW, and CTUIR
Fish	Apply conservation measures and terms and conditions resulting from consultation with USFWS and NMFS.	Site and Facility Upgrades and Additions / Before during and after construction / During production, acclimation, and release operations	Contractor, ODFW, and CTUIR

Environmental Resource	Mitigation Measure	Applicable Proposed Action element / timing	Responsible party
	Apply the screening criteria for water withdrawal devices found in the 2011 NMFS publication "Anadromous Salmonid Passage Facility Design" (NMFS 2011a) that sets forth standards designed to minimize the risk of harming naturally produced salmonids and other aquatic fauna.	During production, acclimation, and release operations	ODFW, and CTUIR
	Maintain fish screens at water intake structures to minimize entrainment of aquatic species.	During production, acclimation, and release operations	ODFW and CTUIR
	Follow established protocols (legal or scientific) for handling ESA-listed species during broodstock collection and smolt trapping.	During broodstock collection and smolt trapping	/ ODFW and CTUIR
	Ensure that the facilities are operating in compliance with all applicable fish health guidelines and facility operation standards and protocols, by conducting annual audits and producing reports that indicate the level of compliance with applicable standards and criteria.	During production, acclimation, and release operations	ODFW and CTUIR
	Adaptively manage fish releases to maximize survival of released and non-target fish based on recent studies, research, monitoring, and evaluation activities.	During production, acclimation, and release operations	ODFW and CTUIR
	Use therapeutic chemicals only when necessary, and typically for short durations, to be in conformance with accepted standard practices and treatment applications.	During production, acclimation, and release operations	ODFW and CTUIR
Wildlife	Apply timing and methods of construction consistent with conservation measures and terms and conditions from consultation with USFWS	Site and Facility Upgrades and Additions / Before and during construction	ODFW and CTUIR
Land Use and Recreation	Provide appropriate contact information for contractor liaisons and project staff to nearby residents for any concerns or complaints during construction.	Site and Facility Upgrades and Additions / During and after construction	Contractor, ODFW, and CTUIR
	Repair damage to roads that may occur through project construction or construction vehicle use.	Site and Facility Upgrades and Additions / Before during and after construction	Contractor

Environmental Resource	Mitigation Measure	Applicable Proposed Action element / timing	Responsible party
	Limit construction activity to normal workday hours (typically 8:00 AM to 5:00 PM) to minimize impacts to nearby residents.	Site and Facility Upgrades and Additions / During construction	Contractor
Visual Resources	Remove all temporary structures, devices, materials, and 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.	Site and Facility Upgrades and Additions / After construction	Contractor
Air Quality, Noise, and Public Safety	Sequence and schedule construction work to minimize the amount of bare soil exposed to wind erosion.	Site and Facility Upgrades and Additions / Before and during construction	Contractor
	Apply dust control measures (e.g., watering trucks, low speeds, apply gravel to access roads, etc.) as needed. Minimize dust generation during facility construction 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.	Site and Facility Upgrades and Additions / Before and during construction	Contractor
	Do not burn vegetation or other debris associated with construction clearing.	Site and Facility Upgrades and Additions / During construction	Contractor
	Handle and dispose of all potentially odorous waste during operation in a manner that does not generate odorous emissions.	Site and Facility Upgrades and Additions / During and after construction	Contractor
	Recycle or salvage nonhazardous construction and demolition debris, as well as waste generated during facility operation, where practicable.	During construction, production, acclimation, and release operations	Contractor, ODFW, CTUIR
	Use flaggers and safety signage as necessary to avoid vehicle and other conflicts.	Site and Facility Upgrades and Additions / Before and during construction	Contractor

Environmental Resource	Mitigation Measure	Applicable Proposed Action element / timing	Responsible party
	Use the least noise-generating equipment and methods for operations at facilities where noise might intrude into residential areas. Require sound-control devices on all construction equipment powered by gasoline or diesel engines that are at least as effective as those originally provided by the manufacturer.	Site and Facility Upgrades and Additions / Before and during construction	Contractor
	Require sound-control devices that are at least as effective as those originally provided by the manufacturer on all equipment powered by gasoline or diesel engines.	Site and Facility Upgrades and Additions / Before and during construction	Contractor
	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.	Site and Facility Upgrades and Additions / Before and during construction	Contractor
	Prepare and implement a Spill Prevention, Containment, and Control Plan. Include the following measures: • reduce and 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 • employee training on spill containment	Site and Facility Upgrades and Additions / Before construction	Contractor

Environmental Resource	Mitigation Measure	Applicable Proposed Action element / timing	Responsible party
	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.	Site and Facility Upgrades and Additions / Before and during construction	Contractor
	Dispose of non-hazardous waste in approved landfills. Dispose of hazardous waste according to applicable federal and state laws.	Site and Facility Upgrades and Additions / During and after construction	Contractor
	Conduct all project-related activities in compliance with regulations and established guidelines for use, handling, storage, and disposal of toxic and hazardous substances.	During construction, production, acclimation, and release operations	Contractor, ODFW, CTUIR
	Train staff in the proper use, transport, handling, and storage of all chemicals to minimize dangers of overexposure or accidental release to the environment.	During construction, production, acclimation, and release operations	Contractor, ODFW, CTUIR
	Coordinate with local law enforcement, fire protection, and other emergency responders to ensure they are prepared to address any emergencies that may arise during construction.	Site and Facility Upgrades and Additions / Before and during construction	Contractor
	Prepare a Safety Plan in compliance with state requirements before starting construction; specify how to manage hazardous materials, such as fuel and any toxic materials found in work sites; include a Fire Prevention and Suppression Plan, and detail how to respond to emergency situations. Keep the Safety Plan on site during construction and maintain and update, as needed.	Site and Facility Upgrades and Additions / Before construction	Contractor
	Require the construction contractor to hold safety meetings with workers at the start of each work week to review potential safety issues and concerns.	Site and Facility Upgrades and Additions / Before and during construction	Contractor

Environmental Resource	Mitigation Measure	Applicable Proposed Action element / timing	Responsible party
Cultural Resources	Mark known cultural resource sites as 'avoidance areas' on construction drawings and flag as 'no-work areas' in the field prior to construction.	Site and Facility Upgrades and Additions / Before construction	BPA, ODFW, CTUIR, and Contractor
	Modify project design and incorporate protective measures in design to avoid or minimize impacts to cultural resources	Site and Facility Upgrades and Additions / Before construction	BPA, ODFW, CTUIR, and Contractor
	For new chiller construction: (1) excavate down two feet (as planned for construction) to native soil in the area where the chiller addition would be located, or up to two additional feet of excavation in a smaller discrete sample area if native soil is not encountered within two feet of excavation; (2) conduct an archaeological investigation in the area of exposed native soil with up to two shovel test probes; and (3) findings must be negative for construction to continue without further consultation.	Site and Facility Upgrades and Additions / During construction	Contractor, BPA, ODFW
	Protect any unanticipated cultural resources discovered during construction as follows: • Stop work in the immediate vicinity of the discovery and protect find in place. • Notify BPA Archaeologist and BPA Contracting Officer's Representative immediately. • Implement mitigation or other measures as instructed by BPA.	Site and Facility Upgrades and Additions / During construction	Contractor, BPA, ODFW, CTUIR
Climate Change	Encourage the use of the proper size of equipment for each job because larger equipment requires the use of additional fuel.	Site and Facility Upgrades and Additions / Before construction	Contractor, ODFW, CTUIR, and BPA
	Ensure that all vehicle and construction equipment engines are maintained in good operating condition to minimize exhaust emissions.	Site and Facility Upgrades and Additions / Before and during construction	Contractor

Environmental Resource	Mitigation Measure	Applicable Proposed Action element / timing	Responsible party
	Minimize vehicle idling.	Site and Facility Upgrades and Additions / During construction	Contractor
	Encourage carpooling and the use of shuttle vans among workers to minimize emissions.	Site and Facility Upgrades and Additions / Before and during construction	Contractor
	Use alternative fuels, such as propane, for stationary equipment at the construction sites or use electrical power where practicable.	Site and Facility Upgrades and Additions / During construction	Contractor

Chapter 3. Affected Environment and Environmental Consequences

This chapter includes an analysis of the potential effects of the Proposed Action and the No Action Alternative on the human environment. The sections below provide a detailed, resource-specific, discussion of the existing condition of the affected environment and the Proposed Action's environmental effects. Effects are characterized as "high," "moderate," "low," or "no effect." "High" effects that have not been mitigated are considered to be significant effects, whereas "moderate" and "low" effects are not.

The mitigation measures referenced in this chapter refer to those described in Section 2.3 "*Mitigation Measures*."

3.1 Actions and Impacts of the Proposed Action

3.1.1 Chinook Salmon Production, Acclimation and Release Actions and Impacts

The salmon production, acclimation, and release programs would trap and handle ESA-listed salmonids and other fish; and adults selected for broodstock would be spawned (by killing fish and removing their eggs and milt (sperm). Broodstock and juveniles are trapped, handled, transported, fin clipped, injected, held, reared in a tank environment, and fed. All hatchery-produced juveniles are handled or marked in some way (pit tags, adipose fin clip, or coded wire tags).

Hundreds of gallons of water per minute would continue to be diverted at each of the facilities. Effluent (fish waste and rearing water) would be produced, treated, and discharged into the Umatilla and Columbia rivers. Emissions would be produced from the vehicles used to transport workers and fish.

Hundreds of thousands of hatchery-produced juvenile salmonids would be released into the Umatilla River each spring. This pulse of young fish into the aquatic system is quite different from a natural state where juveniles would have been occupying the system as they hatched and reared throughout the available habitat over the prior two seasons and their impact on the system thereby widely distributed and accommodated over time since the time of hatching.

3.1.2 Routine Maintenance Actions and Impacts

Routine maintenance of the Hatchery and satellite facilities would not disturb native soils or vegetation because the work would be primarily on buildings and equipment currently in place, and on facility sites and grounds that have been in place and operating for decades. The work would, however, generate noise and emissions from vehicles or other equipment (e.g., generators and lawnmowers).

3.1.3 Site and Facility Upgrades Actions and Impacts

Site and facility upgrades, like routine maintenance, would not impact undisturbed soils or vegetation since the work would be within facility sites and grounds that have been in place and operating for decades, and would not impact areas or fish not already impacted by past and ongoing hatchery operations. The work would generate noise and emissions from vehicles or other equipment (e.g., generators and lawnmowers) but may increase efficiency or productive capability of hatchery operations.

3.1.4 Additional Water Source Development Actions and Impacts

This action incorporates four approaches to acquiring additional water: drilling new wells; use of existing, nearby, wells; reuse of hatchery water; and moving juveniles to acclimation facilities earlier (see Section 2.1.4, "*Additional Water Source Development*").

Drilling new wells would require using heavy equipment for site clearing and leveling which would eliminate vegetation and impact soil by compaction and destruction of surface soil horizons. Mechanized equipment would also be needed to dig trenches for pipelines to bring water to the hatchery. Some drilling techniques use fluids (generally water with additives) which require careful containment and disposal but nonetheless have a risk of spills and leakage. Site-clearing and drilling equipment would produce emissions and have the potential to leak fuels, oils, and hydraulic fluids.

Use of nearby wells would require the connection of those wells to the Hatchery's water systems which would require the use of mechanized equipment to excavate for pipelines which would impact soil and vegetation as described above.

Reuse of hatchery water would require infrastructure changes at the Hatchery to accommodate the necessary water collection, filtering, treatment, and aeration equipment. These changes, however, would be within the existing footprint of the site and not disturb native soils or vegetation. The impacts would be similar to those described in Section 3.1.3, "*Site and Facility Upgrades Actions and Impacts*."

Moving juveniles to acclimation facilities early would require modifications to the Thornhollow and Imeques facilities' water systems to enable them to function during icing conditions. These modifications, as those for the water re-use infrastructure discussed above, would be within the existing footprint of the sites, so the impacts would be as those described in Section 3.1.3, "*Site and Facility Upgrades Actions and Impacts*."[8]

The impacts of implementing these four approaches for providing additional water to the hatchery may be few and relatively benign, but the successful result of providing that additional water would be a greatly increased capability for producing more juvenile fish.

3.1.5 Research Monitoring, and Evaluation Actions and Impacts

The RM&E actions create no physical impact to other affected resources (e.g., vegetation removal or soil disturbance) as the actions focus primarily on juvenile fish. These fish would be trapped, handled, transported, measured, marked (pit tags, adipose fin clip, or coded wire tags) and mostly released. Some may be incidentally or intentionally harmed in the process for condition assays, etc. Adult fish would also be impacted, but this impact overlaps those from broodstock collection where fish are trapped, handled, and transported. Some may be released during broodstock selection, but others kept for artificial spawning. RM&E measurements and records would be taken on these adult fish as they are encountered throughout this process.

[8]Additional impacts of these actions beyond the existing facilities' footprints would require re-evaluation to determine if separate site-specific NEPA analyses would be needed.

3.2 Effects of the Proposed Action

3.2.1 Geology and Soils

3.2.1.1 Affected Environment

The topography of the Umatilla basin is varied. From the upper basin canyons in the Blue Mountains, the Umatilla River descends to a wide expanse of plains and terraces in the lower basin. The lower basin is prime agricultural land, composed of tertiary and quaternary loess, alluvium, glacio-fluvial, and lacustrine sediment deposits that mantle the underlying Columbia River basalts (Harrison 2020). Soil at the Umatilla Hatchery, however, is classified by the U.S. Soil Conservation Service as Ellum fine sandy loam, a type which supports range and wildlife habitat but is not considered prime or unique farmland (CEQ 1980). Soils are similar at the Pendleton, Thornhollow and Imeques acclimation facilities which are all within the "Xerofluvent" soil type. These soils are mixed alluvium with surface layers of loamy soils mixed with sand or cobbles and underlying layers of gravely soils mixed with sand, cobbles, or loam and are primarily used for pasture or wildlife habitat (U.S.D.A. SCS 1985).

The program's facilities are dispersed along the watershed's mid to lower elevations and geographic settings consistent with their function as displayed in the table below.

Table 6 Geographic Settings of Program Facilities

Facility/site	Location	Functions	Geographic setting
Umatilla Hatchery	RM 278.5 on Columbia River, approx. 3.5 miles downstream of Irrigon, OR	incubation and rearing	Flat lowlands, amongst wildlife refuge natural habitats and irrigated farmlands
Three Mile Falls Dam	RM 4 on Umatilla River	adult trapping and holding	Flat lowlands, amongst irrigated farmlands
Westland Irrigation District Facilities	RM 26.3 on Umatilla River near Echo, OR	juvenile trapping	Flat lowlands, amongst irrigated farmlands
Rieth Bridge Direct Release Site	RM 48 on Umatilla River	smolt direct release	Broad floodplain amid rolling foothills
Pendleton Acclimation Facility	RM 56 on Umatilla River	smolt acclimation and direct release	Broad floodplain amid rolling foothills
Thornhollow Acclimation Facility	RM 73.5 on Umatilla River	smolt acclimation and direct release	Broadening floodplain at transition from canyon lands to rolling foothills
Imeques C-mem-ini-kem Acclimation Facility	RM 79.5 on Umatilla River	smolt acclimation and release	Narrow floodplain in lower elevation, steep, canyon lands

3.2.1.2 Effects of the Proposed Action

The Proposed Action includes only one action, the drilling of new wells in the flat lowlands around the hatchery, which could impact native soils that had not already been impacted by hatchery construction and operations to date. This drilling and excavation for pipelines would excavate, displace, and compact native soils as described above in Section 3.1.4 "*Additional Water Source Development Actions and Impacts*." The scale of this activity, however, would be small, with soil disruption limited to the constructed well pads (generally less than 0.05 acre), and the temporary

road access necessary to move equipment in and out of the construction area. In total, the impacts are anticipated to be less than one acre in size and upon completion, the impacted soils would be seeded with native grass and forb species for site recovery and erosion control.

Other actions would occur either within buildings or within facilities that would disturb soils on surfaced areas (gravel, asphalt, etc.) or other areas with previously disturbed soils. Since there would be few actions that would disturb previously-undisturbed soils, and those would be in very small areas with minimization measures applied as described in Section 2.3 "*Mitigation Measures*," the overall effect on soils would be low.

3.2.1.3 Effects of the No Action Alternative

Under the No Action alternative, all Umatilla Hatchery production programs at all its facilities would cease. There would be no new ground disturbance associated with the Proposed Action and thus, no new effects on geology and soils.

3.2.2 Water Resources

Water quantity and quality in the Umatilla River basin is critical to the success of the hatchery programs, which releases millions of juvenile fish from the program's satellite facilities and direct release sites. Surface and ground water quantity and quality are therefore discussed for both the river basin and the program facilities in the sections below.

3.2.2.1 Affected Environment

Water Quantity

Water supplies in the Umatilla River basin

The Umatilla River flows from nearly 6,000 feet elevation in the Blue Mountains in northeast Oregon down through narrow canyons, then across a series of broad valleys with irrigated farmland, and then through the City of Pendleton before emptying into the Columbia River at the City of Umatilla. It is 89 miles long, drains an area of 2,290 square miles, and has an annual mean flow of about 500 cubic feet per second measured near the mouth of the river (Harrison 2020).

The mainstem Umatilla River has eight main tributaries: the North and South Forks and Meacham Creek in the upper subbasin; Wildhorse, Tutuilla, McKay, and Birch creeks in the mid subbasin; and Butter Creek in the lower subbasin. Except for Wildhorse Creek, the main tributaries drain a portion of the Blue Mountains and enter the Umatilla River from the south. Wildhorse Creek drains the divide between the Umatilla River and the Walla Walla River to the north. There are also many smaller tributary creeks, some of them intermittent. Flows, which are influenced by snowmelt runoff, are highest in April and lowest in September.

Umatilla River water is heavily appropriated for irrigated agriculture. The first irrigation diversion was installed in 1893; private irrigation companies began delivering water in 1903 and 1905; and in 1906, the Umatilla Project was initiated by the Bureau of Reclamation. That project was expanded in 1927, 1938, and 1993 such that the Umatilla Basin Project now supplies water to more than 17,000 acres and a supplemental supply to about 13,000 acres. So much water was being diverted from the Umatilla River that from the mid-1920s until the early 1990s, the lower river was drained dry by irrigation during the summer and fall (U.S. Bureau of Reclamation 2012).

Water for irrigation comes from the river and from impoundments, including Cold Springs Dam and Reservoir, Feed Canal Diversion Dam and Canal, and Maxwell Diversion Dam and Canal in the East

Division; Three Mile Falls Diversion Dam on the Umatilla and the 27-mile West Extension Main Canal in the West Division; and McKay Dam and Reservoir in the South Division. Some 3,800 acres not included in an irrigation district receive either a full or supplemental water supply from McKay Reservoir under individual storage contracts.

Studies for means of restoring flows and anadromous fish runs to the Umatilla River began after passage of the Northwest Power Act (16 U.S.C. 839 §§ *et seq*). Studies focused on bringing additional water to the Umatilla River from the Columbia River and resulted in the Umatilla Basin Project, authorized by the 1988 Umatilla Basin Project Act, which would pump water from the Columbia to fill irrigation reservoirs during the irrigation season, leave Umatilla River water in the river for anadromous fish to imprint on, and build a new reservoir system that would be used to keep water in the river when salmon are migrating.

Two phases of the project have been completed, and a third phase is currently being studied. The first two phases, along with intentional flow management for fish passage, have been successful in restoring up to half of the summertime flows of the Umatilla River that have proven effective thus far in supporting the return of spawning Chinook salmon.

Water Supplies for the Umatilla Hatchery Programs

As discussed in Section 1.3.1, "*Umatilla Hatchery Water Supply and Fish Production Issues,*" water supplies for the hatchery come from a system of wells that have been slowly failing over time and are now insufficient to meet hatchery goals.

Water supply at Imeques and Thornhollow acclimation sites are also affected in many years by ice accumulations on their water intakes in winter, limiting water supply.

The table below describes the water sources for each facility.

Table 7 Maximum water use for each facility in the BPA-funded Umatilla Hatchery Programs

Facility	Surface water use (cfs)	Ground-water use (cfs)	Water source
Umatilla Hatchery	0	12.3	Well water
Three Mile Falls Dam trap	11.1	0	Umatilla River
Walla Walla Hatchery	19.2[1]	0	South Fork Walla Walla River
Pendleton Acclimation Facility	14.3	0	Umatilla River
Thornhollow Acclimation Facility	6.7	0	Umatilla River
Imeques C-mem-ini-kem Acclimation Facility	14.3	0	Umatilla River

[1] *BPA 2018a*

Water Quality

Water quality in the lower Umatilla River Basin (both surface and groundwater) has been known to be an issue since studies were first conducted in the late 1960's. The basin has nitrate concentration issues arising primarily from agricultural irrigation discharges and confined animal feeding operations (ODEQ 2023a), high pH and low dissolved oxygen (NPCC 2004). Hatchery facilities and operations are in both the upper and lower Umatilla River Basin, with facility

discharges in both areas. The hatchery and some of the facilities have effluent treatment facilities, some do not, as displayed in the table below.

Table 8 Facility Discharge Treatment and Location

Facility/site	Function	Discharge treatment	Discharge water body
Umatilla Hatchery	incubation and rearing	sludge tank and settling pond	Columbia River
Three Mile Falls Dam	adult trapping and holding	None- water outlet only	Umatilla River
Walla Walla Hatchery	adult holding and spawning	settling pond	South Fork Walla Walla River
Pendleton Acclimation Facility	smolt acclimation and direct release	settling pond	Umatilla River
Thornhollow Acclimation Facility	smolt acclimation and release	None – water outlet only	Umatilla River
Imeques C-mem-ini-kem Acclimation Facility	smolt acclimation and release	None – water outlet only	Umatilla River

Hatchery discharges are regulated under the Clean Water Act through the issuance of National Pollution Discharge Elimination System (NPDES) permits by the State of Oregon. NPDES permits are not needed for hatchery facilities that release less than 20,000 pounds of fish per year or feed fish less than 5,000 pounds of fish feed per year (EPA 2023). All facilities in the program are compliant with their NPDES permit or do not require one, and as such, their discharges are limited and monitored to ensure effects to water quality and human health are protected. The Umatilla, Bonneville, and Walla Walla hatcheries operate under a NPDES permit and all use a settling pond to settle out uneaten food and fish waste before being discharged into receiving waters. Effluent is tested each quarter for settleable solids, total suspended solids, pH, and temperature in compliance with those NPDES permits. The other facilities fall below the threshold for obtaining NPDES permits.

3.2.2.2 Effects of the Proposed Action

Water Quantity

In general, hatchery programs can affect groundwater and hydrology when they take groundwater from a well or surface water from a neighboring river or stream. All water, minus evaporation, which is diverted from a river or taken from a well is usually discharged to an adjacent water body after it circulates through the hatchery facility. When hatchery programs use surface water, they may reduce flows in the stream between the water intake and discharge structures with impacts to that stream or river depending on the amount of water withdrawn in comparison to the amount in the stream. Generally, water intake and discharge structures are located as close together as possible to minimize the area of the stream that may be impacted by a water withdrawal.

For this Proposed Action, the effects to water quantity in the Umatilla River would come only from the satellite facilities. For these facilities, their ongoing withdrawal (with no proposal to modify the amount of water withdrawn) is each less than one percent of the river's flow with no measurable effect on physical or biological features of the river between intake and discharge locations. Because of the small proportion of total stream flow used and the short distance over which the diminished flows would occur, the effect on water quantity in the Umatilla River would be low.

This Proposed Action also uses a holding facility at the Walla Wall Hatchery, which diverts water from the Walla Walla River. Effects of that hatchery's entire operation would reduce flows in that river by up to 11 cfs between withdrawal and discharge points, a distance of 250 to 450 ft. Previous analysis determine this withdrawal would cause a low effect (BPA 2018a), and the Umatilla program's effect would be just a small portion of that.

Umatilla Hatchery uses only groundwater and thus has the potential to reduce the amount of water for other users in the same aquifer. For this Proposed Action, however, the well serving as the primary water source is adjacent to the Columbia River and believed to be hydraulically linked to it, not from an isolated aquifer (BPA 1987). There would, therefore, be no impact on other groundwater users. Four other wells serving the hatchery, another providing domestic water for the hatchery residences, and sites being evaluated for future drilling (Miller et al 2019), are all located, or would be located, on lands managed by the U.S. Fish and Wildlife Service or the Army Corps of Engineers in locations that avoid interference with each other and other existing wells (Miller et al 2019). Since there would be on impact on groundwater in isolated aquifers and wells would be located to avoid interference with existing wells the effect on ground water quantity would be low.

Water Quality

Effects to water quality from this Proposed Action would come primarily from the impacts of effluent discharge from ongoing production program operations at the Hatchery and the satellite facilities.

Used water from the Hatchery is discharged at three locations into the Columbia River adjacent to the hatchery. One comes directly from the incubation infrastructure where it was used to oxygenate the incubating eggs and thus contains no fish food or feces, though it could contain minor amounts of chemicals needed to protect incubating eggs. The other two discharge locations come from the effluent treatment system which is composed of a 20,680-square-foot asphalt settling pond with an 810-square-foot sludge tank.

The discharge of effluent from hatcheries into rivers has the potential to elevate temperature, ammonia, organic nitrogen, total phosphorus, biological oxygen demand, pH, and suspended solids levels (Sparrow 1981; WDOE 1989; Kendra 1991; Cripps 1995; Bergheim and Åsgård 1996; Michael 2003). Chemical use within hatcheries could result in the release of antibiotics (a therapeutic), fungicides, and disinfectants into receiving waters (Boxall et al. 2004; Pouliquen et al. 2008; Martínez-Bueno et al. 2009). Other chemicals and organisms that could potentially be released by hatchery operations are polychlorinated biphenyls, dichlorodiphenyltrichloroethane and its metabolites (Missildine et al. 2005; HSRG 2009), pathogens (HSRG 2005; HSRG 2009), steroid hormones (Kolodziej et al. 2004), anesthetics, pesticides, and herbicides.

Effects on water quality in the Columbia and Umatilla rivers and their tributaries would come from the discharge of water that may have traces of fish food and fish waste even after processing through settlement ponds. Potential contaminants also include byproducts from chemicals used for disease control, such as formalin. Water containing formalin would be diluted and breaks down rapidly, and hatchery discharges would meet NPDES requirements. In addition, Hatchery

discharges of this chemical are also not expected to adversely affect both mid-Columbia steelhead and bull trout (Shepard et al. 2015). The discharge amounts are, and would continue to be, low in comparison to the volume of the receiving waters and within the parameters set by the State of Oregon for the issuance (or non-issuance in the case of the acclimation facilities) of their NPDES permits. These permits, with their attendant monitoring and reporting, address the potential pollution concerns and prevent them from significantly affecting water quality. These contaminants, therefore, are unlikely to adversely affect salmonids and other fish in the receiving waters.

An increase in effluent discharge may occur at the Thornhollow and Imeques facilities if some spring Chinook rearing is transferred there as a water need reduction measure for the Umatilla Hatchery (Section 3.1.4 "*Additional Water Source Development Actions and Impacts*"). As noted in Section 3.2.2.1 "*Affected Environment*," however, monitoring and permitting ensure that total suspended and settleable solids in the discharges would not exceed levels that could result in an adverse effect on water quality.

Water discharged from the facilities also could affect the receiving water's temperatures, primarily as a result of the water's exposure to the sun while in holding, rearing, acclimation, or abatement ponds. Elevated river temperatures can increase bacterial growth rates, thereby increasing the risk of pathogens in water. Increased water temperatures can also harm fish by reducing growth rates, increasing physiological stress, or even causing death (WDOE 2000). The program, however, maintains cool water temperatures in their holding, rearing and acclimation ponds so there would be no such temperature impacts. Any such impact, therefore, would only come from the hatcheries' abatement ponds. The Umatilla, Walla Walla, and Columbia rivers, however, are the receiving waters for these abatement pond discharges, and all are so large by comparison to the discharge that any elevated temperature contribution from the discharges would be rapidly negated.

There would be no impacts to water quantity or quality from research, monitoring, or evaluation activities associated with hatchery or satellite facility operations. These activities take no action that would use or affect water resources beyond what was described above, nor do they modify hydrologic, riparian, or upland conditions. There may be a potential for short-term, small-scale disturbance of stream or riverbeds associated with people wading in these waters as they conduct habitat and spawning surveys; or by installing and operating screw traps, but those effects to the water resource would be low.

Routine maintenance actions are not anticipated to contribute materially to either sediment or temperature conditions in the Umatilla River. Annual debris and sediment cleanout from all facilities' water intakes is the most likely of the operations and maintenance actions to contribute to water quality issues, but it would only cause a slight pulse in turbidity during the action, and the amount and duration of this sediment input would be very low and rapidly negated in the flows of the receiving waters.

Because discharges are treated where needed, monitoring and permitting ensures discharges would not create adverse effects, and receiving water bodies are large by comparison to the discharges, the overall effect of the Proposed Action's impact on water quality would be low.

3.2.2.3 Effects of the No Action Alternative

Under the No Action alternative, all Umatilla Hatchery production programs would cease. No water would be withdrawn from the Umatilla River or from groundwater. Likewise, no effluent-laden water would be discharged back into the rivers or streams following Hatchery or acclimation facility use.

These facilities currently take only a small proportion of the total flow from adjacent streams, and the effect on water quantity is already minimized by the short distance (between 60 and 1,800 feet) between water intake and discharge. None of these facilities draw water from a State Critical Groundwater Area (i.e., there is sufficient water in the aquifer for irrigation and other uses). Therefore, effects on groundwater and hydrology from terminating production at the Hatchery and the satellite facilities (the No Action Alternative) would be low relative to existing conditions.

The effect on water quality from the termination of hatchery operations would be the cessation of effluent discharges into the Columbia or Umatilla rivers. This would be a beneficial effect for the rivers, though as discussed above, the relative quantity and impact of this effluent is low; thus, the improvement from not discharging it would also be low, though beneficial.

3.2.3 Vegetation

3.2.3.1 Affected Environment

The ecotype in which most Hatchery and satellite facilities are located is part of the Columbia Basin Province (Daubenmire 1970 and Franklin and Dyrness 1973), dominated by remnant bunchgrass (*Agropyron, Poa*, *Bromus*, and *Fescu*e spp.), invasive cheatgrass (*Bromus tectorum*) and sagebrush (*Artemisia spp.*), bitterbrush (*Purshia tridentata*), and rabbitbrush (*Chrysothamnus nauseosus*), or the agricultural lands that have replaced them.

The vegetation changes with elevation up the Umatilla River Basin, transitioning from grasses and shrubs to Ponderosa pine and Douglas-fir/grand fir forests in the highest elevations. Most facilities are located in the lowest elevations, though the Thornhollow and Imeques acclimation sites are located upstream in the lower canyons of the watershed where grass and shrubs dominate the south facing aspects and conifer trees dominate the northern slopes.

The Hatchery site is on a flat bench adjacent to the Columbia River supporting grasses and shrubs vegetation with native riparian habitats (primarily willows, grasses and forbs) along the river. The other facilities are similarly situated along the Umatilla River or its tributaries with varying vegetation conditions as described in the table below.

Table 9 Vegetative Characteristics at Facilities

Facility/site	Geographic setting	Vegetative Characteristics
Umatilla Hatchery	Flat lowlands, amongst irrigated farmlands	Palouse grasslands with narrow riparian corridor along Columbia River
Three Mile Falls Dam	Flat lowlands, amongst irrigated farmlands	Riparian willow and hardwood habitats in broad floodplain; grass and sage community on slopes; irrigated agriculture on flatlands above.
Westland Irrigation District Facilities	Flat lowlands, amongst irrigated farmlands	Riparian hardwood corridor in narrow floodplain, grass and sage community on slopes; irrigated agriculture on flatlands above.
Rieth Bridge Direct Release Site	Broad floodplain amid rolling foothills	No riparian habitats at bridge location in narrow incised river corridor within floodplain; grass and sage community on slopes; irrigated agriculture on flatlands above.

Facility/site	Geographic setting	Vegetative Characteristics
Pendleton Acclimation Facility	Broad floodplain amid rolling foothills	Narrow riparian hardwood community along river; surrounded by irrigated agricultural lands and residential developments.
Thornhollow Acclimation Facility	Narrow floodplain in lower elevation canyon lands	Riparian hardwood community along river with grass/sage communities on surrounding slopes. Facility set in floodplain amid large (1 to 5 acres) residential lots with irrigated pastures.
Imeques C-mem-ini-kem Acclimation Facility	Narrow floodplain in lower elevation, steep, canyon lands	Riparian hardwood community along river with conifer forest on north-facing slopes and grass/sage communities on south-facing slopes. Facility set in floodplain amid native grass/sage community and some irrigated pasture lands.

No ESA-listed or proposed endangered or threatened plant species or candidate species have been identified at project sites. Russian thistle (*Salsola tragus*), also known as the "tumble weed," is the most problematic invasive plant at the Umatilla Hatchery.

3.2.3.2 Effects of the Proposed Action

The Proposed Action includes only one action, the drilling of new wells, which could impact native soils with native vegetation that had not already been impacted by hatchery and facility construction and operations to date. This action could affect a couple of sites near the Umatilla Hatchery, and would excavate, displace, and compact soils and native vegetation as described above in Section 3.1.4 "*Additional Water Source Development Actions and Impacts*" and 3.2.1.2 "*Effects of the Proposed Action*." The scale of this activity, however, would be small, with soil and vegetation disruption limited to the constructed well pads (generally less than 0.05 acre), the buried pipelines that would convey water to existing lines to the hatchery, and the temporary road access necessary to move equipment in and out. In total, the impacts are anticipated to be less than one acre in size and upon completion the impacted soils would be seeded with native grass and forb species for site recovery and erosion control. Other actions would occur either within buildings or within facility boundaries on surfaced areas (gravel, asphalt, etc.) with no vegetation or would require no native vegetation disturbance.

Disturbance of soil of any degree, however, would provide an opportunity for the spread of invasive plants. Application of the mitigation measures in Section 2.3 "*Mitigation Measures*" designed to prevent the spread of noxious weeds would effectively minimize or prevent infestations of these species.

There would be no impacts to vegetation from operations at the satellite facilities, or from research, monitoring, or evaluation activities associated with hatchery and satellite facility operations.

Since there would be few actions that would disturb previously-undisturbed vegetation, and those would be in very small areas with minimization measures applied as described in Section 2.3 "*Mitigation Measures*," the overall effect on vegetation would be low.

3.2.3.3 Effects of the No Action Alternative

Under the No Action alternative, all Umatilla Hatchery production programs and associated activities at all its facilities would cease. The No Action alternative would not cause new impacts to

vegetation in the project area, but could allow for the spread of noxious weeds within the hatchery facility grounds in the absence of the ongoing control applied by current operations. This potential spread of noxious weeds could adversely impact native plant communities by outcompeting native plants for moisture and space in those limited areas.

3.2.4 Wetlands and Floodplains

3.2.4.1 Affected Environment

The Umatilla Hatchery is located along the shores of a reservoir formed by the John Day Dam downriver. Though much of the Columbia River's original floodplains are inundated, there is still a narrow floodplain along the shores of the reservoir. The hatchery is located outside of the floodplain, but the hatcheries discharge outlets are located within it (FEMA 2023). Every satellite facility, except the Imeques site, is within the floodplain designated by FEMA as a "Regulatory Floodway"[9] (FEMA 2023). The Imeques site is immediately adjacent to it. The satellite facilities were all constructed on graveled pads on floodplains but do not contain any wetland habitats within them.

3.2.4.2 Effects of the Proposed Action

The only action disturbing soil or vegetation (with potential to alter wetlands or floodplains) would be the drilling of new wells, and that would be on the uplands around the Hatchery above the floodplain and outside of wetlands. These wells would be sited and designed to not deplete groundwater and would therefore not affect wetlands. No other actions associated with the ongoing program (e.g., routine operations, facility maintenance, etc.), though located in floodplains and near wetlands, have potential to impact these features. The actions also would not physically or vegetatively modify wetlands or floodplains in a manner that would create additional impacts on FEMA-designated floodplains, and therefore, would remain in accordance with the applicable floodplain protection standards. There would also be no impacts to wetlands and floodplains from research, monitoring, or evaluation activities associated with either hatchery operations or the acclimation and release of juveniles. The effect of the Proposed Action on wetlands and floodplains would therefore be low.

3.2.4.3 Effects of the No Action Alternative

Under the No Action alternative, all Umatilla Hatchery production programs at all its facilities would cease. There would be no new impacts from the No Action alternative on wetlands or floodplains.

3.2.5 Fish

3.2.5.1 Affected Environment

Fish Habitat

Fish populations in the Umatilla River have been dramatically affected by historical habitat loss and alteration. Irrigation water withdrawals created low flow and thermal migration barriers for fish.

[9] A "Regulatory Floodway" is the area including and around a watercourse that cannot be filled in or have obstructions placed in it without causing water surface elevations to increase over a certain amount (usually one foot) upstream of the filled area or obstruction.

Dam construction on the Umatilla River created migration barriers for anadromous fish, movement delays or barriers for resident species, segmented resident fish populations, and created warm water reservoirs. Habitat was degraded by channeling the river in a single main channel in the lower reaches thus removing side channels, alcoves, and islands, converting former off-channel habitats to farmlands; and fish populations were poisoned as rotenone was applied along 80 miles of the river's length in 1967 and 1974 to eradicate Pacific lampreys (Close et al., 2009).

However, an aggressive program of habitat restoration and fish reintroductions was begun in the 1980s and continues to the present. Water from the Columbia River was redirected to the Umatilla basin to provide enough flow for salmon migration (see Section 3.2.2.1 "*Affected Environment*"); habitat restoration projects at multiple locations along the river were, and continue to be, funded by BPA and other entities; fish production programs (some of which are the subject of analysis in this EA) were developed that reintroduced Chinook, coho salmon, and steelhead to the river; the Dillon Diversion Dam, a major barrier to fish movement, was removed in 2017; and a program of Pacific Lamprey reintroduction began in 2000 at Three Mile Falls Dam (CRITFC et al 2018).

But fish habitat in the Umatilla River remains permanently altered. Rather than a free-flowing river of cool water, its lower reaches are now a series of warm-water reservoirs created by irrigation diversion dams that continue to segment native populations of fish. What remains of the Umatilla River's original free-flowing conditions can now only be found above Pendleton (river mile 56). Fish habitats in the Umatilla River are now quite varied: there is a mile-long extension of the Columbia River's John Day reservoir up into the Umatilla River's mouth ; there are warm-water reservoirs behind Three Mile Falls Dam and each of the five low-head dams above it; there are free-flowing sections of channelized river through agricultural lands above each of these reservoirs and below the next upstream dam; and there are reaches above Pendleton with naturally-formed pools, riffles, gravel bars, and islands, where the river flows with cooler water through more naturally-functioning floodplains and riparian habitats.

Fish Species

The table below displays a list of species present in both the John Day reservoir (also known as Lake Umatilla) and the Umatilla River. The varied habitats and the passage barriers (dams, thermal conditions, and seasonal low flows), as described above limits the distributions of many of these species as shown.

Table 10 Fish species in the Umatilla and Columbia Rivers

Resident Fish	Anadromous Fish
Walleye (*Sander vitreus*)[2]	Steelhead (*Oncorhynchus mykiss irideus*)
Carp (*Cyprinus carpio*)	Chinook salmon (*Oncorhynchus tshawytscha*)
Bridgelip sucker (*Catostomus columbianus*)	Coho salmon (*Oncorhynchus kisutch*)
Largescale sucker (*Catostomus macrocheilus*)	Sockeye salmon (*Oncorhynchus nerka*)[1]
Pikeminnow (*Ptychocheilus oregonensis*)	Shad (*Alosa sapidissima*)[1]
Largemouth bass (*Micropterus salmoides*)[2]	Pacific lamprey (*Entosphenus tridentatus*)[2]
Bull trout (*Salvelinus confluentus*)[3]	
White Sturgeon (*Acipenser transmontanus*)[1]	
Channel Catfish (*Ictalurus punctatus*)[1]	

Resident Fish	Anadromous Fish
Whitefish (*Prosopium williamsoni*)	
Redside shiner (*Richardsonius b*alteatus)	
Peamouth (*Mylocheilus caurinus*)	
Dace (*Rhinichthys umatilla*)	
Chiselmouth (*Acrocheilus alutaceus*)	
Threespine stickleback (*Gasterosteus aculeatus*)	
Sculpin (*Cottus hubbsi*)	
Yellow perch (*Perca flavescens*)	
Trout-perch (*Percopsis omiscomaycus*)[2]	
Brown bullhead (*Ameiurus nebulosus*)[2]	
Yellow bullhead (*Ameiurus natalis*)[2]	
Mosquito fish (*Gambusia affinis*)[2]	
White crappie (*Pomoxis annularis*)	
Black crappie (*Pomoxis nigromaculatus*)	
Bluegill (*Lepomis macrochirus*)	
Pumpkinseed (*Lepomis gibbosus*)	

[1] –not present in Umatilla River or only likely in John Day pool below Three Mile Falls Dam
[2] – uncommon or likely not present in upper reaches of the Umatilla River above Pendleton
[3] –present only in upper reaches above Pendleton

Anadromous Salmonids

Historically, the Umatilla River supported runs of fall Chinook, spring Chinook, coho salmon, and steelhead. All species of salmon were eliminated from the basin in the early 1900's through a combination of overfishing; extensive water withdrawals, and habitat degradation in the Umatilla River; and construction and operation of the dams in the Umatilla River which blocked fish passage. Steelhead, however, with their ability to survive in higher elevations without needing to migrate to the ocean to mature and spawn, persisted in the watershed and the Umatilla River today supports a small run of native ESA-listed steelhead that are both naturally and hatchery produced.[10] Today's runs of Chinook and coho, however, are all reintroduced (as discussed above) and are, therefore, not listed under the ESA.

Umatilla River Fall Chinook

The Umatilla River Fall Chinook is part of the Mid-Columbia Fall Chinook Species Management Unit (SMU).[11] The Mid-Columbia Fall Chinook SMU includes three extinct populations, one population

[10] Effects from steelhead production are not discussed further in this EA because the Umatilla River Steelhead Program is not part of this proposed action. See Footnote 2 in Section 1.1 "Introduction."

[11] An SMU is a geographic location that is known to be important for the conservation of threatened species for which enough information is available for effective planning and management. An SMU is able to support viable populations of one or more species over the long term and is important for the species' long-term viability.

that is still in existence, and one population whose existence is uncertain (Table 11). While native populations in the John Day, Umatilla, and Walla Walla River basins are extinct, reintroduction of Chinook in those basins have reestablished small populations that are likely maintained primarily by hatchery production. The remaining population in the Deschutes River Basin is strong, however, and ameliorates risks of further population losses (ODFW 2005). The loss or uncertainty in status of four of these five populations demonstrates the significance of historical habitat impacts on this SMU, and still appear to affect the reintroduced populations there.

Table 11 Population list and existence status for the Mid-Columbia Fall Chinook SMU

Native Population Present?	Population	Description
Yes	Deschutes	Deschutes River basin
No	John Day	John Day River basin
No	Umatilla	Umatilla River basin
No	Walla Walla	Walla Walla River basin
Uncertain	Mainstem	Mainstem Columbia River from the Dalles Dam to The Oregon/Washington border

Fall Chinook return to the Umatilla River from October through December and spawn from November through December. Juveniles rear in the river from December through April then acclimate and migrate out in May. Their reintroduction to the Umatilla River began in 1982. From 1995 to 2012, hatchery adult returns to the Umatilla River mouth ranged from 289 to 3,950 and averaged 1,547 with high variability (Clarke et al. 2014). Over the last six years the average has been a bit less, 1,395 per year, with variability between years still very high (ODFW 2023b).

Umatilla River Spring Chinook

The Umatilla River Spring Chinook is part of the Mid-Columbia Spring Chinook SMU. This SMU includes eight populations, four that are extinct, and four that are still in existence (Table 12). The Umatilla and Walla Walla populations became extinct in the early 1900s due to extensive irrigation withdrawals and habitat modification. Construction of the Pelton-Round Butte Dam complex eliminated access to the Metolius and Crooked populations in 1958. (ODFW 2005).

Table 12 Population List and existence status for the Mid-Columbia Spring Chinook SMU

Native Population Present?	Population	Description
Yes	Lower Deschutes	Deschutes River basin up to Round Butte Dam
No	Metolius	Metolius River basin (Deschutes tributary)
No	Crooked	Crooked River basin (Deschutes tributary)
Yes	North Fork John Day	North Fork John Day River basin
Yes	Middle Fork John Day	Middle Fork John Day River basin
Yes	Upper John Day	John Day River basin upstream from mouth of North Fork

Native Population Present?	Population	Description
No	Umatilla	Umatilla River basin
No	Walla Walla	Walla Walla River basin

Native spring Chinook arrive in the Umatilla River during April and May and spawn from August through September. Juveniles rear from September through March then acclimate and migrate out the following April after spending their first summer and winter in the river. Their reintroduction to the Umatilla River began in the spring of 1986 and the average annual adult returns to the Umatilla River for the next 25 years averaged about 2,400 adults with a high of 5,900 in 2002 (Contor et al 2011); Average adult returns since 2011 have increased slightly to 2,860 annually, though variation among years is high (439 to 5969) (ODFW 2023b). Returns are about 75% hatchery fish and 25% natural origin fish (ODFW 2023b).

Umatilla River Coho Salmon

Coho salmon in the Umatilla River are part of the Interior Columbia Coho SMU which consists of two extinct populations: the Umatilla and the Wallowa (Table 13). Both are extinct, and populations there today have been re-introduced and are maintained by hatchery production. Both the Umatilla and Wallowa populations within this SMU are extinct as a result of extensive water use, habitat degradation, and dam passage problems (ODFW 2005, NMFS 2014). It is believed that coho were eliminated from the Umatilla shortly after the construction of Three Mile Falls Dam in 1914.

Table 13 Population List and existence status for the Interior Columbia Coho SMU

Native Population Present?	Population	Description
No	Umatilla	Umatilla River basin
No	Wallowa	Wallowa River basin (Grande Ronde River tributary)

Coho salmon reintroductions began between 1966 and 1968 with releases of fry and out-planted eggs. Coho smolts were released in 1969, but it was not until 1987 that an ongoing reintroduction program with annual releases of coho smolts began (Contor 2013). Since then, coho adult returns have averaged about 5,170 fish annually though the returns vary greatly from year to year (ODFW 2023b). Native adult returns, however, have never risen above a few hundred each year demonstrating that successful coho spawning in the Umatilla River is limited. (Contor 2013).

Resident Fish Species

Approximately 60 species of non-anadromous fish live in the Columbia River and its tributaries. About one-half are native species primarily of the families Salmonidae (trout), *Catastomidae* (suckers), *Cyprinidae* (carps and minnows), and *Cottidae* (sculpins). White sturgeon (*Acipenser transmontanus*) occurs in the Columbia River. The Columbia and Umatilla River basins also support at least 25 introduced species, primarily representing the taxonomic families *Percidae* (perch and walleye), *Centrarchidae* (bass, crappie, sunfish), and *Ictaluridae* (catfish).

Bull Trout

Bull trout were listed as threatened under the ESA in 1999 with a Final Recovery Plan produced in 2015. The recovery plan is built around management of "Core Areas" (usually sub watersheds) and "Recovery Units" which are aggregations of Core Areas. The Hatchery and the satellite facilities are located in the Umatilla River Core Area within the Lower Mid-Columbia Geographic Region of the Mid-Columbia River Recovery Unit for the Columbia River Distinct Population Segment of bull trout (USFWS 2015). The bull trout population in the Umatilla basin is also designated as the Umatilla Bull Trout Species Management Unit by the State of Oregon.

Bull trout are sensitive to increased water temperatures, poor water quality, poor habitat conditions, and low flow conditions, and thus select colder waters at higher elevations with less disturbed habitats. In the Umatilla River, therefore, populations are limited to the upper basin, and the lower Umatilla River is not used by bull trout other than for occasional migratory passage. The State of Oregon identifies two bull trout populations in the upper basin above Pendleton, Oregon: one in Meacham Creek and one in the Upper Umatilla River. The abundance of the Meacham population is low, and distribution is limited (ODFW 2005).

Bull trout exhibit two different life history strategies. Fluvial (migratory) bull trout spawn in river basin headwaters and juveniles rear there for one to four years before migrating as subadults downstream to larger main stem areas. Very few fish were recorded as exhibiting this life form in the Umatilla River (Sankovich et al 2014). The other life history strategy, where bull trout complete their entire life cycle in the tributary streams, also occurs in the basin. Studies from 2004 to 2014 concluded that this is the primary life history strategy in Umatilla River and that only one population, in the North Fork Umatilla River, is supporting a viable bull trout population (Sankovich et al 2014). Those studies also identified an adult bull trout immigrating into the North Fork Umatilla population from the Walla Walla and Tucannon basins, providing evidence for biological connectivity between populations in adjacent basins.

Bull trout feed primarily on fish as sub-adults and adults, and can therefore be a substantial predator of young salmon. Juvenile bull trout feed on similar prey as salmon (USFWS 2002, 2008).

Pacific Lamprey

Pacific lampreys are unique in their life stages and habitat use among anadromous fish. After egg hatching in tributary streams and rivers they exist in a larval phase in clean, fine, sediments in the tributaries for 5 to 7 years before morphing into their microphthalmia (juvenile pre-migration) phase in the months prior to their migration to the ocean. They spend 18 to 40 months in the ocean then migrate back to their natal streams to spawn.

Like anadromous salmonids, lamprey populations were diminished by passage barriers, water quality and quantity reductions, and habitat losses (ODFW 2005). In the Umatilla River basin this led to their extinction until reintroduction efforts began in the early 2000s when lamprey from the John Day River were transplanted to the Umatilla River (Close et al 2003, ODFW 2005). From these reintroductions and some improvement of passage issues in the Umatilla River (Jackson and Moser 2012) adult lampreys have increased their returns from being functionally extinct in the late 1990's to over 2,600 in 2018 (BPA 2018b). Reintroduction efforts and actions to improve passage over Three Mile Falls Dam are ongoing.

ESA- and State-Listed Fish

There are two species of ESA- and state-listed fish in the area of the Proposed Action as displayed in the table below.

Table 14 ESA- and State-listed fish species in the Umatilla Basin

Species	ESA status	Critical Habitat	Protective Regulations	State of Oregon listing
Middle Columbia River Steelhead (*Oncorhynchus mykiss*)	Threatened (January 5, 2006; (71 Federal Register (FR) 833))	September 2, 2005. 70 FR 52630	June 28, 2005. 70 FR 37159	Middle Columbia River Species Management Unit designated as "Sensitive-Critical"
Bull trout (*Salvelinus confluentus*)	Threatened (November 1, 1999. (64 FR 58910)	October 18, 2010. 75 FR 63898	70 FR 63898	Umatilla Species Management Unit designated as "Sensitive-Critical"

Designated Critical Habitat under the ESA

Critical habitat for Snake River steelhead includes essentially all reaches of the Umatilla River and its tributaries (CTUIR tribal lands excluded) and Meacham Creek.

Critical habitat for bull trout includes all reaches of the Umatilla River and Meacham Creek.

3.2.5.2 Effects of the Proposed Action

Effects on fish are caused by the impacts of actions associated with ongoing Chinook and coho capture, production, acclimation, and release activities within the hatcheries and satellite facilities, and the research, monitoring, and evaluation actions. The Proposed Action does not include any physical facility changes or construction actions at the hatchery or satellite facilities that would impact aquatic habitats or rivers beyond instream wading and hand tool use. Effluent releases would also have minimal potential to affect water quality sufficiently to impact fish use (Section 3.2.2.2 "*Effects of the Proposed Action, Water Quality*"). The effects on fish and fish habitats from these actions are discussed further below and would be low.

Effects on Fish from Ongoing Hatchery Operations, including Monitoring and Evaluation

Broodstock Capture

The capture of Chinook and coho broodstock at Three Mile Falls Dam is stressful on adult fish. For broodstock, this may be of little consequence since those fish would be sacrificed for their eggs and sperm, but non-target fish such as bull trout, other native fish species, or target species not selected for broodstock could also be captured. Though ultimately released, these non-target fish would be handled and moved from the trap to the release location and increased potential of mortality is a possibility from the stress of that capture and handling.

Artificial production

The hatchery environment and the experience of artificial production is stressful on individual fish. Broodstock and juveniles are netted, handled, transported, fin clipped, injected, reared in a crowded tank environment, and fed. All hatchery-produced juveniles are handled or marked in some way (pit tags, adipose fin clip, or coded wire tags). These actions are potentially harmful, and

some mortality occurs, though effects are minimized by adherence to established fish handling protocols (Section 2.3 "*Mitigation Measures*").

Juvenile Release

Most of the effects on fish from the Proposed Action would result from releasing 1.91 million hatchery-origin Chinook and coho salmon in the Umatilla River basin each year. These fish comprise the vast majority of all salmonid smolt outmigration from the Umatilla River and produce most of the adult returns to Three Mile Falls Dam. Releasing hatchery-origin fish could affect genetics, disease, ecological interactions, nutrient cycling, and harvest as discussed below.

- **Genetic influence** – Effects on native salmon stocks can occur from hatchery-origin adults escaping to the spawning grounds, ultimately influencing the genetic make-up of natural offspring. In the Umatilla basin, however, all native stocks of Chinook and coho salmon had been eliminated and the naturalized populations there now are derived from introduced fish and hatchery-reared fish intentionally released at Three Mile Falls Dam where they had been trapped on their return to spawn. These releases are intended to help rebuild a naturalized population so genetic influence here is not an issue.

  Straying of hatchery produced salmon into the spawning grounds of other watersheds could, however, influence genetics of native fish in those watersheds. Monitoring reveals that stray rates (predominantly into the Snake River basin) for Umatilla River Chinook sub-yearlings are about 35% and range from 0.2 to 2% for Umatilla River spring Chinook and no more than 2% for fall Chinook (ODFW and CTUIR 2011b and 2011c). The 2016 NMFS Biological Opinion specified the Tucannon River and the Snake River Basin upstream of Lower Granite Dam where Umatilla River Chinook strays have been found and where the effects of genetic interactions among the spawning adult fish could be seen. NMFS concluded that the program as planned would be operated such that less than 5 percent of the naturally spawning population in the Tucannon and the Snake River Basin would consist of Umatilla hatchery fish and the gene flow between the program fish and local populations would be below the level at which substantial adverse genetic effects would be expected, and that the program included "the best approaches to avoid or minimize those adverse effects" (NMFS 2016).

  Stray rates from Umatilla River coho are not well documented but estimated to be less than 5% (ODFW and CTUIR 2011a).

  Effective acclimation and direct release strategies are applied for Umatilla River Fall Chinook to reduce the potential for straying, and inserting PIT tags allows collection facilities in other watersheds to identify and exclude these strays as they are encountered thereby minimizing genetic influence by these stray hatchery fish.

- **Disease transfer** – Disease transfer is a risk and an effect of the annual release of 1.91 million juvenile anadromous salmonids each year into the Umatilla River basin. Hatchery conditions are susceptible to disease outbreak, and ultimately disease transmission by the fish reared there. The interaction of these hatchery-reared fish with natural-origin fish increases the risk of disease transmission to natural-origin fish. Hatchery operators, however, would implement mitigation measures (see Section 2.3 "*Mitigation Measures*") to prevent and control outbreaks in the hatchery and minimize the potential for disease transfer upon release.
- **Ecological interactions** (competition and predation) – Chinook and coho salmon would be reared in hatchery facilities and released into the Umatilla River basin. Hatchery-origin

Chinook and coho salmon would be released into areas where natural-origin fish may spawn, rear, and migrate. Consequently, competition for food and cover with natural-origin juvenile salmon and steelhead would result in the areas of release, the migration corridor, and the Columbia River estuary. These ecological effects are most severe when wild and hatchery fish share a limited environment for a substantial period of time (Kostow 2009). Such a mass of released juvenile fish may also attract more avian or terrestrial fish predators which could increase risk to native fish; but, at the same time, that mass of hatchery fish may overwhelm the capabilities of a local predator population thereby providing protective cover to native species. Predation by large numbers of released hatchery fish on smaller native fish could have an effect on those smaller fish species' populations. However, though juvenile yearling Chinook can prey on fishes smaller than themselves, research reveals that most of their diet is insects and crustaceans with less than ten percent being embryonic fish (Rondorf et. al. 1990, Muir and Coley 1996). Further, released hatchery fish usually migrate downstream within hours or days of release, so these predation effects would be temporary in any particular location. Fish from the Umatilla Hatchery programs are acclimated and ultimately released according to regionally accepted Best Management Practices which includes timing and volitional releases to minimize the impact of these competitive and other ecological interactions. Volitional releases allow fish to leave acclimation ponds when they are ready to migrate and most likely to move immediately down river, minimizing competitive effects in the river. Forced releases, now rarely applied, place fish in the river prior to their impulse to migrate where they hold for a time, all the while competing with resident species for food and space.

- **Nutrient Cycling** – migration of adult fish transfers ocean-derived nutrients upriver where they are ultimately deposited into river systems upon the death of post-spawned fish. Aquatic and riparian ecosystems benefit from this nutrient cycling, and this benefit would be increased for all species by the availability of nutrients from hatchery-origin salmon carcasses.
- **Harvest** – Chinook salmon would be released from hatchery facilities and would return to the Umatilla River basin where they may be intercepted by commercial, recreational, and tribal fisheries. Hatchery production and release numbers increase harvest opportunities for fisheries in the ocean/west coast, Columbia River, and tribal treaty fisheries in the Umatilla River basin. This increased harvest potential also increases the potential for non-target species to be taken, as increased fishing pressure is applied. Some of these non-target species may be ESA-listed or otherwise protected. This impact is monitored by state and federal agencies which regulate harvest timing and methods in response.

Restoration of anadromous fish populations

The above discussions focus on the adverse effects of hatchery operations on fish and fish habitat. The largest effect of hatchery operations on fish, however, relates to its fundamental purpose: to restore salmon populations in the Umatilla River basin. As discussed in Section 3.2.5.1 "*Affected Environment*," above, anadromous fish runs in the Umatilla River basin were essentially extirpated in the early 1900s, but recovery efforts have produced variable, yet consistent, numbers of returning Chinook and coho to the Umatilla River, due primarily to production program actions. Given the habitat conditions in the Umatilla River, and the low numbers of native adults returning to the river each year, it appears that these populations are dependent on these production programs and continued operations would maintain these populations.

Monitoring and Evaluation

Effects of monitoring and evaluation are associated with the stress and risk of injury to individual fish during handling (for tagging, marking, and measuring purposes) and to the operation of weirs and traps and the incidental capture and handling of non-target fish during those operations. As discussed under "Artificial Production," above, these actions are potentially harmful, and some mortality occurs, though effects are minimized by adherence to established fish handling protocols (See Mitigation Measures, Section 2.3 "*Mitigation Measures*").

Effects on Essential Fish Habitat

Because there are no extant natural coho populations in the Umatilla basin, and Essential Fish Habitat (EFH) has not been described for steelhead in the Umatilla basin, the effects on EFH would be limited to the effects of the proposed action on EFH of Chinook salmon.

Essential Fish Habitat includes four major components: (1) spawning and incubation; (2) juvenile rearing; (3) juvenile migration corridors; and (4) adult migration corridors and adult holding habitat. In their 2016 Umatilla River Biological Opinion, NMFS concluded that EFH might be affected by the proposed action from "effects of hatchery operations on adult and juvenile migration corridors in the Umatilla River, and ecological interactions and genetic effects on natural Chinook salmon spawning areas in the Tucannon River and the Snake River Basin upstream of Lower Granite Dam" (NMFS 2016).

There would be no effect on the spawning, incubation, or juvenile rearing habitat components, and no effect on migration corridors or holding habitat since there is no action proposed that would modify aquatic habitats. The water withdrawals are consistent with water rights that prevent the streams from being de-watered, and the amount of water to be removed will be largely returned to the river at points between 60 and 1,800 feet (depending on the facility) from the point of withdrawal. Effects would be limited to those from returning adult hatchery fish straying into river basins where wild fish would naturally spawn as discussed above.

Summary of Effects of the Proposed Action

The effects on fish from the Proposed Action include a combination of moderately to highly beneficial effects in the form of contributing to increases in Chinook and coho returns, providing a short-term juvenile salmon food source for native fish, and contributing to the cycling of marine nutrients in the basin, along with low adverse effects from hatchery and satellite facility operations. Effects also include some potential for adverse genetic influence of native stocks in the Snake River basin by stray Chinook and coho, though mitigated and monitored. Overall, the effects on fish and fish habitats from program operations would be moderately beneficial, weighted largely by the restored runs of Chinook and coho to the Umatilla River Basin.

3.2.5.3 Effects of the No Action Alternative

Under the No Action alternative, all Umatilla Hatchery production programs at all its facilities would cease. Current hatchery and acclimation site operations would cease, as would their water withdrawals and their effluent discharges. Though current water uses and discharges are only a minor adverse and localized effect, the cessation of water quantity and quality impacts under the No Action Alternative would be a low positive effect.

Under the No Action Alternative, BPA funding of ongoing Umatilla Hatchery production of fall Chinook, spring Chinook, and coho for release in the Umatilla basin, however, would cease. Numbers of these fish would likely decline in the basin as current population levels and habitat

conditions may not be self-sustaining. As a result, less salmon would be available for fisheries in the Columbia River, which may require an increase in production at other hatcheries in the Columbia Basin.

The largest effect of the No Action Alternative would be a reduction in the numbers of fish produced to maintain and increase runs of fall and spring Chinook. Though Chinook salmon production would likely continue at other facilities, populations of these fish may be reduced. The adverse effect of this No Action Alternative on Chinook salmon runs would likely be moderate.

3.2.6 Wildlife

3.2.6.1 Affected Environment

With the exception of the Umatilla Hatchery, all sites and facilities are located in riparian bottomlands that support willow and hardwood riparian habitats. The sites themselves provide limited habitat since they are primarily gravel-surfaced pads with concrete-lined ponds, but the surrounding riparian woodlands provide essential breeding and foraging habitat, and travel corridors for birds, amphibians, reptiles, mammals, and other wildlife.

In arid areas, such as the Umatilla River basin, riparian zones are vital habitats for a variety of wildlife species as they provide abundant insects, plants, and moisture throughout the year. Some species are dependent upon them, and some use them only for specific life stages. Great blue herons, belted kingfisher, mink, muskrat, and beaver, for example, use riparian areas for all of their feeding, shelter, and reproductive needs. Some species, like deer, use a variety of habitats but may choose riparian zones to have their fawns. Neo-tropical birds use riparian zones as they migrate back and forth from Central and South America, and scavengers eat salmon carcasses in the riparian zone.

The project sites support no unique or exceptionally high-value habitats such as unique wetlands, cliffs, meadows, etc., and only two species of concern, the yellow-billed cuckoo (*Coccyzus americanus*), listed as Threatened under ESA, and the monarch butterfly (*Danaus plexippus*), a candidate species under ESA, have been identified with potential to occur in habitats near the program's sites (USFWS, 2023). The yellow billed cuckoo is associated with large acres (greater than two hundred acres) of wooded floodplain, and there are no facilities near such large patches. Monarch butterfly habitat is defined largely by the presence of milkweed and flowering plants, which can be found in many areas such as fields, roadside areas, open areas, wet areas, or even urban gardens. As such, it is possible monarchs may be located in vegetated spots surrounding program facilities. The facilities themselves, however, are primarily surfaced areas (gravel, asphalt, etc.) with little potential for milkweed or other flowering plants in any concentration to provide habitat for monarch butterflies, and actions considered in this EA would not be located in vegetated areas surrounding the facilities where such vegetative communities or previously undisturbed soil would be impacted.

3.2.6.2 Effects of the Proposed Action

The effects of the Proposed Action on wildlife or their habitats would occur from well drilling near the hatchery and operational activities at all facilities. The release of juvenile Chinook and coho also has the potential to affect wildlife by increasing anadromous fish returns to the Umatilla River and altering, beneficially, the food web there. No physical changes are proposed for any of the facilities that would alter the minimal wildlife habitat values of those facilities.

The operational actions at the Hatchery or its satellite facilities are expected to affect few wildlife species since these actions would occur only within the facility's grounds, which provides little habitat. At the Hatchery, the habitat affected would be regularly mowed lawns around the residences and between the hatchery structures and the Columbia River. Though a few local deer are known to use the patch of lawn by the river, few species regularly use habitat like this. Species such as killdeer, western meadowlarks, bobolink, grasshopper sparrow, and savannah sparrow; and small mammals such as field mice, voles, and shrews may occupy such sites.

The effects of ongoing activities at satellite facilities (generally within riparian habitats) to wildlife generally come from two sources: disturbance of wildlife by human activity during operations, and from the attraction that young fish in ponds would have for piscivorous birds and animals that would lead to conflict between operators and wildlife. Neither of these disturbance sources are considered to be enough to displace wildlife use or occupancy of nearby habitats.

There would be no impacts to designated critical habitat for ESA-listed species or identified priority habitats for any wildlife. Such impacts may have occurred with facility construction (loss of riparian habitat for the cuckoo, and the loss of native ground cover that may have supported milkweed (*Ascelpias* spp. - the obligate host plants used by the monarch butterfly for egg laying), but no such habitat conversions are proposed as part of this action. The small pads impacted by well drilling would be in sage and bunchgrass habitats unlikely to support milkweed species as this plant requires more moisture than these sites provide. All other construction activities (such as for the chiller expansion or new shed) would occur within the fenced, unvegetated facility and would not impact wildlife habitat beyond noise disturbance consistent with current operations.

Maintaining the increased anadromous fish runs, however, would continue to provide some level of increased contribution to the food web throughout the Umatilla Basin, as well as in the Columbia River Estuary and ocean environments where these fish might travel. This increased food base would benefit marine birds and mammals in the Pacific Ocean and the Columbia River Estuary as well as piscivorous birds and mammals in the lower and middle reaches of the Umatilla River basin.

There would be no impacts to wildlife habitat from research, monitoring, or evaluation activities. These activities would not modify wildlife habitats, nor do they require human occupancy of wildlife habitats for more than just transient periods. There may be a potential for short-term, small-scale disturbance of wildlife associated with people conducting fish habitat and spawning surveys; or by installing and operating screw traps, but those effects would be minimal.

Because of limited potential for the actions to modify wildlife habitat and their minimal potential to disturb wildlife in their existing habitat, the overall effect of this Alternative's impacts on wildlife would be low.

3.2.6.3 Effects of the No Action Alternative

Under the No Action Alternative, Umatilla Hatchery production programs would cease and there would be no more releases of juvenile Chinook salmon or coho into the Umatilla River. Returns of adult Chinook and coho to the Umatilla River Basin would likely decrease. Wildlife such as kingfishers, osprey, bald eagles, otter, mink, black bear, and other piscivorous or omnivorous species would experience a decrease in fish food sources.

The No Action Alternative would create no new direct impacts to wildlife habitats and would cease wildlife-disturbing actions at existing facilities. The overall effect of this Alternative's impacts on wildlife would be low.

3.2.7 Land Use and Recreation

3.2.7.1 Affected Environment

The Hatchery is bordered on the northeast by the John Day reservoir of the Columbia River and on the southeast by the Irrigon Fish Hatchery just 400 feet away. The Hatchery is bordered to the southwest and northwest by 115 acres of private land, five of which includes a public boat ramp adjacent to the hatchery on the northwest. These lands are zoned for industrial use and the Morrow County Grain Growers elevator is sited on another 20 acres of private land about one half mile northwest. These private lands and the hatcheries are otherwise surrounded by 8,900 acres of the Umatilla National Wildlife Refuge, mostly in upland and wetland habitats with 1,100 acres in irrigated agriculture.

The acclimation and release facilities are all located on small parcels of land, generally less than 1.5 acres each, surrounded mostly by private agricultural or residential development or undeveloped floodplain and riparian habitats.

Tourism and recreation in the Hatchery area are focused on outdoor activities such as fishing in the reservoir and wildlife viewing and hunting (waterfowl, upland game birds, and deer) on the Umatilla National Wildlife Refuge. Recreation along the Umatilla River is focused on fishing and hunting along its entire length, but there is one section within the Pendleton city limits, one mile downstream of the Pendleton Acclimation Facility, which is popular for short kayak and raft runs. The river upstream lacks the flow and depths necessary to support much floating recreation, and the river downstream is blocked by irrigation diversions and Three Mile Falls dam.

The Hatchery attracts visitors who are interested in observing and learning about fish production and offers educational tours and programs which generates revenue for local businesses, including accommodations, restaurants, and recreational service providers. The production programs also contribute to fishing opportunities by increasing fish runs in the Columbia and Umatilla rivers.

3.2.7.2 Effects of the Proposed Action

The Proposed Action makes no changes to land uses by the continued operations and maintenance of the Hatchery and the satellite facilities, RM&E, or from the new water source developments and other improvements. These facilities are in place with no proposal for physical expansion, and the water development proposals require no changes to existing land use designations. There would be no effect on land use.

There could be a benefit to recreation, however, as successful acquisition of additional water would maintain existing production levels of salmon for release, and this continue to benefit both commercial and recreational fishing opportunities.

The overall effect of these actions on recreation would be low to moderate beneficial impacts.

3.2.7.3 Effects of the No Action Alternative

The No Action Alternative would make no changes to land uses as discussed above, but without new water source development there would be a loss of opportunity to produce more salmon for release and the recreational fishing opportunities could be reduced.

The overall effect of the No Action Alternative on land use and recreation would be low.

3.2.8 Visual Resources

3.2.8.1 Affected Environment

The scenery around the Hatchery is dominated by the adjacent John Day reservoir and the surrounding grass and sage vegetation on the undeveloped private and National Wildlife Refuge lands around it. The Hatchery, the adjacent Irrigon hatchery, and the distant but visible grain elevator to the northwest add a small industrial element to the scenery, but that is secondary to the sense of wide-open spaces and native vegetation one has while approaching or driving through the area.

The satellite facilities differ from the Hatchery. As seen in the table in Section 3.2.3, "*Vegetation,*" the scenic character at the sites changes as they progress up the river. The scenery around the Three Mile Falls Dam and Westland Irrigation District sites is clearly large-scale agricultural, with numerous visible irrigation pivots operating in every direction one looks. The scenery around the acclimation and release facilities from Pendleton upstream can be characterized as more rural residential amidst pastures and hay fields adjacent to the river's riparian woodlands. As with the hatcheries, the acclimation and release facilities add a touch of industry to this otherwise pastoral landscape with their steel buildings, gravel pads, concrete ponds, and chain link fences.

3.2.8.2 Effects of the Proposed Action

The Proposed Action would result in little change to the visual character of any of the facilities. No visibly evident structural changes are proposed that would alter what is characterized above. The proposed chiller upgrade would extend one side of one building at the Hatchery, but that would be over a small 30-foot by 50-foot area into an existing paved parking area. The new wells that could be drilled, may have some short-term impacts from the presence of drilling equipment, and the loss of shrub vegetation along the pipelines that would convey water to existing lines, but once complete and revegetated by seeding and planting, the scenery would return to its original condition as viewed by most visitors.

There would be minimal change to the other satellite facilities or their use patterns. The scenic values there would be unchanged. The RM&E activities would not change the scenic landscape and would thus have no effect on visual resources.

Because there would be minimal change to the visual character of any facility or its setting, the overall effect of these actions' impacts on the visual resource would be low.

3.2.8.3 Effects of the No Action Alternative

The No Action Alternative would cease operations at the existing facilities, but likely not remove them. The No Action Alternative would not introduce new features that would change the visual character of the facilities, but the decommissioning of buildings and grounds could, over time, result in their structural disrepair and overgrowth by vegetation if the facilities were not used for some other purpose. Such a condition could degrade the existing visual character.

Thus, there would be no effect on visual resources from the No Action Alternative.

3.2.9 Air Quality, Noise, and Public Safety

3.2.9.1 Existing Condition

The Hatchery and the satellite facilities are located in no- or low-density human occupation areas and currently have clean air, quiet surroundings, and are generally safe from human-created hazards.

All program facility locations have air quality that falls within National Ambient Air Quality Standards (NAAQS). The air pollutants of greatest concern in the region surrounding the facilities are ground-level ozone, commonly known as smog; and fine particulate matter (mostly from wood smoke, other combustion sources, cars and dust), known as PM2.5 (2.5 micrometers and smaller diameter) (ODEQ 2023b).

The project area is in attainment with the NAAQS (ODEQ 2023b). 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 Environmental Protection Agency (EPA) based on the NAAQS.

The Air Quality Index (AQI) is an EPA health index which normalizes the various air pollutants to report one health level.[12] The AQI defines standards as "Good," "Moderate," "Unhealthy for Sensitive Groups," "Unhealthy," and "Very Unhealthy (Alert)." The closest communities to the project facilities where air quality is monitored are Hermiston (for ozone) and Pendleton, Oregon (for PM2.5). In November 2023, Hermiston's AQI, based on ozone, for the month of October was mostly in the "Good" range with occasional extensions into the "Moderate" range, and Pendleton's AQI rating for PM2.5 was mostly in the "Good" range (ODEQ 2023c).

Similarly, there is no problematic noise or public safety condition to which the program's facilities are contributing. The hatchery facilities have no machinery or operations that produce routine and excessive loud noise or emissions. The safety concerns at these facilities are operational for employees (who are trained), but create no hazards for the general public or surrounding residents.

The Hatchery and the satellite facilities are located in areas without fire protection services other than nearby rural fire protective services or state and federal resource management agencies. Medical and hazardous material response is available from the nearest larger towns of Boardman, Hermiston and Pendleton, all within 20 miles of any program facility. Emergency medical response is available from the nearby towns Hermiston and Pendleton, both of which have hospitals. State police, County Sheriffs, and tribal and federal agents patrol their respective jurisdictions and cooperatively respond to emergency needs.

3.2.9.2 Effects of the Proposed Action

The emissions, noise, and public safety effects from current levels of operational activity at the hatchery and the satellite facilities are consistent with those on adjacent and nearby rural agricultural sites along the Columbia and Umatilla rivers which can be described as generally quiet as compared to urban or suburban settings.

The primary effect would be the short-term impacts of construction of the expanded chiller room and the drilling of wells. Site clearing and excavation would create construction-related noises and raise particulates (fugitive dust) for a short time at these sites. Earth moving and construction

[12] The AQI is updated hourly and posted online by EPA at https://www.airnow.gov and on the ODEQ website at https://aqi.oregon.gov/.

activity may continue for about one month, though noise and dust impacts would decrease as the construction activity shifts to the interior infrastructure.

Construction activities also bring the risk of drips or spills of petroleum-based fluids. Drips of hydraulic oil, transmission oil, brake fluids, motor oil, crankcase oil, gear box oil, and synthetic oil are possible, though expected to be minor and highly localized. These products, however, can be acutely lethal to fish and can kill them quickly at a 0.4% concentration in water (Prasad et al. 1987). If not managed, some spills may be large enough to travel into the water table bringing with it toxic contaminants such as benzene which could infiltrate both soil and drinking water; and runoff from storms can carry spilled or dripped petroleum products into rivers. Equipment operations, however, would adhere to the relevant measures in Section 2.3 "*Mitigation Measures*," minimizing the potential for spills and the impacts associated with spills as discussed above. There may be a potential for minor drips that would contaminate soil on the sites, but the impact is anticipated to be low.

Vehicles used for construction would increase traffic on local roads during construction and emit pollutants which contain carbon monoxide, volatile organic compounds, nitrogen oxides, sulfur oxides, and particulates. The levels produced would be low and are expected to have a low impact on air quality and would not contribute to an exceedance of any air quality standards.

Because the proposed construction actions are short-term and small in scale with minimal potential to affect air quality, noise, or public safety, and the ongoing actions produce minimal effects and are consistent with those on surrounding lands, the overall effect of the Proposed Action on air quality, noise, and public safety would be low, and would be mitigated by the application of the measures in Section 2.3 "*Mitigation Measures.*"

3.2.9.3 Effects of the No Action Alternative

The No Action Alternative would cease operations at the existing facilities, eliminating all current sources of impacts to air quality and noise. There would be no change to public safety since current facilities and operations would continue to operate consistently with existing operations.

The overall effect of the No Action Alternative on air, noise, and public safety would be low.

3.2.10 Cultural Resources

The term "cultural resources" refers to a broad range of resources that represent or convey a place's heritage or help tell the story of a region's past. Cultural resources are evidence of human occupation or activity in any district, site, building, structure, artifact, ruin, object, work of art, architecture, or natural feature important in human history at the national, state, or local level. Cultural resources are important for their potential to provide an understanding of long-term human adaptation as well as information regarding patterns of history and culture. Cultural resources are recorded as historic properties, which include any prehistoric or historic resources included, or eligible, for inclusion in the National Register of Historic Places (NRHP). Eligible properties include both properties formally determined as such by the Secretary of the Interior and other properties that meet NRHP listing criteria. The National Historic Preservation Act of 1966, as amended (NHPA), requires that these resources be inventoried and evaluated for eligibility for listing on the NRHP and agencies to evaluate and consider effects of their actions on these resources. Cultural resources are evaluated for eligibility in the NRHP using four criteria commonly known as Criterion A, B, C, or D, as identified in 36 CFR Part 60.4(a–d). These criteria include an examination of the cultural resource's age, integrity, and significance in American culture, among

other things. A cultural resource must meet at least one criterion to be eligible for listing in the NRHP.

3.2.10.1 Affected Environment

Indigenous Context

The project area lies within the cultural area of several groups known as the Plateau Culture. This includes but is not limited to Cayuse (Weyíiletpu), Umatilla (Imatalamłáma), Walla Walla (Walúulapam), Nez Perce (Nimiipuu), Paiutes, Yakama, Wasco, and Warm Springs (Tenino). The Plateau Culture grouping of people have lived in the Pacific Northwest since time immemorial and belonged to the Sahaptin Language group, each tribe spoke a distinct dialect of the language group. Generally, people would travel with the changing seasons, moving from the lowlands in the winter to the highlands in the summer, taking advantage of the food resources available in each area. Prior to contact with settlers, Indigenous peoples harvested fish from the Snake and Columbia rivers and their tributaries, hunted animals such as elk, deer, bear, and waterfowl, and collected roots, black moss, and berries. Historically, natural resources have been the mainstay of the economies of the Indigenous peoples in the Columbia Basin. Salmon are an important aspect of the cultural, symbolic, and economic life and subsistence of the Indigenous tribes that occupied the Columbia Basin. Hunting, fishing, and gathering have been important to tribes for thousands of years. These activities continue to be important today for commercial, subsistence and ceremonial purposes (NMFS 2012). Celilo Falls was a significant and essential place for all Plateau Culture tribes. It was a major lifeline for fishing and trading before being flooded after completion of construction on The Dalles Dam in 1957.

The Walla Walla and Umatilla were the "river peoples" who shared the Columbia River and occupied both sides of the Columbia River from above the junction of the Umatilla River downstream to the vicinity of Willow Creek, Oregon and to Rock Creek, Washington. The Cayuse lived in the lower Columbia Plateau ranging from the Cascade Mountains to the Blue Mountains, within the tributary river valleys (CTUIR 2023b). The Nez Perce Tribe occupied an area that includes present day Idaho, Oregon, and Washington. They traveled throughout this region and parts of Montana and Wyoming to trade, hunt, and fish. Brief hunting trips into Montana for bison provided food and warmth for winter (Nez Perce 2018). The Confederated Tribes of the Warm Springs is comprised of 4 bands (Upper Deschutes (Tygh), Lower Deschutes (Wyam), Tenino, and John Day (Dock-spus) bands) and lived along the Columbia River and the area below. This area can generally be mapped from the mouth of the Deschutes River, down to Sisters, Oregon, west to Mount Jefferson and east to Spray, Oregon. The Wasco lived along both sides of the Columbia River from Lyle, Washington to Tenmile Rapids and tended to stay in that area year-round as opposed to the seasonal migration of other Plateau Culture tribes (Confederated Tribes of the Warm Springs Reservation 2016). The Paiute peoples lived in Southern Oregon and lived a more nomadic lifestyle. They did not regularly associate with the Plateau Culture peoples until their move to the Warm Springs Reservation in 1879 (Ruby et al. 2010). The Yakama Nation is made up of 14 tribes and bands that occupied the western border of the Columbia Plateau in the glaciated summits and forest slopes of the Cascade Mountains to the semiarid sagebrush steppe deserts and basalt canyons along the Columbia River. Each tribe and band had authority over their own territory but regularly gave permission for others for use (Schuster 1998).

The tribes and bands of the Columbia Basin were tied to each other through family, trade, social and economic interests in the Columbia River Gorge and the Northern Plateau. They regularly traversed this landscape, migrating seasonally to harvest huckleberries and other resources, such as game high in the mountains, then salmon from the Columbia River below. Fishing was the primary

means of livelihood and survival for Indigenous peoples, and their geographic setting placed them in the prime location for being the intermediaries of trade between the buffalo country of the Great Plains and rainforest and ocean resources of the Pacific Coast cultures. (CTUIR 2023b).

Historic Context

The history of settler occupation of this area is similar to those on most Indigenous lands in the Columbia Basin, with fur traders, gold miners, immigrants, and missionaries bringing goods, trade, and religion, then disease, conflict, and war which ultimately resulted in treaties with ceded lands, loss of access to resources, and reservations. Their arrival brought dramatic changes that reduced Indigenous populations and constrained their ability to live consistent with their culture. The impact on their fishery was equally dramatic.

Spanish, British, Russian, and American trading ships had been regularly visiting the Pacific Northwest by the time the Lewis and Clark began their expedition in 1805, however, the Lewis and Clark Expedition, also known as the Corps of Discovery Expedition, was a catalyzing event which paved the way for settlement by non-Indigenous peoples. When the first traders and settlers entered the Columbia Basin, they harvested salmon for their own use and for trading, but as their populations increased, they began harvesting larger numbers of fish. The Hudson Bay Company established the first successful trade in Columbia basin salmon, establishing markets in London, Honolulu, and Valparaiso, Chile in the 1830s and 40s. By the late 1840s, salted Columbia River salmon became known in many parts of the world, and commercial fishing developed into an industry over the next two decades. A canning industry was established in the late 1860s. With the establishment of the transcontinental railroad in 1883, frozen salmon (packed in crushed ice) began being shipped eastward (Craig and Hacker 1940).

Increases in capture efficiency using traps and nets, and an increase in fishing intensity provided for a growing industry that ultimately peaked in the 1880s. The catch slowly declined up to the 1930s as a result of intensive fishing and the degradation of migration and spawning habitat from agriculture, mining and logging. Dam, dike, and drainage structure construction for flood control, navigation, irrigation and power production began in the 1930s (Craig and Hacker 1940).

3.2.10.2 Effects of the Proposed Action

Cultural resources may be impacted by activities under the Proposed Action including ground disturbing activities, maintenance of existing production facilities (structures, buildings, and grounds), site and facility upgrades including routine annual maintenance, facility reconstruction or new construction, and water source development. Minimization, avoidance, and mitigation measures developed through consultation under Section 106 of the National Historic Preservation Act would be used to offset potential site-specific project effects.

Minimization and avoidance (Section 2.3 "*Mitigation Measures*") are typically achieved by modifying the project design to lessen the amount or type of construction or activity that is proposed in certain areas. Protective measures can be incorporated into the project design and during implementation that can minimize or avoid affecting cultural resources. In the event a cultural resource is discovered or impacted during project activities, post-review discovery procedures (Table 5 in Section 2.3, "*Mitigation Measures*") would be used to identify how to protect the site, when to stop work, and identify other steps to take.

In some cases, it may be that an impact to cultural resources is unavoidable. In these circumstances, consultation with the State Historic Preservation Office, interested tribes, and other

consulting parties would identify the appropriate approach to mitigating for these effects and avoiding loss of valuable historic and cultural information.

Cultural resources would generally be avoided during project construction and an inadvertent discovery procedure would be in place to stop work and assess any potential cultural resources unearthed during ground-disturbing activities. For these reasons, project work would result in no-to-low, long-term, adverse impacts on historic and cultural resources.

Ongoing smolt production and release activities at the Umatilla Hatchery and satellite facilities would have no potential to affect cultural resources because no ground would be disturbed.

Section 106 consultation specific to the effects to cultural resources from replacing and upgrading the chiller system was initiated on June 9, 2023 with the Oregon State Historic Preservation Office (SHPO), CTUIR, Nez Perce Tribe, Confederated Tribes and Bands of the Yakama Nation, Confederated Tribes of the Warm Springs, United States Fish and Wildlife Service, and the US Army Corps of Engineers on the proposed "Area of Potential Effect"[13] and the proposed survey and analysis methods. No response to this was received from any party. On December 13, 2023, a "Determination Letter"[13] letter was sent by BPA to the consulting parties. On January 8, 2024, SHPO responded with questions. BPA and SHPO held a meeting on February 12, 2024, during which additional survey and monitoring actions were agreed upon to ensure that no historic properties would be affected. On February 26, 2024, BPA sent a letter with an updated determination letter maintaining the previous determination of no historic properties affected with stipulations (as specified in Table 2.3 under Cultural Resources). No additional comments from consulting parties were received during the 30-day comment period, therefore BPA assumed concurrence with its determination of effect on March 27, 2024.

3.2.10.1 Effects of the No Action Alternative

Under the No Action Alternative, where activities ceased but facilities remained, there would be no potential for cultural resources to be disturbed since no construction would occur.

There would be no effect from the No Action Alternative on Cultural Resources.

3.2.11 Climate Change

3.2.11.1 Affected Environment

The EPA defines climate change as any substantial change in measures of climate (such as temperature or precipitation) lasting for an extended period of time (decades or longer) (EPA 2014b). Because climate change is a global concern, the affected environment for climate change is considered at a larger scale, specifically at the state and national scale.

Climate change may result from natural factors and processes or from human activities (EPA 2016). Greenhouse gas (GHG) emissions caused by human activities represent the most significant driver of climate change since the mid-20th century (EPA 2014a, IPCC 2014). GHGs are chemical compounds found in the earth's atmosphere that absorb and trap infrared radiation or heat in the lower part of the atmosphere. The principal GHGs emitted into the atmosphere through human

[13] The "Area of Potential Effect" is a term used in Section 106 consultation to delineate the boundaries within which a project may affect cultural resources. A "Determination Letter" is the next step in the consultation process by which a federal agency notifies the consulting parties of survey and analysis results and makes a determination of the effect the action would have on cultural resources.

activities are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases (EPA 2014a). Of these four gases, CO2 is the major GHG emitted (EPA 2016).

In recent decades, climate change has had widespread impacts on human and natural systems, including rising sea levels, an increased frequency of extreme weather events (e.g., floods, drought, wildfire, and heat waves), acidification of the ocean, shrinking glaciers and sea-ice retreat, reduced crop yields, and shifting geographic ranges or migration patterns for wildlife species (IPCC 2014).

According to the U.S. Global Change Research Program, U.S. average temperature has increased by 1.3° to 1.9°F since recordkeeping began in 1895; most of this increase has occurred since 1970 and the most recent decade was the nation's warmest on record (Walsh, et al. 2014). The resulting impacts of rising temperatures in the U.S. include an increased length of the growing (frost-free) season, increased average precipitation (with localized examples of increases and decreases), and an increase in the frequency and intensity of extreme weather events (e.g., heavy downpours, heat waves, hurricanes, droughts). In the interior Pacific Northwest, the most notable impacts of climate change have been changes in the timing of spring snowmelt and streamflow, widespread forest mortality due to increased wildfire, insect outbreaks and tree diseases, and an increasing vulnerability of the agricultural industry as a result of reduced water supply (Mote et al. 2014).

As average temperatures in the U.S. are expected to continue to rise, the resulting impacts are also expected to continue into the future. Although there is uncertainty about the specific magnitude and timing of future changes, regional climate models for the Pacific Northwest generally predict continued increases in air temperature, stream temperature, and likelihood of wildfire, reductions in spring snowmelt and the supply of freshwater, and a shift in the timing of seasonal streamflow. In the Pacific Northwest, the primary climate-related concerns are an increased likelihood for wildfires and mountain pine beetle outbreaks, reduced availability of habitat for salmon and steelhead due to warming stream temperatures and altered flow regimes, and the long-term impact of reduced water supply on the agricultural industry (Lawler and Mathias 2007, Littell et al. 2009, EPA 2016).

On a statewide level, Oregon is becoming warmer and drier. Its annual average temperature has increased by around 2.2°F over the past century. Without significant reductions in greenhouse gas emissions, its annual temperature is projected to increase by 5°F by mid-century and by 8.2°F by the 2080s. Temperature increases would be most pronounced in the summer, when temperatures are projected to increase by 6.3°F by mid-century and 10.2°F by the 2080s. This level of warming is expected to exacerbate impacts to the natural and human environments (extreme heat, drought, snowpack and glacial decline, and wildfire) that have already started to manifest in the state (ODE 2023).

3.2.11.2 Effect of the Proposed Action

The Proposed Action's contribution to climate change would be from the release of exhaust gases from construction and well-drilling vehicles and from vehicles necessary for ongoing operations. Impacts from construction activities would be short-term (less than six months) and come from only a few construction and worker transport vehicles. There would be no increase in emissions from the ongoing operations of the hatchery for salmon production.

The contribution of greenhouse gas emissions to climate change effects from vehicles associated with these actions would be very low and the overall effect of these actions' impacts on climate change and on environmental justice communities (who are disproportionately impacted by climate change) (see Section 3.2.12) would therefore be low.

Climate change could, however, have an impact on the Umatilla Hatchery production programs. Declining water levels on the Umatilla River, in part attributed to climate change, is driving the need to find alternative water sources (i.e. new wells, recycling water, etc.) for the hatcheries. The Proposed Action includes development of additional water sources to address both current water supply shortfalls and potential future water availability declines from the ongoing effects of climate change.

Climate change could also impact the survival of the hatchery-produced Chinook and coho salmon released onto the Umatilla River. Umatilla River water levels could decrease, and seasonal flow regimes could change, which could necessitate changes in acclimation and release protocols for these fish. Climate-induced declines in water levels during migration periods in the Columbia River mainstem could have impacts by elevating water temperatures, by altering flows at the juvenile bypass systems, or by improving habitat conditions for predatory fish or for fish competing with juvenile salmonids for thermal refugia. Climate change could also alter conditions in the Columbia River estuary, and the Pacific Ocean, which could impact survival of all life stages of these fish. Food sources in the ocean may be impacted, which could affect distribution of these fish in the eastern Pacific Ocean and their resulting exposure to competition and predation there. Changes in the Columbia River's flow regime could alter the timing of adult returns or the availability of estuarine resources (space, food, etc.) for these salmons' conditioning to fresh water upon their return and prior to their run upriver. Changes to rearing, acclimation, and release practices would be applied if and when these climate-driven environmental changes and their potential to impact anadromous fish production programs are realized.

3.2.11.3 Effects of the No Action Alternative

The No Action Alternative would make no new greenhouse gas contribution to the atmosphere since there would be no operation of construction or well-drilling equipment. The existing greenhouse gas contributions from facility and equipment activity that supports current operations would also cease.

There would be no effect of the No Action Alternative on climate change.

3.2.12 Socioeconomics and Environmental Justice

The socioeconomic environment potentially affected by the Umatilla Hatchery production programs include the regional economy along the Columbia River as it relates to sport, commercial, and tribal fisheries; and the local community as it relates to employment income and personal expenditures. Operation of hatchery programs generate economic activity by providing employment opportunities and through local procurement of goods and services for hatchery construction and operations. Further, production program operations increase fish available for harvest from the Pacific Ocean, and the lower and middle Columbia River. Other socioeconomic factors include the local tax base, community services (e.g., fire, county sheriff, roads, and utilities), and local business support through construction/operation expenditures (e.g., stores, suppliers, hotels, and restaurants).

Executive Order 12898 and 14096, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, require federal agencies to identify and address high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. Census data at the state, county, and census tract levels were used to determine the potential presence of minority, low-income, or Indian Tribe populations in the study area.

The study area focusses on Umatilla County for socioeconomic elements and the Umatilla River Basin for impacts related to fisheries.

3.2.12.1 Affected Environment

Population

Umatilla County, Oregon is home to a population of over 80,000 people. The three largest ethnic groups in the county are white/non-Hispanic (65%), White/Hispanic 17.6%, and non-white/Hispanic (9.17%). American Indians make up 2.5% of the county's population (U.S. Census Bureau 2023).

Identifying low-income, minority, and Indian Tribe populations in the study area lays the foundation for analyzing environmental justice impacts in the study area. A census tract within the study area meets environmental-justice criteria if more than 20 percent of its population is below the poverty level or if the percentage of the population that identifies as a minority is greater than the percentage of the state identifying as a minority. Based on the 2017 American Community Survey (ACS) estimate, Oregon's minority population is 15.1 percent. On the basis that they are the home to minority populations higher than the statewide average, most environmental-justice populations reside in two census tracts: census tract 9400, coextensive with the Umatilla Indian Reservation, has a minority population of 49.2 percent; and census tract 9506, encompassing downtown Pendleton and an area south of town to the east of the project area, has a minority population of 21.1 percent.

Economic Base, Employment, and Income

Agriculture plays a vital role in Umatilla County's economy. The region is known for its fertile soil and favorable climate, and is a major producer of wheat, barley, potatoes, onions, corn, and other crops. Livestock farming, including cattle and dairy production, is also significant. The agricultural sector supports numerous related industries such as food processing, packaging, and distribution.

Umatilla County has a strong manufacturing sector that produces a range of products, including processed food and beverages, wood products, metal fabrication, machinery, and electronic equipment.

The county has abundant natural resources that contribute to its economy. The presence of the Columbia River and its multiple purpose dams has led to the development of the energy sector, including the generation of hydroelectric power. The region also has potential for wind energy production. Additionally, timber resources in the nearby Blue Mountains support the wood products industry.

Umatilla County's natural beauty, outdoor recreational opportunities, and cultural attractions draw visitors to the region. The county is known for its recreational activities such as fishing, hunting, boating, camping, and hiking. Additionally, events and attractions like the Pendleton Round-Up rodeo and the Tamástslikt Cultural Institute showcase the area's rich cultural heritage and attract tourists, contributing to the local economy through spending on accommodations, dining, and entertainment.

The county is home to several healthcare facilities, including hospitals, clinics, and long-term care facilities, which together support over 10% of county employment.

The largest employers in Umatilla County are health care and social assistance (employing 4,255 people), retail trade (3,940 people), and manufacturing (3,450 people). The most common job types in the county are office and administrative support occupations (employing 11.7 % of the

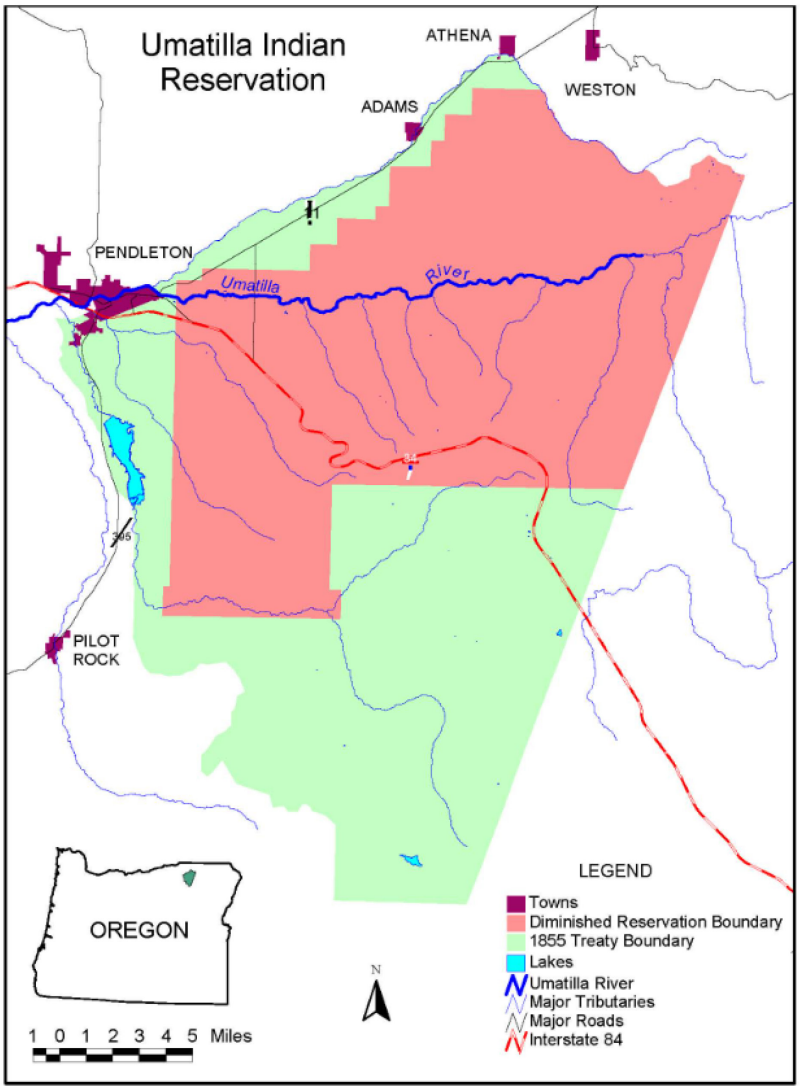
workers), management occupations (9.05%), and sales and related occupations (8%). The highest paying industries are utilities ($64,107 average annual income), public administration ($52,957), and construction ($51,225). The median household income in Umatilla County is about $58,000 annually (U.S. Census Bureau 2023).

The Confederated Tribes of the Umatilla Indian Reservation

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) is a union of three tribes: Cayuse, Umatilla, and Walla Walla. In 1855 these three tribes signed a treaty with the US government, in which it ceded over 6.4 million acres to the United States. In the treaty, the CTUIR reserved rights to fish, hunt, and gather foods and medicines such as roots and berries, and pasture livestock on unclaimed lands. Tribal members continue to exercise these rights throughout the CTUIR's area of traditional use, which extends to and beyond harvesting fish at Willamette Falls in Western Oregon to hunting buffalo in the Greater Yellowstone Area, as they have since time immemorial (CTUIR 2023a).

The reservation created by the treaty was about 250,000 acres (about 391 square miles) but was reduced to about 172,000 acres (about 271 square miles) by legislation in the late 1800s (CTUIR 2012). The largest community is Mission, which is the site of the tribal headquarters as well as the Umatilla Agency of the Bureau of Indian Affairs.

Figure 4 Umatilla Indian Reservation tribal lands: original reservation (light green), and current reservation (red)



The CTUIR has over 3,100 tribal members, nearly half of which live on or near the reservation. The reservation is also home to another 300 Indians who are members of other tribes and about 1,500 non-Indians (CTUIR 2012). Thirty percent of CTUIR membership is composed of children under age 18; fifteen percent are elders over age 55.

The CTUIR economy consists of agriculture, livestock, timber, recreation, hunting, fishing, and commercial development such as a mini-market/gas station, trailer court, grain elevator, and the Wildhorse Resort (which includes a casino, hotel, RV Park, and 18-hole golf course that employees more than 800 individuals). In July 1998, the Tribe opened its Tamástslikt Cultural Institute as the centerpiece of the Resort. CTUIR is the owner of Cayuse Technologies, a new business that opened on the Umatilla Reservation in 2006, employing nearly 300 people (CTUIR 2023b). The day-to-day work of the tribal government is carried out by a staff of roughly 700 employees and includes departments such as administration, health and human services, natural resources, economic and community development, tribal services, education, fire protection, and police (CTUIR 2012).

Tribal members fish in the Columbia River and its tributaries located in southeastern Washington and northeastern Oregon. Approximately 30 tribal members conduct commercial fishing activities for about 60 days each year, typically in Zone 6 (between Bonneville and McNary Dams) of the Columbia River, harvesting Chinook salmon in the fall, and steelhead and sturgeon in the winter. In addition, as many as 100 tribal members participate in ceremonial and subsistence fisheries (NMFS 2003).

Many tribal members still practice the traditional tribal religion called Washat. Some still speak their native languages. A language program is underway to preserve and teach the tribes' languages (CTUIR 2012).

Contribution of Umatilla Hatchery to County and CTUIR Socioeconomics

The hatchery's activities and production help support the local economy by creating jobs, enhancing fishing opportunities, and indirectly supporting related industries.

Umatilla Hatchery is staffed by about ten ODFW personnel, all of which reside in the local area. The hatchery's satellite facilities are operated by the CTUIR, providing jobs (likely less than ten in total). These jobs contribute to the local economy by providing stable employment and income for individuals and their families.

The production programs support commercial and recreational fishing industries in the region. By rearing and releasing salmon into local rivers and streams, the hatchery helps enhance fish populations. This, in turn, provides increased opportunities for recreational anglers, attracting them to the area and contributing to the local economy through fishing-related expenditures, such as equipment, licenses, and lodging.

The production programs indirectly support various fish-related industries, including bait and tackle shops, boat rental services, fishing guides, and fish processing facilities. These businesses benefit from the increased fishing opportunities resulting from the hatchery's efforts. Additionally, the presence of healthy fish populations in local waterways can contribute to the overall appeal of the region for tourism and outdoor recreation, benefiting a range of businesses that cater to visitors.

The larger influence of current ongoing operations, however, is in the contribution the production programs make to the returning fish runs in the Umatilla River basin and the associated cultural and subsistence benefits to the CTUIR from increased fish harvest. The contribution the production programs make to the returning fish runs and increased fish harvest in the Umatilla River basin is significant to the CTUIR's cultural values, by providing two of the foundational First Foods[14] that sustain the continuity of the Tribe's culture (CTUIR 2012).

3.2.12.2 Effects of the Proposed Action

Effects to the surrounding area

Economic effects of hatchery operations, maintenance upgrades, and RM&E for these programs come from the local employment opportunities and regular operation-related expenditures associated with operations of the Hatchery and the satellite facilities. Social effects stem from the long-term economic and cultural benefits of increasing Chinook and coho salmon runs into the

[14] First Foods are the foods ritualistically served by the CTUIR at tribal meals and defined as the minimum ecological products necessary to sustain CTUIR culture (Jones 2009).

Umatilla River basin and to downstream communities along the Columbia River and coastal Oregon and Washington.

The economic impact of direct employment and hatchery expenditures is relatively small. The Hatchery employs up to ten people and the satellite facilities may employ up to another ten. The overall budget for the program is up to 1.5 million dollars, most of which multiplies its way through the Umatilla (mostly) and Morrow Counties' economies. The larger economic impact, however, likely comes from the release of juvenile salmon produced through the production programs.

The released juveniles make their way to the Pacific Ocean where they grow and ultimately develop into adult salmon to return to spawn. These adult salmon provide a commercial and recreational fishery resource in the mainstem Columbia River and along the west coast of the United States. They also support tribal fisheries along the Columbia River. The contribution of the production programs to this resource is likely about 1% of the hatchery contribution, considering the 140 million hatchery fish released into the Columbia River each year (NPCC 2021), and the nearly two million fish released from the Umatilla programs. With the hatchery fish calculated at 63% of returning adults (NPCC 2005) this equates to 0.63% of the overall value of the Columbia River fishery. This larger fishery is estimated to support over 10,000 full-time Oregon and Washington jobs and contribute over $700 million to the gross domestic product (Gislason et al 2021) of which over 63 full-time jobs and over $4.4 million could be attributed to the Umatilla Hatchery production programs.

Since the Proposed Action would continue to provide local employment and the continued production and release of fish would support tribal, commercial and recreational harvest, the overall socioeconomic effect of these actions' impacts would be moderate and beneficial.

Effects Relevant to Environmental Justice

As discussed above, environmental justice populations are present in the general proximity of the project area. There would be some short-term, adverse construction effects to the environmental justice population in the closest census tract (9400) covering the satellite facilities. In addition, as described for the affected resources in the sections above, none of the adverse effects resulting from the Proposed Action would be high. The Proposed Action retains employment opportunities for those employed by the Umatilla Hatchery and the satellite facilities. The continued funding for Chinook and coho production would continue to contribute to the restoration of salmon runs to CTUIR lands providing support for their economy, traditions, and cultural practices. For these reasons, the Proposed Action would not create a unique pathway for environmental justice populations to experience disproportionate and adverse human health and environmental effects (including risks) and hazards.

3.2.12.3 Effects of the No Action Alternative

The No Action Alternative would stop funding of production program operations at the Hatchery and satellite facilities, and all Chinook and coho salmon production, acclimation, and release operations would cease. It would remove the economic benefits the current programs are already providing. The current employment opportunities would be eliminated, and the annual operational expenditures providing local benefits would cease.

This alternative would eliminate existing employment for about 20 people across the production programs.

The No Action Alternative would also reduce the potential for a more rapid return of anadromous fish runs to the Columbia and Umatilla rivers. At present, the runs are augmented by hatchery

production, and if discontinued, the populations restored to date may not persist in the Umatilla River into the future. Under the No Action Alternative, the populations could stagnate or slowly decline. They could, however, also increase over time, but if they do so, it would be more slowly than if augmented.

If the Chinook runs decline there would be a small negative impact to the local economy, but a much larger impact to the CTUIR's social, cultural, and traditional practices, and adversely impact some families whose subsistence is tied to these runs. This could cause disproportionate and adverse human health and environmental effects (including risks) and hazards to CTUIR.

The overall socioeconomic and environmental justice effects of the No Action Alternative would be moderate.

Chapter 4. Cumulative Effects

Cumulative effects are effects on the environment which result from the incremental effects of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Current actions are those projects, developments, and other actions that are underway because they are either under construction or occurring on an ongoing basis. Reasonably foreseeable future actions generally include those actions formally proposed or in the planning stages. Cumulative effects can result from individually minor but collectively significant effects taking place over a period of time.

4.1 Scope, Time Frame, Actions, and Baseline

The geographic scope for this assessment of cumulative effects is the Umatilla River basin and the Columbia River below McNary Dam downstream to Bonneville Dam for the Chinook and coho production and release actions. These areas were identified because the effects of Umatilla Hatchery production programs' juvenile releases and returning adults would impact these waters most. It is recognized that though the Chinook and coho actions taken here would have some effect on the Columbia River estuary below Bonneville Dam and on ocean fisheries and environments, available knowledge and research abilities are insufficient to discern the role and contribution of the Hatchery actions to density dependent interactions affecting aquatic life in these areas and any quantification or qualification of such would be highly speculative.

The past and present actions considered in this assessment include:

- The operation of federal and non-federal dams and associated reservoirs and other infrastructure.
- The installation and operation of irrigation diversions and smaller dams in the Umatilla River that have altered natural flow patterns and blocked some fish from their historical spawning grounds.
- Human activities, including land management and transportation development (railroads and highways) have reduced the connection between river and riparian habitats, increased sedimentation in streams, and altered floodplain function. Land development has resulted in the straightening of rivers and creeks, armoring or other modification of riverbanks, and dewatering with irrigation diversions. This has caused the Umatilla River to become straighter, wider, and shallower with elevated temperatures.
- The multiple anadromous fish hatchery programs in the Columbia River basin with their cumulative effects to date being increasing runs of ESA-listed salmon and steelhead and other anadromous fish in the Columbia River Basin. As described in the Mitchell Act EIS for Columbia River Basin hatchery programs (NMFS 2014), these programs are operated with an adaptive management approach where adjustments are made to address the cumulative effects of hatchery programs, climate change, development, and habitat restoration for fisheries, on the attainment of recovery goals.
- Recreational, commercial, and tribal fish harvest, as well as incidental catches of ESA-listed fish in the Umatilla River Basin.

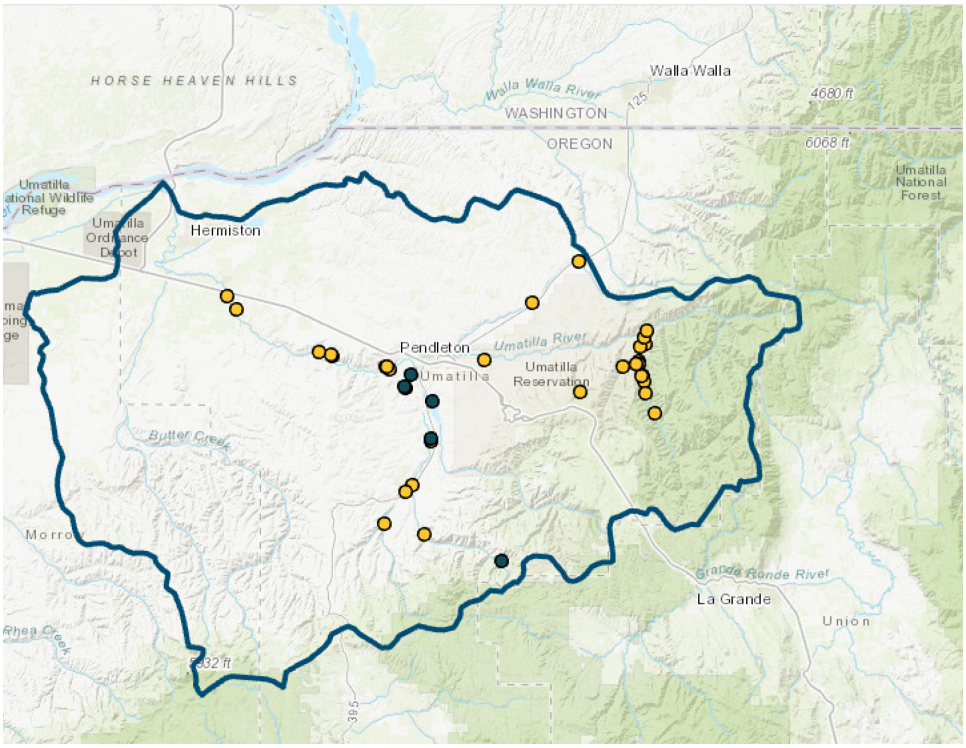
The impacts of these past and present actions on resources potentially affected by the Proposed Action are recognized as current conditions described in Chapter 3, "Affected Environment and Environmental Consequences." Historical development of the Columbia Basin for electrical power,

flood control, navigation, and agricultural needs influenced the existing condition of resources in the area of this cumulative effects assessment. These habitat impacts, along with direct impacts to the populations from historic harvesting of anadromous fish, has led to implementation of management and recovery actions, including numerous hatchery programs.

Planned and reasonably foreseeable future actions in the Umatilla Basin include:

- Economic development projects in Umatilla County, including:
    - Phases 1 and 2 of the "Ordinance Regional Water Supply and Aquifer Restoration Project" which would transfer Columbia River water from Umatilla County's pump station on the Columbia River near the town of Umatilla inland over 5 miles to supply industrial, agricultural, and groundwater recharge needs.
    - Expanding industrial and commercial developments around Umatilla and Hermiston.
    - Housing developments serving military training needs at Rees Training Center; and at Project Path, a transitional housing project to address homelessness in Umatilla County.
- Ongoing grazing, forestry, and mining activities that would continue on private and National Forest System lands in the upper reaches of the Umatilla River basin.
- Ongoing public and private initiatives and actions for the restoration of fish habitat in the Umatilla River Basin as displayed in the list and Figure 5, below: [15]

Figure 5 Ongoing Public and Private Restoration Actions



[15] Interactive map with links to project descriptions can be reviewed at https://umatillariver.org/projects/.

Mapped recently completed and proposed projects include:

- Athena 3rd Street Bridge Replacement
- B&G Resources Riparian Conservation Agreement
- Birch Creek bank stabilization and habitat restoration, river mile 2.8
- Birch Creek Broun (Garton) Dam Fish Passage Rectification
- Birch Creek Taylor Dam Removal
- Buckaroo Creek RM 4.7-6.3 Large Wood Addition
- Cunningham Sheep Co. Fish Passage Rectification
- Dillon Diversion Dam Removal
- East Birch Creek RM 5.3-5.8 Habitat Enhancement
- Imeques Reach Floodplain Restoration Project
- Isquulktpe Creek Road Relocation Design and Transportation Network Survey
- Low Fish Passage Rectification
- Lower Umatilla River Bank Stabilization and Habitat Restoration
- Meacham Creek Bonifer Reach Floodplain Restoration and In-stream Enhancement at RM 1.7 to 5.9
- Meacham Creek Fence and Vegetation
- Meacham Creek Fencing RM 33
- Meacham Creek Floodplain Restoration and In-stream Enhancement RM 6-7
- Meacham Creek Floodplain Restoration and In-stream Enhancement RM 6-8.5
- Meacham Creek Large Wood Implementation RM 4.6-8.3
- Meacham Creek Levee Removal RM 5-6
- Meacham Creek Natural Channel and Levee Modification Project RM 2.4-5.0
- Meacham Creek Vegetation Recovery RM 7.3-7.7
- Meacham RM 10-11 Instream Enhancement and Floodplain Restoration Project
- Peterson Dam Fish Passage Rectification
- UmaBirch Floodplain Restoration and In-stream Enhancement
- Umatilla Riverbank Stabilization and Riparian and Floodplain Vegetation Enhancement Project
- Umatilla River Vegetation RM 37 to RM 55
- Wildhorse Creek Beaver Dam Support Structure Pilot Project

4.2 Proposed Actions Evaluated for Cumulative Effects

For the purposes of this cumulative effects assessment, two primary actions will be assessed: funding the ongoing Chinook and coho production programs, which includes the continued release of thousands of hatchery-reared fish into the Umatilla River basin, and the addition of new water sources. Together, these actions would increase the number of juvenile anadromous fish released into the Umatilla River and create the potential for an increase in the number of returning adults to the Umatilla and the Columbia rivers below McNary Dam.

In-hatchery operations, maintenance, and facility upgrades impacts are *de minimis*. They do not measurably or meaningfully modify the physical or natural resource in comparison to the past, present, and likely future agricultural, industrial, forestry, mining, and river and floodplain restoration actions ongoing in the Columbia and Umatilla River basins, and as such will not be considered in this assessment of cumulative effects. The release of millions of juvenile fish with the intent of building even larger anadromous fish populations over time, however, would have

cumulative effects on natural resources and the ecosystem as well as on the socioeconomic and cultural environment of human communities.

This cumulative effects assessment focuses primarily on the cumulative contribution of the Proposed Action's effects on Fish (See Section 3.2.5). As discussed in Chapter 3, the Proposed Action's adverse effects on other resources (Geology and Soils, Water, Vegetation, Wetlands and Floodplains, Wildlife, Land Use and Recreation, Visual Resources, Air Quality, Noise, Public Safety, Cultural Resources Climate Change and Socioeconomics) are low, thus their contribution to adverse cumulative effects within the Umatilla River Basin or in the Columbia River would be *de minimus*. There are, therefore, no cumulative effects discussions for those resources.

4.3 Cumulative Effects on Resources and Ecosystems

About 140 million ocean-going juvenile salmon and steelhead are released from fish hatcheries in the Columbia River Basin annually, and of these about 70 percent (97 million) are released from facilities upstream of Bonneville Dam (NPCC 2021). At least 155 state, tribal and federal hatcheries are operating to produce and release spring Chinook, fall Chinook, coho, and steelhead that contribute to these140 million fish (NPCC 2021). The Umatilla Hatchery is one of these, contributing a little over 2 million Chinook, coho, and steelhead juveniles to the 97 million released above Bonneville Dam, or about 2.1% of those released fish. This 2.1% is a minimal contribution to the cumulative effects on aquatic resources (discussed below) in the Columbia River from these juvenile fish releases. But the Umatilla Hatcheries programs' contribution from those 2 million juvenile fish to adult returns of Mid-Columbia anadromous fish stocks, however, is more influential.

4.3.1 Restoring Anadromous Fish Runs

BPA funds ODFW and CTUIR to produce and release 2,060,000 salmon and steelhead each year as part of the Umatilla production programs which ultimately contributes to the Mid-Columbia populations of these species. The return of adult spawners to the Umatilla River from these releases comprises a meaningful proportion of goals for restoring Mid-Columbia anadromous fish stocks. Spawning adult returns are displayed in Table 15.

Table 15 Mid-Columbia Anadromous Fish Adult Returns and Umatilla Basin Contribution

Stock	Current Abundance (10yr geometric mean)[1]	Current as Percent of Historic[1]	Returns to Umatilla River Basin[2]	Percentage contribution from Umatilla River Basin
Mid-Columbia River Spring Chinook	11,600	4.7%	2,860	24.6%
Mid-Columbia River Summer/Fall Chinook	11,500	67.6%	1,395	12.1%
Mid-Columbia River Coho	6,324	8.4%	5,170	81.7%
Mid-Columbia River Steelhead	18,044	13.6%	2,826	28.6%
Totals	41,144	NA	9,425	22.9%

[1] from NMFS 2022 for fish returns in Columbia River above Bonneville Dam
[2] from ODFW 2022 for fish returns to Three Mile Falls Dam

Without this cumulative addition, it is likely that growth and recovery of these populations would require a longer time-frame than otherwise, if they remain stable at all. With continued rearing and release, this cumulative addition to other programs' fish provides greater potential for restoration of these populations than without. The role of hatchery production is primary to the maintenance and recovery of Mid-Columbia Chinook and coho salmon where populations have been eliminated, such as the Umatilla River basin (ODFW 2005).

Conversely, hatchery fish have the potential for negative effects on wild populations (e.g., genetic transfer of domestic traits, resource competition, increased predator attraction, and pathogen transfer) and this cumulative addition to other fish releases increases the likelihood these effects would manifest with a moderate effect. This is irrelevant, perhaps, for those basins where populations of these fish have been extirpated and hatchery fish are now the only ones supporting that population, but where the basins still support wild populations, these concerns are relevant.

4.3.1.1 Density Dependence Issues

Habitats for spawning, rearing, and overwintering have been degraded or lost overtime such that current conditions may not be suitable to support increased numbers of fish (either juveniles or returning adults) (ISAB 2015), and density-dependent[16] factors concerning habitat availability now seem to be limiting fish numbers (Walters et al 2013). These factors affect growth and survival rates of both hatchery and wild fish when hatchery fish are released into a stream reach and thereby increase the population density of fish in that reach. As more fish are added to the river system, the more likely these effects are to be triggered.

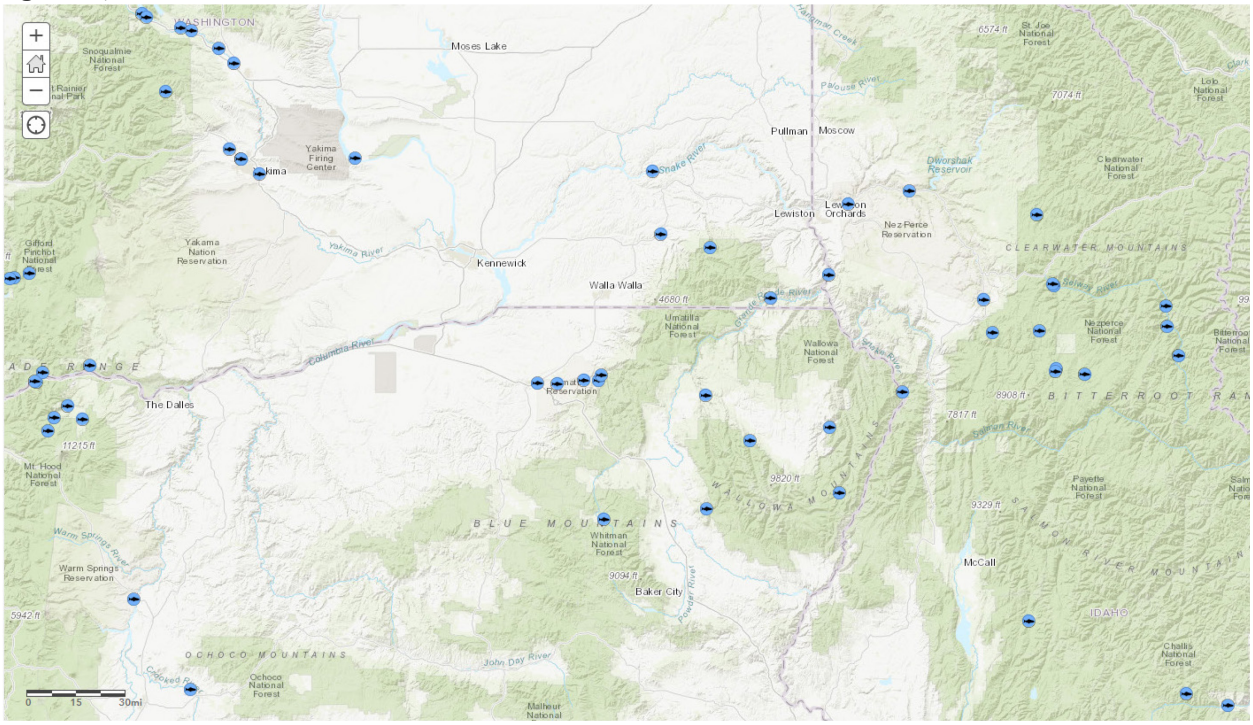
Studies are showing that overwinter mortality, spatial clustering of redds, and limited resource availability are potentially important limiting factors contributing to density-dependent mortality in Snake River Chinook salmon populations, limiting these populations to their present low levels (by comparison to historical levels) and potential for these same dynamics would likely exist wherever hatchery fish are introduced into rivers with wild populations (Walters et al 2103). Density-dependent limiting factors were occurring in all study populations of Snake River fall Chinook, even though population abundances of spawning fish are substantially below historical levels (Walters et al 2103). In effect, habitat conditions may not be available for increasing fish numbers, and habitat improvements are necessary to capitalize on the capability of hatcheries to produce increasing numbers of fish (ISAB 2015). The addition of hatchery fish into limiting habitats where density dependence is at play can have adverse effects on both wild and hatchery fish. The more hatchery fish consistently released, the greater such impacts would be to wild fish, especially during times of environmental stress (ISAB 2015). In the Umatilla River Basin, where habitat conditions are marginal and hatchery releases far outnumber natural fish production, these effects are likely to occur, and the cumulative effect of these additional fish triggering density dependence issues could be likely, though without such additions, the Chinook and coho populations would likely not persist.

[16] "Density dependence" is a term describing factors that limit population sizes whose effect, or intensity of effect, is dependent on the number of individuals in the population.

4.3.1.2 Effects on Wild Fish

Figure 6 displays the large number of acclimation and release facilities where millions of hatchery-reared salmonids are released into rivers across the Columbia River basin (PSMFC 2023), demonstrating the magnitude and extent of these releases.[17]

Figure 6 Juvenile salmonid acclimation release sites above Bonneville Dam



Density-dependent effects and adverse hatchery-to-wild fish effects could increase with cumulative additions of hatchery-reared fish being released, such as from the Umatilla Hatchery's programs. These effects are only relevant, however, if the intent is to restore wild spawning populations. If the goal is simply to increase numbers of fish for recreational, cultural, or subsistence harvest then this may not be of much concern. However, the Umatilla Hatchery production program's efforts to increase fish releases are intended to achieve both goals, with the expectation that ongoing and future habitat improvements (see Section 4.2, "*Proposed Actions Evaluated for Cumulative Effects*") would provide conditions for maintaining increased populations.

Additionally, these hatchery production programs, and their associated fisheries, are managed based on their impacts on ESA-listed fish in the Columbia River Basin. Numbers and effects are closely monitored to ensure that if the effects of hatchery production programs, fisheries, predation, habitat restoration, ocean conditions, and conservation efforts do not allow sufficient escapement of returning adult salmon and steelhead to meet recovery goals, then adjustments to fisheries and to the hatchery production levels would likely be proposed. Given this adaptive management approach, the overall cumulative effect on wild fish would be low.

[17] Only release sites with acclimation facilities are shown on this map. Twice or more as many sites would be shown if direct release sites release were included.

4.3.1.3 Marine-derived Nutrients

There would also be a meaningful cumulative benefit by the increased addition of marine-derived nutrients from the increasing numbers of returning adult Chinook and coho anticipated. This nutrient input, along with those from naturally produced fish and ongoing and future habitat restoration efforts, would amplify the productivity and carrying capacity of these habitats.

4.3.1.4 Conclusion on Cumulative Effects to Resources and Ecosystems

In conclusion, the cumulative effect to fish from the proposed changes to the Umatilla production programs with their ongoing smolt releases would be beneficially high from a Chinook and coho population restoration perspective, though moderately adverse for wild, naturally-spawning, steelhead from the cumulative genetic, competition, and pathogen impacts. The cumulative effects would be low for other fish species since these rapidly migrating juveniles would not meaningfully increase competition for resources because of the short time they share habitats. The cumulative benefit from the increased marine-derived nutrients to habitat productivity could be moderate. Overall, the cumulative effect on fish would be moderate and beneficial.

4.4 Cumulative Effects on Human Communities

Umatilla County is economically diversified and dependent on manufacturing, agriculture and natural resources.

Most of this economic diversity and strength, however, is centered in the lower basin, in the Hermiston-Pendleton area. Continued operation of the hatchery production programs would continue to provide for the approximately 20 workers and their families, but this is a low number of families, considering the population of the Hermiston and Pendleton areas (over 37,000 combined) where it would not have much of a cumulative socioeconomic impact.

Outlying communities within the CTUIR Reservation such as Mission, Cayuse, and Gibbon, however, are far smaller, much less economically diverse, and populated by a higher proportion of tribal members. These communities could be impacted by the cumulative addition of these fish produced as part of the Hatchery production programs and potential future restoration of salmon runs. The effect of these actions, when combined with the effects of other past, present, and reasonably foreseeable future basin-wide restoration projects, acclimation facilities, and monitoring efforts aimed at increasing salmon returns, could have a moderate, long-term beneficial cumulative impact on subsistence fisheries and tribal families over time, depending on the success of the efforts.

The cumulative effect of the fisheries actions on human communities economically would be slightly beneficial. Socially and culturally, however, the cumulative addition of these fish could be beneficial over time as they increase in support of the social and cultural values of the CTUIR.

Chapter 5. 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 contacted are included in the list in ~~Chapter 6~~Appendix 2, Agencies, Tribes, Organizations, and Persons Contacted.

5.1 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 and make this information available to the public. 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.

5.2 Indigenous Knowledge

Consistent with CEQ regulations and related guidance including CEQ's November 30, 2022, Guidance for Federal Departments and Agencies on Indigenous Knowledge, BPA has engaged affected communities, Tribes, and Indigenous Peoples including the Confederated Tribes of the Umatilla Indian Reservation to inform the assessment of environmental effects.

5.3 Fish and Wildlife

5.3.1 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 designated critical habitat. The effects on species listed under the ESA are discussed in Chapter 3 of this EA, specifically in Section 3.5.14, "*Fish*"; and Section 3.6.1 "*Wildlife*." No ESA-listed plant species were identified at the production program facilities.

ESA consultation with NMFS for the effects of the Umatilla River Spring Chinook Salmon, Fall Chinook and Coho Salmon Hatchery Programs on Steelhead and Chinook was first completed on March 15, 2011 (NMFS 2011b). Re-initiation of that consultation with NMFS was completed on August 24, 2016 (NMFS 2016). The consultation included all aspects of the hatchery and satellite facility operations including all stages of production and release (trapping, holding, hauling, spawning, incubation, rearing, and release) of Chinook, coho and steelhead; facility maintenance, including instream work on water intakes and outflows with mechanized equipment; and monitoring and evaluation actions. In that consultation, NMFS concluded that operations of the Hatchery was "not likely to jeopardize the continued existence of the MCR (Mid-Columbia River) Umatilla River Hatchery Steelhead DPS (distinct population segment), the Snake River Spring/Summer Chinook Salmon ESU (evolutionarily significant unit), or the Snake River Fall Chinook Salmon ESU, or to destroy or adversely modify their designated critical habitat." Effects on EFH were found to be minimal and effectively minimized by hatchery actions. The consultation required that the "action agencies must reinitiate EFH consultation with NMFS if the proposed

action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations."

ESA consultation with the USFWS for the effects of the Hatchery's programs on bull trout was completed on September 12, 2008, and amended by letter on March 13, 2015. The 2015 consultation was as inclusive of hatchery actions as that described for the NMFS consultation above. The conclusion of the opinion was that the Hatchery production programs were not likely to jeopardize the continued existence of the Columbia River DPS of bull trout, and would not be likely to destroy or adversely modify designated critical habitat. The March 2015 amendment letter concerned Hatchery production program changes at that time but concluded that those changes would not result in effects outside of the scope of the original consultation.

5.3.2 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 3.2.5, "*Fish*," and 3.2.6, "*Wildlife*," of this EA indicates that the alternatives would have limited impacts on fish and wildlife, with implementation of appropriate mitigation.

5.3.3 Magnuson-Stevens Fishery Conservation and Management Act of 1976

The National Marine Fisheries Service 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 EFH. Under Section 305(b)(2) of the act, BPA is required to consult with NMFS for actions that adversely affect EFH; in turn, NMFS is required to provide EFH conservation and enhancement recommendations. As discussed in Section 3.2.5, "*Fish*," the Proposed Action would result in minimal direct or indirect effects on EFH. Effects on EFH were evaluated in the consultations documented in Section 5.3.1 "*Endangered Species Act*."

5.3.4 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.

The Department of Energy and USFWS have a memorandum of understanding to address migratory bird conservation in accordance with Executive Order 13186 (Responsibilities to Federal Agencies to Protect Migratory Birds). This order directs each federal agency taking actions that may affect migratory birds to work with the USFWS to develop an agreement to conserve those birds. The memorandum of understanding addresses how both agencies can work cooperatively to address migratory bird conservation and includes specific measures to consider implementing during project planning and implementation.

Fish collection, culture, and release activities (in riparian habitats) would have few effects to nesting or foraging migratory birds, though some minor and temporary disturbance of birds is likely. The level of effect on these species is low and consistent with the Migratory Bird Treaty Act.

5.3.5 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 and killing of 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 anadromous fish.

5.4 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 3.2.4, "*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.

5.4.1 Clean Water Act Section 401

Under Section 401, a permit to conduct an activity that causes discharges into waters of the United States is issued only after the affected state or tribe with Clean Water Act authority certifies that existing water quality standards would not be violated if the permit were issued. The current proposal includes no new actions that would cause discharge. Oregon Department of Environmental Quality (ODEQ) is the agency that would provide the certification for any future actions that may require it. The state's process is triggered when a permit is required under the Clean Water Act, such as a National Pollutant Discharge Elimination System (NPDES) permit (Section 402) or a U.S. Army Corps of Engineers Section 404 permit (see Section 3.9 "*Wetlands and Floodplains*").

5.4.2 Clean Water Act Section 402

Section 402 authorizes NPDES permits for the discharge of pollutants, such as stormwater or hatchery effluent discharges. The NPDES permit for the Hatchery is administered by ODEQ, and environmental monitoring is conducted annually by ODFW to ensure facility operations meet the requirements of that permit. The following environmental parameters are currently monitored:

- Total Suspended Solids – measured quarterly. Two composite samples are collected, one during normal operations and one during cleaning. Some facilities may take more samples because of multiple outfalls.
- Settleable Solids – measured quarterly. Two composite samples are collected, one during normal operations and one during cleaning. Some facilities may take more samples because of multiple outfalls.

- pH – measured quarterly when settleable solids are measured.
- Total Ammonia and Total Phosphorus – measured quarterly during the first 12 months of the permit when settleable solids are measured.
- Water Temperatures – daily maximum and minimum water temperatures are measured within the hatchery. Temperature units are recorded for egg development in some hatcheries.
- Dissolved Oxygen – measured weekly and when conditions warrant (e.g., periods of low flows and high temperatures).
- Air Temperatures – maximum and minimum temperatures are recorded daily at some stations, but there are no special monitoring requirements.
- Flow Logs – changes in water flows through the hatchery ponds are recorded weekly.

The satellite facilities require no NPDES permits (production under 20,000 pounds) for their activities in support of the Proposed Action's programs.

5.4.3 Clean Water Act Section 404

Authorization from the US Army Corps of Engineers 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. The Proposed Action includes no activity with such material discharge so there would be no new impact on wetlands, and thus no additional need to coordinate with the Corps to obtain a Section 404 permit. Existing water intakes and effluent outfalls may require a permit for routine maintenance, which would continue to be necessary with continued funding of the project.

5.5 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. Ongoing production and release activities at the Hatchery and satellite facilities would have no potential to affect cultural resources because no ground would be disturbed. Future maintenance and upgrade actions included in this Proposed Action include only those with no potential to affect cultural resources so Section 106 consultations would not be required.

Section 106 consultation on the effects to cultural resources from replacing and upgrading the chiller system was initiated on June 9, 2023 with the Oregon State Historic Preservation Office (SHPO), CTUIR, Nez Perce Tribe, Confederated Tribes and Bands of the Yakama Nation, Confederated Tribes of the Warm Springs, United States Fish and Wildlife Service, and the US Army

Corps of Engineers on the proposed "Area of Potential Effect" and the proposed survey and analysis methods. No response to this was received from any party. On December 13, 2023, a "Determination Letter" letter was sent by BPA to the consulting parties. On January 8, 2024, SHPO responded with questions. BPA and SHPO held a meeting on February 12, 2024, during which additional survey and monitoring actions were agreed upon to ensure that no historic properties would be affected (as specified in Table 2.3 under Cultural Resources) ~~Discussions between SHPO and BPA concerning this determination are ongoing~~ (see Section 3.2.10.2, "*Effects of the Proposed Action*"). On February 26, 2024, BPA sent a letter with an updated determination letter maintaining the previous determination of no historic properties affected with stipulations (as specified in Table 2.3 under Cultural Resources). No additional comments from consulting parties were received during the 30-day comment period, therefore BPA assumed concurrence with its determination of effect on March 27, 2024.

5.6 Local Plan Consistency

Umatilla Hatchery is located in Morrow County on lands zoned as a "General Industrial Zone" which was established to "provide, protect and recognize areas well suited for medium and heavy industrial development and uses free from conflict with commercial, residential and other incompatible land uses" in Section 3.070 of the Morrow County , Oregon Zoning Ordinance (Morrow County, 2001). The hatchery facility and its operations are consistent with that zoning.

The Three Mile Falls Dam and the Westland Irrigation District facilities are in areas designated "R-4 Recreation Residential Zone" in the Umatilla County Comprehensive Plan (Umatilla County Planning Department 1983). This general designation was applied to areas having a high recreation value, such as beside lakes, rivers and streams and allows for "Conditional Uses" which include utility facilities which are consistent with the Three Mile Falls Dam facility and operations.

The Walla Walla Hatchery is in an area designated "North/South Ag" in the Umatilla County Comprehensive Plan (Umatilla County Planning Department 1983). This general designation allows for a variety of uses with which the hatchery and its operations are consistent.

The Pendleton, Thornhollow, and Imeques satellite facilities are located on the CTUIR reservation and therefore not subject to the Umatilla County Zoning Ordinance.

5.7 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 3.2.9, "*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.

5.8 Executive Order on Environmental Justice

Executive Order 12898 and 14096, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, states that federal agencies shall identify and address, as appropriate, high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. As described throughout this EA, none of the adverse effects resulting from the Proposed Action would be high or likely to result in disproportionate and adverse impacts on any population, including environmental justice populations and no adverse

effects to are expected. For these reasons, the Proposed Action would not cause any disproportionate and adverse human health and environmental effects (including risks) and hazards on environmental justice populations.

5.9 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 from this action would include limited temporary fugitive dust and vehicle emissions from construction, and negligible effects from operation, as discussed in Section 3.2.9, "*Air Quality, Noise, and Public Safety."*

5.10 Climate Change

On January 9, 2023, CEQ issued interim guidance, "NEPA Guidance on Consideration of Greenhouse Gas Emissions and Climate Change" (88 Federal Register 5). In general, the interim guidance calls for agencies to consider: (1) the potential effects of a proposed action on climate change, including by assessing both GHG emissions and reductions from the proposed action; and (2) the effects of climate change on a proposed action and its environmental impacts. Consistent with CEQ's interim guidance, the EA discloses the Proposed Action activities that would produce GHG emissions, which include ~~soil disturbance 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 eggs and smolts. These activities would make low contributions to the GHG emissions associated with climate change, as discussed in Section 3.2.11~~2~~ "~~*Socioeconomics and Environmental Justice*~~ *Climate Change*" of this EA. In addition, BPA analyzed the potential climate change impacts to hatchery program operations and the survival of hatchery fish throughout their life cycle, as well as adaptive measures to address those impacts under the Proposed Action in S~~s~~ection 3.2.11.

5.11 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 Umatilla Hatchery and the satellite facilities are on lands with soils classified by the U.S. Soil Conservation Service as a type which supports range and wildlife habitat but is not considered prime or unique farmland (CEQ 1980). Neither the hatchery nor the satellite facilities are on sites that have been designated as farmland of statewide or local importance.

5.12 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 operate under prescribed mitigation measures (Section 2.3 "*Mitigation Measures*") to minimize spill and spread of toxic substances that provide direction for use, handling, storage, and disposal of hazardous substances. Regulated pesticide products would not be used.

Appendix 1. Acronyms

Acronym	Definition
ACS	American Community Survey
AFS	American Fisheries Society
AQI	Air Quality Index
BKD	bacterial kidney disease
BMP	Best Management Practice
BPA	Bonneville Power Administration
CEQ	Council on Environmental Quality
COE	US Army Corps of Engineers
CRITFC	Columbia River Inter-Tribal Fish Commission
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
DOE	Department of Energy
DPS	Distinct Population Segment
EA	Environmental Assessment
EFH	Essential Fish Habitat
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FCRPS	Federal Columbia River Power System
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
GHG	greenhouse gas
GPM	gallons per minute
HGMP	Hatchery and Genetics Management Plan
HSRG	Hatchery Scientific Review Group
IPCC	Intergovernmental Panel on Climate Change
ISAB	Independent Scientific Advisory Board
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966

NMFS	National Marine Fisheries Service
NPCC	Northwest Power and Conservation Council
NPDES	National Pollution Discharge Elimination System
NRHP	National Register of Historic Places
ODE	Oregon Department of Energy
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
PSMFC	Pacific States Marine Fisheries Commission
PIT	Passive Integrated Transponder
PM2.5	Particulate Matter 2.5 micrometers in diameter
RM&E	research, monitoring, and evaluation
SCS	Soil Conservation Service
SHPO	State Historic Preservation Office
SMU	Species Management Unit
USFWS	U.S. Fish and Wildlife Service
WDOE	Washington Department of Ecology

Appendix 2. Agencies, Tribes, Organizations, and Persons Contacted

The project mailing list included local, state, and federal agencies; interest groups; libraries; and potentially interested or affected landowners. They have directly received or have been given instructions on how to receive project information, and had the opportunity to review the draft EA. Specific entities (other than private persons) receiving the scoping notifications, the draft EA, and this final EA are listed below by category.

Tribes or Tribal Groups

- Confederated Tribes of the Umatilla Indian Reservation
- Columbia River Inter-Tribal Fish Commission

Federal Agencies and Elected Officials

- Environmental Protection Agency, Region 10, Environmental Review; Seattle, WA
- National Marine Fisheries Service
- U.S. Fish and Wildlife Service
- U.S. Senators and Representatives from Oregon State

Oregon State Agencies and Elected Officials

- Oregon Department of Fish and Wildlife
- Oregon Department of Environmental Quality
- Oregon Water Resources Department
- State of Oregon House and Senate members for Districts encompassing the project area
- Oregon Governor's Office – Senior Special Assistant for Natural Resources
- Idaho Governor's Office of Species Conservation

Local Government

- Board of Commissioners – Umatilla County
- Umatilla County Planning Department
- Columbia River Gorge Commission

Libraries and Newspapers

- Hermiston Public Library
- Pendleton Public Library
- Umatilla Public Library
- Regional Federal Depository Library, Oregon State Library (Salem, Oregon)
- Heppner Library-Museum
- Oregon State University Library
- University of Oregon Library

Business, Interest Groups, Organizations, and other entities

- Northwest Power and Conservation Council
- Native Fish Society
- Trout Unlimited
- Save our Wild Salmon
- Advocates for the West
- American Rivers
- Columbia Riverkeeper

- Conservation Angler
- Northwest Sportfishing Association
- Natural Resources Defense Council
- Sierra Club
- Hood River Watershed Group
- Hood River Soil and Water Conservation District
- Nature Conservancy (Oregon and Washington Offices)
- Oregon Wild
- Western Watersheds Project
- Portland General Electric

Landowners

- Nine landowners with properties surrounding or near program facilities.

Appendix 3. References

American Fisheries Society (AFS). 2020. Fish Health Section Blue Book, 2020 Edition. Available at: https://units.fisheries.org/fhs/fish-health-section-blue-book-2020/.

Bergheim, A., and T, Åsgård. 1996. Chapter 3. Waste Production from Aquaculture. In: Aquaculture and Water Resource Management, Donald J. Baird, et al. (eds). Blackwell Science, Ltd. Oxford, England. Pages 50 to 80.

Boxall, A.B., L.A. Fogg, P.A. Blackwell, P. Kay, E.J. Pemberton, and A. Croxford. 2004. Veterinary medicines in the environment. Rev Environ Contam Toxicol. 2004: 1 to 91.

BPA (Bonneville Power Administration). 1987. Final Environmental Assessment Umatilla Fish Hatchery. Office of Power and Resources Management, Bonneville Power Administration U.S. Department of Energy February 1997.

BPA. 2018a. Walla Walla Basin Spring Chinook Hatchery Program Final Environmental Impact Statement. Available at: https://www.bpa.gov/-/media/Aep/efw/nepa/completed/walla-walla-hatchery-program/20180525-walla-walla-hatchery-final-eis.pdf.

BPA. 2018b. Pacific lamprey return to Umatilla River in record numbers. PR 10-18. Available at: https://www.bpa.gov/-/media/Aep/about/publications/news-releases/20180612-pr-10-18-pacific-lamprey-return-to-umatilla-river-in-record-numbers.pdf.

Clarke, L. R., W. A. Cameron, R. S. Hogg, and R. W. Carmichael. 2014. Umatilla monitoring and evaluation annual report: 2013. Annual Report to the Bonneville Power Administration, Project 1990-005-00, Portland, Oregon.

Close, D. A., Currens, K. P., Jackson, A., Wildbill, A. J., Hansen, J., Bronson, P., & Aronsuu, K. 2009. Lessons from the reintroduction of a non-charismatic, migratory fish: Pacific Lamprey in the upper Umatilla River, Oregon, pp. 233–253. In L. R. Brown, S. D. Chase, M. Mesa, R. Beamish, & P. B. Moyle (Eds.), Biology, management, and conservation of lampreys in North America. American Fisheries Society, Symposium 72, Bethesda, Maryland.

Close, D., K. Aronsuu, A. Jackson, T. Robinson, J. Bayer, J. Seeleye, S. Yun, A, Scott, W. Li, and C. Torgersen. 2003. Pacific lamprey research and restoration project. Project No. 1994-02600, BPA Report DOE/BP-00005455-6.

Columbia River Inter-Tribal Fish Commission (CRITFC), Yakama Nation, Confederated Tribes of the Umatilla Indian Reservation, and Nez Perce Tribe. 2018. Master Plan: Pacific Lamprey Artificial Propagation, Translocation, Restoration, and Research. Conceptual phase to address Step 1 – Master Plan review elements. March 23, 2018. Available at: https://www.critfc.org/wp-content/uploads/2018/04/20180327-Master-Plan-Pac-Lamprey.pdf.

Confederated Tribes of the Umatilla Indian Reservation (CTUIR). 2012. Confederated Tribes of the Umatilla Indian Reservation, Quick Facts. Jan. 2012. Available at: https://web.archive.org/web/20120127050104/http://www.umatilla.nsn.us/CTUIR%20info%20packet.pdf.

CTUIR. 2023a. A Brief History of CTUIR. Background Information on Our People. https://ctuir.org/about/brief-history-of-ctuir/.

CTUIR. 2023b. Cayuse-Umatilla-Walla Walla, Confederated Tribes of the Umatilla Indian Reservation website. Available at: https://ctuir.org/.

Confederated Tribes of Warm Springs. 2016. "History." *Confederated Tribes of Warm Springs* website. Available at: https://warmsprings-nsn.gov/history/.

Contor, C., & Costi, K., and Bonifer, J. 2011. Reintroduction of Spring Chinook into the Umatilla River, OR. Available at: https://www.researchgate.net/publication/267877214_Reintroduction_of_Spring_Chinook_into_the_Umatilla_River_OR.

Contor, C. editor. 2013. The Umatilla Basin Natural Production Monitoring and Evaluation Project, 2013 Annual Progress Report. Project 1990-005-01 Contract 00061878 U.S. Department of Energy, Bonneville Power Administration Division of Fish and Wildlife, P.O. Box 3621, Portland, Oregon 97208-3621. Available at: https://www.cbfish.org/Document.mvc/Viewer/P136604.

Council on Environmental Quality (CEQ). 1980. Impacts on Unique Farmlands. 45 FR 59186. September 8, 1980.

Craig, J.A., and R.L. Hacker. 1940. The history and development of the fisheries of the Columbia River. United States Bureau of Fisheries. Washington, [D.C.] : U.S. Govt. Print. Off., 1940.

Cripps, S.J. 1995. Serial particle size fractionation and characterization of an aquacultural effluent. Aquaculture, 133: 323-339.

Daubenmire, Rexford, F. 1970. Steppe Vegetation of Washington. Technical Bulletin (Washington Agricultural Experiment Station) 62. Available at: https://content.libraries.wsu.edu/digital/collection/palouse_dig/id/6357/.

Environmental Protection Agency (EPA). 2014a Climate Change Indicators in the U.S., 2014. Third Ed. EPA 430-R-14-004. Available at: www.epa.gov/climatechange/indicators.

EPA. 2014b. U.S. EPA Air Quality System Data Mart [internet database] Annual Summary Data 2014. Available at: https://www.epa.gov/outdoor-air-quality-data.

EPA. 2016. Causes of Climate Change. 2016. Available at: https://www3.epa.gov/climatechange/science/causes.html.

EPA. 2023. Aquaculture NPDES Permitting. https://www.epa.gov/npdes/aquaculture-npdes-permitting.

Federal Emergency Management Agency (FEMA). 2023. FEMA Flood Map Service Center. http://msc.fema.gov

Franklin, Jerry F., Dyrness, C.T. 1973. Natural vegetation of Oregon and Washington. Gen. Tech. Rep. PNW-GTR-008. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 427 p. Available at: https://www.fs.usda.gov/research/treesearch/26203.

Gislason, G., Lam, E., Knapp, G. and Guettabi, M. 2021 Economic Impacts of Pacific Salmon Fisheries; Institute of Social & Economic Research, University of Alaska Anchorage, Anchorage, U.S.A.; Prepared for the Pacific Salmon Commission, July 2021.

Harrison, J. 2020. Umatilla River. The Oregon Encyclopedia. Available at: https://www.oregonencyclopedia.org/articles/umatilla_river.

Hatchery Scientific Review Group (HSRG). 2005. Hatchery reform in Washington State: principles and emerging issues. Fisheries 30(6):1-23.

HSRG. 2009. Columbia River hatchery reform system wide report. Available at: http://www.hatcheryreform.us/hrp/reports/system/welcome_show.action. ICTRT (Interior Columbia Technical Recovery Team). 2003. Independent populations of Chinook, steelhead, and sockeye for listed Evolutionarily Significant Units within the interior Columbia River domain. Working draft.

Intergovernmental Panel on Climate Change (IPCC). 2014. Climate Change 2014: Synthesis Report Summary for Policymakers. Contribution of Working Groups I, II, and III to the Fifth Assessment Report of the Intergovernmental panel on Climate Change [Core writing team, R. K. Pachauri and L. A. Meyer (eds.)]. IPCC Geneva Switzerland, 151 pp. Available at: https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf.

Independent Scientific Advisory Board (ISAB). 2015. Density Dependence and its Implications for Fish Management and Restoration Programs in the Columbia River Basin. ISAB 2015-1. February 25, 2015. Available at: https://www.nwcouncil.org/media/filer_public/ca/f8/caf855b9-696e-4b39-aa9e-963451a0a986/isab2015-1_0.pdf.

Jackson, A., M. Moser. 2012. Low-Elevation Dams Are Impediments to Adult Pacific Lamprey Spawning Migration in the Umatilla River, Oregon. Available at: https://www.tandfonline.com/doi/full/10.1080/02755947.2012.675950.

Jones, K. L., G. C. Poole, E. J. Quaempts, S. O'Daniel, T. Beechie. 2009. Umatilla River Vision. Prepared for the Confederated Tribes of the Umatilla Indian Reservation, 31 pp.

Kendra, W. 1991. Quality of salmonid hatchery effluents during a summer low-flow season. Transactions of the American Fisheries Society 120: 43-51.

Kolodziej, E.P., T. Harter, and D.L. Sedlak. 2004. Dairy wastewater, aquaculture, and spawning fish as sources of steroid hormones in the aquatic environment. Environ Sci Technol. 38:6377-6384.

Kostow, K. 2009. Factors that Contribute to the Ecological Risks of Salmon and Steelhead Hatchery Programs and Some Mitigating Strategies. Reviews in Fish Biology and Fisheries 19:9-13.

Lawler J. J. and M. Mathias. 2007. Climate Change and the Future of Biodiversity in Washington. Report prepared for the Washington Biodiversity Council. Available at: http://www.rco.wa.gov/documents/biodiversity/WA-Climate-BiodiversityReport.pdf.

Littell, J.S., M. McGuire Elsner, L.C. Whitely Binder, and A.K. Snover (eds). 2009. The Washington Climate Change Impacts Assessment: Evaluating Washington's Future in a Changing Climate - Executive Summary. In The Washington Climate Change Impacts Assessment: Evaluating Washington's Future in a Changing Climate, Climate Impacts Group, University of Washington, Seattle, Washington. Available at: www.cses.washington.edu/db/pdf/wacciaexecsummary638.pdf.

Martínez-Bueno, M.J., M.D. Hernando, A. Agüera, and A.R. Fernández-Alba. 2009. Application of passive sampling devices for screening of micro-pollutants in marine aquaculture using LC-MS/MS. Talanta. 77:1518-1527.

Michael, J.H., Jr. 2003. Nutrients in salmon hatchery wastewater and its removal through the use of wetland constructed to treat off-line settling pond effluent. Aquaculture, 226: 213- 225.

Miller, J., Igloria, R., Walt, B., Borody-Heine, B., Eldridge, R., and Charlo, B. 2019. Detailed Pros/Cons Assessment of Alternatives for the Umatilla Hatchery, Final Report. Prepared For Bonneville Power Administration by Four Peaks Environmental Science & Data Solutions 5 South Wenatchee Ave #210 Wenatchee, Washington 98801. May, 2019

Missildine, B.R., R.J. Peters, G. Chin-Leo, and D. Houck. 2005. Polychlorinated biphenyl concentrations in adult Chinook salmon (*Oncorhynchus tshawytscha*) returning to coastal and Puget Sound hatcheries of Washington State. Environmental Science and Technology. 39: 6944-6951

Morrow County. 2001. Morrow County, Oregon Zoning Ordinance. November 7, 2001. Available at: https://www.co.morrow.or.us/sites/default/files/fileattachments/planning/page/8861/zoning_art_1_12202022.pdf.

Mote, P., A.K. Snover, S. Capalbo, S.D. Eigenbrode, P. Glick, J. Little, R. Raymondi, and S. Reeder. 2014. Climate Change Impacts in the U.S.: The Third National Climate Assessment. Ch. 21: Northwest, pp. 487-513. U.S. Global Change Research Program. Available at: http://nca2014.globalchange.gov/downloads.

Muir, W.D., and T.C. Coley. 1996. Diet of Yearling Chinook salmon and feeding success during downstream migration in the Snake and Columbia Rivers. Northwest Science, 70(4): 298-305

National Marine Fisheries Service (NMFS). 2003. Final programmatic environmental impact statement for Pacific salmon fisheries management off the coasts of Southeast Alaska, Washington, Oregon, and California, and in the Columbia River basin. National Marine Fisheries Service, Northwest Region, Seattle, WA.

NMFS. 2011a. Anadromous Salmonid Passage Facility Design. National Marine Fisheries Service - Northwest Region. July 2011. Available at: http://www.nwr.noaa.gov/Salmon-Hydropower/FERC/upload/Fish-Passage-Design.pdf.

NMFS. 2011b. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act . Essential Fish Habitat (EFH) Consultation .Umatilla River Spring Chinook Salmon, Fall Chinook Salmon, and Coho Salmon Hatchery Programs. NMFS Consultation Number: 2010/06511. April 19, 2011.

NMFS. 2012. Final Environmental Assessment to Analyze Impacts of a NOAA's National Marine Fisheries Service Issuance of two Permits for the Hatchery Genetic Management Plans Submitted by the Washington Department of Fish and Wildlife, the Idaho Department of Fish and Game, the Oregon Department of Fish and Wildlife, and the Nez Perce Tribe Under Section 10 of the Endangered Species Act. October 2012

NMFS. 2013. FINAL DRAFT ENVIRONMENTAL ASSESSMENT. Environmental Assessment to Analyze Impacts of a NOAA's National Marine Fisheries Service Determination to Issue Section 10 Permits for the Continued Operation of Eight Hatchery Programs within the Tucannon, Grande Ronde, and Imnaha River Basins. Available at: https://www.energy.gov/sites/default/files/2017/01/f34/EA-2054-FEA-2017_0.pdf.

NMFS. 2014. Final Environmental Impact Statement to Inform Columbia River Basin Hatchery Operations and the Funding of Mitchell Act Hatchery Programs. September 2014.

NMFS. 2016. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Reinitiated

Consultation. Umatilla River Spring Chinook Salmon, Fall Chinook Salmon, and Coho Salmon Hatchery Programs. August 24, 2016.

NMFS. 2020. Columbia River Basin Hatcheries Environmental Assessment. Touchet River Endemic Summer Steelhead; Umatilla River Summer Steelhead; Round Butte Hatchery Summer Steelhead; Round Butte Hatchery Spring Chinook Salmon; Hood River Winter Steelhead; Hood River Spring Chinook Salmon. April 2, 2020

NMFS. 2022. Rebuilding Interior Columbia Basin Salmon and Steelhead. September 30, 2022. Available at: https://www.fisheries.noaa.gov/resource/document/rebuilding-interior-columbia-basin-salmon-and-steelhead.

Nez Perce Tribe. 2018. "History." Nez Perce Tribe website. https://nezperce.org/about/history/

Northwest Power and Conservation Council (NPCC). 2004; Draft Umatilla/Willow Subbasin Plan. Prepared for Northwest Power and Conservation Council. Available at: https://www.nwcouncil.org/sites/default/files/EntirePlan_sm.pdf.

NPCC. 2005. Economic Effects from Columbia River Basin Anadromous Salmonid Fish Production. January 1, 2005. Available at: https://www.nwcouncil.org/reports/economic-effects-from-columbia-river-basin-anadromous-salmonid-fish-production/.

NPCC. 2021. Report: Most Hatchery Salmon and Steelhead Are Released Above Bonneville Dam. March 11, 2021. Available at: https://www.nwcouncil.org/news/report-most-hatchery-salmon-and-steelhead-are-released-above-bonneville-dam/#:~:text=About%20140%20million%20ocean%2Dgoing,facilities%20upstream%20of%20Bonneville%20Dam.

Oregon Department of Energy (ODE). 2023. OCCRI's Sixth Climate Assessment Outlines Climate Change Effects on Oregon. Available at: https://energyinfo.oregon.gov/blog/2023/1/11/occris-sixth-climate-assessment-outlines-climate-change-effects-on-oregon#:~:text=Oregon%20%E2%80%94%20Energy%20Info-,OCCRI%27s%20Sixth%20Climate%20Assessment%20Outlines%20Climate%20Change%20Effects%20on%20Oregon,of%20climate%20change%20in%20Oregon.

Oregon Department of Environmental Quality (ODEQ). 2023a. Water Quality Programs website. Nitrate Contamination: Lower Umatilla Basin. Available at: https://www.oregon.gov/deq/wq/programs/Pages/nitratecontamination.aspx.

ODEQ. 2023b. Oregon Annual Ambient Criteria Pollutant Air Monitoring Network Plan. Available at: https://www.oregon.gov/deq/aq/Documents/AnnualACPAMNPlan.pdf.

ODEQ. 2023c. Oregon.Gov Air Quality Monitoring website. Accessed on November 2, 2023, at https://aqi.oregon.gov/.

Oregon Department of Fish and Wildlife (ODFW). 2005. Oregon Native Fish Status Report, Volume 1 Species Management Unit Summaries. Volume II Assessment Methods and Populations Results. 2005. Available at: https://www.dfw.state.or.us/fish/ONFSR/.

ODFW. 2023a. Umatilla Hatchery Program Management Plan. Available at: https://www.dfw.state.or.us/fish/HGMP/docs/2023/Umatilla%20HPMP%202023.pdf.

ODFW. 2023b. Three Mile Falls Dam Fish Counts. Available at: https://myodfw.com/three-mile-falls-dam-fish-counts.

ODFW and CTUIR. 2011a. Hatchery and Genetic Management Plan, Umatilla River Coho Program. Umatilla Watershed, Columbia Region. 20 April 2011.

ODFW and CTUIR. 2011b. Hatchery and Genetic Management Plan, Umatilla River Fall Chinook Program. Umatilla Watershed, Columbia Region. 20 April 2011.

ODFW and CTUIR. 2011c. Hatchery and Genetic Management Plan, Umatilla River Spring Chinook Program. Umatilla Watershed, Columbia Region. 20 April 2011.

ODFW and CTUIR. 2022. Umatilla Hatchery and Basin Annual Operation Plan for the Period of October 1, 2022 - September 30, 2023. October 2022.

Pacific States Marine Fisheries Commission (PSMFC). 2023. Mapping application available at: https://psmfc.maps.arcgis.com/home/webmap/viewer.html?useExisting=1&layers=666f05330e1a470e9b4dc2c9f9ba0169.

Pouliquen, H., C. Thorin, J. Haury, M. Larhantec-Verdier, M.L. Morvan, R. Delépée, H. Le Bris. 2008. Comparison of water, sediment and plants for the monitoring of antibiotics: a case study on a river dedicated to fish farming. Environ Toxicol Chem. 2008 Nov 3:1

Prasad, M. S.; Kumari, K.. 1987. "Toxicity of Crude Oil to the Survival of the Fresh Water Fish *Puntius sophore* (HAM.)." Acta Hydrochimica et Hydrobiologica. 15: 29. doi:10.1002/aheh.19870150106.

Rondorf, D.W. G. A. Gray, and R. B. Fairley. 1990. Feeding ecology of subyearling Chinook salmon in riverine and reservoir habitats of the Columbia River. Transactions of the American Fisheries Society 119(1): 16-24

Richter, A., Kolmes, S. 2005. Maximum Temperature Limits for Chinook, Coho, and Chum Salmon, and Steelhead Trout in the Pacific Northwest. Reviews in Fisheries Science, 13:23-49. Available at: https://www.noaa.gov/sites/default/files/legacy/document/2020/Oct/07354626288.pdf.

Ruby, Robert H., John A. Brown, and Cary C. Collins. 2010. A Guide to the Indian Tribes of the Pacific Northwest. 3rd Edition, University of Oklahoma Press.

Sankovich, P,M., Marshall G.B. and Skalicky, J.J. 2014. Bull Trout Distribution, Movements and Habitat Assessment in the Umatilla River Basin. 2014 Annual Report. U.S. Fish and Wildlife Service Columbia River Fisheries Program Office. Available at: https://docslib.org/doc/3634275/bull-trout-distribution-movements-and-habitat-assessment-in-the-umatilla-river-basin.

Schuster, Helen H.. 1998. "Yakima and Neighboring Groups." In Handbook of North American Indians, Volume 12, edited by William C. Sturtevant. Smithsonian Institute, Washington D.C.

Shepard, B., LaTier, A., and Gockel, C. 2015. Federal Aquaculture Facilities and Aquaculture Facilities Located in Indian Country within the Boundaries of Washington State. NPDES General Permit WAG130000. Biological Evaluation for Endangered Species Act Section 7 Consultation with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service. December 23, 2015. Available at: https://www.epa.gov/sites/default/files/2017-09/documents/r10-npdes-washington-aquaculture-gp-wag130000-biological-evaluation-2015.pdf.

Sparrow, R.A.H. 1981. Hatchery Effluent Water Quality in British Columbia. Bio-Engineering Symposium for Fish Culture (FCS Publ. 1): 162-166.

Umatilla County Planning Department. 1983. Umatilla County Development Ordinance of May 9, 1983 revised August 29, 1983. Available at: https://www.co.umatilla.or.us/fileadmin/user_upload/Planning/Ordinances/Ordinance_83-5.pdf.

U.S. Bureau of Reclamation. 2012. "Umatilla Basin Water Supply Study for the Confederated Tribes of Umatilla Indian Reservation," January 2012. Available at: https://www.usbr.gov/pn/studies/umatilla/appraisalfinal.pdf.

U.S. Census Bureau. 2023. Data USA: Umatilla County, OR. Available at: https://datausa.io/profile/geo/umatilla-county-or.

U.S.D.A. Soil Conservation Service (SCS). 1985. Soil Survey of Umatilla County Area, Oregon. Available at: https://archive.org/details/UmatillaOR1988/mode/1up?view=theater.

U.S. Fish and Wildlife Service (USFWS). 2002. Bull Trout (*Salvelinus confluentus*) Draft Recovery Plan. Fish and Wildlife Service, Portland, Oregon. Available at: http://ecos.fws.gov/docs/recovery_plan/021129.pdf. Accessed May 9, 2012.

USFWS. 2008. Biological Opinion to BPA for the Umatilla Hatchery Program, Umatilla and Wallowa Counties, Oregon and Walla Walla County, Washington. US Fish and Wildlife Service, La Grande Field Office, La Grande, Oregon. 8330.F0109(08), 13420-2008-F-0109. September 12, 2008.

USFWS. 2015. Mid-Columbia Recovery Unit Implementation Plan for Bull Trout (*Salvelinus confluentus*). Portland, Oregon. September 2015. Available at: https://www.seattle.gov/light/skagit/Relicensing/cs/groups/secure/@scl.skagit.team/documents/document/cm9k/ndy1/~edisp/prod465603.pdf.

Walsh, J., D. Wuebbles, K. Hayhoe, J. Kossin, K. Kunkel, G. Stephens, P Thorne, R. Vose, M. Wehner, J. Willis, D. Anderson, S. Doney, R. Feely, P. Hennon, V. Kharin, T. Knutson, F. Landerer, T. Lenton, J. Kennedy, and R. Somerville. 2014. Climate Change Impacts in the U.S.: The Third National Climate Assessment. Chapter 2: Our Changing Climate, pp. 19-67. U.S. Global Change Research Program. Available at: http://nca2014.globalchange.gov/downloads.

Walters, A.W., Copeland, T., Venditti, D.A. 2013. The density dilemma: limitations on juvenile production in threatened salmon populations. Ecology of freshwater Fish 2013:22: 508-519.

Washington Department of Ecology (WDOE). 1989. Quality and Fate of Fish Hatchery Effluents during the Summer Low Flow Season. Publication No. 89-17. Prepared by Will Kendra, Washington Department of Ecology, Environmental Investigations and Laboratory Services Program, Surface Water Investigations Section, Mail Stop PV-11, Olympia, Washington 98504. May 1989.

WDOE. 2000. Focus. Effects of Elevated Water Temperatures on Salmonids. Available at: https://apps.ecology.wa.gov/publications/publications/0010046.pdf.

Appendix 4. Draft EA Comments Received and BPA's Responses

BPA mailed or emailed a notice of its availability or a copy of the draft EA to about 60 contacts representing interested and affected persons, agencies, Tribes, and organizations. The comment period ran from February 13 to March 14, 2024. BPA received three comments from one individual.

BPA numbered the comments consecutively as they were received below. The table below displays the comment letter numbers and associated commenter. In each comment letter, individual comments have also been numbered. For each comment, individual comments appear as "Comment Received," with BPA responses to each in the "BPA's Response" column.

Comment Number/Commenter	Comment Received	BPA Response
Krajcik/CTUIR UMA-Hat 240004 - 1	Section 3.2.3.3: No action option could negatively impact native plants by removing any control of invasive plants done by facility staff.	BPA revised Section 3.2.3.3 in the final EA to discuss the potential spread of noxious weeds without the ongoing treatments under the No Action Alternative.
Krajcik/CTUIR UMA-Hat 240004 - 2	Section 3.2.8.3: No action could lead to buildings being overgrown by plants, and building degradation, leading to an eyesore in the landscape.	BPA revised Section 3.2.8.3 in the final EA to discuss potential changes to the visual character of facilities under the No Action Alternative.
Krajcik/CTUIR UMA-Hat 240004 - 3	Section 5.4.3: There will not be additional activity requiring a section 404 permit. Current intake and outfall maintenance does require a permit, which would continue to be necessary with continued funding of the project.	BPA revised Section 5.4.3 to include Section 404 permit considerations for ongoing intake and outfall maintenance.
Krajcik/CTUIR UMA-Hat 240004 - 4	Chapter 5 Intro: Refers to Chapter 6 as a list of agencies and businesses contacted for comment. The list is actually in Appendix 2.	Correction made in the final EA.
Michelsen Correa/Environmental Protection Agency UMA-Hat240005 - 1	Thank you for the opportunity to review the Bonneville Power Administration's February 2024 Draft Environmental Assessment for the Continued Funding for Umatilla Hatchery Programs (Umatilla River Spring Chinook, Fall Chinook, and Coho). EPA has completed its	BPA appreciates the U.S. Environmental Protection Agency's review of the draft EA.

Comment Number/Commenter	Comment Received	BPA Response
	review and did not identify significant public health, welfare, or environmental quality concerns to be addressed in the Final EA.	
Michelsen Correa/Environmental Protection Agency UMA-Hat240005 - 2	EPA includes the following recommendations to help strengthen the section on climate change impacts. Declining water levels on the Umatilla River, in part attributed to climate change, is driving the need to find alternative water sources (i.e. new wells, recycling water, etc.) for the hatcheries. EPA recommends the FEA include a discussion about the project's improvements and their sufficiency to meet continued declines in the Umatilla River water levels under future climate change scenarios. Also include a discussion about how climate change may impact the survival of hatchery-produced chinook salmon, which may experience increased mortality due to climate change.	BPA revised its analysis of climate change effects on the Proposed Action in final EA Section 3.2.11.2 to describe the anticipated impacts that climate change would have on hatchery programs and hatchery-produced fish.
Michelsen Correa/Environmental Protection Agency UMA-Hat240005 - 3	On January 9, 2023, CEQ published interim guidance to assist federal agencies in assessing and disclosing climate change impacts during environmental reviews. CEQ developed this guidance in response to Executive Order 13990 on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. This interim guidance is effective immediately. CEQ indicated that agencies use this interim	Consistent with CEQ's interim guidance, BPA has considered the potential climate change impacts to, as well as from, the implementation of the Proposed Action. In response to this comment, the final EA includes a revised discussion in Section 5.10 citing CEQ's interim guidance. Section 3.2.11.2 includes an analysis of climate change impacts to ongoing hatchery operations and hatchery fish and identifies

Comment Number/Commenter	Comment Received	BPA Response
	guidance to inform the NEPA review for all new proposed actions and may use it for evaluations in process, as agencies deem appropriate, such as informing the consideration of alternatives or helping address comments raised through the public comment process. EPA recommends the FEA apply the interim guidance as appropriate, to ensure robust consideration of potential climate impacts, mitigation, and adaptation issues.	potential adaptive measures to address those impacts.
Pace UMA-Hat240001 - 1	The draft EA, p. 16, states ODFW, CTUIR, and Westland Irrigation District could acquire funding from other sources and proceed with these actions. For the purposes of this EA, however, the No Action Alternative describes the effects if there were a decision to not proceed with these actions and hatchery production of all stocks at the hatchery and the satellite facilities would cease." For consideration, this statement makes it clear the BPA has conflated the no action alternative for BPA funding, which is the concern of the EA, with the failure by any and all other responsible parties (CTUIR, Westlands Irrigation, and ODFW) to fund any of the activities proposed for BPA funding. This conflation is not accord with the requirements of NEPA. BPA funding this project is the issue. The assumption that if BPA does not fund the facility then none	The Council on Environmental Quality regulations for implementing the procedural provisions of NEPA, applicable to BPA, require the identification of a no action alternative (40 C.F.R. § 1502.14(c)). Consistent with CEQ Guidance on the two options for how to define the No Action Alternative, Bonneville concluded the No Action Alternative for this project would mean the project would not occur. See 40 Most Asked Questions Concerning the CEQ's National Environmental Policy Act. In particular, the no action alternative identified for the purposes of the Umatilla Hatchery EA reasonably assumes that discontinued BPA funding would result in ceased operations because the actions of ODFW, CTUIR, and Westland Irrigation District to secure an adequate amount of funding to replace BPA's funding in an amount sufficient to continue operations is not reasonably predictable. As discussed in

Comment Number/Commenter	Comment Received	BPA Response
	of the actions will be taken by any other party is not the issue for purposes of NEPA documentation.	Section 2.2, No Action Alternative, ODFW, CTUIR, and Westland Irrigation District could acquire funding from other sources and proceed with the hatchery actions, but the sources or the certainty of that funding is unknown.
Pace UMA-Hat240001 - 2	The fact is BPA funding of upgrades, new water supplies, facilities would be "in lieu of funding" by the parties that are actually responsible for carrying out these actions. Put differently, BPA funding these activities would violate the provisions of the Northwest Power Act, which limit ratepayers, obligations to funding ONLY the protection, mitigation and enhancement of fish and wildlife to the extent that hydropower is responsible for declining resources. BPA is not a charitable organization. The Northwest Power Act specifically forbids saddling BPA ratepayers with costs that are the responsibility of CTUI, ODFW and Westlands. The combination of inappropriate characterization of the no action alternative with violations of the Acts, in lieu funding provisions renders this analysis fatally flawed, notwithstanding the fact that such a characterization is overused, often abused, and just plain tiresome.	BPA funding ODFW, CTUIR, and Westland Irrigation District to continue the hatchery programs is one element of BPA's efforts to protect, mitigate, and enhance fish and wildlife in a manner consistent with the Northwest Power and Conservation Council Fish and Wildlife Program, as directed by the Northwest Power Act. BPA will continue to comply with the Northwest Power Act, including all in-lieu prohibitions.

Comment Number/Commenter	Comment Received	BPA Response
Pace UMA-Hat240002 - 3	There are several provisions of the Northwest Power Act that counsel against BPA funding the development of new long-term hatchery water sources, routine facility maintenance, equipment upgrades, non-recurring maintenance actions to maintain, repair, or replace equipment, and development of new wells, hatchery water-reuse systems, or improvements at acclimation sites to reduce water use. Section 839b(h)(6)(A) of the Power Act requires that funding for fish and wildlife complement the existing and future activities of the Federal and the regions State fish and wildlife agencies and appropriate Indian tribes. Section 839b(h)(8)(B) of the Act mandates that consumers of electric power shall ONLY bear the cost of measures designed to deal with adverse impacts caused by the development and operation of electric power facilities. Section 839b(h)(10)(a) restricts expenditures of the Administrator to be in addition to, not IN LIEU OF, other expenditures authorized or required from other entities under other agreements or provisions of law. I respectfully submit that none of the items listed above can be funded by ratepayers given these provisions, in whole or in part, of the Act. These matters should--perhaps must--be addressed in the environmental analyses before	The actions under the Proposed Action would be consistent with the Northwest Power Act, including all in-lieu prohibitions. First, the activities under the Proposed Action, including the development of new water sources and facilities to support fish production, would continue to complement the existing and future activities of state wildlife agencies such as ODFW, and CTUIR to continue implementing the Umatilla Hatchery Program. Second, BPA's funding would be consistent with Section 839b(h)(1 O)(A) of the Northwest Power Act, which directs Bonneville's Administrator to use funds to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of the FCRPS.

Comment Number/Commenter	Comment Received	BPA Response
	this proposed action can proceed. On the other hand, activities such as broodstock collection, egg incubation, juvenile rearing, and release can and should be funded as these are clearly protection, mitigation and enhancement actions for fish and wildlife. Everything else should be the responsibility of CTUI, ODFW and/or the Irrigation District.	
Pace UMA-Hat240003 - 4	In the event that BPA decides to proceed with funding for this project, section 839b(h)(10)(B). it must submit budgets to the Congress pursuant to 16 U.S.C. 838 et seq. and be funded in the same manner and in accordance with the same procedures as major transmission facilities under the Federal Columbia River Transmission System Act.	Comment noted. BPA would follow the applicable requirements for submitting budgetary information to Congress.

BONNEVILLE POWER ADMINISTRATION
DOE/EA-2249 ▪ April 2024