Supplement Analysis
for the
Columbia Estuary Ecosystem Restoration Program
Programmatic Environmental Assessment
(DOE/EA-2006/SA-16)

The Shire Enhancement Project
BPA project number 2012-015-00

Bonneville Power Administration
Department of Energy

Introduction

Bonneville Power Administration (BPA) and the U.S. Army Corps of Engineers (Corps) are partners in the Columbia Estuary Ecosystem Restoration Program (Program), which is a collaboration intended to evaluate, protect, monitor, and restore fish and wildlife habitat in the Columbia River estuary.

BPA and the Corps completed the Columbia Estuary Ecosystem Restoration Program Environmental Assessment (DOE/EA-2006) (Programmatic EA). The Programmatic EA streamlines the environmental review of routine actions with well understood and predictable environmental impacts common to restoration projects in the Columbia River estuary. The purpose of this supplement analysis (SA) is to provide site-specific information about an individual restoration project proposed under the Program.

Consistent with the Programmatic EA, this SA analyzes the effects of The Shire Enhancement Project (Project). This Project aims to restore perennial fish passage to 1.1 miles of Yeon Springs, a cold-water tributary to the Columbia River, located in the Columbia River Gorge National Scenic Area (CRGNSA).

This SA analyzes the site-specific impacts of the Project to determine if the Project is within the scope of the analysis considered in the Programmatic EA. This SA also evaluates whether the proposed project presents substantial new circumstances or information relevant to environmental impacts that were not addressed in the Programmatic Estuary EA. Additionally, the findings of this SA determine whether additional National Environmental Policy Act (NEPA) analysis is needed in accordance with the US Department of Energy (DOE) NEPA Implementing Procedures.[1]

Proposed Activities

BPA proposes to fund the Cowlitz Indian Tribe to design and construct the Shire Enhancement Project on land owned by the State of Oregon (for the use of the University of Oregon) in Skamania County, Washington. Additional federal funds are provided by the U.S. Department of Commerce through the Pacific Coastal Salmon Recovery Fund, administered by the Washington State Recreation and Conservation Office. As the Project sponsor, the Cowlitz Indian Tribe is also committing its own matching funds to cover a portion of the total Project costs. The Project would be implemented under a Landowner Agreement between the Cowlitz Indian Tribe and the University of Oregon, ensuring long-term stewardship and access for the restoration work, which is designed to restore fish passage and enhance wetland and riparian habitat within the CRGNSA.

[1] Consistent with National Environmental Policy Act of 1969, 42 U.S.C. 4321 *et seq.*, as amended.

The primary purpose of the Shire Enhancement Project is to restore volitional fish access to Columbia River floodplain wetlands and surrounding high-quality cold-water spring tributaries. This would be achieved by removing a fish passage barrier to Yeon Springs, increasing habitat complexity with large woody debris, and enhancing riparian areas through invasive species reduction and native replanting to promote future beaver recruitment.

The overarching goal is to benefit out-of-basin juvenile salmonids seeking cold-water refuge and to provide complex rearing/spawning habitat for local populations of Lower Columbia coho, Chinook, and chum salmon, as well as steelhead. Additionally, the Project would treat 4.5 acres of degraded riparian and wetland habitat, currently infested with non-native reed canary grass, and re-establish native shrub and tree species to restore ecological communities and provide shade over the creek channels.

The proposed action is also consistent with the following Columbia River estuary (CRE) module-management actions, developed by National Marine Fisheries Service (NMFS) to aid in the recovery of salmon and steelhead throughout the region:

- CRE-1: Protect intact riparian areas in the estuary and restore riparian areas that are degraded.
- CRE-9: Restore degraded areas with high intrinsic potential for high-quality habitat.
- CRE-10: Re-establish or improve access to off-channel habitats by lowering the elevation to restore tidal marsh and shallow-water habitats and tidal channels.
- CRE-15: Reduce the introduction and spread of invasive plants.

These actions would support conservation of Endangered Species Act (ESA)-listed species considered in the 2020 ESA consultation with the National Marine Fisheries Service on the operations and maintenance of the Columbia River System while also supporting ongoing efforts to mitigate for effects of the Federal Columbia River Power System on fish and wildlife in the mainstem Columbia River and its tributaries pursuant to the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) (16 U.S.C. (USC) 839 et seq.).

Project Area

The Project site is located approximately 12 miles east of the City of Washougal in Skamania County, Washington, and includes 1.1 miles of the Yeon Springs tributary system before its confluence with the Columbia River (Figure 1). The Project area is approximately 4.5 acres and involves rehabilitation of degraded riparian/wetland habitat, culvert replacement and large wood placement. The functionality of channel and floodplain processes in the reach are impaired by past landscape modifications, the construction of a 660-foot-long levee, and invasive species. Adjacent historic land use, including the construction of a railroad and highway, has resulted in the removal of riparian and floodplain vegetation, channel contouring, and the installation of fish passage barriers. As a result, the Yeon Springs confluence with the Columbia River has an exposed bedrock sill that seasonally impedes fish access during low flows. The incised channel is disconnected from its historic floodplain, and much of the area is dominated by a dense monoculture of non-native reed canary grass, which has degraded the riparian and wetland habitat.

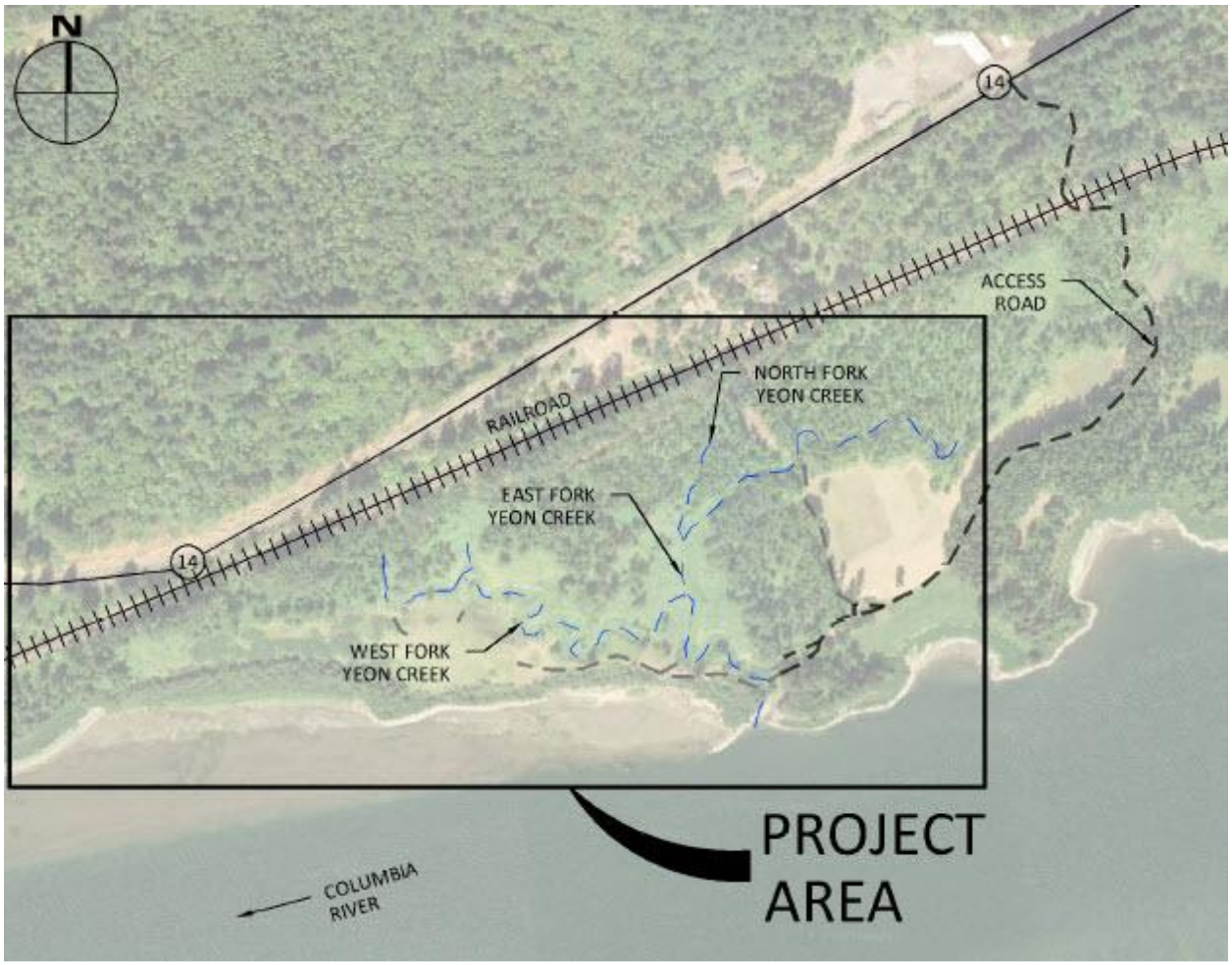

Figure 1: The Shire Enhancement Project Area (Yeon Springs)

The Project encompasses four primary elements:

Yeon Springs Fish Grade Control

This involves lowering the bedrock sill at the confluence of the Columbia River and Yeon Springs and enhancing habitat functions through the placement of anchored log grade controls and streambed material. The objective is to create a roughened channel with accessible gradients to restore juvenile and adult fish access to 1.1 miles of cold-water refugia. The work would involve excavation of bedrock (132 cubic yards [CY]) and native soil (4 CY) which would be reused.

East Fork Yeon Creek Culvert Replacement

The existing 24-inch-diameter culvert, which is silted in and buried by beaver activity, would be replaced with a creek spanning deck bridge. This replacement would remove the barrier to fish passage and restore natural flows. The bridge would be constructed from muted earth-toned wood, metal, and concrete, with streambed material placed to match grades. Construction would include placing bridge footings, abutments, and wingwalls (14 CY) and backfilling (168 CY).

Large Wood Placement

Large wood structures, incorporating logs and rootwads secured by driven log piles, would be strategically placed in the West Fork and East Fork Yeon creeks, and Yeon Springs. These structures are designed to re-engage the surrounding floodplain, provide complex cover for salmonids, and encourage beaver activity to naturally flood reed canary grass thickets. Approximately 999 CY of logs would be placed in wetlands and 27 CY in waterbodies for an approximate number of 50 to 60 structures.

Riparian Restoration

Riparian restoration would involve a three-phased herbicide application to reduce non-native reed canary grass and Himalayan blackberry, followed by planting native low-land species such as Pacific willow and red osier dogwood in 4.5 acres of riparian habitat. This would establish cover, enhance habitat complexity, and provide a food source for future beaver populations. Active management of reed canary grass would continue until native plantings are well-established. All disturbed areas would be seeded and planted with native vegetation.

Construction Details

Heavy equipment, such as excavators, off-road haul trucks, and skid steers, would access the site using existing maintained gravel roads and a previously overgrown access road. Both access routes are located in upland areas. The overgrown access road, currently dense with blackberries, would be cleared with a brush hog. From these roads, excavators would reach the proposed restoration sites at the mouth of Yeon Spring via temporary bridges and by traversing over grass and shrub vegetation. Contractor staging and log stockpile areas would be situated in flat, upland regions. Equipment refueling would occur at a minimum distance of 150 feet from open water to prevent contamination.

To minimize impacts on wetlands, temporary bridges, steel plates, or timber mats would be employed when crossing grass and shrub vegetation. In-water work would adhere to the approved in-water work window (July 15 to September 30). During this period, work areas would be dewatered and isolated using temporary bulk bag cofferdams. Turbidity monitoring would be conducted throughout in-water activities, and a staged rewatering plan would be implemented to ensure minimal discharge of turbid water into Yeon Springs or the Columbia River. All applicable (Habitat Improvement Program) HIP4 Conservation Measures would be applied to prevent pollution and protect aquatic resources.

Monitoring and Adaptive Management

A monitoring and adaptive management plan (MAMP) was developed to identify measurable metrics tied to the Project objectives that would allow for efficient observation and provide procedures to ensure such objectives are being met. Actions considered in the MAMP include additional large wood enhancement, supplemental riparian planting, additional browse protection, supplemental watering, and additional noxious weed control.

Environmental Effects

The typical environmental impacts associated with the Columbia Estuary Ecosystem Restoration Program are described in Chapter 3 of the Programmatic Estuary EA. Below is a description of the potential site-specific impacts of the Shire Enhancement Project and an assessment of whether these impacts are consistent with those described in the Programmatic Estuary EA.

1. **Fish**

The effects of the Shire Enhancement Project, including grade control, culvert replacement, large wood placement, and riparian restoration, are consistent with the analysis in the Programmatic EA, "Fish," Section 3.2. The Programmatic EA, Section 3.2.3, describes limited, short-term impacts to individual fish with an overall net benefit to individual fish, fish populations, and fish habitat.

The Project area supports ESA-listed Columbia River chum salmon (*Oncorhynchus keta*); Lower Columbia River coho salmon (*Oncorhynchus kisutch*); Lower Columbia River Chinook salmon (*Oncorhynchus tshawytscha*); Lower Columbia River steelhead (*Oncorhynchus mykiss*); and other juvenile salmonids. Critical Habitat for eulachon (*Thaleichthys pacificus*) (Southern Distinct Population Segment [DPS]); chum (*Oncorhynchus keta*) (Columbia River Evolutionarily Significant Unit [ESU]); Chinook (*Oncorhynchus tshawytscha*) (Lower Columbia River ESU, Upper Columbia River spring run ESU, Snake River fall run ESU, and Snake River spring/summer run ESU); coho (*Oncorhynchus kisutch*) (Lower Columbia River ESU); sockeye (*Oncorhynchus nerka*) (Snake River ESU) salmon; and steelhead (*Oncorhynchus mykiss*) (Lower Columbia River DPS, Snake River Basin DPS and Upper Columbia DPS) are

identified at the Project location. This part of Yeon Creek and its confluence with the Columbia River is assumed to be a critical migration corridor and provide cold-water refuge and rearing/spawning habitat for juvenile and adult salmonids.

Consultation on the effects of this action on these species was completed under BPA's programmatic Fish and Wildlife Habitat Improvement Program (HIP4) ESA consultation (NMFS# WCRO-2020-00102 and USFWS# 01E0FW00-19Y-F-0710), with the conclusion that the Project would likely adversely affect these species and their designated critical habitat but would not likely result in jeopardy to the species or result in destruction or adverse modification of their designated critical habitat. All applicable Conservation Measures and terms and conditions from the HIP4 consultation would be implemented during Project construction. For bull trout (*Salvelinus confluentus*), a "No Effect" determination has been made, as the Project area water temperatures and habitat conditions are not suitable for this species.

The short-term adverse effects of this Project would include temporary disturbance from lowering the bedrock sill, culvert replacement, large wood placement, and riparian restoration activities, likely creating conditions where sediment would be released for a short period of time following construction. Project actions within the Ordinary High Water mark would be subject to the conservation measures required by HIP, including that work would occur within the approved work window (July 15 to September 30) for this waterbody and during low water conditions. The work areas at the Yeon Creek outlet and East Fork Yeon Creek would be dewatered and isolated from the Columbia River and Yeon Springs flows during construction. As such, it is not anticipated that these activities would cause appreciable increases in turbidity beyond the immediate work area. Any turbid water from isolated areas would be pumped to upland locations for infiltration.

The amount of sediment released would be moderate in the short term because there would be some in-stream excavation, dewatering, and reintroduction of flows over newly exposed soils and gravels. However, conservation measures such as work area isolation and fish salvage would be applied, minimizing these impacts. These conservation measures would include slowly dewatering the reach; conducting fish capture activities during periods of coolest water temperatures; having a fish biologist supervise fish capture activities; and effectively utilizing block nets to secure the area. Turbidity curtains and fish exclusion nets would be used on their own in slack water areas to isolate the work area where dewatering is not needed or in conjunction with cofferdams as needed to further limit turbidity releases and exclude fish from the work area.

The work area isolation, fish salvage, dewatering, and in-stream construction activity would displace fish from the work area until the work area is re-watered. Small aquatic organisms that could not be practically salvaged would likely be destroyed. The newly constructed in-stream environment would be re-colonized by fish and other aquatic organisms with near-full recovery likely in a matter of weeks, and full recovery expected following the first seasonal flushing flows. The anticipated amount of activity and the level of aquatic species disturbance, however, is consistent with the analysis in the Programmatic EA in Section 3.2.3, which describes that movement, sounds, and vibrations of human and mechanical activity would disturb fish and likely displace them temporarily.

This Project's beneficial effects would include the restoration of perennial fish passage to 1.1 miles of Yeon Springs, providing cold-water refuge and complex rearing/spawning habitat for salmonids. The Project would enhance habitat functions with anchored log grade controls and streambed material; create a roughened channel with accessible gradients; replace a culvert on East Fork Yeon Creek with a spanning deck bridge to remove a fish barrier; and place large wood structures to reconnect the floodplain and provide cover. Additionally, riparian restoration efforts would treat 4.5 acres of degraded habitat, reduce non-native species, and establish native shrubs and trees, promoting future beaver recruitment and improving shade over creek channels. The frequency and duration of hydrological connectivity within this reach of Yeon Springs and the Columbia River would increase, along with the restoration of stream flow and temperature regimes to ranges beneficial to fish and other aquatic species. These beneficial effects are consistent with the analysis in the Programmatic EA in

Section 3.2.4. which concludes that despite short term adverse effects due to sedimentation, overall impacts to fish would be beneficial because of the increased food web support, conversion of vegetation to more natural conditions, restored and improved hydrology, and enhanced water quality. Overall, the Project would result in temporary, localized, minor adverse impacts during construction and would have moderate, long-term beneficial impacts to fish and aquatic habitat.

2. **Hydrology and Hydraulics**

The effects of the Shire Enhancement Project on hydrology and hydraulics are consistent with the analysis in the Programmatic EA, "Hydrology and Hydraulics," Section 3.3. The Programmatic EA, Section 3.3.3, describes both short-term localized changes and long-term beneficial effects on hydrologic regimes and floodplain function.

While the Project involves modifying stream channels and associated wetlands, it would not affect the overall quantity of water available. There would be no water withdrawals associated with the Project, and improved groundwater recharge is anticipated through the restoration of floodplain function and the encouragement of beaver activity. Therefore, the Project is expected to have low effects on hydrology, including water quantity.

In the long term, the Project would improve hydrology and hydraulics. Lowering the bedrock sill at the confluence of the Columbia River and Yeon Springs would allow for a larger volume of water to enter and exit on the flood and ebb tides, increasing the exchange of water across the Project area. As described in the Programmatic EA, Section 3.3.3, this beneficially affects fish and wildlife production, water quality, sediment transport processes, nutrient cycling, primary production and food web dynamics, and water storage to attenuate the impacts of high flow and flood events. Given the long-term beneficial impacts, the overall effects on hydrology and hydraulics are anticipated to be beneficial and low.

3. **Water Quality**

The effects of the Shire Enhancement Project on water quality are consistent with the analysis in the Programmatic EA, "Water Quality," Section 3.4. The Programmatic EA, Section 3.4.3, describes short-term construction-related water quality impacts related to turbidity and erosion and long-term beneficial effects from enhanced ecological function.

In the short term, the Project would generate temporary sediment inputs during construction activities, particularly from excavation at the Yeon Springs outlet and the East Fork Yeon Creek for culvert replacement, as well as during the reintroduction of flows to dewatered work areas. These short-term effects would be minimized by implementing a comprehensive suite of conservation measures described in the HIP4. These measures include isolating work areas using temporary cofferdams; dewatering procedures that pump turbid water to upland infiltration areas; minimizing the extent of impacted areas; locating refueling areas away from water bodies; using biodegradable hydraulic fluids; and revegetating disturbed areas immediately following Project completion. Staging areas would be in upland locations, and temporary erosion and sediment control measures would be in place, including turbidity monitoring downstream of work areas. The construction is also scheduled during the approved in-water work window (July 15 to September 30) when most of the site is seasonally dry or at low water conditions, further reducing potential water quality impacts.

Over the long term, the Project is expected to improve water quality through enhanced ecological function. The restoration of 4.5 acres of degraded riparian and wetland habitat with native species, reduction of non-native reed canary grass, and re-establishment of shade over creek channels would contribute to lower water temperatures and reduced pollutant runoff. The increased hydrological connectivity and improved floodplain function would enhance nutrient cycling and filtration within the Yeon Springs system. The overall effects on water quality are anticipated to be low to moderate in the short term, beneficial in the long term and further mitigated by sediment and erosion control practices, consistent with the Programmatic EA, Section 3.4.3.

4. **Geomorphology, Soils, and Topography**

The effects on geomorphology, soils, and topography from the Shire Enhancement Project are consistent with the analysis in the Programmatic EA, "Geomorphology, Soils, and Topography," Section 3.5. The Programmatic EA, Section 3.5.3, identifies short-term impacts from temporary increases in soil erosion, compaction, and mixing of soil horizons, leading to long-term beneficial effects from the restoration of natural soil forming process, erosion patterns, and floodplain function.

The proposed Project involves excavation for fish passage enhancement at the Yeon Springs outlet and replacement of a culvert on East Fork Yeon Creek, along with large wood placement and riparian restoration. These activities would involve temporary displacement and disturbance of native soils and bedrock. Specifically, the Project includes permanent excavation of 132 CY of bedrock and 4 CY of native soils at the Yeon Creek outlet, and temporary excavation of 182 CY of existing road fill at the East Fork Yeon Creek culvert site. Fill material, consisting of streambed materials, slash, and logs, would be placed to restore habitat complexity. This includes 24 CY of streambed material and 999 CY of logs in wetlands; and 81 CY of streambed material and 27 CY of logs in the Yeon Creek waterbody. In addition, 14 CY of concrete fill would be used for the new bridge footings and abutments. Temporary fill for access and dewatering would include 19 CY for temporary crossings and 12 CY for temporary cofferdams in wetlands, plus 6 CY for crossings and 18 CY for cofferdams in the waterbody.

HIP4 Conservation Measures would be implemented to minimize Project impacts on soils and topography. Construction would occur when the site is seasonally dry. To minimize soil compaction and disturbance, equipment would use upland access routes where feasible. In wet areas, temporary crossings, steel plates, and timber mats, with specialized equipment tracks would be used. Staging and stockpile areas would be located in relatively flat upland areas to prevent erosion. All disturbed areas resulting in bare soil would be stabilized with seed and straw mulch and covered with native vegetation material upon Project completion.

While loose materials may release fine sediment into Yeon Springs and Columbia River during construction, this release would be short-term and localized. The Project design includes dewatering work areas and staged rewatering to minimize turbidity. Visual monitoring would occur 200 feet downstream of the work areas to ensure turbid water does not leave the site.

In the long term, the placement of large wood structures and streambed materials is designed to enhance sediment retention and improve channel stability. The riparian restoration efforts, including invasive species removal and native plantings, would improve soil biology and function by reestablishing healthy plant communities.

Considering the temporary, localized nature of construction impacts, the impact minimization conservation measures, and substantial long-term benefits in terms of improved ecological function, channel stability, and soil health, the overall effect on geomorphology, soils, and topography is anticipated to be low and beneficial, consistent with the Programmatic EA, Section 3.5.3.

5. **Sediment Quality**

The effects of the Shire Enhancement Project on sediment quality are consistent with the analysis in the Programmatic EA, "Sediment Quality," Section 3.6. The Programmatic EA, Section 3.6.3, describes short-term impacts from mechanical disturbance and redistribution of sediments, and the potential introduction of pollutants, with overall moderate long-term effects as wetlands increase sediment trapping of toxic contaminants.

The Shire Enhancement Project would temporarily disturb existing sediments due to excavation at the Yeon Springs outlet, culvert replacement, and large wood placement. Sediment may be re-suspended and redistributed within Yeon Springs and its confluence with the Columbia River during these activities.

The Project area is not near development or contaminated sites, and field sampling conducted for the Programmatic EA indicated that sediment quality in most of the estuary was generally free of contamination. Therefore, the risk of mobilizing contaminated sediments is considered low for this Project.

Over the long term, the Project's riparian restoration efforts, including invasive species removal and native plantings, would contribute organic matter to the local sediments, improving soil biology and function. The increased hydrological connectivity and floodplain function may enhance localized sediment deposition and retention, consistent with the long-term beneficial outcomes described in the Programmatic EA. This could lead to an increased capacity for the local environment to bind and store nutrients and potentially, over time, sequester contaminants from the water column, thus improving overall water quality in the long run.

Overall, the Shire Enhancement Project is expected to have low impacts on sediment quality in the short term, with long-term beneficial effects from increased organic matter and potential contaminant sequestration, consistent with the Programmatic EA, Section 3.6.3.

6. **Air Quality**

The effects of this action for The Shire Enhancement Project are consistent with the analysis in the Programmatic EA, "Air Quality," Section 3.7. The Programmatic EA, Section 3.7.3, describes low impacts to air quality from temporary and localized emissions.

The Shire Enhancement Project is located along the Columbia River in the rural Columbia River Gorge, away from major population centers. Project activities, primarily involving heavy equipment such as excavators, off-road haul trucks, and skid steers, would generate temporary increases in air emissions from vehicle exhaust and dust, and temporary increases in noise during construction. However, these effects would be short-term, confined to the construction period (anticipated July to March of the following year, with in-water work July 15 to September 30), and localized to the immediate Project area. Given the rural setting, these temporary disturbances are not expected to substantially impact public health or cause prolonged impacts to residents.

Consequently, potential air quality impacts from the Shire Enhancement Project would primarily occur during construction. As detailed in Section 3.7.3 of the Programmatic EA, these temporary and localized impacts are expected to be low and would not result in long-term effects on air quality.

7. **Wildlife**

The effects of the Shire Enhancement Project on wildlife are consistent with the analysis in the Programmatic EA, "Wildlife," Section 3.8. The Programmatic EA, Section 3.8.3, describes overall moderate impacts to wildlife and habitat. In the short term, construction and restoration activities would temporarily displace wildlife due to increased noise and human presence. However, proposed restoration activities would result in substantial, long-term beneficial impacts to wildlife by providing much larger and higher-quality foraging and breeding areas.

The Project area is located in Skamania County, Washington, which contains a diverse range of wildlife. ESA-listed terrestrial and avian species identified by the United States Fish and Wildlife Information for Planning and Consultation (USFWS IPaC) tool as potentially occurring in or near the Project area include the gray wolf (*Canis lupus*), North American wolverine (*Gulo gulo luscus*), northern spotted owl (*Strix occidentalis caurina*), yellow-billed cuckoo (*Coccyzus americanus*), and Northwestern Pond turtle (*Actinemys marmorata*). The monarch butterfly (*Danaus plexippus*) and Suckley's cuckoo bumble bee (*Bombus suckleyi*) are also identified as proposed threatened or endangered species. Based on habitat assessments within the Project area, suitable habitat is largely absent for the gray wolf, North American wolverine, northern spotted owl, monarch butterfly, and Suckley's cuckoo bumble bee, leading to a determination of 'no effect' for these species. However, potentially suitable habitat exists for the yellow-billed cuckoo, particularly in scrub-shrub wetland habitats. Consultation on the effects of this action on this species was completed under HIP4 ESA consultation. With the conservation measures

employed, the proposed action is Not Likely to Adversely Affect the western yellow-billed cuckoo as the species is unlikely to be present at the time of the proposed activities. Bald eagles *(Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are potentially present in the Project area and are protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Pre-construction surveys for active nests would be conducted, and appropriate buffer zones and timing restrictions would be implemented according to USFWS Service guidelines to avoid disturbance.

The proposed restoration actions are expected to improve aquatic and riparian habitat conditions, increasing habitat resiliency, carrying capacity, and connectivity within and across watersheds. These improvements would enhance wildlife reproductive success at both the individual level (from improved site conditions within a home range) and at the population level (by improving dispersal capabilities between separated subpopulations). Specifically, riparian restoration through invasive species removal (reed canary grass and Himalayan blackberry) and planting of native species such as Pacific willow and red osier dogwood would provide an abundant food source for future beaver populations and enhance habitat complexity. This would be beneficial for a wide array of wildlife including the yellow-billed cuckoo and Northwestern pond turtle. The increased log complexity in the streams is also expected to encourage beaver to build dams, flooding surrounding reed canary grass thickets and further enhancing wetland conditions.

Some minor, temporary disturbance to individual wildlife and their habitats may occur during construction due to the presence of humans and machinery. However, all activities would follow HIP4 conservation measures. These include timing restrictions to minimize impacts during sensitive periods (e.g., in-water work window of July 15 to September 30, which also aims to avoid the primary breeding season for the yellow-billed cuckoo, typically June to early August, and the period when yellow-billed cuckoos would have migrated south by October). Informal surveys would be completed prior to herbicide application to confirm the absence of yellow-billed cuckoos and Northwestern pond turtles. The Project would also involve avoiding known nest sites and implementing Conservation Measures such as avoiding wetland impacts where possible, using temporary crossings to reduce disturbance, and minimizing vegetation clearing. Displaced wildlife are expected to reoccupy the site once construction activities conclude. If any other ESA-listed species or their suitable habitat are discovered during Project implementation, all work would cease in that area, and appropriate federal agencies would be consulted to determine further action.

Given the short-term, localized nature of construction-related impacts, and the substantial long-term habitat benefits expected from the Project, the overall adverse effect on wildlife is anticipated to be low and temporary, ultimately leading to beneficial ecological uplift and improved habitat for numerous species, consistent with the programmatic analysis in Section 3.8.3.

8. **Wetlands, Floodplains, and Vegetation**

The effects on wetlands, floodplains and vegetation from the Shire Enhancement Project are consistent with the analysis in the Programmatic EA, "Wetlands, Floodplains, and Vegetation," Section 3.9. The Programmatic EA, Section 3.9.3, describes overall moderate effects to these resources, concluding that long-term outcomes would be beneficial after accounting for moderate, short term adverse impacts associated with construction and vegetation management.

Wetland delineations were conducted in 2014 and 2021, with site visits in 2025 to confirm conditions. The Project area contains a major wetland complex (Wetland 1), encompassing approximately 32 acres. This wetland complex contains palustrine forested, scrub-shrub, and emergent wetland types. The wetland complex is characterized by saturated, permanently, and seasonally flooded areas within the Columbia River floodplain. As previously mentioned, it is densely vegetated, primarily with non-native species such as reed canary grass and Himalayan blackberry, though it also hosts native species like Douglas' meadowsweet, willow, Oregon ash, Nootka rose, flowering dogwood, cascara false buckthorn, and black cottonwood in adjacent forested uplands. The wetland complex is traversed by at least three stream channels (North Fork Yeon Creek, West Fork Yeon Creek, and East Fork Yeon Creek), which flow through the seasonally flooded areas and drain to the Columbia River. While the entire wetland

complex floods seasonally, and channels are evident during these times, for most of the year, it functions more as a wetland, with creek channels becoming vegetated and lacking a defined bed and bank. There are intermittent areas with defined bed and bank, particularly near spring-fed water inputs or small impounded pools, extending down to the Yeon Creek confluence at the Columbia River. Four spring-fed tributaries (West Fork Yeon Springs, Railroad Springs, Waterfall Springs, and East Fork Yeon Springs) provide critical cold-water inputs to the Columbia River.

The Project is anticipated to impact wetlands during construction. These impacts include temporary wetland vegetation and soil disturbance from equipment movement and temporary creek crossings, primarily affecting dense reed canary grass monocultures. Additionally, permanent fill would be placed in wetland areas, consisting of log structures (999 CY), boulder ballast, and a streambed mix (24 CY). A wooden bridge replacing the culvert on East Fork Yeon Creek would also require the placement of 14 CY of concrete for bridge footings and 168 CY of backfill for stability. Furthermore, permanent excavation activities would occur in the wetland area of the Yeon Creek outlet for bedrock removal (132 CY) and native soils (4 CY), which would be reused within the channels.

The Project design incorporates several measures to avoid and minimize adverse impacts to wetlands. Construction would occur when the site is seasonally dry and wetted areas of the creeks are at their lowest. Work reaches would be dewatered to isolate them from active flows, and temporary bulk bag cofferdams would be used to disconnect work areas from the Columbia River, taking advantage of low water conditions. Tracked excavators would approach excavation sites through upland areas where feasible; where wet areas cannot be avoided, temporary crossings (totaling 25 CY of material), steel plates, timber mats, or specialized tracks would be used to minimize wetland disturbance. The contractor would also be directed to avoid all impacts to the wetland when moving between excavation locations. All relevant HIP4 Conservation Measures would be implemented to reduce impacts to wetlands and other aquatic resources. These include minimizing vegetation clearing; locating staging and stockpile areas in uplands; regular inspection and maintenance of equipment; proper refueling protocols; spill prevention and response plans; secure waste management; use of biodegradable hydraulic fluids; and implementation of a temporary erosion and sediment control plan. Turbid water would be pumped to upland areas for infiltration, and flows would be slowly reintroduced following enhancement activities to limit the release of turbid water.

The Project would have short-term, temporary impacts and long-term beneficial wetland impacts through fish barrier removal, stream function improvements, and habitat restoration. The placement of large wood would direct stream flows onto the floodplain and encourage flooding of reed canary grass thickets, further improving wetland conditions. Willow plantings would promote beaver establishment, which would extend the duration of flooding and enhance wetland habitats. Temporary impacts from construction equipment and stream crossings would occur in reed canary grass monocultures, and these areas would be restored post-construction by decompacting soils and seeding with native vegetation. Finally, all permanent fill placed in wetlands consists of materials that contribute to habitat structures and streambed stability, directly supporting the Project's ecological goals.

As required for work in wetlands, the Project proponent has submitted applications for federal, state, and local permits. Applications have been submitted to the U.S. Army Corps of Engineers (USACE) for a Clean Water Act Section 404 Nationwide Permit 27 and a Rivers and Harbors Act Section 10 permit; the USACE acknowledged receipt of this application on January 30, 2026 (NWS-2026-93). A Request for Section 401 Water Quality Certification was submitted to the Washington State Department of Ecology on March 6, 2026. Work in wetlands would not occur prior to securing a Section 404 permit and Section 401 certification and work in navigable waterbodies would not start until receiving a Section 10 permit. This Project was approved for a Fish Habitat Enhancement Exemption as part of the Washington Department of Fish and Wildlife Hydraulic Project Approval requirements. The Project design and Best Management Practices (BMPs), including all applicable HIP4 Conservation Measures, are intended to comply with all applicable state and federal water quality standards and protection measures for wetlands and floodplains.

No ESA-listed upland or wetland plant species are present within this Project area. All areas of ground disturbance within the West Fork, East Fork, and Yeon Springs would be seeded and planted with native vegetation. Active management of reed canary grass would continue until native plantings are well-established. The long-term effects of replacing widespread non-native vegetation with diverse native plant communities, coupled with enhanced hydrological function and habitat complexity, are expected to be beneficial.

Therefore, considering both the short-term, localized crushing or removal of vegetation and the long-term ecological uplift, the overall effects of the Proposed Action on wetlands, floodplains and vegetation are anticipated to be beneficial and consistent with the analysis in Section 3.9.3 of the Programmatic EA.

9. **Land Use and Recreation**

The effects of the Shire Enhancement Project on land use and recreation are consistent with the analysis in the Programmatic EA, "Land Use and Recreation," Section 3.10. The Programmatic EA, Section 3.10.3, describes overall low to moderate effects, including changes in land ownership and conversion of agricultural lands to natural habitats.

Because the Project would be located in the CRGNSA, the Cowlitz Indian Tribe submitted a CRGNSA management plan consistency review application packet to Skamania County, Washington, on January 30, 2026, and received a final consistency determination on May 28, 2026. The land use designation was Forest (F) within a Special Management Area and River Bottomlands landscape setting, with Rural Conservancy and Aquatic shoreline designations. The consistency review affirmed that the proposed resource enhancement is consistent and an allowed use under these designations in the CRGNSA Management Plan and complied with Skamania County Code Title 22. Key findings from the review found that the Project would not adversely affect land use, recreation, or scenic quality. The application documented that all Project activities, including the replacement of a failed culvert with a small, visually subordinate bridge, would not be visible from any Key Viewing Areas (KVAs) like Interstate 84. This would preserve the scenic character of the CRGNSA (see Section 12 below for further discussion of visual impacts). The Project was also designed to be compatible with existing recreational and educational uses, such as university field trips and boating on the Columbia River, which would not be displaced. The CRGNSA review confirmed the Project's adherence to the conditions and consistency in the CRGNSA management plan.

Given the limited scale of enhancement activities within the 75-acre property and the Project's objectives toward habitat restoration and consistency with land use and land management plans, the overall effect on land use and recreation is anticipated to be low, consistent with the analysis in Section 3.10.3 of the Programmatic EA.

10. **Cultural Resources**

The effects of the Shire Enhancement Project on cultural resources are consistent with the analysis in the Programmatic EA, "Cultural Resources," Section 3.11. The Programmatic EA, Section 3.11.3, describes low impacts to cultural resources because they would be avoided by construction, and any expected effects would be appropriately resolved through the Section 106 consultation process under the National Historic Preservation Act.

On April 15, 2024, BPA initiated Section 106 consultation (DAHP Log No.: 2025-04-02241; BPA CR Project No.: WA 2021 191) with the Cowlitz Indian Tribe, the Confederated Tribes and Bands of the Yakama Nation, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, the Nez Perce Tribe, the Washington Department of Archaeology and Historic Preservation (DAHP), and the U.S. Forest Service CRGNSA. BPA conducted background research using the Washington Information System for Architectural and Archaeological Records Database (WISAARD) followed by an intensive field survey of the Area of Potential Effect (APE).

The investigation confirmed that the Project APE is entirely within the boundaries of "The Shire" (Property ID 716032), a designed landscape previously recommended eligible for listing on the National Register of Historic Places (NRHP) under Criteria A and C. BPA historians affirmed its ongoing eligibility and integrity. The field survey also identified one archaeological isolated find, SA00719, which BPA determined is not eligible for the NRHP due to its lack of integrity and association. The proposed Project, including the replacement of a non-contributing culvert with a low-profile bridge, was designed to be visually subordinate and would not alter the character-defining features of The Shire historic property.

Based on these findings, BPA determined that the implementation of the proposed Project would result in no adverse effect to historic properties. A final determination letter detailing these findings was sent to all consulting parties on April 21, 2026, initiating a 30-day comment period. DAHP concurred with BPA's determination on April 27, 2026. No objections were received from any consulting party upon the conclusion of the comment period. The determination also includes a standard inadvertent discovery clause, requiring that work be halted if cultural materials are encountered. Therefore, the overall effect to cultural resources is expected to be low, consistent with the Programmatic EA, Section 3.11.3.

11. **Socioeconomics**

The effects of the Shire Enhancement Project on socioeconomics are consistent with the analysis in the Programmatic EA, "Socioeconomics and Environmental Justice," Section 3.12. The Programmatic EA, Section 3.12.3, describes low impacts to socioeconomics.

The Shire Enhancement Project is located in Skamania County, a rural area, and would not generate a requirement for additional permanent employees. However, it would create short-term employment opportunities for individuals involved in the construction and restoration activities, such as heavy equipment operators, restoration technicians, and project managers. This temporary employment would provide a small, short-term economic input to the local community through wages and the potential for local spending on services, fuel, equipment, and meals. These short-term economic benefits are considered positive but would not substantially alter the regional employment landscape or housing availability for local populations. The Project's primary goal is environmental enhancement, and any socioeconomic impacts are incidental to this purpose. Therefore, the degree of socioeconomic effect is anticipated to be low, consistent with the Programmatic EA, Section 3.12.3.

12. **Visual Resources**

The effects of the Shire Enhancement Project on visual resources are consistent with the analysis in the Programmatic EA, "Visual Resources," Section 3.13. The Programmatic EA, Section 3.13.3, describes low to moderate impacts to visual resources.

The proposed work would have low effects on visual quality. The Project site is located along State Highway 14, and some activities, particularly at the Yeon Creek outlet and along the access roads, would be visible to travelers. Project-related construction would result in some short-term visual impacts. These may include disturbed earth from excavation, the presence of heavy equipment, temporary cofferdams, and newly installed large wood structures and riparian plantings. However, these visual impacts would be temporary, lasting for the duration of the construction period (anticipated July to March).

In the long term, the Project's restored areas would have a more natural and aesthetically pleasing appearance as native vegetation becomes established, and the habitat features integrate into the landscape. The Project is specifically designed to achieve visual subordinance from KVAs by utilizing existing topography and vegetation, as detailed in the CRGNSA consistency application and determination. The Project would not break the skyline as seen from any KVA. The replacement of the failed culvert with a spanning deck bridge on East Fork Yeon Creek is designed to use non-reflective, muted earth tones and would not be visible from KVAs like Interstate 84 and Multnomah Falls due to topography and dense vegetative screening. The bridge itself would be constructed from a combination of wood, metal, and a buried concrete base, with colors matching the red-brown dark earth tones found

in the CRGNSA Scenic Resources Implementation Handbook. The consistency determination further confirms the Project is compatible with the general scale and mass of existing nearby development. Therefore, the overall impact on visual resources is anticipated to be low, consistent with the Programmatic EA, Section 3.13.3.

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

The effects of the Shire Enhancement Project on noise, hazardous waste, and public health and safety are consistent with the analysis in the Programmatic EA, "Noise, Hazardous Waste, and Public Health and Safety," Section 3.14. The Programmatic EA, Section 3.14.3, describes low impacts to noise, hazardous waste, and public health and safety.

The Shire Enhancement Project is located along the Columbia River in the rural Columbia River Gorge, away from major population centers. Project activities, primarily involving heavy equipment such as excavators, off-road haul trucks, and skid steers, would generate temporary increases in noise during construction. However, these effects would be short-term, confined to the construction period (anticipated July to March, with in-water work July 15 to September 30), and localized to the immediate Project area. Given the rural setting, these temporary disturbances are not expected to substantially impact public health or cause prolonged annoyance to residents.

Public health and safety would be addressed through the implementation of BMPs and HIP4 Conservation Measures during construction, including controlling dust and maintaining equipment to minimize emissions. In addition, large woody debris would be stabilized to withstand a 100-year event. This would minimize risk to public safety and property damage during high flow events.

The Project would have a low impact on public safety infrastructure (e.g., roads, telecommunications) from construction activities and emergency services (police, fire, ambulance) through the implementation of BMPs, such as regular inspection and maintenance of equipment, proper refueling protocols, spill prevention and response plans and secure waste management. Therefore, the potential impacts to noise, hazardous waste, and public health and safety from the Shire Enhancement Project are anticipated to be low, consistent with the Programmatic EA, Section 3.14.3.

14. **Transportation and Infrastructure**

The effects of the Shire Enhancement Project on transportation and infrastructure are consistent with the analysis in the Programmatic EA, "Transportation and Infrastructure," Section 3.15. The Programmatic EA, Section 3.15.3, describes low to moderate long-term impacts, including potential changes to local roads and access, but with no impact to navigability.

Project access would utilize existing maintained gravel roads and an old access road that is currently overgrown with blackberries. Clearing blackberries along this old access road would be conducted with a brush hog. Heavy equipment, including excavators, off-road haul trucks, and skid steers, would be transported to and from the Project site. These activities would primarily occur in upland areas. While Project vehicles and equipment would share local roads with other traffic during mobilization and demobilization, no public or private roads would be closed, temporarily blocked, or relocated as a direct result of the Project activities. Construction would occur over several months, but the impact of increased traffic from construction vehicles would be intermittent and localized. There would be no impacts to public infrastructure (e.g. roads, telecommunications) with on-site road improvement from replacing the culvert with a bridge.

Therefore, the level of impact on transportation and infrastructure is considered low, consistent with the analysis presented in the Programmatic EA, Section 3.15.3.

15. **Climate Change**

The effects of the Shire Enhancement Project on climate change are consistent with the analysis in the Programmatic EA, "Climate Change," Section 3.16. The Programmatic EA, Section 3.16.3, describes low and beneficial impacts to climate change, with short-term emissions offset by long-term carbon sequestration and enhanced ecosystem resilience.

Project-related emissions of greenhouse gases (GHGs) are anticipated to be low due to the short duration of construction activities, estimated from July to March, and the relatively small number of vehicles and equipment involved. While these activities would generate some GHGs, the overall contribution to atmospheric concentrations would be minimal and temporary. This minimal contribution to climate change would be offset by the long-term beneficial outcomes of the Project. Enhanced floodplain function, including increased water table inputs and improved hydrologic connections, would contribute to ecosystem resilience. The restoration of 4.5 acres of riparian and wetland habitat, with the planting of native shrub and tree species, would lead to increased carbon sequestration over time. Furthermore, improved instream and riparian habitat conditions could result in decreased water temperatures in Yeon Springs, contributing to localized climate adaptation strategies for aquatic species.

Overall, the long-term impacts on climate change from the Project are expected to be low and beneficial, consistent with the impacts described in the Programmatic EA, Section 3.16.3.

Findings

This SA finds that the types of actions and the potential impacts related to the proposed Shire Restoration Project are consistent with those analyzed in the Columbia Estuary Ecosystem Restoration Program Environmental Assessment (DOE/EA-2006) and Finding of No Significant Impact. There are no substantial changes in the Programmatic EA's Proposed Action and no substantial new circumstances or information about the significance of the adverse effects that bear on the analysis in the Programmatic EA's Proposed Action or its impacts within the meaning of NEPA as amended and the DOE NEPA Implementing Procedures. Therefore, no further NEPA analysis or documentation is required.

DANIEL GAMBETTA
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