UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1201 NE Lloyd Boulevard, Suite 1100
Portland, OR 97232

Refer to NMFS Consultation No.:
WCR-2018-10175

November 14, 2018

Amy Gibbons
Acting Chief, Regulatory Branch
U.S. Army Corps of Engineers
P.O. Box 2946
Portland, Oregon 97208-2946

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the PGE Harborton Restoration Project, Willamette River (6th Field HUC 170900120302) and Multnomah Channel (6th Field HUC 170900120205), Multnomah County, Oregon (Corps No.: NWP-2013-338

Dear Ms. Gibbons:

Thank you for your letter of June 14, 2018, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for PGE Harborton Restoration project. Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA)(16 U.S.C. 1855(b)) for this action.

In this opinion, NMFS concludes that the proposed action is not likely to jeopardize the continued existence of fifteen species of ESA-listed species: Lower Columbia River (LCR) Chinook salmon (*Oncorhynchus tshawytscha*), Upper Willamette River (UWR) Chinook salmon, Upper Columbia River (UCR) spring-run Chinook salmon, Snake River (SR) spring/summer run Chinook salmon, SR fall-run Chinook salmon, Columbia River (CR) chum salmon (*O. keta*), LCR coho salmon (*O. kisutch*), SR sockeye salmon (*O. nerka*), LCR steelhead (*O. mykiss*), UWR steelhead, MCR steelhead, UCR steelhead, Snake River Basin (SRB) steelhead, Southern distinct population segment (DPS) green sturgeon (*Acipenser medirostris*), Southern DPS eulachon (*Thaleichthys pacificus*), and their designated critical habitats.

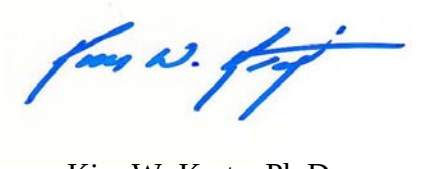
As required by section 7 of the ESA, NMFS is providing an incidental take statement with the opinion. The incidental take statement describes reasonable and prudent measures NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements, that the Federal action agency must comply with to carry out the reasonable and prudent measures. Incidental take from actions that meet these terms and conditions will be exempt from the ESA's prohibition against the take of listed species.

This document also includes the results of our analysis of the action's likely effects on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and includes three conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH. Two of these conservation recommendations are a subset of the ESA take statement's terms and conditions. Section 305(b)(4) (B) of the MSA requires Federal agencies to provide a detailed written response to NMFS within 30 days after receiving these recommendations. If the response is inconsistent with the EFH conservation recommendations, the Federal action agency must explain why the recommendations will not be followed, including the scientific justification for any disagreements over the effects of the action and the recommendations.

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we request that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

Please contact Mischa Connine in the Willamette Branch of the Oregon Washington Coastal Office, at 503-230-5401 or Mischa.Connine@noaa.gov if you have any questions concerning this section 7 consultation, or if you require additional information.

Sincerely,



Kim W. Kratz, Ph.D
Assistant Regional Administrator
Oregon Washington Coastal Office

cc: Melody White, U.S. Army Corps of Engineers
Chris Bozzini, Portland General Electric
Colin MacLaren, Portland General Electric

Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response

PGE Harborton Restoration Project
Willamette River (6th Field HUC 170900120302) and Multnomah Channel (6th Field HUC 170900120205), Multnomah County, Oregon (Corps No.: NWP-2013-338)

NMFS Consultation Number: WCR-2018-10175

Action Agency: U.S. Army Corps of Engineers

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species or Critical Habitat?	Is Action Likely To Jeopardize the Species?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Lower Columbia River (LCR) Chinook salmon (*Oncorhynchus tschawtscha*)	T	Yes	No	No
Upper Columbia River (UCR) spring-run Chinook salmon	E	Yes	No	No
Upper Willamette River (UWR) Spring-run Chinook salmon	T	Yes	No	No
Snake River (SR) spring/summer run Chinook salmon	T	Yes	No	No
SR fall-run Chinook salmon	T	Yes	No	No
Columbia River (CR) chum salmon (*O. keta*)	T	Yes	No	No
LCR coho salmon (*O. kisutch*)	T	Yes	No	No
SR sockeye salmon (*O. nerka*)	E	Yes	No	No
LCR steelhead (*O. mykiss*)	T	Yes	No	No
Mid Columbia River steelhead	T	Yes	No	No
UCR steelhead	T	Yes	No	No
UWR steelhead	T	Yes	No	No
SR steelhead	T	Yes	No	No
Southern DPS of green sturgeon (*Acipenser medirostris*)	T	Yes	No	No
Southern DPS of Pacific eulachon (*Thaleichthys pacificus*)	T	Yes	No	No

Fishery Management Plan That Identifies EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Salmon	Yes	Yes

Consultation Conducted By: National Marine Fisheries Service, West Coast Region

Issued By:

Kim W. Kratz, Ph.D
Assistant Regional Administrator
Oregon Washington Coastal Office

Date: November 14, 2018

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1. INTRODUCTION

This Introduction section provides information relevant to the other sections of this document and is incorporated by reference into Sections 2 and 3 below.

1.1 Background

The National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 USC 1531 et seq.), and implementing regulations at 50 CFR 402.

We also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 et seq.) and implementing regulations at 50 CFR 600.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). A complete record of this consultation is at the Oregon and Washington Coastal Office.

1.2 Consultation History

The PGE Harborton project was identified as a restoration project to offset some of the Natural Resource Damage Assessment liability for the Portland Harbor Superfund Site. The development of this project was coordinated through the Portland Harbor Restoration Committee. Several meetings took place 2015-2018. On April 4, 2017, NMFS received a letter from the U.S. Army Corps of Engineers (Corps), requesting formal consultation on the effects of authorizing PGE to construct the Harborton restoration project based on their authority under section 404 of the Clean Water Act and section 10 of the Rivers and Harbors Act. On August 17, 2017, the Corps withdrew the request for formal consultation because PGE (applicant) project modifications. On June 20, 2018, NMFS received a letter from the Corps, with a revised biological assessment (BA), requesting formal consultation for the Harborton project. On July 2, 2018, we sent an insufficiency letter to the Corps, requesting information on the proposed stormwater plan, herbicide use, and juvenile salmonid sampling. We received a response to our information request on July 11, 2018. Consultation was initiated on July 11, 2018. This document is based on the information provided in the meetings and documents described above.

The Corps concluded that the proposed action may affect, but is not likely to adversely affect Upper Columbia River (UCR) spring-run Chinook salmon, Snake River (SR) spring/summer-run Chinook salmon, SR fall-run Chinook salmon, Columbia River chum salmon (*O. keta*), SR sockeye salmon (*O. nerka*), Middle Columbia River steelhead, UCR steelhead, and Snake River Basin steelhead, and their designated critical habitats; however, upon review of the project NMFS finds that the proposed action is likely to adversely affect these species due to the close proximity of the project.

A complete record of this consultation is on file in Portland, Oregon.

1.3 Proposed Federal Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (50 CFR 402.02). "Interrelated actions" are those that are part of a larger action and depend on the larger action for their justification. "Interdependent actions" are those that have no independent utility apart from the action under consideration (50 CFR 402.02). There are no interdependent or interrelated actions associated with the proposed action.

The action is the Corps' issuance of a permit under section 10 of the Rivers and Harbors Act and section 404 of the Clean Water Act to PGE to construct, operate, and maintain the Harborton restoration project.

The Harborton property is located at 12500 NW Marina Way, Portland, Oregon, where the Multnomah Channel diverges from the mainstem Willamette River at approximately RM 3.3 (Figure 1). The Harborton site a 74-acre property adjacent to PGE's substation. The site is historic off-channel and backwater habitat of the Willamette River, and consists of dredge fill material. The site includes an electrical substation, switchyard, service roads, upland habitats, two unnamed tributaries of the Willamette River (North Channel and South Channel), riparian shoreline, wetlands, remnant native riparian, and backwater floodplain habitats (Figure 2).

PGE proposes to restore habitat elements to support native fish, terrestrial species, amphibian species, and avian species. A NMFS engineer reviewed and approved project elements for fish passage, including side-channel work, and the culvert replacement. A summary of the proposed action is described below.

- Excavate material to create a new opening to a subtidal channel, and riparian habitats within the active channel margin;
- Excavate material to create, and reconnect a channel that will connect to the Willamette River and Multnomah Channel. Excavate material at the shoreline of the Willamette River to ensure that there is a smooth elevation transition between the channels and the existing waterways;
- Replace an existing culvert at the mouth of the South Channel with a culvert that will meet NMFS fish passage criteria (NMFS 2011a);
- Reduce the area of the electrical substation, and treat stormwater runoff from the substation;
- Place all excavated material in the substation area, and establish upland forest habitat on the area;
- Establish riparian habitat adjacent to the created active channel margin habitats by grading and planting;
- Install large woody debris within the created channels and marsh/mudflat to provide in-water habitat structure and complexity;
- Control invasive vegetation with mechanical removal, and herbicides;
- Plant native vegetation;

- Juvenile salmonid monitoring via snorkel surveys, beach seining, and trapping; and
- Provide permanent protection of the site (excluding areas already encumbered by easements) through placement of a conservation easement or deed restriction.

The Harborton site is divided into four sub-areas for planning, and design purposes (Figures 3 & 4).

Sub-Area 1

PGE proposes to replace the failed downstream culvert on the South Channel to provide fish passage to 1,000 feet of cold-water tributary habitat. PGE will excavate a portion of this side channel, regrade the stream banks, add large woody debris, and add native substrate material to the channel. PGE will remove invasive plants, and plant native riparian, and wetland species. PGE proposes to follow the Invasive and Non-native Plant Control PDCs in the SLOPES V Restoration opinion (NMFS 2013).

Sub-Area 2

PGE proposes to reduce the area of the existing substation from 18 acres to 11 acres. The existing pole yard will be removed from this location and relocated off site. Excavation from other areas will be placed in the upland substation area. PGE will enhance and create 9 acres of upland, and riparian habitats. PGE proposes to follow the Invasive and Non-native Plant Control PDCs in the SLOPES V Restoration opinion (NMFS 2013).

As part of the substation construction, PGE will treat all the stormwater with a vegetated detention facility according to the stormwater plan submitted. The stormwater plan will meet all criteria in SLOPES V Stormwater, Transportation, and Utilities (STU) (NMFS 2014), as shown below.

PGE will reduce the size of the substation from 15 acres to 8.51 acres of impervious surface. As described in the stormwater plan, PGE will:

- Construct a vegetated detention facility with 18-inches of amended soils to treat 8.15 acres of stormwater runoff.
- The stormwater treatment facility was based on 0.85 acre-ft of runoff.
    - PCR = contributing impervious area (CIA) x design storm (DS)
    - CIA = 8.15 ac of impervious surface
    - DS = 50% of the 2-yr 24-hr storm in the project area = 1.3 in of 0.1 ft
    - ac-ft =8.51 ac x 0.1 ft
- The facility discharges to the Willamette River and does not need to meet the pre-development runoff rate.
- PGE will comply with the relevant design criteria for construction practices, including monitoring and reporting.

Sub-Areas 3 and 4

PGE will remove the berm separating Sub-Area 3 from Sub-Area 4, and construct a new outlet channel to the Willamette River for the North Channel. Creation of the new outlet channel will allow fish to access the stream during all periods when flow is present in the stream. PGE will also excavate existing fill in Sub-Area 3 to expand off-channel habitat availability during high river stage conditions. As part of moving the channel outlet, PGE will fill in the current channel that is connected to the Multnomah Channel, near Fred's Marina. PGE will remove invasive plants, and plant native riparian, and wetland species. PGE proposes to follow the Invasive and Non-native Plant Control PDCs in the SLOPES V Restoration opinion (NMFS 2013).

There is an existing wetland complex in Sub-Area 4 as a consequence of the berm that was placed in the past. This wetland complex is not accessible to, nor suitable as off-channel habitat for juvenile salmonids. Excavation is not proposed in this area; however, the removal of the levee adjacent to this area will increase the extent of the wetland, and provide off-channel habitat to juvenile salmonids by allowing inundation of the Willamette River into the wetland. During high flows, juvenile salmonids will have access to approximately 28 acres of off-channel habitat.

Contaminants Present at the Site

Sub-Areas 1 and 3 contain, organochlorinated pesticides (e.g., DDE, DDT) and poly aromatic hydrocarbons (PAHs). PGE proposed to over-excavate the contaminated sediment by 12-inches, and to regrade the proposed surface elevation with clean material sourced from offsite.

Juvenile Salmonid Monitoring

Juvenile salmonid monitoring will be conducted to determine the presence or absence of juvenile salmonids. Monitoring could take place during years 1,3,5,7, and 10. Surveys will be conducted up to two times per months from February through May. Monitoring will be conducted using snorkel surveys or beach seining. Beach seining will only be conducted until juvenile salmonids are captured. Once juvenile salmonids are captured, beach seining will no longer continue. Snorkel surveys may continue through the remainder of the monitoring period.

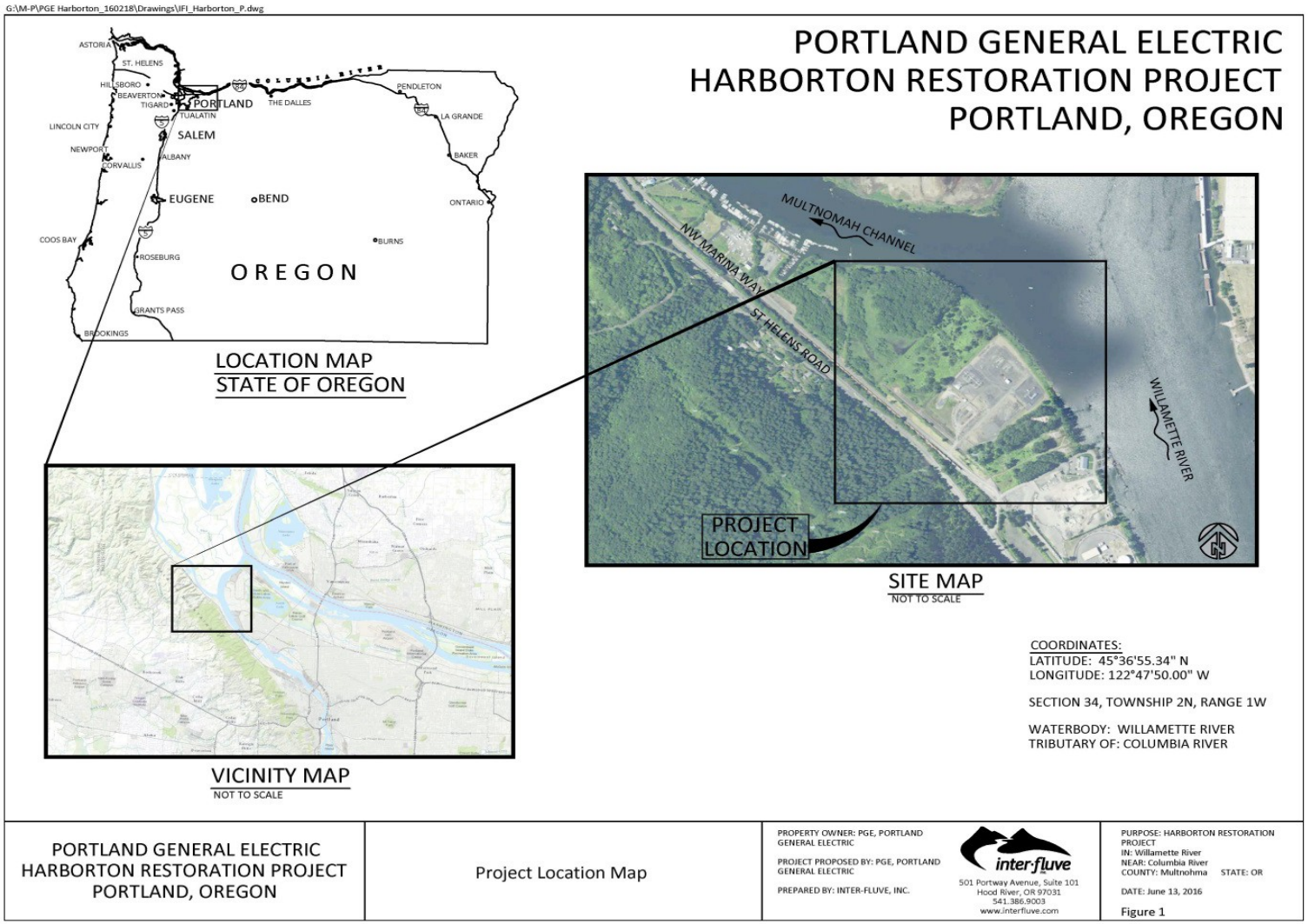

Figure 1. Project location map for the Harborton restoration project.

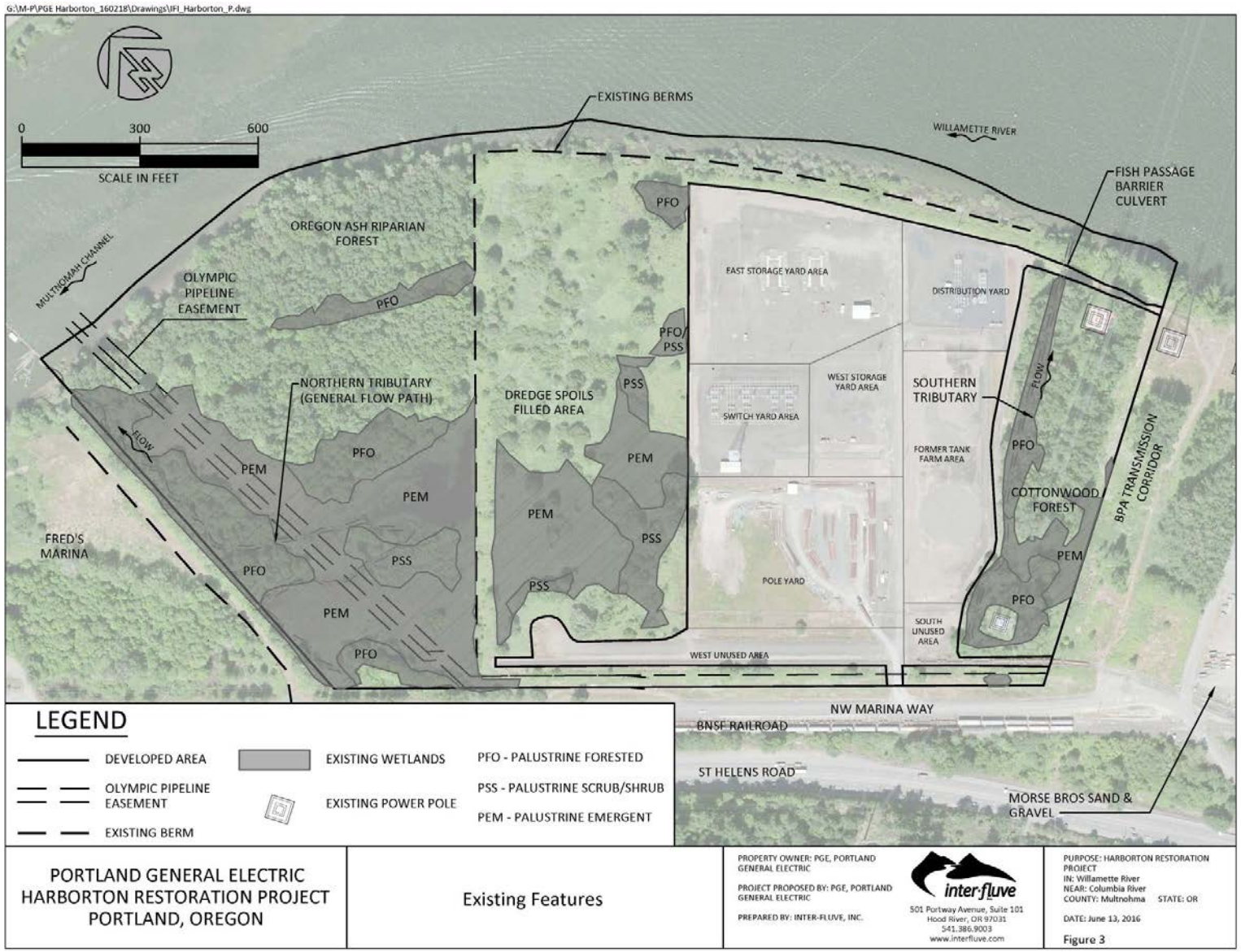

Figure 2. Current site conditions at the Harborton site.

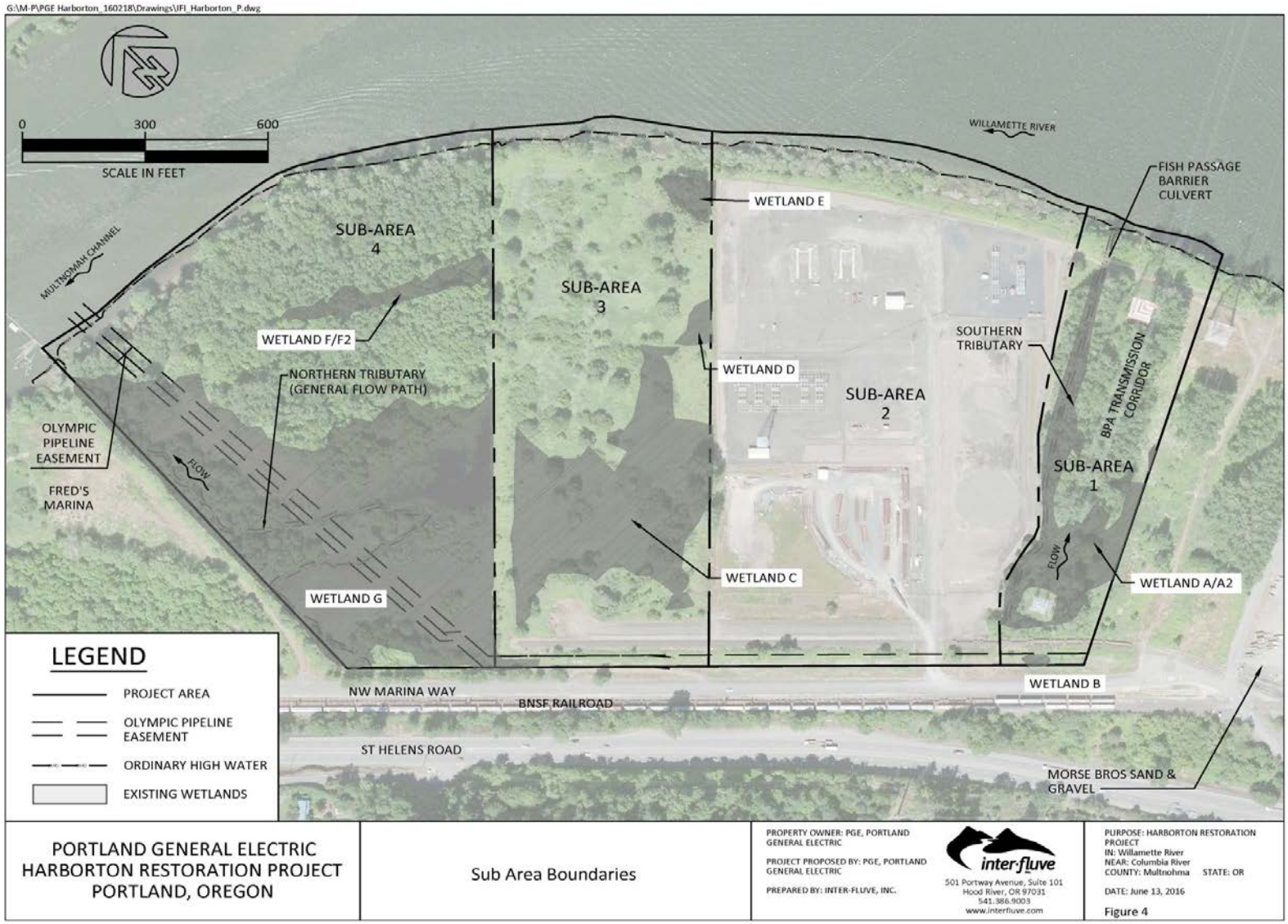

Figure 3. Sub-Areas 1-4 for the Harborton Site.

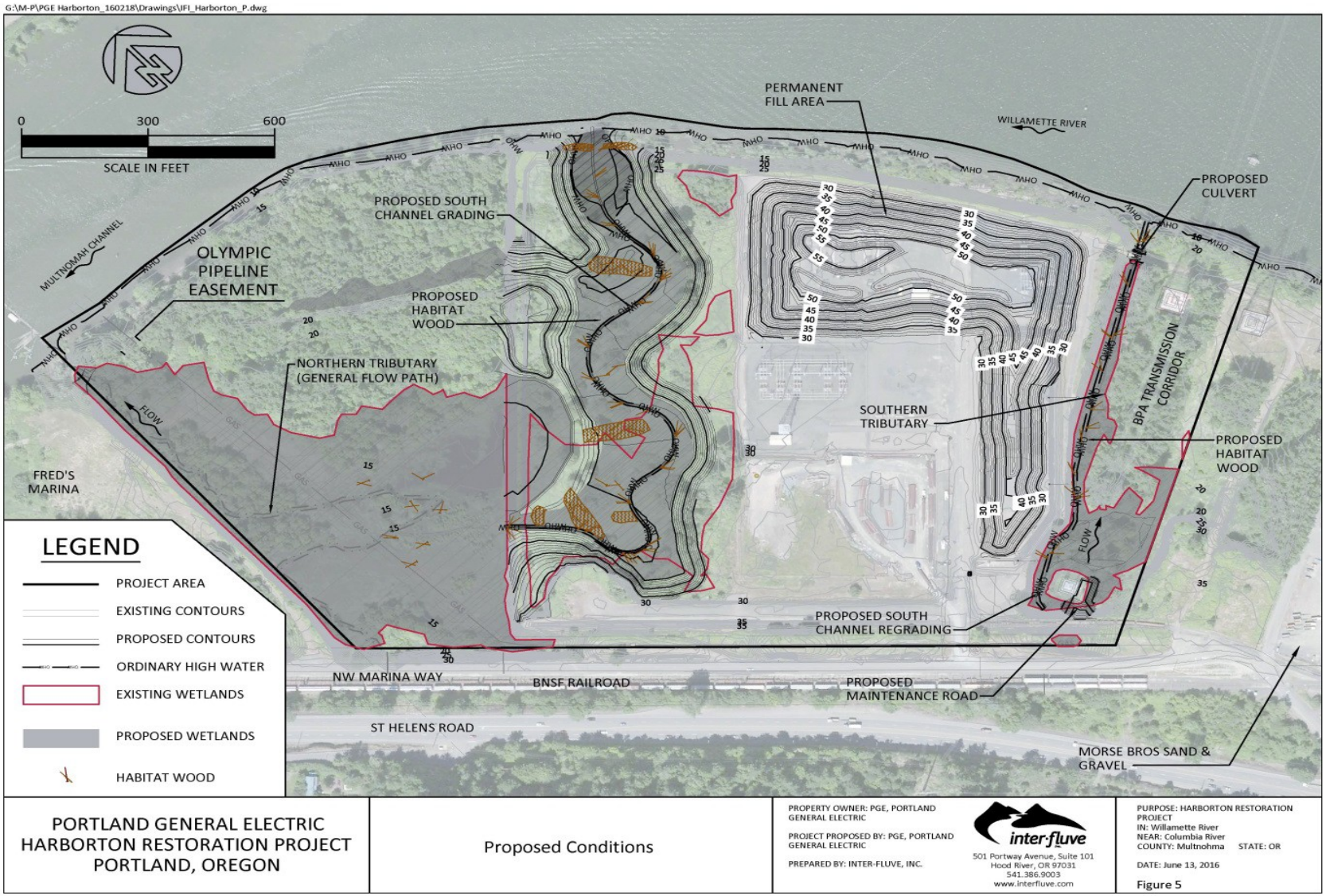

Figure 4. Proposed Restoration Conditions for the Harborton Restoration Project.

2. ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of the ESA, each Federal agency must ensure that its actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. Per the requirements of the ESA, Federal action agencies consult with NMFS and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provides an opinion stating how the agency's actions would affect listed species and their critical habitats. If incidental take is reasonably certain to occur, section 7(b)(4) requires NMFS to provide an ITS that specifies the impact of any incidental taking and includes non-discretionary reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

2.1 Analytical Approach

This biological opinion includes both a jeopardy analysis and/or an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "to jeopardize the continued existence of" a listed species, which is "to engage in an action that would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

This biological opinion relies on the definition of "destruction or adverse modification," which "means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features" (81 FR 7214).

The designation(s) of critical habitat for (species) use(s) the term primary constituent element (PCE) or essential features. The new critical habitat regulations (81 FR 7414) replace this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a ''destruction or adverse modification'' analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this biological opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

We use the following approach to determine whether a proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat:

- Identify the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.
- Describe the environmental baseline in the action area.
- Analyze the effects of the proposed action on both species and their habitat using an "exposure-response-risk" approach.

- Describe any cumulative effects in the action area.
- Integrate and synthesize the above factors by: (1) Reviewing the status of the species and critical habitat; and (2) adding the effects of the action, the environmental baseline, and cumulative effects to assess the risk that the proposed action poses to species and critical habitat.
- Reach a conclusion about whether species are jeopardized or critical habitat is adversely modified.
- If necessary, suggest a RPA to the proposed action.

2.2 Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' current "reproduction, numbers, or distribution" as described in 50 CFR 402.02. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the current function of the essential PBFs that help to form that conservation value.

One factor affecting the status of ESA-listed species considered in this opinion, and aquatic habitat at large, is climate change. Climate change is likely to play an increasingly important role in determining the abundance and distribution of ESA-listed species, and the conservation value of designated critical habitats, in the Pacific Northwest. These changes will not be spatially homogeneous across the Pacific Northwest. The largest hydrologic responses are expected to occur in basins with significant snow accumulation, where warming decreases snow pack, increases winter flows, and advances the timing of spring melt (Mote et al. 2014, Mote 2016). Rain-dominated watersheds and those with significant contributions from groundwater may be less sensitive to predicted changes in climate (Tague et al. 2013, Mote et al. 2014).

During the last century, average regional air temperatures in the Pacific Northwest increased by 1-1.4°F as an annual average, and up to 2°F in some seasons (based on average linear increase per decade; Abatzoglou et al. 2014; Kunkel et al. 2013). Warming is likely to continue during the next century as average temperatures are projected to increase another 3 to 10°F, with the largest increases predicted to occur in the summer (Mote et al. 2014). Decreases in summer precipitation of as much as 30% by the end of the century are consistently predicted across climate models (Mote et al. 2014). Precipitation is more likely to occur during October through March, less during summer months, and more winter precipitation will be rain than snow (ISAB 2007; Mote et al. 2013; Mote et al. 2014). Earlier snowmelt will cause lower stream flows in late spring, summer, and fall, and water temperatures will be warmer (ISAB 2007; Mote et al. 2014). Models consistently predict increases in the frequency of severe winter precipitation events (i.e., 20-year and 50-year events), in the western United States (Dominguez et al. 2012). The largest increases in winter flood frequency and magnitude are predicted in mixed rain-snow watersheds (Mote et al. 2014).

Overall, about one-third of the current cold-water salmonid habitat in the Pacific Northwest is likely to exceed key water temperature thresholds by the end of this century (Mantua et al. 2009). Higher temperatures will reduce the quality of available salmonid habitat for most freshwater life stages (ISAB 2007). Reduced flows will make it more difficult for migrating fish to pass physical and thermal obstructions, limiting their access to available habitat (Mantua et al. 2010; Isaak et al. 2012). Temperature increases shift timing of key life cycle events for salmonids and species forming the base of their aquatic food webs (Crozier et al. 2011; Tillmann and Siemann 2011; Winder and Schindler 2004). Higher stream temperatures will also cause decreases in dissolved oxygen and may also cause earlier onset of stratification and reduced mixing between layers in lakes and reservoirs, which can also result in reduced oxygen (Meyer et al. 1999; Winder and Schindler 2004, Raymondi et al. 2013). Higher temperatures are likely to cause several species to become more susceptible to parasites, disease, and higher predation rates (Crozier et al. 2008; Wainwright and Weitkamp 2013; Raymondi et al. 2013).

As more basins become rain-dominated and prone to more severe winter storms, higher winter stream flows may increase the risk that winter or spring floods in sensitive watersheds will damage spawning redds and wash away incubating eggs (Goode et al. 2013). Earlier peak stream flows will also alter migration timing for salmon smolts, and may flush some young salmon and steelhead from rivers to estuaries before they are physically mature, increasing stress and reducing smolt survival (McMahon and Hartman 1989; Lawson et al. 2004).

In addition to changes in freshwater conditions, predicted changes for coastal waters in the Pacific Northwest as a result of climate change include increasing surface water temperature, increasing but highly variable acidity, and increasing storm frequency and magnitude (Mote et al. 2014). Elevated ocean temperatures already documented for the Pacific Northwest are highly likely to continue during the next century, with sea surface temperature projected to increase by 1.0-3.7^{o}C by the end of the century (IPCC 2014). Habitat loss, shifts in species' ranges and abundances, and altered marine food webs could have substantial consequences to anadromous, coastal, and marine species in the Pacific Northwest (Tillmann and Siemann 2011, Reeder et al. 2013).

Moreover, as atmospheric carbon emissions increase, increasing levels of carbon are absorbed by the oceans, changing the pH of the water. Acidification also impacts sensitive estuary habitats, where organic matter and nutrient inputs further reduce pH and produce conditions more corrosive than those in offshore waters (Feely et al. 2012, Sunda and Cai 2012).

Global sea levels are expected to continue rising throughout this century, reaching likely predicted increases of 10-32 inches by 2081-2100 (IPCC 2014). These changes will likely result in increased erosion and more frequent and severe coastal flooding, and shifts in the composition of nearshore habitats (Tillmann and Siemann 2011, Reeder et al. 2013). Estuarine-dependent salmonids such as chum and Chinook salmon are predicted to be impacted by significant reductions in rearing habitat in some Pacific Northwest coastal areas (Glick et al. 2007).

Historically, warm periods in the coastal Pacific Ocean have coincided with relatively low abundances of salmon and steelhead, while cooler ocean periods have coincided with relatively high abundances, and therefore these species are predicted to fare poorly in warming ocean

conditions (Scheuerell and Williams 2005; Zabel et al. 2006). This is supported by the recent observation that anomalously warm sea surface temperatures off the coast of Washington from 2013 to 2016 resulted in poor coho and Chinook salmon body condition for juveniles caught in those waters (NWFSC 2015). Changes to estuarine and coastal conditions, as well as the timing of seasonal shifts in these habitats, have the potential to impact a wide range of listed aquatic species (Tillmann and Siemann 2011, Reeder et al. 2013).

The adaptive ability of these threatened and endangered species is depressed due to reductions in population size, habitat quantity and diversity, and loss of behavioral and genetic variation. Without these natural sources of resilience, systematic changes in local and regional climatic conditions due to anthropogenic global climate change will likely reduce long-term viability and sustainability of populations in many of these ESUs (NWFSC 2015). New stressors generated by climate change, or existing stressors with effects that have been amplified by climate change, may also have synergistic impacts on species and ecosystems (Doney et al. 2012). These conditions will possibly intensify the climate change stressors inhibiting recovery of ESA-listed species in the future.

2.2.1 Status of the Species

Table 1, below provides a summary of listing and recovery plan information, status summaries and limiting factors for the species addressed in this opinion. More information can be found in recovery plans and status reviews for these species.

Table 1. Listing classification and date, recovery plan reference, most recent status review, status summary, and limiting factors for each species considered in this opinion.

Species	Listing Classification and Date	Recovery Plan Reference	Most Recent Status Review	Status Summary	Limiting Factors
Lower Columbia River Chinook salmon	Threatened 6/28/05	NMFS 2013	NWFSC 2015	This ESU comprises 32 independent populations. Twenty-seven populations are at very high risk, 2 populations are at high risk, one population is at moderate risk, and 2 populations are at very low risk Overall, there was little change since the last status review in the biological status of this ESU, although there are some positive trends. Increases in abundance were noted in about 70% of the fall-run populations and decreases in hatchery contribution were noted for several populations. Relative to baseline VSP levels identified in the recovery plan, there has been an overall improvement in the status of a number of fall-run populations, although most are still far from the recovery plan goals.	• Reduced access to spawning and rearing habitat • Hatchery-related effects • Harvest-related effects on fall Chinook salmon • An altered flow regime and Columbia River plume • Reduced access to off-channel rearing habitat • Reduced productivity resulting from sediment and nutrient-related changes in the estuary • Contaminant
Upper Columbia River spring-run Chinook salmon	Endangered 6/28/05	Upper Columbia Salmon Recovery Board 2007	NWFSC 2015	This ESU comprises four independent populations. Three are at high risk and one is functionally extirpated. Current estimates of natural origin spawner abundance increased relative to the levels observed in the prior review for all three extant populations, and productivities were higher for the Wenatchee and Entiat populations and unchanged for the Methow population. However, abundance and productivity remained well below the viable thresholds called for in the Upper Columbia Recovery Plan for all three populations.	• Effects related to hydropower system in the mainstem Columbia River • Degraded freshwater habitat • Degraded estuarine and nearshore marine habitat • Hatchery-related effects • Persistence of non-native (exotic) fish species • Harvest in Columbia River fisheries
Snake River spring/summer-run Chinook salmon	Threatened 6/28/05	NMFS 2016a (draft)	NWFSC 2015	This ESU comprises 28 extant and four extirpated populations. All expect one extant population (Chamberlin Creek) are at high risk. Natural origin abundance has increased over the levels reported in the prior review for most populations in this ESU, although the increases were not substantial enough to change viability ratings. Relatively high ocean survivals in recent years were a major factor in recent abundance	• Degraded freshwater habitat • Effects related to the hydropower system in the mainstem Columbia River, • Altered flows and degraded water quality • Harvest-related effects • Predation

Species	Listing Classification and Date	Recovery Plan Reference	Most Recent Status Review	Status Summary	Limiting Factors
				patterns. While there have been improvements in abundance and productivity in several populations relative to prior reviews, those changes have not been sufficient to warrant a change in ESU status.	
Upper Willamette River Chinook salmon	Threatened 6/28/05	NMFS 2011b	NWFSC 2015	This ESU comprises seven populations. Five populations are at very high risk, one population is at moderate risk (Clackamas River) and one population is at low risk (McKenzie River). Consideration of data collected since the last status review in 2010 indicates the fraction of hatchery origin fish in all populations remains high (even in Clackamas and McKenzie populations). The proportion of natural origin spawners improved in the North and South Santiam basins, but is still well below identified recovery goals. Abundance levels for five of the seven populations remain well below their recovery goals. Of these, the Calapooia River may be functionally extinct and the Molalla River remains critically low. Abundances in the North and South Santiam rivers have risen since the 2010 review, but still range only in the high hundreds of fish. The Clackamas and McKenzie populations have previously been viewed as natural population strongholds, but have both experienced declines in abundance despite having access to much of their historical spawning habitat. Overall, populations appear to be at either moderate or high risk, there has been likely little net change in the VSP score for the ESU since the last review, so the ESU remains at moderate risk.	• Degraded freshwater habitat • Degraded water quality • Increased disease incidence • Altered stream flows • Reduced access to spawning and rearing habitats • Altered food web due to reduced inputs of microdetritus • Predation by native and non-native species, including hatchery fish • Competition related to introduced salmon and steelhead • Altered population traits due to fisheries and bycatch
Snake River fall-run Chinook salmon	Threatened 6/28/05	NMFS 2015a (draft)	NWFSC 2015	This ESU has one extant population. Historically, large populations of fall Chinook salmon spawned in the Snake River upstream of the Hells Canyon Dam complex. The extant population is at moderate risk for both diversity and spatial structure and abundance and productivity. The overall viability rating for this	• Degraded floodplain connectivity and function • Harvest-related effects • Loss of access to historical habitat above Hells Canyon and other Snake River dams • Impacts from mainstem Columbia River and Snake River hydropower systems

Species	Listing Classification and Date	Recovery Plan Reference	Most Recent Status Review	Status Summary	Limiting Factors
				population is 'viable.' Overall, the status of Snake River fall Chinook salmon has clearly improved compared to the time of listing and compared to prior status reviews. The single extant population in the ESU is currently meeting the criteria for a rating of 'viable' developed by the ICTRT, but the ESU as a whole is not meeting the recovery goals described in the recovery plan for the species, which require the single population to be "highly viable with high certainty" and/or will require reintroduction of a viable population above the Hells Canyon Dam complex.	• Hatchery-related effects • Degraded estuarine and nearshore habitat.
Columbia River chum salmon	Threatened 6/28/05	NMFS 2013	NWFSC 2015	Overall, the status of most chum salmon populations is unchanged from the baseline VSP scores estimated in the recovery plan. A total of 3 of 17 populations are at or near their recovery viability goals, although under the recovery plan scenario these populations have very low recovery goals of 0. The remaining populations generally require a higher level of viability and most require substantial improvements to reach their viability goals. Even with the improvements observed during the last five years, the majority of populations in this ESU remain at a high or very high risk category and considerable progress remains to be made to achieve the recovery goals.	• Degraded estuarine and nearshore marine habitat • Degraded freshwater habitat • Degraded stream flow as a result of hydropower and water supply operations • Reduced water quality • Current or potential predation • An altered flow regime and Columbia River plume • Reduced access to off-channel rearing habitat in the lower Columbia River • Reduced productivity resulting from sediment and nutrient-related changes in the estuary • Juvenile fish wake strandings • Contaminants
Lower Columbia River coho salmon	Threatened 6/28/05	NMFS 2013	NWFSC 2015	Of the 24 populations that make up this ESU, 21 populations are at very high risk, 1 population is at high risk, and 2 populations are at moderate risk. Recent recovery efforts may have contributed to the observed natural production, but in the absence of longer term data sets it is not possible to parse out these effects. Populations with longer term data sets exhibit stable or slightly positive abundance trends. Some trap and haul programs appear to be operating at or near replacement, although other	• Degraded estuarine and near-shore marine habitat • Fish passage barriers • Degraded freshwater habitat: Hatchery-related effects • Harvest-related effects • An altered flow regime and Columbia River plume • Reduced access to off-channel rearing habitat in the lower Columbia River

Species	Listing Classification and Date	Recovery Plan Reference	Most Recent Status Review	Status Summary	Limiting Factors
				programs still are far from that threshold and require supplementation with additional hatchery-origin spawners .Initiation of or improvement in the downstream juvenile facilities at Cowlitz Falls, Merwin, and North Fork Dam are likely to further improve the status of the associated upstream populations. While these and other recovery efforts have likely improved the status of a number of coho salmon populations, abundances are still at low levels and the majority of the populations remain at moderate or high risk. For the Lower Columbia River region land development and increasing human population pressures will likely continue to degrade habitat, especially in lowland areas. Although populations in this ESU have generally improved, especially in the 2013/14 and 2014/15 return years, recent poor ocean conditions suggest that population declines might occur in the upcoming return years	• Reduced productivity resulting from sediment and nutrient-related changes in the estuary • Juvenile fish wake strandings • Contaminants
Snake River sockeye salmon	Endangered 6/28/05	NMFS 2015	NWFSC 2015	This single population ESU is at very high risk dues to small population size. There is high risk across all four basic risk measures. Although the captive brood program has been successful in providing substantial numbers of hatchery produced fish for use in supplementation efforts, substantial increases in survival rates across all life history stages must occur to re-establish sustainable natural production In terms of natural production, the Snake River Sockeye ESU remains at extremely high risk although there has been substantial progress on the first phase of the proposed recovery approach – developing a hatchery based program to amplify and conserve the stock to facilitate reintroductions.	• Effects related to the hydropower system in the mainstem Columbia River • Reduced water quality and elevated temperatures in the Salmon River • Water quantity • Predation

Species	Listing Classification and Date	Recovery Plan Reference	Most Recent Status Review	Status Summary	Limiting Factors
Upper Columbia River steelhead	Threatened 1/5/06	Upper Columbia Salmon Recovery Board 2007	NWFSC 2015	This DPS comprises four independent populations. Three populations are at high risk of extinction while 1 population is at moderate risk. Upper Columbia River steelhead populations have increased relative to the low levels observed in the 1990s, but natural origin abundance and productivity remain well below viability thresholds for three out of the four populations. The status of the Wenatchee River steelhead population continued to improve based on the additional year's information available for the most recent review. The abundance and productivity viability rating for the Wenatchee River exceeds the minimum threshold for 5% extinction risk. However, the overall DPS status remains unchanged from the prior review, remaining at high risk driven by low abundance and productivity relative to viability objectives and diversity concerns.	• Adverse effects related to the mainstem Columbia River hydropower system • Impaired tributary fish passage • Degraded floodplain connectivity and function, channel structure and complexity, riparian areas, large woody debris recruitment, stream flow, and water quality • Hatchery-related effects • Predation and competition • Harvest-related effects
Lower Columbia River steelhead	Threatened 1/5/06	NMFS 2013	NWFSC 2015	This DPS comprises 23 historical populations, 17 winter-run populations and six summer-run populations. Nine populations are at very high risk, 7 populations are at high risk, 6 populations are at moderate risk, and 1 population is at low risk. The majority of winter-run steelhead populations in this DPS continue to persist at low abundances. Hatchery interactions remain a concern in select basins, but the overall situation is somewhat improved compared to prior reviews. Summer-run steelhead populations were similarly stable, but at low abundance levels. The decline in the Wind River summer-run population is a source of concern, given that this population has been considered one of the healthiest of the summer-runs; however, the most recent abundance estimates suggest that the decline was a single year aberration. Passage programs in the Cowlitz and Lewis basins have the potential to provide considerable improvements in abundance and spatial structure, but have not produced self-sustaining	• Degraded estuarine and nearshore marine habitat • Degraded freshwater habitat • Reduced access to spawning and rearing habitat • Avian and marine mammal predation • Hatchery-related effects • An altered flow regime and Columbia River plume • Reduced access to off-channel rearing habitat in the lower Columbia River • Reduced productivity resulting from sediment and nutrient-related changes in the estuary • Juvenile fish wake strandings • Contaminants

Species	Listing Classification and Date	Recovery Plan Reference	Most Recent Status Review	Status Summary	Limiting Factors
				populations to date. Even with modest improvements in the status of several winter-run DIPs, none of the populations appear to be at fully viable status, and similarly none of the MPGs meet the criteria for viability.	
Upper Willamette River steelhead	Threatened 1/5/06	NMFS 2011b	NWFSC 2015	This DPS has four demographically independent populations. Three populations are at low risk and one population is at moderate risk. Declines in abundance noted in the last status review continued through the period from 2010-2015. While rates of decline appear moderate, the DPS continues to demonstrate the overall low abundance pattern that was of concern during the last status review. The causes of these declines are not well understood, although much accessible habitat is degraded and under continued development pressure. The elimination of winter-run hatchery release in the basin reduces hatchery threats, but non-native summer steelhead hatchery releases are still a concern for species diversity and a source of competition for the DPS. While the collective risk to the persistence of the DPS has not changed significantly in recent years, continued declines and potential negative impacts from climate change may cause increased risk in the near future.	• Degraded freshwater habitat • Degraded water quality • Increased disease incidence • Altered stream flows • Reduced access to spawning and rearing habitats due to impaired passage at dams • Altered food web due to changes in inputs of microdetritus • Predation by native and non-native species, including hatchery fish and pinnipeds • Competition related to introduced salmon and steelhead • Altered population traits due to interbreeding with hatchery origin fish
Middle Columbia River steelhead	Threatened 1/5/06	NMFS 2009	NWFSC 2015	This DPS comprises 17 extant populations. The DPS does not currently include steelhead that are designated as part of an experimental population above the Pelton Round Butte Hydroelectric Project. Returns to the Yakima River basin and to the Umatilla and Walla Walla Rivers have been higher over the most recent brood cycle, while natural origin returns to the John Day River have decreased. There have been improvements in the viability ratings for some of the component populations, but the DPS is not currently meeting the viability criteria in the MCR steelhead recovery plan. In general, the	• Degraded freshwater habitat • Mainstem Columbia River hydropower-related impacts • Degraded estuarine and nearshore marine habitat • Hatchery-related effects • Harvest-related effects • Effects of predation, competition, and disease

Species	Listing Classification and Date	Recovery Plan Reference	Most Recent Status Review	Status Summary	Limiting Factors
				majority of population level viability ratings remained unchanged from prior reviews for each major population group within the DPS.	
Snake River basin steelhead	Threatened 1/5/06	NMFS 2016 (draft)	NWFSC 2015	This DPS comprises 24 populations. Two populations are at high risk, 15 populations are rated as maintained, 3 populations are rated between high risk and maintained, 2 populations are at moderate risk, 1 population is viable, and 1 population is highly viable. Four out of the five MPGs are not meeting the specific objectives in the draft recovery plan based on the updated status information available for this review, and the status of many individual populations remains uncertain A great deal of uncertainty still remains regarding the relative proportion of hatchery fish in natural spawning areas near major hatchery release sites within individual populations.	• Adverse effects related to the mainstem Columbia River hydropower system • Impaired tributary fish passage • Degraded freshwater habitat • Increased water temperature • Harvest-related effects, particularly for B-run steelhead • Predation • Genetic diversity effects from out-of-population hatchery releases
Southern DPS of green sturgeon	Threatened 4/7/06	In development	NMFS 2015c	The Sacramento River contains the only known green sturgeon spawning population in this DPS. The current estimate of spawning adult abundance is between 824-1,872 individuals. Telemetry data and genetic analyses suggest that Southern DPS green sturgeon generally occur from Graves Harbor, Alaska to Monterey Bay, California and, within this range, most frequently occur in coastal waters of Washington, Oregon, and Vancouver Island and near San Francisco and Monterey bays. Within the nearshore marine environment, tagging and fisheries data indicate that Northern and Southern DPS green sturgeon prefer marine waters of less than a depth of 110 meters.	• Reduction of its spawning area to a single known population • Lack of water quantity • Poor water quality • Poaching

Species	Listing Classification and Date	Recovery Plan Reference	Most Recent Status Review	Status Summary	Limiting Factors
Southern DPS of eulachon	Threatened 3/18/10	NMFS 2017	Gustafson et al. 2016	The Southern DPS of eulachon includes all naturally-spawned populations that occur in rivers south of the Nass River in British Columbia to the Mad River in California. Sub populations for this species include the Fraser River, Columbia River, British Columbia and the Klamath River. In the early 1990s, there was an abrupt decline in the abundance of eulachon returning to the Columbia River. Despite a brief period of improved returns in 2001-2003, the returns and associated commercial landings eventually declined to the low levels observed in the mid-1990s. Although eulachon abundance in monitored rivers has generally improved, especially in the 2013-2015 return years, recent poor ocean conditions and the likelihood that these conditions will persist into the near future suggest that population declines may be widespread in the upcoming return years	• Changes in ocean conditions due to climate change, particularly in the southern portion of the species' range where ocean warming trends may be the most pronounced and may alter prey, spawning, and rearing success. • Climate-induced change to freshwater habitats • Bycatch of eulachon in commercial fisheries • Adverse effects related to dams and water diversions • Water quality, • Shoreline construction • Over harvest • Predation

2.2.1 Status of the Critical Habitat

This section describes the status of designated critical habitat affected by the proposed action by examining the condition and trends of the essential physical and biological features of that habitat throughout the designated areas. These features are essential to the conservation of the ESA-listed species because they support one or more of the species' life stages (*e.g.*, sites with conditions that support spawning, rearing, migration and foraging).

For most salmon and steelhead, NMFS's critical habitat analytical review teams (CHARTs) ranked watersheds within designated critical habitat at the scale of the fifth-field hydrologic unit code (HUC5) in terms of the conservation value they provide to each ESA-listed species that they support (NMFS 2005). The conservation rankings were high, medium, or low. To determine the conservation value of each watershed to species viability, the CHARTs evaluated the quantity and quality of habitat features, the relationship of the area compared to other areas within the species' range, and the significance to the species of the population occupying that area. Even if a location had poor habitat quality, it could be ranked with a high conservation value if it were essential due to factors such as limited availability, a unique contribution of the population it served, or is serving another important role.

A summary of the status of critical habitats, considered in this opinion, is provided in Table 2, below.

Table 2. Critical habitat, designation date, federal register citation, and status summary for critical habitat considered in this opinion

Species	Designation Date and Federal Register Citation	Critical Habitat Status Summary
Lower Columbia River Chinook salmon	9/02/05 70 FR 52630	Critical habitat encompasses 10 subbasins in Oregon and Washington containing 47 occupied watersheds, as well as the lower Columbia River rearing/migration corridor. Most HUC5 watersheds with PCEs for salmon are in fair-to-poor or fair-to-good condition (NMFS 2005). However, most of these watersheds have some, or high potential for improvement. We rated conservation value of HUC5 watersheds as high for 30 watersheds, medium for 13 watersheds, and low for four watersheds.
Upper Columbia River spring-run Chinook salmon	9/02/05 70 FR 52630	Critical habitat encompasses four subbasins in Washington containing 15 occupied watersheds, as well as the Columbia River rearing/migration corridor. Most HUC5 watersheds with PCEs for salmon are in fair-to-poor or fair-to-good condition. However, most of these watersheds have some, or high, potential for improvement. We rated conservation value of HUC5 watersheds as high for 10 watersheds, and medium for five watersheds. Migratory habitat quality in this area has been severely affected by the development and operation of the dams and reservoirs of the Federal Columbia River Power System.
Snake River spring/summer-run Chinook salmon	10/25/99 64 FR 57399	Critical habitat consists of river reaches of the Columbia, Snake, and Salmon rivers, and all tributaries of the Snake and Salmon rivers (except the Clearwater River) presently or historically accessible to this ESU (except reaches above impassable natural falls and Hells Canyon Dam). Habitat quality in tributary streams varies from excellent in wilderness and roadless areas, to poor in areas subject to heavy agricultural and urban development (Wissmar et al. 1994). Reduced summer stream flows, impaired water quality, and reduced habitat complexity are common problems. Migratory habitat quality in this area has been severely affected by the development and operation of the dams and reservoirs of the Federal Columbia River Power System.
Upper Willamette River Chinook salmon	9/02/05 70 FR 52630	Critical habitat encompasses 10 subbasins in Oregon containing 56 occupied watersheds, as well as the lower Willamette/Columbia River rearing/migration corridor. Most HUC5 watersheds with PCEs for salmon are in fair-to-poor or fair-to-good condition. However, most of these watersheds have some, or high, potential for improvement. Watersheds are in good to excellent condition with no potential for improvement only in the upper McKenzie River and its tributaries (NMFS 2005). We rated conservation value of HUC5 watersheds as high for 22 watersheds, medium for 16 watersheds, and low for 18 watersheds.
Snake River fall-run Chinook salmon	10/25/99 64 FR 57399	Critical habitat consists of river reaches of the Columbia, Snake, and Salmon rivers, and all tributaries of the Snake and Salmon rivers presently or historically accessible to this ESU (except reaches above impassable natural falls, and Dworshak and Hells Canyon dams). Habitat quality in tributary streams varies from excellent in wilderness and roadless areas, to poor in areas subject to heavy agricultural and urban development (Wissmar et al. 1994). Reduced summer stream flows, impaired water quality, and reduced habitat complexity are common problems. Migratory habitat quality in this area has been severely affected by the development and operation of the dams and reservoirs of the Federal Columbia River Power System.
Columbia River chum salmon	9/02/05 70 FR 52630	Critical habitat encompasses six subbasins in Oregon and Washington containing 19 occupied watersheds, as well as the lower Columbia River rearing/migration corridor. Most HUC5 watersheds with PCEs for salmon are in fair-to-poor or fair-to-good condition (NMFS 2005). However, most of these watersheds have some or a high potential for improvement. We rated conservation value of HUC5 watersheds as high for 16 watersheds, and medium for three watersheds.

Species	Designation Date and Federal Register Citation	Critical Habitat Status Summary
Lower Columbia River coho salmon	2/24/16 81 FR 9252	Critical habitat encompasses 10 subbasins in Oregon and Washington containing 55 occupied watersheds, as well as the lower Columbia River and estuary rearing/migration corridor. Most HUC5 watersheds with PCEs for salmon are in fair-to-poor or fair-to-good condition (NMFS 2005). However, most of these watersheds have some or a high potential for improvement. We rated conservation value of HUC5 watersheds as high for 34 watersheds, medium for 18 watersheds, and low for three watersheds.
Snake River sockeye salmon	10/25/99 64 FR 57399	Critical habitat consists of river reaches of the Columbia, Snake, and Salmon rivers; Alturas Lake Creek; Valley Creek; and Stanley, Redfish, Yellow Belly, Pettit and Alturas lakes (including their inlet and outlet creeks). Water quality in all five lakes generally is adequate for juvenile sockeye salmon, although zooplankton numbers vary considerably. Some reaches of the Salmon River and tributaries exhibit temporary elevated water temperatures and sediment loads that could restrict sockeye salmon production and survival (NMFS 2015b). Migratory habitat quality in this area has been severely affected by the development and operation of the dams and reservoirs of the Federal Columbia River Power System.
Upper Columbia River steelhead	9/02/05 70 FR 52630	Critical habitat encompasses 10 subbasins in Washington containing 31 occupied watersheds, as well as the Columbia River rearing/migration corridor. Most HUC5 watersheds with PCEs for salmon are in fair-to-poor or fair-to-good condition (NMFS 2005). However, most of these watersheds have some or a high potential for improvement. We rated conservation value of HUC5 watersheds as high for 20 watersheds, medium for eight watersheds, and low for three watersheds.
Lower Columbia River steelhead	9/02/05 70 FR 52630	Critical habitat encompasses nine subbasins in Oregon and Washington containing 41 occupied watersheds, as well as the lower Columbia River rearing/migration corridor. Most HUC5 watersheds with PCEs for salmon are in fair-to-poor or fair-to-good condition (NMFS 2005). However, most of these watersheds have some or a high potential for improvement. We rated conservation value of HUC5 watersheds as high for 28 watersheds, medium for 11 watersheds, and low for two watersheds.
Upper Willamette River steelhead	9/02/05 70 FR 52630	Critical habitat encompasses seven subbasins in Oregon containing 34 occupied watersheds, as well as the lower Willamette/Columbia River rearing/migration corridor. Most HUC5 watersheds with PCEs for salmon are in fair-to-poor or fair-to-good condition (NMFS 2005). However, most of these watersheds have some or a high potential for improvement. Watersheds are in good to excellent condition with no potential for improvement only in the upper McKenzie River and its tributaries (NMFS 2005). We rated conservation value of HUC5 watersheds as high for 25 watersheds, medium for 6 watersheds, and low for 3 watersheds.
Middle Columbia River steelhead	9/02/05 70 FR 52630	Critical habitat encompasses 15 subbasins in Oregon and Washington containing 111 occupied watersheds, as well as the Columbia River rearing/migration corridor. Most HUC5 watersheds with PCEs for salmon are in fair-to-poor or fair-to-good condition (NMFS 2005). However, most of these watersheds have some or a high potential for improvement. We rated conservation value of occupied HUC5 watersheds as high for 80 watersheds, medium for 24 watersheds, and low for 9 watersheds.
Snake River basin steelhead	9/02/05 70 FR 52630	Critical habitat encompasses 25 subbasins in Oregon, Washington, and Idaho. Habitat quality in tributary streams varies from excellent in wilderness and roadless areas, to poor in areas subject to heavy agricultural and urban development (Wissmar et al. 1994). Reduced summer stream flows, impaired water quality, and reduced habitat complexity are common problems. Migratory habitat quality in this area has been severely affected by the development and operation of the dams and reservoirs of the Federal Columbia River Power System.

Species	Designation Date and Federal Register Citation	Critical Habitat Status Summary
Southern DPS of green sturgeon	10/09/09 74 FR 52300	Critical habitat has been designated in coastal U.S. marine waters within 60 fathoms depth from Monterey Bay, California (including Monterey Bay), north to Cape Flattery, Washington, including the Strait of Juan de Fuca, Washington, to its United States boundary; the Sacramento River, lower Feather River, and lower Yuba River in California; the Sacramento-San Joaquin Delta and Suisun, San Pablo, and San Francisco bays in California; tidally influenced areas of the Columbia River estuary from the mouth upstream to river mile 46; and certain coastal bays and estuaries in California (Humboldt Bay), Oregon (Coos Bay, Winchester Bay, Yaquina Bay, and Nehalem Bay), and Washington (Willapa Bay and Grays Harbor), including, but not limited to, areas upstream to the head of tide in various streams that drain into the bays, as listed in Table 1 in USDC (2009). The CHRT identified several activities that threaten the PCEs in coastal bays and estuaries and necessitate the need for special management considerations or protection. The application of pesticides is likely to adversely affect prey resources and water quality within the bays and estuaries, as well as the growth and reproductive health of Southern DPS green sturgeon through bioaccumulation. Other activities of concern include those that disturb bottom substrates, adversely affect prey resources, or degrade water quality through re-suspension of contaminated sediments. Of particular concern are activities that affect prey resources. Prey resources are affected by: commercial shipping and activities generating point source pollution and non-point source pollution that discharge contaminants and result in bioaccumulation of contaminants in green sturgeon; disposal of dredged materials that bury prey resources; and bottom trawl fisheries that disturb the bottom (but result in beneficial or adverse effects on prey resources for green sturgeon).
Southern DPS of eulachon	10/20/11 76 FR 65324	Critical habitat for eulachon includes portions of 16 rivers and streams in California, Oregon, and Washington. All of these areas are designated as migration and spawning habitat for this species. In Oregon, we designated 24.2 miles of the lower Umpqua River, 12.4 miles of the lower Sandy River, and 0.2 miles of Tenmile Creek. We also designated the mainstem Columbia River from the mouth to the base of Bonneville Dam, a distance of 143.2 miles. Dams and water diversions are moderate threats to eulachon in the Columbia and Klamath rivers where hydropower generation and flood control are major activities. Degraded water quality is common in some areas occupied by southern DPS eulachon. In the Columbia and Klamath river basins, large-scale impoundment of water has increased winter water temperatures, potentially altering the water temperature during eulachon spawning periods. Numerous chemical contaminants are also present in spawning rivers, but the exact effect these compounds have on spawning and egg development is unknown. Dredging is a low to moderate threat to eulachon in the Columbia River. Dredging during eulachon spawning would be particularly detrimental.

2.3 Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The proposed project is located at 12500 NW Marina Way, Portland, Oregon, where the Multnomah Channel diverges from the mainstem Willamette River at approximately RM 3.3. For this consultation, the action area includes the streambeds, streambanks, riparian areas, and upland areas within the proposed project area. For this project, the action area also includes the effects of stormwater runoff, which extends downstream of the project area (including the Columbia River to the confluence with the Pacific Ocean).

2.4 Environmental Baseline

The "environmental baseline" includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

The Willamette River watershed covers approximately 11,500 square miles in northwest Oregon between the Coast and Cascade mountain ranges. The river travels 187 miles from its headwaters to its confluence with the Columbia River. Precipitation occurs primarily in the fall, winter, and spring, with little rainfall during June, July, and August. The lowest river flow occurs during late summer. The numerous dams on the Willamette River and its tributary systems largely regulate flows in the mainstem Willamette River.

The lower Willamette River sub-basin is located in a predominantly urban setting of the greater Portland metropolitan region. Habitat conditions within the lower Willamette River are highly degraded. The streambanks have been channelized, off-channel areas developed, many tributaries piped, and the river has been disconnected from its floodplain as the lower valley was urbanized. Silt loading to the lower Willamette River has increased over historic levels due to logging, agriculture, road building, and urban and suburban development within the watershed.

The lower Willamette River sub-basin has been heavily modified in the project vicinity. The channel has been dredged to accommodate commercial shipping, while docks, piers, bulkheads (seawalls), and rock revetment (riprap) have replaced much of the natural bank habitat. Pollution exists from industrial sources, especially in the river sediments. A section of the Portland Harbor, from approximately RM 1.9 to 11.81, was identified as a U.S. Environmental Protection Agency (EPA) Superfund site in 2000. Primary contaminants include mercury, PCBs, PAHs, dioxins, furans, and pesticides (EPA, 2000).

The Multnomah Channel is a branch of the Willamette River starting approximately 15 miles downstream from the Willamette River's convergence with the Columbia River, and is approximately 20 miles long. The Multnomah Channel defines the western side of Sauvie Island before it too joins the Columbia near the city of St. Helens, Oregon.

The Multnomah Channel has been channelized and now flows through an artificially straight stretch before reaching its confluence with the Columbia River at St. Helens. Portions of the channel have hard rock bank protection to protect adjacent farmlands, roads, and utilities. The bottom end of the channel at Scappoose Bay is relatively undiked; however, the Sauvie Island side of the channel has been extensively diked. These modifications have resulted in the simplification of in-channel habitat, disconnection of the channel from its floodplain, and loss of off-channel rearing habitat and wetland areas along the margins of the river. Over-water structures have increased shading, thereby providing an advantage to predatory (northern pikeminnow, smallmouth bass, largemouth bass and walleye) fish. Native aquatic vegetation and shallow water habitat has also been reduced or eliminated in the Multnomah Channel, reducing the amount of refugia available to juvenile fish. Hard bank protection has resulted in reduced benthic invertebrate habitat, an important prey source for ESA-listed juvenile salmon and steelhead.

The condition of habitat within the action area is generally degraded (Trustee Council 2010). Lack of habitat complexity and poor water quality have led to reduced survival for juvenile and adult salmon and steelhead migrating through the action area. The introduction of non-native predators has also reduced survival. Juvenile fish rearing in the action area find semi-functional habitat, but poor water quality and lack of forage impede growth and reduce survival. It is likely that habitat degradation has reduced the quantity of food available for these fish.

In addition, organochlorinated pesticides (e.g., DDE, DDT) and PAHs contaminants are currently present at the site. Excavation and grading at the site will result in the removal of approximately 160,000 cubic yards of material and the exposure of underlying soils that will become the new surface of the restored site. The SEF completed by AECOM in 2015 concluded that the fill material proposed for excavation was not suitable for unconfined, in-water placement; however, the beneficial re-use and permanent placement of excavated soil in Sub Area 2 for upland habitat creation is acceptable and appropriate. Comparison of soil data against DEQ screening criteria found that organochlorinated pesticides and PAHs will be present in new cut surface at concentrations that exceed DEQ screening level criteria. PGE will over-excavate the contaminated sediment by 12-inches in Sub-Areas 1 and 3, and regrade the proposed surface elevation with clean material sourced from offsite.

Despite the poor conditions for anadromous fish, the action area retains its ability to serve as a functional migration corridor. There are no passage barriers and the area has sufficient water quantity to provide fish passage year round. Fish that travel through the area quickly can avoid experiencing effects caused by the degraded baseline. However, fish that linger in the area will experience the adverse effects described above. The overall impact of the baseline conditions is a slight reduction in the abundance and productivity of populations migrating through the action area.

Condition of Critical Habitat PBFs in the Action Area

The NMFS' Critical Habitat Analytical Review Team (CHART) designated the lower Willamette/Columbia River corridor is of "high" conservation value for the watershed and this corridor is highly essential to ESU conservation (NMFS 2005). The CHART noted that this

corridor connects every watershed and population in this ESU with the ocean and is used by rearing/migrating juveniles and migrating adults. The Columbia River estuary is a particularly important area for this ESU as both juveniles and adults make the critical physiological transition between life in freshwater and marine habitats (Marriott *et al*. 2002). Channel modifications; dams; irrigation impoundments and withdrawals; road building and maintenance; river, estuary, and ocean traffic; urbanization; and wetland loss and removal in the watershed were identified by the CHART as needing special management considerations or protection (NMFS 2005).

Critical habitat is designated in the action area for LCR Chinook salmon, UWR Chinook salmon, LCR steelhead, and UWR steelhead, and proposed for LCR coho salmon. The action area supports two PBFs; freshwater rearing and migration corridor. As noted above, the condition of the critical habitat PBFs in the action area is generally poor with most of the physical and biological features impaired. Water quality is poor with water temperature higher than what is ideal for salmonids during summer, elevated levels fecal coliform, and elevated levels of contaminants (PCBs, PAHs, metals, pesticides, dioxins, and furans). There are no passage barriers identified within the action area. Water quantity may be altered from the natural hydrograph due to water withdrawals upstream of the action area. Floodplain connectivity has been reduced due to loss of wetlands and extensive diking.

2.5 Effects of the Action

Under the ESA, “effects of the action” means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.

The proposed action will affect salmonid species considered in this opinion by causing physical, chemical, and biological changes to the environment. These effects include a reduction in water quality from the use of herbicides, a temporary reduction in water quality from increased suspended sediment, a long-term decrease in water quality from stormwater inputs, harassment/displacement from excavation of native material below OHW, and a long-term increase in rearing and foraging habitat from the creation of sub-tidal channels and placement of LWD. Monitoring and sampling of juvenile salmonids will result in harassment/displacement and direct take on individual juvenile salmonids. Harrassment/displacement of juvenile salmonids will occur from snorkel surveys and direct take of individual salmonids will occur from handling during trapping.

Dredging in Sub-Areas 1 and 3 are not expected to result in release of any organochlorinated pesticides or poly aromatic hydrocarbons because PGE has proposes to over-excavate the contaminated sediment by 12-inches, to regrade the proposed surface elevation with clean material sourced from offsite, and to dispose of all dredged materials at an approved upland disposal site.

The detailed discussion of the effects of this action, except for exaction of contaminated materials, is incorporated here by reference from the SLOPES V Restoration opinion (NMFS 2013), SLOPES V STU opinion (NMFS 2014). The referenced opinions include the same effects as this opinion; however, we could not use two programmatic opinions to cover one action. This action has much smaller scale effects compared to those covered in the referenced opinions. Therefore, all effects of the action mentioned above should be small in scale and duration.

2.6 Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Some continuing non-Federal activities are reasonably certain to contribute to climate effects within the action area. However, it is difficult if not impossible to distinguish between the action area's future environmental conditions caused by global climate change that are properly part of the environmental baseline *vs.* cumulative effects. Therefore, all relevant future climate-related environmental conditions in the action area are described in the environmental baseline.

For this restoration action, the cumulative effects are incorporated here by reference from the SLOPES V Restoration opinion (NMFS 2013), SLOPES V STU opinion (NMFS 2014). This action has much smaller scale of cumulative effects compared to those covered in the referenced opinions because the action area in this opinion is much smaller than the references opinions. Therefore, all effects of the action mentioned above should be small in scale and duration.

2.7 Integration and Synthesis

The Integration and Synthesis section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action to the environmental baseline and the cumulative effects, taking into account the status of the species and critical habitat, to formulate the agency's biological opinion as to whether the proposed action is likely to: (1) Reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminishes the value of designated or proposed critical habitat for the conservation of the species.

Individuals of many ESA-listed salmon, and steelhead, use the action area to rear in, and migrate through the action area. The viability of the various populations that comprise the 15 salmon and steelhead species considered in this opinion ranges from extirpated or nearly so to populations that are a low risk for extinction.

Adult upstream migrating ESA-listed salmonids are present primarily from early spring through autumn but upstream migrating fish may be found year-around. Shallow water habitats are an important rearing habitat for juvenile salmon and steelhead, especially for species that spend an

extended amount of time in freshwater. The highest densities of juvenile salmon and steelhead occur in the spring when individuals of all the species may be present, with the lowest densities occurring in the summer and fall. The juvenile fish tend to inhabit shallow waters near the shoreline but have been observed at depths of 20 feet. Some individuals spend little time in shallow water or in the estuary during juvenile migration, although food produced in the shallow waters and estuaries may still be important to the migrating fish.

The action area is designated as critical habitat for the LCR, and UWR ESA-listed salmon and, steelhead. The physical and biological features of salmon and steelhead critical habitat in the action area are freshwater rearing, and adult and juvenile migration corridors.

Information described the environmental baseline in the action area as degraded from the presence of impaired fish passage, floodplain fill, streambank degradation, and degraded riparian conditions. Similarly, it is likely that the environmental baseline is also not meeting the biological requirements of individual fish of ESA-listed species at sites where this restoration project will occur due to one or more impaired aquatic habitat functions related to any of the habitat factors limiting the recovery of the species in that area, but the quality of critical habitat at this sits is likely to be improved due to completion of the restoration project.

Habitat improvement projects are being actively implemented through salmon recovery efforts, the FCRPS, and a combination of Federal, tribal, state and local actions. At the same time population growth and development pressures on aquatic systems are increasing, particularly in the Willamette Valley. The extent to which these trends may further reduce populations, degrade the quality and function of critical habitat, or preclude some restoration actions, is unknown.

Stormwater runoff from the substation will deliver a small amount of pollutants to the Willamette River, and downstream to the Columbia River to the confluence of the Pacific Ocean; however, PGE will treat the stormwater according to the PDCs identified in SLOPES V STU (NMFS 2014) to minimize these effects, and will not appreciably reduce or prevent the increase of abundance or productivity of the populations addressed by this consultation.

Short-term effects of restoration actions on ESA-listed fish and designated critical habitat include effects related to erosion and runoff from the construction site, work area isolation, and the use of herbicides. This project will be implemented using BMPs such that construction impacts will cause only short-term, localized, and minor effects. This restoration project will have short term impacts due to construction, but long-term will contribute to reducing many of the factors limiting the recovery of these species including fish passage, floodplain connectivity and function, channel structure and complexity, and riparian vegetation and bank conditions.

Climate change is likely to affect all species considered in this opinion and their habitat in the program area. These effects are expected to be positive and negative, but are likely to result in a generally negative trend for stream flow and temperature.

As described in the cumulative effects of state and private actions that are reasonably certain to occur within the action area are also variable across the program action area. In urban areas there will be continued population growth, but redevelopment will begin to improve negative baseline

conditions. Agricultural and forestry practices in rural areas will also likely become restorative in nature. Federal efforts to improve aquatic habitat conditions throughout the State of Oregon action area will gradually improve habitat conditions overall.

In summary, the proposed project will result in relatively intense but brief disturbances to a small area, but these disturbances will not appreciably reduce or prevent the increase of abundance or productivity of the populations addressed by this consultation. This is because: (1) Effects from stormwater will be minimal; (2) Effects from construction related activities are short-term and temporary, (3) A very small portion of the total number of fish in any one population will be exposed to the adverse effects of the proposed action, (4) The geographic extent of the adverse effects is small when compared to the size of any watershed where an action will occur or the total area occupied by any of the species affected. Similarly, the proposed project will not affect the diversity of any populations or species because the effects of the action will not impact factors that primarily influence population diversity such as management of hatchery fish or selective harvest practices. Projects that improve fish passage may improve population spatial structure. By contributing to improved habitat conditions that will, over the long term, support populations with higher abundance and productivity, projects completed under the proposed program are consistent with the recovery strategies of increasing productivity and spatial diversity, a critical step toward recovery of these species as whole.

The conservation value of critical habitat within the action area for salmon and steelhead varies by life history strategy, and is higher for species with stream-type histories than for the ocean-type. That is because the latter group is more reliant on shallow-water habitats and small tributaries that are easily affected by a wide range of natural and human disturbances.

For the most part, the conservation value of these critical habitats is high and the proposed project will have minor short-term effects on the quality and function of critical habitat PBFs. The full set of BMPs proposed by PGE will ensure that these short-term effects to PBFs remain minimal. As the restoration project matures over time, habitat conditions may improve and critical habitat will be able to better serve its intended conservation role, supporting viable populations of ESA-listed salmon, and steelhead.

Thus, the proposed program is not likely to result in appreciable reductions in the likelihood of both survival and recovery of the species in the wild by reducing its numbers, reproduction, or distribution; or reduce the value of designated or proposed critical habitat for the conservation of the species.

2.8 Conclusion

After reviewing the current status of the listed species, the environmental baseline within the action area, the effects of the proposed action, any effects of interrelated and interdependent actions, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of LCR Chinook salmon, UCR spring-run Chinook salmon, SR spring/summer run Chinook salmon, SR fall-run Chinook salmon, UWR Chinook salmon, CR chum salmon, LCR coho salmon, SR sockeye salmon, LCR steelhead, MCR steelhead, UCR steelhead, SRB steelhead, UWR steelhead, southern DPS of green sturgeon, and

southern DPS of eulachon, or result in the destruction or adverse modification of designated critical habitats.

2.9 Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). “Incidental take” is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

2.9.1 Amount or Extent of Take

In the biological opinion, NMFS determined that incidental take is reasonably certain to occur as follows:

Activities necessary to construct the project and monitor juvenile salmonids will occur within the active channel of the Willamette River. The in-water work will occur when all species of juvenile salmonids could potentially be present during downstream migration. LCR Chinook salmon, CR chum salmon, LCR coho salmon, LCR steelhead, and UWR steelhead adults could potentially be present during upstream migration. It is reasonably certain that some listed salmonids will be present in the action area during the in-water work and at times when herbicides will be applied. Adverse effects to juveniles will include harassment and delayed downstream migration. Adverse effects to adults will include harassment and delayed upstream migration. These effects are reasonably certain to result in harassment of adults and juveniles, and harm of adults and juveniles (avoidance behaviors) that will likely lead to injury or death of a few individuals.

The use of herbicides will occur annually within the floodplain and along the water’s edge of the newly created side channels. The herbicide application will occur anytime throughout the year and could affect all species of rearing juvenile salmonids. Adult salmonids, will likely be exposed to herbicides at levels that would disrupt normal behavior. The effects are reasonably certain to result in incidental take/harassment of juvenile salmonids that will likely lead to injury of a few individuals.

Stormwater runoff will occur year-round during periods of rain, generally October-May. Because the effects of stormwater runoff reach the confluence of the Columbia River, and the Pacific Ocean, all species of rearing juvenile salmonids, and adults considered in this opinion could be

affected. The effects are reasonably certain to result in incidental take of juveniles and adults that will likely lead to injury of a few individuals.

The distribution and abundance of fish that occur within an action area are affected by habitat quality, competition, predation, and the interaction of processes that influence genetic, population, and environmental characteristics. These biotic and environmental processes interact in ways that may be random or directional, and may operate across far broader temporal and spatial scales than are affected by the proposed action. Thus, the distribution and abundance of fish within the action area cannot be attributed entirely to habitat conditions, nor can NMFS precisely predict the number of fish that are reasonably certain to be injured or killed if their habitat is modified or degraded by the proposed action. In such circumstances, NMFS cannot provide an amount of take that would be caused by some elements of the proposed action, including in-water work, herbicide application, and stormwater runoff.

The amount of take for juvenile salmonid monitoring is based on sampling data (Teel *et al.* 2009) conducted on off-channel sites on and around Sauvie Island. Based on these data, juvenile salmonid monitoring is reasonable certain to capture or injure up to 31 juvenile Chinook salmon, 31 juvenile coho salmon, and 31 juvenile steelhead as a single occurrence within the 10 year monitoring period. Approximately one percent of the fish handled or captured will likely die (one fish per species). Seining, as a method of monitoring, will cease once any juveniles are captured. If this amount of take is exceeded, the reinititation provision of this opinion will apply.

The best available indicator for the extent of take caused by in-water construction is the extent of suspended sediment plumes. This feature best integrates the likely take pathway associated with in and near water construction, is proportional to the anticipated amount of take, and is the most practical and feasible indicator to measure. Thus, the extent of take indicator that will be used as a reinitiation trigger for this consultation is increased suspended sediment from construction activities with suspended sediment plumes 1,000 feet from the boundary of construction activities at 10% over the background level.

The best available indicator for the extent of take for herbicide application is the number of acres treated per year. This feature best integrates the likely take pathway associated with this action, is proportional to the anticipated amount of take, and is the most practical and feasible indicator to measure. Thus, the extent of take indicator that will be used as a reinitiation trigger for this consultation is herbicide application on a maximum of 11 acres per year.

The available indicator for the extent of take for stormwater runoff is the combination of stormwater facility inspection, maintenance, and operation standards because those variables will determine whether the stormwater treatment system continues to reduce the concentration of pollutants in stormwater runoff as designed, and thus reflect the amount of incidental take analyzed in the opinion (Claytor and Brown 1996; Santa Clara Valley Urban Runoff Pollution Prevention Program 1999; Santa Clara Valley Urban Runoff Pollution Prevention Program 2001):

1. Inspection of the stormwater facility will occur quarterly for the first two years, and twice per year, thereafter.

2. Within 48 hours of major rainfall events (defined as more than one inch of rain over a 24-hour period).All structural components, including inlets and outlets, must freely convey stormwater.
3. Maintenance activities will include the following:
    a. Remove sediment, debris, and blockages from riprap outfall.
    b. Replace or repair liner as needed.
    c. Replant per original planting plan, or substitute from the plant list.
    d. Maintain grass height of 6-9 inches. Trim to allow sight lines and foot traffic, also to ensure inlets and outlets freely convey stormwater into and out of the facility.
    e. Manually remove weeds.
    f. Sediment more than 4 inches will deep must be removed.
    g. Stabilize 3:1 slopes/banks with plantings from the original planting plan or plant list.

2.9.2 Effect of the Take

In the biological opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

2.8.3 Reasonable and Prudent Measures

"Reasonable and prudent measures" are nondiscretionary measures to minimize the amount or extent of incidental take (50 CFR 402.02).

The following measures are necessary and appropriate to minimize the impact of incidental take of listed species from the proposed action:
The Corps shall:

1. Minimize incidental take from construction, operation, and maintenance of the project by applying conditions to the proposed action that avoid or minimize adverse effects to water quality and the ecology of aquatic systems.
2. Ensure completion of a monitoring and reporting program to confirm that the take exemption for the proposed action is not exceeded, and that the terms and conditions in this incidental take statement are effective in minimizing incidental take.

2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and the Corps or any applicant must comply with them in order to implement the reasonable and prudent measures (50 CFR 402.14). The Corps or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this incidental take statement (50 CFR 402.14). If the following terms and conditions are not complied with, the protective coverage of section 7(o)(2) will likely lapse.

1. To implement reasonable and prudent measure #1, the Corps shall ensure that:
   a. Work Window. To minimize effects to juvenile salmonids, construction shall be limited to the in-water work window of July 1-October 31.

2. To implement reasonable and prudent measure #2, the Corps shall ensure that:
   a. Turbidity. Monitoring shall be conducted and recorded as described below. Monitoring shall occur each day during daylight hours when in-water work is being conducted.
      i. Representative background point. An observation must be taken every 2 hours at a relatively undisturbed area at least 600 feet upcurrent from in-water disturbance to establish background turbidity levels for each monitoring cycle. Background turbidity, location, time, and tidal stage must be recorded prior to monitoring downcurrent.
      ii. Compliance point. Monitoring shall occur every 2 hours approximately 1,000 feet downcurrent from the point of disturbance and be compared against the background observation. The turbidity, location, time, and tidal stage must be recorded for each sample.
      iii. Compliance. Results from the compliance points should be compared to the background levels taken during that monitoring interval. Turbidity may not exceed an increase of 10% above background at the compliance point during construction.
      iv. Exceedance. If an exceedance occurs, the applicant must modify the activity and continue to monitor every 2 hours. If an exceedance over the background level continues after the second monitoring interval, the activity must stop until the turbidity levels return to background. If the exceedances continue, then work must be stopped and NMFS notified so that revisions to the BMPs can be evaluated.
      v. If the weather conditions are unsuitable for monitoring (heavy fog, ice/snow, excessive winds, rough water, *etc*.), then operations must cease until conditions are suitable for monitoring.
      vi. Copies of daily logs for turbidity monitoring shall be available to NMFS upon request.
   b. Herbicide Application. Report the number of acres of herbicide application annually, and herbicides use, for two years.
   c. Stormwater Facility. Report the monitoring and maintenance activities for two years.
   d. Juvenile Salmonid Monitoring. Report the following data for juvenile fish sampling:
      i. Means of fish monitoring.
      ii. Number of ESA-listed salmonids observed or captured.
      iii. Condition of ESA-listed salmonids released.
      iv. Any incidence of observed injury or mortality.
   e. Reporting. The applicant reports all monitoring items, including turbidity observations to NMFS within 60 days of the close of any work window that had in-water work within it. Any exceedance of take covered by this opinion must be

reported to NMFS immediately. The report will include a discussion of implementation of the terms and conditions in #1, above.

f. The applicant will submit monitoring reports to:

National Marine Fisheries Service
Oregon Washington Coastal Office
Attn: WCR-2018-10175
1201 NE Lloyd Blvd, Suite 1100
Portland, OR 97232-2778

2.10 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02).

NMFS offers the following conservation recommendation:

- Minimize the use of herbicides for non-native and invasive vegetation control by exploring alternative methods of vegetation control.

Please notify NMFS if the Corps carries out this recommendation so that we will be kept informed of actions that are intended to improve the conservation of listed species or their designated critical habitats.

2.11 Reinitiation of Consultation

This concludes formal consultation for PGE Harborton Restoration project.

As 50 CFR 402.16 states, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental taking specified in the ITS is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an effect on the listed species or critical habitat that was not considered in this opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT RESPONSE

Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. The MSA (section 3) defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.”

Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH.

This analysis is based, in part, on the EFH assessment provided by the Corps and descriptions of EFH for Pacific Coast salmon (PFMC 2014) contained in the fishery management plans developed by the PFMC and approved by the Secretary of Commerce.

3.1 Essential Fish Habitat Affected by the Project

The proposed action and action area for this consultation are described in the Introduction to this document. The action area includes areas designated as EFH for various life-history stages of Chinook and coho salmon as identified in the Fishery Management Plan for Pacific coast salmon (PFMC 2014).

3.2 Adverse Effects on Essential Fish Habitat

Based on information provided by the action agency and the analysis of effects presented in the ESA portion of this document, NMFS concludes that proposed action will have adverse effects on EFH designated for Chinook and coho salmon. Adverse effects of the proposed action will include sub-lethal effects from exposure to contaminants to juvenile and adult Chinook and coho salmon, harassment and increased suspended sediment during construction on juvenile and adult Chinook and coho salmon, and delayed upstream migration of adult Chinook and coho salmon.

3.3 Essential Fish Habitat Conservation Recommendations

Fully implementing these EFH conservation recommendations would protect, by avoiding or minimizing the adverse effects described in section 3.2, above, approximately 80 acres of designated EFH for Pacific Coast salmon.

1. Follow term and condition 1 as presented in the ESA portion of this document to minimize adverse effects to water quality and the ecology of aquatic systems from the construction, operation, and maintenance of the project.
2. Follow term and condition 2 as presented in the ESA portion of this document to minimize adverse effects to water quality and the ecology of aquatic systems from project-related activities (general construction and in-water work).
3. Implement the conservation recommendation presented as part of the ESA portion of this document.

3.4 Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, the Corps must provide a detailed response in writing to NMFS within 30 days after receiving an EFH Conservation Recommendation. Such a response must be provided at least 10 days prior to final approval of the action if the response is inconsistent with any of NMFS' EFH Conservation Recommendations unless NMFS and the Federal agency have agreed to use alternative time frames for the Federal agency response. The response must include a description of measures proposed by the agency for avoiding, minimizing, mitigating, or otherwise offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the Conservation Recommendations, the Federal agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects (50 CFR 600.920(k)(1)).

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we ask that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

3.5 Supplemental Consultation

The Corps 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 (50 CFR 600.920(l)).

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The Data Quality Act (DQA) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components, documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion are The Corps. Other interested users could include PGE. Individual copies of this opinion were provided to the Corps and PGE. The format and naming adheres to conventional standards for style.

4.2 Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security

of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

4.3 Objectivity

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References section. The analyses in this opinion and EFH consultation, contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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