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 97232-1274

Refer to NMFS No:
WCRO-2019-00214

March 13, 2020

Michelle Walker
Chief, Regulatory Branch
U.S. Army Corps of Engineers, Seattle District
Regulatory Branch CENSW-OD-RG
P.O. Box 3755
Seattle, Washington 98124-3755

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Ocean Properties LLC Maintenance Dredge Project in Sandy Point, Washington (Corps No. NWS-2016-188)

Dear Ms. Walker:

Thank you for your letter on April 9, 2019, 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 the proposed Ocean Properties LLC Maintenance Dredge Project in Sandy Point, Washington. This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402, 84 FR 45016).

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.

The enclosed document contains the biological opinion (Opinion) prepared by NMFS pursuant to section 7(a)(2) of the ESA on the effects of the proposed action. In this Opinion, NMFS concludes that the proposed action is not likely to jeopardize the continued existence of Puget Sound (PS) Chinook salmon, PS steelhead, Puget Sound/Georgia Basin (PS/GB) bocaccio, PS/GB yelloweye rockfish, humpback whales, and Southern Resident killer whales (SRKW). NMFS also concludes that the proposed action is not likely to result in the destruction or adverse modification of designated critical habitat for PS Chinook salmon, PS/GB bocaccio, and SRKW.

As required by section 7 of the ESA, we are providing an incidental take statement with the opinion. The incidental take statement describes reasonable and prudent measures we consider necessary or appropriate to minimize incidental take associated with this action. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements that the United States Army Corps of Engineers (Corps) and any person who performs the action 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 take prohibition.

NMFS also reviewed the likely effects of the proposed action on essential fish habitat (EFH), pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1855(b)), and concluded that the action would adversely affect the EFH of Pacific Coast groundfish, coastal pelagic species, and Pacific Coast salmon. Therefore, we have included the results of that review in Section 3 of this document.

Please contact Melaina Wright, consulting biologist at the Oregon Washington Coastal Office (OWCO) in Seattle, at melaina.wright@noaa.gov or 206-526-6155 if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

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

cc: Randel J. Perry, Corps
Juliana Houghton, Corps

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

Ocean Properties LLC Maintenance Dredge Project
Whatcom County, Washington (Corps No. NWS-2016-188)

NMFS Consultation Number: WCRO-2019-00214

Action Agency: United States Army Corps of Engineers, Seattle District

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely To Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*)	Threatened	Yes	No	Yes	No
Puget Sound steelhead (*O. mykiss*)	Threatened	Yes	No	NA	NA
Puget Sound/ Georgia Basin bocaccio (*S. paucispinis*)	Endangered	Yes	No	Yes	No
Puget Sound/ Georgia Basin yelloweye rockfish (*Sebastes ruberrimus*)	Threatened	Yes	No	NA	NA
Southern Resident killer whale (*Orcinus orca*)	Endangered	No	No	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
Pacific Coast Groundfish	Yes	Yes
Coastal Pelagic Species	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: March 13, 2020

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ºC – Degrees Celsius
ºF – Degrees Fahrenheit
BA – Biological Assessment
CFR – Code of Federal Regulations
Corps – United States Army Corps of Engineers
dB – Decibels
DNR – Washington State Department of Natural Resources
DO – Dissolved Oxygen
DPS – Distinct Population Segment
DQA – Data Quality Act
Ecology – Washington State Department of Ecology
EF – Essential Features
EFH – Essential Fish Habitat
ESA – Endangered Species Act
ESU – Evolutionarily Significant Unit
FR – Federal Register
HAPC – Habitat Area of Particular Concern
IPCC – Intergovernmental Panel on Climate Change
ISAB – Independent Scientific Advisory Board
ITS – Incidental Take Statement
MFR – Memorandum for the Record
MFS – Memorandum for the Services
Mg/kg – Milligrams per kilogram of sediment
mg/L – Milligrams per Liter
MHW – Mean high water
MHHW – Mean Higher High Water Line
MLLW – Mean Lower Low Water Line
MPG – Major Population Group
MSA – Magnuson-Stevens Fishery Conservation and Management Act
NLAA – Not Likely to Adversely Affect
NMFS – National Marine Fisheries Service
NOAA – National Oceanic and Atmospheric Administration
NWFSC – Northwest Fisheries Science Center
Opinion – Biological Opinion

OWCO – Oregon Washington Coastal Office
PAH – Polycyclic Aromatic Hydrocarbon
PBF – Physical and Biological Feature
PCB – Polychlorinated Biphenyl
PFMC – Pacific Fishery Management Council
PCE – Primary Constituent Element
PS – Puget Sound
PS/GB – Puget Sound/Georgia Basin
RMS – Root Mean Square Sound Pressure Level
ROV – Remotely Operated Underwater Vehicle
RPA – Reasonable and Prudent Alternative
RPM – Reasonable and Prudent Measure
SAV – Submerged Aquatic Vegetation
SEL – Sound Exposure Level
SEL_{cum} – Cumulative Sound Exposure Level
SRKW – Southern Resident Killer Whale
SSDC – Shared Strategy Development Committee
TRT – Technical Recovery Team
TSS – Total Suspended Solids
USC – United States Code
VSP – Viable Salmon Population
WCR – West Coast Region
WDFW – Washington State Department of Fish and Wildlife

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, as amended. 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).). The document will be available within two weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. A complete record of this consultation is on file at the Oregon Washington Coastal Area Office.

1.2. Consultation History

On December 20, 2018, NMFS received a request to initiate ESA section 7 consultation from the United States Army Corps of Engineers (Corps). On January 8, 2019, NMFS received the initiation package from the Corps. The initiation package included an ESA section 7 consultation initiation letter, Memorandum for the Services (MFS), biological assessment (BA), Memorandum for the Record (MFR) for the Corps' review of the BA, sediment sample analysis, forage fish spawning map, and a set of project drawings. The Corps determined the action may affect but is not likely to adversely affect (NLAA) Puget Sound (PS) Chinook salmon and their critical habitat, PS steelhead, and Southern Resident killer whales (SRKW) and their critical habitat. They determined there would be no effect on Puget Sound/Georgia Basin (PS/GB) yelloweye rockfish, and PS/GB bocaccio and their critical habitat. They also determined that the project would not adversely affect essential fish habitat (EFH).

On January 23, 2019, NMFS requested the Corps adjust the in-water work window to reduce impacts to juvenile salmonids. On February 1, 2019, the Corps provided their effect determination for humpback whales. The Corps determined there would be no effect on humpback whales. On February 5, 2019, the Corps agreed to change the start of the in-water work window from August 1 to November 1.

On February 5, 2019, the Corps notified NMFS of a change to the project description. The project would now involve placing dredged material along the southern edge of the South Cape property to create a storm berm. On February 14, 2019, the Corps provided an estimate of the volume of sediment and the area across which the dredged material would be placed. On February 19, 2019, the Corps provided information on the exact volume of dredged material that would be placed, where it would be placed, the diameter of the material, and sediment transport. The Corps also provided drawings of the proposed storm berm. On February 25, 2019, NMFS asked the Corps where the remaining dredged material would be transported.

On March 14, 2019, we informed the Corps that we could not concur with all of their effects determinations. On April 9, 2019, the Corps requested formal consultation with NMFS and provided information regarding where the dredged material would be transported.

On July 8, 2019, NMFS requested additional information about the area of eelgrass within the dredge prism. The Corps provided that information on the same date. On July 30, 2019, NMFS requested information on the duration of dredging, the expected extent of the turbidity plume, and how many vessels use the entrance channel per day. The Corps provided this information on August 13, 2019, August 26, 2019, and September 4, 2019.

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). Federal action means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a Federal Agency (50 CFR 600.910).

The Corps is proposing to authorize the Ocean Properties Maintenance Dredge Project at Sandy Point, Whatcom County, Washington (48.788000, -122.709000; **Figure 1**, **Figure 2**). Project activities include maintenance dredging 29,423 cubic yards of accumulated sediment and gravel at the entrance of Sandy Point Harbor, and the creation of a berm for storm erosion protection on a property within the harbor (Figure 3, Figure 4). We considered whether or not the proposed action would cause any other activities and determined that it would cause the following activities: vessel activity associated with the continued existence of the manmade entrance channel. Vessel activity is a consequence caused by the proposed action, because it would not occur but for the proposed action and is reasonably certain to occur.

The entrance channel is currently -3 feet mean lower low water (MLLW) and 108 feet wide at mean high water (MHW). Two gravel bars perpendicular to the entrance reduce the depth to -1 foot MLLW. The applicant will dredge to a maximum depth of -10 feet MLLW and a width of 207 feet in an area of 89,085 square feet. They will dredge up to 6 hours per day for 30 days between November 1 and January 31 when ESA-listed species are least likely to be present. They will use track-mounted excavators below MHW during low tide, and ensure that only the arm and bucket of the excavator will enter the water during work. They will begin excavation inside the harbor entrance and move toward the outside to minimize increased turbidity outside the harbor. When dredging is complete, the applicant will return driftwood to its original location, and grade the work area to pre-project conditions.

The applicant will temporarily stockpile dredge material landward of MHW. They will install silt fences and berms to contain dredge material in the stockpile areas and prevent material from entering the water. They will use a rubber-wheeled front-end loader to transfer dredge material to a barge anchored by ecology blocks. They will then transport approximately 5,000 cubic yards of dredged material to a temporary stockpile site across the harbor. They will load the remaining dredge material on a truck and transport it to an inland disposal site. They will use the 5,000 cubic yards of dredge material at the stockpile site for storm erosion protection. They will place the dredged material landward of mean higher high water (MHHW) across 1.15 acres on the South Cape property (Figure 4). Fueling will take place within an impervious containment area landward of the MHHW line. They will use biodegradable hydraulic fluid in all heavy equipment operating on the shoreline, transport barge, or over the water.

Prior to dredging, the applicant will conduct an eelgrass macroalgae survey within the dredge area and within a 25-foot buffer area following Washington State Department of Fish and Wildlife (WDFW) guidelines. They will not place barge anchors, spuds, and cables in the mapped eelgrass bed near the harbor entrance. They will move barges with minimum power in order to reduce propeller scour of submerged aquatic vegetation (SAV) outside of the dredge area. They will not direct propwash toward mapped eelgrass beds near the project area. Prior to dredging, the applicant will conduct a forage fish spawning survey following WDFW guidelines. If eggs are present, they will postpone dredge operations until spawning and incubation activity have not been observed by subsequent surveys conducted at two-week intervals.

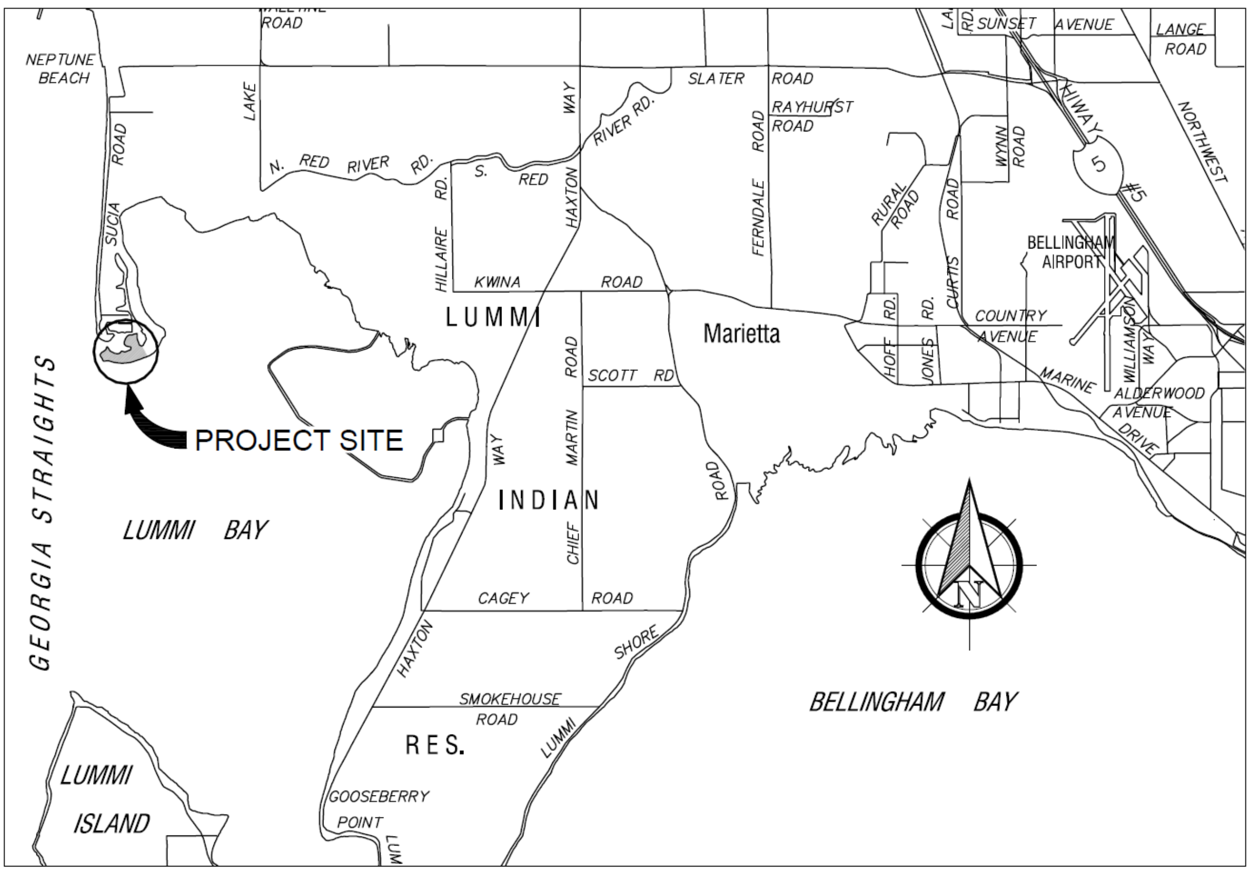

Figure 1. Project site location in Sandy Point Harbor, Whatcom County, Washington.

Figure 2. Aerial view of project site and vicinity.

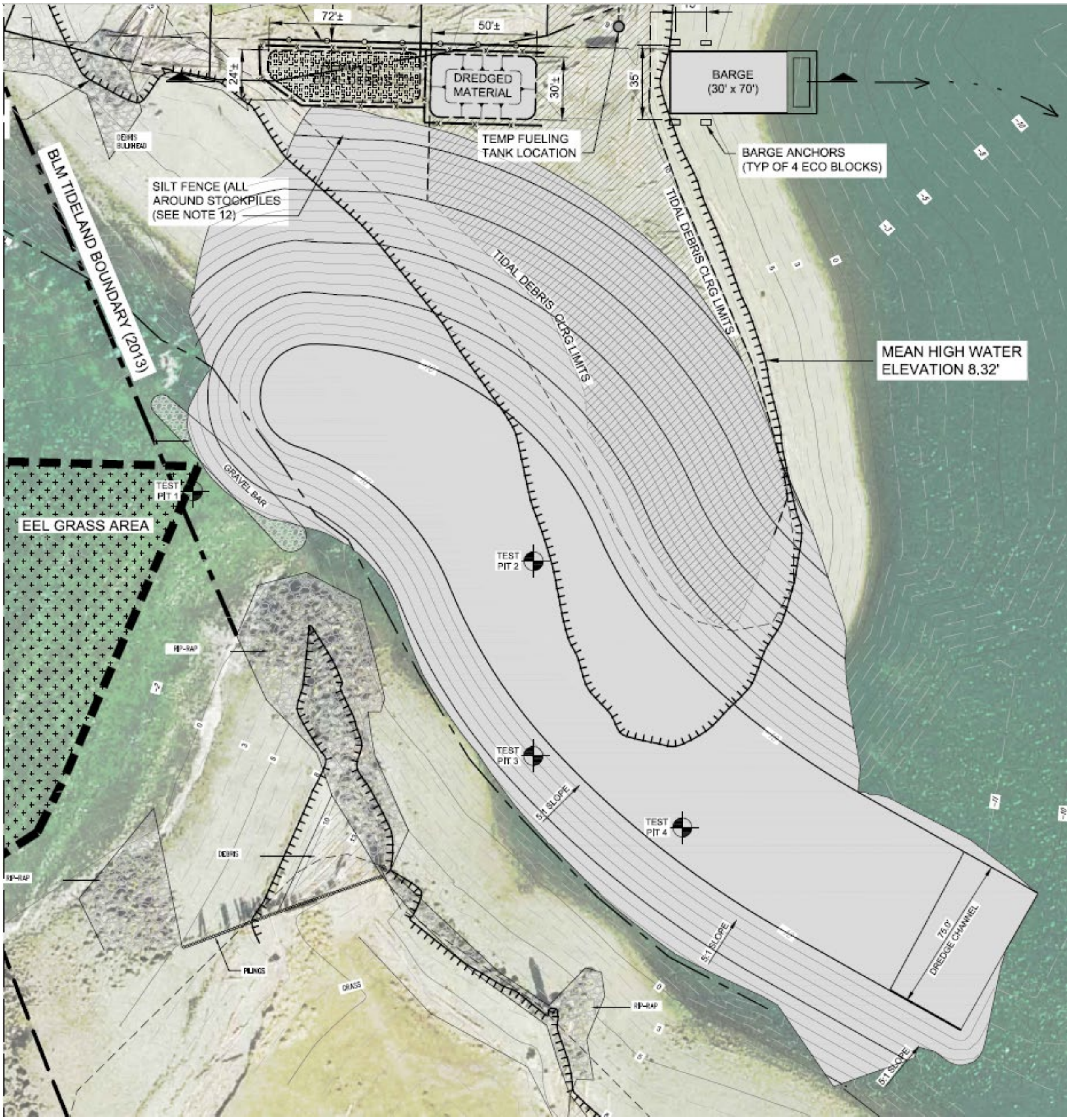

Figure 3. Location of dredge channel, stockpile area, barge, and eelgrass bed.

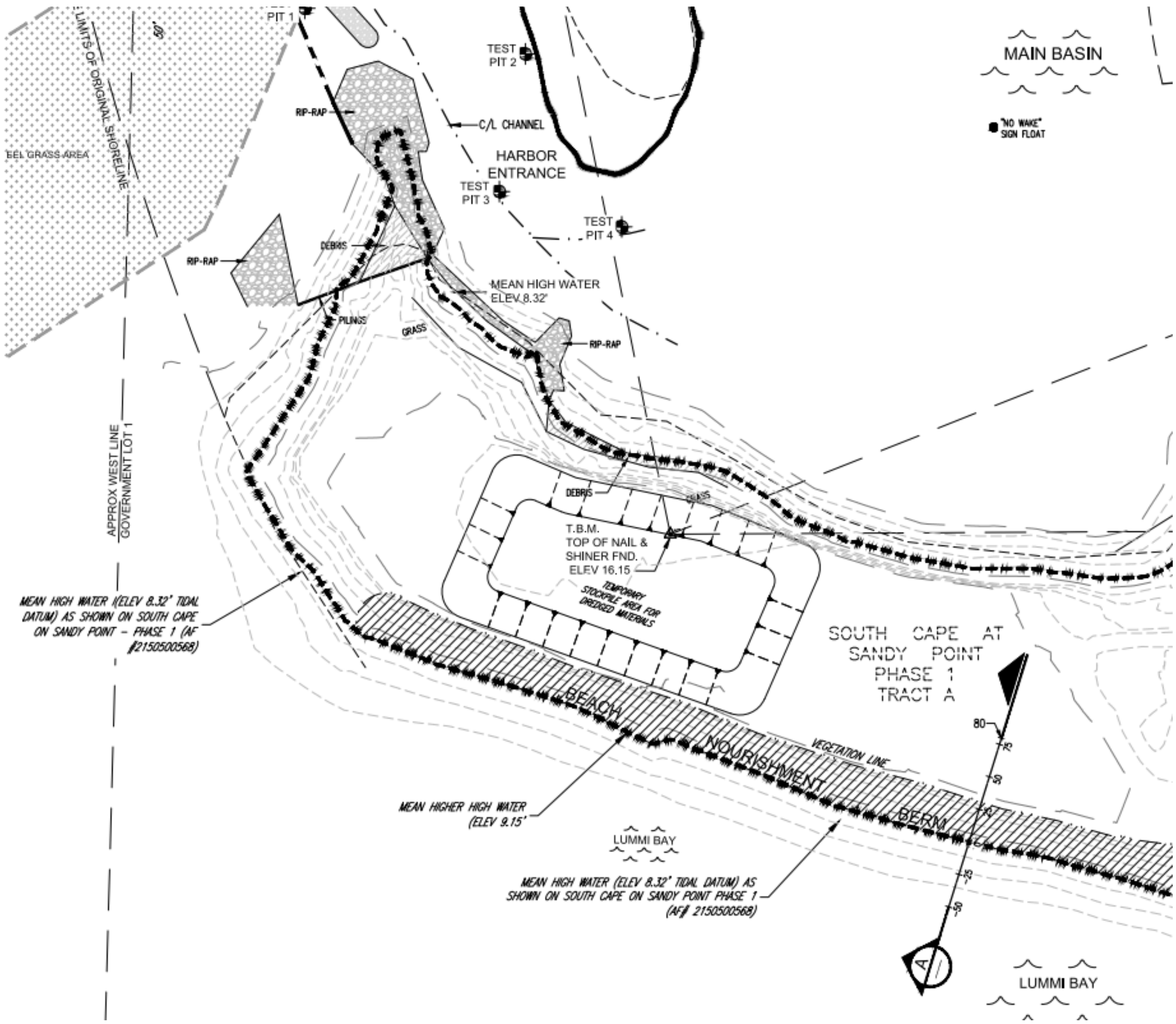

Figure 4. Location of proposed stockpile site and berm on the South Cape property.

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 provide 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.

The Corps determined the proposed action is not likely to adversely affect humpback whales, and SRKW and their critical habitat. Our concurrence is documented in the "Not Likely to Adversely Affect" Determinations section (Section 2.12).

2.1. Analytical Approach

This biological opinion includes both a jeopardy analysis and an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "jeopardize the continued existence of" a listed species, which is "to engage in an action that reasonably 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 CFR402.02). 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 as a whole for the conservation of a listed species" (50 CFR 402.02).

The designation(s) of critical habitat for (species) use(s) the term primary constituent element (PCE) or essential features. The 2016 critical habitat regulations (50 CFR 424.12) replaced 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.

The 2019 regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the regulations (84 FR 44977), that definition does not change the scope of our analysis and in this opinion we use the terms "effects" and "consequences" interchangeably.

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

- Evaluate the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.
- Evaluate the environmental baseline of the species and critical habitat.
- Evaluate the effects of the proposed action on species and their habitat using an exposure-response approach.
- Evaluate cumulative effects.
- In the integration and synthesis, add the effects of the action and cumulative effects to the environmental baseline, and, in light of the status of the species and critical habitat, analyze whether the proposed action is likely to: (1) directly or indirectly 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, or (2) directly or indirectly result in an alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.

- If necessary, suggest a reasonable and prudent alternative 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' "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 function of the essential PBFs that help to form that conservation value.

2.2.1. Climate Change

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. 2016; Mote et al. 2014). Rain-dominated watersheds and those with significant contributions from groundwater may be less sensitive to predicted changes in climate (Mote et al. 2014; Tague et al. 2013).

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 percent 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 (Isaak et al. 2012;

Mantua et al. 2010). Temperature increases shift timing of key life cycle events for salmonids and species forming the base of their aquatic foodwebs (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; Raymondi et al. 2013; Winder and Schindler 2004). Higher temperatures are likely to cause several species to become more susceptible to parasites, disease, and higher predation rates (Crozier et al. 2008; Raymondi et al. 2013; Wainwright and Weitkamp 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 (Lawson et al. 2004; McMahon and Hartman 1989).

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 to 3.7ºC 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 (Reeder et al. 2013; Tillmann and Siemann 2011).

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 to 32 inches by 2081 to 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 (Reeder et al. 2013; Tillmann and Siemann 2011). 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 (Reeder et al. 2013; Tillmann and Siemann 2011).

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 evolutionarily significant units (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.

2.2.2. Status of the Species

This section provides a summary of listing and recovery plan information, status, and limiting factors for the species addressed in this opinion. More information can be found in recovery plans and status reviews for these species. These documents are available on the NMFS West Coast Region website (http://www.fisheries.noaa.gov/).

Puget Sound Chinook Salmon

We listed the PS Chinook salmon ESU as threatened on June 28, 2005 (70 FR 37160). Recovery plans for PS Chinook salmon include the Shared Strategy for Puget Sound 2007 Plan and the NMFS 2006 Plan (NMFS 2006; SSDC 2007). The most recent status review was in 2015 (NWFSC 2015). This ESU comprises 22 populations distributed over five geographic areas. Most populations within the ESU have declined in abundance over the past 7 to 10 years, with widespread negative trends in natural-origin spawner abundance and hatchery-origin spawners present in high fractions in most populations outside of the Skagit watershed. Escapement levels for all populations remain well below the Technical Recovery Team (TRT) planning ranges for recovery, and most populations are consistently below the spawner-recruit levels identified by the TRT as consistent with recovery.

Limiting factors for PS Chinook salmon include:
1. Degraded floodplain and in river channel structure.
2. Degraded estuarine conditions and loss of estuarine habitat
3. Degraded riparian areas and loss of in river large woody debris
4. Excessive fine-grained sediment in spawning gravel
5. Degraded water quality and temperature
6. Degraded nearshore conditions
7. Impaired passage for migrating fish
8. Severely altered flow regime

Puget Sound Steelhead

We listed the PS steelhead distinct population segment (DPS) as threatened on May 11, 2007 (72 FR 26722). There is a recovery plan for this DPS (NMFS 2019). The most recent status review was in 2015 (NWFSC 2015). This DPS comprises 32 populations. The DPS is currently at very low viability, with most of the 32 populations and all three population groups at low viability. Long-term abundance trends have been predominantly negative or flat across the DPS. Information considered during the most recent status review indicates that the biological risks faced by the PS Steelhead DPS have not substantively changed since the listing in 2007, or since the 2011 status review. Furthermore, the PS Steelhead TRT recently concluded that the DPS was at very low viability, as were all three of its constituent major population groups (MPGs), and many of its 32 populations. In the near term, the outlook for environmental conditions affecting PS steelhead is not optimistic. While harvest and hatchery production of steelhead in PS are currently at low levels and are not likely to increase substantially in the foreseeable future, some recent environmental trends not favorable to PS steelhead survival and production are expected to continue.

Limiting factors for PS steelhead include:
1. Continued destruction and modification of habitat
2. Widespread declines in adult abundance despite significant reductions in harvest
3. Threats to diversity posed by use of two hatchery steelhead stocks
4. Declining diversity in the DPS, including the uncertain but weak status of summer-run fish
5. A reduction in spatial structure
6. Reduced habitat quality
7. Urbanization
8. Dikes, hardening of banks with riprap, and channelization

Puget Sound/Georgia Basin Bocaccio

We listed the PS/GB bocaccio DPS as endangered on April 28, 2010 (75 FR 22276). A recovery plan for PS/GB bocaccio was published by NMFS in 2017 (NMFS 2017). The most recent status review was in 2016 (NMFS 2016). Though bocaccio were never a predominant segment of the multi-species rockfish population within the PS/GB, their present-day abundance is likely a fraction of their pre-contemporary fishery abundance. Most bocaccio within the DPS may have been historically spatially limited to several basins within the DPS. They were apparently historically most abundant in the Central and South Sound with no documented occurrences in the San Juan Basin until 2008. The apparent reduction of populations of bocaccio in the Main Basin and South Sound represents a further reduction in the historically spatially limited distribution of bocaccio, and adds significant risk to the viability of the DPS.

Limiting factors for PS/GB bocaccio include:
1. Over harvest
2. Water pollution
3. Climate-induced changes to rockfish habitat
4. Small population dynamics

Puget Sound/Georgia Basin Yelloweye Rockfish

We listed the PS/GB yelloweye rockfish DPS as threatened on April 28, 2010 (75 FR 22276). A recovery plan for PS/GB yelloweye rockfish was published by NMFS in 2017 (NMFS 2017). The most recent status review was in 2016 (NMFS 2016). Yelloweye rockfish within the PS/GB (in United States waters) are very likely the most abundant within the San Juan Basin of the DPS. Yelloweye rockfish spatial structure and connectivity is threatened by the apparent reduction of fish within each of the basins of the DPS. This reduction is probably most acute within the basins of PS proper. The severe reduction of fish in these basins may eventually result in a contraction of the DPS' range.

Limiting factors for PS/GB yelloweye rockfish include:
1. Over harvest
2. Water pollution
3. Climate-induced changes to rockfish habitat
4. Small population dynamics

2.2.3. 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).

Puget Sound Chinook Salmon

We designated critical habitat for PS Chinook salmon on September 2, 2005 (70 FR 52630). Critical habitat for PS Chinook salmon includes 1,683 miles of streams, 41 square miles of lakes, and 2,182 miles of nearshore marine habitat in PS. The PS Chinook salmon ESU has 61 freshwater and 19 marine areas within its range. Of the freshwater watersheds, 41 are rated high conservation value, 12 low conservation value, and eight received a medium rating. Of the marine areas, all 19 are ranked with high conservation value. Marine habitat threats include urbanization, wetland draining and conversion, dredging, armoring of shorelines, and marina and port development. These activities have diminished the availability and quality of nearshore marine habitats and reduced water quality across the region.

Puget Sound/Georgia Basin Bocaccio

We designated critical habitat for the PS/GB DPS of bocaccio on November 13, 2014 (79 FR 68042). Critical habitat for bocaccio rockfish includes 590.4 square miles of nearshore habitat and 414.1 square miles of deepwater habitat. Critical habitat is not designated in areas outside of United States jurisdiction; therefore, although waters in Canada are part of the DPSs' ranges for this species, critical habitat was not designated in that area. Based on the natural history of bocaccio and their habitat needs, NMFS identified two PBFs, essential for their conservation: 1) Deepwater sites (>30 meters) that support growth, survival, reproduction, and feeding opportunities; 2) Nearshore juvenile rearing sites with sand, rock and/or cobbles to support forage and refuge. Habitat threats include degradation of rocky habitat, loss of eelgrass and kelp, introduction of non-native species that modify habitat, and degradation of water quality as specific threats to rockfish habitat in the Georgia Basin.

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 action area for this project includes the waters and substrates within 277 meters of the entrance channel due to the spatial extent of underwater sound (Section 2.5.1). It also includes approximately 50,000 square feet of land and tidal waters due to the placement and inundation of a stormwater berm along the South Cape property.

2.4. Environmental Baseline

The "environmental baseline" refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. 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 consultations, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR 402.02).

Sandy Point is a sand and gravel spit formed by net-shore drift. Sandy Point Harbor is a manmade harbor that was excavated during the 1950s and 1960s (Figure 5). The entrance channel has not been dredged since its completion in 1961. Shoaling has reduced depths in the entrance channel, and two gravel bars have formed. According to the applicant's coastal processes evaluation, sediment from the northwestern side of Sandy Point was deposited along the south side of the South Cape property forming large sand bars prior to the initial dredging. Sediment is now deposited along Cape Horn (**Figure 2**) and a much smaller volume of sediment is transported to South Cape, which has caused erosion over time.

The shoreline is degraded from shoreline development and maritime activities in the harbor. Within Sandy Point harbor and its canals, approximately 300 vessels permanently moor at over 130 private docks and two commercial marinas. Approximately 50 vessels pass through the harbor entrance per day. Government agencies that utilize the harbor include the US Coast Guard, US Border Patrol and Homeland Security, Whatcom County Sherriff, Lummi Law and Order, Lummi Drug Task Force, Sandy Point Fire Department, and Washington State Department of Fisheries. Commercial users include oil spill response, diving, and construction companies.

Substrate at the project site consists primarily of gravel and sand, with one percent classified as fine sediment (silt and clay). A patchy eelgrass bed is present adjacent to the proposed dredge area (Figure 6). Another patchy eelgrass bed is present along the north side of the harbor entrance. According to the Washington State Forage Fish Spawning Map (WDFW 2018), Pacific herring spawning has been documented in the action area, and surf smelt spawning has been documented approximately 2 miles north. Pacific herring utilize eelgrass as a spawning substrate (Penttila 2007). The spawning season for Pacific herring in the action area occurs outside of the in-water work window. Surf smelt may occupy documented spawning habitat every month of the year, with seasonal peaks in the summer (May-August) and fall (September to March).

Past and ongoing anthropogenic impacts, including climate change, described in Section 2.2 have impacted ESA-listed species and critical habitat present in the action area. The harbor is used for private and commercial vessel moorage. In-water noise in the action area is primarily characterized by vessel traffic from fishing vessels, passenger vessels, and pleasure craft that use the harbor. The site is not listed on the Washington State 303(d) list of impaired waterways for water quality and sediment quality (Ecology 2018). According to the sediment analysis study conducted for the proposed project, sediment within the proposed dredging area does not exceed reporting limits for gas (20 mg/kg), diesel (50 mg/kg), and (100 mg/kg).

Juvenile PS Chinook are nearshore oriented (Fresh 2006). Juvenile PS Chinook salmon are generally found in the nearshore of nearby Bellingham Bay between February and August, but some may be present through October (Beamer et al. 2016; Rice et al. 2011). Juvenile PS steelhead migrate seaward as smolts in March to early June, and appear to move directly out into the ocean to rear, spending little time in the nearshore zone (Goetz et al. 2015). They are not commonly caught on beach seine surveys (Brennan et al. 2004).

Adult PS Chinook can reside in PS year-round. In the Nooksack River Basin, spring-run Chinook salmon enter freshwater as early as March with spawning occurring mid-August through September. Adult winter-run PS steelhead typically return to their natal river November through May. Summer-run PS steelhead return between April and October. Adult PS Chinook salmon and PS steelhead usually inhabit water much deeper than the waters in and around the action area.

Pacunski et al. (2013) surveyed the San Juan Islands by remotely operated underwater vehicle (ROV) between September and November 2008. They observed listed rockfish south of the San Juan Islands National Wildlife Refuge. Rockfish fertilize their eggs internally and extrude the young as larvae, which are approximately 4 millimeters to 5 millimeters in length (Love et al. 2002). Larval rockfish appear in the greatest numbers during the spring months (Greene and Godersky 2012; Moser and Boehlert 1991; Palsson et al. 2009). However, PS rockfish have been reported to extrude larvae as late as September (Greene and Godersky 2012). Rockfish larvae are typically found in the pelagic zone, often occupying the upper layers of open waters, under floating algae, detached seagrass, and kelp. Rockfish larvae are thought to be mostly distributed passively by currents (Love et al. 2002).

Juvenile rockfish move from the pelagic environment and associate with the benthic environment when they reach about 30 to 90 millimeters in length at approximately 3 to 6 months of age (Love et al. 2002). Juvenile bocaccio are known to settle onto rocky or cobble substrates in the shallow nearshore in areas that support kelp and sandy zones with eelgrass or drift algae. They move to progressively deeper waters as they grow (Love et al. 2002; Palsson et al. 2009).

Yelloweye rockfish are not known to typically occupy shallow water habitats (Love et al. 2002). Juvenile yelloweye rockfish between 25 and 100 millimeters have been observed in areas of high relief at depths greater than 48 feet (Love et al. 2002). These conditions are not supported in the action area. Adult yelloweye and bocaccio typically occupy waters deeper than 300 feet and 165 feet, respectively (Love et al. 2002) and prefer rocky habitats. Given these depths do not occur in the action area, it is extremely unlikely that adult ESA-listed rockfish will occur within the shallow water in the action area.

Figure 5. Sandy Point before dredging in 1942 (left), after initial dredging in 1961 (center), and currently in 2017 (right).

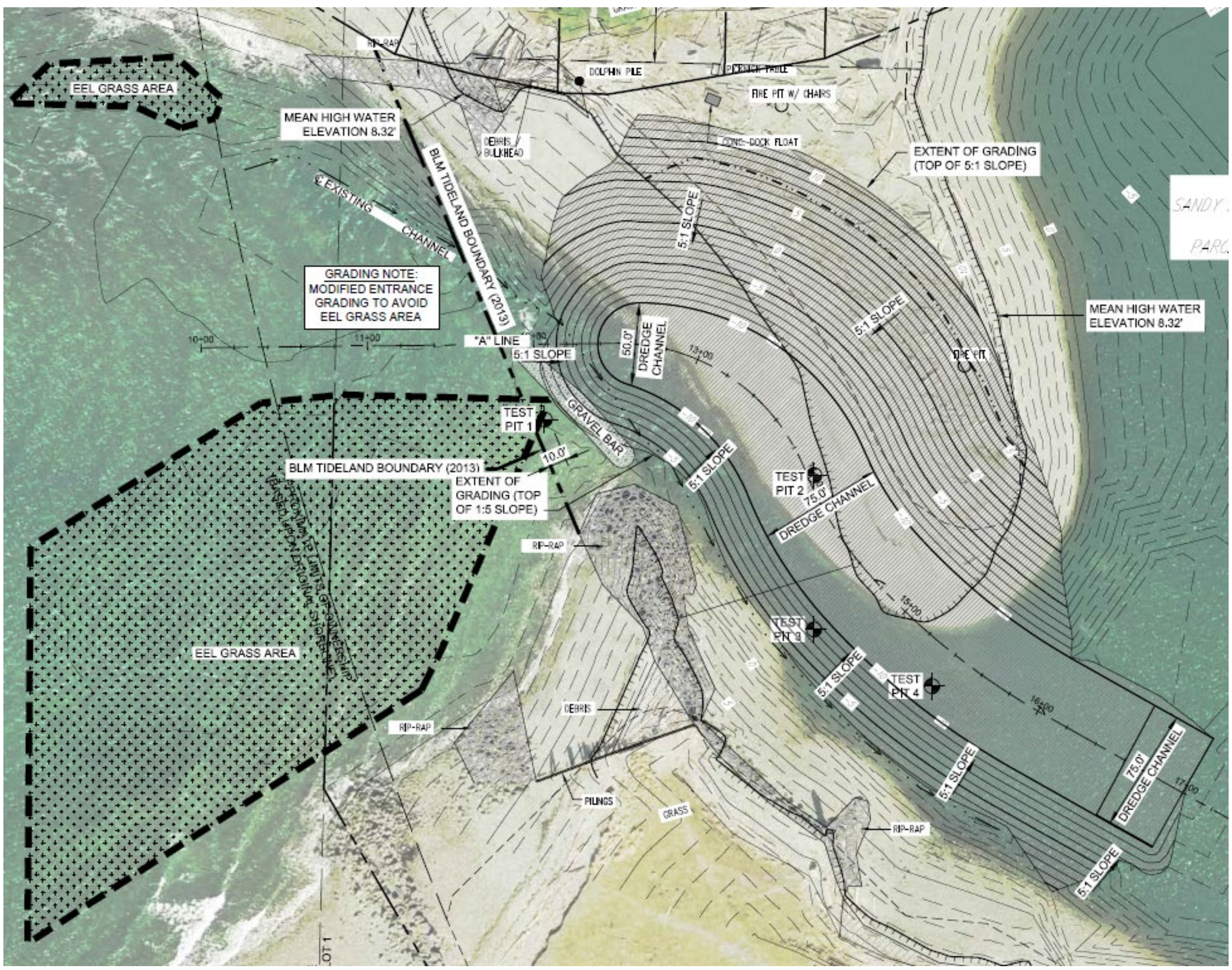

Figure 6. Location of eelgrass beds relative to proposed dredge area.

2.5. Effects of the Action

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b).

2.5.1. Effects on Species

Entrainment and Strike

In this context, entrainment refers to the uptake of aquatic organisms by dredge equipment (i.e., the dredge bucket). Dredge buckets entrain slow-moving and sessile benthic epifauna along with burrowing infauna that are removed with the sediments. They also entrain algae and aquatic vegetation. There is little evidence of mechanical dredge entrainment of mobile organisms such as fish. In the southeast region of the United States, where heavy dredging operations occur, only two live sturgeon (NMFS 2012) are known to have been taken by clamshell dredging since 1990. This is likely due to a combination of factors that make exposure very rare. In order to be struck by or entrained in a dredge bucket, an organism must be directly under the bucket when it drops. The small size of the bucket, compared against the distribution of the organisms across the available habitat make this situation very unlikely. That likelihood would decrease after the first few bucket cycles, because mobile organisms are most likely to move away from the disturbance. Further, dredges move very slowly during dredging operations, with the excavator typically staying in one location for many minutes to several hours, while the bucket is repeatedly lowered and raised within an area limited to the range of the crane arm.

As described in Section 2.4, it is extremely unlikely that juvenile PS Chinook salmon and juvenile PS steelhead will be present during the in-water work window of November 1 to January 31. Adult PS Chinook and PS steelhead are not nearshore dependent but may pass through the area during migration. Adult PS Chinook salmon, adult PS steelhead, and juvenile PS/GB bocaccio in the vicinity of the dredge at the start of the operation would likely swim away to avoid the noise and activity. Based on the best available information described above (NMFS 2012), NMFS considers it highly unlikely that adult PS Chinook salmon, adult PS steelhead, and juvenile PS/GB bocaccio would be struck or entrained by the dredging equipment.

The maximum estimated density of larval rockfish in the action area is 1 larvae per 1,000 cubic meters, based on nearby Bellingham Bay (Greene and Godersky 2012). Assuming two percent of larvae are ESA-listed rockfish species (Pacunski et al. 2013), the density of PS/GB bocaccio and yelloweye rockfish larvae in the action area is estimated to be 0.02 larvae per 1,000 cubic meters. Given the small size of the bucket and duration of dredging, entrainment and bucket strike of listed rockfish larvae is very unlikely to occur.

Vessel traffic would not occur during dredging, because the applicant will use land-based excavators and will keep the construction barge stationary while transferring dredge material from stockpile areas. While transporting some of the dredged material across the harbor (Section

2.4), the barge would move very slowly at approximately 12 miles per hour or less. As described in Section 2.4, it is extremely unlikely that juvenile PS Chinook salmon and juvenile PS steelhead will be present during the in-water work window of November 1 to January 31. Adult salmon and steelhead and juvenile bocaccio are not surface dependent. Adult listed salmonids are capable of detecting the vessel and high-speed swimming that would be more than adequate to avoid collision with the vessel. Should adult PS Chinook salmon and PS steelhead be close to the surface along the path of a moving dredge-related vessel, NMFS expects that exposed individuals would respond by quickly swimming down and away from the perceived threat, and therefore avoid collision. Juvenile PS/GB bocaccio are unlikely to be affected as they are associated with benthic habitat away from the surface where effects are likely to occur. Thus, the risk of collision between construction-related vessels and adult PS Chinook salmon, adult PS steelhead, and juvenile PS/GB bocaccio is very unlikely.

Underwater Noise

NMFS established the injury thresholds for impulsive sound at 206 dB peak, 187 dB cumulative sound exposure level (SEL_{cum}) for fish more than 2 grams, and 183 dB SEL_{cum} for fish less than 2 grams (Fisheries Hydroacoustic Working Group 2008). The behavioral disturbance threshold is 150 dB root mean square (RMS). Any received level below 150 dB sound exposure level (SEL) is considered "Effective Quiet" (Stadler and Woodbury 2009).

Noise generated from dredging is estimated based on a measured received level of 124 dB re 1µPa at 150 meters (Jones and Marten 2016). The area of continuous acoustic affect (above 150 dB SEL) will include all of the water within 3 meters. Noise generated from moving the barge is estimated based on a source levels of 170 dB ± 5 dB for tugboat propulsion (Veirs et al. 2016). However, the available information describes the vessel running at or close to full-speed, which is likely to overestimate exposure risk. Because SEL is often identical to RMS for non-impulsive sources, we assume that the reported sound levels by Veirs et al. (2016) are in dB RMS which would, at worst, overestimate sound levels. To conservatively estimate source levels, we also assume that the mean plus the standard deviation represents the source level for tugboats. Given the highest maximum source level for tugboats is 175 dB, we conservatively assume that the area of continuous acoustic affect (above 150 dB SEL) will include all of the water within 46 meters.

As described in Section 2.4, it is extremely unlikely that juvenile PS Chinook salmon and juvenile PS steelhead will be present during the in-water work window of November 1 to January 31. Adult PS Chinook salmon and juvenile and adult PS steelhead are not nearshore dependent but may pass through the area of acoustic effect during migration. Any fish that remains within 3 meters of dredging or 46 meters of vessel activity for the entire 6-hour duration of a single workday would likely experience physiological impacts on auditory and non-auditory soft tissues from accumulated sound energy. The severity and permanence of those impacts would depend on the range from the source and the duration of the exposure, with intensity decreasing with increased distance and/or reduced length of exposure. Adult PS Chinook salmon and juvenile and adult PS steelhead will be larger than 2 grams, highly mobile, and will be passing through the area during migration. Therefore, they are unlikely to accumulate injurious levels of sound energy. The most likely effect of exposure to project-related noise would be temporary minor behavioral effects, such as avoidance of the area within 3 meters of dredging or 46 meters of vessel activity. The exposure would cause no measurable effects on the fitness of exposed individuals. Further, it is extremely unlikely that any avoidance of the project site would prevent fish from moving past the area, nor would it prevent them from accessing important habitat resources.

However, the area of acoustic effect would overlap with the eelgrass bed, which is the habitat most likely to be occupied by juvenile PS/GB bocaccio. Bocaccio within 3 meters of dredging and 46 meters of vessel activity are likely to experience behavioral disturbance. Effects may include the onset of behavioral disturbances such as acoustic masking (Codarin et al. 2009), startle responses and altered swimming (Neo et al. 2014), abandonment or avoidance of the area of acoustic effect (Mueller 1980; Picciulin et al. 2010; Sebastianutto et al. 2011; Xie et al. 2008) and increased vulnerability to predators (Simpson et al. 2016). PS/GB bocaccio and yelloweye rockfish larvae may pass through the area on the currents and are expected to only be briefly exposed to project-related noises. It is unlikely that project-related noise would cause any detectable effects in exposed larvae.

With implementation of the proposed action, vessel use of the entrance channel will continue into the foreseeable future. The vast majority of that activity will likely occur during daylight hours, but some pre-dawn or post-dusk engine running and vessel movement may take place at the site. In the absence of specific use estimates, this assessment assumes that on any given day, 12 hours of continuous vessel noise is likely to occur, which likely overestimates exposure risk most of the time. Unlike construction noises, vessel noise could occur year-round. As discussed in Section 2.4, the vessels most likely to utilize the entrance channel are fishing and small private recreational vessels (i.e., sailing vessels, motor yacht, and yachts). These vessels produce non-impulsive sound. Source levels are 164 dB ± 9 dB for fishing vessels and 159 dB ± 9 dB for private recreational vessels (Veirs et al. 2016). However, the available information describes vessels running at or close to full-speed, which is likely to overestimate exposure risk. Because SEL is often identical to RMS for non-impulsive sources, we assume that reported sound levels by Veirs et al. (2016) are in dB RMS which would, at worst, overestimate sound levels. To conservatively estimate source levels, we also assume that the mean plus the standard deviation represents the source level for each type of vessel. Given the fishing boats have the highest maximum source level (173 dB), we conservatively assume that the area of continuous acoustic affect (above 150 dB SEL) will include the area within 34 meters around vessel traffic.

Adult PS Chinook, and adult and juvenile PS steelhead are not nearshore dependent but may pass through the area of acoustic effect during migration. As described above, the most likely effect of exposure to project-related noise would be temporary minor behavioral effects, such as avoidance of the area within 34 meters of vessel activity. The exposure would cause no measurable effects on the fitness of exposed individuals. However, the area of continuous acoustic effect will overlap with the eelgrass bed, which is the habitat considered most likely to be occupied by juvenile PS Chinook salmon and PS/GB bocaccio. As discussed above, juvenile Chinook salmon and bocaccio that are within 34 meters or vessel traffic are likely to experience behavioral disturbance, such as acoustic masking, startle response, altered swimming patterns, avoidance, and increased risk of predation. The intensity of these effects would increase with increased proximity to the source and/or duration.

The number of individual PS Chinook salmon and PS/GB bocaccio that would be affected by this stressor is unquantifiable with any degree of certainty. However, the affected individuals would represent such small subsets of their respective cohorts that the numbers of exposed fish would be too low to cause detectable population-level effects.

Turbidity

Dredging will cause short-term and localized increases in turbidity and total suspended solids (TSS). Laboratory studies have consistently found that the 96-hour median lethal concentration of fine sediments for juvenile salmonids is above 6,000 mg/L (Stober et al. 1981) and 1,097 mg/L for 1 to 3-hour exposure (Newcombe and Jensen 1996). LaSalle et al. (1991) determined that, within 300 feet of bucket dredging fine silt or clay, the expected concentrations of suspended sediment would be about 700 and 1,100 mg/L at the surface and bottom of the water column, respectively. Lower concentrations are expected at the project location, because the sediment consists primarily of coarse sand with less than 1 percent fines (silt or clay). Once dredging is complete, sediments are expected to settle out of the water quickly. Similar material dredged in the Columbia River settled out of the water column at 0.03 to 0.06 feet per second (Nowacki et al. 2012). Upland, the stockpiled dredge material is unlikely to enter the water as it will be placed landward of MHW within fences and berms.

According the applicant's Biological Assessment, increased turbidity is expected to be limited to the area within 500 feet of dredging. To the extent that adult salmonids and PS/GB bocaccio are present in the areas with elevated suspended sediment, they are expected to be of sufficient size to swim away from these areas, which would limit the potential for, and duration of, exposure. However, suspended sediment at these concentrations may elicit behavioral effects (e.g., alarm reaction and avoidance of the plume) with only six minutes of exposure (Newcombe and Jensen 1996). Physiological effects (e.g., gill flaring and coughing) may occur with 15 minutes of exposure, temporary reduced feeding rates and success with 1 hour of exposure, and moderate levels of stress with 3 hours of exposure (Newcombe and Jensen 1996). The number of individuals that would be affected by this stressor is unquantifiable with any degree of certainty. However, the small affected area suggests that any individuals that may be affected would likely comprise extremely small subsets of the cohorts from their respective populations, and the numbers of exposed fish would be too low to cause any detectable population-level effects.

The applicant will install silt fences and berms, which will prevent dredge material in the stockpile from entering the water. As described in Section 1.3, the applicant will place dredged material on the South Cape property above MHHW. TSS levels could be elevated during tidal inundations of the site during construction and future storm events. Given the strong tidal currents in the area, turbidity and TSS levels would return to background levels quickly. Any elevations in TSS generated by these construction activities will likely be within the normal fluctuations of TSS levels in the action area. Therefore, listed fish are unlikely to experience any adverse effects from elevated TSS from these activities.

Though construction-related vessels (e.g. tugboats to move the barge) and vessels continuing to travel through the channel will likely operate a low power levels, they will be situated over relatively shallow water (about -10 feet MLLW) and are likely to mobilize sediments. A recent study described the turbidly caused by tugboats operations in water about 40 feet (12 meters) deep (ESTCP 2016). At about 13 minutes, the plume extended about 550 yards (500 meters) and had a TSS concentration of about 80 mg/L. The plume persisted for many hours and extended far from the event. However, the TSS concentration fell to 30 mg/L within 1 hour and to 15 mg/L within 3 hours. Turbidity from construction-related vessels and ongoing vessel traffic would be temporary and at concentrations too low to cause more than temporary, non-injurious effects (e.g., avoidance of the plume). Therefore, it is not expected to affect the fitness of exposed individuals.

Dissolved oxygen

Mobilization of anaerobic sediments can decrease dissolved oxygen (DO) levels (Hicks et al. 1991; Morton 1976). Given the high rate of tidal exchange in the entrance channel and small affected area, any reductions in DO from dredging will be too small and short-lived to have detectable effects on the behaviors or fitness of any adult PS Chinook salmon, adult PS steelhead, or juvenile PS/GB bocaccio exposed.

Contaminants

The sediment analysis study conducted for the proposed project found that sediment within the proposed dredging area does not exceed reporting limits for gas (20 mg/kg), diesel (50 mg/kg), and oil (100 mg/kg). However, the sediments were not tested for other contaminants. Common contaminants include metals, pesticides, polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAHs), phenols, and phthalates. Many of these pollutants can cause impacts on fish that range from avoidance of an area to mortality in the exposed individuals, depending on the pollutant and its concentration (Feist et al. 2011; Göbel et al. 2007; Incardona et al. 2005; Incardona et al. 2004; Incardona et al. 2006; McIntyre et al. 2012; Meador et al. 2006; Sandahl et al. 2007; Spromberg et al. 2016). Should sediments be contaminated, dredging and construction-related propeller scour will mobilize contaminants into the water column. Propeller scour from vessels that will continue to use the entrance channel may also mobilized contaminated sediments. Additionally, contaminants that may be present in the dredged material could be mobilized during tidal inundations of the South Cape property berm (Section 1.3) during storm events.

According to the applicant's Biological Assessment, increase turbidity is expected to be limited to the area within 500 feet of dredging. NMFS expects the water and substrate within 500 feet of dredging, and within 550 yards of vessel activity (ESTCP 2016) will have increased levels of PAHs. Within this area, contaminants may be biologically available for years, at steadily decreasing levels. While present, contaminants such as PAHs are likely to bioaccumulate in benthic invertebrates (Landrum et al. 1984; Landrum and Scavia 1983; Neff 1982), some of which will be consumed by listed fish that forage in the action area. Fish have low PAH uptake retention (Niimi and Dookhran 1989; Niimi and Palazzo 1986) and metabolize PAHs rapidly (Hellou and Payne 1986; Roubal et al. 1977; Statham et al. 1978; Varanasi et al. 1989). Nevertheless, even brief exposure to PAH-contaminated habitats has been shown to reduce growth, suppress immune competence, and increased mortality in outmigrating juvenile Chinook salmon (Meador et al. 2006; Varanasi et al. 1993). Juvenile bocaccio may consume contaminated forage as they are likely to be present within the SAV in the action area. It is unlikely that adult salmonids and rockfish that feed on forage fish would be impacted as biomagnification of PAHs does not occur in fish (Suedel et al. 1994).

The annual number of juvenile Chinook salmon and PS/GB bocaccio that may be exposed to contaminated forage that will be attributable to this action is unquantifiable with any degree of certainty, as is the amount of contaminated prey that any individual fish may consume, or the intensity of any effects that an exposed individual may experience. However, the small affected area and the low volume of contaminated sediment that would be brought to the surface suggest that the probability of trophic connectivity to the contamination would be very low for any individual fish. Therefore, the numbers of fish that may be exposed to contaminated prey annually will be very low, and no detectable effects at the population level for Chinook salmon or bocaccio are expected.

Many of the fuels, lubricants, and other fluids used by construction-related equipment are petroleum-based hydrocarbons with PAHs that are known to be injurious to fish. However, fueling will take place within an impervious containment area landward of the MHHW line. The applicant will use biodegradable hydraulic fluid in all heavy equipment operating on the shoreline, transport barge, or over the water. In the unlikely event of a construction-related spill or discharge, the event would likely be very small, quickly contained and cleaned. Most of the fuels that would be used for this type of work would evaporate relatively quickly (Werme et al. 2010), and/or be quickly diluted by the high rate of water exchange. The in-water presence of construction-related contaminants would be very short-lived, and at concentrations too low to cause detectable effects.

Infrequent and relatively small discharges of petroleum-based fuels and lubricants that contain PAHs could occur from the approximately 50 vessels that utilize the entrance channel per day. These vessels may discharge petroleum-based fuels and lubricants, contributing to the pollutants in the area. As described above, the potential effects of exposure to contaminants can range from avoidance of an area to mortality, depending on the compound and its concentration (Meador et al. 2006). Some contaminants would evaporate relatively quickly (Werme et al. 2010), and tidal currents would help disperse pollutants. However, discharged pollutants would tend to collect within Sandy Point harbor, which is highly enclosed at the surface.

Over the decades-long life of the new entrance channel, some juvenile PS Chinook salmon and PS/GB bocaccio in the action area would be directly exposed to petroleum-based pollutants, and/or exposed to contaminated prey resources, at concentrations capable of causing reduced growth, increased susceptibility to infection, and increased mortality. The number of individuals that would be affected by exposure to fuels and lubricants is unquantifiable with any degree of certainty. However, based on the expected infrequency and small volumes of discharge, the number of individuals would represent such small subsets of their respective cohorts that their loss would cause no detectable population-level effects. Adult PS Chinook and juvenile and adult PS steelhead are not nearshore dependent and are not expected to remain in the action area long enough to be impacted by vessel-related discharges.

Propeller Wash

As described in Section 2.4, approximately 50 vessels are expected to utilize the entrance channel per day. During construction, tugboat could be used to move the construction barge. Killgore et al. (2011) report that fish are killed by spinning boat propellers. Propeller-related turbulence has also been documented to kill small aquatic organisms like copepods (Bickel et al.

2011). Small fish and larvae that are exposed to propeller wash may also be displaced by the fast-moving turbulent water. Propeller wash is unlikely to affect adult PS Chinook salmon and PS steelhead, because they are unlikely to approach close enough to operating vessels to be exposed. In the unlikely event of adult exposure, their increased size and swimming ability suggest that they will swim away from the propeller wash with no detectable effects other than a very brief avoidance behavior. Juvenile PS/GB bocaccio are unlikely to be affected as they are associated with benthic habitat away from the surface where effects are likely to occur.

Juvenile salmonids and PS/GB bocaccio and yelloweye rockfish larvae are likely to be relatively close to the surface where they may be exposed to spinning propellers and propeller wash, and will be too small to effectively swim against the turbulent water. Although the likelihood of this interaction is very low for any individual fish or any individual boat trip, it is likely that over the life of the channel, at least some juvenile salmonids and rockfish larvae will be injured, killed, or displaced by propellers or propeller wash. The annual number of individuals that may be impacted by this stressor is unquantifiable with any degree of certainty. However, based on the expectation that exposed individuals would be very small subsets of the cohorts from their respective populations, the numbers of exposed fish will be too low to cause detectable population-level effects.

Natural Cover

As discussed in Section 1.3, the applicant will temporarily remove existing driftwood and return it to its original location after dredging is complete. It extremely unlikely that juvenile salmonids will be present during the in-water work window of November 1 to January 31. Therefore, the temporary reduction in large woody debris during the in-water work window will not affect juvenile Chinook salmon. Adult salmonids and bocaccio are not dependent on large woody debris for cover. Therefore, they would be unaffected by any temporary reduction in large woody debris.

A patchy eelgrass bed is present adjacent to the proposed dredge area (Section 2.4). As discussed in Section 1.3, the applicant will conduct an eelgrass survey prior to dredging. They will not place barge anchors, spuds, and cables in the mapped eelgrass bed near the harbor entrance. They will move barges with minimum power in order to reduce propeller scour of submerged aquatic vegetation (SAV) outside of the dredge area. Additionally, they will not direct propwash toward mapped eelgrass beds near the project area. Any shading of SAV from increased TSS is expected to be short-lived.

The Washington State Department of Natural Resources (DNR) recently conducted a study of the depth distribution of eelgrass in Puget Sound (DNR 2015). They found that eelgrass is distributed between +1.4 meters to -12 meters MLLW, and the optimal depth range is between 0 and 2 meters below MLLW. Though dredging will occur outside the mapped eelgrass beds, the applicant will dredge right to the edge of the mapped bed. If any eelgrass is damaged or destroyed, it is expected to recover within 24 months (Boese et al. 2009). Eelgrass may be slower to recolonize in areas where dredging has increased depths beyond the optional range for growth. However, any eelgrass affected would be a small part of the total available eelgrass near the project site. Therefore, any reduction in SAV is unlikely to be detectable by juvenile PS Chinook salmon and PS/GB bocaccio.

According to the applicant's coastal processes evaluation, dredging will not increase average tidal velocities in the approach and entrance channel. Therefore, dredging is unlikely to increase tidal scour of SAV. However, with high levels of vessel traffic, propeller scour can reduce SAV. Though vessels traveling through the channel will likely operate a low power levels, they will be situated over relatively shallow water (-10 feet MLLW or less). Given the relatively small size of the affected area compared to availability of SAV in the surrounding area, any reduction in SAV is not likely to be detectable by juvenile PS Chinook salmon and PS/GB bocaccio. Adult PS Chinook salmon and PS steelhead do not utilize SAV for cover. Therefore, they would be unaffected by any changes in SAV.

Forage

Forage fish spawning habitat for Pacific herring has been documented in the action area, and surf smelt spawning occurs within 2 miles (Section 2.4). The authorized work window avoids herring spawning season (Penttila 2007). However, surf smelt spawning could occur in the vicinity of the project throughout the year. The applicant will conduct a forage fish spawning survey following WDFW guidelines. If eggs are present, they will postpone dredge operations until spawning and incubation activity have not been observed by subsequent surveys conducted at two-week intervals. Should forage fish (non-spawning adults or juveniles) be present in the action area, they may be exposed to project-related effects.

As described above, given short duration of dredging and small size of the dredge bucket relative to the available habitat in the area, entrainment and bucket strike of fish is very unlikely to occur. Any reductions in DO from dredging will be too small and short-lived to have detectable effects on the behaviors or fitness of forage fish. Dredging and propeller scour may reduce SAV, including eelgrass. However, given the relatively small size of the affected area compared to availability of SAV in the surrounding area, any reduction is unlikely to be detectable by forage fish or lead to population-level changes in their abundance.

Any forage fish that remains within the area of acoustic effect (3 meters for dredging or 46 meters for vessel activity) for the entire 6-hour duration of a single workday would likely experience physiological impacts on auditory and non-auditory soft tissues from accumulated sound energy. Forage fish within the area of acoustic effect are likely to experience behavioral disturbance, such as acoustic masking, startle response, altered swimming patterns, avoidance, and increased risk of predation. Suspended sediment from dredging may result in behavioral and physiological effects that may affect the fitness and survival of exposed fish. Dredging and propeller scour from construction-related vessels and ongoing vessel use may mobilized contaminated sediments. Fish may also be exposed to petroleum-based discharges from construction equipment, construction vessels, and vessels that will continue to use the entrance channel. Additionally, propellers and propeller wash from vessels that will continue to use the entrance channel may injure or kill adult, juvenile, and larval forage fish.

The number of individual forage fish that would be affected by underwater noise, suspended sediment, contaminants, and propellers and propeller wash is unquantifiable with any degree of certainty. However, given the small affected area, the exposed individuals would represent such small subsets of their respective cohorts that the numbers of exposed fish would be too low to cause detectable population-level effects. Because there will be no population-level changes in forage fish abundance, the growth, fitness, and survival of PS Chinook salmon, PS steelhead, and PS/GB bocaccio will not be impaired.

Juvenile salmonids prey on planktonic organisms such as copepods and euphausiids, as well as on the larvae of many benthic species and fish (NMFS 2006). Dredging will reduce the abundance of benthic resources. Recolonization of sediment-covered benthic habitat is variable; occurring within weeks to months (McCabe et al. 1998). The dredged material placed on the South Cape property will be above MHHW, and will primarily be in the gravel range. The material may be mobilized during large storm events, which may provide some sediment supply to South Cape over time. However, the addition of gravel to the mud flats below will change the characteristics of the substrate, which may alter the composition and abundance of nearshore benthic communities (Dethier and Schoch 2005). Further, in areas with high levels of vessel traffic, propeller scour can diminish the density and diversity of the benthic community. As discussed above, though vessels traveling through the channel will be situated over relatively shallow water.

However, given the relatively small size of the affected area compared to availability of benthic resources in the surrounding area, any reduction is not expected to impair growth, fitness, or survival of juvenile salmonids and PS/GB bocaccio. Adult PS Chinook salmon and PS steelhead do not prey on planktonic larvae. Therefore, they would be unaffected by alterations in the composition and abundance of invertebrates in the action area.

Reduced Shallow-Water Habitat

Juvenile Chinook salmon typically forage in shallow waters (0 to 0.5 meters depth) and gradually shift to 2 to 4 meters depth as they increase in size (Tabor et al. 2011). Though benthic prey species are expected to recover quickly (McCabe et al. 1998), dredging will increase depth and reduce the amount of foraging habitat available for rearing and migrating juvenile PS Chinook salmon. Additionally, as described in the applicant's coastal processes evaluation, the presence of the entrance channel causes sediment to be deposited along Cape Horn and reduces the volume of sediment transported to South Cape. The dredge material placed on the South Cape property may provide a sediment supply to South Cape in the short-term. However, in the long-term, the proposed action will continue to prevent recruitment and accumulation of sediment that would otherwise enable the establishment and maintenance of shallow water foraging habitat along the South Cape property.

The utilization of deeper habitat could expose juvenile Chinook salmon to increased piscivorous predation. This has been shown in the marine environment where juvenile salmonid consumption by piscivorous predators increased fivefold when juvenile pink salmon were forced to leave the shallow nearshore (Willette 2001). The annual number of juvenile PS Chinook salmon that may be exposed to increased predation attributable to this action is unquantifiable with any degree of certainty. However, the small affected area suggests that the probability of mortality would be very low for any individual fish. Therefore, the numbers of fish that may be exposed to increased predation annually will be very low, and no detectable effects at the population level are expected.

Adult PS Chinook salmon, and adult and juvenile PS steelhead utilize are relatively large and are not nearshore-oriented. Therefore, they are not likely to be affected by a reduction in shallow water habitat. Juvenile bocaccio associate with benthic habitat, and move to progressively deeper waters as they grow (Love et al. 2002; Palsson et al. 2009). Therefore, they are not likely to be affected by a reduction in shallow water habitat.

2.5.2. Effects on Critical Habitat

Past critical habitat designations have used the terms primary constituent elements (PCE) or essential features (EF) to identify important habitat qualities. The new critical habitat regulations (81 FR 7214) replace those terms with physical or biological features (PBF). This shift in terminology does not change the approach used in conducting our analysis, whether the original designation identified PCE, EF, or PBF.

Chinook Salmon

Designated critical habitat within the action area for PS Chinook salmon consists of nearshore marine areas and their essential physical and biological features. The PBFs of PS Chinook salmon critical habitat in the action area are nearshore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.

Free of Obstruction and Excessive Predation

The proposed work may cause temporary minor avoidance of the area around dredging and vessel activity due to elevated noise, activity, and reduced water quality. Because the affected areas would be very small and would not prevent movement around the work area, the action would cause no meaningful effect on this PBF's ability to support migration of PS Chinook salmon. The proposed action will cause no change in the abundance of predators, but the reduction in shallow water habitat may cause increased predation on juveniles. Vessel noise may also increase the risk of predation on juveniles. Therefore, the action will cause a long-term minor change in the quality and function of this PBF.

Water Quality

Dredging will cause temporary effects on water quality. It would mobilize contaminants and suspended sediments, and may also reduce DO. Detectable effects on water quality are expected to be limited to the area within 500 feet of dredging and 550 yards of vessel activity. The applicant will temporarily stockpile dredge material landward of MHW, and install silt fences and berms to prevent material from entering the water. TSS levels along the South Cape property could be elevated during tidal inundations of the site during construction and future storm events. Propeller scour from vessels traveling through the channel may also mobilize sediments and contaminants.

The applicant will use biodegradable hydraulic fluid in all heavy equipment operating on the shoreline, transport barge, or over the water. All fueling will take place within an impervious containment area landward of the MHHW line. In the unlikely event of a construction-related spill or discharge, the event would likely be very small, quickly contained and cleaned. Most of the fuels that would be used for this type of work would evaporate relatively quickly and/or be quickly diluted by the high rate of water exchange outside the harbor. However, pollutants discharged from ongoing vessel activity would tend to collect within Sandy Point harbor, which is highly enclosed at the surface. Therefore, the action would cause a long-term minor change in the quality and function of this PBF.

Water Quantity
Dredging would cause virtually no effect on water quantity. The amount of water taken up during dredging is virtually undetectable against the water volumes in the affected water body. Therefore, the action would cause no detectable effect on this PBF's ability to support PS Chinook salmon, and no change in the quality and function of this PBF.

Natural Cover
The applicant will not place barge anchors, spuds, and cables in the mapped eelgrass bed near the harbor entrance. They will move barges with minimum power in order to reduce propeller scour of SAV outside of the dredge area. They will not direct propwash toward mapped eelgrass beds near the project area. Shading of SAV from increased TSS is expected to be short-lived. Should any eelgrass be damaged or destroyed dredging, it is expected to recover in about 24 months (Boese et al. 2009) or more. The affected area would be a small part to the total available eelgrass habitat in the surrounding area. When dredging is complete, the applicant will return driftwood to its original location. The proposed dredging will not increase average tidal velocities in the approach and entrance channel. Therefore, dredging is unlikely to increase tidal scour of SAV. However, propeller scour will cause a long-term reduction in SAV, which will maintain this PBF at a slightly reduced functional level compared to undisturbed areas.

Forage
As described in Section 2.5.1, the proposed project will affect forage fish during construction and during continued use of the entrance channel. Specifically, forage fish could be injured or killed by underwater noise, suspended sediment, contaminants, and propellers and propeller wash from dredging and construction-related vessels as well as ongoing vessel use in the entrance channel. Dredging will cause short-term minor effects on forage in that it would remove benthic organisms. Detectable effects on benthic resources are expected to be limited to the dredging area, with recolonization occurring within a few weeks to months (McCabe et al. 1998). Though benthic prey species are expected to recover quickly, dredging will increase depth and reduce the amount of shallow foraging habitat available for rearing and migrating subyearling Chinook salmon. Further, petroleum-based spills, discharges, and mobilized sediments may contaminate forage.

Ongoing vessel traffic will cause a long-term reduction in benthic resources. Propellers and propeller wash will mobilize sediments and dislodge aquatic organisms, diminishing the density and diversity of the benthic community. Additionally, dredged material placed on the South Cape property may be mobilized during storm events, which may change the characteristics of the existing substrate and alter the composition and abundance of nearshore benthic communities over time (Dethier and Schoch 2005). Therefore, the action will cause a long-term negative minor change in the quality and function of this PBF.

Rockfish

Nearshore areas (less than 30 meters, 98 feet deep, relative to MLLW) with substrates such as sand, rock and/or cobble compositions, that also support kelp, provide settlement habitat for juvenile bocaccio. Designated critical habitat for PS/GB yelloweye rockfish does not occur in the action area. The PBFs for juvenile bocaccio in the action area include juvenile settlement habitats located in the nearshore with substrates such as sand, rock and/or cobble compositions that also support kelp with the following attributes

- Quantity, quality, and availability of prey species to support individual growth, survival, reproduction, and feeding opportunities; and
- Water quality and sufficient levels of dissolved oxygen to support growth, survival, reproduction, and feeding opportunities.

Quantity, Quality, and Availability of Prey Species

As described in Section 2.5.1, the proposed project will affect forage fish during construction and during continued use of the entrance channel. Specifically, forage fish could be injured or killed by underwater noise, suspended sediment, contaminants, and propellers and propeller wash from dredging and construction-related vessels, as well as ongoing vessel use in the entrance channel.

Dredging will cause short-term minor effects on forage in that it would remove benthic organisms. Detectable effects on benthic resources are expected to be limited to the dredging area, with recolonization occurring within a few weeks to months (McCabe et al. 1998). However, ongoing vessel traffic will cause a long-term reduction in benthic resources. Propellers and propeller wash will mobilize sediments and dislodge aquatic organisms, diminishing the density and diversity of the benthic community. Additionally, dredged material placed on the South Cape property may be mobilized during storm events, which may change the characteristics of the existing substrate and alter the composition and abundance of nearshore benthic communities over time (Dethier and Schoch 2005). Further, petroleum-based spills, discharges, and mobilized sediments may contaminate forage. Therefore, the action will cause a long-term negative minor change in the quality and function of this PBF.

Water Quality

Dredging will cause temporary effects on water quality. It would cause no measurable changes in water temperature and salinity, but would mobilize contaminants and suspended sediments, and may also reduce DO. Detectable effects on water quality are expected to be limited to the area within 500 feet of dredging and 550 yards of vessel activity. The applicant will temporarily stockpile dredge material landward of MHW, and install silt fences and berms to prevent material from entering the water. TSS levels along the South Cape property could be elevated during tidal inundations of the site during construction and future storm events. Propeller scour from vessels traveling through the channel may also mobilize sediments and contaminants.

The applicant will use biodegradable hydraulic fluid in all heavy equipment operating on the shoreline, transport barge, or over the water. All fueling will take place within an impervious containment area landward of the MHHW line. In the unlikely event of a construction-related spill or discharge, the event would likely be very small, quickly contained and cleaned. Most of the fuels that would be used for this type of work would evaporate relatively quickly and/or be quickly diluted by the high rate of water exchange outside the harbor. However, pollutants discharged from ongoing vessel activity would tend to collect within Sandy Point harbor, which is highly enclosed at the surface. Therefore, the action would cause a long-term minor change in the quality and function of this PBF.

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 and 402.17(a)). 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 (Section 2.4).

The current condition of ESA-listed species and designated critical habitat within the action area are described in the Status of the Species and Critical Habitat and the Environmental Baseline sections above. The contribution of non-federal activities to those conditions include past and on-going shoreline development, vessel activities, and upland urbanization. Those actions were driven by a combination of economic conditions that characterized traditional natural resource-based industries, general resource demands associated with settlement of local and regional population centers, and the efforts of social groups dedicated to restoration and use of natural amenities, such as cultural inspiration and recreational experiences.

NMFS is unaware of any specific future non-federal activities that are reasonably certain to affect the action area. However, NMFS is reasonably certain that future non-federal actions such as vessel activity are likely to continue and increase in the future as the human population continues to grow across the region. Continued habitat loss and degradation of water quality from development and chronic low-level inputs of non-point source pollutants will likely continue into the future. Recreational and commercial use of nearshore waters within the action area is also likely to increase as the human population grows.

The intensity of these influences depends on many social and economic factors, and therefore is difficult to predict. Further, the adoption of more environmentally acceptable practices and standards may gradually reduce some negative environmental impacts over time. Interest in restoration activities has increased as environmental awareness rises among the public. State, tribal, and local governments have developed plans and initiatives to benefit ESA-listed species in the action area. However, the implementation of plans, initiatives, and specific restoration projects are often subject to political, legislative, and fiscal challenges that increase the uncertainty of their success.

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 (Section 2.5) to the environmental baseline (Section 2.4) and the cumulative effects (Section 2.6), taking into account the status of the species and critical habitat (Section 2.2), 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 diminish the value of designated or proposed critical habitat as a whole for the conservation of the species.

2.7.1. ESA-listed Species

The species considered in this Opinion have been listed under the ESA, based on declines from historic levels of abundance and productivity, loss of spatial structure and diversity, and an array of limiting factors as a baseline habitat condition. Each species will be affected over time by cumulative effects, some positive – as recovery plan implementation and regulatory revisions increase habitat protections and restoration, and some negative – as climate change and unregulated or difficult to regulate sources of environmental degradation persist or increase. Overall, to the degree that habitat trends are negative, as described below, effects on viability parameters of each species are also likely to be negative. In this context we consider the effects of the proposed action's effect on individuals of the listed species at the population scale. The action area provides habitat for nearshore marine life histories of PS Chinook salmon, PS steelhead, PS/GB bocaccio, and PS/GB yelloweye rockfish.

Chinook Salmon

The action area supports PS Chinook salmon adult and juvenile migration, and juvenile rearing. The long-term trend in abundance of the PS Chinook salmon ESU is slightly negative. Reduced or eliminated accessibility to historically important habitat, combined with degraded conditions in available habitat appear to be the greatest threats to the recovery of PS Chinook salmon. Degraded water quality and temperature, degraded nearshore conditions, and impaired passage for migrating fish also continue to impact this species.

The environmental baseline within the action area has been degraded from the creation of the entrance channel, shoreline development, and maritime activities. However, despite this overall degraded condition, the area remains supportive of juvenile and adult PS Chinook salmon. Eelgrass is present adjacent to the project area, which provides cover and forage for rearing individuals.

The construction work window overlaps with the timing of adult PS Chinook, but not juvenile PS Chinook. Very low numbers of adult PS Chinook salmon may be displaced due to project-related noise. As adults are likely to swim away to avoid dredging noise and activity, it is highly unlikely that they would be struck or entrained by dredging equipment. Adults present may be exposed to sediment concentrations that are expected to elicit temporary behavioral effects (e.g., avoidance of the plume), temporary physiological effects (e.g., gill flaring), temporary reduced feeding rates and success, and moderate levels of stress, which may affect the fitness of the exposed individuals. Pollutants discharged from ongoing vessel activity would tend to collect within Sandy Point harbor, which is highly enclosed at the surface. The potential effects of exposure could range from avoidance of the area to mortality, depending on the compound and its concentration (Meador et al. 2006). These pollutants may also contaminate forage.

Dredging will reduce the availability of shallow water habitat. The utilization of deeper habitat will expose juvenile Chinook salmon to increased piscivorous predation. Propellers and propeller wash associated with continued use of the channel may also injure, kill, or displace juvenile PS Chinook salmon. Vessel noise may increase the risk of predation on juveniles. The number of juveniles that are likely to be injured or killed by action-related stressors is unknown, but is expected to be extremely low, and such a small fraction of a cohort that it will have no detectable effect on any of the characteristics of a viable salmon population (VSP), abundance, productivity, distribution, or genetic diversity) for the affected population(s).

The proposed action will allow the continued existence of the entrance channel, which will keep certain habitat conditions at slightly reduced functional levels as compared to undisturbed areas. However, the channel with not worsen any habitat conditions in a manner that will act to limit the recovery of this species. Any reduction in the availability of forage and natural cover for juvenile PS Chinook salmon is unlikely to be detectable given the relatively small size of the affected area compared to availability of similar habitat near the project site.

Based on the best available information, the scale of the direct and indirect effects of the proposed action, when considered in combination with the degraded baseline, cumulative effects, and the impacts of climate change, will be too small to cause any population level impacts on PS Chinook salmon. Therefore, the proposed action will not appreciably reduce the likelihood of survival and recovery of this listed species.

Steelhead

The action area supports adult and juvenile migration. The DPS is currently at very low viability, and long-term abundance trends have been predominantly negative or flat across the DPS. Continued destruction and modification of habitat, widespread declines in adult abundance, and declining diversity appear to be the greatest threats to the recovery of PS steelhead. Reduced habitat quality and urbanization also continue to impact this species. The environmental baseline within the action area has been degraded from the creation of the entrance channel, shoreline development, and maritime activities. However, despite this degraded condition, the area remains supportive of PS steelhead.

Project-related work will avoid the presence of out-migrating juvenile PS steelhead, but will overlap with the presence of returning adults. Very low numbers of adult PS steelhead may be displaced due to noise from dredging and vessel activity. As adults are likely to swim away to avoid dredging noise and activity, it is highly unlikely that they would be struck or entrained by dredging equipment. Adults present may be exposed to sediment concentrations that are expected to elicit temporary behavioral effects (e.g., avoidance of the plume), temporary physiological effects (e.g., gill flaring), temporary reduced feeding rates and success, and moderate levels of stress, which may affect the fitness of the exposed individuals. The effects of this exposure are uncertain, but not expected to result in injury to individual fish.

Propellers and propeller wash associated with continued use of the channel may also injure, kill, or displace juvenile PS steelhead. The number of juveniles that are likely to be injured or killed by action-related stressors is unknown, but is expected to be extremely low, and such a small fraction of a cohort that it will have no detectable effect on any of the characteristics of a VSP, abundance, productivity, distribution, or genetic diversity) for the affected population(s).

Based on the best available information, the scale of the direct and indirect effects of the proposed action, when considered in combination with the degraded baseline, cumulative effects, and the impacts of climate change, will be too small to cause any population level impacts on PS steelhead. Therefore, the proposed action will not appreciably reduce the likelihood of survival and recovery of this listed species.

Bocaccio

The action area may support juvenile rearing and larvae. No reliable population estimates are available for the DPS, but the best available information indicates that bocaccio were never a predominant segment of the total rockfish abundance in Puget Sound, and suggest that their present-day abundance is likely a fraction of their pre-contemporary fishery abundance. Fishing removals and degraded water quality appear to be the greatest threats to the recovery of the DPS.

The environmental baseline within the action area has been degraded from the creation of the entrance channel, shoreline development, and maritime activities. However, despite this degraded condition, the area remains supportive of juvenile and larval PS/GB bocaccio. Eelgrass is present adjacent to the project area, which provides cover and forage for rearing individuals.

The construction work window largely overlaps with the presence of juveniles. Should individuals be present, very low numbers of juvenile PS/GB bocaccio may be displaced due to noise from dredging and vessel activity. As juveniles are likely to swim away to avoid dredging noise and activity, it is highly unlikely that they would be struck or entrained by dredging equipment. Juveniles present may be exposed to sediment concentrations that are expected to elicit temporary behavioral effects (e.g., avoidance of the plume), temporary physiological effects (e.g., gill flaring), temporary reduced feeding rates and success, and moderate levels of stress, which may affect the fitness of the exposed individuals. Pollutants discharged from ongoing vessel activity would tend to collect within Sandy Point harbor, which is highly enclosed at the surface. The potential effects of exposure could range from avoidance of the area to mortality, depending on the compound and its concentration (Meador et al. 2006). These pollutants may also contaminate forage.

Propellers and propeller wash associated with continued use of the channel may injure, kill, or displace PS/GB bocaccio larvae. Vessel noise may also increase the risk of predation on juveniles. The number of juvenile and larval PS/GB bocaccio that are likely to be injured or killed by action-related stressors is unknown, but is expected to be extremely low, and such a small fraction of a cohort that it will have no detectable effect on any of the characteristics of a viable population (abundance, productivity, distribution, or genetic diversity) for this DPS.

The proposed action will allow the continued existence of the entrance channel, which will keep certain habitat conditions at slightly reduced functional levels as compared to undisturbed areas.

However, the channel with not worsen any habitat conditions in a manner that will act to limit the recovery of this species. Any reduction in the availability of planktonic prey or eelgrass for PS/GB bocaccio is unlikely to be detectable given the relatively small size of the affected area compared to availability of similar habitat near the project site.

Based on the best available information, the scale of the direct and indirect effects of the proposed action, when considered in combination with the degraded baseline, cumulative effects, and the impacts of climate change, will be too small to cause any population level impacts on PS/GB bocaccio. Therefore, the proposed action will not appreciably reduce the likelihood of survival and recovery of this listed species.

Yelloweye Rockfish

The action area may support larvae. Best available information suggests that the present-day abundance of yelloweye rockfish in PS is likely a fraction of their pre-contemporary fishery abundance. Fishing removals and degraded water quality appear to be the greatest threats to the recovery of the DPS. The environmental baseline within the action area has been degraded from the creation of the entrance channel, shoreline development, and maritime activities. However, despite this degraded condition, the area remains supportive of PS/GB yelloweye rockfish larvae.

Propellers and propeller wash associated with continued use of the channel may injure, kill, or displace larval PS/GB yelloweye rockfish. The number of PS/GB yelloweye rockfish larvae that are likely to be injured or killed by action-related stressors is unknown, but is expected to be extremely low, and such a small fraction of a cohort that it will have no detectable effect on any of the characteristics of a viable population (abundance, productivity, distribution, or genetic diversity) for this DPS. As discussed above, there will be no population-level effects for PS Chinook salmon and PS/GB bocaccio. Thus, there will be no detectable effect on forage availability for the adult PS/GB yelloweye rockfish that prey on them.

Based on the best available information, the scale of the direct and indirect effects of the proposed action, when considered in combination with the degraded baseline, cumulative effects, and the impacts of climate change, will be too small to cause any population level impacts on PS/GB yelloweye rockfish. Therefore, the proposed action will not appreciably reduce the likelihood of survival and recovery of this listed species.

2.7.2. Critical Habitat

As described above at Section 2.5.2, the proposed action is likely to adversely affect designated critical habitat for PS Chinook salmon and PS/GB bocaccio.

Chinook Salmon

For PS Chinook salmon critical habitat, past and ongoing anthropogenic activities have diminished the availability and quality of nearshore marine habitats and reduced water quality across the Puget Sound basin. Marine habitat threats include urbanization, wetland draining and conversion, dredging, armoring of shorelines, and marina and port development. Future non-federal actions and climate change are likely to increase and continue acting against the quality of salmonid critical habitat. The intensity of those influences on salmonid habitats is uncertain, as is the degree to which those impacts may be tempered by adoption of more environmentally acceptable land use practices, implementation of non-federal plans that are intended to benefit salmonids, and efforts to address the effects of climate change.

The PBF for PS Chinook salmon critical habitat in the action area are limited to nearshore marine areas free of obstruction and excessive predation. The site attributes of those PBF that will be affected by the action are limited to water quality, natural cover, and forage that support juvenile growth and maturation. As described above, the environmental conditions within the action area have been degraded by past and ongoing human activity, but remain supportive of PS Chinook salmon. Eelgrass is present adjacent to the project area, which provides cover and forage for juvenile PS Chinook salmon.

The proposed work may cause temporary minor avoidance of the area around dredging and vessel activity due to elevated noise, activity, and reduced water quality but would not have meaningful effect on this PBF's ability to support migration. The proposed action will cause no change in the abundance of predators, but the reduction in shallow water habitat may cause increased predation on juveniles. Ongoing vessel noise may also increase the risk of predation. Therefore, the action will cause a long-term change in the quality and function of this PBF.

Detectable effects on water quality (increased suspended sediments, mobilization of contaminants, reduced DO) are expected to be limited to the area within 500 feet of dredging, and 550 yards of construction-related vessel activity. In the unlikely event of a construction-related spill or discharge, the event would likely be very small, quickly contained and cleaned. Most of the fuels that would be used for this type of work would evaporate relatively quickly and/or be quickly diluted by the high rate of water exchange outside the harbor.

However, pollutants discharged from ongoing vessel activity would tend to collect within Sandy Point harbor, which is highly enclosed at the surface. Propeller scour from vessels traveling through the channel will mobilize sediment and contaminants. Additionally, TSS and contaminant levels along South Cape property could be elevated during tidal inundations of the site during construction and future storm events. Therefore, the action will cause a long-term negative minor change in the quality and function of this PBF.

The number of individual forage fish that would be affected by underwater noise, suspended sediment, contaminants, and propellers and propeller wash is unquantifiable with any degree of certainty. However, given the small affected area, the exposed individuals would represent such small subsets of their respective cohorts that the numbers of exposed fish would be too low to cause detectable population-level effects.

Forage fish are expected to be injured or killed by underwater noise, suspended sediment, contaminants, and propellers and propeller wash from dredging and construction-related vessels as well as ongoing vessel use in the entrance channel. Detectable effects on benthic organisms are expected to be limited to the dredging area, with recolonization occurring within a few weeks to months (McCabe et al. 1998). Though benthic prey species are expected to recover quickly, dredging will reduce the amount of shallow foraging habitat available for rearing and migrating subyearling Chinook salmon. Propellers and propeller wash will dislodge aquatic organisms, diminishing the density and diversity of the benthic community. Dredged material placed on the South Cape property may change the characteristics of the existing substrate and alter the composition and abundance of nearshore benthic communities over time (Dethier and Schoch 2005). Further, spills, discharges, and mobilization of contaminated sediments during dredging, use of construction-related vessels, and continued use of vessels in the entrance channel may contaminate forage. Therefore, the action will cause a long-term negative minor change in the quality and function of this PBF.

Should any eelgrass be damaged or removed by dredging or shading from increased suspended sediments, it is expected to recover in about 24 months (Boese et al. 2009). However, propeller scour will cause a long-term reduction in SAV, which will maintain this PBF at a slightly reduced functional level compared to undisturbed areas.

The proposed action will allow the continued existence of the entrance channel, which will keep certain habitat conditions at slightly reduced functional levels as compared to undisturbed areas. However, based on the best available information, the scale of the proposed action's effects, when considered in combination with the degraded baseline, cumulative effects, and the impacts of climate change, will be too small to cause any detectable long-term negative changes in the quality or functionality of the nearshore marine area PBFs in the action area. Therefore, this critical habitat will maintain its current level of functionality, and retain its current ability for PBF to become functionally established, to serve the intended conservation role for PS Chinook salmon.

Bocaccio

For PS/GB bocaccio critical habitat, nearshore critical habitat has been degraded by past and ongoing shoreline development that has altered shoreline substrates, degraded water quality, and reduced eelgrass and kelp habitats in many areas of Puget Sound. Future non-federal actions and climate change are likely to increase and continue acting against the quality of PS/GB bocaccio critical habitat. The intensity of those influences is uncertain, as is the degree to which those impacts may be tempered by adoption of more environmentally acceptable practices, restoration activities, and efforts to address the effects of climate change.

The PBF for PS/GB bocaccio critical habitat in the action area is limited to nearshore settlement habitats with sand, rock, and/or cobble substrates that also support kelp. The site attributes of that PBF that will be affected by the action are limited to prey quantity, quality, and availability, and water quality and sufficient DO to support individual growth, survival, reproduction, and feeding opportunities. As described above, the environmental conditions within the action area have been degraded by past and ongoing human activity, but remains supportive of PS/GB bocaccio. Eelgrass is present adjacent to the project area, which provides cover and forage for juvenile PS/GB bocaccio.

Detectable effects on water quality (increased suspended sediments, mobilization of contaminants, reduced DO) are expected to be limited to the area within 500 feet of dredging, and are not expected to persist past several hours following the cessation of dredging. In-water presence of contaminants related to mobilization of sediments along the South Cape property would be very infrequent, very short-lived, and at concentrations too low to cause detectable effects. However, pollutants discharged from ongoing vessel activity would tend to collect within Sandy Point harbor, which is highly enclosed at the surface. Therefore, the action will cause a long-term negative minor change in the quality and function of this PBF.

The proposed action will not affect kelp per se, but propeller scour will maintain long-term minor effects on eelgrass, which is a habitat type also utilized by juvenile bocaccio in nearshore habitats. Detectable effects on benthic organisms are expected to be limited to the dredging area, with recolonization occurring within a few weeks to months (McCabe et al. 1998). However, propellers and propeller wash will dislodge aquatic organisms, diminishing the density and diversity of the benthic community. Dredged material placed on the South Cape property may change the characteristics of the existing substrate and alter the composition and abundance of nearshore benthic communities over time (Dethier and Schoch 2005). Further, spills, discharges, and mobilization of contaminated sediments during dredging, use of construction-related vessels, and continued use of vessels in the entrance channel may contaminate forage. Therefore, the action will cause a long-term negative minor change in the quality and function of this PBF.

The proposed action will allow the continued existence of the entrance channel, which will keep certain habitat conditions at slightly reduced functional levels as compared to undisturbed areas. However, based on the best available information, the scale of the proposed action's effects, when considered in combination with the degraded baseline, cumulative effects, and the impacts of climate change, will be too small to cause any detectable long-term negative changes in the quality or functionality of the nearshore settlement PBF in the action area. Therefore, this critical habitat PBF will maintain its current level of functionality, and retain its current ability for PBF to become functionally established, to serve the intended conservation role for PS/GB bocaccio.

2.8. Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of PS Chinook salmon, PS steelhead, PS/GB bocaccio and PS/GB yelloweye rockfish, or adversely modify designated critical habitat for PS Chinook salmon and PS/GB bocaccio.

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:

PS Chinook salmon from

- Elevated noise
- Elevated turbidity
- Propeller wash
- Contaminants
- Reduced shallow water habitat

PS/GB bocaccio from

- Elevated noise
- Elevated turbidity
- Contaminants
- Propeller wash

PS steelhead from

- Elevated turbidity
- Propeller wash

PS/GB yelloweye rockfish from

- Propeller wash

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.

Therefore, we cannot predict with meaningful accuracy the number of PS Chinook salmon, PS steelhead, PS/GB bocaccio, and PS/GB yelloweye rockfish that are reasonably certain to be injured or killed by exposure to any of these stressors. Additionally, NMFS knows of no device or practicable technique that would yield reliable counts of individuals that experience these impacts. In such circumstances, NMFS uses the causal link established between the activity and the likely extent and duration of changes in habitat conditions to describe the extent of take as a numerical level of habitat disturbance. The most appropriate surrogates for take are action-related parameters that are directly related to the magnitude of the expected take.

Construction-Related Noise and Propeller Wash

For this action, the timing and duration of work are the best available surrogates for the extent of take of listed species from exposure to construction-related noise and propeller wash. Timing and duration of work are applicable, because the planned work windows were selected to reduce the potential for fish presence at the project site. Therefore, working outside of the planned work window and/or working for longer than planned would increase the number of fish likely to be exposed to construction-related impacts that are likely to cause injury or reduce fitness.

Increased Suspended Sediment and Contaminated Forage

For increased suspended sediment, the best available indicator for the extent of take is the extent of visible increased turbidity. Based on past projects (Bloch 2010), the observed extent of turbidity is a reliable indicator of the extent of elevated suspended sediment, and therefore, the extent of exposure of to listed species. Because contaminants may be released during activities that increase suspended sediment, the observed extent of turbidity is also a reliable indicator of the extent of contaminant exposure. Therefore, if the surrogate is exceeded, reinitiation of consultation will be required. This surrogate will function as an effective reinitiation trigger, because the extent of visible turbidity can be can and will be measured and reported.

Vessel Noise, Propeller Wash, Contaminated Water, and Reduced Shallow Water Habitat

For take resulting from vessel noise, propeller wash, contaminated water, and reduced shallow water habitat, we use the area and volume of the dredge prism as a habitat surrogate. This surrogate is proportional to the amount of take, because we expect additional predation and vessel activity (and associated noise, propeller wash, spills and discharges) with increasing size and depth of the dredged area.

As the volume and area of dredging increases, the less shallow water habitat is available for juvenile salmonids and the more likely they will enter deeper water where they are at greater risk of predation. As volume and area of dredging increase, the more sediment that will be deposited at the entrance channel and the less sediment will be deposited along the south side of Sandy Point. Erosion will occur along the south, reducing shallow water habitat and exposing juveniles to increased predation.

With increasing volume and area of dredging, more vessels and vessels of larger size will be able to utilize the entrance channel. Thus, vessel noise, propeller wash, and the number and size of petroleum-based discharges will increase. The take represented by this surrogate is equivalent to the maximum amount of take considered in our jeopardy analysis. Therefore, if the surrogate is exceeded, reinitiation of consultation will be required. This surrogate will function as an effective reinitiation trigger because the area of overwater cover can and will be measured and reported.

In summary, the extent of take for this action is defined as:

1. PS Chinook salmon, PS steelhead, and PS/GB bocaccio:
    - 1.1 In-water work window between November 1 and January 31;
    - 1.2 Geographic extent of visible turbidity; and
    - 1.3 Dredge volume and area.

2. PS/GB yelloweye rockfish:
    2.1 In-water work window between November 1 and January 31; and
    2.2 Dredge volume and area.

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.

2.9.3. Reasonable and Prudent Measures

"Reasonable and prudent measures" are nondiscretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02). NMFS believes that the full application of the reasonable and prudent measures described below is necessary and appropriate to minimize the likelihood of incidental take of ESA-listed species.

The Corps shall:

1. Implement monitoring and reporting to confirm that the take exemption for the proposed action is not exceeded.

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 RPMs (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 ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

1) The following terms and conditions implement reasonable and prudent measure 1:
    a) Require the applicant to maintain and submit construction logs to verify that all take indicators are monitored and reported. The logs should indicate:
        i) In-water work window of November 1 to January 31;
        ii) Maximum of 30 days of dredging;
        iii) Maximum of 6 hours of dredging in a single day;
        iv) Maximum dredge area of 89,085 square feet;
        v) Volume of removed accumulated sediment and gravel not to exceed 29,423 cubic yards;
        vi) Dredge prism dimensions not to exceed the length, width, and depth depicted in the project drawings; and
        vii) Visible turbidity plume not to exceed 500 feet from the project site during any portion of the project.

2) Submit an electronic post-construction report to NMFS within six months of project completion. Send the report to: projectreports.wcr@noaa.gov. Be sure to include the NMFS Tracking number for this project in the subject line: Attn: WCRO-2019-00214.

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).

1) The Corps should look for opportunities to restore nearshore habitat for juvenile salmonids in the Nooksack watershed.
2) The Corps should encourage the applicant to develop a plan to reduce the environmental impacts of Sandy Point Harbor. Suggested measures include:
    a) Instruct users about the importance of nearshore marine habitats at the site to juvenile salmonids and rockfish;
    b) Require users to operate vessels at low speeds near the entrance channel and other shoreline areas to reduce propeller scour;
    c) Require users to maintain and operate their vessels with the intent to reduce the potential for toxic chemicals to enter or remain in the water at the site; and
    d) Establish a system to prevent and/or remove litter and wastes around the entrance channels and other shoreline areas.

2.11. Reinitiation of Consultation

This concludes formal consultation for the Corps' authorization of the Ocean Properties Maintenance Dredge Project. As 50 CFR 402.16 states, reinitiation of consultation is required and shall be requested by the Federal agency or by the Service 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 identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action.

2.12. "Not Likely to Adversely Affect" Determinations

This concurrence was prepared pursuant to section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402 and agency guidance for preparation of letters of concurrence. NMFS concurs with the Corps' determination that the proposed action is not likely to adversely affect humpback whales, and SRKW and their designated critical habitat

2.12.1. Southern Resident Killer Whales and Humpback Whales

The maximum distance of underwater noise from the proposed action is 277 meters. This represents the distance from dredging to the threshold for behavioral disruption. According to Orca Network (2019), no humpback whales in the vicinity of Sandy Point from 2003 to 2019. According to The Whale Museum (2019), SRKW have been observed in the vicinity of Sandy Point. Observations range from a total of one to fourteen individuals per month over the period of 1990 to 2013. With depths in the action area of less than 20 feet, the presence of SRKW and humpback whales in the action area is extremely unlikely. Therefore, suspended sediment and construction-related noise are not likely to adversely affect SRKW and humpback whales.

Any PS Chinook salmon exposed to project-related effects would represent such small subsets of their respective cohorts that the numbers of exposed fish would be too low to cause detectable population-level changes in abundance. Therefore, the proposed action will not measurably reduce SRKW forage. Because the number of juvenile PS Chinook salmon that consume contaminated prey at the site would be very low, and because only a small subset of those individuals may be consumed by SRKW, the action is extremely unlikely to cause detectable levels of contaminants in SRKW.

As discussed in Section 1.3, vessel activity is interrelated and interdependent with the proposed action. However, the proposed action will not increase the number or frequency (timing) of vessel transits in the action area. It will not change the concentration of vessel traffic, and therefore, will not change sound propagation and the soundscape in the action area. Further, it will not change the acoustic characteristics (such as the source level or frequency spectrum) of the individual vessels, because it will not affect factors such as vessels' size, shape, speed, load, age, condition, or propulsion system (Southall et al. 2019). Therefore, ongoing vessel activity is not likely to adversely affect SRKW and humpback whales.

2.12.2. Southern Resident Killer Whale (SRKW) Critical Habitat

The proposed action is not likely to adversely affect critical habitat that has been designated for SRKW. We designated critical habitat for SRKW on November 29, 2006 (71 FR 69054). Critical habitat for SRKW includes marine waters of PS that are at least 20 feet deep.

The PBFs of SRKW critical habitat in the action area include:

- Water quality to support growth and development;
- Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction and development, as well as overall population growth; and
- Passage conditions to allow for migration, resting, and foraging.

The proposed action will cause ephemeral minor effects on water quality. It will cause no measurable changes in water temperature and salinity. The presence of detectable levels of contaminants, including suspended sediments, will be ephemeral, infrequent, localized, and of such low concentrations that changes in water quality will be insignificant.

As discussed above, the proposed action will cause ephemeral minor effects on prey. Any PS Chinook salmon exposed to project-related effects would represent such small subsets of their respective cohorts that the numbers of exposed fish would be too low to cause detectable population-level changes in abundance. Therefore, effects to SRKW prey quantity and availability will be insignificant. Additionally, because the number of juvenile PS Chinook salmon that consume contaminated prey at the site would be very low, and because only a small subset of those individuals may be consumed by SRKW, the action is extremely unlikely to cause detectable levels of contaminants in SRKW.

Detectable levels of construction-related noise will be limited to 277 meters from the project site. As described above, SRKW are not present within this area during the in-water work window. Therefore, the action will cause insignificant effects on this PBF.

As described above, the proposed action will not increase the number or frequency (timing) of vessel transits in the action area. It will not change the concentration of vessel traffic or change the acoustic characteristics of the individual vessels. Therefore, effects to SRKW passage from vessel activity interrelated and interdependent with the proposed action will be insignificant.

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 groundfish (PFMC 2005), coastal pelagic species (PFMC 1998), and 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 Sections 1 and 2 of this document. The action area includes areas designated as EFH for various life-history stages of Pacific coast groundfish, coastal pelagic species, and Pacific coast salmon. The PFMC described and identified EFH for Pacific Coast groundfish (PFMC 2005), coastal pelagic species (PFMC 1998), and Pacific Coast salmon (PFMC 2014). The action area has been designated as an estuarine habitat area of particular concern (HAPC).

3.2. Adverse Effects on Essential Fish Habitat

The ESA portion of this document describes the adverse effects of this proposed action on ESA-listed species and critical habitat, and is relevant to the effects on EFH for Pacific coast groundfish, coastal pelagic species, and Pacific coast salmon. Based on the analysis of effects presented in Section 2.5, the proposed action will cause small-scale adverse effects on this EFH through direct or indirect physical, chemical, or biological alteration of the water or substrate, and through alteration of benthic communities, and the reduction in prey availability. Therefore, we have determined that the proposed action would adversely affect the EFH identified above.

3.3. Essential Fish Habitat Conservation Recommendations

Fully implementing the EFH conservation recommendation below would protect, by avoiding or minimizing the adverse effects described in Section 3.2, above, approximately 2 acres of designated EFH for Pacific Coast salmon, Pacific Coast groundfish, and coastal pelagic species.

1. To reduce adverse alteration of the physical, chemical, or biological characteristics of the water and substrate, the Corps shall require the applicant to implement the project and associated conservation measures as described in Section 1.3 of this Opinion, particularly:
    - 1.1 Install silt fences and berms to contain dredge material in stockpile areas.
    - 1.2 Ensure fueling will only take place within an impervious containment area landward of MHHW.
    - 1.3 Use biodegradable hydraulic fluid in all heavy equipment operating on the shoreline, transport barge, or over the water.

2. To reduce adverse alteration of benthic communities and reduction in prey availability, the Corps shall require the applicant to implement the project and associated conservation measures as described in Section 1.3 of this Opinion, particularly:
    - 2.1 Conduct a forage fish spawning survey following WDFW guidelines prior to dredging. If eggs are present, postpone dredge operations until spawning and incubation activity have not been observed by subsequent surveys conducted at two-week intervals.
    - 2.2 Conduct an eelgrass survey within the dredge area and a 25-foot buffer area following WDFW guidelines prior to dredging.
    - 2.3 Ensure that barge anchors, spuds, and cables are not placed on eelgrass.
    - 2.4 Ensure that propwash is not directed towards eelgrass.
    - 2.5 Ensure that barges or other structures do not ground out on the bottom.
    - 2.6 Move barges with the minimum power in order to reduce propeller scour of submerged aquatic vegetation.

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 user of this opinion is the Corps. Other interested users could include affected tribes, residents, and users of Sandy Point harbor. Individual copies of this opinion were provided to the Corps. The document will be available within two weeks at the NOAA Library Institutional Repository (https://repository.library.noaa.gov/welcome). 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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