UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

AUG 21 2014

OFFICE OF
ECOSYSTEMS, TRIBAL AND
PUBLIC AFFAIRS

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

William T. Lynn
1201 Pacific Avenue, Suite 2100
Tacoma, Washington 98402

Re: In the Matter of Jon Koloski
Administrative Order on Consent (EPA Docket No. CWA-10-2014-0078)

Dear Mr. Lynn:

Enclosed is the Administrative Order on Consent (Consent Order) that was negotiated between Mr. Jon Koloski and the U.S. Environmental Protection Agency (EPA) regarding remedies for the environmental and habitat losses resulting from your clients unauthorized discharge of dredged or fill material into waters of the United States at his property located at 22760 U.S. Highway 101 North, Shelton, Washington.

The Consent Order requires Mr. Koloski to conduct on-site mitigation consistent with the National Marine Fisheries Service's December 22, 2011 Biological Opinion (Exhibit A of the Consent Order) and the Scope of Work Memo (Exhibit B of the Consent Order), obtain an Army Corps of Engineers Section 404 Nationwide 32 permit, and pay $60,500 to the Hood Canal Coordinating Council In-Lieu Fee Program for off-site mitigation.

Please carefully review the enclosed Consent Order. For technical questions regarding the Consent Order, please contact Becky Fauver at (206) 553-1353 or fauver.becky@epa.gov. Legal questions concerning the Consent Order should be directed to Endre Szalay, Assistant Regional Counsel at (206) 553-1073 or szalay.endre@epa.gov. Thank you for your attention to this matter.

Sincerely,

Linda Anderson-Carnahan for

R. David Allnutt, Director
Office of Ecosystems, Tribal and Public Affairs

Enclosure: Signed Administrative Order on Consent

cc: Muffy Walker, USACE (Corps), Seattle District (via email)
David J. Martin, USACE (Corps), Seattle District (via email)

Jeff Fisher, NMFS-NOAA (via email)
Rick Mraz, WDOE (via email)
Margaret Bigelow, WDFW (via email)
Grace Miller, Mason County (via email)
Todd Maybrown, Allen, Hansen & Maybrown P.S. (via email)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

In the Matter of:	**DOCKET NO. CWA-10-2014-0078**
JON KOLOSKI, **Shelton, Washington**	**ADMINISTRATIVE ORDER ON CONSENT**
Respondent.	

The United States Environmental Protection Agency ("EPA"), with the consent of Jon Koloski ("Respondent"), issues this Administrative Order on Consent ("Consent Order") pursuant to the authority vested in the EPA Administrator by Sections 308 and 309(a) of the Clean Water Act ("Act" or "CWA"), 33 U.S.C. §§ 1318 and 1319(a). This authority has been delegated to the Regional Administrator, Region 10, and has been duly redelegated to the undersigned Director of the Office of Ecosystems, Tribal and Public Affairs.

The purpose of this Consent Order is to remedy the environmental and habitat losses resulting from Respondent's discharge of dredged or fill material into waters of the United States more fully described in Section II below. Respondent agrees to the effect of this Consent Order as described in Sections I and IV, and agrees to carry out the terms and conditions described in Section III.

U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140
(206) 553-1073

I. APPLICABILITY

1.1 Respondent waives any and all remedies, claims for relief, and otherwise available rights to judicial or administrative review that Respondent may have with respect to any issue of fact or law or any terms and conditions set forth in this Consent Order, including any right of judicial review of this Consent Order under the Administrative Procedure Act, 5 U.S.C. §§ 701-708.

1.2 This Consent Order shall be binding on Respondent and his agents, employees, attorneys, successors, and assigns, and on all persons, contractors, and consultants acting in concert with Respondent.

1.3 Respondent must provide a copy of this Consent Order to all contractors and/or consultants retained to perform any of the work described in this Consent Order at least 48 hours prior to the initiation of such work.

1.4 If Respondent transfers any interest in the real property prior to completion of the work described in this Consent Order, Respondent must provide a copy of this Consent Order to any successor in ownership, control, operation, or any other interest in all or any portion of the real property at issue at least 30 days prior to the transfer and must simultaneously notify EPA in writing that such notice has been given. No transfer or contract shall in any way affect Respondent's obligation to comply fully with all the terms and conditions of this Consent Order.

II. FINDINGS AND CONCLUSIONS

2.1 Section 301(a) of the Act, 33 U.S.C. § 1311(a), prohibits the discharge of pollutants into waters of the United States by any person, except as authorized by a permit issued pursuant to Section 402 or 404 of the Act, 33 U.S.C. § 1342 or 1344. Each discharge of pollutants from a point source that is not authorized by such a permit constitutes a violation of Section 301(a) of the Act, 33 U.S.C. § 1311(a).

2.2 Respondent is a "person" within the meaning of Sections 301(a) and 502(5) of the Act, 33 U.S.C. §§ 1311(a) and 1362(5).

2.3 Respondent owns, possesses, and/or controls approximately .098 acres of real property in Shelton, Washington, including tidelands. This property is located at 22760 North US Highway 101, Shelton, Washington, Latitude 47.383184°, Longitude -123.148259°. Respondent's Shelton property is hereinafter referred to as the "Site."

2.4 At the time of the unauthorized activities described below, the Site extended into the near shore of the Hood Canal, a water which is subject to the ebb and flow of the tide and therefore is a "navigable water" as defined in CWA Section 502(7), 33 U.S.C. § 1362(7), and is a "water of the United States" as defined in 33 C.F.R. § 328.3(a)(1), and 40 C.F.R. § 232.2.

2.5 Without receiving a CWA Section 404 permit and without undertaking the measures in the National Marine Fisheries Service's ("NMFS's") December 22, 2011 Biological Opinion, during fall 2011, at times more fully known to Respondent, Respondent and/or persons acting on his behalf, used construction equipment, including a concrete truck and chute, to place dredged and/or fill material into 500 square feet (50 feet by 10 feet) of the near shore of the Hood Canal at the Site. This activity occurred when the Respondent was installing a concrete bulkhead 10 feet waterward of Respondent's original bulkhead and filling behind the newly installed bulkhead.

2.6 The construction equipment referenced in Paragraph 2.5 is a "point source" within the meaning of Section 502(14) of the Act, 33 U.S.C. § 1362(14).

2.7 The dredged and/or fill materials that Respondent and/or persons acting on his behalf caused to be discharged, as referenced in Paragraph 2.5, included dirt, rock, sand, and concrete, among other things, each of which constitutes "dredged material" and/or "fill material" within the meaning of 40 C.F.R. § 232.2, and each of which constitutes a "pollutant" within the meaning of Section 502(6) of the Act, 33 U.S.C. § 1362(6).

2.8 By causing such dredged and/or fill materials to enter waters of the United States, Respondent engaged in the "discharge of pollutants" from a point source within the meaning of Sections 301(a) and 502(12) of the Act, 33 U.S.C. §§ 1311(a) and 1362(12).

2.9 Respondent's discharges of dredged and/or fill materials described in Paragraph 2.5 above were not authorized by any permit issued pursuant to Section 404 of the Act, 33 U.S.C. § 1344. Respondent is therefore in violation of section 301(a) of the Act, 33 U.S.C. § 1311(a).

2.10 Each day the dredged and/or fill material remains in place without the required permit constitutes an additional day of violation of Section 301(a) of the Act, 33 U.S.C. § 1311(a).

2.11 Taking into account the seriousness of these violations and any good faith efforts to comply with applicable requirements, the parties acknowledge and agree the schedule for compliance contained in Section III of this Consent Order is reasonable and appropriate.

III. COMPLIANCE MEASURES

Based upon the foregoing FINDINGS AND CONCLUSIONS and pursuant to Sections 308 and 309(a) of the Act, 33 U.S.C. §§ 1318 and 1319(a), it is hereby AGREED and ORDERED as follows:

3.1 Prohibition of Discharge: Respondent shall not discharge any additional pollutants into any waters of the United States at the Site except in compliance with this Consent Order or a permit issued pursuant to the Clean Water Act.

3.2 Submission of Restoration and Mitigation Work Plan: No later than **45 days after the effective date of this Consent Order**, Respondent must submit to the EPA contact identified in Paragraph 3.10 of this Consent Order, for review and approval, a final Restoration and Mitigation Work Plan consistent with the terms and conditions outlined in NMFS's Biological Opinion, attached as Exhibit A, as well as the Scope of Work Memo for the on-site mitigation, attached as Exhibit B. The EPA shall review and respond within a reasonable time. At a minimum, this Restoration and Mitigation Work Plan must include:

3.2.1 A scaled site map depicting the Site's property boundaries, existing bulkhead, and Hood Canal;

3.2.2 A description of the exact areas where remedial activities will occur, using the scaled site map described in 3.2.1 above as a base. Indicate the location of proposed plantings/seedlings;

3.2.3 A Restoration Plan identifying the specific plant species, planting densities, planting locations and vegetation techniques that Respondent will employ to vegetate the fill behind the bulkhead as described in the Biological Opinion and in accordance with the Scope of Work Memo. The Restoration Plan must also detail the procedures for sediment supplementation in accordance with the Scope of Work Memo;

3.2.4 A Monitoring Plan describing the vegetation, sediment supplementation and photographic monitoring and documentation Respondent will employ to satisfy the Biological Opinion and Scope of Work Memo monitoring goals; and

3.2.5 A Contingency Plan establishing success standards for the vegetation on the fill behind the bulkhead. The Contingency Plan must also identify the steps Respondent will take to respond to any failure to attain these success standards.

It is Respondent's responsibility to ensure that activities conducted under the Restoration and Mitigation Work Plan comply with federal, state and local regulations or requirements. Commencing work under the Plan is subject to EPA approval.

3.3 Notification to EPA: At least seven days prior to commencing activities on the Site under the EPA-approved Restoration and Mitigation Work Plan, Respondent must notify the EPA representative identified in Paragraph 3.10.

3.4 Implementation: Within **90 days after EPA approval of the Restoration and Mitigation Work Plan**, Respondent must complete the on-site restoration work as required by the EPA-approved Restoration and Mitigation Work Plan.

3.5 Completion Report: Within fourteen days of completing the initial on-site mitigation activities described in the Restoration and Mitigation Work Plan, Respondent must

notify, in writing, the EPA representative identified in Paragraph 3.10. The notification must include photographs of Site conditions before and after compliance with this Consent Order.

3.6 Site Inspection: Upon receipt of the notification referenced in Paragraph 3.5, EPA may schedule a Site inspection by EPA or its designated representative and may invite the U.S. Army Corps of Engineers and/or NMFS to participate in the inspection so long as said Site visit is completed within seven (7) business days of the notification so as to not delay or interfere with the Restoration and Mitigation Plan.

3.7 Annual Report: On or before the first anniversary of EPA's approval of the Completion Report described in Paragraph 3.5 above, Respondent must submit to the EPA contact identified in Paragraph 3.10 of this Consent Order the first of five annual reports that include (1) documentation of the sediment supplementation and (2) documentation of the vegetation efforts described in the approved Restoration and Mitigation Work Plan. Respondent must submit similar such annual reports on the same date in each of the following four years.

3.8 Site Access: Respondent must provide and/or obtain access to the Site to implement this Consent Order and must provide access to all records and documentation related to the conditions at the Site and the restoration and mitigation activities conducted pursuant to this Consent Order. Such access must be provided to EPA employees and representatives. These individuals must be permitted to move freely at the Site in order to conduct actions which EPA determines to be necessary, so long as they do not unreasonably interfere with any of Respondent's activities at the Site.

3.9 Force Majeure: In the event that there is an actual or anticipated delay attributable to force majeure, the time for performance of the obligation shall be extended by written agreement of the parties. An extension of the time for performing an obligation directly affected by the force majeure event shall not, of itself, extend the time for performing a subsequent obligation.

(a) For the purposes of this Consent Order, "force majeure" shall mean any event entirely beyond the control of Respondent or any entity controlled by Respondent, including Respondent' contractors, consultants, and subcontractors, that delays or prevents performance of any obligation under this Consent Order notwithstanding Respondent's best efforts to avoid the delay. The best efforts requirement includes using best efforts to anticipate any such event and minimize the delay caused by any such event to the greatest extent practicable. Examples of events that are not force majeure events include, but are not limited to, increased costs or expenses of any work to be performed under this Consent Order and financial difficulties encountered by Respondent.

(b) If any event may occur or has occurred that may delay the performance of any obligation under this Consent Order, whether or not caused by a force majeure, Respondent must notify by telephone the EPA contact identified in Paragraph 3.10 of this Consent Order, within two business days of when Respondent became aware that the event might cause a delay. Within seven days thereafter, Respondent must provide in writing the reasons for the delay, the anticipated duration of the delay, the measures taken or to be taken to prevent or minimize the delay, a timetable by which those measures will be implemented, and whether, in Respondent's opinion, such event may cause or contribute to an endangerment to public health, welfare, or the environment. Respondent must exercise best efforts to avoid or minimize any delay and any effects of a delay. Failure to comply with the notice requirements of this paragraph shall preclude Respondent from asserting any claim of force majeure.

(c) Respondent shall have the burden of demonstrating, by a preponderance of the evidence, that the actual or anticipated delay has been or will be caused by a force majeure event, that the duration of the delay was or will be warranted under the circumstances, that Respondent did exercise or is using best efforts to avoid and mitigate

the effects of the delay, and that Respondent complied with the requirements of this section.

3.10 Project Coordinators: The parties have designated his respective Project Coordinators as follows:

(a) For EPA:

Becky Fauver
Aquatic Resources Unit
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Mail Stop – ETPA-083
Seattle, Washington 98101
Phone: (206) 553-1353

(b) For Respondent:

Jon Koloski
15816 SE 160th Pl.
Renton, Washington 98058
Phone: (425) 1226-1485

The Project Coordinators shall be responsible for overseeing the implementation of this Consent Order and receiving communications, which include, but are not limited to, all documents, reports, comments, approvals, and other correspondence submitted or exchanged under this Consent Order. EPA and Respondent may change their respective Project Coordinator by giving the other party advance written notice.

3.11 Off-site Mitigation Payment - **No later than 60 days after the effective date of this Consent Order**, Respondent shall pay $60,500 to the Hood Canal Coordinating Council for the purpose of mitigation for the impacts associated with the unauthorized discharge of fill material described in paragraph 2.5. The payment amount is based, in part, on the NMFS's Habitat Equivalency Assessment which takes into account the lost functions of the impacted aquatic resource as well as the average cost of in-kind restoration within the Puget Sound. Payment must be made by cashier's check or certified check and must include a copy of this document and a cover letter stating that payment is in partial satisfaction of the Administrative

Order on Consent with EPA Region 10, Docket No. CWA-10-2014-0078. The check must be made out to "Hood Canal Coordinating Council" and reference "In-Lieu Fee Mitigation Program" and sent by certified mail, return receipt requested to:

Hood Canal Coordinating Council
17791 Fjord Drive NE
Suite 122
Poulsbo, WA 98370

Respondent must send a photocopy of the check to the EPA Project Coordinator identified in Paragraph 3.10.

3.12 Failure to timely and appropriately implement to EPA's satisfaction any element of the EPA-approved Restoration and Mitigation Work Plan or timely make payment to the Hood Canal Coordinating Council for the off-site mitigation shall be deemed a violation of this Consent Order and of the Clean Water Act.

3.13 Nationwide Permit 32 for Completed Enforcement Actions, 77 Fed. Reg. 10184, 10184 (Feb. 21, 2012), authorizes "[a]ny structure, work, or discharge of dredged or fill material remaining in place or undertaken for mitigation, restoration, or environmental benefit in compliance with" the terms of a CWA 309(a) Consent Order. Upon the effective date of this Consent Order, as described in paragraph 3.14 below, Respondent shall provide to the District Engineer of the U.S. Army Corps of Engineers, Seattle District an application in the form of the letter attached at Exhibit C, which requests the District Engineer to verify that Nationwide Permit 32, authorizes the Respondent to retain the bulkhead in waters of the United States and place sediment immediately waterward of the bulkhead annually for five years in accordance with the Scope of Work Memo.

3.14 This Consent Order shall become effective on the date it is signed by EPA.

IV. SANCTIONS

4.1 Notice is hereby given that violation of, or failure to comply with, the foregoing Consent Order may subject Respondent to: (1) civil penalties of up to $37,500 per day of violation pursuant to Section 309(d) of the Act, 33 U.S.C. § 1319(d), and 40 C.F.R. Part 19; or (2) administrative penalties of up to $16,000 per day for each violation, pursuant to Section 309(g) of the Act, 33 U.S.C. § 1319(g), and 40 C.F.R. Part 19.

4.2 This Consent Order is not a permit, and nothing in this Consent Order shall be construed to relieve Respondent of any applicable requirements of federal, state, or local law.

The undersigned representative of Respondent certifies that he is fully authorized to enter into the terms and conditions of this Order and to bind Respondent to this document.

STIPULATED and AGREED this 5TH day of AUGUST, 2014:

Jon W. Koloski

Jon Koloski

It is so ORDERED and AGREED this 21st day of AUGUST, 2014:

Linda Anderson-Carnahan for

R. David Allnutt, Director
Office of Ecosystems, Tribal and Public Affairs

U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140
(206) 553-1073

EXHIBIT A: NMFS BIOLOGICAL OPINION

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, Washington 98115

NMFS Tracking Number:
2010/06130

December 22, 2011

Ms. Michelle Walker
Chief, Regulatory Branch
U.S. Army Corps of Engineers
Seattle District
Post Office Box 3755
Seattle, Washington 98124-3755

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Jon Koloski New Bulkhead Project (COE No.: NWS-2010-08007-SO), Hood Canal (Sixth Field HUC 171100180301- Finch Creek-Frontal Hood Canal, Mason County).

Dear Ms. Walker:

The enclosed document contains a biological opinion (opinion) prepared by the National Marine Fisheries Service (NMFS) pursuant to section 7(a)(2) of the Endangered Species Act (ESA) on the effects of the U.S. Army Corp of Engineers (COE) issuance of a permit to Jon Koloski for the construction of a new bulkhead in Hood Canal. In this biological opinion, NMFS concludes the action, as proposed, is not likely to jeopardize the continued existence of Puget Sound (PS) Chinook salmon (*Oncorhynchus tshawytscha*), or Hood Canal summer-run (HCSR) chum salmon (*O. keta*). In addition, NMFS concludes that the proposed action is not likely to adversely affect PS steelhead (*O. mykiss*), or the PS/Georgia Strait Distinct Population Segments (DPSs) of yelloweye rockfish (*Sebastes ruberrimus*), canary rockfish (*S. pinniger*), or Bocaccio (*S. paucispinis),* or Southern Resident killer whale (*Orcinus orca*), and that the proposed action will not affect Steller sea lion (*Eumetopias jubatus*). Further, NMFS concludes the action, as proposed, will not result in the destruction or adverse modification of designated critical habitat for PS Chinook salmon, or HCSR chum salmon. Critical habitat has not been designated for PS steelhead, or the ESA-listed rockfish species.

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

This document also includes the results of our analysis of the action's likely effects on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and includes five conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH. Four of the conservation recommendations are a subset of the ESA terms and conditions, and one is unique to the EFH consultation. A written response is required under MSA section 305(b)(4)(B).

If you have questions regarding this consultation, please contact David Molenaar of my staff at the Washington State Habitat Office by phone at (360) 753-9456, by email at david.molenaar@noaa.gov, or by mail at the letterhead address.

Sincerely,

for William W. Steele, Jr.
Regional Administrator

Enclosure

cc: Darren Habel, COE

Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion, Section 7(a)(2) "Not Likely to Adversely Affect" Determinations, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation

Koloski Bulkhead
(Sixth Field Hydrological Unit Code: 171100180301)
Mason County, Washington

NMFS Consultation Number: 2010/06130

Action Agency: U.S. Army Corps of Engineers

Affected Species and Determinations:

ESA-listed species	Status	Is Action Likely To Adversely Affect Species or Critical Habitat?	Is Action Likely to Jeopardize the Species?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Puget Sound (PS) steelhead (*Oncorhynchus mykiss*)	Threatened	No	No	No
Hood Canal Summer run-chum salmon (*O. keta*)	Threatened	Yes	No	No
PS Chinook salmon (*O. tshawytscha*)	Threatened	Yes	No	No
Yelloweye rockfish (*Sebastes ruberrimus*),	Threatened	No	No	No
Canary rockfish (*S. pinniger*)	Threatened	No	No	No
Bocaccio (*S. paucispinis*)	Endangered	No	No	No
Southern resident killer Whale (*Orcinus orca*)	Endangered	No	No	No
Steller sea lion (*Eumetopias jubatus*)	Threatened	No	No	No

Fishery Management Plan That Describes EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendation Provided?
Pacific Coast Salmon	Yes	Yes
Pacific Coast Groundfish	Yes	Yes
Coastal Pelagic Species	Yes	Yes

Consultation Conducted By: National Marine Fisheries Service, Northwest Region

Issued By:

for William W. Stelle, Jr.
Regional Administrator

Date: 12-22-2011

TABLE OF CONTENTS

LIST OF ACRONYMS

BE	Biological Evaluation
BMP	Best Management Practices
BRT	Biological Review Team
CH	Critical Habitat
CHART	Critical Habitat Analytical Review Team
COE	U.S. Army Corps of Engineers
DPS	Distinct Population Segment
DQA	Data Quality Act
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Units
FG	Functional Grating
HUC	Hydrologic Unit Code
MFS	Memorandum for the Services
MHHW	Mean Higher High Water line
MLLW	Mean Lower Low Water
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NMFS	National Marine Fisheries Service
Opinion	Biological Opinion
PAR	Population Recovery Approach
PCE	Primary Constituent Elements
PFMC	Pacific Fishery Management Council
PS	Puget Sound
PSTRT	Puget Sound Technical Recovery Team
RGP	Regional General Permit
SAV	Submerged Aquatic Vegetation
VSP	Viable Salmonid Populations
WDFW	Washington Department of Fish and Wildlife
WDOE	Washington Department of Ecology

1.0 INTRODUCTION

1.1 Background

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

The NMFS also completed an Essential Fish Habitat (EFH) consultation. It was prepared 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.

The opinion and EFH conservation recommendations are both in compliance with Section 515 of the Treasury and General Government Appropriations Act of 2001 (Data Quality Act) (44 U.S.C. 3504 (d)(1) and 3516), and underwent pre-dissemination review.

1.2 Consultation History

On December 26, 2010, NMFS received a request for consultation from the U.S. Army Corps of Engineers (COE). The COE proposes to permit the applicant, Jon Koloski (Koloski), to construct a new concrete bulkhead 6 feet waterward of an existing bulkhead on Hood Canal, Mason County (Sixth Field Hydrologic Unit Code (HUC 6) 171100180301-Finch Creek-Frontal Hood Canal. The COE's permit authority is under Section 404 of the Clean Water Act (33 U.S.C. 1344) and Section 10 of the Rivers and Harbors Act (33 U.S.C. 403).

The following chronology documents key points of the consultation process that led to this opinion:

Before consultation, on October 13, 2010 the COE submitted information outlining the proposal to NMFS for input on likely effects to listed species and critical habitat. NMFS replied to the COE on October 13, December 7, and December 9, 2010, indicating the proposal would require formal consultation. Based on the applicant's response to the memo for the services (MFS) and input by NMFS, the COE scheduled a site visit with the applicant on December 12, 2010. During the site visit, NMFS informed the COE that formal consultation would be necessary if the project were not re-designed to further minimize impacts by (1) constructing the bulkhead in its existing footprint; (2) building immediately in front of the existing bulkhead; or (3) maintaining the existing bulkhead to avoid or minimize impacts. NMFS gave additional input to the COE on December 13, December 23, and December 29, 2010. The COE provided final information on the MFS on December 29, 2010, at which time NMFS initiated formal consultation with the COE. A complete record of this consultation is on file at Lacey, Washington.

After reviewing the COE effects determinations for the species listed on the cover page and the information gathered during preconsultation, NMFS determined the action is likely to adversely affect Hood Canal summer-run (HCSR) chum (*Oncorhynchus keta)* salmon, Puget Sound (PS) Chinook salmon (O. *tshawytscha*), and their designated critical habitat. Formal consultation on these species and their critical habitat is presented in the biological opinion in this document.

The action is not likely to adversely affect PS steelhead (*O. mykiss*), yelloweye rockfish (*Sebastes ruberrimus*), canary rockfish (*S. pinniger*), and Bocaccio (*S. paucispinis*). Furthermore, the action is not likely to adversely affect Southern Resident killer whales (*Orcinus orca*) or Steller sea lion (*Eumetopias jubatus*). The bases for these determinations are explained in section 2.11 of the biological opinion. Finally, the action will affect EFH for Pacific salmonids and groundfish. Listing information for the species covered in formal consultation is identified in Table 1.

Table 1. Federal Register notices for final rules that list threatened and endangered species, designate CHs, or apply protective regulations to listed species considered in this consultation.

Species	ESU or DPS[1]	Original Listing Notice	Listing Status Reaffirmed	Critical Habitat	4(d) Protective Regulations
Chinook salmon (*Oncorhynchus tshawytscha*)	Puget Sound	3/24/99 64 FR 14308 Threatened	8/15/11 76FR50448 Threatened	9/02/05 70 FR 52630	6/28/05 70 FR 37160
Chum salmon (*O. keta*)	Hood Canal summer-run	03/25/99 64 FR 14507 Threatened	8/15/11 76FR50448 Threatened	9/02/2005 70 FR 52630	6/28/05 70 FR 37160

1.3 Description of the Proposed Action

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

The COE proposes to issue a permit to Koloski to construct a new poured-in-place, concrete bulkhead located near Potlach, Washington (see Figures 1 and 2). The existing bulkhead is cast-in-place concrete 8 inches think, 4 feet tall and 50 feet long, including a recessed 4foot wide stair, intercepting the beach at approximately plus 10.8 feet, MLLW. The footing for the existing bulkhead and stairs extends 6 inches waterward from the bulkhead, and more than 2 feet below the existing beach substrate. The new bulkhead will have the same dimensions, but will be constructed 6 feet waterward from the face of the existing bulkhead, and the base of the bulkhead will be positioned between tidal elevations of plus 9.7 feet mean lower low water (MLLW) to plus 10.8 feet MLLW.

Construction sequencing will include: mobilizing supplies and equipment, including grounding the barge at low tide to off-load equipment and some supplies; excavating the footing; temporary storage of excavated sediment/fill on the beach; pouring concrete; and backfilling behind the new bulkhead. Wood forms will be used for the concrete pour and will remain in place until the concrete has cured to minimize leaching of cement into the aquatic environment. All work will be conducted from on the beach, but limited to a 25-foot work corridor in front of the proposed new bulkhead. Total estimated time to construct the new bulkhead is 12-14 days.

The NMFS has determined that timing of the work, construction BMPs together will limit the potential for suspended sediment and turbidity associated with the proposed activity, and thus,

[1] An "evolutionarily significant unit" (ESU) of Pacific salmon (Waples 1991) and a "distinct population segment" (DPS) (Policy Regarding the Recognition of District Vertebrate Population; 61 FR 4721, Feb 7, 1996) are both "species" as defined in Section 3 of the ESA.

turbidity/sediment is not likely to adversely affect listed PS Chinook salmon and HCSR chum salmon, and are therefore not evaluated further in the remainder of this biological opinion.

The site has potential spawning substrate for surf smelt and Pacific sand lance, which are forage base for salmonids. Surf smelt spawn from plus 5.0 feet MLLW to mean higher high water (MHHW) and sand lance spawn from plus 7.0 feet MLLW to ordinary high water. The proposed construction timing for this project is July 16 through September 14, to avoid the largest presence of juvenile salmonids and likely avoids forage fish spawning activity.

No interrelated or interdependent activities were identified by the applicant, the COE or NMFS, during this consultation.

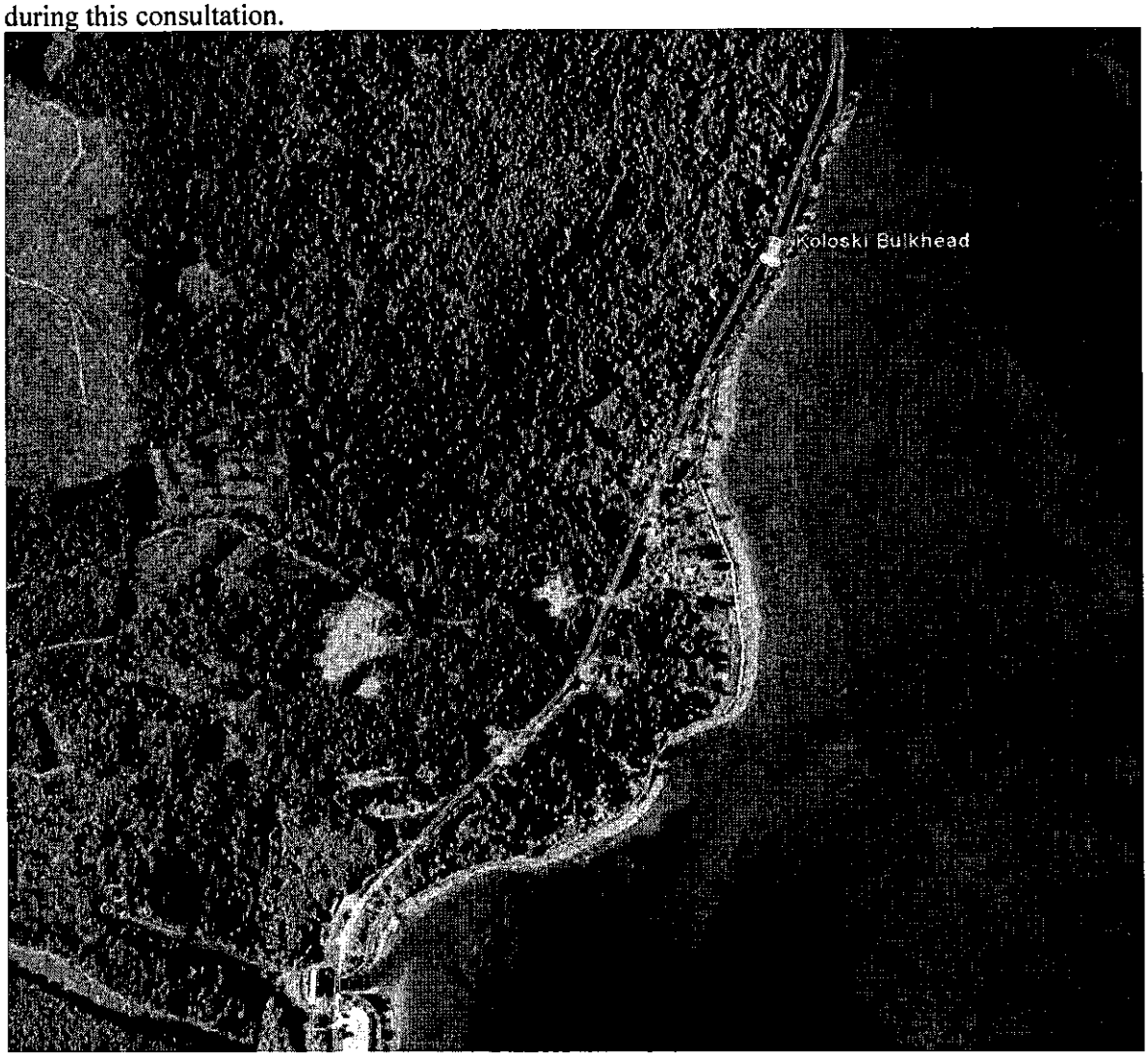

Figure 1, Location of project and surrounding area. Armored shorelines within the action area. Color scheme, representation of the percent shoreline armor in the action area: Red 100; orange, 80 and yellow, 50 percent armored, respectively.

Figure 2. Project site located in southwestern portion of Hood Canal.

1.4 Action Area

The '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 402.2). The action area for this consultation is located in southwestern Hood Canal, Mason County (Section 23, Township 22 North, Range 04 West; Latitude 47.383085° North, Longitude 123.147643° West; Sixth Field HUC 171100180301-Kennedy-Goldsborough).

The NMFS determined the action area by the likely extent of the direct and indirect effects from the fill and armoring on : (1) permanent loss of 300 square feet of upper intertidal nearshore habitat invertebrate prey production and surf smelt spawning habitat on-site and consequent loss of prey export into an approximate 6,336 square foot area of the 1.2 mile-long portion of the local littoral drift cell, starting approximately 0.6 miles north of the project site near Hoodsport and terminating at the discharge channel for the Tacoma City Light hydroelectric generation station, 0.6 miles north of Potlatch.

The action area contains rearing habitat and a migration corridor for PS Chinook salmon and HCSR chum salmon. The closest populations of PS Chinook salmon spawn in the Skokomish River and Mid-Hood Canal rivers. Lilliwaup Creek, Tahuya River and Union River support ESA-listed HCSR chum salmon. The number of juveniles and adults in the action area during construction will be minimized due to the July 16 to September 14 work window.

The action area also contains designated EFH for 33 species of groundfish (PMFC 2005), three species of Pacific salmon (PFMC 1999) and 5 coastal pelagic species (PFMC 1998), and is in an area where environmental effects of the proposed project will adversely affect EFH for these species.

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 on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with the United States Fish and Wildlife Service, NMFS, or both, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitat. Section 7(b)(3) requires that at the conclusion of consultation, the Service provide an opinion stating how the agencies' actions will affect listed species or their critical habitat. If incidental take is expected, Section 7(b)(4) requires the provision of an incidental take statement (ITS) specifying the impact of any incidental taking, and including reasonable and prudent measures to minimize such impacts.

2.1 Analytical Approach of the Biological Opinion

Section 7(a)(2) of the ESA requires Federal agencies, in consultation with NMFS, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. The jeopardy analysis considers both survival and recovery of the species. The adverse modification analysis considers the impacts to the conservation value of the designated critical habitat.

"To jeopardize the continued existence of a listed species" means to engage in an action that would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02).

This biological opinion does not rely on the regulatory definition of 'destruction or adverse modification' of critical habitat at 50 C.F.R. 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat. [2]

[2] Memorandum from William T. Hogarth to Regional Administrators, Office of Protected Resources, NMFS (Application of the "Destruction or Adverse Modification" Standard Under Section 7(a)(2) of the Endangered Species Act) (November 7, 2005).

The NMFS used the following approach to determine whether the proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat. To complete the jeopardy analysis presented in this opinion, NMFS reviewed the rangewide status of each listed species of Pacific salmon and steelhead likely to be adversely affected by the proposed action, the effect of the environmental baseline in the action area, the effects of the action as proposed, and cumulative effects (50 CFR 402.14(g)). The effects of the action were added to the environmental baseline along with the cumulative effects, to assess whether the action could reasonably be expected to appreciably reduce the likelihood of both survival and recovery of the species in the wild by reducing its numbers, reproduction, or distribution;

The adverse modification of critical habitat analysis includes a review of the status of critical habitat rangewide, the role of the environmental baseline, and evaluation of the proposed actions effects on Primary Constituent Elements (PCEs) of critical habitat. The anticipated effects, together with the anticipated cumulative effects on PCES, are added to the baseline to determine if these would reduce the value of designated or proposed, critical habitat for the conservation of the species.

2.2 Rangewide Status of the Species and Critical Habitat

This section presents information about the status of listed species and their designated critical habitats. It evaluates the status and trend of listed species, using attributes associated with a "viable salmonid population" (VSP; McElhany et al. 2000), including information about their geographic distribution, population structure, risks of extinction, and the factors limiting their recovery. These attributes are influenced by survival, behavior, and experiences throughout the entire life cycle, characteristics that are influenced by habitat and other environmental conditions.

One factor affecting both status of species and critical habitat throughout Washington, state is climate change. Climate change has been well documented in the scientific literature (Intergovernmental Panel on Climate Change (IPCC) 2007; ISAB 2007). Several studies have revealed that climate change has the potential to affect ecosystems in nearly all tributaries throughout the state (Independent Scientific Advisory Board (ISAB) 2007; Battin et al. 2007). While the intensity of effects will vary by region (ISAB 2007), climate change is generally expected to alter aquatic habitat (water yield, peak flows, and stream temperature). Evidence includes increases in average air and ocean temperatures, widespread melting of snow and glaciers, and rising sea level. Observations consistent with a changing global climate have already been documented in changes of species ranges and in a wide array of environmental trends (ISAB 2007; Hari et al. 2006; Rieman et al. 2007). In the northern hemisphere, ice cover durations over lakes and rivers have decreased by almost 20 days since the mid-1800s. These changes in snow pack decrease ocean productivity in the marine environment (ISAB 2007; Scheurell and Williams 2005).

As climate change alters the structure and distribution of rainfall, snowpack, and glaciations, each factor will in turn alter riverine hydrographs. Given the increasing certainty that climate change is occurring and is accelerating (Battin et al. 2007), NMFS anticipates salmonid habitats will be affected. An assessment by (O'Neal 2002) of the potential impacts of climate warming on salmon and trout habitat for the Pacific Northwest suggests a substantial decline in the habitats suitable for cold water fishes. Salmon habitat may be severely affected, in part because these fishes can only occupy areas below barriers and are thus restricted to lower, warmer

elevations within the region. Projected salmon habitat loss in Washington is about 22 percent by 2090, which does not consider the associated impact of changing hydrology. Karl et al. (2009) predicts approximately one-third of the current salmon habitat in the Pacific Northwest will no longer be suitable by the end of this century due to climate change. The extent to which anadromous fish encounter serious adverse effects from changing hydrology will vary for each watershed and specific information is not available for Hood Canal.

In Washington State, most models project warmer air temperatures, increases in winter precipitation, and decreases in summer precipitation. Average temperatures in Washington State are likely to increase between 3.1 and 5.3 degrees Fahrenheit by 2040 (Casola et al. 2005). Warmer air temperatures will lead to more precipitation falling as rain rather than snow. As the snow pack diminishes, seasonal hydrology will shift to more frequent and severe early large storms, changing stream flow timing and increasing peak stream flows, which may limit salmon survival (Karl et al. 2009; NMFS 2008a). The largest driver of climate-induced decline in salmon populations in rivers is projected to be the impact of increased winter peak flows, which scour the streambed and destroy salmon eggs (Battin et al. 2007). Higher water temperatures and lower spawning flows, together with increased magnitude of winter peak flows are all likely to increase salmon mortality. Higher ambient air temperatures will likely cause water temperatures to rise (ISAB 2007). Salmon and steelhead require cold water for spawning and incubation. As climate change progresses and stream temperatures warm, thermal refugia will be essential to persistence of many salmonid populations. Thermal refugia are important for providing salmon and steelhead with patches of suitable habitat while allowing them to undertake migrations through or to make foraging forays into areas with greater than optimal temperatures. To avoid waters above summer maximum temperatures, juvenile rearing may be increasingly found only in the confluence of colder tributaries or other areas of cold water refugia (Environmental Protection Agency (EPA) 2003).

Climate change is expected to make recovery targets for these salmon populations more difficult to achieve. Habitat action can address the adverse impacts of climate change on salmon. Examples include restoring connections to historical floodplains and freshwater and estuarine habitats to provide fish refugia and areas to store excess floodwaters, protecting and restoring riparian vegetation to ameliorate stream temperature increases, and purchasing or applying easements to lands that provide important cold water or refuge habitat (ISAB 2007; Battin et al. 2007).

As described in ISAB (2007), effects of climate change in estuarine habitat include: higher winter freshwater flows and higher sea level elevation may lead to increased sediment deposition and wave damage; lower freshwater flows in late spring and summer may lead to upstream extension of the salt wedge, possibly influencing the distribution of salmonid prey and predators; and increased temperature of freshwater inflows may extend the range of warm-adapted non-indigenous species that are normally found only in freshwater. In all of these cases, the specific effects on salmon and steelhead abundance, productivity, spatial distribution and diversity are poorly understood.

Effects of climate change that have influenced marine habitat and species that are expected to continue in the future, include: increased ocean temperature, increased stratification of the water column, and changes in intensity and timing of coastal upwelling. These continuing changes will alter primary and secondary productivity, the structure of marine communities, and in turn, the growth, productivity, survival, and migrations of salmonids. A mismatch between earlier smolt

migrations (due to earlier peak spring freshwater flows and decreased incubation period) and altered upwelling may reduce marine survival rates. Increased concentration of CO2 reduces the availability of carbonate for shell-forming invertebrates, including some that are prey items for juvenile salmonids.

2.2.1 Puget Sound Chinook Salmon Evolutionarily Significant Unit

The PS Chinook salmon ESU was listed as threatened on March 24, 1999 (64 FR 14208). Major limiting factors for the Puget Sound Chinook populations include a range of adverse effects associated with land use activities including urbanization, forestry, agriculture, and development. Populations are limited also by the adverse effects of hatchery operations and harvest. The severity and relative contribution of these factors varies by population. Declines in fish populations in Puget Sound in the 1980s and into the 1990s may reflect broad-scale shifts in natural limiting conditions, such as increased predator abundances and decreased food resources in ocean rearing areas.

Spatial Structure and Diversity

The PS Chinook salmon ESU includes all naturally spawned Chinook salmon populations from rivers and streams flowing into Puget Sound, including the Straits of Juan De Fuca from the Elwha River, eastward, and the rivers and streams flowing into Hood Canal, South Sound, North Sound and the Strait of Georgia in Washington. There are 22 independent populations within five geographic regions of Chinook salmon in the ESU (Good et al. 2005). Of an estimated 31 original populations, nine spawning aggregations are extinct (Good et al. 2005). Of the nine extinct populations, eight were spring Chinook salmon, which differ from summer or fall Chinook salmon by having earlier river entry timing, longer holding periods prior to spawning, earlier spawn timing, and higher proportions of yearling emigrants that have an extended freshwater life-history strategy (Groot and Margolis 1991). The loss of spring Chinook salmon populations significantly reduces the historic life-history diversity and spatial structure of the ESU, and thus adds to the extinction risk of the ESU.

Abundance and Productivity

In addition to the loss of several populations, overall abundance of the ESU has declined substantially from historical levels, and many populations are small enough that genetic and demographic risks are likely to be relatively high (63 FR 11494; March 9, 1998). In the 1998 status review, NMFS noted that the average run size (hatchery plus natural) at that time was approximately 240,000 fish with natural spawning escapement averaging 25,000 fish (Myers et al. 1998). Between 1999 and 2009, the geometric mean of natural spawners in populations of PS Chinook salmon ranges from 150 (Mid-Hood Canal population) to just over 10,000 fish (Upper Skagit River population) and natural spawning escapement has increased to an annual average of approximately 45,000 with increases observed in all life history types (NMFS 2010). Twenty-one of the PS Chinook populations exhibit stable or increasing trends in abundance.

Eleven populations exhibit a stable or increasing growth rate in return (i.e., recruits/spawners) and populations exhibit a stable or increasing growth rate in escapement (i.e., spawners/spawners). Growth rates in return, from 1990 to 2005, show substantial declining trends for the South Fork Nooksack, South Fork Stillaguamish, Puyallup, Nisqually, Skokomish and Mid-Hood Canal populations. The White River population shows a significant increasing

trend in population growth rates for both return and escapement. Population growth rates for both return and escapement are declining for the South Fork Stillaguamish, Sammamish, and Puyallup populations. No clear population patterns in trends and abundance or growth rate are evident among the 22 populations (NMFS 2010).

PS Chinook salmon populations within the Hood Canal that may utilize the action area are the Skokomish River and Mid-Hood Canal populations, both of which are considered Tier 1 populations, must be recovered to viability to recover the ESU (NMFS, 2010). There is no trend in the population growth with the slope of in natural-origin abundance equal to 0.05 and -0.5, for the Skokomish River and Mid-Hood Canal PS Chinook populations.

Factors for Decline

Factors for decline of PS Chinook salmon include a variety of human activities that have degraded extensive areas of Chinook salmon spawning and rearing habitat in Puget Sound. Watershed development and associated urbanization throughout the Puget Sound, Hood Canal, and Strait of Juan de Fuca regions have increased sedimentation, raised water temperatures, decreased large woody debris recruitment, decreased gravel recruitment, reduced river pools and spawning areas, and dredged and filled estuarine rearing areas (Bishop and Morgan 1996).

2.2.2 Hood Canal Summer-run Chum Salmon Evolutionarily Significant Unit

The HCSR chum salmon ESU was listed as threatened on March 25, 1999 (64 FR 14508). The main causes for the decline of the Hood Canal summer chum are: (1) climate-related changes in stream flow patterns, (2) past fishery exploitation, and (3) cumulative habitat loss (NMFS 2007).

Spatial Structure and Diversity

The HCSR chum salmon ESU includes all naturally spawned populations of summer-run chum salmon in Hood Canal and its tributaries as well as populations in Olympic Peninsula rivers between Hood Canal and Dungeness Bay, Washington. The Puget Sound Technical Recovery Team PSTRT identified two independent populations of Hood Canal summer chum (Sands et al. 2007). The Strait of Juan de Fuca population spawns in rivers and streams entering the eastern Strait and Admiralty Inlet. The Hood Canal population includes all spawning aggregations within the Hood Canal catchment. Of an estimated 16 historical populations in the ESU, seven populations are believed to have been extirpated or nearly extirpated. Most of these extirpations have occurred in populations on the eastern side of Hood Canal, generating additional concern for ESU spatial structure. The widespread loss of estuary and lower floodplain habitat was noted by the Biological Review Team (BRT) as a continuing threat to ESU spatial structure and connectivity.

Abundance and Productivity

The recent 5-year mean abundance is variable among populations in the ESU, ranging from one fish to nearly 4,500 fish. The 4-year total average escapement has increased from 2,367 summer chum (between 1988 and 1991) to 45,606 summer chum (between 2003 and 2006) (WDFW and PNPTC 2007). Most populations remain depressed and long-term trends in productivity are above replacement for only the Quilcene and Union River populations. Both the Strait of Juan de Fuca and Hood Canal populations must be recovered to viability to recover the ESU. HCSR

chum salmon populations that may utilize the action area are the Lilliwaup Creek, Tahuya River and the Union River (Correa 2003).

Factors for Decline

The main factors for the decline of the HCSR chum salmon are fishery exploitation (harvest) and cumulative habitat loss. The areas that most directly affect survival and persistence of HCSR chum populations are the immediate nearshore marine habitat. Thus, loss of channel complexity, altered sediment dynamics, riparian degradation, estuarine habitat loss and degradation from diking, filling, log storage, and road causeways, and alteration of the nearshore environment from shoreline development are factors limiting the ESU's survival.

2.2.3 Status of Critical Habitat

The NMFS designated critical habitat for the PS Chinook salmon and HCSR chum salmon ESUs on September 2, 2005 (70 FR 52630). This designation includes freshwater rivers and streams, estuarine waters, and marine waters including Puget Sound. In estuarine and nearshore marine areas, critical habitat includes areas contiguous with the shoreline from the line of extreme high water out to a depth no greater than 30 meters (98 feet) relative to mean lower low water (MLLW. SR killer whales does not have critical habitat in the action area.

The NMFS reviews the status of designated critical habitat affected by the proposed action by examining the condition and trends of primary constituent elements (PCEs) throughout the designated area. The PCEs are the physical and biological features identified as essential to the conservation of the listed species. Multiple PCEs are degraded throughout designated critical habitat for PS Chinook salmon and HCSR chum salmon. In marine and estuarine areas, PCEs essential for growth, maturation, and migration have been impaired by loss of pocket estuaries and shallow water areas, removal of riparian vegetation, water quality degradation, and bank hardening. Freshwater PCEs in many streams and rivers have similar degradation through loss of floodplains, channel simplification, bank armoring and devegetation, along with stormwater effects on water quality, water volume and velocity, and substrates.

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 rated low conservation value, and eight received a medium rating. Of the marine areas, all 19 are ranked with high conservation value (NMFS 2005b). The HCSR chum salmon ESU has 47 watersheds. Of these, 30 are ranked with high conservation value, 13 medium value, and 4 with low value for conservation. All nearshore habitat areas from the southern terminus of Hood Canal northeast to Dungeness Bay in the Strait of Juan de Fuca warrant a high conservation value to the HCSR chum salmon ESU. These habitat areas are found along approximately 402 miles of shoreline within the range of this ESU (NMFS 2005b). Section 2.3.2, describes PCE's, and highlights those applicable to the listed species in the action area.

More site specific detail about the condition of salmonid habitat, including designated critical habitat, appears in the environmental baseline section of this opinion.

2.3 Environmental Baseline

The "environmental baseline" includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all

proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

The NMFS describes the environmental baseline in terms of the habitat features and processes necessary to support the life stages of each listed species expresses in the action area. Each listed species considered in this opinion resides in or migrates through the action area. Because salmonids rear in and migrate through the action area, the habitat conditions they require are in the action area are: sufficiently abundant prey, available shallow water margins for refuge from predators, riparian vegetation for cover and detrital input, and good water quality.

Shipman (2008) indicated most beaches on Puget Sound lie within littoral cells (or drift cells) within which there is a net long-term transport of sediment along the shoreline. Drift cells are semi-independent coastal compartments, each containing its own sources and sinks of sediment. Many of the drift cells located in the southern and western Hood Canal shorelines are almost completely armored. The action area contains 1.2 miles of a local drift cell. Within the drift cell there is one spit type marsh, Neelim Marsh, where the primary physical process for building and maintaining these types of marshes are longshore wave-generated erosion, transport, and deposition of sediments (PNPTC 2006). PNPTC (2006) indicated that Neelim Marsh provides feeding and refuge functions vital to juvenile salmonids and is ranked as moderately impaired. There are also stream-deltas in Hood Canal, outside of the action area, but the physical processes for their development and function depend on stream fluvial processes and provide three vital functions for juveniles salmonids, including: osmoregulation, feeding and refuge.

The action area's shoreline is similar to most of the Puget Sound's shoreline conditions. Exotic vegetation has invaded the shoreline within and adjacent to the action area and much of the historic native riparian vegetation has been logged or removed by residential development and state highway infrastructure. Armoring also exists within the action area. According to the BA, the majority of the action area was filled and bulkheaded from the 1940's through approximately 1965. The proposed project site was filled and armored with bulkhead in 1946, pre-dating section 404 review.

According to Correa (2003), the "combined armoring from transportation and residential development effectively disrupts most backshore sediment recruitment" and this would be true also within the drift cell in the action area. Information the COE provided on the project indicates that up to 5,700 lineal feet of shoreline found within this drift cell, including that of the action area, has been armored, including 100 percent of the 1/4-mile length of shoreline south of the project site, with the remaining approximate 3/4-mile portion of the shoreline within the action area being 50 to 80 percent fill and armored.

Although there are no data specific to the project site, the upper intertidal sand, gravel, cobble benthic macroinvertebrate community at the project is likely similar to beaches with similar sediment composition (sand, grave, cobble), dominated by: amphipods, Nematoda, Oligochaeta, ploychaete worms and harpacticoid copepods and terrestrial insects (Toft, 2005). However, due to the highly modified shoreline, it is anticipated that the taxa richness of insects is lower, similar to other beaches with reduced input from native riparian vegetation communities (Toft, 2005).

The substrate on-site has been documented as potentially providing forage fish spawning substrate, but has only been sampled once, in the last 10 years (WDFW Salmon Scape).

Documented forage fish (surf smelt) spawning habitat is located less than two miles to the northeast on the Kitsap Peninsula. WDFW, Pentilla (2007), indicated specific homing to certain beaches of origin has not been proven and that spawning sites are distributed evenly across the landscape and spawning populations may vary considerably depending on environmental conditions (WDFW Bargman 1998). It is reasonable to assume the substrate on-site would be used by surf smelt in the future.

Hood Canal, including the proposed project area, is designated on the 303d list by the Washington Department of Ecology (WDOE), because the area is particularly susceptible to low dissolved oxygen (DO) levels (Newton et al 2002).

2.3.1 Species in the Action Area

The PS Technical Recovery Team (Ruckelhaus et al. 2006) identified two independent populations of PS Chinook salmon within Hood Canal: the Skokomish River and Mid-Hood Canal Rivers (Dosewallips, Duckabush, and Hamma Hamma). The closest HCSR chum salmon conservation units to the action area are from Lilliwaup Creek, Tahuya River and Union River. These two PS Chinook salmon populations and three HCSR chum salmon conservation units use the action area for a portion of their life histories.

Skokomish River Chinook Salmon and Mid-Hood Canal Rivers Chinook Salmon

Three of the five regions (Strait of Juan de Fuca, Georgia Basin, and Hood Canal) contain only two populations each, ranked as tier 1 populations, both of which must be recovered to low risk in order to recover the ESU (NOAA 2010). The 10-year geometric mean escapement (spawners) in the Skokomish River population is 1,300, with no trend in the population growth with the slope of in natural-origin abundance equal to 0.05 (NMFS 2010). As noted under the Skokomish River Chinook salmon of the Recovery Plan, the Mid-Hood Canal Rivers Chinook salmon (Dosewallips, Duckabush, and Hamma Hamma Rivers) are considered one of two Tier 1 populations, within category 2 watersheds, both of which must be recovered to viability to recover the ESU (NMFS 2010). The 10-year geometric mean escapement (spawners) in the Skokomish River is 150, with no trend in the population growth slope equal to -0.5 (NMFS 2010). Because of the diverse life history patterns exhibited by Chinook, both the Skokomish River and Mid-Hood Canal Rivers Chinook populations can be found in the estuarine environment in Hood Canal during all months of the year (Peters 2011).

The life history stages likely to rely on the action area are fry and delta fry migrants (Shared Strategy 2005). Both life history stages are heavily dependent on the nearshore for foraging, growth and maturation. Juvenile migration in Hood Canal begins in early March and peaks from late April through June (Peters 2011) meaning the work will take place during a period of decreasing fish presence. Although there is no site-specific data, typically, juvenile Chinook reside in the Skokomish estuary from 20 to 40 days, (Peters 2011). Several studies captured juvenile Chinook salmon in the estuary from January through August, with peak abundance occurring in as early as late January to as late as May (Peters 2011), again peaking outside of the work window. The greatest abundance of adult PS Chinook salmon within the action area during the work window occurs from early August to October as the adults return from the ocean to their natal streams and rivers which also have the largest presence occurring outside of the work window. Some juvenile PS Chinook are likely present in the action area during the in-water work window, but NMFS believes they will be of sufficient size to no longer orient to the

shoreline, because as the juveniles increase in size they occupy deeper offshore waters, in search of larger prey.

Lilliwaup Creek Summer-run Chum Salmon

Summer chum salmon produced from Lilliwaup Creek are part of the Hood Canal population targeted for recovery by the PSTRT. The Hood Canal population is one of two independent summer chum populations tentatively identified by the PSTRT (Brewer 2005). Lilliwaup Creek summer run Chum salmon, is one of the sizable summer chum salmon spawning aggregations found on the southwestern portion of the canal (Sands et al 2009). This creek is identified within the Lilliwaup Conservation Unit, which also includes the Skokomish River watersheds (Brewer 2005), Lilliwaup Creek summer run chum declined along with other Hood Canal summer chum stocks in the 1980s and have remained at a low level. In 1992, this stock was a component of the Hood Canal summer chum stock and did not receive a separate status rating. In 2002, the stock was rated critical because of continuously low escapements (Sands et al 2009). Sands (2009), average escapement from 1993 to 2004, was 229 fish, which was 4 times below the 2001-2004 target, and 8 times below the 1997 to 2004 target. Estimated escapements to Lilliwaup Creek range from 13 to 858 over the last four years, averaging 246 spawners. Because the population meets two high risk criteria (low population size, $N_e < 500$ or $N < 2,500$) and is in a chronic depression situation, the risk of extinction is judged to be high. (Brewer 2005). Factors for decline include: loss of channel complexity (LWD, channel condition, loss of side channel, channel instability), riparian degradation for and estuarine habitat loss and degradation (diking, filling, log storage, road causeways), Brewer (2005).

The action area supports the fry migrant life stage (Salo et al. 1980). This life history stage is heavily depends on the nearshore for foraging, growth and maturation. Most HCSR chum juveniles originating from streams on southern Hood Canal cross Hood Canal following surface freshwater flows from the tip of Toandos Peninsula to the shorelines of the Kitsap Peninsula (NBK Bangor waterfront), Salo et al. 1980. At an average migration rate of 4.4 miles per day, the majority of chum emigrants from southern Hood Canal exit the canal to the north within 14 days after their initial emergence in seawater (WDFW and PNPTT 2001). At this rate of migration it is anticipated that juvenile HCSR chum salmon, originating from above noted rivers and creeks are likely to migrate through the action area January through April, with a peak in late March (PNPTT 2000, SAIC 2006).

The greatest abundance of HCSR chum adult salmon within the action area return to Hood Canal from early August through the first week in October (WDFW and PNPTT 2001).

Tahuya River Summer-run Chum Salmon

Summer chum salmon produced from Tahuya River are part of the Hood Canal population targeted for recovery by the PSTRT. The Hood Canal population is one of two independent summer chum populations tentatively identified by the PSTRT (Brewer 2005). The Tahuya River summer-run chum stock, a part of the Union Conservation Unit (Brewer 2005), includes the Tahuya River and Union River watersheds. The Tahuya River summer-run chum stock was extirpated. Returns to the Tahuya River diminished to below 200 during the 1980's and to one fish in the 1990's, but are in the process of being reintroduced through hatchery supplementation, started in 2003, using brood stock from the Union River. Current return rates for hatchery introductions ranged from 0.65 to 0.01 percent from 2003 through 2005, respectively, with no

data on the fry released in 2006 and 2007 (WDFW and PNPTT 2001). According to Brewer (2005), broodstock from naturally produced Union stock is being used to rebuild summer chum salmon in the Union River and will be used for the Tahuya supplementation program. The Tahuya program was begun in 2004. Interim recovery goals have not been established for the Tahuya stock. Factors for decline include: loss of channel complexity (LWD, channel condition, loss of side channel, channel instability), riparian degradation for and estuarine habitat loss and degradation (diking, filling, log storage, road causeways), Brewer (2005).

Fry migrants are heavily dependent on the nearshore for foraging, growth and maturation. Most HCSR chum juveniles originating from streams on southern Hood Canal cross Hood Canal following surface freshwater flows from the tip of Toandos Peninsula to the western shorelines of the Kitsap Peninsula (NBK Bangor waterfront), Salo et al. 1980. At an average migration rate of 4.4 miles per day, the majority of chum emigrants from southern Hood Canal exit the canal to the north within 14 days after their initial emergence in seawater (WDFW and PNPTT 2001). At this rate of migration it is anticipated that juvenile HCSR chum salmon, originating from above noted rivers and creeks are likely to migrate through the action area January through April, with a peak in late March (PNPTT 2000, SAIC 2006).

The greatest abundance of HCSR chum adult salmon within the action area return to Hood Canal from early August through the first week in October (WDFW and PNPTT 2001).

Union River Summer-run chum Salmon

Summer chum salmon produced from Tahuya River are part of the Hood Canal population targeted for recovery by the PSTRT. The Hood Canal population is one of two independent summer chum populations tentatively identified by the PSTRT (Brewer 2005). Union River summer run chum salmon, is one of the strongest performing spawning stocks, however, those numbers include an unknown contribution of hatchery-origin spawners, which when taken into consideration, will reduce the escapement values. Average escapement from 1993 to 2004, was 2000 fish, which exceeded the 2001-2004 target, and only 2 times below the 1997 to 2004 target (WDFW and PNPTT 2001). Brewer (2005), estimated escapements to the Union River show no declining trend over the period of record and, in fact, appear to have increased somewhat since the 1970s. Escapements over the last four years have ranged from 159 to 1,491, averaging 817 spawners. This stock has shown a recent increasing escapement trend, and its risk of extinction is now rated as low. Factors for decline include: in-stream, loss of channel complexity (LWD, channel condition, loss of side channel, channel instability), riparian degradation for and estuarine habitat loss and degradation (diking, filling, log storage, road causeways), Brewer (2005).

Like Chinook salmon fry migrants, chum fry rely on the action area (Salo et al. 1980) and are heavily dependent on the nearshore for foraging, growth and maturation. Most HCSR chum juveniles originating from streams on southern Hood Canal cross Hood Canal following surface freshwater flows from the tip of Toandos Peninsula to the western shorelines of the Kitsap Peninsula (NBK Bangor waterfront), Salo et al. 1980. At an average migration rate of 4.4 miles per day, the majority of chum emigrants from southern Hood Canal exit the canal to the north within 14 days after their initial emergence in seawater (WDFW and PNPTT 2001). At this rate of migration it is anticipated that juvenile HCSR chum salmon, originating from above noted rivers and creeks are likely to migrate through the action area January through April, with a peak in late March (PNPTT 2000, SAIC 2006).

The greatest abundance of HCSR chum adult salmon within the action area return to Hood Canal from early August through the first week in October (WDFW and PNPTT 2001).

2.3.2 Critical Habitat in the Action Area

Within the action area critical habitat has been designated consisting of the PCEs for freshwater migration and rearing. These PCEs have the following attributes, among others: (1) Nearshore marine areas free of obstruction and excessive predation with; (2) water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and (3) natural cover such as submerged and overhanging large wood.

2.4 Effects of the Action on the Species and its Designated Critical Habitat

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

2.4.1 Effects on Listed Species

The NMFS analyzes how changes to habitat caused by the action will affect individual fish in the action area. The analysis then turns to whether these effects on individual fish result in appreciable consequences to the Hood Canal populations of PS Chinook salmon and HCSR chum salmon. Next, the analysis considers how these population-level effects influence the viability characteristics of the PS Chinook salmon and HCSR chum salmon ESU's. Habitat and population level consequences of the proposed action on PS Chinook salmon and HCSR chum salmon are partially informed by the comprehensive data set regarding PS Chinook salmon and HCSR chum salmon distribution within the Hood Canal. This body of data contributes to a scientifically based framework from which NMFS can analyze the biological ramifications of the placement of fill and bulkhead in the nearshore of Hood Canal. The consequences to the individual populations and the PS Chinook salmon and HCSR chum salmon ESU are generally framed within the VSP assessment tools in McElhany et al., (2000). The VSP assessment tools, which include the abundance, productivity, distribution and diversity of salmonid populations, are analogous to a species' reproduction, numbers, or distribution.

The direct effect of the action is an immediate permanent loss of shallow aquatic habitat through filling and bulkheading of 300 square feet of upper intertidal habitat in Hood Canal. Several indirect habitat effects include reduced riparian function, altered microclimate, reduced export and colonization of benthic prey, off-site and hydraulic changes, resulting in alteration to the sediment composition on and off-site. Each of these habitat effects will in turn, reduce the overall availability of the prey base necessary for rearing juvenile salmonids to survive, grow, and mature. In addition, these four habitat changes will create beneficial opportunities for fish that prey on juvenile salmonids. Not knowing the typical density of juvenile PS Chinook and HCSR chum salmon for the action area, NMFS cannot estimate the number of fish that will be affected by the proposed action, but NMFS can reasonably identify how the effects will impact all cohorts of salmonids for the life of the project:

Permanent Loss of Intertidal Habitat

Armoring even this small stretch of nearshore habitat, alters habitat-forming processes leading to long-lasting decrease in the function of the processes that create and maintain salmonid habitat in the action area. The proposed bulkhead will fill upper intertidal habitat between the intertidal elevations of plus 9.7 feet and plus 10.8 feet, MLLW. Marine invertebrate prey productivity at these elevations is likely lower than those of natural, shorelines without armoring and intact riparian vegetation Toft (2009), however, removing even less productive foraging areas will affect individuals of the listed fish that would normally rear and feed in, or migrate through the action area. Decreased availability of prey will increase competition among juvenile fish, decrease their growth and development, in turn reducing their fitness for subsequent life histories and possibly overall lifetime reproductive success for the life of the project.

In early life history stages, juvenile salmonids experience some of the highest growth rates, and mortality rates, compared to subsequent life history stages (Duffy et al 2010). Duffy et al. (2010) found juvenile Chinook salmon, (less than 90mm FL), are highly dependent on nearshore habitat for foraging, consume primarily benthic and epibenthic prey dominate diet by weight. Larger, juvenile Chinook (90 to 149 mm FL), have a more evenly distributed diet, insects becoming a more dominant prey item with increasing size, along with benthic and epibenthic prey (Brennan, et el, 2004). Toft (2009) indicated that shoreline armoring even at higher tidal elevations still affects fish feeding, where juvenile Chinook salmon consumed less terrestrial/riparian prey (insects) at sites with supratidal and intertidal retaining structures compared to those feeding at unarmored beaches. Invertebrate assemblages are negatively affected by the amount of seaward armoring, as shoreline modifications that encroach into intertidal beach elevations below Mean Higher High Water (MHHW) have a greater impact on benthic macroinvertebrates than those installed higher than MHHW (Sobocinski, 2003). Thus, the placement of the bulkhead waterward of its existing location will compound the existing, sub-optimal baseline feeding conditions. It will also increasing the frequency of wave and tidal energy off the face of the bulkhead, altering substrate size to coarser, grain size profile. Altering substrate composition will also modify prey complexity and productivity in a manner that reduces foraging success for juvenile PS Chinook and HCSR chum salmon.

It is important to note that reducing the prey base at the project location (loss of 300-square feet of upper intertidal benthic prey production) is a direct effect but will also have the indirect effect of reduced export of invertebrate prey down-drift and off-site into the littoral drift cell. This translates into lost benthic colonization opportunity by invertebrate prey, equal to the length of the drift cell (1.2 miles, or 6,336 linear feet), multiplied by similar depth and or width profile of intertidal habitat filled on-site (i.e., 6-feet in width), for a total annual reduction in invertebrate prey production area of 38,016 square feet.

Decreased Riparian Function

The baseline condition of insufficient riparian functions in the action area will be exacerbated by expansion of the bulkhead 6-feet waterward. The movement waterward of the bulkhead increases the distance between the aquatic habitat and the small amount of riparian vegetation that is retained at the project site. This decreases the amount of detrital input of prey, and of leaf litter which becomes a potential prey source, Brennan and Culverwell (2004) suggests that marine riparian vegetation may be critical in the support of food organisms for salmonids that

migrate along the shoreline, specifically insect drop. Duffy (2010) has shown that Chinook and chum salmon are highly dependent upon shallow, nearshore waters, and that insects derived from the terrestrial environment appear to play an important role in their diets. Duffy (2010) found that diet composition varied with habitats (nearshore, offshore) season, years, and fish size-classes. At nearshore sites, insects (all months) and gammarid amphipods (July) were dominant prey sources, whereas in offshore diets decapods (primarily crab larvae; July) and fish (September) were most important. As the fish grew, and spent subsequently more time off-shore, Chinook became increasingly more piscivorous.

Bollens (2010) also found that salmon often demonstrated strongly positive or negative selection for specific prey types. Insects, while less abundant in the plankton, or available prey, dominated the diet of salmonids Bollens (2010). Simenstad, et al (1993) found juvenile HCSR chum salmon fry diet included epibenthic copepods (Harpacticoida) and insects. Surf smelt (*Hypomesus pretiosus*) are an import prey item of salmon, particularly, Chinook (Hunt, et al, 1999, Duffy et al, 2010). In Hood Canal, Bollens (2010) found that chum and Chinook salmon both highly preferred insects, in addition to other select marine invertebrate prey. Thus, the increased distance between riparian vegetation and the water that will be created by the waterward placement of the bulkhead will create another small incremental reduction in prey availability to juvenile Chinook salmon and HCSR chum salmon.

Microclimate Changes

Rice (2006) found that on armored beaches the microclimate had significantly higher daily mean light intensity, air temperature, and substrate temperature, and significantly lower daily mean relative humidity, and that such changes in light, thermal, and moisture conditions can have severe biological consequences. On estuarine shorelines, removal of overhanging supralittoral vegetation (see above) increases beach exposure to sunlight, increasing temperature and evaporation and drying out beach environments. Reductions in structural complexity and accumulation of organic debris on altered beaches may reduce capacity for water retention, further contributing to drying. Reduction in taxonomic richness and abundance of invertebrate assemblages on armored beaches when compared to natural beaches, are likely to be partially due to changes in microclimate. Solar radiation that leads to increased temperatures and desiccation has long been recognized as one of the classic limiting factors for upper intertidal organisms and plays an important role in determining distribution, abundance, and species composition (Brennan and Culverwell 2004). On beaches with documented surf smelt spawning, Rice (2006) found that armored beaches had significantly higher daily mean light intensity, air temperature, and substrate temperature, and significantly lower daily mean relative humidity. Lee and Levings (2007) reviewed the effects of temperature and desiccation rates of surf smelt eggs and suggested a threshold relative humidity requirement (RH) is required for successful development and hatching of surf smelt embryos. The proportion of surf smelt eggs containing live embryos on the altered beach were approximately half that of the natural beach (Rice 2006). This suggests an additional degrading factor for salmonid prey base will result from the project.

Hydraulic Changes

Upper nearshore habitat functions, already degraded by existing fill and bulkhead, will be compounded by expansion of the bulkhead 6-feet waterward. Shipman (2010) presented the clearest results documenting the biological effects of armoring have come from studies of supratidal invertebrates. Species richness and absolute abundance in benthic cores and fallout

traps in central Puget Sound tended to be lower at the base of armored sites than on natural substrates (Sobocinski 2010). Sobocinski (2010) suggested that the extent of intertidal coverage of armoring is an important determinant of ecological effects. Toft (2009) attributed negative effects of shoreline armoring on invertebrate assemblages by limiting the sediment supply, and reflecting wave energy which can increase erosion and coarsen sediments. Toft (2009) found at armored sites, physical alterations in sediments and wave activity altered invertebrate community, taxa richness was low, and invertebrate assemblages were different than natural reference sites. Toft (2009) found armored sites, physical alterations in sediments and wave activity altered invertebrate community, taxa richness was low, and invertebrate assemblages were different than natural reference sites. Toft (2009) found much higher taxa richness unique to higher elevations associated with beach-wrack deposition (with important links to terrestrial zone productivity), on natural un-armored shoreline at the tidal elevation of plus 12.0 feet, MLLW, as compared to armored shorelines of the same tidal elevations. Since approximately 63,630 square feet of similar upper intertidal habitat has been lost within the action area, prey productivity from the remaining patches of upper intertidal habitat below MHHW becomes that much more valued in supporting juvenile PS Chinook and HCSR chum salmon.

Simenstad (1993) documented that altered sediment grain size profile can effect prey abundance and taxa of invertebrate prey, depending on site characteristics. Approximately, 63,360 square feet of upper intertidal habitat located waterward of MHHW within the action area, has been partially, or entirely eliminated by fill and armoring from SR 101 and residential development. On-site, existing nearshore conditions are reduced or truncated by the existing house, bulkhead and fill. Further waterward expansion of shoreline armoring of the upper nearshore to plus 9.7 feet mean lower low water (MLLW), will, as noted above by Toft (2009), increase exposure to wave energy and coarsening the substrate waterward of the face of the bulkhead, further reducing surf smelt spawning habitat potential, that extends to plus 7.0 feet, MLLW. This effect will reduce production potential of surf smelt spawning habitat and thereby reduce foraging opportunities for juvenile PS Chinook and HCSR chum salmon.

As noted, these physical changes to habitat attributes will diminish the benthic invertebrate, forage fish, and terrestrial prey bases. Reduced prey availability decreases carrying capacity of the action area, and increases the amount of competition among juvenile salmonids for the scarcer food supply, including within-species competition and feeding behavior, as suggested by Toft 2007. This results in lower rates of survival among the affected populations, and of the juvenile fish that do survive, it is likely that they will have lower growth rates, and lesser rates of development necessary to support their marine lifestage. This will make them more susceptible to predation and other mortality factors.

Increased Predation on Juvenile Salmonids

Each of the juvenile life stages of PS Chinook salmon and HCSR chum use the shallow nearshore migratory corridor to avoid being consumed by piscivorous predators including staghorn sculpin, cutthroat trout, and larger salmon (Duffy 2009). Willette (2001) reported findings that support this theory of nearshore dependent behavior. Juvenile pink salmon in Prince William Sound leave the shallow nearshore when the biomass of large copepods (their food) declined. With the juvenile pink salmon foraging in deeper water, the mean daily individual predator consumption of salmon increased by a factor of five. In the absence of any studies on the increase of predation risk on juvenile Chinook and HCSR chum salmon in Puget Sound, the results from the Willette (2001) indicate that decreasing the suitability of nearshore

migration habitat will increase predation on juvenile Chinook and chum salmon. Toft (2007) observed greater densities of juvenile salmonids along shorelines with either riprap or overwater structures extending from the supratidal zone into the subtidal zone, where these structures truncated shallow-water zone and creating deep water at the shoreline. Toft (2007) also suggested this type of schooling aggregation of juvenile salmonids may have implication for susceptibility to additional exposure to predation, within-species competition and feeding behavior.

Although the Koloski bulkhead does not reach subtidal depths, it will cause the same truncation of upper intertidal habitat functions. Based on the current tidal elevation, moving the base of the bulkhead waterward an additional 6 feet, will increase the frequency of tides that intersect the face of the bulkhead over 175 times per year over current conditions. During the life of the project, anticipated peak migration period for juvenile PS Chinook and HCSR chum salmon (January through May) will coincide with similar tidal conditions at the base of the new bulkhead, each time causing deeper water exposure of the rearing or migrating cohort, and increasing the exposure to predation risk. With the waterward location of the bulkhead, this event will occur an additional 70 times per year more than occurred before project completion.

Based on this information, these effects of the action will affect individual fish of each cohort that would normally rear, forage and seek refuge in, or migrate through the action area. Each cohort will be exposed to increased predation risk episodically, among all future cohorts of the specific populations of PS Chinook and HCSR chum salmon, for the life of the project.

Relevance of the Effects of the Action on Population Viability

The NMFS evaluates project effects at the species scale by first determining if effects to individual fish will, aggregated numerically and over time, negatively influence any of the characteristics of specific populations. The characteristics of a viable population are abundance, population growth rate (productivity), spatial structure, and diversity. If any of these are negatively influenced, NMFS reviews the relative role of the population in terms of its contribution to the viability of the species.

Each year, various life stages of salmon from the Skokomish River and Mid-Hood Canal PS Chinook populations and the Lilliwaup Creek, Tahuya River and Union River HCSR chum populations, use the action area and will experience effects of the action. Salmonids of every cohort of these populations must pass through the action area twice, once as juveniles en route to the Pacific Ocean and again as adults when they return to spawn. In addition, juveniles of these listed salmonids travel slowly through the action area on their way to the ocean, actively feeding and growing. Juvenile salmonids are therefore more susceptible to the effects of the action.

The bulkhead will degrade the features and function of the migratory corridor, likely altering juvenile migration behavior, and exposing a small number of juveniles from these populations to passage through deeper water resulting in increased exposure to predation. More frequent exposure to predation will result in death of an indeterminable increase in the number[3] of these small fish for the life of the project.

[3] As noted in previous section, increasing the frequency at which the new bulkhead is exposed to tidal action will increase the frequency of deeper water exposure, and commensurate exposure risk to predation. Over the life of the project, likely on the order of decades, it is highly likely one or more juvenile listed salmonid will be consumed by other fish or birds, immediately waterward of the bulkhead as a result.

Also, a permanent reduced intertidal foraging and prey productivity, causes incrementally less resource for each cohort of juvenile fish to meet the full demand for their growth and maturation. Less food results in reduced fitness to a small but indeterminable number of individual fish from all of the noted populations, but this will not kill individual fish. More likely, the reduced fitness among individual fish from these populations, combined with other life history risks, such as increased exposure to predation, will create a small increase in the death rate of among [4]of these small fish that will persist for the life of the project.

The additional incremental loss of some juvenile fish from each cohort, will reduce the abundance of each population when juveniles are being considered, however, it is not expected that this will reduce productivity, spatial structure or diversity of the respective populations, because the loss of individual juvenile must be extremely high for it to influence the return rate of adult spawners. NMFS does not anticipate that even collectively, the additional increment of juveniles that are injured or killed as a consequence of the habitat impairment from the proposed bulkhead will alter the return rate in a discernible manner. Thus productivity, spatial structure, and diversity of the populations will be maintained.

2.4.2 Effects on Critical Habitat

The NMFS designated critical habitat for the PS Chinook salmon and HCSR chum salmon ESUs on September 2, 2005 (70 FR 52630). This designation includes freshwater rivers and streams, estuarine waters, and marine waters including Puget Sound. In estuarine and nearshore marine areas, critical habitat includes areas contiguous with the shoreline from the line of extreme high water out to a depth no greater than 30 meters (98 feet) relative to MLLW.

The action area contains the nearshore marine PCE of critical habitat. The nearshore marine PCE consists of essential elements including areas free of obstruction and excessive predation; the water quality and quantity required to support growth and maturation foraging opportunities; natural cover, overhanging vegetation.

As described above, the proposed bulkhead will permanently increase obstruction in the nearshore by reducing the extent of relatively shallow migratory corridor for juvenile PS Chinook and HCSR chum by 300 square feet. Deepening and reducing the shallow migratory corridor will increase the time and frequency that the bulkhead is immersed by tides and exposure to greater predation risk to juvenile PS Chinook and juvenile HCSR chum salmon. Increased predation risk decreases the function of the areas free of obstruction and excessive predation element. Also, the project's encroachment waterward with additional fill and armor will further reduce function of the water quality element for the support of foraging opportunities to support growth and maturation of juvenile salmonids. This effect will be acute and permanent in the 300 square feet where the fill and bulkhead will be place, and will be indirect and less acute over the 1.2 mile drift cell, which will experience an incremental decline of forage prey base production and export of aquatic invertebrates (this increment of loss will occur over an area equal to 38,016 square feet). Similarly, forage opportunities will decline with the permanent elimination surf smelt spawning habitat by 300-square feet and consequently, incrementally, reduce the contribution to surf smelt stocks in Hood Canal and Puget Sound, as a

[4] Incremental reduction in prey resources for the life of the project, on the order of ten's of years, will likely result in cumulative loss prey opportunity to listed juvenile salmonids, reducing fitness and increasing susceptibility to increased predations risk to at least one, or more listed juvenile salmonids.

whole. NMFS assumes reduction of invertebrate benthic prey and surf smelt spawning, will incrementally, reduce the availability of invertebrate prey and forage fish for PS Chinook and HCSR chum salmon within the action area.

Lastly, natural cover and overhanging vegetation will be reduced at the project site. Increasing the distance, waterward, by 6-feet, will, incrementally, further reduce these beneficial functions by: (1) reducing terrestrial insect drop; (2) reducing allochthonous input (nutrients required for primary prey production); (3) exacerbate regulation of surface beach temperatures (necessary to retain interstitial moisture and consequent invertebrate prey and surf smelt egg survival, etc.). Incrementally, loss of riparian vegetation will reduce the ability of the nearshore marine PCE to support foraging success, growth and maturation, and fitness success of PS Chinook and HCSR chum salmon in the action area.

These adverse effects on the nearshore marine PCEs cannot be quantified that easily. However, these multiple negative impacts to CH will add a further increment of degradation to habitat factors that are identified as limiting in the action area (i.e., shoreline armoring, loss of riparian vegetation and sediment source feed to the beach). However, the project site does not offer unique or distinctive habitat values that make the increment of additional degradation significant for the overall conservation value of the watershed and HUC.

2.5 Cumulative Effects

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

The action area is located within Mason County and is located along SR 101, between Hoodsport and Potlach, two small rural hamlets immediately adjacent to private-commercial forests. Mason County is projected to grow from 56,900 in 2009 to 69,568 in 2020 and to 80,043 in 2030, an approximately 40 percent increase over the next 20 years (Mason County 2010). Thus, NMFS assumes that future private and state actions will continue within the action area, increasing as population density rises. As the human population in the action area continues to grow, demand for agricultural, commercial, or residential development is also likely to grow. The NMFS contends the majority of environmental effects related to future growth will be linked to land clearing, associated land-use changes (i.e., from forest to lawn or pasture), and increased impervious surface and related watershed changes.

Furthermore, many of the existing local and state regulatory mechanisms intended to minimize and avoid effects on watershed function and listed species from future commercial, industrial, and residential development are generally not adequate, or not implemented sufficiently. Though these existing regulations could decrease adverse effects on watershed function, as currently constructed and implemented, they still allow incremental degradation to occur. Over time, the incremental degradation, when added to the already degraded environmental baseline, will likely result in reduced habitat quality for at-risk salmon.

Currently, in the action area, almost all of the shoreline has been developed; therefore cumulative effects are anticipated to be low.

2.6 Integration and Synthesis

The Integration and Synthesis section is the final step of NMFS' assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action to the environmental baseline and the cumulative effects to formulate the agency's biological opinion as to whether the proposed action is likely to: (1) result in appreciable reductions in the likelihood of both survival and recovery of the species in the wild by reducing its numbers, reproduction, or distribution; or (2) reduce the value of designated or proposed critical habitat for the conservation of the species. These assessments are made in full consideration of the status of the species and critical habitat.

On-site, nearshore habitat conditions are reduced or eliminated by the existing house, bulkhead and fill. The action area has been filled and armored extensively, up to as much as 100 percent, resulting in the permanent loss of approximately 63,360 square feet of fill and armor of upper intertidal habitat waterward of MHHW. When adding to similar projects conducted in the past, the effects will result in the loss of a few of the most vulnerable life history stage of juvenile salmonids from the PS Chinook and HCSR chum populations within Hood Canal. Project effects, when added to baseline conditions increase already present migration obstacles, and increase exposure to predation risk; simultaneously the project will reduce availability of preferred prey resources, and as prey base declines, overall growth, development, and fitness declines among some juvenile PS Chinook and HCSR chum salmon in all future cohorts for the life of the project, which is reasonably anticipated to be several decades.

When considered together with anticipated cumulative effects of non-federal actions, the effects of the action, when added to the already degraded baseline, are likely negatively affected the salmon populations' abundance and productivity. To the extent that recovery actions are implemented, and protective measures with future development actions continue to be required, some adverse cumulative effects may be minimized, but will probably not be completely avoided. The aggregate level of injury or death distributed evenly among the various populations is not likely however, to alter existing trends in population viability parameters. Even if the aggregate level of injury or death were associated with just one population, which is not likely, it would not appreciably alter the likelihood of that population's persistence. However, the action when added to the baseline, and when cumulative effects are considered, is not likely to create an improvement of the populations viability parameters, and will not, therefore in the aggregate, support recovery efforts of the respective populations. Furthermore, the nearshore marine PCE of critical habitat will be degraded by the proposed action, but even when added to the baseline, and when cumulative effects are factored, it is difficult for NMFS to reasonably conclude that the watershed will be diminish in its conservation value in a measurable degree. Although quantifying an incremental change in the conservation value for the critical habitat affected by the project is not possible, it is reasonably likely that those effects within the action area, though indiscernibly small on a year-by-year basis, at some point in the future are likely to accumulate to the point that it constitutes a large deleterious effect on the watershed's conservation value. However, this action will not cause that point of aggregated effect and therefore does not appreciably reduce the conservation value of the watershed in which the action area is located.

2.7 Conclusion

After reviewing the current status of the listed species, the environmental baseline within the action area, the effects of 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, HCSR chum salmon, or to destroy or adversely modify PS Chinook, HCSR chum salmon designated critical habitat.

2.8. Incidental Take Statement

Section 9 of the ESA and Federal regulation 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 results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. For purposes of this consultation, we interpret "harass" to mean an intentional or negligent action that has the potential to injure an animal or disrupt its normal behaviors to a point where such behaviors are abandoned or significantly altered.[5] 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 an incidental take statement.

2.8.1 Amount or Extent of Take

Habitat modifying effects persisting for the life of the project (decrease in feeding success, obstructed migratory and rearing corridor, and increased predation risk to nearshore dependant juvenile Chinook and chum salmon fry) will cause take in the form of harm of juvenile fry salmon among all PS Chinook Hood Canal populations and HCSR chum salmon stocks from the southwestern and eastern arm of Hood Canal (see Figure 2).

The NMFS' ability to quantify the amount of take from harm as a number of fish depends on whether there is sufficient information to determine the number of fish that will be present, both at the time of the construction, and for each year that the project modifies habitat. This assessment can be difficult, if not impossible, to accomplish, despite the use of the best available scientific and commercial data, because of the range of individual fish responses to habitat change, and because the number of fish is highly variable over time, and by cohort. Currently, NMFS does not have any data available to quantify the precisely the number of these fishes, the number that will exhibit particular responsive behaviors, nor specific increases in predation risk, reduction in food and related reduced fitness.

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[5] NMFS has not adopted a regulatory definition of harassment under the ESA. The World English Dictionary defines harass as "to trouble, torment, or confuse by continual persistent attacks, questions, etc." The U.S. Fish and Wildlife Service defines "harass" in its regulations as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3).
The interpretation we adopt in this consultation is consistent with our understanding of the dictionary definition of harass and is consistent with the U.S. Fish and Wildlife interpretation of the term.

While this uncertainty makes it impossible to quantify take as numbers of fish killed or injured, the extent of habitat change to which present and future generations of fish will be exposed is readily discernable and presents a reliable measure of the extent of take that can be monitored and tracked. When the specific number of individuals "harmed" cannot be predicted, NMFS quantifies the extent of take based on the extent of habitat modified (51 FR 19926 at 19954; June 3, 1986).

Take in the form of harm will be caused by the permanent modification of 300 square feet of habitat that would otherwise provide a benthic prey base, nearshore migratory corridor, forage fish spawning opportunities, riparian benefits on beach micro habitat (including allochthonous input and insect drop prey) and refuge from risk of predation. In addition, indirect effects of the project will cause take in the form of harm from reduced prey production off-site, where the drift cell will be less nourished by benthic and forage fish as prey.

Take in the form of harm from the loss of invertebrate prey production and surf smelt spawning habitat potential is calculated as: (1) the square footage of upper intertidal habitat that will be filled and bulkheaded, equal to 300 square feet and: (2) lost export of these invertebrate prey items to an area similar habitat conditions colonized by invertebrate prey (similar tidal elevation and width - 6-feet) within the 1.2 mile littoral drift cell (6-feet x 1.2 miles = 0.87 acres). Table 6 demonstrates the area of habitat associated with take.

Table 6, Expected Limit of Take

On-site area impact (sq feet)	Area of Impacted Littoral Drift Cell, plus equivalent prey colonization area (square feet)	Total Nearshore Available in Hood Canal with Equivalent prey Colonization Area (square feet)	Percent of amount of Take (square feet)
300	38,016	6,446,880	0.59

2.8.2 Effect of the Take

Because of the relatively small extent of take caused by the project, the take will not alter viability characteristics of the affected populations, but it will preserve a chronic condition of diminished habitat value that is likely to hold productivity levels among juvenile salmonids at current levels, which are below or at, productivity targets identified in the recovery plans (NMFS 2006, NMFS 2007, and NMFS 2010).

2.8.3 Reasonable and Prudent Measures and Terms and Conditions

"Reasonable and prudent measures" are nondiscretionary measures to minimize the amount or extent of incidental take (50 CFR 402.02). "Terms and conditions" implement the reasonable and prudent measures (50 CFR 402.14). These must be carried out for the exemption in section 7(o)(2) to apply.

The NMFS believes that the full application of minimization measures included as part of the proposed action, together with use of the reasonable and prudent measures (RPMs) and terms

and conditions described below, are necessary and sufficient to avoid, minimize, and offset the incidental take of listed species resulting from the proposed action.

The COE shall:

1. Minimize incidental take by reducing the effects of the fill and bulkhead of upper intertidal habitat on surf smelt spawning habitat and invertebrate prey production and increased risk of exposure to predation.

2. Track and monitor to ensure minimization measures are meeting the objective of minimizing take.

The COE and/or its applicant must fully comply with the following terms and conditions (T&C) that implement the RPMs described above:

1. To implement RPM number 1 (reducing effects at the bulkhead site), the COE shall ensure that:

    a. Benthic habitat immediately waterward of the new bulkhead is annually enhanced with sediment supplementation for the life of the project.

    b. The requirement for sediment supplementation for the life of the project will run with the land, and shall be noted as a requirement on the deed of the property.

    c. The sediment supplementation program shall comply with the following schedule and sediment specifications:

        i. Initial sediment supplementation, immediately following construction, followed by annual sediment supplementation, according to the allowable work schedule outlined in terms and condition 1.a.
        ii. Deposit a volume of 8 cubic yards of sediment per supplementation event onto the beach, immediately waterward of and along the entire 50-foot length of the bulkhead.
        iii. Sediment will comply with the following grain-size profile passing weight specifications:

Screen Size	Average	Specifications
1/2-inch	100-%	100-%
3/8-inch	99.7-%	95-100-%
#8	83.5-%	80-100-%
#16	63.6-%	50-85-%
#50	6.5-%	10-30-%
#200	2.0-%	0-2.5-%

        i. An additional 8 cubic yards of the same material shall be placed annually.

    d. The 6-foot portion of fill behind bulkhead is planted with native woody vegetation, composed of at least 3 evergreen trees, and the remaining vegetation

will be composed of at least three species of shrubby vegetation, planted a maximum 2-foot on center and:

i. vegetation will be allowed to grow to full height and width potential to ensure maximum potential for allochthonous input and insect drop to the aquatic habitat waterward of the bulkhead, and;
ii. vegetation will have a 90 percent survival, monitored and noted on annual basis in conjunction with sediment supplementation plan.

2. To implement RPM number 2 (monitoring and reporting), the COE shall:

a. Supply documentation to NMFS that the bulkhead is constructed no further than 6-foot waterward of existing bulkhead.
b. Provide photo documentation that the 6-foot width of fill behind the bulkhead is planted with applicable native woody vegetation with applicable conditions outlines in T&C, 1.c.ii.
c. Ensure that the applicant supply the above documentation within 90 days following the completion of each proposed construction project, a, and submit as built pictures, showing detail and context so that NMFS will be able to verify: a) the location of the new bulkhead; b) the planting of native woody vegetation.
d. Ensure that the pictures for photo-documentation and monitoring include the project name and the project tracking number. All documents must be provided to:
Washington State Director for Habitat Conservation
National Marine Fisheries Service
Attn: 2010/06130
510 Desmond Drive SE, Suite 103
Lacey, Washington 98503

or submit an electronic copy to: David.Molenaarr@noaa.gov, or Jeff.Fisher@noaa.gov.

2.9. 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).

The following recommendations are discretionary measures that NMFS believes are consistent with this obligation and therefore should be carried out by the COE:

1. Promote the creation of like-habitat. This should include removal of derelict or unnecessary bulkhead-like structures and fill at locations within the local drift cell in order to promote maximum potential for forage fish spawning opportunities and benthic invertebrate prey productions.

2. Work with NMFS in the development and implementation of a conservation bank, or establishment of an in-lieu fee program in Hood Canal to offset unavoidable adverse effects resulting from the construction of single-family residential marine

bulkheads and associated pier-ramp-floats.

2.10 Reinitiation of Consultation

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

2.11 "Not Likely to Adversely Affect" Determinations

As mentioned in the background section of this document, certain species that occur in the action area, and PCEs of critical habitat for some species, were not expected to be adversely affected by the proposed action. The rationale for that position is provided below.

Puget Sound Steelhead Distinct Population Segment

Although Puget Sound steelhead from the Skokomish, Tahuya, and Union rivers are present in the action areas, this species is not likely to encounter the effects of the action because of their life history and project timing. According to the best scientific and commercial data available, adult winter-run steelhead typically enter streams and rivers from November to April and spawn from February through June. Summer-run steelhead typically enter streams May through October with spawning from about February through April. Typically, PS steelhead juveniles emigrate from natal rivers as 2-year old smolts from March through June, peaking in April and May. Studies show juveniles move rapidly from the nearshore to deeper water and leave the estuary quickly. Weekly beach seine surveys conducted from mid-July through early September, 2005 (SAIC 2006) captured only 14 juvenile steelhead. Other studies show similar results. In a study conducted in Hood Canal in 2006 and 2007, acoustically tagged steelhead smolts from four Hood Canal rivers emigrated from their respective natal river mouth to the Hood Canal Bridge over an average of 15 to 17 days (Moore et al. 2010). By mid-July, most juveniles from rivers in Hood Canal would have travelled past the Hood Canal Bridge and would not be present in the action area during in-water work. Consequently, PS steelhead are unlikely to be present in the action area during the in-water work window, and will not experience the effects of the action. Therefore PS steelhead were not discussed in this opinion.

Puget Sound/Georgia Basin Distinct Population Segments of Yelloweye Rockfish, Canary Rockfish, and Bocaccio

ESA-listed rockfish species are not likely to encounter the effects of the action because of their life history and project timing. According to the best scientific and commercial data available, Rockfish fertilize their eggs internally and the young are extruded as larvae. Rockfish larvae are pelagic, often occupying the upper portion of the water column near floating algae, detached seagrass, and kelp. When bocaccio and canary rockfish reach sizes of 3 to 9 cm and are approximately 3 to 6 months old, they settle onto shallow nearshore waters in rocky or cobble substrates that support kelp (Love et al., 1991, Love et al., 2002). Areas with floating and

submerged kelp species support the highest densities of most juvenile rockfish (Carr 1983, Halderson and Richards 1987, Matthews 1989, Hayden-Spear 2006). Juvenile yelloweye rockfish settle near the upper depth range used by adults (Yamanaka and Lacko 2001) and do not typically occupy intertidal waters (Love et al., 1991; Studebaker et al. 2009). Adult yelloweye rockfish, canary rockfish and bocaccio usually occupy habitats that are deeper than 120 feet (Love et al., 2002). Adult yelloweye rockfish, canary rockfish, and bocaccio have been documented in South Puget Sound (Washington et al., 1977, 1978, WDFW unpublished data). Portions of the shoreline of Hood Canal support kelp, thus juvenile canary rockfish and bocaccio could occupy these areas, particularly during spring and summer months. Larvae of ESA-listed rockfish could occur within southern Hood Canal (including action area) throughout the year.

Juvenile yelloweye rockfish are unlikely to occupy habitats of the nearshore, and therefore would not be affected by project construction. Adult yelloweye rockfish, canary rockfish and bocaccio are unlikely to be present and thus exposed to project effects because each of the four project vicinities is shallower than 120 feet deep. Effects from small pulses of turbidity (from excavation of bulkhead footings and storage of construction supplies on the beach) are unlikely to rise to the level of harm. Suspended sediment levels within the Puget Sound are naturally variable, particularly within nearshore habitats that are subject to sediment suspension as a result of tide, wave and wind action (Downing 1983). Thus any suspended sediment from construction would likely be within the range of natural variability experienced by juvenile rockfish.

Larval yelloweye rockfish, canary rockfish or bocaccio could occur within the project vicinity, though they are generally dispersed by currents after they are born, making the concentration or probability of presence of larvae in any one location extremely small (NMFS 2003). We assessed the time and area that this project would result in in-water construction and determined that the size of the project vicinity where effects could occur to larval ESA-listed rockfish, combined with the short duration of all project activities, make it extremely unlikely and therefore discountable that a larval yelloweye rockfish, canary rockfish or bocaccio will be present. Indirect effects of the proposed action include the addition of fill and shoreline armoring in nearshore habitat. Unlike some salmonids, juvenile and adult rockfish behaviors (such as foraging and migration) arrive from open water to beneficial habitats, so risk of predation are not likely to place them in a length-of-the-shoreline migration corridor, as juvenile salmon (Dan Tonnes, pers. comm., NMFS, 2011, Pallson, 2009).

The potential for adult and larval ESA-listed rockfish, and juvenile yelloweye rockfish to be exposed to project effects is discountable. Juvenile canary rockfish and bocaccio may be exposed to project effects, though these effects would be insignificant. Therefore, NMFS concurs with your determination of "may affect, not likely to adversely affect" Puget Sound/Georgia Basin yelloweye rockfish, canary rockfish, and bocaccio

Southern Resident Killer Whales

Southern Resident killer whales are not likely to encounter the effects of the action. According to the best scientific and commercial data available, SR killer whales spend considerable time in the Georgia Basin from late spring to early autumn, with concentrated activity in the inland waters of Washington State around the San Juan Islands, and then move south into Puget Sound in early autumn. While these are seasonal patterns, Southern Resident killer whales have the potential to occur throughout their range (from Central California north to the Queen Charlotte Islands) at any time during the year. The Whale Museum manages a long-term database of SR

killer whale sightings and geospatial locations in inland waters of Washington. While these data are predominately opportunistic sightings from a variety of sources (public reports, commercial whale watching, Soundwatch, Lime Kiln State Park land-based observations, and independent research reports), SR killer whales are highly visible in inland waters, and widely followed by the interested public and research community. The dataset does not account for level of observation effort by season or location; however, it is the most comprehensive long-term dataset available to evaluate broad scale habitat use by SR killer whales in inland waters. For these reasons, NMFS relies on the number of past sightings to assess the likelihood of SR killer whale presence in a project area and during work windows. A review of this dataset from the years 1990 to 2008 indicates that SR killer whales have not been observed in Hood Canal.

The proposed actions are not anticipated to affect prey quality; however, the project may affect the quantity of prey available to Southern Residents. As described above for Steller sea lions, any salmonid take up to the aforementioned maximum extent and amount would result in an insignificant reduction in prey resources for Southern Resident killer whales that may intercept these species within their range. Therefore, NMFS finds that the proposed actions may affect, but are not likely to adversely affect Southern Resident killer whales.

Southern Resident Killer Whale Critical Habitat

Critical habitat includes approximately 2,560 square miles of Puget Sound, excluding areas with water less than 20 feet deep relative to extreme high water. The PCEs for SR killer whale critical habitat are: (1) Water quality to support growth and development; (2) prey species of sufficient quantity, quality, and availability to support individual growth, reproduction and development, as well as overall population growth; and (3) passage conditions to allow for migration, resting, and foraging.

The proposed action is not likely to adversely affect the quality of prey species. However, it may affect the quantity of prey available. As described above, any salmonid take up to the aforementioned maximum extent and amount would result in an insignificant reduction in prey resources for Southern Resident killer whales that may intercept these species within their range. The NMFS finds that the potential adverse effects to SR killer whale critical habitat are discountable or insignificant and finds that the proposed actions may affect, but are not likely to adversely affect SR killer whale critical habitat.

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

The consultation requirement of 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 effects include the direct or indirect physical, chemical, or biological alterations 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 EFH, 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 COE and descriptions of EFH for Pacific coast groundfish (PFMC 2005), coastal pelagic species (PFMC 1998), and Pacific coast salmon (PFMC 1999) contained in the fishery management plans developed by the Pacific Fishery Management Council (PFMC) and approved by the Secretary of Commerce.

3.1 Essential Fish Habitat Affected by the Project

The proposed action and action area for this consultation are described in the Introduction to this document. The action area includes areas designated as EFH for various life stages of 46 species of Pacific coast groundfish, four species of coastal pelagic, and three species of Pacific salmon (Table 4).

3.2 Adverse Effects on Essential Fish Habitat

Based on information provided in the BA and the analysis of effects presented in the ESA portion of this document, NMFS concludes that the proposed action will degrade EFH due to loss rearing and foraging habitat. These effects will occur in the nearshore by the loss of: (1) 300 square feet, on-site, and reduced production, off-site to 38,016 square feet, of marine invertebrate prey production; (2) 300 square feet of surf smelt spawning habitat; (3) 300 square feet of riparian influence and terrestrial insect prey input; (4) 300 square feet, on-site of obstacle-free migratory corridor and increased predation risk.

3.3 Essential Fish Habitat Conservation Recommendations

NMFS incorporates a subset of the terms and conditions here as EFH conservation recommendations necessary to avoid, mitigate, or offset the impact of the proposed action on EFH, plus has one additional conservation recommendation that is unique to the EFH consultation. The COE should require the applicant to:

1. Enhance benthic habitat immediately waterward of the new bulkhead annually with sediment supplementation, for the life of the project.

2. Place the requirement for sediment supplementation for the life of the project as a deed restriction that will run with the land.

3. The sediment supplementation program shall comply with the following schedule and sediment specifications:

- Initial sediment supplementation, immediately following construction, followed by annual sediment supplementation, according to the allowable work schedule outlined in terms and condition 1.a.
- Deposit a volume of 8 cubic yards of sediment per supplementation event onto the beach, immediately waterward of and along the entire 50-foot length of the bulkhead.
- Sediment will comply with the following grain-size profile passing weight specifications:

Screen Size	Average	Specifications
1/2-inch	100-%	100-%
3/8-inch	99.7-%	95-100-%
#8	83.5-%	80-100-%
#16	63.6-%	50-85-%
#50	6.5-%	10-30-%
#200	2.0-%	0-2.5-%

- An additional 8 cubic yards of the same material shall be placed annually.

4. The 6-foot portion of fill behind bulkhead is planted with native woody vegetation, composed of at least 3 evergreen trees, and the remaining vegetation will be composed of at least three species of shrubby vegetation, planted a maximum 2-foot on center and:

- vegetation will be allowed to grow to full height and width potential to ensure maximum potential for allochthonous input and insect drop to the aquatic habitat waterward of the bulkhead, and;

- vegetation will have a 90 percent survival, monitored and noted on annual basis in conjunction with sediment supplementation plan.

5. Remove 300 square feet of like shoreline armor and fill within the action area and restore intertidal habitat functions, equal or greater to those functions lost by the proposed bulkhead.

The NMFS expects that full implementation of these EFH conservation recommendations would protect, by avoiding or minimizing the adverse effects above, approximately 38,016 square feet of designated EFH for Pacific coast salmon, Pacific coast groundfish, and coastal pelagic species.

3.4 Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, the Federal agency must provide a detailed response in writing to NMFS within 30 days after receiving an EFH Conservation Recommendation from NMFS. 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, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NMFS 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 COE 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)).

Table 4. Species of fishes with designated EFH occurring in Hood Canal.

Groundfish Species	Blue rockfish (*S. mystinus*)	Rougheye rockfish (*S. aleutianus*)	Flathead sole (*Hippoglossoides elassodon*)
Leopard shark (*Triakis semifasciata*)	Bocaccio (*S. paucispinis*)	Sharpchin rockfish (*S. zacentrus*)	Pacific sanddab (*Citharichthys sordidus*)
Soupfin shark (*Galeorhinus zyopterus*)	Brown rockfish (*S. auriculatus*)	Shortbelly rockfish (*S. jordani*)	Petrale sole (*Eopsetta jordani*)
Spiny dogfish (*Squalus acanthias*)	Canary rockfish (*S. pinniger*)	Shortraker rockfish (*S. borealis*)	Rex sole (*Glyptocephalus zachirus*)
Big skate (*Raja binoculata*)	Chilipepper (*S. goodei*)	Silvergray rockfish (*S. brevispinus*)	Rock sole (*Lepidopsetta bilineata*)
California skate (*R. inornata*)	China rockfish (*S. nebulosus*)	Speckled rockfish (*S. ovalis*)	Sand sole (*Psettichthys melanostictus*)
Longnose skate (*R. rhina*)	Copper rockfish (*S. caurinus*)	Splitnose rockfish (*S. diploproa*)	Starry flounder (*Platyichthys stellatus*)
Ratfish (*Hydrolagus colliei*)	Darkblotched rockfish (*S. crameri*)	Stripetail rockfish (*S. saxicola*)	
Pacific rattail (*Coryphaenoides acrolepsis*)	Grass rockfish (*S. rastrelliger*)	Tiger rockfish (*S. nigrocinctus*)	**Coastal Pelagic Species**
Lingcod (*Ophiodon elongatus*)	Greenspotted rockfish (*S. chlorostictus*)	Vermillion rockfish (*S. miniatus*)	Northern anchovy (*Engraulis mordax*)
Cabezon (*Scorpaenichthys marmoratus*)	Greenstriped rockfish (*S. elongatus*)	Widow Rockfish (*S. entomelas*)	Pacific sardine (*Sardinops sagax*)
Kelp greenling (*Hexagrammos decagrammus*)	Longspine thornyhead (*Sebastolobus altivelis*)	Yelloweye rockfish (*S. ruberrimus*)	Pacific mackerel (*Scomber japonicus*)
Pacific cod (*Gadus macrocephalus*)	Shortspine thornyhead (*Sebastolobus alascanus*)	Yellowmouth rockfish (*S. reedi*)	Jack mackerel (*Trachurus symmetricus*)

Pacific whiting (Hake) (*Merluccius productus*)	Pacific Ocean perch (*S. alutus*)	Yellowtail rockfish (*S. flavidus*)	Market squid (*Loligo opalescens*)
Sablefish (*Anoplopoma fimbria*)	Quillback rockfish (*S. maliger*)	Arrowtooth flounder (*Atheresthes stomias*)	
Aurora rockfish (*Sebastes aurora*)	Redbanded rockfish (*S. babcocki*)	Butter sole (*Isopsetta isolepsis*)	**Salmon**
Bank Rockfish (*S. rufus*)	Redstripe rockfish (*S. proriger*)	Curlfin sole (*Pleuronichthys decurrens*)	Coho salmon (*O. kisutch*)
Black rockfish (*S. melanops*)	Rosethorn rockfish (*S. helvomaculatus*)	Dover sole (*Microstomus pacificus*)	Chinook salmon (*O. tshawytscha*)
Blackgill rockfish (*S. melanostomus*)	Rosy rockfish (*S. rosaceus*)	English sole (*Parophrys vetulus*)	

4. DATA QUALITY ACT DOCUMENTATION AND 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 user. The intended user is the action agency and its applicant, Jon Koloski.

Individual copies were provided to the action agency and its applicant Jon Koloski. This consultation will be posted on the NMFS Northwest Region website (http://www.nwr.noaa.gov). 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 600.920(j).

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References section. The analyses in this Opinion/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 Northwest Region ESA quality control and assurance processes.

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EXHIBIT B: SCOPE OF WORK MEMO

SCOPE OF WORK FOR ON-SITE MITIGATION

Minimum components for the on-site restoration for the unauthorized bulkhead at Mr. Koloski's property include:

1. Sediment supplementation immediately waterward of the bulkhead shall comply with the following schedule and sediment specifications:

   a. Deposit a volume of 8 cubic yards of sediment per supplementation event onto the beach, immediately waterward of and along the entire 50-foot length of the bulkhead.
   b. Sediment will comply with the following grain-size profile passing weight specifications:

Screen Size	**Average**	**Specifications**
1/2-inch	100-%	100-%
3/8-inch	99.7-%	95-100-%
#8	83.5-%	80-100-%
#16	63.6-%	50-85-%
#50	6.5-%	10-30-%
#200	2.0-%	0-2.5-%

   c. An additional 8 cubic yards of the same material shall be placed annually for a total of five years.

2. The area behind bulkhead is planted with native woody vegetation, composed of at least 3 trees, such as evergreen trees or willows, and the remaining vegetation will be composed of at least three species of shrubby vegetation, planted in pots a maximum 2-foot on center and:
   a. Vegetation will be allowed to grow to full height and width potential to ensure maximum potential for allochthonous input and insect drop to the aquatic habitat waterward of the bulkhead, and;
   b. Vegetation will have a 90 percent survival, monitored and noted on annual basis in conjunction with sediment supplementation plan.

3. Monitoring and Reporting requirements include:
   a. Record beach profiles before and immediately after placement of beach nourishment material, 6 months and 1 year following construction, and annually for the 5 years following. Beach profiles will be taken on-site, and the adjacent properties on either side of the project site (minimum three- transects per parcel or property).
   b. Provide photo documentation that the area behind the bulkhead is planted with applicable native woody vegetation in pots.
   c. Within fourteen days of completing the on-site mitigation activities described above, the EPA and NMFS must be notified in writing. The notification must include photographs of site conditions before and after the on-site mitigation work.
   d. On or before the first anniversary of EPA's approval of the Completion Report described above, Respondent must submit to the EPA contact identified below the first of five annual reports that include: (1) documentation of the sediment supplementation, and (2) documentation of the vegetation efforts described in the approved Restoration and Mitigation Work Plan. Respondent must submit similar such annual reports on the same date in each of the following four years.
   e. Ensure that the pictures for photo-documentation and monitoring include the project name and the NMFS project tracking number (2010/06130). All documents must be provided to:

Becky Fauver, Aquatic Resources Unit
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Mail Stop ETPA-083
Seattle, Washington 98101

Washington State Director for Habitat Conservation
National Marine Fisheries Service
Attn: 2010/06130
510 Desmond Drive SE, Suite 103
Lacey, Washington 98503

EXHIBIT C: NWP 32 REQUEST LETTER

[DATE]

Ms. Michelle Walker
Chief, Regulatory Branch
U.S. Army Corps of Engineers – Seattle District
Post Office Box 3755
Seattle, Washington 98124-3755

Re: **Request for Nationwide Permit 32 Verification; Docket No. CWA-2014-0078**
22760 North US Highway 101, Shelton, Washington

Dear Sir or Madame:

I am writing to request the Corps to verify that retaining my bulkhead and periodically placing eight cubic yards of fish habitat enhancement material into waters of the United States annually for five years is authorized by Nationwide Permit 32 (NWP 32) at the above-referenced Property. This request is made to comply with the provisions of the Administrative Compliance Order on Consent entered into between [Insert Respondent's Name] and the U.S. Environmental Protection Agency dated _____2014, CWA-10-2014-0078, and enclosed with this letter. I have also enclosed a Joint Aquatic Resources Project Application form and supporting documents, such as drawings.

I understand that this verification would remain valid until the current NWP 32 expires (currently, March 18, 2017) provided I comply with all applicable terms and conditions of the NWP 32 verification, including any special conditions, and the terms of the consent Order.

Please send the NWP 32 verification letter to: [Mailing Address]

Sincerely,

[Name]

Enclosures