



AGENDA

City of Gig Harbor Hearing Examiner Virtual Hearing of Thursday May 20, 2021 at 1:30 PM

Due to public health concerns, this meeting will be accessible to listen by using the information below:
link to join Webinar <https://zoom.us/j/91776616946>
Call-in: (253) 215-8782 Meeting ID: 917 7661 6946

To speak during the meeting, press the Raise Hand button near the bottom of your Zoom window or press *9 on your phone. Comments are only allowed during designated portions of the meeting. Please refrain from "raising your hand" until the Hearing Examiner has announced that he has opened the public comment portion of the meeting. Your name or the last four digits of your phone number will be called out when it is your turn to speak. When using your phone to call in you may need to press *6 to unmute yourself. All speakers will have up to three minutes to speak.

If you wish to submit written public comment, please provide your comments to the Planning Division by **Thursday, May 20, 2021 at 12:00 noon**. All written comments must be able to be read in 3 minutes or less to be included in the record and have the title: **FOR PUBLIC COMMENT** included. Send comments to: candrews@gigharborwa.gov. Written comments will be read during the appropriate agenda item.

I. Open Public Meeting

II. Public Hearing

Items on this agenda will be reviewed according to the following format:

1. Open public hearing
2. Staff Report
3. Applicant's presentation
4. Public Comment
5. Close public hearing

New Business

1. **CITY OF GIG HARBOR PUBLIC WORKS DEPARTMENT., GIG HARBOR, WA 98335-5872:**
ANCICH PARK PUBLIC LAUNCH FLOATS, (PL-SDP-18-0003, PL-SPR-18-0009, PL-DR-18-0179, PL-NCR-18-0007, PL-FLOOD-18-0002, PL-SEPA-18-0013). The proposal is for the redevelopment of the subject site through demolition of an existing dock system and installation of a replacement dock. The proposed action will consist of removing the existing gangway, floats, one (1) finger float, and fourteen (14) 16-inch diameter creosote-treated timber piles. A total of 1,096 square feet of overwater coverage is proposed for demolition. Pile removal will be completed from a barge in the harbor using a vibratory hammer. All other structures will be removed from the site without the need for heavy equipment.

The existing 1,096 square foot dock system, constructed almost entirely of solid decking, will be redeveloped with a 1,614 square foot dock constructed of grated decking creating a net 45% open area.

The proposed development will result in a net increase of 518 square feet of overwater coverage. Five (5) steel guide piles will be driven to keep the floating dock in place. Piles will be driven with a vibratory hammer as far as possible. They will then be driven to final depth with an impact hammer. 24 grounding posts will be installed beneath the corners of the specified float modules ensuring that they do not ground onto the seabed at low tides. Grounding posts will be installed by driving short segments of 12-inch diameter steel pipe with a vibratory hammer. Grounding posts will be proofed with an impact hammer to verify bearing capacity. Pre-cast panels, beams and top plates will be welded or bolted onto the pile foundations to construct the new overwater dock system. Float modules will be fabricated offsite and delivered to the site via barge. The floats will be attached to the guide piles over the grounding posts at high tide. External pile hoops will bolt to the float modules. An 80-foot long gangway will be fabricated off-site, delivered via barge and lifted into position, connecting the fixed pier to the floating dock. Gangway connections will be installed without the need for heavy equipment. The site is located at 3525 Harborview Dr., on the northeasterly side of Harborview Drive, approximately 250 feet northwest of the intersection of Harborview Drive and Novak Street. Section 05 Township 21 Range 02 Quarter 33, (Assessor's Parcel No. 5970000244).

III. Adjournment



"THE MARITIME CITY"

DEVELOPMENT SERVICES

**COMMUNITY DEVELOPMENT DEPARTMENT
PLANNING DIVISION
STAFF REPORT**

TO: Hearing Examiner
FROM: Planning Staff, Kim Mahoney
DATE: May 13, 2021

RE: PL-SDP-18-0003, PL-SPR-18-0009, PL-NCR-18-0007, PL-DR-18-0179, PL-FLOOD-18-0002, PL-SEPA-18-0013
Ancich Waterfront Park Community Paddler's Dock
Public Hearing Date: May 20, 2021

I. GENERAL INFORMATION

- A. Agent:** Davido Consulting Group (DCG), Inc.
c/o Nicole Foster
9706 4th Ave NE #300
Seattle, WA 98115
- B. Owner:** City of Gig Harbor Public Works Department
c/o Jeff Langhelm
3510 Grandview Street
Gig Harbor, WA 98335

II. APPLICANT'S REQUEST:

The proposal is for the redevelopment of the subject site through demolition of an existing dock system and installation of a replacement dock. The proposed action will consist of removing the existing gangway, floats, one (1) finger float, and fourteen (14) 16-inch diameter creosote-treated timber piles. A total of 1,096 square feet of overwater coverage is proposed for demolition. Pile removal will be completed from a barge in

the harbor using a vibratory hammer. All other structures will be removed from the site without the need for heavy equipment.

The existing 1,096 square foot dock system, constructed almost entirely of solid decking, will be redeveloped with a 1,614 square foot dock constructed of grated decking creating a net 45% open area. The proposed development will result in a net increase of 518 square feet of overwater coverage. Five (5) steel guide piles will be driven to keep the floating dock in place. Piles will be driven with a vibratory hammer as far as possible. They will then be driven to final depth with an impact hammer. 24 grounding posts will be installed beneath the corners of the specified float modules ensuring that they do not ground onto the seabed at low tides. Grounding posts will be installed by driving short segments of 12-inch diameter steel pipe with a vibratory hammer. Grounding posts will be proofed with an impact hammer to verify bearing capacity. Pre-cast panels, beams and top plates will be welded or bolted onto the pile foundations to construct the new overwater dock system. Float modules will be fabricated offsite and delivered to the site via barge. The floats will be attached to the guide piles over the grounding posts at high tide. External pile hoops will bolt to the float modules. An 80-foot long gangway will be fabricated off-site, delivered via barge and lifted into position, connecting the fixed pier to the floating dock. Gangway connections will be installed without the need for heavy equipment.

This request is encompassed in shoreline substantial development permit (PL-SDP-18-0003), site plan review (PL-SPR-18-0009), design review permit (PL-DR-18-0179), and nonconforming review (PL-NCR-18-0007) applications. The applicant has also submitted a floodplain development permit application (PL-FLOOD-18-0002), which will be reviewed administratively subsequent to approval of the related and aforementioned project application permits by the Hearing Examiner. The Mitigated Determination of Nonsignificance (MDNS) issued in staff's processing of PL-SEPA-18-0013 has been included with this staff report as Exhibit I and is further described in Section VII of this report. The proposed site improvements are exhibited in the applicant's site plan, which is included as Exhibit B to this staff report.

III. SITE DESCRIPTION

- A. Location:** 3525 Harborview Drive, Gig Harbor, WA 98332. The site is located on the northeast side of Harborview Drive, approximately 250 feet northwest of the intersection with Novak Street. Sec 05, Tw 21, R 02, Qtr 33.
Assessor's Parcel No: 5970000244

B. Site Area/Acreage: 0.78 acres (uplands and private tidelands)

C. Existing Site Characteristics:

- 1. Topography:** The site generally slopes down from the southwest to the northeast. From Harborview Drive, the uplands slope down toward Gig Harbor Bay at approximately 24 percent, terminating at a concrete cast-in-place bulkhead which spans the width of the subject site. Total topographic relief across the site is approximately 24 feet.
- 2. Vegetation:** The developed subject site's uplands are vegetated with deciduous trees, shrubbery, and grasses. Microalgal habitat sparsely vegetates the tidal area of the site.
- 3. Wetlands and Critical Areas:** The site fronts Gig Harbor Bay, a critical fish and wildlife habitat area. All work proposed as a part of these site improvements will be completed waterward of the Ordinary High-Water Mark (OHWM), and will be in-water work within Gig Harbor Bay.

The site is also regulated by the city's Flood Hazard Construction Standard Ordinance (GHMC Chapter 18.10). Further, the proposed improvements are located within a Special Flood Hazard Area, Zone AE (FIRM Panel 53053C), and within the regulated riparian buffer zone, both of which are regulated by GHMC 18.10.100 which require the applicant to submit a habitat assessment report and a letter from the National Marine Fisheries Service (NMFS) stating that the development complies with requirements under the biological opinion of the Endangered Species Act (ESA). Under its "determination of effects," the Biological Assessment (Reference No. 3, Exhibit I) concluded that the proposed site improvements and its associated proposed mitigation would likely adversely affect Puget Sound Steelhead Trout and Puget Sound Chinook species and their critical habitat located within regulated proximity of the proposed site improvements. Per the requirements of GHMC 18.10.100, the applicant provided to the City a letter from NMFS demonstrating the proposed project's concurrence through consultation under Section 7 of the ESA (Reference No. 5, Exhibit I). The biological opinion prepared for and reviewed by NMFS is included as Reference No. 4 of Exhibit I. The concurrence letter and subsequent confirmation with NMFS confirms that the proposed mitigation sufficiently

addresses the ecologic impacts of the proposed site improvements, and is therefore consistent with the requirement to ensure no net loss of ecological function set forth in the Gig Harbor Shoreline Master Program (SMP).

The applicant has applied for a Floodplain Development Permit Application on November 27, 2018. This permit is associated with file no. PL-FLOOD-18-0002 which will be administratively processed concurrent with the applicant's application for permits from the City's Building and Fire Division, provided the Hearing Examiner determines the land use permits which are the subject request of this proposal are approvable.

D. Zoning:

1. **Subject parcel:** Waterfront Millville (WM)
2. **Adjacent zoning and current use:**
 - a. **North:** Gig Harbor Bay
 - b. **East:** WM – marina
 - c. **South:** Single-Family Residential (R-1) – single-family dwelling
 - d. **West:** WM – marina

- E. Utilities / Road Access:** The parcel is accessed from Harborview Drive, a public right-of-way. The property is serviced by City of Gig Harbor sewer and water.

IV. APPLICABLE CODES AND POLICIES

A. Comprehensive Plan: The site is designated Waterfront (WF) by the City's Comprehensive Plan. The purpose of this land use category is to provide for a variety of mixed uses along the waterfront which are allowed under the City of Gig Harbor Shoreline Master Program and as more particularly defined under the zoning code. Generally, the lower intensity waterfront areas would favor residential and marina uses while the more intense waterfront areas would provide for higher density residential and commercial/retail uses.

The site is also located in the Harbor area described in Chapter 3 of the City's Comprehensive Plan. This Chapter provides that it is the City's desire to have mixed uses along the waterfront in Gig Harbor areas, including those commercial endeavors such as commercial fishing, boating, marine shops and services, restaurants and retail shops, as well as residential uses which provide the bay's unique appeal. The vision of

the Harbor is to continue to develop and enhance the recreation, tourism and marine industries along Gig Harbor waterfront as an economic asset in a manner that will enhance the public enjoyment of and public access to the bay.

B. Gig Harbor Municipal Code:

The subject parcel is zoned WM Waterfront Millville District.

The following code chapters apply to this proposal:

- a. 17.48 WM Waterfront Millville District
- b. 17.96 Site Plans
- c. 17.98 & 17.99 Design Review
- d. 18.04 Environmental Review (SEPA)
- e. 18.10 Flood Hazard Construction Standards

C. Shoreline Master Program: Development upon the shorelines of Gig Harbor is regulated by the city of Gig Harbor Shoreline Master Program (SMP) that was adopted on November 25, 2013 and became effective on December 27, 2013. The subject site is located within the “Historic Working Waterfront” Shoreline Environmental Designation. The following subsections of the SMP apply to this project:

Subsection 5.2.6 – Historic Working Waterfront Shoreline Environment Designation

Subsection 6.2 – No Net Loss of Ecological Function, Marine Shorelines Regulations, and Critical Areas

Subsection 6.5 – Public Access

Subsection 7.11 – Boating and Marinas: Piers, Docks, and Moorage

Subsection 8.2 – Types of Shoreline Permits

Subsection 8.11 – Nonconforming Uses and Structures

D. Washington Administrative Code: The Shoreline Substantial Development Permit must be found consistent with the provisions of WAC 173-27-150 which state as follows:

- (1) A substantial development permit shall be granted only when the development proposed is consistent with:
 - a. The policies and procedures of the act;
 - b. The provisions of the regulation; and
 - c. The applicable master program adopted or approved for the area. Provided, that where no master program has been approved for an area, the development shall be reviewed for consistency with the provisions of Chapter 173-26 WAC, and to the extent feasible, any draft or approved master program which can be reasonably ascertained as representing the policy of the local government.

- (2) Local government may attach conditions to the approval of permits as necessary to assure consistency of the project with the act and the local master program.

V. BACKGROUND INFORMATION:

The subject site was part of the City of Gig Harbor's original incorporation and was annexed into the City in 1946. The site is developed with the Jerkovich Pier, the Ancich Waterfront non-motorized boat storage building (approved via PL-SDP-16-0005, see Hearing Examiner decision attached as Exhibit C to this staff report), and the historic Ancich Netshed and Pier. The Ancich Netshed is listed on the City's Register of Historic Places pursuant to the City of Gig Harbor Resolution #743-A (associated with permit file no. HR-08-0001). No development or modifications of the Ancich Netshed are included as part of the proposed improvements. The approval of PL-SDP-16-0005 included the construction of a boat storage building and redevelopment of the site to be used as a public park; these improvements have been completed. Previous to this development, the City conducted soil sampling at the site based on letters submitted by the Department of Ecology in response to the SEPA threshold determination issued for PL-SEPA-16-0014 associated with the proposed development project. The soil samples found lead and arsenic levels below the maximum contamination thresholds set forth in the Model Toxics Control Act (MTCA). The Department of Ecology provided a written response to the City's soil sample findings concluding the no remediation for contamination was necessary, nor was it necessary for the City to enter into a Voluntary Cleanup Program; please see Exhibit D for the written confirmation provided by the Department of Ecology.

The scope of the subject proposal relates to the existing pier structure located along the eastern property line (the Jerkovich Pier), on which the site's easterly neighbor has an existing 10-foot easement to access their privately-owned floating dock system located waterward of the applicant's sublet portion of the pier structure. The applicant formally submitted for a Shoreline Substantial Development Permit, Administrative Design Review, Site Plan Review, Nonconforming Structure Review, Floodplain Development Permit, and SEPA review on November 27, 2018.

VI. DESIGN REVIEW:

The Design Review process is outlined in Chapter 17.98 GHMC. Section 17.98.050 outlines the process for administrative design review applications. This section states that an applicant may request administrative processing of a design review application or portions thereof if it conforms to the specific requirements of Chapter 17.99 GHMC. Staff

has reviewed the applicant's proposed design and finds that the design conforms with all applicable provisions of GHMC 17.99, Design Manual.

VII. ENVIRONMENTAL REVIEW:

The City issued a Mitigated Determination of Non-Significance (MDNS) for the proposed action on April 8, 2021. The MDNS and its adopted reference documents are collectively attached to this staff report as Exhibit I. The legal notice of the MDNS was published in The News Tribune newspaper and mailed to all property owners within 300 feet of the subject site on April 8, 2021. One comment was received in response to the MDNS provided by the Department of Ecology which is included as Exhibit E to this staff report. No appeals were timely filed on the threshold determination, and the MDNS became final on April 29, 2021. The mitigation measures outlined in the MDNS have been recommended as conditions to the Hearing Examiner's decision in Section XI of this report.

VIII. PUBLIC NOTICE:

The legal notice of the proposed action and scheduled hearing (NOPH) was published in The News Tribune publication, posted on the subject site, and mailed to all property owners within 300 feet of the subject site on May 6, 2021. As of the date of this report, no comments have been received by the public in response to the NOPH. The Declarations of Mailing, Publishing and Posting for the NOPH are attached to the staff report as Exhibit F.

Notice of Application (NOA) for the proposed action was published in the Peninsula Gateway, posted on the site, and mailed to all property owners within 300 feet of the subject site on December 6, 2018. No public comments were received in response to the NOA. The Declarations of Mailing, Posting, and Publishing for the NOA are marked as Exhibit G.

The City maintains an Interested Parties Roster for members of the public who have requested notice of any project permit activity applicable to the subject site. These members of the public have received proper notice of the proposed improvements, and the City has received no comments from any Interested Party. The Interested Parties Roster is included with this staff report as Exhibit H.

IX. STAFF ANALYSIS AND FINDINGS:

A. Planning Staff

1. Comprehensive Plan:

The Land Use map in the Comprehensive Plan identifies the site as being located within an area designated as “Waterfront.” The purpose of the Waterfront land use designation is to provide for a variety of mixed uses along the waterfront which are allowed under the City of Gig Harbor Shoreline Master Program and as more particularly defined under the zoning code. Generally, the lower intensity waterfront areas favor residential and marinas while the more intense waterfront areas provide for higher density residential and commercial/retail uses.

Goals provided in the Shoreline Management Element Chapter of the Comprehensive Plan promote the retention of a mixed-use waterfront, including those fishing, boating, tourist, and residential uses which provide the shoreline’s unique appeal. These goals are further supported in the Harbor Chapter of the Comprehensive Plan, which promotes the development and enhancement of recreation, tourism, and marine industries along the Gig Harbor waterfront as an economic asset in a manner that will enhance the public enjoyment of, and public access to, the bay.

The proposal would allow for the redevelopment of the site’s existing dock system to serve an increase in public access and enjoyment of Gig Harbor Bay. The site’s upland park and associated dock structure are permitted uses under the Historic Working Waterfront shoreline designation and Waterfront Millville zoning designation. Particularly, the proposed dock improvements will support the unique opportunity for non-motorized watercraft launching in Gig Harbor Bay, perpetuating the goals of the Waterfront land use designation in its promotion of boating, public access, and public enjoyment, and in its support of the mixed-use waterfront which provides the shoreline’s unique appeal. Therefore, the proposed improvements are generally consistent with the goals of this Plan.

2. Gig Harbor Municipal Code:

a. 17.48 Waterfront Millville District (WM):

The WM District intends to “provide a wide range of uses and activities on the shoreline of Gig Harbor located within the area between Rosedale Street and Stinson Avenue. This district serves primarily as a medium intensity, mixed use waterfront district with an emphasis on medium-density residential, marine-dependent and marine-related uses. Uses which enhance the historic fishing village atmosphere and which are harmonious with surrounding residential areas are encouraged.”

The proposed project will improve the subject site consistent with the stated intent of the WM District. The applicant proposes site improvements which enhance public access and public enjoyment of Gig Harbor Bay associated with the holistic marine-related use of the site. The improvements afford the opportunity for increased public exposure to the upland development of the site, which includes the Ancich Brothers' historic netshed and a waterfront public park, further supporting the WM district's intent to enhance the historic fishing village atmosphere that is of immense local pride and cultural relevance. Staff has analyzed the proposed site improvements against the applicable development and performance standards set forth in GHMC 17.48 and notes consistency with all applicable provisions. Therefore, the proposed project is generally consistent with the intent and performance standards of the WM zoning district.

b. 17.96 Site Plans:

GHMC 17.96.035 sets forth the criteria for approval of major site plan review applications. The criteria are as follows:

- A. The site plan is compatible with the surrounding uses; and
- B. The site plan is compliant with all relevant statutory codes, regulations, and ordinances.

As is discussed in this staff report, the proposed activity is for the redevelopment of an existing dock structure in a manner which improves the existing water-oriented and recreational use of the subject site. The use of the site will remain as-is, which is consistent with the surrounding mixed uses throughout the WM zoning district and with the intent of the zone.

If appropriately conditioned, the proposed project is generally compliant with all relevant statutory codes, regulations, and ordinances, to include the criteria for approval of the site plan review permit.

c. 17.98 & 17.99 Design Review:

GHMC Chapter 17.98 sets forth the City Design Review process. Consistent with GHMC 17.98.050, an applicant may request administrative processing of a design review application or portions thereof if it conforms to the specific requirements of Chapter 17.99 GHMC. The applicant has requested administrative review of its proposed improvements. As such, staff has reviewed the proposed

site design against the applicable criteria set forth in GHMC Chapter 17.99, Design Manual. If properly conditioned, the proposed dock improvements are generally consistent with the specific requirements of GHMC 17.99, Design Manual.

3. Gig Harbor Shoreline Master Program (SMP):

- a. Historic Working Waterfront Environment (SMP 5.2.6)** – The purpose of this designation is *to recognize and preserve two of Gig Harbor's most notable historic industries: commercial fishing and boatbuilding. The area possesses a significant concentration of historic uses and structures. This concentration of contiguous net sheds and commercial fishing vessel moorage facilities on either side of the historic Eddon Boat Building facility and Eddon Boat Park, have aesthetic, architectural, historical and cultural significance that characterize the community's regional maritime identity...This environment should recognize historic resources such as overwater net shed structures; promote public access and knowledge of Gig Harbor's history; and support tourism, while protecting existing ecological functions, restoring ecological functions that have been previously degraded, and enhancing public access to the shoreline.*

It is further described in SMP 5.2.6(D)(8) that all development and uses waterward of the ordinary high water mark should be located and designed to minimize interference with surface navigation and to minimize adverse visual impacts, and to allow for the safe, unobstructed passage of fish and wildlife, particularly those species dependent on migration.

- b. Marine, Shorelines, Vegetation Conservation and Critical Areas Protection (SMP 6.2)** – Subsection 6.2.1 states, *Assure no net loss of shoreline ecological functions and processes. This means all shoreline use and development should be carried out in a manner that avoids and minimizes adverse impacts so that the resulting ecological condition does not become worse than the current condition. Natural features of the shoreline and nearshore environment that provide ecological functions and that should be protected include marine riparian habitat, banks and bluffs, beaches and backshore, critical saltwater habitat, wetlands and streams. Shoreline processes that should be protected include erosion and accretion; sediment delivery, transport and storage, and large woody debris recruitment.*

Subsection 6.2.5.23(7) states, *Compensatory mitigation shall be provided to offset impacts to critical fish and wildlife habitat and to meet the requirements of no net loss of shoreline functions. The applicant shall demonstrate that the compensatory mitigation achieves no net loss.*

c. Public Access (SMP 6.5) – Subsection 6.5.2(1)(d) states, *Shoreline substantial development shall provide public access where the following condition is present: Where the development is proposed or funded by a public entity or on public lands, except where public access improvements would adversely affect publicly funded restoration actions.* Subsection 6.5.3(1)(c) states, *Developments within the shoreline area that are required to provide public access per Section 6.5.2 shall provide, at a minimum, visual access to the water. Visual access shall consist of one of the following: A public viewing platform at the highest level of any structure on the property, with the platform having a minimum area of fifty (50) square feet. Railings around the platform, consistent with the City Building Code, may extend the maximum allowable height.*

d. Boating and Marinas: Piers, Docks, and Moorage (SMP 7.11) – Section 7.11.7 affords the following regulations to the use and design of non-residential piers, docks, floats, and lifts:

Subsection 7.11.7(2) states, *Piers, docks, floats and lifts associated with commercial, industrial, or public recreational developments are allowed only when ecological impacts are mitigated in accordance with the program, and: a) The dock/pier/float is required to accommodate a water-dependent use; or b) The dock/pier/float provides opportunities for a substantial number of people to access the shoreline.*

Subsection 7.11.7(6) states, *To minimize adverse effects on nearshore habitats and species caused by overwater structures that reduce ambient light levels, the following shall apply: a) The width of docks, piers, floats and lifts shall be the minimum necessary, and in no case shall be wider than eight (8) feet unless grating is used in accordance with, and authorized by, state resource agency regulations; b) Materials that will allow light to pass through the deck may be required where the width exceeds eight (8) feet; c) Grating to allow light passage or reflective panels to increase light refraction into the water shall be used on piers, docks, floats and gangways in nearshore areas; d) Use of non-toxic materials, including, but not limited to,*

steel, concrete and non-toxic wood shall be approved by applicable state agencies.

Subsection 7.11.7(8) states, Commercial, industrial or public recreational docks, piers, floats and lifts shall be designed and located to ensure that such structures and the vessels moored to them do not ground out during low tidal cycles.

e. Nonconforming Uses and Structures (SMP 8.11) –

Subsection 8.11.8(1) states, When a lawful structure existed at the effective date of the adoption or an amendment of the applicable regulations and could not be built under the terms of the current regulations set forth in this Shoreline Master Program, or amendments thereof, by reason of the restrictions on area, lot size or dimension, coverage, height, yards and the location on the lot or other requirements concerning the structure, such structure may be continued as a nonconforming structure so long as it remains otherwise lawful and shall be subject to the applicable provisions of the section. Subsection 8.11.8(1)(c) states, any such nonconforming structure or nonconforming portion of a structure that is intentionally damaged, intentionally altered, or intentionally removed may be reconstructed to the same or smaller configuration existing immediately prior to the time the structure was damaged or altered provided the standards set forth as SMP 8.11.8(1)(c)(i) through (vi) are met.

f. Staff Analysis – The proposed site improvements foster the existing use of the site as a public waterfront park and afford the unique opportunity for the public to access and enjoy the Gig Harbor waterfront by launching non-motorized watercraft from the improved dock. Use of the site in this manner increases the public access to the site's uplands, which is developed with a public park and the existing historic Ancich Brothers Netshed. The site improvements, therefore, support the Historic Working Waterfront Environment's intent of preserving and exhibiting Gig Harbor's proud historic industries in commercial fishing and boatbuilding by increasing public access opportunities near the historically relevant on-site structures and the land on which they operated. The proposed improvements also substantially increase public access to, and enjoyment of, Gig Harbor Bay in a manner which protects the ecological function of the Bay. As such, the proposed Community Paddler's Dock at Ancich Waterfront Park is consistent with the intent of the Historic Working Waterfront Environment and is a permitted use in the site's shoreline environment.

The applicant has submitted analysis of its efforts to ensure no net loss of ecological function as a result of the proposed site improvements. The proposed improvements' impact on the ecological function of Gig Harbor Bay and the compensatory mitigation plan to address such impacts have been analyzed at length by staff and by partnering agencies, to include the United States Army Corps of Engineers (USACE) and the National Marine Fisheries Service (NMFS). An impacts analysis, biological assessment, agency correspondence, and a demonstration of consultation under Section 7 of the Endangered Species Act (ESA) has been included as Reference documents with the Mitigated Determination of Nonsignificance ("MDNS") included as Exhibit I to this staff report. Having corresponded with other agencies with jurisdiction of the proposed improvements, staff notes that the applicant has offered sufficient mitigation to ensure no net loss of ecological function to the shoreline processes of Gig Harbor Bay, if properly mitigated. The MDNS (Exhibit I) issued by staff on April 8, 2021 established mitigation measures to ensure the no net loss analysis and determination is substantiated; these measures have been included as recommended conditions of approval included in Section XI of this staff report.

The proposed dock improvements are associated with the Ancich Park Improvements & Net Shed Restoration approved via permit file no. PL-SDP-16-0005. Improvements associated with the project included the upland redevelopment of the subject site, which included the creation of a public park and development of a one-story, 3,000 square foot storage building for non-motorized watercraft. A public rooftop viewing platform was also developed to serve the public access requirements of the site improvements holistically, to include the dock improvements discussed herein. The public access has been designed consistent with SMP 6.5.3.1(c).

As has been previously discussed in this staff report, the applicant's proposed dock improvements and float installation have sufficiently mitigated for ecological impacts in accordance with the applicable criteria of the SMP. The dock improvements are also associated with public recreational development, accommodating the water-dependent use intrinsic to the non-motorized watercraft public launch floats which provide the unique opportunity for substantial members of the public to access and enjoy the shoreline. The design of the replacement dock structure improves ambient light levels for the nearshore

marine environment by removing the existing dock constructed almost entirely of solid decking with a new grated dock creating a net 45% open area for light penetration. The limited size of the dock's width and the applicant's chosen materials for construction serve to minimize adverse effects on nearshore habitat, avoid shading of beach substrate, and avoid obstructions to navigation or pleasure boating in the area. The proposed improvements are, therefore, consistent with the applicable provisions of SMP 7.11.7.

The site's existing dock is legally nonconforming to the minimum setback for boating facilities with regard to the dock's proximity to the shared eastern property line and the state lease land managed by the Department of Natural Resources (DNR) located waterward of the site's improvement footprint. Based on records with the Pierce County Assessor-Treasurer (see Exhibit J), the existing dock was developed on the site in 1969, which predated the Gig Harbor Shoreline Master Program (SMP) and the Washington state Shoreline Management Act (SMA) which established the setback regulations to which the dock is nonconforming. The applicant proposes to intentionally demolish the existing nonconforming structure and develop a new dock structure which is less nonconforming to the existing dock's configuration and location within regulated setbacks; please see Sheets 4-6 of Exhibit B which represent the positioning of the existing dock and the proposed dock in relation to the adjoining private and public property lines. The applicant has designed the new dock to replace the existing nonconforming structure in a manner which complies with the standards set forth in SMP 8.11.8(1)(c), if appropriately conditioned.

Based on the preceding analysis, if appropriately conditioned, the subject request is generally consistent with the aforementioned goals and policies of the SMP.

Consistency with WAC 173-27-150 – Review Criteria for Substantial Development Permits:

The subject request is consistent with the goals of RCW 90.58, the State Shoreline Management Act, that promote the public use of shorelines, while protecting against adverse effects to the public health, the land and its vegetation and wildlife and the waters of the state and their aquatic life. The proposal is also consistent with the applicable requirements of the SMP. In this regard, the proposed improvements to the site would support the water-oriented and

water-dependent use and, if properly conditioned, wouldn't adversely impact the site's ecological functions and processes. Therefore, the proposal is consistent with the applicable requirements of the WAC 173-27-150, if conditioned appropriately.

B. Operations and Engineering

The City Engineer has reviewed the subject request and has found the proposal to be generally consistent with the applicable provisions of the Code.

C. Fire Marshal/Building Official

The Building Official has reviewed the subject request and has found the proposal to be generally consistent with the applicable provisions of the Code.

X. CONCLUSIONS:

A. Shoreline Substantial Development Permit:

1. The proposed improvements are generally consistent with the policies and provisions of the Shoreline Management Act ("the Act").
2. If properly conditioned, the proposal is generally consistent with the applicable goals and policies of the SMP.
3. The proposal is consistent with the requirements of WAC 173-27-150.

B. Site Plan Review:

1. Based upon the findings of fact previously addressed in Section IX of this staff report, the proposed site improvements are consistent with the criteria for site plan approval set forth in GHMC 17.96.035, if appropriately conditioned.

C. Design Review:

1. Based upon the findings of fact previously addressed in Section IX of this staff report, the proposal is generally consistent with the applicable provisions of GHMC Chapter 17.99, Design Manual.

D. Nonconforming Review Permit:

1. Based upon the findings of fact previously addressed in Section IX of this staff report, the existing structure is subject to nonconforming rights related to its proximity within the setback for boating facilities set forth in Table 7-3 of the Gig Harbor Shoreline Master Program, specific to the private property line to the east and the public lease land area managed by the Department of Natural Resources along the northern (waterward) property line. The proposed structure for development has been designed consistent with all applicable provisions of SMP 8.11.8(1)(c), if appropriately conditioned.

XI. RECOMMENDATIONS:

Should the requested Shoreline Substantial Development permit, Site Plan Review permit, Design Review permit, and Nonconforming Review permit be approved, staff recommends the imposition of the following special conditions of approval and SEPA mitigation measures:

Land Use Special Conditions:

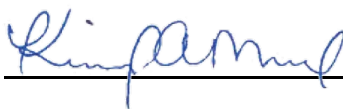
1. The applicant shall obtain civil and building permits from the city prior to commencing construction on the proposed improvements, as needed.
2. Prior to civil permit issuance, all applicable conditions required by the Department of Ecology in comment letters received by the City must be met (see Exhibit E).
3. The site improvements are to be redeveloped in a manner consistent with the plan set prepared by Davido Consulting Group (DCG), Inc., dated January 2021 (see Exhibit B).
4. Redevelopment of the subject site shall occur within one (1) year of the time of intentional damage or alteration of the existing nonconforming structure or shall not occur at all. As per GHSMP 8.11.8(1)(c)(ii), the Community Development Director ("Director") may grant not more than two (2) one-year extensions for such redevelopment based on good cause.
5. Prior to issuance of building permits, the applicant shall provide the Planning Division with all required final permit approvals from other state and federal agencies. Activity which requires permits or approvals from other agencies may not commence until such approvals are acquired by the applicant and provided to the City of Gig Harbor Planning staff.

6. The authorization granted herein is subject to all applicable federal, state, and local laws, regulations, and ordinances. Compliance with such laws, regulations, and ordinances is a condition precedent to the approvals granted and is a continuing requirement of such approvals. By accepting these approvals, the applicant represents that the development and activities allowed will comply with such laws, regulations, and ordinances. If, during the term of the approval granted, the development and activities permitted do not comply with such laws, regulations, or ordinances, the applicant agrees to promptly bring such development or activities into compliance, and acknowledges that bringing such development or activities into compliance may require new permit applications to be considered by staff or the Hearing Examiner.

**Mitigation Measures – Mitigated Determination of Nonsignificance –
File No. PL-SEPA-18-0013**

7. The applicant shall provide mitigation consistently with all representations set forth in the applicant's Compensatory Mitigation Plan and No Net Loss Analysis (Reference No. 2, Exhibit I).
8. The applicant shall adhere to the mitigation required by the Public Works Department as set forth in Reference No. 6 to the MDNS (Exhibit I), as applicable.
9. The applicant shall adhere to the Best Management Practices (BMPs) described in Section 8A of the JARPA (Reference No. 7, Exhibit I) completed by Davido Consulting Group, Inc. dated November 18, 2020.
10. Should archeological materials or human remains be observed during project activities, all work in the immediate vicinity shall stop. The State Department of Archeology and Historic Preservation, the City of Gig Harbor Planning Division, any affected Tribe, and the local coroner (as applicable) shall be contacted immediately to help assess the findings and determine how to preserve the resource(s). Compliance with all applicable laws pertaining to archeological resources (RCW 27.53, RCW 27.44, and WAC 25-48) is required.

Project Planner: Kimberly Mahoney, Associate Planner



Date: May 13, 2021

The following exhibits are included for your review of the development application:

- Exhibit A – Staff report for PL-SDP-18-0003, PL-SPR-18-0009, PL-NCR-18-0007, PL-DR-18-0179, PL-FLOOD-18-0002, PL-SEPA-18-0013, dated May 13, 2021
- Exhibit B – Site Plan prepared for the City of Gig Harbor Ancich Park – Jerkovich Pier Community Paddler's Dock, prepared by Davido Consulting Group (DCG), Inc., dated January 2021
- Exhibit C – Hearing Examiner decision, PL-SDP-16-0005 et al., dated April 4, 2017
- Exhibit D – Letter from Department of Ecology to Peter Katich, Senior Planner, dated February 6, 2017
- Exhibit E – Letter from Department of Ecology to Kimberly Mahoney, Associated Planner, in response to MDNS issued for PL-SEPA-18-0013, dated April 22, 2021
- Exhibit F – Declarations of Mailing, Publishing, and Posting, Notice of Public Hearing
- Exhibit G – Declarations of Mailing, Publishing, and Posting, Notice of Application
- Exhibit H – Interested Parties Roster for any project permit activity at 3525 Harborview Drive
- Exhibit I – Mitigated Determination of Nonsignificance (MDNS) issued for permit file no. PL-SEPA-18-0013, dated April 8, 2021
- Exhibit J – Pierce County Assessor-Treasurer Property Summary for 3525 Harborview Drive

Duration of Permits: The Shoreline Substantial Development addressed herein shall expire two (2) years from its effective date, unless construction activities commence or, if no construction is proposed, the use or activity is commenced. If substantial progress is made within two years, the permit shall remain valid for five (5) years. If construction is not completed within 5 years, the administrator may grant an extension of time up to but not exceeding one (1) year for substantial progress and for completion of the project pursuant to section 4.08.E of the Gig Harbor Shoreline Master Program and WAC 173-27-090.

The site plan review, design review permit, and nonconforming review permit addressed by this decision, shall expire three (3) years from the date of decision unless a complete application for subsequent building permit or civil permit has been submitted and remained active, pursuant to GHMC 19.02.008. Upon written request by the property owner, prior to the date of land use permit expiration, the director may grant an extension of time up to but not exceeding one (1) year pursuant to GHMC 19.02.008(F). See GHMC 19.02.008 for complete regulations on the duration of permit approvals and expiration of permits.

Administrative Appeal: There is no administrative appeal for this decision. Any appeal of this decision shall be in accordance with RCW 36.70C and RCW 90.58.140.

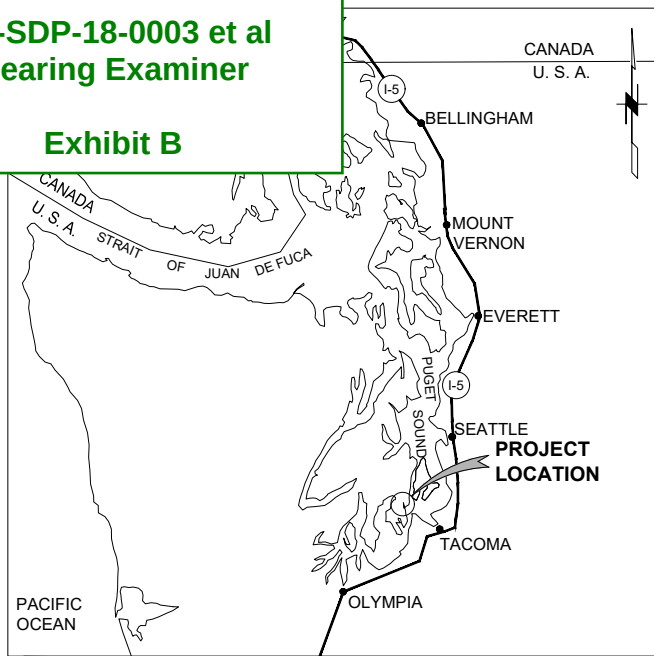
Property Tax Valuation: Affected property owners may request a change in property tax valuation notwithstanding any program of revaluation by contacting the Pierce County Assessor-Treasurer.

Availability of Complete Project Permit File for Review: The complete project permit file, including findings, conclusions and conditions of approval, if any, is available for review at the city of Gig Harbor Planning Department, 3510 Grandview Street, Gig Harbor, WA 98335. Please contact Kim Mahoney, Associate Planner, at 253-851-6170 should you desire to review the file.

Ancich Waterfront Park Community Paddler's Dock

PL-SDP-18-0003 et al
Hearing Examiner

Exhibit B



VICINITY MAP

NTS

CITY OF GIG HARBOR

MAYOR - KIT KUHN

PUBLIC WORKS DIRECTOR - JEFF LANGHELM

CITY ADMINISTRATOR - BOB LARSON

CITY COUNCIL MEMBERS -

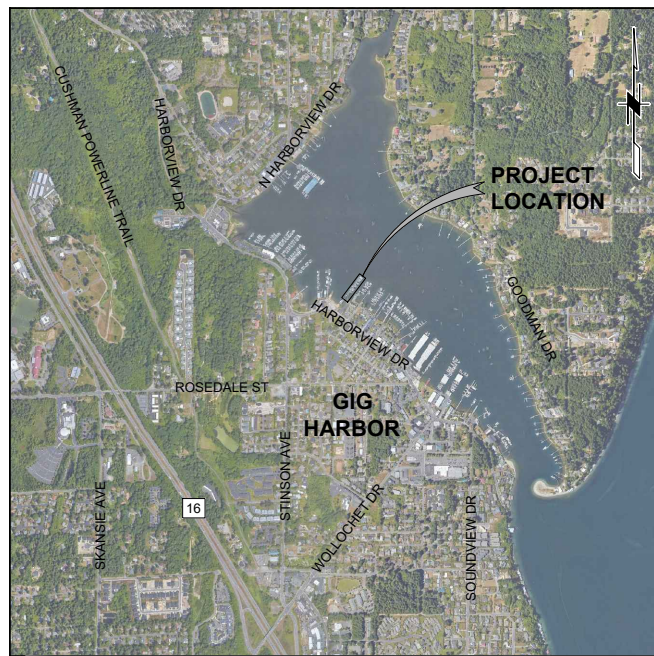
JENI WOOCK, BOB HIMES, JIM FANICH,
TRACIE MARKLEY, ROBYN DENSON,
LE RODENBERG, SPENCER ABERSOLD

SHEET INDEX

No.	SHEET TITLE
1	TITLE SHEET AND SHEET INDEX
2	OVERALL SITE PLAN
3	EXISTING AND DEMOLITION PLAN
4	EXISTING AND DEMOLITION PLAN
5	PROPOSED DOCK PLAN
6	PROPOSED DOCK PLAN
7	PROPOSED DOCK PROFILE
8	PROPOSED DOCK PROFILE
9	PROPOSED DOCK DETAILS
10	PROPOSED DOCK DETAILS
11	PROPOSED DOCK DETAILS

DCG
civil structural

9706 4th Ave NE
Suite 300
Seattle, WA 98115
P: 206.523.0024
www.dcgengr.com



PROJECT LOCATION

NTS

VERTICAL DATUM CONVERSION

(FEMA BFE = +14 NAVD 88)

MLLW	NGVD 29	NAVD 88	DATUM PLANE
+17.00	+10.54	+14.00	- FEMA FLOOD ELEV.
+13.80	+7.34	+10.80	- HIGHEST OBSERVED
+13.59	+7.13	+10.59	- HIGH TIDE LINE
+12.80	+6.34	+9.80	- ORDINARY HIGH WATER
+11.80	+5.34	+8.80	- MEAN HIGHER HIGH WATER
+11.00	+4.54	+8.00	- MEAN HIGH WATER
+6.90	+0.44	+3.90	- MEAN TIDE LEVEL
+2.80	-3.66	-0.20	- MEAN LOW WATER
0.00	-6.46	-3.00	- MEAN LOWER LOW WATER
-4.30	-10.76	-7.30	- LOWEST OBSERVED

SOURCES:

MLLW: US ARMY CORPS OF ENGINEERS' SOUTH PUGET SOUND
REGION TIDAL DATUM #72 - GIG HARBOR.

NGVD 29 AND NAVD 88: NOAA's VERTICAL DATUM TRANSFORMATION
(v3.3) AT JERISICH DOCK (LAT 47.3310, LONG -122.5816).

HTL: HTL IS 13.59' MLLW, BASED IN THE NOAA PREDICTED TIDE
(STATION NO. 9446369) ON 2021/12/06 AT 07:22 AM.

PURPOSE: PROVIDE EASY ACCESS TO THE
WATERFRONT, CREATE A SAFE AND
APPROPRIATE PLACE FOR PADDLERS OF
ALL SKILL LEVELS TO LAUNCH
HUMAN-POWERED WATERCRAFT, AND
PROMOTE OUTDOOR RECREATIONAL
OPPORTUNITIES FOR THE COMMUNITY.

ADJACENT PROPERTY OWNERS:

- CAROLYN S. BERG
- FRISBIE ROBERT G
- TARABOCHIA DOMINICH J JR AND
ANCICH LLC
- PUBLIC RIGHT OF WAY

CITY OF GIG HARBOR ANCICH PARK - JERKOVICH PIER COMMUNITY PADDLERS DOCK

TITLE SHEET AND SHEET INDEX

CITY OF GIG HARBOR
3510 GRAND VIEW ST.
GIG HARBOR, WA, 98335

PROPOSED: REPLACE EXISTING
GANGWAY, FLOATS, AND GUIDE PILES TO
ALLOW SAFE COMMUNITY ACCESS AND
LAUNCH OF WATERCRAFT.

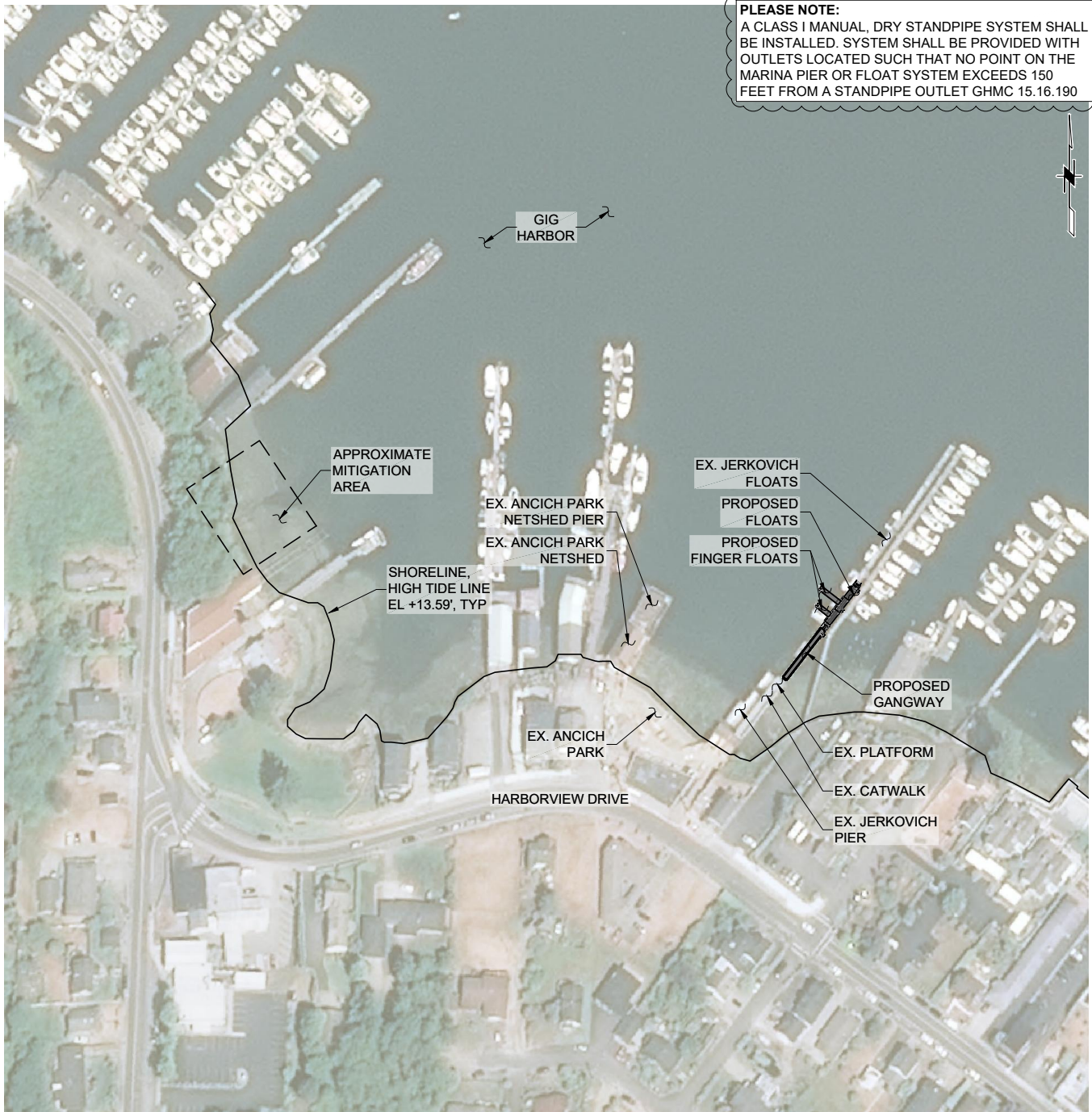
IN: GIG HARBOR
AT: GIG HARBOR, WA,
PIERCE COUNTY
S5, T21N, R2E

APPLICATION BY:
CITY OF GIG HARBOR

SHEET: 1 OF 11

DATE: JAN. 2021

1/19/21 - DREW - JDCGLLOCALFILES\HARBOR\GIG HARBOR\COMMUNITY PADDLERS DOCK\DWG\DRAWING\PADDLERS DOCK_JARPA_20.DWG



PLEASE NOTE:

A CLASS I MANUAL, DRY STANDPIPE SYSTEM SHALL BE INSTALLED. SYSTEM SHALL BE PROVIDED WITH OUTLETS LOCATED SUCH THAT NO POINT ON THE MARINA PIER OR FLOAT SYSTEM EXCEEDS 150 FEET FROM A STANDPIPE OUTLET GHMC 15.16.190



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Seattle, WA 98115
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PURPOSE: PROVIDE EASY ACCESS TO THE WATERFRONT, CREATE A SAFE AND APPROPRIATE PLACE FOR PADDLERS OF ALL SKILL LEVELS TO LAUNCH HUMAN-POWERED WATERCRAFT, AND PROMOTE OUTDOOR RECREATIONAL OPPORTUNITIES FOR THE COMMUNITY.

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4. PUBLIC RIGHT OF WAY

**CITY OF GIG HARBOR
ANCICH PARK - JERKOVICH PIER
COMMUNITY PADDLERS DOCK**

**OVERALL
SITE PLAN**



CITY OF GIG HARBOR
3510 GRAND VIEW ST.
GIG HARBOR, WA, 98335

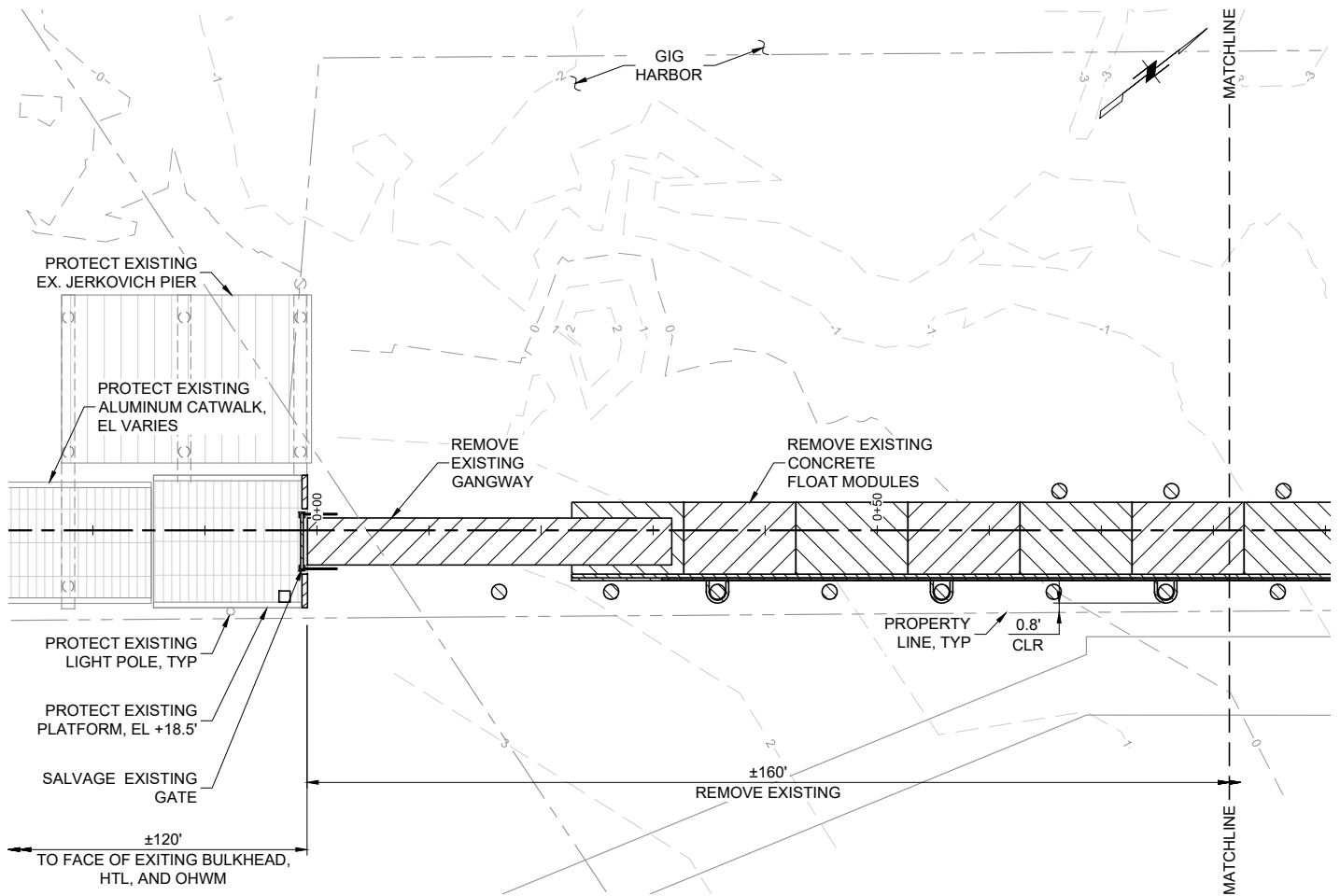
PROPOSED: REPLACE EXISTING GANGWAY, FLOATS, AND GUIDE PILES TO ALLOW SAFE COMMUNITY ACCESS AND LAUNCH OF WATERCRAFT.

IN: GIG HARBOR
AT: GIG HARBOR, WA,
PIERCE COUNTY
S5, T21N, R2E

APPLICATION BY:
CITY OF GIG HARBOR

SHEET: 2 OF 11

DATE: JAN. 2021



PURPOSE: PROVIDE EASY ACCESS TO THE WATERFRONT, CREATE A SAFE AND APPROPRIATE PLACE FOR PADDLERS OF ALL SKILL LEVELS TO LAUNCH HUMAN-POWERED WATERCRAFT, AND PROMOTE OUTDOOR RECREATIONAL OPPORTUNITIES FOR THE COMMUNITY.

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**CITY OF GIG HARBOR
ANCICH PARK - JERKOVICH PIER
COMMUNITY PADDLERS DOCK**

**EXISTING AND
DEMOLITION PLAN**



CITY OF GIG HARBOR
3510 GRAND VIEW ST.
GIG HARBOR, WA, 98335

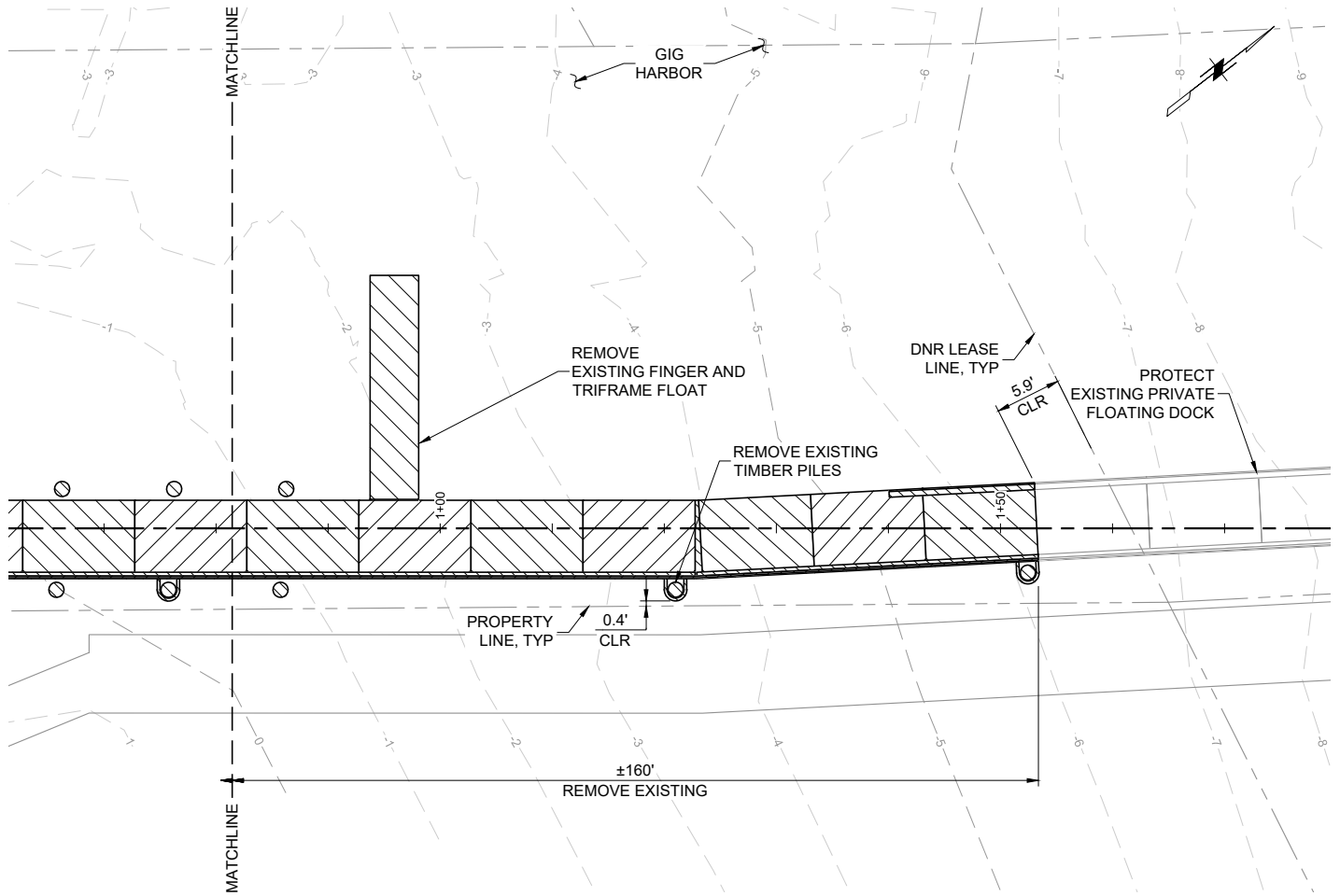
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IN: GIG HARBOR
AT: GIG HARBOR, WA,
PIERCE COUNTY
S5, T21N, R2E

APPLICATION BY:
CITY OF GIG HARBOR

SHEET: 3 OF 11

DATE: JAN. 2021



PURPOSE: PROVIDE EASY ACCESS TO THE WATERFRONT, CREATE A SAFE AND APPROPRIATE PLACE FOR PADDLERS OF ALL SKILL LEVELS TO LAUNCH HUMAN-POWERED WATERCRAFT, AND PROMOTE OUTDOOR RECREATIONAL OPPORTUNITIES FOR THE COMMUNITY.

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**CITY OF GIG HARBOR
ANCICH PARK - JERKOVICH PIER
COMMUNITY PADDLERS DOCK**

**EXISTING AND
DEMOLITION PLAN**



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3510 GRAND VIEW ST.
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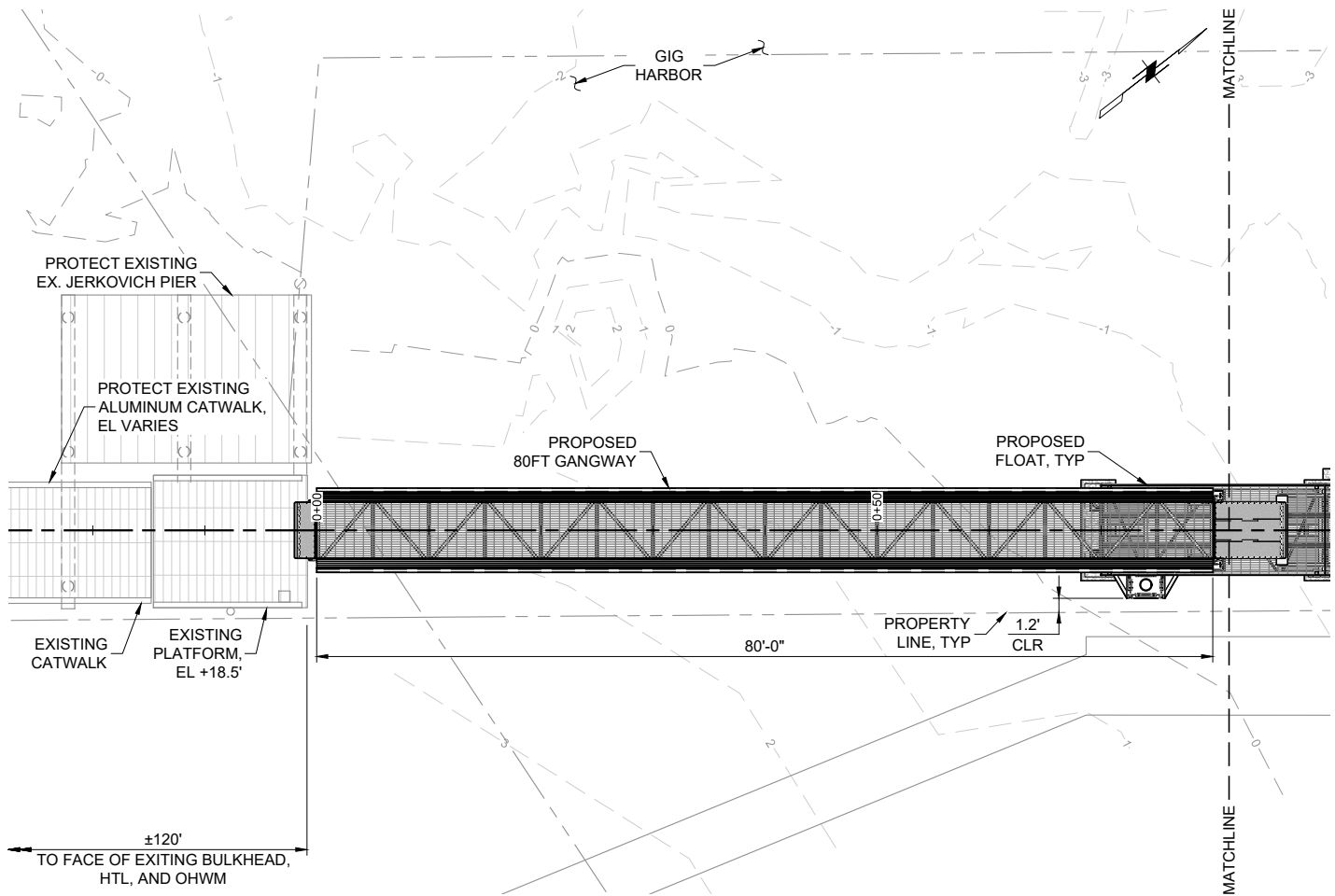
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APPLICATION BY:
CITY OF GIG HARBOR

SHEET: 4 OF 11

DATE: JAN. 2021



PURPOSE: PROVIDE EASY ACCESS TO THE WATERFRONT, CREATE A SAFE AND APPROPRIATE PLACE FOR PADDLERS OF ALL SKILL LEVELS TO LAUNCH HUMAN-POWERED WATERCRAFT, AND PROMOTE OUTDOOR RECREATIONAL OPPORTUNITIES FOR THE COMMUNITY.

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**CITY OF GIG HARBOR
ANCICH PARK - JERKOVICH PIER
COMMUNITY PADDLERS DOCK**

**PROPOSED
DOCK PLAN**



CITY OF GIG HARBOR
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GIG HARBOR, WA, 98335

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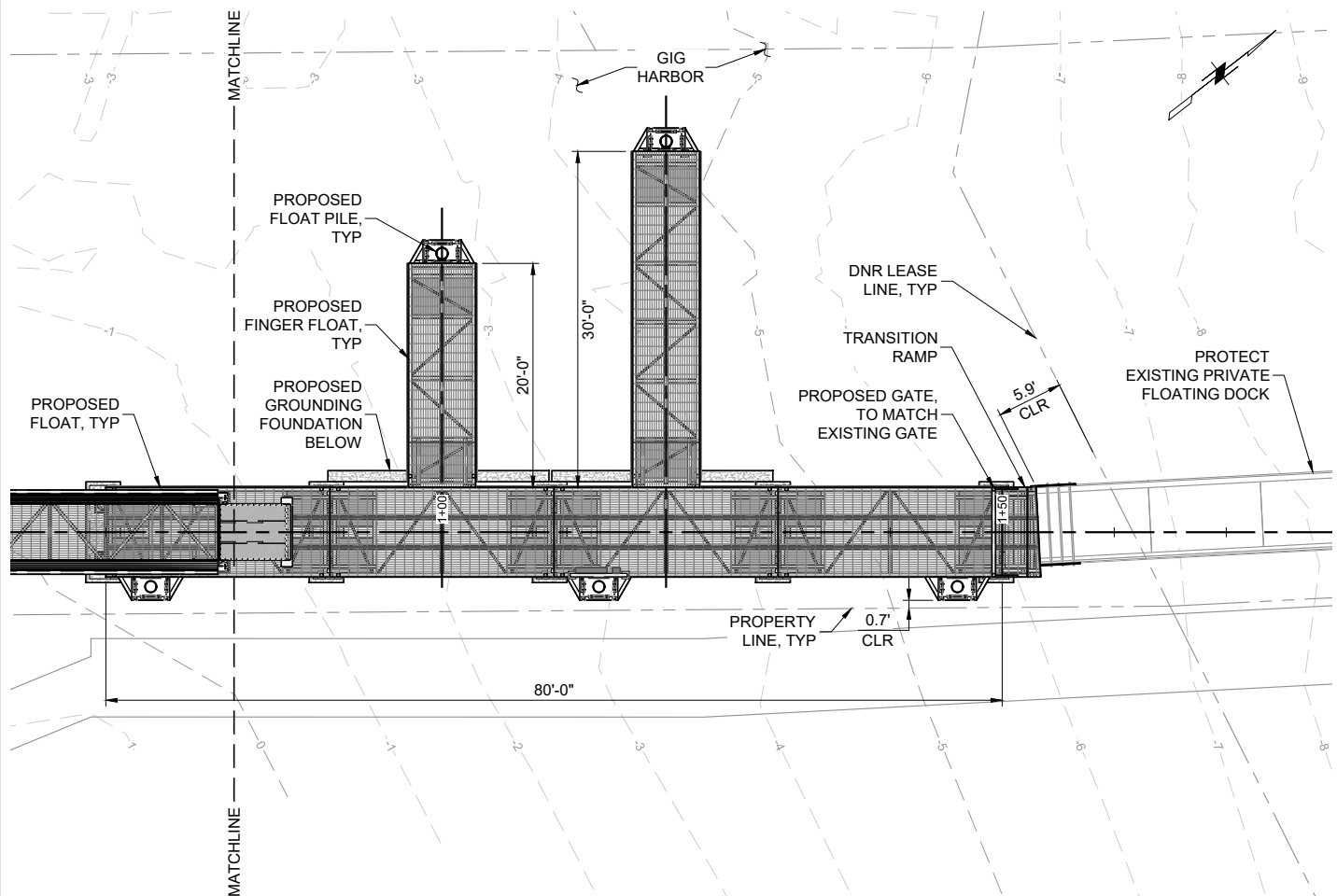
IN: GIG HARBOR
AT: GIG HARBOR, WA,
PIERCE COUNTY
S5, T21N, R2E

APPLICATION BY:
CITY OF GIG HARBOR

SHEET: 5 OF 11

DATE: JAN. 2021

1/19/21 - DREW - JDCG.LOCAL\FILES\HARBOR\CLIENTS\CIVIL_PUBL\CITY OF GIG HARBOR\COMMUNITY PADDLERS DOCK\DWG\DRAWING\PADDLERS DOCK_JARPA_20.DWG



PURPOSE: PROVIDE EASY ACCESS TO THE WATERFRONT, CREATE A SAFE AND APPROPRIATE PLACE FOR PADDLERS OF ALL SKILL LEVELS TO LAUNCH HUMAN-POWERED WATERCRAFT, AND PROMOTE OUTDOOR RECREATIONAL OPPORTUNITIES FOR THE COMMUNITY.

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**CITY OF GIG HARBOR
ANCICH PARK - JERKOVICH PIER
COMMUNITY PADDLERS DOCK**

**PROPOSED
DOCK PLAN**



CITY OF GIG HARBOR
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GIG HARBOR, WA, 98335

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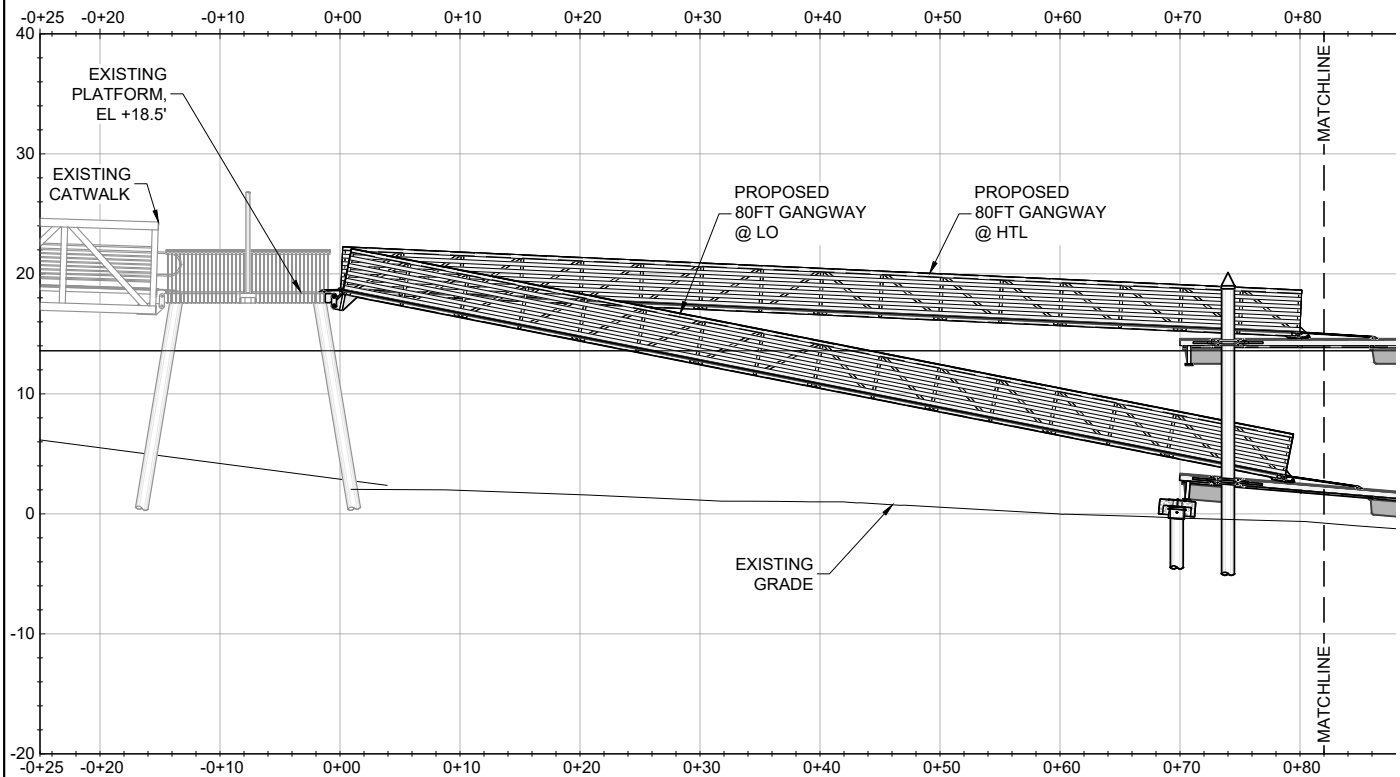
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PIERCE COUNTY
S5, T21N, R2E

APPLICATION BY:
CITY OF GIG HARBOR

SHEET: 6 OF 11

DATE: JAN. 2021

1/19/21 - DREW - I:\DCG\LOCAL FILES\HARBOR\DCG\CLIENTS\CIVIL_PUBLICATION\GIG HARBOR\COMMUNITY PADDLERS DOCK\DWG\DRAWING\GIP PADDLERS DOCK_JARPA_20.DWG



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**CITY OF GIG HARBOR
ANCICH PARK - JERKOVICH PIER
COMMUNITY PADDLERS DOCK**

**PROPOSED
DOCK PROFILE**



CITY OF GIG HARBOR
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GIG HARBOR, WA, 98335

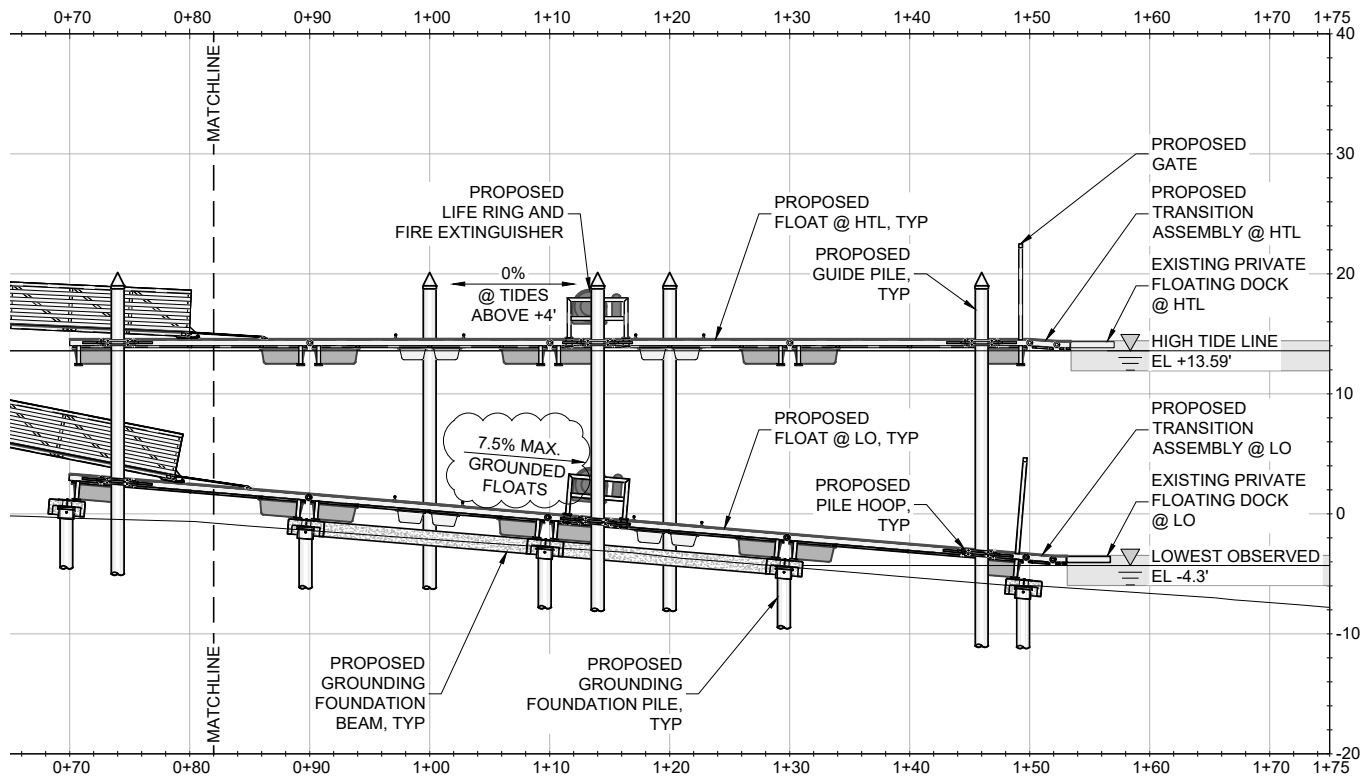
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IN: GIG HARBOR
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APPLICATION BY:
CITY OF GIG HARBOR

SHEET: 7 OF 11

DATE: JAN. 2021



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**CITY OF GIG HARBOR
ANCICH PARK - JERKOVICH PIER
COMMUNITY PADDLERS DOCK**

**PROPOSED
DOCK PROFILE**



CITY OF GIG HARBOR
3510 GRAND VIEW ST.
GIG HARBOR, WA, 98335

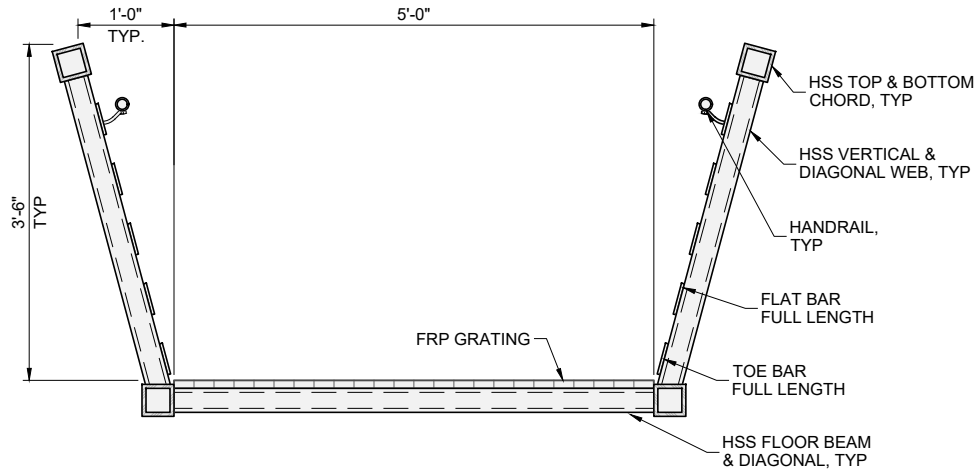
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IN: GIG HARBOR
AT: GIG HARBOR, WA,
PIERCE COUNTY
S5, T21N, R2E

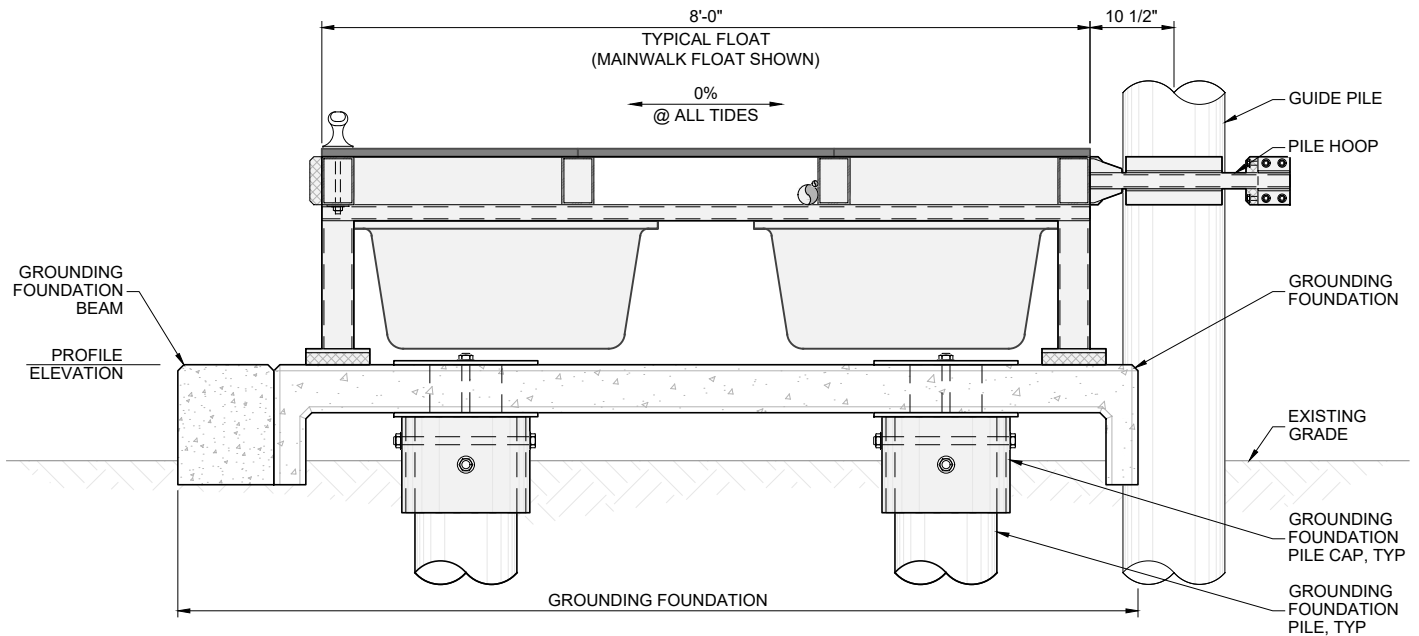
APPLICATION BY:
CITY OF GIG HARBOR

SHEET: 8 OF 11

DATE: JAN. 2021



PROPOSED ALUMINUM GANGWAY SECTION



PROPOSED FLOAT SECTION

NTS - SHOWN W/ FLOAT GROUNDED



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Seattle, WA 98115
P: 206.523.0024
www.dcgengr.com

PURPOSE: PROVIDE EASY ACCESS TO THE WATERFRONT, CREATE A SAFE AND APPROPRIATE PLACE FOR PADDLERS OF ALL SKILL LEVELS TO LAUNCH HUMAN-POWERED WATERCRAFT, AND PROMOTE OUTDOOR RECREATIONAL OPPORTUNITIES FOR THE COMMUNITY.

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CITY OF GIG HARBOR ANCICH PARK - JERKOVICH PIER COMMUNITY PADDLERS DOCK

PROPOSED DETAILS

CITY OF GIG HARBOR
3510 GRAND VIEW ST.
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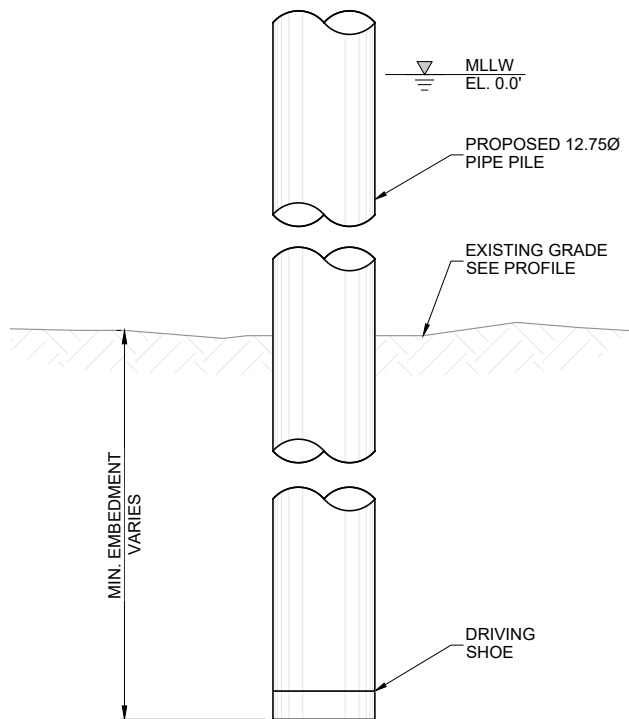
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IN: GIG HARBOR
AT: GIG HARBOR, WA,
PIERCE COUNTY
S5, T21N, R2E

APPLICATION BY:
CITY OF GIG HARBOR
SHEET: 9 OF 11

DATE: JAN. 2021

1/19/21 - DREW - I:\DCG\LOCAL\FILES\HARBOR\DCG\CLIENTS\CIVIL_PUBL\GIG HARBOR\COMMUNITY PADDLERS DOCK\DWG\DRAWING\PADDLERS DOCK_JARPA_20.DWG



TYPICAL GUIDE PILE INSTALLATION

NTS



9706 4th Ave NE
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PURPOSE: PROVIDE EASY ACCESS TO THE WATERFRONT, CREATE A SAFE AND APPROPRIATE PLACE FOR PADDLERS OF ALL SKILL LEVELS TO LAUNCH HUMAN-POWERED WATERCRAFT, AND PROMOTE OUTDOOR RECREATIONAL OPPORTUNITIES FOR THE COMMUNITY.

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**CITY OF GIG HARBOR
ANCICH PARK - JERKOVICH PIER
COMMUNITY PADDLERS DOCK**

**PROPOSED
DETAILS**

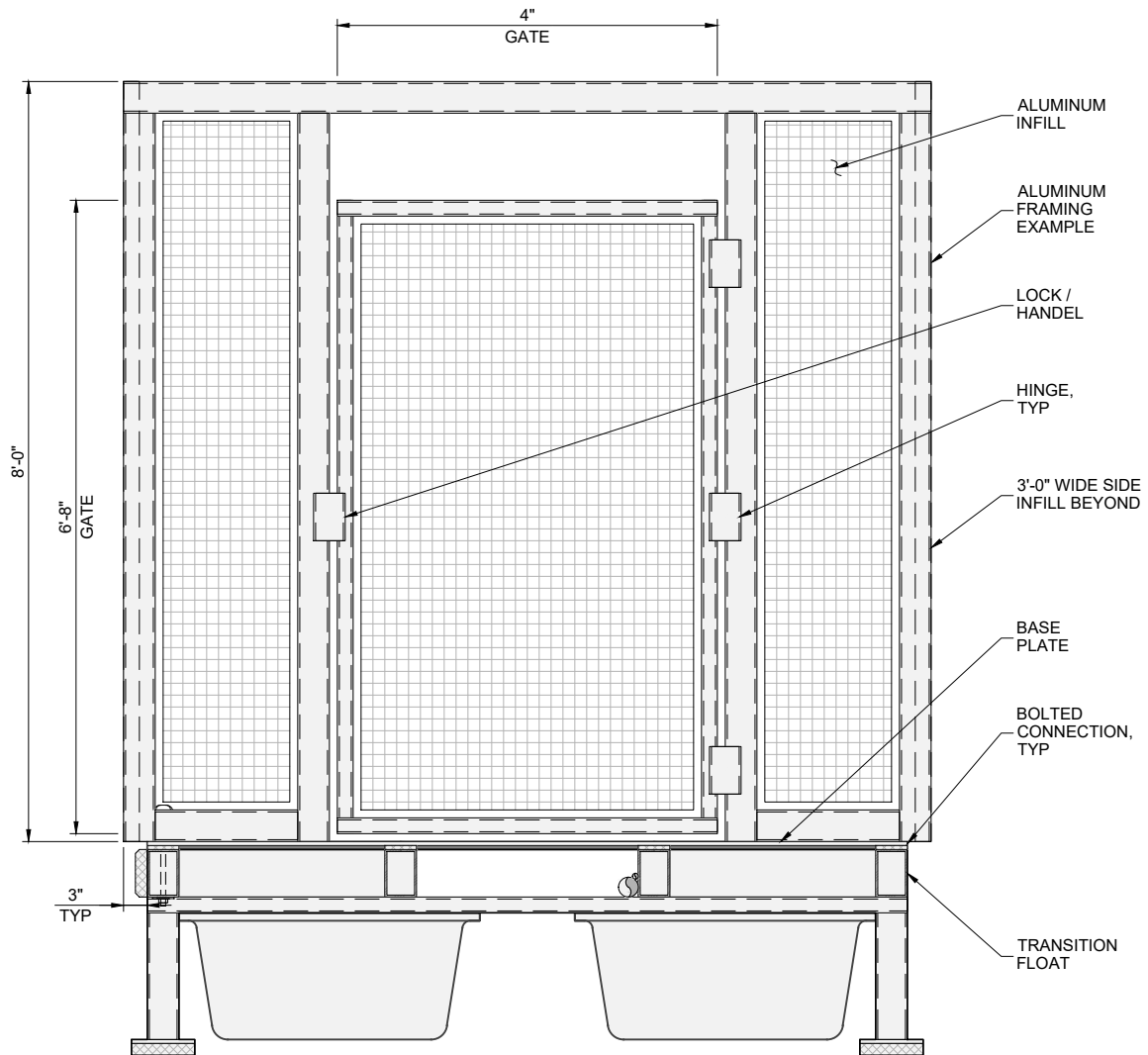
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IN: GIG HARBOR
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PIERCE COUNTY
S5, T21N, R2E

APPLICATION BY:
CITY OF GIG HARBOR

SHEET: 10 OF 11 **DATE:** JAN. 2021



SECURITY GATE ELEVATION



9706 4th Ave NE
Suite 300
Seattle, WA 98115
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www.dcgengr.com

PURPOSE: PROVIDE EASY ACCESS TO THE WATERFRONT, CREATE A SAFE AND APPROPRIATE PLACE FOR PADDLERS OF ALL SKILL LEVELS TO LAUNCH HUMAN-POWERED WATERCRAFT, AND PROMOTE OUTDOOR RECREATIONAL OPPORTUNITIES FOR THE COMMUNITY.

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4. PUBLIC RIGHT OF WAY

CITY OF GIG HARBOR ANCICH PARK - JERKOVICH PIER COMMUNITY PADDLERS DOCK

PROPOSED DETAILS

CITY OF GIG HARBOR
3510 GRAND VIEW ST.
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AT: GIG HARBOR, WA,
PIERCE COUNTY
S5, T21N, R2E

APPLICATION BY:
CITY OF GIG HARBOR

SHEET: 11 OF 11 **DATE:** JAN. 2021

April 4, 2017

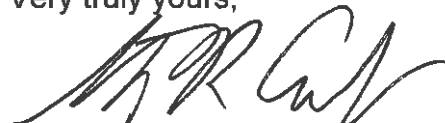
City of Gig Harbor Public Works Department
Attn: Katrina Knutson, Parks Project Administrator
3510 Grandview Street
Gig Harbor, WA 98335

**RE: SPR-16-0006, SDP-16-0005, SVAR-16-0001,
SCUP-16-0002, DR-16-0159 and ALP-16-0004
Ancich Park Improvements & Net Shed Restoration**

Dear Applicant:

Transmitted herewith is the Report and Decision of the City of Gig Harbor Hearing Examiner regarding your request for the above-entitled matter.

Very truly yours,



STEPHEN K. CAUSSEAU, JR.
Hearing Examiner

SKC/jjp

cc: Parties of Record

1X

**Ancich Waterfront Park
Community Paddler's Dock**

**PL-SDP-18-0003 et al
Hearing Examiner**

Exhibit C

OFFICE OF THE HEARING EXAMINER

CITY OF GIG HARBOR

REPORT AND DECISION

CASE NO.: **SPR-16-0006, SDP-16-0005, SVAR-16-0001,
SCUP-16-0002, DR-16-0159 and ALP-16-0004
Ancich Park Improvements & Net Shed Restoration**

APPLICANT: City of Gig Harbor Public Works Department
Attn: Katrina Knutson, Parks Project Administrator
3510 Grandview Street
Gig Harbor, WA 98335

OWNER: City of Gig Harbor
3510 Grandview Street
Gig Harbor, WA 98335

AGENT: PND Engineers, Inc.
Attn: Steven Robert
1736 Fourth Avenue South
Seattle, WA 98134

PLANNER: Peter Katich, Senior Planner

SUMMARY OF REQUEST:

Approval of various permits and a shoreline critical areas variance to allow development of a public park and upland, one-story, 3,000 square foot, storage building for non-motorized watercraft. The building would also provide a public restroom facility and a roof-top public viewing area and would be accessed from Harborview Drive. The project also includes a new, marine bulkhead along the length of the shoreline frontage; restoration and improvement of one, existing, marine, stormwater outfall; demolition, reconstruction and expansion of the Ancich overwater pier; restoration and improvement of the Ancich Net Shed; and restoration of the Jerkovich overwater pier. The parcel is located at 3525 Harborview Drive within the City of Gig Harbor.

SUMMARY OF DECISION: Request granted, subject to conditions.

DATE OF DECISION: April 4, 2017

PUBLIC HEARING:

After reviewing the Planning Department Staff Report and examining available information on file with the application, the Examiner conducted a public hearing on the request as follows:

The hearing was opened on March 16, 2017, at 1:30 p.m.

Parties wishing to testify were sworn in by the Examiner.

The following exhibits were submitted and made a part of the record as follows:

- EXHIBIT "A" - Community Development Department Staff Report**
- EXHIBIT "B" - Plan Set**
- EXHIBIT "C" - Mitigated Determination of Non-significance**
- EXHIBIT "D" - DRB Notice of Recommendation**
- EXHIBIT "E" - Ecology Letters**
- EXHIBIT "F" - Ecology Letter**
- EXHIBIT "G" - DNR Letters**
- EXHIBIT "H" - Public Comments**
- EXHIBIT "I" - Pubic Notice for Hearing and Application**
- EXHIBIT "J" - Landscape Plan**
- EXHIBIT "K" - Shoreline Variance**
- EXHIBIT "L" - Shoreline Conditional Use Permit**
- EXHIBIT "M" - Power Point Presentation**
- EXHIBIT "N" - Full Size Site Plan**
- EXHIBIT "O" - Additional Condition**

The Minutes of the Public Hearing set forth below are not the official record and are provided for the convenience of the parties. The official record is the recording of the hearing that can be transcribed for purposes of appeal.

PETER KATICH appeared, presented the Community Development Department Staff Report, and testified that the project includes a 3,000 square foot, non-motorized boat storage building with rooftop viewing area and restrooms. An existing bulkhead will be demolished, and two pier restorations and the restoration of the Ancich Net Shed will also occur. The project will also include improvements to Harborview Drive, and a second phase will provide a moorage facility on the Ancich Pier for the commercial fishing fleet. The parcel is located within the Waterfront Millville zone and is also subject to an Historic Working Waterfront Overlay. Restoration of the piers will further policies of the Comprehensive Plan and zoning code. A 2008 Examiner's decision approved a 25 slip marina, two single-family dwellings, and off-street parking for the site. Restoration of the net shed requires a Certification of Appropriateness pursuant to the GHMC. The Design Board held three meetings and obtained public comments. He has included their notice of

recommendation as an exhibit. The City responsible official issued a SEPA MDNS on December 22, 2016, and received no appeals. The City provided proper public notice. He analyzed the project for consistency with shoreline conditional use permit, site plan review, and other permit criteria. Page 31 of his Staff Report sets forth conditions of approval to include the MDNS mitigating measures. He then requested inclusion of an additional condition that addresses approval of users of the storage building, once they are identified. Part of the storage building will consist of boat storage. The City will further examine parking requirements upon determination of the users. They will address parking once tenants are chosen, and only then will the applicant submit a lease to the planning director for approval. The applicant must show that proposed uses can meet parking requirements. According to GHMC 17.72.030 no parking spaces are required for the net shed, and the code requires no off-street parking for commercial fishing moorage provided the boats have an active commercial fishing license. The City contemplates a portion of the structure for non-motorized boat storage, and the closest classified use thereto is mini-storage. Two parking stalls are required for a mini-storage facility. The applicant must show the stalls on the site plan. According to the code, off-street parking can be provided within 500 feet of the site. Also, the planning director has the authority to determine necessary parking. He referred to Exhibit C-10 and an email dated December 21, 2016, from Emily Appleton evaluating the applicant's analysis and agreeing therewith. The project does provide adequate parking. The public will have no access to the commercial fishing pier portion of the Jerkovich Dock.

KATRINA KNUTSON appeared and testified that the site is one of the last undeveloped, waterfront parcels. It is very small and was purchased by the City in 2012. In 2013 the Planning Department conducted a number of meetings and public forums to determine an appropriate use. A City Council Resolution agreed with the proposed use of non-motorized boat storage for the building. The City then submitted four grant applications to develop the park and secured funding therefor. They anticipated one year from concept to design, and have provided significant opportunities for public comment. They refined the project after receiving objections from two City Council members and a citizen. The Design Review Board held three meetings to consider the design of the building. She then reviewed the net shed and testified that only the City-owned net shed will be used for commercial fishing. Fishermen can store nets and equipment in the structure. The DRB issued its approval on April 13 for the net shed design. The Jerkovich Pier is owned by the City and an easement exists to the float system. She met with the Jerkovich family and they are very involved in the project and gracious to work with. They will now finalize a lease. The City wants to provide access to the water for the public. Residents indicated that they cannot see the water enough, and this project will enhance the view shed. The project will open views to the water from existing conditions. Concerning the 3,000 square foot storage building, they worked with the City Council to determine an appropriate size. They will provide public restrooms and anticipate use of the building by nonprofit organizations. The project will meet all applicable plans to include policies addressing open space and the waterfront. The view platform will consist of 2,300 square feet and pedestrians can walk onto the platform, and an ADA lift provides access to the shoreline. The parcel consists of .72 acres.

STEVE ROBERT, PND Engineers, appeared and testified that the project consists of three major components: the park, the Ancich Pier, and the Jerkovich Pier. Other portions of the project include road and stormwater improvements and mitigation for culverts. The site is small and complicated. A considerable, 23 foot topographic difference exists between the road and the ordinary high watermark. However, the grade allows construction of the building below the road. A failing timber bulkhead extends across the shoreline, and the failure allowed the creation of a wetland behind the said bulkhead. A wetland also exists adjacent to Harborview Drive. The wetlands and buffer impact about 25 percent of the site. A variance is required to use the site. The retaining wall along the road is not adequate. The pier beneath the net shed is in poor condition. They will rehabilitate the shed and retain as much of the original material as possible while still meeting applicable codes. They will utilize a 30 year design criteria. The present bulkhead structure is at the high tide level. They wanted to involve the community as much as possible, and along with the architect came up with the strategies for development. They will provide a vegetative buffer along the shoreline. They held an open house on May 16, 2016, and considered two, alternative concepts. The public voted on the concepts, and they tried to find a middle ground for the two opposing views. Their proposal is for a 3,000 square foot building beneath the road grade, and driveway access to both piers. An ADA ramp could not be constructed due to the grade, and so they provided a lift. They will install a retaining wall to support the road and a new bulkhead. They will provide a support bulkhead around the piers and a smaller bulkhead along the balance of the shoreline. The plaza will include green spaces and a hard surface, and they will also provide a boat loading, parking stall. They will include a rain garden that a timber pedestrian bridge will cross. The Council wanted to push the building toward the road and away from the shoreline. The front of the building will have three large doors to accommodate boats. The DRB carefully considered and reviewed the façade. They also reviewed the light pole and power pole locations. The light pole will be replaced by onsite lighting. The utility poles will be relocated to the property lines, one at each end of the property line. They need to expand the footprint of the pier around the net shed for vehicles. They will utilize steel grating and Douglas fir. They will locate a crane on the east side of the pier for use by the fishing fleet and will provide power to the shed. They will use the original material as much as possible and will waterproof the building. They will use the original windows now boarded up. A door on the upland side of the shed will provide through access. The DAHP will approve the design. Concerning the Jerkovich Pier, they will reduce the footprint of the pier and will provide a vehicle turn-around and pedestrian access. They will also have a 30 year design so that they will need no retrofit for the pilings. They will install pole lights on the piers and lights within the railings as well. The turn-around accommodates only the Jerkovich family. They will widen the Harborview sidewalk to eight feet as it extends to the Eddon Boat Park. They will provide two, eight foot, parking lanes, and will need to excavate significantly to place the storage building under the sidewalk.

MS. KNUTSON reappeared and testified that parking is an important mitigation, and the project also promotes walkability. The expansion of the sidewalk will allow much better pedestrian access.

MR. ROBERT reappeared and testified that the outfall improvements will address the erosion of the beach at the Eddon Boat Park. They will provide a rock splash facility at the outfall and will place gravel and woody debris on the beach.

NICOLE WHITE appeared and testified that the woody debris will also provide habitat.

MR. KATICH reappeared and testified that the mitigation for the outfall is a different project and not part of the present application.

KAREN McDONELL appeared in opposition and testified that she grew up across the street from the project. She comes from a commercial fishing family and noted that the Waterfront Millville zone is restrictive in the development it allows. Here, proposing a recreational center in a residential neighborhood is not appropriate. The City proposes a recreational center, not a net shed or other fishing facilities. A kayak club will move into the facility and will run a camp six days a week, and members will train six days a week. There will be a dynamic use of site. Also, young people will carry kayaks down a long corridor and will cross the Jerkovich Pier. The parking spot on the Jerkovich Pier will be lost. It will serve as a turn-around for boaters. Vehicles utilizing the turn-around will have conflicts with kayakers, and it will create a dangerous situation. The fishing boats are gone for substantial periods of time and fishermen need to haul gear to their boats. She objects to the design of the building as it looks modern. It consists of a cement box on a cement slab and is not in keeping with the waterfront. It could look much more historic. She questioned the MDNS as it does not address improvements to the Ancich Pier that includes removal of an asphalt surface. What impact will removal have on the environment? The storage building should not be used as a recreational center, and should be used primarily for storage. The plans show no facilities for launching kayaks.

LITA DAWN STANTON appeared and testified that she supports improvement of views and the additional use of the shoreline, but opposes the size of the building. It is too big for the Waterfront Millville area, and the voting was mainly by children attending the meeting with their parents. A majority of residents in the area opposed the plan. The building will help a water sports club in an area of permanent, public open space. The boat storage is supposed to be for the public benefit and not for a private club. The parking space sizes are inadequate. Shoreline Master Plan setbacks intrude into the site, but even so, the building got larger. She is opposed to the project without use limits. The project should not go forward without knowing of the tenants.

MARY ELLEN GILMOUR appeared and testified that the City was great in working with them. She has concerns regarding the turn-around, as the easement mentions a truck and trailer. They will need a larger area to handle such a large vehicle.

MR. KATICH reappeared and referred to the site plan and its provision of adequate off-street loading. He has never seen a permit proposed that provides such vision of the shoreline and the opportunities for marine activities. Such furthers the intent of the WM

zone.

The Examiner then left the record open until the close of business on March 17, 2017, for receipt of an additional condition regarding future tenants of the building. Mr. Katich submitted the proposed condition by email dated March 16, 2017. No one spoke further in this matter and the Hearing Examiner took the matter under advisement. The hearing was concluded at 2:30 p.m.

NOTE: A complete record of this hearing is available in the office of the City of Gig Harbor Planning Department.

FINDINGS, CONCLUSIONS, AND DECISION:

FINDINGS:

1. The Hearing Examiner has admitted documentary evidence into the record, heard testimony, and taken this matter under advisement.
2. Pursuant to Chapter 197-11 of the Washington Administrative Code (WAC) and GHMC Chapter 18.04, on December 22, 2016, the City of Gig Harbor issued a Mitigated Determination of Non-significance (MDNS) for the proposed action following review pursuant to the State Environmental Policy Act (SEPA). The appeal period for the MDNS expired on January 12, 2017, and no appeals were filed. The MDNS is attached to the Staff Report as Exhibit "C."
3. Notice of application was provided twice for the project; first on September 22, 2016 and again on October 27, 2016 (File #'s SCUP-16-0002 & ALP-16-0004 only). Letters dated September 28 and December 28, 2016 from the Washington Department of Natural Resources (DNR) were received by the city and are attached to the staff report as Exhibit "G." The legal notice of the proposed action and scheduled hearing was published in the Peninsula Gateway on March 2, 2017. In addition, notice was mailed to all property owners within 300 feet of the subject site on March 2, 2017. Notice was also posted on the subject site on March 2, 2017. The certification of public notice for the hearing and the certification of Notice of Application for the request are attached to the staff report as Exhibit "I."
4. The City of Gig Harbor Parks Project Administrator, Katrina Knutson, on behalf of the City of Gig Harbor Public Works Department (applicant) proposes to develop an unimproved, .72 acre parcel of property owned by the City of Gig Harbor into a waterfront park. The irregularly shaped parcel abuts Harborview Drive on the south and extends to Gig Harbor Bay on the north. The parcel is framed by the Ancich Pier and net shed on the west and the Jerkovich Pier on the east. To accomplish the improvements the applicant must obtain the following approvals:

Site Plan Review (SPR),
Shoreline Substantial Development Permit (SDP),
Shoreline Variance (SVAR),
Shoreline Conditional Use Permit (SCUP),
Design Review (DR), and
Alternative Landscape Plan (ALP).

5. The City previously approved the site for development with the Rainer Yacht Harbor that included a 25 slip marina for moorage of recreational vessels, two single-family residential dwellings with two parking garages, replacement of a bulkhead, and removal of a portion of an overwater pier. The project was never commenced and the City acquired the parcel in 2012. In 2013 the City began to explore methods of developing the site into a public park. The City provided significant opportunities for public involvement on the proposed design. In addition, the City Design Review Board (DRB) conducted three public meetings to consider the design of the proposed boat storage building and restoration of the historic Ancich Net Shed located on the Ancich Pier. City and DRB efforts resulted in the present proposal.
6. The applicant proposes numerous improvements to the site both waterward and landward of the ordinary high watermark as shown on Exhibit B to the Staff Report and the power point presentation. In addition, the project is completely described in the attachments to the SEPA MDNS (Exhibit C).
7. Major facets of the upland improvements to the site include a new, one-story, 3,000 square foot, single level, storage building that will extend from beneath the sidewalk adjacent to Harborview Drive a distance of approximately 45 feet waterward. The front, external wall will consist of large doors that will allow convenient storage access for kayaks and other non-motorized vessels. The roof of the building will include a flat, 2,300 square foot, viewing platform that will have ADA access, landscaped areas, benches, and picnic tables. A "grand staircase" descends along the west side of said structure from Harborview Drive to a lower patio that extends across the width of the parcel and includes picnic tables. Stairs and a pathway extend from the center of the lower patio to the bulkhead, and recessed stairs therein provide access to the beach. A landscape area extends across the full width of the parcel between the two piers. Two parking spaces designated for "loading" are provided onsite (one for each pier) as well as one loading/parking space on Harborview Drive for the boat storage facility and a second space for handicapped usage. The applicant proposes to repave the driveway access to the Jerkovich Pier and provide a vehicle turn-around immediately waterward of the bulkhead. A new, widened sidewalk will extend from the proposed park along the north side of Harborview Drive to the Eddon Boat Park. The boat storage building will also provide public restroom facilities. The above described improvements will also require the filling of two, onsite wetlands.

8. Waterward improvements include the demolition, reconstruction, and expansion of the Ancich Pier, restoration and improvement of the Ancich Net Shed, and restoration of the Jerkovich Pier. Furthermore, the applicant will improve one, existing, stormwater outfall off-site on property located to the north of Eddon Boat Park, but such improvements will be separately considered. The plans also show replacement of a failing bulkhead that extends across the entire shoreline.
9. The parcel is located within the "Waterfront" designation of the City of Gig Harbor Comprehensive Plan and the "Waterfront Millville" (WM) zone classification of the Gig Harbor Municipal Code (GHMC). The site is also located within the Historic Working Waterfront Shoreline Environment of the City of Gig Harbor Shoreline Master Program (SMP). The parcel is also covered by an Historic District Overlay. Zoning on the north side of Harborview Drive is limited to WM, and improvements include a single-family residential dwelling and boat moorage/marina. Parcels to the south of Harborview Drive are located in the Single-Family Residential (R-1) and improved with single-family residential homes. Gig Harbor Bay is to the north.
10. The proposed use of the site is consist with applicable goals and policies of the Comprehensive Plan as set forth and analyzed by staff on pages 8-14 of the Staff Report. The Examiner hereby accepts staff's analysis as his own and incorporates by this reference all of staff's analysis of applicable Comprehensive Plan goals and policies as if set forth in full.
11. The parcel is located within the WM zone classification of the GHMC. Section 17.14.010 GHMC sets forth a Land Use Matrix that authorizes "Public Parks" within the WM classification as an outright permitted use. The project satisfies all development standards for the WM zone set forth in GHMC 17.48.040. The parcel exceeds 15,000 square feet in size and 100 feet in width; the maximum hard surface coverage will not exceed 70 percent; and the maximum gross floor area of the proposed storage structure will not exceed 3,500 square feet. All improvements on the site will satisfy the 18 foot height limit as allowed by the Historic Overlay District. The park also satisfies the intent of the WM classification set forth in GHMC 17.48.010 as it contributes to the wide range of uses and activities contemplated for the Gig Harbor shoreline between Rosedale Street and Stinson Avenue. The intent of the WM classification also includes enhancement of the historic fishing village atmosphere in a manner harmonious with surrounding residential areas. In the present case the park proposes improvements to two, commercial, fishing piers and restoration of an historic net shed.
12. The proposed park satisfies all "performance standards" set forth in GHMC 17.48.090 as all exterior mechanical devices are screened, and the project includes a significant, landscaped area. The project proposes no outdoor storage of materials as all boats will be stored within the enclosed building. Design review will ensure that the outdoor lighting meets the standards set forth in GHMC 17.99.350 and 460. The project significantly improves water view opportunities by providing a

plaza on top of the boat storage structure and a second plaza below such structure. The project also provides pedestrian access to the beach. The parcel extends significantly more than 20 frontage feet along Harborview Drive (20 percent of the total waterfront frontage of the parcel). A minimum, five foot wide, public stairway and ADA compliant lift provide access to the lower patio. The viewing platform is substantially greater than the minimum required 50 square feet. Trash receptacles will be screened from view and no restaurants are proposed.

13. Section 17.48.050 GHMC requires all proposed uses and development within the WM classification to obtain site plan review approval in accordance with Chapter 17.96 GHMC. To obtain such approval the applicant must show that the proposed site plan is compatible with surrounding uses, and that it complies with all relevant, statutory code regulations and ordinances. The applicant's proposal for the site is substantially less intense than the previously approved 25 slip marina and two single-family dwellings with parking garages. Furthermore, the previous approval did not include either restoration of an historic net shed or improvement of two commercial fishing piers. The present proposal of a public park benefits the entire City and is compatible with adjoining uses that include moorage piers and upland improvements.
14. The project also complies with all relevant, statutory codes, regulations, and ordinances with the exception of landscaping requirements. The applicant has proposed an alternative landscaping plan that meets all requirements for such as found hereinafter. The City conducted a thorough review of the off street parking requirements set forth in Chapter 17.72 GHMC. The applicant demonstrated that the 47 on street parking stalls located within 500 feet of the site along Harborview Drive, Stinson Avenue, and Novak Street will provide adequate parking to serve the park. The City traffic engineer supports use of on street parking in an attachment to the MDNS. As previously found, no appeals of the MDNS were submitted. The City appropriately utilized the mini-storage facility use parking requirements to determine the number of parking spaces needed by the boat storage building.
15. The applicant requests approval of an ALP that will modify two of the landscape requirements set forth in GHMC 17.78.070 as follows:
 - A. Section 17.78.070(A)(2) GHMC requires that a minimum of 40 percent of all required plantings be evergreen trees a minimum of six feet in height. The applicant correctly asserts that evergreen trees will significantly obstruct views to Gig Harbor Bay. As an alternative, the ALP proposes a substantial number of low growing plants that will maintain views of Gig Harbor Bay.
 - B. Section 17.78.070(C)(1) GHMC provides that where no front yard setback is required or where buildings are constructed to the property line, an applicant must provide either street trees at an interval of one every 20 feet, or planter boxes at the same interval. Again, the applicant correctly asserts that street

trees will impede views of Gig Harbor Bay. The ALP proposes a street level, rooftop plaza with lawn and low growing plants that will maintain views of the water. Therefore, the applicant has shown that the proposed ALP obtains a superior result than following the landscaping requirements of the GHMC in accordance with GHMC 17.78.100(A). The proposed landscaping also provides water view opportunities in accordance with GHMC 17.78.100(D).

16. Prior to obtaining a shoreline substantial development permit the applicant must show that the project is consistent with the goals and policies of the SMP. Pages 17-24 of the Staff Report set forth applicable goals and policies of the SMP and staff's analysis thereof. Said goals and policies as well as staff's analysis are hereby adopted by this reference as if fully set forth herein. The applicant has therefore satisfied all criteria for a substantial development permit.
17. The applicant requests a shoreline variance to eliminate two wetlands and their buffers in order to develop the project. A Category II Estuarine Wetland (Wetland 1) is located behind the failed bulkhead and extends in a linear manner between the bulkhead and the mainland. Wetland 2 consists of a 1,810 square foot, Category IV Palustrine Emergent Wetland that is located adjacent to Harborview Drive. Both wetlands and buffers are degraded and consist of mowed lawn and invasive plant species. The applicant proposes mitigation for the loss of the wetlands and buffers by removing 189 creosote pilings and 67 cubic yards of fill from the shoreline. In addition, the applicant proposes 4,000 square feet of vegetation within the shoreline buffer to include native grasses, shrubs, and trees. Such will increase water quality and provide habitat. The applicant will also restore and enhance one, existing outfall located to the north of the project site below the ordinary high watermark in an eroding shoreline. The applicant will recontour the outfall, and possibly install large, woody debris. The mitigation measures will provide a net benefit to shoreline ecological functions.
18. Prior to obtaining a shoreline variance the applicant must show that the request satisfies the criteria set forth in SMP Section 8.2.5. Findings on each criterion are hereby made as follows:
 - 8.2.5(E)(1) In the present case failure to grant the shoreline variance would thwart policies of the State Shoreline Management Act (SMA) that strongly encourage public views of and access to the shoreline. In addition, the applicant must show that extraordinary circumstances exist and that the public interest will suffer no substantial detrimental effect. The applicant has made such showings as the intent of the project is to create a waterfront park that will provide both views of and access to Gig Harbor Bay. The project includes non-motorized boat storage for those wishing to utilize Gig Harbor Bay and other shoreline areas. The project also promotes the public interest by supporting the Gig Harbor commercial fishing fleet and restoring a commercial fishing net shed. As previously found, development of the park is

consistent with the City's Comprehensive Plan and with the goals and policies of the SMP. Without the variance, the two, low value wetlands and buffers will prevent development of the public park.

8.2.5(E)(2)(a) Strict application of the bulk, dimensional, or performance standards (the wetland and buffer requirements) precludes all reasonable use of the property not otherwise prohibited. Retention of the wetlands and buffers precludes all reasonable use of this publicly owned, waterfront parcel to include a public park.

(2)(b) The hardship described above (wetlands and buffers) are specifically related to the property and the result of unique conditions such as natural features and the requirements of the SMP, and not from deed restrictions or the applicant's own actions. In the present case the hardship consists of the existence of two, low value wetlands and buffers.

(2)(c) Design of the project is compatible with other authorized uses within the area and uses planned for the area under both the Comprehensive Plan and the SMP. Furthermore, the project will not cause adverse impacts to the shoreline environment. As previously found the project is compatible with applicable goals and policies of both the Comprehensive Plan and SMP, and implementation of the mitigating measures will result in a net benefit to the shoreline environment.

(2)(d) The variance will not constitute a grant of special privilege not enjoyed by other properties in the area. The applicant proposes a significant, public benefit, namely, a waterfront park.

(2)(e) The variance is the minimum necessary to afford relief. The project may not proceed without approval of the entire variance request (elimination of the wetlands and buffers).

(2)(f) For the reasons set forth above, the public interest will suffer no substantial, detrimental effect.

E(3)(c) The project will not affect public rights of navigation or use of the shorelines. To the contrary, the project will ensure a greater use of the shoreline and Gig Harbor Bay by the public.

(E)(4) The project will not establish a precedent for future actions along the shoreline and therefore will create no adverse cumulative impacts due to additional requests for like actions. To the contrary, similar variances that would authorize a significant, public park amenity while promoting and furthering the City's historic commercial fishing fleet would benefit the City and the public.

(E)(5) The request proposes no variance from the use regulations of the SMP.

19. Pursuant to Table 7-1 in Subsection 1.1 of the SMP, the applicant must acquire a shoreline conditional use permit to provide hard armoring type bulkheads for a site within the Historic Working Waterfront Environment. Prior to obtaining such permit the applicant must show that the request satisfies the criteria set forth in Subsection 8.2.4 of the SMP. Findings on each criterion are hereby made as follows:
- A. The proposed bulkhead is consistent with the policies of RCW 90.58.020 (the SMA) and with the SMP. The applicant proposes to construct the new bulkhead landward of the existing bulkhead that has failed. Furthermore, a new, 25 foot wide, native vegetation buffer will extend the length of the bulkhead, and stairs through the bulkhead will provide access to the beach. Finally, as set forth hereinabove, the applicant proposes additional mitigation for the loss of the wetlands north of the Eddon Boat Park parcel.
 - B. The bulkhead will not interfere with normal public use of public shorelines. The public currently has no access to the shoreline from the site. The bulkhead will protect the upland area that the applicant will develop into a park and other water oriented uses. A recessed stairway through the bulkhead will provide a new access to the beach. Portions of the bulkhead will also serve as abutments to support the two, overwater piers located on the site. Thus, the bulkhead will enhance public use of the proposed park to include access to the water.
 - C. The proposed bulkhead is compatible with other authorized uses within the area and with uses planned for the area pursuant to the Comprehensive Plan and SMP as found above.
 - D. The bulkhead will cause no significant adverse impacts to the shoreline environment. The applicant prepared a Critical Areas Report and Biological Evaluation that address impacts to the shoreline environment to include ecological functions. The conceptual mitigation plan represents a net overall benefit to the shoreline environment.
 - E. Construction of the bulkhead will benefit the public interest, and therefore the public will suffer no substantial detrimental effect.
 - F. The final criterion requires consideration of cumulative impacts of additional requests for like actions in the area. In the present case, if additional public parks were proposed and needed a bulkhead for protection of park amenities, such would benefit the overall use of the shoreline and provide additional public access to the water.

20. The City of Gig Harbor Design Review Board (DRB) considered the 3,000 square foot storage building and related Ancich Park improvements to include the historic net shed. The DRB conducted public meetings on October 13, November 3, and December 8, 2016, and issued a recommendation to approve the project on January 17, 2017. The Examiner hereby adopts the DRB recommendation by this reference as if set forth in full.
21. Residents wrote letters and testified of concerns regarding the size of the storage building, believing it too large and disproportionate to the public park area. Residents also expressed disagreement with the design of the doors on the building; skewing of the voting results by having children vote; determining parking and other impacts prior to knowing the tenants; disagreement with the DRBs recommendation that did not include softening lines of the building, placing white trim around the windows, using light colored concrete on the plazas, and other design/architectural items; and that the park will become a "recreational center" in a residential neighborhood. As previously found the DRB held three public meetings to consider various development ideas, the design and size of the new storage facility, and the net shed restoration. It is assumed that those disagreeing with the DRBs recommendation spoke at the meetings and members considered their concerns. The Examiner finds the DRB's recommendation and reasons therefor very convincing and has adopted them as his own. While not everyone agrees with the DRB's recommendations, they are well-founded and appropriate. Furthermore, the 3,000 square foot building will also include restroom facilities, and the doors will face the net shed and the commercial fishing piers, and will be consistent with said uses. Concerning the appropriateness of the project at its proposed location, the WM zone classification authorizes public parks as an outright permitted use. A condition of approval requires review and approval of tenant leases by the Planning Director prior to execution.

CONCLUSIONS:

1. The Hearing Examiner has jurisdiction to consider and decide the issues presented by this request.
2. The applicant has shown that the request for approval of site plan review, design review, an alternative landscape plan, shoreline substantial development permit, shoreline conditional use permit, and shoreline variance satisfy all criteria set forth in the GHMC and SMP and therefore should be approved subject to the following conditions:
 1. The applicant shall develop the site consistent with the permit recommendations and plans previously approved by the city's DRB which are set forth in Exhibits "B" and "D" to this report.

2. Prior to commencing any development activity waterward of the site's Mean Higher High Water or Ordinary High Water Marks, the applicant shall obtain all necessary permit approvals from the Washington Department of Fish & Wildlife and the U.S. Army Corps of Engineers.

Mitigation Measures-Mitigated Determination of Nonsignificance-File No. SEPA-16-0014:

The applicant shall comply with all mitigation measures set forth in the SEPA MDNS issued for the project, including the following:

3. The applicant shall comply with all representations and mitigation measures set forth in its Critical Area Study dated July 21, 2016, including the Conceptual Mitigation Plan (see Exhibit "C").
4. The applicant shall comply with all requirements set forth in the Public Works Department, Engineering Division memorandum dated December 12, 2016, from Emily Appleton, P.E., Senior Engineer.
5. Once the tenants have been identified for the storage building and the terms of the associated leases finalized, the applicant shall submit to the Planning Director the lease(s) for review. The Director shall then determine if the approved site plan adequately provides for parking to serve the storage building and if additional site plan review is required.
6. The decision set forth herein is based upon representations made and exhibits, including plans and proposals submitted at the hearing conducted by the hearing examiner. Any substantial change(s) or deviation(s) in such plans, proposals, or conditions of approval imposed shall be subject to the approval of the hearing examiner and may require further and additional hearings.
7. The authorization granted herein is subject to all applicable federal, state, and local laws, regulations, and ordinances. Compliance with such laws, regulations, and ordinances is a condition precedent to the approvals granted and is a continuing requirement of such approvals. By accepting this/these approvals, the applicant represents that the development and activities allowed will comply with such laws, regulations, and ordinances. If, during the term of the approval granted, the development and activities permitted do not comply with such laws, regulations, or ordinances, the applicant agrees to promptly bring such development or activities into compliance.

DECISION:

The request for site plan review approval, a shoreline substantial development permit, shoreline variance, shoreline conditional use permit, design review, and alternative landscape plan for the Ancich Park and Net Shed improvements at a site located at 3525 Harborview Drive, is hereby granted subject to the conditions contained in the conclusions above.

ORDERED this 4th day of April, 2017.



STEPHEN K. CAUSSEAU, JR.
Hearing Examiner

TRANSMITTED this 4th day of April, 2017, to the following:

APPLICANT: City of Gig Harbor Public Works Department
Attn: Katrina Knutson, Parks Project Administrator
3510 Grandview Street
Gig Harbor, WA 98335

OWNER: City of Gig Harbor
3510 Grandview Street
Gig Harbor, WA 98335

AGENT: PND Engineers, Inc.
Attn: Steven Robert
1736 Fourth Avenue South
Seattle, WA 98134

OTHERS:

Karen Bujacich McDonell
3607 Ross Avenue
Gig Harbor, WA 98332

K.M. McDonel
14410 Sherman Drive N.W.
Gig Harbor, WA 98332

Dawn Stanton
1722 Sullivan Drive N.W.
Gig Harbor, WA

Mary Ellen Gilmour
3107 North 22nd Street
Tacoma, WA

Peter Ivanovich pivan@northwestern.edu

CITY OF GIG HARBOR

Duration of Permit Approval:

The shoreline substantial development permit, shoreline variances and shoreline conditional use permit addressed by this decision shall expire two (2) years from the effective date of the decision, unless construction activities commence or, if no construction is proposed, the use or activity is commenced. If substantial progress is made within two years, the permit shall remain valid for five (5) years. If construction is not completed within 5 years, the administrator may grant an extension of time up to but not exceeding one (1) year for substantial progress and for completion of the project pursuant to section 4.08 E of the Gig Harbor Shoreline Master Program and WAC 173-27-090. The remaining land use permits addressed by this decision, shall expire three (3) years from the date of the decision, unless a complete application for subsequent building permit or civil permit has been submitted and remained active, pursuant to GHMC 19.02.008. Upon written request by the property owner, prior to the date of land use permit expiration, the director may grant an extension of time up to but not exceeding one (1) year pursuant to GHMC 19.02.008(F). See GHMC 19.02.008 for complete regulations on the duration of permit approvals and expiration of permits.

Availability of Complete Project Permit File for Review:

The complete project permit file, including findings, conclusions and conditions of approval, if any, is available for review at the city of Gig Harbor Planning Department, 3510 Grandview Street, Gig Harbor, WA 98335. Please contact Peter Katich, Senior Planner, at 253-851-6170 should you desire to review the file.

Concerning Further Review

There is no administrative appeal of the hearing examiner's decision. A request for reconsideration may be filed according to the procedures set forth in Ordinance No. 1073. If a request for reconsideration is filed, this may affect the deadline for filing judicial appeal (Chapter 36.70c RCW) (see Ord. 1073, Ch. 36.70C RCW and RCW 90.58.180). Affected property owners may request a change in valuation for property tax purposes notwithstanding any program of revaluation.



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000

711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

Peter Katich, Senior Planer
City of Gig Harbor
Community Development Department
3510 Grandview St
Gig Harbor, WA 98335

2/6/2017

Re: Ancich Park Improvements and Netshed Restoration Project (PL-SEPA-16-0014)

Dear Mr. Katich,

Thank you for the opportunity to provide comments on the Ancich Park Improvement project. The property is located at 3658 Harborview Dr. The proposed project is located in an area that may have been contaminated with arsenic and lead due to the air emissions originating from the old Asarco Smelter in north Tacoma.

The applicant, City of Gig Harbor Public Works, proposed to improvements to the Ancich Park. Ecology recommended soil sampling at the Property. Ecology also recommended enrollment in the Voluntary Cleanup Program (VCP) with Ecology if lead, arsenic or other contaminants were found at concentrations above Model Toxics Control Act (MTCA) Method A cleanup levels.

The MTCA cleanup levels are:

- Average arsenic ≤ 20 milligrams per kilogram (mg/kg)
 - Average lead ≤ 250 mg/kg
- OR
- Maximum arsenic concentration is ≤ 40 mg/kg
 - Maximum lead concentration is ≤ 500 mg/kg

On 1/19/2017, PND Engineers, Inc. conducted soil sampling at the Property following the Tacoma Smelter Plume Model Remedies Guidance . They collected 14 soil samples at 11 locations (Figure 1). The soil sampling methodology consisted of collecting 11 samples from 0 to 6 inches below ground surface (bgs) and 3 samples from 6 to 12 inches bgs. Upon completion of soil and duff sampling, the samples were analyzed for arsenic and lead concentrations using Method EPA 6010C by SPECTRA Laboratories (summary of the sampling results are shown in Table 1).

Table 1. Summary of Sampling Results

Sample Type	Arsenic mg/kg (EPA 7010)			Lead mg/kg (EPA 7010)		
	Minimum	Maximum	Average	Minimum	Maximum	Average
Soil Depth 0-6"	5	5	5	58	175	103
Soil Depth 6-12"	5	5	5	84	102	95
MTCA Cleanup Levels		40	20		500	250

Numbers in **Bold** represent values above the MTCA cleanup levels

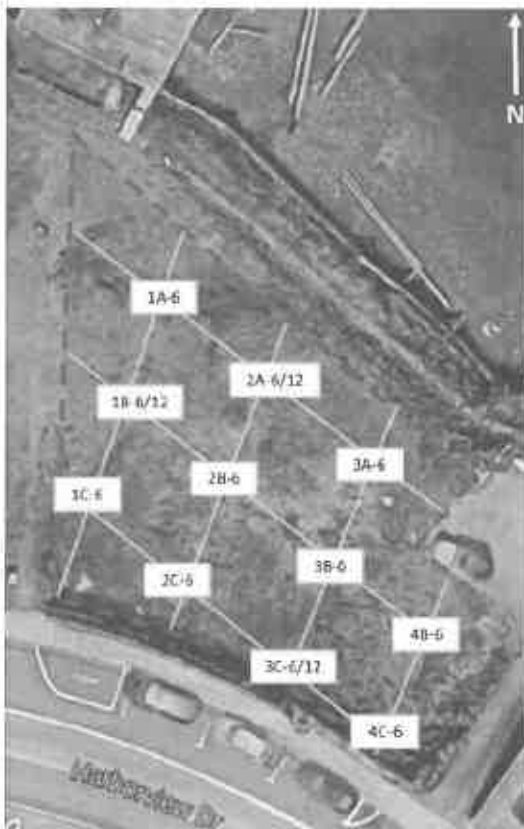


Figure 1. Sampling Locations

The average concentrations of arsenic and lead **were below** cleanup levels. No single sample exceeded 40 mg/kg for arsenic and 500 mg/kg for lead. Ecology expects that the grading and mixing of soil during Property development will result in further reduction of the concentration of arsenic.

Ecology does not recommend this Property enter the Voluntary Cleanup Program.

No remediation for Tacoma Smelter Plume contamination is needed for this project.

Please note, this not a "No Further Action" determination for the Property, since the property was never determined to have contamination warranting cleanup and never entered into the Voluntary Cleanup Program (VCP).

If you have any questions, please feel free to call me at 360-407-7094.

Best regards,

Eva Barber

Eva Barber
 Technical Assistance Coordinator
Toxics Cleanup Program, Southwest Regional Office
 Washington State Department of Ecology
 360-407-7094



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

**Ancich Waterfront Park
Community Paddler's Dock**

**PL-SDP-18-0003 et al
Hearing Examiner**

Exhibit E

April 22, 2021

Kimberly Mahoney, Associate Planner
City of Gig Harbor
Community Development Department
Planning Division
3510 Grandview Street
Gig Harbor, WA 98335

Dear Kimberly Mahoney:

Thank you for the opportunity to comment on the mitigated determination of nonsignificance for the Ancich Park Public Launch Floats Project (PL-SDP-18-0003, PL-SPR-18-0009, PL-DR-18-0179, PL-NCR-18-0007, PL-FLOOD-18-0002, PL-SEPA-18-0013) located at 3525 Harborview Drive as proposed by PND Engineers. The Department of Ecology (Ecology) reviewed the environmental checklist and information provided. Ecology's previous comments submitted January 7, 2019 on the prethreshold consultation, still apply to the project described (see enclosure). After further review, Ecology has the following additional comment(s):

SOLID WASTE MANAGEMENT: Derek Rockett (360) 407-6287

The applicant proposes to remove a structure(s) that contain treated wood. Please refer to Ecology's publication "Focus on Treated Wood Exclusion," available at: [Focus on Treated Wood](#), for suggested best management practices and disposal requirements for treated wood. All removed debris and dredged material resulting from this project must be disposed of at an approved site. Contact the local jurisdictional health department for proper management of these materials.

**WATER QUALITY/WATERSHED RESOURCES UNIT:
Jessica Eakens (360) 407-0246**

Erosion control measures must be in place prior to any clearing, grading, or construction. These control measures must be effective to prevent stormwater runoff from carrying soil and other pollutants into surface water or stormdrains that lead to waters of the state. Sand, silt, clay particles, and soil will damage aquatic habitat and are considered to be pollutants.

Any discharge of sediment-laden runoff or other pollutants to waters of the state is in violation of Chapter 90.48 RCW, Water Pollution Control, and WAC 173-201A, Water

Quality Standards for Surface Waters of the State of Washington, and is subject to enforcement action.

Construction Stormwater General Permit:

The following construction activities require coverage under the Construction Stormwater General Permit:

1. Clearing, grading and/or excavation that results in the disturbance of one or more acres **and** discharges stormwater to surface waters of the State; and
2. Clearing, grading and/or excavation on sites smaller than one acre that are part of a larger common plan of development or sale, if the common plan of development or sale will ultimately disturb one acre or more **and** discharge stormwater to surface waters of the State.
 - a) This includes forest practices (including, but not limited to, class IV conversions) that are part of a construction activity that will result in the disturbance of one or more acres, **and** discharge to surface waters of the State; and
3. Any size construction activity discharging stormwater to waters of the State that Ecology:
 - a) Determines to be a significant contributor of pollutants to waters of the State of Washington.
 - b) Reasonably expects to cause a violation of any water quality standard.

If there are known soil/ground water contaminants present on-site, additional information (including, but not limited to: temporary erosion and sediment control plans; stormwater pollution prevention plan; list of known contaminants with concentrations and depths found; a site map depicting the sample location(s); and additional studies/reports regarding contaminant(s)) will be required to be submitted. For additional information on contaminated construction sites, please contact Carol Serdar at Carol.Serdar@ecy.wa.gov, or by phone at (360) 742-9751.

Additionally, sites that discharge to segments of waterbodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, high pH, or phosphorous, or to waterbodies covered by a TMDL may need to meet additional sampling and record keeping requirements. See condition S8 of the Construction Stormwater General Permit for a description of these requirements. To see if your site discharges to a TMDL or 303(d)-listed waterbody, use Ecology's Water Quality Atlas at: <https://fortress.wa.gov/ecy/waterqualityatlas/StartPage.aspx>.

The applicant may apply online or obtain an application from Ecology's website at: <http://www.ecy.wa.gov/programs/wq/stormwater/construction/-Application>. Construction site operators must apply for a permit at least 60 days prior to discharging stormwater from construction activities and must submit it on or before the date of the first public notice.

Kimberly Mahoney

April 22, 2021

Page 3

Ecology's comments are based upon information provided by the lead agency. As such, they may not constitute an exhaustive list of the various authorizations that must be obtained or legal requirements that must be fulfilled in order to carry out the proposed action.

If you have any questions or would like to respond to these comments, please contact the appropriate reviewing staff listed above.

Department of Ecology
Southwest Regional Office

(GMP:202101811)

Enclosure

cc: Derek Rockett, SWM
Jessica Eakens, WQ



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300
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January 7, 2019

Peter Katich, Senior Planner
City of Gig Harbor
Community Development Department
Planning Division
3510 Grandview Street
Gig Harbor, WA 98335

Dear Peter Katich:

Thank you for the opportunity to comment on the prethreshold consultation for the Ancich Park Public Launch Floats Project (PL-SDP-18-0003, PL-SPR-18-0009, PL-DR-18-0179, PL-NCR-18-0007, PL-FLOOD-18-0002, PL-SEPA-18-0013) located at 3525 Harborview Drive as proposed by PND Engineers. The Department of Ecology (Ecology) reviewed the environmental checklist and has the following comment(s):

TOXICS CLEANUP: Eva Barber (360) 407-7094

This property is within a quarter mile of two contaminated Sites. The Sites are Brunette & KB Partnership, Facility Site ID (FSID) 7239 and Nikolich Property, FSID 20826. To search and access information concerning these Sites, see <http://www.ecy.wa.gov/fs/> and <https://fortress.wa.gov/ecy/gsp/SiteSearchPage.aspx>.

If contamination is suspected, discovered, or occurs during the proposed construction and installation of a new ADA accessible pier, testing of the potentially contaminated media must be conducted. If contamination of soil or groundwater is readily apparent, or is revealed by sampling, Ecology must be notified. Contact the Environmental Report Tracking System Coordinator at the Southwest Regional Office (SWRO) at (360) 407-6300. For assistance and information about subsequent cleanup and to identify the type of testing that will be required, contact Eva Barber with the SWRO, Toxics Cleanup Program at (360) 407-7094.

SOLID WASTE MANAGEMENT: Derek Rockett (360) 407-6287

All removed debris and dredged material resulting from this project must be disposed of at an approved site. Contact the local jurisdictional health department for proper management of these materials.

WATER QUALITY: Chris Montague-Breakwell (360) 407-6364

Erosion control measures must be in place prior to any clearing, grading, or construction. These control measures must be effective to prevent stormwater runoff from carrying soil and other pollutants into surface water or stormdrains that lead to waters of the state. Sand, silt, clay particles, and soil will damage aquatic habitat and are considered to be pollutants.

Any discharge of sediment-laden runoff or other pollutants to waters of the state is in violation of Chapter 90.48 RCW, Water Pollution Control, and WAC 173-201A, Water Quality Standards for Surface Waters of the State of Washington, and is subject to enforcement action.

The following construction activities require coverage under the Construction Stormwater General Permit:

1. Clearing, grading and/or excavation that results in the disturbance of one or more acres **and** discharges stormwater to surface waters of the State; and
2. Clearing, grading and/or excavation on sites smaller than one acre that are part of a larger common plan of development or sale, if the common plan of development or sale will ultimately disturb one acre or more **and** discharge stormwater to surface waters of the State.
 - a) This includes forest practices (including, but not limited to, class IV conversions) that are part of a construction activity that will result in the disturbance of one or more acres, **and** discharge to surface waters of the State; and
3. Any size construction activity discharging stormwater to waters of the State that Ecology:
 - a) Determines to be a significant contributor of pollutants to waters of the State of Washington.
 - b) Reasonably expects to cause a violation of any water quality standard.

If there are known soil/ground water contaminants present on-site, additional information (including, but not limited to: temporary erosion and sediment control plans; stormwater pollution prevention plan; list of known contaminants with concentrations and depths found; a site map depicting the sample location(s); and additional studies/reports regarding contaminant(s)) will be required to be submitted.

You may apply online or obtain an application from Ecology's website at: <http://www.ecy.wa.gov/programs/wq/stormwater/construction/> - [Application](#). Construction site operators must apply for a permit at least 60 days prior to discharging stormwater from construction activities and must submit it on or before the date of the first public notice.

Peter Katich, Senior Planner

January 7, 2019

Page 3

Ecology's comments are based upon information provided by the lead agency. As such, they may not constitute an exhaustive list of the various authorizations that must be obtained or legal requirements that must be fulfilled in order to carry out the proposed action.

If you have any questions or would like to respond to these comments, please contact the appropriate reviewing staff listed above.

Department of Ecology
Southwest Regional Office

(MLD:201806787)

cc: Eva Barber, TCP
Derek Rockett, SWM
Chris Montague-Breakwell, WQ
Nicole Foster, PND Engineers (Applicant)

City of Gig Harbor
Transmittal Form

Ancich Waterfront Park
Community Paddler's Dock

PL-SDP-18-0003 et al
Hearing Examiner

Exhibit F

Routing for: NOA SEPA **NOPH** NOPM NOD Notice Date: MA
Project: Ancich Park Public Launch Floats

PERMIT NO. PL-SDP-18-0003, PL-SPR-18-0009, PL-DR-18-0179, PL-NCR-18-0007, PL-FLOOD-18-0002 and PL-SEPA-18-0013

Planner:
KIMBERLY MAHONEY

Routed to: ☐ Public Works–Operations ☐ Building and Fire Safety
City Depts. ☐ Public Works–Engineering ☐ Other_____

SEPA Agencies: ☐ Washington Department of Ecology, SEPA Register
(NOA, SEPA) ☐ Washington Department of Commerce, attn: Review Team
Electronic Mail ☐ Pierce Transit Land Use Review, attn: Kelly Haden, Monica Adams
☐ Washington State Department of Fish & Wildlife, attn: SEPA Desk
☐ Washington State Department of Natural Resources, attn: SEPA Center
☐ Washington State DAHP, attn: Gretchen Kaehler
☐ Puyallup Tribe of Indians Historic Preservation, attn: Judy Wright
☐ Puyallup Tribe Cultural Resources, attn: Brandon Reynon/Jeffrey Thomas
☐ PenMet Parks, attn: Elaine Sorenson
☐ Pierce County Fire District Number 5, attn: Eric Watson/Eric Waters
☐ Suquamish Tribe, attn: Dennis Lewarch
☐ Peninsula School District, attn: Vicki Smith
☐ Pierce County Planning and Land Services
☐ Washington State Department of Transportation, attn: Dale Severson / SEPA Reviews
☐ Squaxin Island Tribe, attn: Rhonda Foster
☐ Muckleshoot Tribe, attn: Laura Murphy
☐ Washington Department of Corrections, attn: Eric Heinitz
☐ Puget Sound Partnership, attn: Marsha Engel

Other Parties: ☒ Applicant/Owner/Agent (NOA, **NOPH**, NOPM, SEPA, NOD)
1st Class Mail ☐ DRB (NOA for Non-residential, Multi-family, Subdivisions, Public Projects)
☐ Parks Commission via Terri Reed (NOA)
☒ **Property Owners within 300 feet of site: attached list (NOA, SEPA, **NOPH**, NOPM, NOD for Type II permits only)**
☐ Parties of Record: attached list (NOPH, NOPM, NOD)
☐ Pierce County (NOA for Plats adjacent to City Limits)
☐ Pierce County Assessor-Treasurer (NOD)
☐ WA Transportation Secretary (NOA for Plats adj. to State ROW, or within 2 miles of Airport—approximately any plats south of Pioneer/Wollochet

interchange)

☐ TACOMA NEWS TRIBUNE

CERTIFICATION OF PUBLIC NOTICE

=====

DECLARATION OF MAILING

I, **Cindy Andrews** (printed name), declare under penalty of perjury under the laws of the State of Washington and the United States of America that the foregoing is true and correct to the best of my knowledge:

On **MAY 6, 2021** I mailed **(e-mailed)** a true and correct copy of the **NOTICE OF PUBLIC HEARING**

Project Name **ANCICH PARK PUBLIC LAUNCH FLOATS**

Project Location 3525 HARBORVIEW DR

Permit Number(s): PL-SDP-18-0003, PL-SPR-18-0009, PL-DR-18-0179, PL-NCR-18-0007, PL-FLOOD-18-0002 and PL-SEPA-18-0013

to the individuals/agencies identified on the attached transmittal form by United States Postal Service, inter-office routing, or electronic mail, as specified on the attached.

SIGNED at Gig Harbor, Washington, this 6th day of May 2021

Cindy Andrews

DECLARANT (signature)



"THE MARITIME CITY"

CITY OF GIG HARBOR NOTICE OF PUBLIC HEARING

ANCICH PARK PUBLIC LAUNCH FLOATS

Permit Number(s): PL-SDP-18-0003, PL-SPR-18-0009, PL-DR-18-0179, PL-NCR-18-0007, PL-FLOOD-18-0002, PL-SEPA-18-0013

Date of Notice: May 6, 2021

Applicant: City of Gig Harbor Public Works Department, 3510 Grandview Street, Gig Harbor, WA 98335

Agent: Davido Consulting Group, Inc., c/o Nicole Foster, 9706 4th Ave NE #300, Seattle, WA 98115

Project Location: 3525 Harborview Drive, Gig Harbor, WA (Assessor's Parcel No. 5970000244). The site is located on the northeasterly side of Harborview Drive, approximately 250 feet northwest of the intersection of Harborview Drive and Novak Street. Section 05 Township 21 Range 02 Quarter 33.

Project Description: The proposal is for the redevelopment of the subject site through demolition of an existing dock system and installation of a replacement dock. The proposed action will consist of removing the existing gangway, floats, one (1) finger float, and fourteen (14) 16-inch diameter creosote-treated timber piles. A total of 1,096 square feet of overwater coverage is proposed for demolition. Pile removal will be completed from a barge in the harbor using a vibratory hammer. All other structures will be removed from the site without the need for heavy equipment.

The existing 1,096 square foot dock system, constructed almost entirely of solid decking, will be redeveloped with a 1,614 square foot dock constructed of grated decking creating a net 45% open area. The proposed development will result in a net increase of 518 square feet of overwater coverage. Five (5) steel guide piles will be driven to keep the floating dock in place. Piles will be driven with a vibratory hammer as far as possible. They will then be driven to final depth with an impact hammer. 24 grounding posts will be installed beneath the corners of the specified float modules ensuring that they do not ground onto the seabed at low tides. Grounding posts will be installed by driving short segments of 12-inch diameter steel pipe with a vibratory hammer. Grounding posts will be proofed with an impact hammer to verify bearing capacity. Pre-cast panels, beams and top plates will be welded or bolted onto the pile foundations to construct the new overwater dock system. Float modules will be fabricated offsite and delivered to the site via barge. The floats will be attached to the guide piles over the grounding posts at high tide. External pile hoops will bolt to the float modules. An 80-foot long gangway will

be fabricated off-site, delivered via barge and lifted into position, connecting the fixed pier to the floating dock. Gangway connections will be installed without the need for heavy equipment.

SEPA Threshold Mitigated Determination of Nonsignificance (MDNS) was issued on April 8, 2021
Determination: under WAC 197-11-340(2)

PUBLIC Hearing Examiner, **May 20, 2021 at 1:30PM**, at Gig Harbor Civic Center,
HEARING DATE: Council Chambers, 3510 Grandview Street, Gig Harbor.

NOTE: This public hearing may be held in an online format subject to the latest public health recommendations.

Interested persons are invited to attend the public hearing and provide testimony on this proposal. The hearing will be conducted in the manner prescribed by Gig Harbor Municipal Code Chapter 19.05.

As of March 16, 2020, at 12 PM noon, our Civic Center will be closed to the general public until further notice. Therefore, documents pertinent to this application are available for review and inspection online only using the City of Gig Harbor Permit Portal. Please contact Kimberly Mahoney, Associate Planner, for questions regarding access to other documents pertinent to this application. A copy of the staff report on this proposal will be available at least seven days prior to the hearing. A copy of the application, all documents and evidence relied upon by the applicant, and applicable criteria are available for inspection at no cost; copies will be provided at the requestor's cost.

Interested persons may comment on the above stated application or may request a copy of the decision on this application. **Requests for notification, written comments, including any written comments addressing the findings required for a decision, must be submitted to the Planning Division no later than 12:00 pm on May 20, 2021.**

Questions regarding the above stated application should be made to Kimberly Mahoney, Associate Planner, City of Gig Harbor Community Development Department, 3510 Grandview Street, Gig Harbor, WA 98335, or by calling 851-6170. Additional permit information can also be found at www.cityofgigharbor.net by clicking "[Permit Portal](#)" then clicking "Applications," entering "Hearing Examiner Hearing" and then selecting the Hearing date and clicking on "More Details".

TaxParcelNumber	TaxpayerName	Delivery_Address
Parcel: 0221053093	BUJACICH GEORGE P TTEE	3619 ROSS AVE
Parcel: 5973000020	BORIS WILLIAM O TTEE	3519 HARBORVIEW DR UNIT 2
Parcel: 5970000215	MULLAN LLC	PO BOX 7605
Parcel: 5973000030	GLEIN GARY A & LINDA D	3519 HARBORVIEW DR APT 3
Parcel: 5973000010	DOWD MICHAEL T & CHRISTINE A	3519 HARBORVIEW DR APT 1
Parcel: 5970000372	MUELLER RAND A	3514 HARBORVIEW DR
Parcel: 5973000050	MILLVILLE MARINA LLC	3519 HARBORVIEW DR
Parcel: 0221053083	FRANICH JAMES M	3702 HARBORVIEW DR
Parcel: 5970000263	KADZIK PAUL L & JANICE K	3518 HARBORVIEW DR
Parcel: 5973000020	BORIS WILLIAM O TTEE	3519 HARBORVIEW DR UNIT 2
Parcel: 0221053113	TARABOCHIA DOMINICK J JR & ANCICH LLC	8021 SHIRLEY AVE
Parcel: 0221053050	CITY OF GIG HARBOR	3510 GRANDVIEW ST
Parcel: 5970000301	ALLEN RICHARD B & ALLEN KRISTINE	3603 ROSS AVE
Parcel: 5973000030	GLEIN GARY A & LINDA D	3519 HARBORVIEW DR APT 3
Parcel: 0221053071	BUJACICH DOCK LLC	3607 ROSS AVE
Parcel: 5973000010	DOWD MICHAEL T & CHRISTINE A	3519 HARBORVIEW DR APT 1
Parcel: 5973000040	SMITH LELAND C & PETERSON PAMELA H	3519 HARBORVIEW DR UNIT 4
Parcel: 5973000010	DOWD MICHAEL T & CHRISTINE A	3519 HARBORVIEW DR APT 1
Parcel: 5970000230	BERG CAROLYN S	3526 HARBORVIEW DR
Parcel: 5970000310	MOORE JANE M & DENNIS D	3525 ROSS AVE
Parcel: 5973000060	UNKNOWN CONVERSION PARTY	UNKNOWN PARTY ADDRESS
Parcel: 0221053003	LEE JOHN J & HAN S	9167 NW KAISER RD
Parcel: 0221053058	VANBERG RICHARD L & JEAN C	3616 HARBORVIEW DR
Parcel: 0221053095	BUJACICH JACK D JR & BUJACICH PATRICIA R CO-TTEE	3607 ROSS AVE
Parcel: 5970000271	ALLEN RICHARD B & ALLEN KRISTINE	3603 ROSS AVE
Parcel: 5973000020	BORIS WILLIAM O TTEE	3519 HARBORVIEW DR UNIT 2
Parcel: 5970000180	IVANOVICH PETER D	222 E PEARSON ST APT 1701
Parcel: 0221053030	MALICH KENNETH A & BARBARA P	3515 ROSS AVE
Parcel: 5970000191	UNKNOWN CONVERSION PARTY	UNKNOWN PARTY ADDRESS
Parcel: 0221053051	FAIRWAY HOLDINGS LLC	PO BOX 99695
Parcel: 5973000030	GLEIN GARY A & LINDA D	3519 HARBORVIEW DR APT 3
Parcel: 5970000291	BERG CAROLYN S ET AL	3526 HARBORVIEW DR
Parcel: 5973000040	SMITH LELAND C & PETERSON PAMELA H	3519 HARBORVIEW DR UNIT 4
Parcel: 0221053092	BUJACICH JACK D JR & BUJACICH PATRICIA R CO-TTEE	3607 ROSS AVE
Parcel: 5970000244	CITY OF GIG HARBOR	3510 GRANDVIEW ST
Parcel: 5970000161	HARBOR CONDOMINIUM ASSOCIATION	5500 OLYMPIC DR STE H105
Parcel: 5973010010	UNKNOWN CONVERSION PARTY	UNKNOWN PARTY ADDRESS
Parcel: 0221053042	QUIGG PATRICK D & KATHLEEN A	1831 BEL AIRE AVE
Parcel: 0221053114	TARABOCHIA DOMINICK J JR & ANCICH LLC	8021 SHIRLEY AVE

City_State Zipcode

GIG HARBOR, WA 98332-1856

GIG HARBOR, WA 98332

TACOMA, WA 98417

GIG HARBOR, WA 98332-2183

GIG HARBOR, WA 98332

GIG HARBOR, WA 98332-2128

GIG HARBOR, WA 98332-2183

GIG HARBOR, WA 98332-2130

GIG HARBOR, WA 98332-2128

GIG HARBOR, WA 98332

GIG HARBOR, WA 98332

GIG HARBOR, WA 98335-1214

GIG HARBOR, WA 98332-1856

GIG HARBOR, WA 98332-2183

GIG HARBOR, WA 98332-1856

GIG HARBOR, WA 98332

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GIG HARBOR, WA 98332

GIG HARBOR, WA 98332-2128

GIG HARBOR, WA 98332-1845

UNKNOWN CITY, WA

PORTLAND, OR 97231-2731

GIG HARBOR, WA 98332-2129

GIG HARBOR, WA 98332-1856

GIG HARBOR, WA 98332-1856

GIG HARBOR, WA 98332

CHICAGO, IL 60611

GIG HARBOR, WA 98332-1845

UNKNOWN CITY, WA

LAKEWOOD, WA 98496-0695

GIG HARBOR, WA 98332-2183

GIG HARBOR, WA 98332-2128

GIG HARBOR, WA 98332

GIG HARBOR, WA 98332-1856

GIG HARBOR, WA 98335-1214

GIG HARBOR, WA 98335

UNKNOWN CITY, WA

ABERDEEN, WA 98520-1305

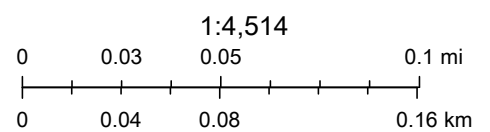
GIG HARBOR, WA 98332

ArcGIS Web Map



5/5/2021, 9:13:22 AM

 Parcels



Copyright 2021 HxIP., Maxar



**PLANNING DEPARTMENT
INTERESTED PARTIES**

Project Name: ANY PROJECT PERMIT ACTIVITY

Location: 3525 HARBORVIEW DR

Applicant:

Associated Permits:

Associated Notices: —

Parties:

NANCY JERKOVICH

nancyjerkovich@gmail.com

6828 93rd St Ct N.W.

Gig Harbor, WA 98332

NICK JERKOVICH JR.

3710 Harborview Dr.

Gig Harbor, WA 98332

CAROL MORRIS

carol@carolmorrislaw.com

MORRIS LAW, P.C.

carol_a_morris@msn.com

P.O. BOX 948

Parties:

Seabeck, WA 98380

Please refer to Gig Harbor Municipal Code (GHMC), Title 19, for any questions relative to the administration of the development code.

This list should not be considered an exhaustive list of all those parties who may be interested in this project. This list represents only those parties who have commented at some point during the permit project and/or who have explicitly requested that they are included in project related correspondence.

This list does not represent Parties of Record as defined in GHMC 19.06.003, however some may qualify as such.

RECEIVED

By C. ANDREWS at 1:59 pm, May 06, 2021

CERTIFICATION OF PUBLIC NOTICE

DECLARATION OF POSTING

I, Brandon Crosswhite (printed name), declare under penalty of perjury under the laws of the State of Washington and the United States of America that the foregoing is true and correct to the best of my knowledge:

On May 6th, 2021 I caused to be posted the notice board provided by the

City for the **NOTICE OF PUBLIC HEARING** on the following:

Project Name: **ANCICH PARK PUBLIC LAUNCH FLOATS**

Project Location **3525 HARBORVIEW DR**

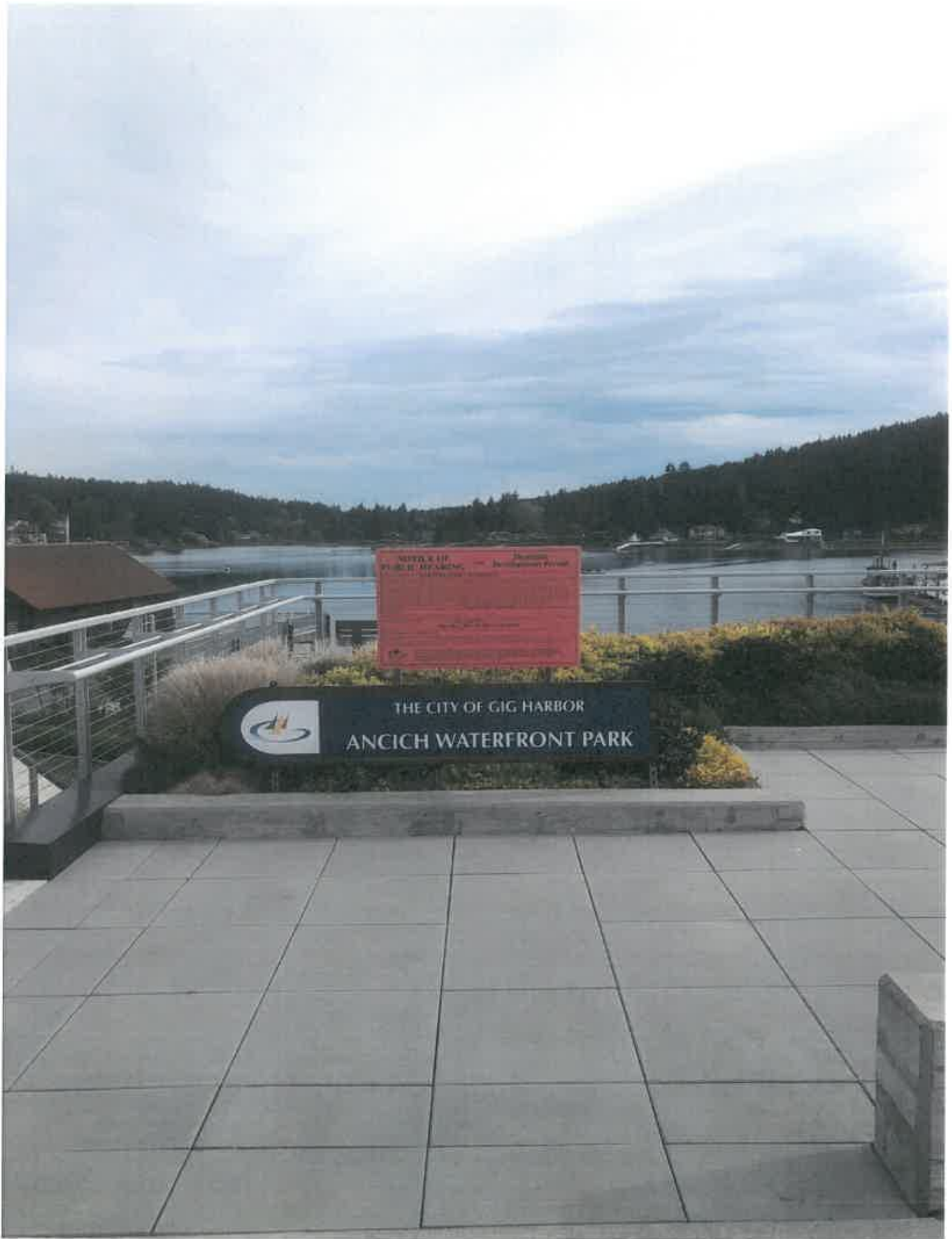
Permit Number(s): **PL-SDP-18-0003, PL-SPR-18-0009, PL-DR-18-0179, PL-NCR-18-0007, PL-FLOOD-18-0002, PL-SEPA-18-0013**

the locations indicated below meeting the requirements of GHMC 19.03.001(A).

- ☒ Sign located 5'-6' top at Ancich Park
- ☒ Sign is completely visible to pedestrians

SIGNED at Gig Harbor, Washington, this 6th day of May, 2021.


DECLARANT (signature)



NORTH K 117
PUBLIC MEETING
Development Permit

THE CITY OF GIG HARBOR
ANCICH WATERFRONT PARK

CERTIFICATION OF PUBLIC NOTICE

=====

DECLARATION OF PUBLISHING

I, Michelle Thomas (printed name), declare under penalty of perjury under the laws of the State of Washington and the United States of America that the foregoing is true and correct to the best of my knowledge:

On April 30, 2021 I sent a true and correct copy of the **NOTICE OF PUBLIC HEARING** for publication in the **May 6, 2021** edition of the Tacoma News Tribune for the following:

Project Name: **Ancich Park Public Launch Floats**

Project Location: **3525 Harborview Drive - Parcel No. 5970000244).**

Permit Number(s): **PL-SDP-18-0003, PL-SPR-18-0009, PL-DR-18-0179, PL-NCR-18-0007, PL-FLOOD-18-0002, PL-SEPA-18-0013**

SIGNED at Gig Harbor, Washington, this 30th day of April, 2021.

Michelle Thomas

DECLARANT (signature)

City of Gig Harbor Transmittal Form

Routing for: NOA SEPA **NOPH** NOPM NOD **Notice Date:** 05.06.2021
Project: Ancich Park Public Launch Floats **Planner:** Kim

Routed to: ☐ Public Works–Operations ☐ Building and Fire Safety
City Depts. ☐ Public Works–Engineering ☐ Other_____

SEPA Agencies: ☐ Washington Department of Ecology, SEPA Register
 (NOA, SEPA) ☐ Washington Department of Commerce
 Electronic Mail ☐ Pierce Transit Land Use Review
☐ Washington State Department of Fish & Wildlife
☐ Washington State Department of Natural Resources
☐ Washington State DAHP
☐ Puyallup Tribe of Indians Historic Preservation
☐ Puyallup Tribe Cultural Resources
☐ PenMet Parks
☐ Gig Harbor Fire & Medic One
☐ Suquamish Tribe
☐ Peninsula School District
☐ Pierce County Planning and Land Services
☐ Washington State Department of Transportation, attn: OR-SEPA-REVIEW
☐ Squaxin Island Tribe
☐ Muckleshoot Tribe
☐ Washington Department of Corrections
☐ Puget Sound Partnership
☐ Nisqually Tribe
☐ Peninsula Light Company

Other Parties: ☐ Applicant/Owner/Agent (NOA, NOPH, NOPM, SEPA, NOD)
 1st Class Mail ☐ DRB (NOA for Non-residential, Multi-family, Subdivisions, Public Projects)
☐ Parks Commission via Terri Reed (NOA)
☐ Property Owners within 300 feet of site: attached list (NOA, SEPA, NOPH, NOPM, NOD for Type II permits only)
☐ Parties of Record: attached list (NOPH, NOPM, NOD)
☐ Pierce County (NOA for Plats adjacent to City Limits)
☐ Pierce County Assessor-Treasurer (NOD)
☐ WA Transportation Secretary (NOA for Plats adj. to State ROW, or within 2 miles of Airport—approximately any plats south of Pioneer/Wollochet interchange)
☒ Other [Tacoma News Tribune](#)



Beaufort Gazette
Belleville News-Democrat
Bellingham Herald
Bradenton Herald
Centre Daily Times
Charlotte Observer
Columbus Ledger-Enquirer
Fresno Bee

The Herald - Rock Hill
Herald Sun - Durham
Idaho Statesman
Island Packet
Kansas City Star
Lexington Herald-Leader
Merced Sun-Star
Miami Herald

el Nuevo Herald - Miami
Modesto Bee
Raleigh News & Observer
The Olympian
Sacramento Bee
Fort Worth Star-Telegram
The State - Columbia
Sun Herald - Biloxi

Sun News - Myrtle Beach
The News Tribune Tacoma
The Telegraph - Macon
San Luis Obispo Tribune
Tri-City Herald
Wichita Eagle

Order Confirmation

CITY OF GIG HARBOR
3510 GRANDVIEW ST
GIG HARBOR WA 983351214

Order Number: 57528
Order PO:
Bill-To Account: 23685
Date: 04/30/21
Sales Contact: Bettina Jantzen
Sales Contact Phone:

Dates	Order No.	Description	Product	Size	Times Run	None
05/06/2021 - 05/06/2021	57528	Print Legal Ad IPL0021973	TAC-News Tribune - Legal Legals & Public Notices CLS	3 x 6.01 in	1	\$209.84

Order Total Cost

\$209.84

Ad Preview

CITY OF GIG HARBOR NOTICE OF PUBLIC HEARING

ANCICH PARK PUBLIC LAUNCH FLOATS

Permit Number(s): PL-SDP-18-0003, PL-SPR-18-0009, PL-DR-18-0179, PL-NCR-18-0007, PL-FLOOD-18-0002, PL-SEPA-18-0013

Date of Notice: May 6, 2021

Applicant: City of Gig Harbor Public Works Department, 3510 Grandview Street, Gig Harbor, WA 98335

Agent: Davido Consulting Group, Inc., c/o Nicole Foster, 9706 4th Ave NE #300, Seattle, WA 98115

Project Location: 3525 Harborview Drive, Gig Harbor, WA (Assessor's Parcel No. 5970000244). The site is located on the northeasterly side of Harborview Drive, approximately 250 feet northwest of the intersection of Harborview Drive and Novak Street. Section 05 Township 21 Range 02 Quarter 33.

Project Description: The proposal is for the redevelopment of the subject site through demolition of an existing dock system and installation of a replacement dock. The proposed action will consist of removing the existing gangway, floats, one (1) finger float, and fourteen (14) 16-inch diameter creosote-treated timber piles. A total of 1,096 square feet of overwater coverage is proposed for demolition. Pile removal will be completed from a barge in the harbor using a vibratory hammer. All other structures will be removed from the site without the need for heavy equipment. The existing 1,096 square foot dock system, constructed almost entirely of solid decking, will be redeveloped with a 1,614 square foot dock constructed of grated decking creating a net 45% open area. The proposed development will result in a net increase of 518 square feet of overwater coverage. Five (5) steel guide piles will be driven to keep the floating dock in place. Piles will be driven with a vibratory hammer as far as possible. They will then be driven to final depth with an impact hammer. 24 grounding posts will be installed beneath the corners of the specified float modules ensuring that they do not ground onto the seabed at low tides. Grounding posts will be installed by driving short segments of 12-inch diameter steel pipe with a vibratory hammer. Grounding posts will be proofed with an impact hammer to verify bearing capacity. Pre-cast panels, beams and top plates will be welded or bolted onto the pile foundations to construct the new overwater dock system. Float modules will be fabricated offsite and delivered to the site via barge. The floats will be attached to the guide piles over the grounding posts at high tide. External pile hoops will bolt to the float modules. An 80-foot long gangway will be fabricated off-site, delivered via barge and lifted into position, connecting the fixed pier to the floating dock. Gangway connections will be installed without the need for heavy equipment.

SEPA Threshold Determination: Mitigated Determination of Nonsignificance (MDNS) was issued on April 8, 2021 under WAC 197-11-340(2)

PUBLIC HEARING DATE: Hearing Examiner, **May 20, 2021 at 1:30PM**, at Gig Harbor Civic Center, Council Chambers, 3510 Grandview Street, Gig Harbor.

NOTE: This public hearing may be held in an online format subject to the latest public health recommendations.

Interested persons are invited to attend the public hearing and provide testimony on this proposal. The hearing will be conducted in the manner prescribed by Gig Harbor Municipal Code Chapter 19.05.

As of March 16, 2020, at 12 PM noon, our Civic Center will be closed to the general public until further notice. Therefore, documents pertinent to this application are available for review and inspection online only using the City of Gig Harbor Permit Portal. Please contact Kimberly Mahoney, Associate Planner, for questions regarding access to other documents pertinent to this application. A copy of the staff report on this proposal will be available at least seven days prior to the hearing. A copy of the application, all documents and evidence relied upon by the applicant, and applicable criteria are available for inspection at no cost; copies will be provided at the requestor's cost.

Interested persons may comment on the above stated application or may request a copy of the decision on this application. Requests for notification, written comments, including any written comments addressing the findings required for a decision, must be submitted to the Planning Division no later than 12:00 pm on May 20, 2021.

Questions regarding the above stated application should be made to Kimberly Mahoney, Associate Planner, City of Gig Harbor Community Development Department, 3510 Grandview Street, Gig Harbor, WA 98335, or by calling 851-6170. Additional permit information can also be found at www.cityofgigharbor.net by clicking "Permit Portal" then clicking "Applications," entering "Hearing Examiner Hearing" and then selecting the Hearing date and clicking on "More Details".

IPL0021973

May 6 2021

**Ancich Waterfront Park
Community Paddler's Dock**

**PL-SDP-18-0003 et al
Hearing Examiner**

Exhibit G

CERTIFICATION OF PUBLIC NOTICE

=====

DECLARATION OF MAILING

I, **MELISSA HARTWIG** (printed name), declare under penalty of perjury under the laws of the State of Washington and the United States of America that the foregoing is true and correct to the best of my knowledge:

On **DECEMBER 6, 2018** I mailed, a true and correct copy of the **NOA** for the following:

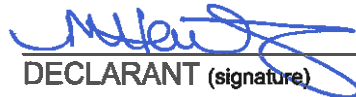
Project Name: **ANCICH PARK PUBLIC LAUNCH FLOATS – TYPE III PERMIT**

Project Location: **3525 HARBORVIEW DRIVE**

Permit Number(s): **PL-SDP-18-0003, PL-SPR-18-0009, PL-DR-18-0179, PL-NCR-18-0007, PL-FLOOD-18-0002, PL-SEPA-18-0013**

to the individuals/agencies identified on the attached transmittal form by United States Postal Service, inter-office routing, or electronic mail, as specified on the attached.

SIGNED at **GIG HARBOR, WA**, this **6TH** day of **DECEMBER**, 2018


DECLARANT (signature)

City of Gig Harbor
Transmittal Form

Routing for:

NOA SEPA NOPH NOPM NOD

Notice Date: Dec 6th, 2018

Project: Ancich Park Public Launch
Floats 1 PL: SDP-18-0003

Planner: PEJ

Routed to:
City Depts.

- ☐ Public Works-Operations
☐ Public Works-Engineering

- ☐ Building and Fire Safety
☐ Other _____

SEPA Agencies:
(NOA, SEPA)
Electronic Mail

- ☐ Washington Department of Ecology, SEPA Register
☐ Washington Department of Commerce, attn: Review Team
☐ Pierce Transit Land Use Review, attn: Kelly Haden, Monica Adams
☐ Washington State Department of Fish & Wildlife, attn: SEPA Desk
☐ Washington State Department of Natural Resources, attn: SEPA Center
☐ Washington State DAHP, attn: Gretchen Kaehler
☐ Puyallup Tribe of Indians Historic Preservation, attn: Judy Wright
☐ Puyallup Tribe Cultural Resources, attn: Brandon Reynon/Jeffrey Thomas
☐ PenMet Parks, attn: Elaine Sorenson
☐ Pierce County Fire District Number 5, attn: Eric Watson/Eric Waters
☐ Suquamish Tribe, attn: Dennis Lewarch
☐ Peninsula School District, attn: Vicki Smith
☐ Pierce County Planning and Land Services
☐ Washington State Department of Transportation, attn: Dale Severson / SEPA Reviews
☐ Squaxin Island Tribe, attn: Rhonda Foster
☐ Muckleshoot Tribe, attn: Laura Murphy
☐ Washington Department of Corrections, attn: Eric Heinitz
☐ Puget Sound Partnership, attn: Marsha Engel

Other Parties:

1st Class Mail

- ☒ Applicant/Owner/Agent (NOA, NOPH, NOPM, SEPA, NOD)
☒ DRB (NOA for Non-residential, Multi-family, Subdivisions, Public Projects)
☒ Parks Commission via Terri Reed (NOA)
☐ Property Owners within 300 feet of site: attached list (NOA, SEPA, NOPH, NOPM, NOD for Type II permits only)
☐ Parties of Record: attached list (NOPH, NOPM, NOD)
☐ Pierce County (NOA for Plats adjacent to City Limits)
☐ Pierce County Assessor-Treasurer (NOD)
☐ WA Transportation Secretary (NOA for Plats adj. to State ROW, or within 2 miles of Airport—approximately any plats south of Pioneer/Wollochet interchange)
☐ Other _____



"THE MARITIME CITY"

DEVELOPMENT SERVICES

CITY OF GIG HARBOR

NOTICE OF APPLICATION

December 6th, 2018

ANCICH PARK PUBLIC LAUNCH FLOATS

Type III Permit

Permit Number(s): PL-SDP-18-0003, PL-SPR-18-0009, PL-DR-18-0179, PL-NCR-18-0007, PL-FLOOD-18-0002, PL-SEPA-18-0013

Date Application was Submitted: November 20th, 2018

Date of Notice of Complete Application: November 27th, 2018

Name of Applicant: Nicole Foster, PND Engineers, 1736 Fourth Ave S, Suite A, Seattle, WA 98134

Name of Agent: City of Gig Harbor, 3510 Gig Harbor, WA 98335-1214

Project Location: 3525 Harborview Dr., site is located on the north side of Harborview Drive, approximately 300 feet west of the intersection with Novak Street.
Sec 05, Tw 21, R 2.

Description of Proposed Project: The proposal includes the construction and installation of a new ADA accessible pier and floating dock for launching human powered watercraft associated with the recently construction boat storage building.

Project Permits Included with Application: Shoreline Substantial Development Permit, Major Site Plan Review, Design Review, Nonconforming Use and Structure Review, Flood Hazard Review and SEPA Review.

Further Studies Being Required by Applicable Official: None at this time.

Other Required Permits Not Included in Application: Building permits.

Existing Environmental Documents which Evaluate Proposed Project:
SEPA Environmental Checklist, prepared by Nicole Foster, Environmental Scientist, dated November 16th, 2018; Critical Areas Report, prepared by PND Engineers, Inc,

dated November 2018; Biological Assessment, prepared by PND Engineers, Inc, dated November 2018

Tentative Public Meeting or Public Hearing Date: A hearing date has not been scheduled for this application.

Documents pertinent to this application are available for review and inspection at the City of Gig Harbor Planning Department, 3510 Grandview Street, Gig Harbor, WA 98335, during normal business hours, Monday through Friday. An open record public hearing will be held on this project, at this time the hearing has not been scheduled. A copy of the staff report on this project proposal will be available seven days prior to the public hearing.

Interested persons may comment on the above stated application or may request any notice of public hearing or a copy of the decision on this application, or participate in any public hearings. Requests for notification or written comments must be submitted to the Planning Department by no later than January 7th, 2019. All public comments or requests must be received at the Planning Department by no later than 5:00pm on the last date of the comment period.

Questions regarding the above stated application should be made to Peter Katich, Senior Planner, City of Gig Harbor Planning Department, 3510 Grandview St., Gig Harbor, WA 98335, or by calling 851-6170. Additional permit information can also be found at www.cityofgigharbor.net by clicking "Permit Portal" and entering the above permit numbers.

1 5970000244 8400
CITY OF GIG HARBOR
3510 GRANDVIEW ST
GIG HARBOR, WA 98335-1214

2 0221053003 1101
LEE JOHN J & HAN S
3705 HARBORVIEW DR
GIG HARBOR, WA 98332

3 0221053030 9391
MALICH KENNETH A & BARBARA P
3515 ROSS AVE
GIG HARBOR, WA 98332-1845

4 0221053042 1101
QUIGG PATRICK D & KATHLEEN A
1831 BEL AIRE AVE
ABERDEEN, WA 98520-1305

5 0221053050 6400
CITY OF GIG HARBOR
3510 GRANDVIEW ST
GIG HARBOR, WA 98335-1214

6 0221053051 1101
FAIRWAY HOLDINGS LLC
PO BOX 99695
LAKEWOOD, WA 98496-0695

7 0221053058 1101
VANBERG RICHARD L & JEAN C
3616 HARBORVIEW DR
GIG HARBOR, WA 98332-2129

8 0221053071 7420
BUJACICH DOCK LLC
3607 ROSS AVE
GIG HARBOR, WA 98332-1856

9 0221053083 1101
FRANICH JAMES M
3702 HARBORVIEW DR
GIG HARBOR, WA 98332-2130

10 0221053092 1101
BUJACICH JACK D
3607 ROSS AVE
GIG HARBOR, WA 98332-1856

11 0221053093 1101
BUJACICH GEORGE P TTEE
3619 ROSS AVE
GIG HARBOR, WA 98332-1856

12 0221053095 9100
BUJACICH JACK D JR
3607 ROSS AVE
GIG HARBOR, WA 98332-1856

13 0221053113 8400
TARABOCHIA DOMINICK J JR & ANICHL L.
3309 56TH ST NW STE 107
GIG HARBOR, WA 98335-8580

14 0221053114 9391
TARABOCHIA DOMINICK J JR & ANICHL L.
3309 56TH ST NW STE 107
GIG HARBOR, WA 98335-8580

15 5970000161 4600
HARBOR CONDOMINIUM ASSOCIATION
3505 HARBORVIEW DR
GIG HARBOR, WA 98332-2128

16 5970000180 1101
IVANOVICH PETER D
222 E PEARSON ST APT 1701
CHICAGO, IL 60611

17 5970000191 0000
UNKNOWN CONVERSION PARTY
UNKNOWN PARTY ADDRESS
UNKNOWN CITY, WA null

18 5970000215 7420
MULLAN LLC
PO BOX 7605
TACOMA, WA 98417

19 5970000230 1101
BERG CAROLYN S
3526 HARBORVIEW DR
GIG HARBOR, WA 98332-2128

20 5970000263 1101
KADZIK PAUL L & JANICE K
3518 HARBORVIEW DR
GIG HARBOR, WA 98332-2128

21 5970000271 9100
ALLEN RICHARD B & ELSIE M
3603 ROSS AVE
GIG HARBOR, WA 98332-1856

22 5970000291 1101
BERG CAROLYN S ET AL
3526 HARBORVIEW DR
GIG HARBOR, WA 98332-2128

23 5970000301 1101
ALLEN RICHARD B & ELSIE M
3603 ROSS AVE
GIG HARBOR, WA 98332-1856

24 5970000310 1101
MOORE JANE M & DENNIS D
3525 ROSS AVE
GIG HARBOR, WA 98332-1845

25 5970000372 1101
MUELLER RAND A
3514 HARBORVIEW DR
GIG HARBOR, WA 98332-2128

26 5973000010 1405
DOWD MICHAEL T & CHRISTINE A
3519 HARBORVIEW DR APT 1
GIG HARBOR, WA 98332

27 5973000020 1405
BORIS WILLIAM O TTEE
3519 HARBORVIEW DR UNIT 2
GIG HARBOR, WA 98332

28 5973000030 1405
GLEIN GARY A & LINDA D
3519 HARBORVIEW DR APT 3
GIG HARBOR, WA 98332-2183

29 5973000040 1405
SMITH LELAND C & PETERSON PAMELA H
3519 HARBORVIEW DR UNIT 4
GIG HARBOR, WA 98332

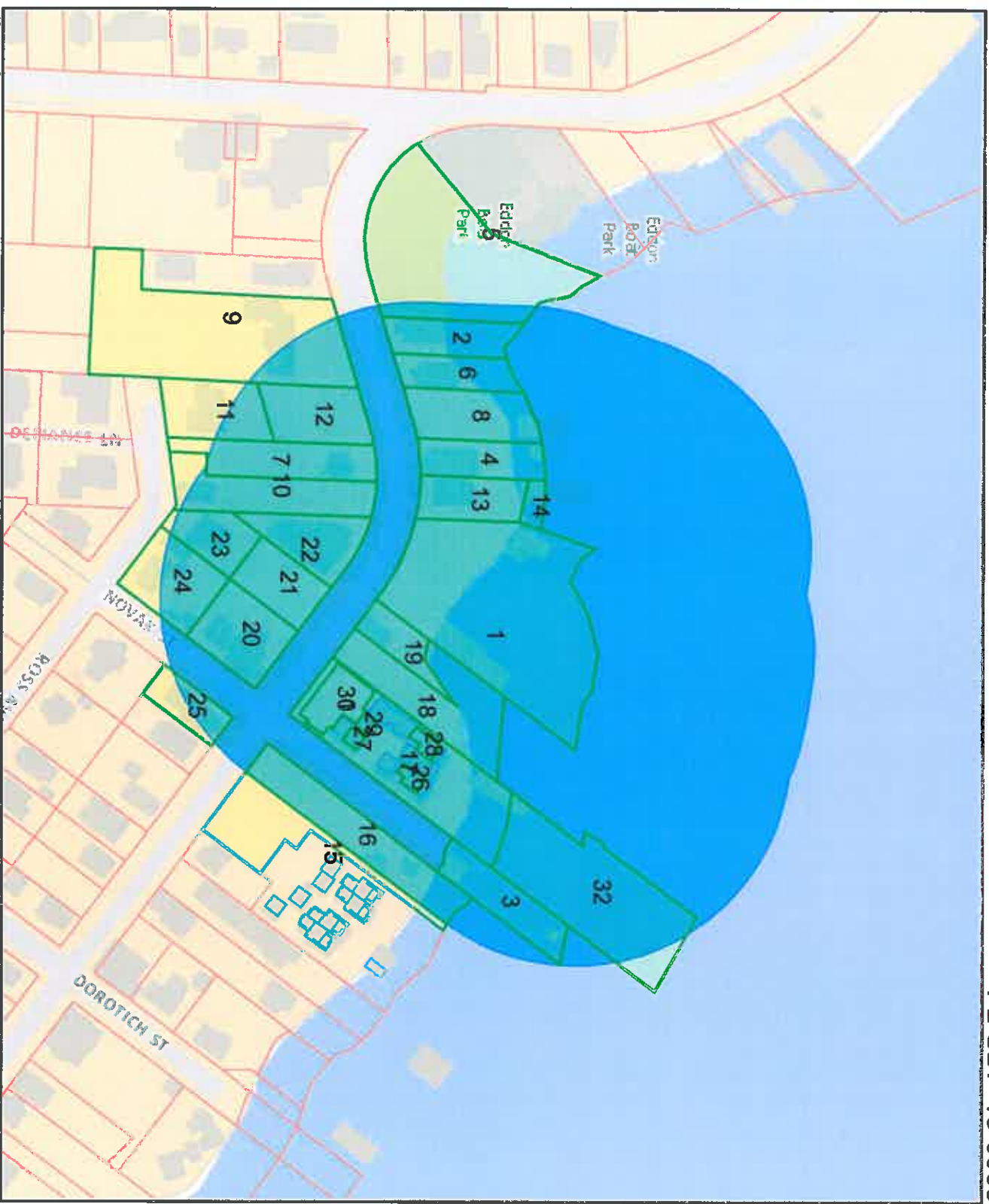
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MILLVILLE MARINA LLC
3519 HARBORVIEW DR
GIG HARBOR, WA 98332-2183

31 5973000060 0000
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UNKNOWN PARTY ADDRESS
UNKNOWN CITY, WA null

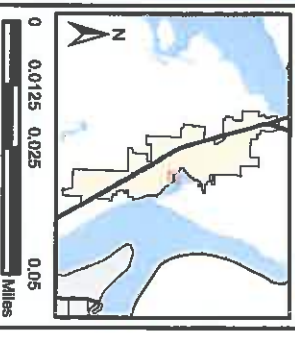
32 5973010010 0000
UNKNOWN CONVERSION PARTY
UNKNOWN PARTY ADDRESS
UNKNOWN CITY, WA null

Ancich Park Public Launch Ancich Public Floats

PL-SDP-18-0003



- ### Legend
- Tax Parcels**
- Base Parcel
 - Condominium



The map features are approximate and are intended only to provide an indication of said feature. Additional areas that have not been mapped may be present. This is not a survey. Orthophotos and other data may not align. The County assumes no liability for variations ascertained by actual survey. ALL DATA IS EXPRESSLY PROVIDED 'AS IS' AND 'WITH ALL FAULTS'. The County makes no warranty of fitness for a particular purpose.

Date: 11/30/2018 09:13 AM

Legals

Legals & Public Notices

CITY OF GIG HARBOR
NOTICE OF APPLICATION
December 6th, 2018
ANCHOR PARK PUBLIC LAUNCH FLOATE
Type III Permit

Permit Number(s): PL-SDP-18-0003, PL-SPR-18-0009, PL-DR-18-0179, PL-NCR-18-0007, PL-FLO-18-0002, PL-SEPA-18-0013.

Date Application was Submitted: November 20th, 2018

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Name of Agent: City of Gig Harbor, 3510 Gig Harbor WA 98335-1214

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Description of Proposed Project: The proposal includes the construction and installation of a new ADA accessible pier and floating dock for launching human powered watercraft associated with the recently constructed boat storage building.

Project Permits included with Application: Shoreline Substantial Development Permit, Major Site Plan Review, Design Review, Nonconforming Use and Structure Review, Flood Hazard Review and SEPA Review.

Further Studies Being Required by Applicable Official: None at this time.

Other Required Permits Not Included in Application: Building Permits.

Existing Environmental Documents which Evaluate Proposed Project:

SEPA Environmental Checklist, prepared by Nicole Foster, Environmental Scientist, dated November 16th, 2018.

Critical Areas Report, prepared by PND Engineers, Inc., dated November 2018.

Biological Assessment, prepared by PND Engineers, Inc., dated November 2018.

Interim Public Meeting or Public Hearing Date: A hearing date has not been scheduled for this application.

Documents pertinent to this application are available for review and inspection at the City of Gig Harbor Planning Department, 3510 Grandview Street, Gig Harbor, WA 98335, during normal business hours, Monday through Friday.

An open record/public hearing will be held on this project, at this time the hearing has not been scheduled. A copy of the staff report on this project proposal will be available seven days prior to the public hearing.

Interested persons may comment on the above stated application or may request any notice of public hearing or a copy of the decision on this application, or participate in any public hearings.

Requests for notification or written comments must be submitted to the Planning Department by no later than January 7th, 2019. All public comments or requests must be received at the Planning Department by no later than 5:00pm on the last date of the comment period.

Questions regarding the above stated application should be made to Peter Katich, Senior Planner, City of Gig Harbor Planning Department, 3510 Grandview St., Gig Harbor, WA 98335, or by calling 853-6170. Additional permit information can also be found at www.cityofgigharbor.net by clicking "Permit Portal" and entering the above permit numbers.

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Documents pertinent to this application are available for review and inspection at the City of Gig Harbor Planning Department, 3510 Grandview Street, Gig Harbor, WA 98335, during normal business hours, Monday through Friday.

An open record/public hearing will be held on this project, at this time the hearing has not been scheduled. A copy of the staff report on this project proposal will be available seven days prior to the public hearing.

Interested persons may comment on the above stated application or may request any notice of public hearing or a copy of the decision on this application, or participate in any public hearings.

Requests for notification or written comments must be submitted to the Planning Department by no later than January 7th, 2019. All public comments or requests must be received at the Planning Department by no later than 5:00pm on the last date of the comment period.

Questions regarding the above stated application should be made to Peter Katich, Senior Planner, City of Gig Harbor Planning Department, 3510 Grandview St., Gig Harbor, WA 98335, or by calling 853-6170. Additional permit information can also be found at www.cityofgigharbor.net by clicking "Permit Portal" and entering the above permit numbers.

Documents pertinent to this application are available for review and inspection at the City of Gig Harbor Planning Department, 3510 Grandview Street, Gig Harbor, WA 98335, during normal business hours, Monday through Friday.

An open record/public hearing will be held on this project, at this time the hearing has not been scheduled. A copy of the staff report on this project proposal will be available seven days prior to the public hearing.

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An open record/public hearing will be held on this project, at this time the hearing has not been scheduled. A copy of the staff report on this project proposal will be available seven days prior to the public hearing.

Legals & Public Notices

NOTICE OF SMALL WORKS ROSTER

NOTICE IS HEREBY GIVEN that Pierce County Fire District #5 (PCFD #5) is updating the Small Works Roster of contractors interested in working on public works improvement contracts. The District is accepting applications for both Gig Harbor Fire and Key Peninsula Fire Districts to be placed on the roster(s) from: licensed, bonded and insured contractors. Categories include all types of general construction including but not limited to: general contracting, painting, landscaping, plumbing, electrical, mechanical, HVAC, and other public works. A notice, substantially in the form of this notice, will be published semi-annually in a newspaper of general circulation, advertising the existence of the Small Works Roster, and soliciting the names of vendors for the list. Such roster may be used instead of formal sealed bidding procedures when the estimated contract award is \$20,000 - \$300,000. Minority and women-owned businesses are encouraged to apply. Send application to be placed on the roster, including contractor's registration number, bonding and insurance information to: PCFD #5 Headquarters, 10222 Bujaich Road NW Gig Harbor, WA 98332. Qualified contractors will be added to the roster on a continual basis.

NOTICE OF VENDOR LIST

NOTICE IS HEREBY GIVEN that Pierce County Fire District #5 (PCFD #5) is updating the Vendor List for parties interested in contracting with the Gig Harbor Fire or Key Peninsula Fire Districts for the sale of materials, equipment, supplies or services, when the amount of the sale is projected to be between \$10,000 and \$50,000. The District is accepting applications from qualified parties to be placed on the Vendor List. A notice, substantially in the form of this notice, will be published semi-annually in a newspaper of general circulation, advertising the existence of the vendor list, and soliciting the names of vendors for the list. Such Vendor List will be used instead of formal sealed bidding procedures when the estimated contract price is between \$10,000 and \$50,000. For eligible purchases, the District staff will solicit at least three quotations from vendors on the list, whenever reasonably possible. Minority and women-owned businesses are encouraged to apply. Send application to be placed on the Vendor List, including your address, telephone number, and other pertinent contact information, to: PCFD #5 Headquarters, 10222 Bujaich Road NW, Gig Harbor, WA 98332. Phone # 253-851-3111. Qualified vendors will be added to the Vendor List on a continual basis.

SUMMARY OF ORDINANCE NO. 1399
of the City of Gig Harbor, Washington

On the 26th of November, the City Council of the City of Gig Harbor, passed Ordinance No. 1399, the main point of which may be summarized by its title as follows:

AN ORDINANCE OF THE CITY COUNCIL OF GIG HARBOR, WASHINGTON, RELATING TO NON-RECYCLABLE PLASTIC DISPOSABLE FOOD SERVICEWARE; ADDING A NEW CHAPTER 5.15 TO THE GIG HARBOR MUNICIPAL CODE ENTITLED "SINGLE USE FOOD SERVICEWARE AND LITTER REDUCTION"; PROVIDING FOR SEVERABILITY AND ESTABLISHING AN EFFECTIVE DATE.

The full text of this Ordinance will be mailed upon request.

APPROVED by the City Council at their meeting of November 26, 2018.

BY: MOLLY M. TOWSLEE, CITY CLERK

Want to
jump start your
business?

Put an ad in our
Business & Services
Directory.

253.428.8000

SUMMARY OF ORDINANCE NO. 1401

of the City of Gig Harbor, Washington
On the 26th of November, the City Council of the City of Gig Harbor, passed Ordinance No. 1401, the main point of which may be summarized by its title as follows:

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF GIG HARBOR, WASHINGTON, RELATING TO TRANSPORTATION IMPACT FEES; AMENDING THE FORMULA USED BY THE CITY TO CALCULATE TRANSPORTATION IMPACT FEES; ADOPTING A NEW PROJECT LIST AS REQUIRED BY SHAC SECTION 19.12.120 FOR THE CALCULATION OF TRANSPORTATION IMPACT FEES; ESTABLISHING A NEW SCHEDULE OF TRANSPORTATION IMPACT FEES FOR USE BEGINNING ON NOVEMBER 26, 2018;

AMENDING SECTIONS 19.12.070 AND 19.12.080 OF THE GIG HARBOR MUNICIPAL CODE; AMENDING APPENDICES A-1 AND A-2 AND REPEALING APPENDIX A-3 TO ORDINANCE NO. 1078;

PROVIDING FOR SEVERABILITY AND ESTABLISHING AN EFFECTIVE DATE.

The full text of this Ordinance will be mailed upon request.

APPROVED by the City Council at their meeting of November 26, 2018.

BY: MOLLY M. TOWSLEE, CITY CLERK

SUMMARY OF ORDINANCE NO. 1402

of the City of Gig Harbor, Washington
On the 26th of November, the City Council of the City of Gig Harbor, passed Ordinance No. 1402, the main point of which may be summarized by its title as follows:

AN ORDINANCE OF THE CITY COUNCIL OF GIG HARBOR, WASHINGTON, ADOPTING THE 2018 ANNUAL BUDGET;

ESTABLISHING APPROPRIATIONS OF FUNDS FOR THE 2018 FISCAL YEAR; TRANSMITTING BUDGET COPIES TO THE STATE; PROVIDING FOR SEVERABILITY AND ESTABLISHING AN EFFECTIVE DATE.

The full text of this Ordinance will be mailed upon request.

APPROVED by the City Council at their meeting of November 26, 2018.

BY: MOLLY M. TOWSLEE, CITY CLERK

SUMMARY OF ORDINANCE NO. 1400

of the City of Gig Harbor, Washington
On the 26th of November, the City Council of the City of Gig Harbor, passed Ordinance No. 1400, the main point of which may be summarized by its title as follows:

AN ORDINANCE OF THE CITY COUNCIL OF GIG HARBOR, WASHINGTON, RELATING TO GROWTH MANAGEMENT AND PLANNING; MAKING THE FOLLOWING AMENDMENTS TO THE CITY OF GIG HARBOR COMPREHENSIVE PLAN FOR THE 2017-2018 AMENDMENT CYCLE: UPDATING THE INTRODUCTION, LAND USE, ECONOMIC DEVELOPMENT, TRANSPORTATION AND ACTIVE TRANSPORTATION PLANELEMENTS IN RELATION TO RESOLUTION NO. 1037; REMOVING THE CURRENT TRANSPORTATION ELEMENT AND REPLACING WITH THE 2018 CONNECT THE BIG TRANSPORTATION ELEMENT; UPDATING THE CAPITAL FACILITIES ELEMENT AND PARKS AND RECREATION ELEMENT TO ENSURE CONSISTENCY WITH THE 2016 ADOPTED PARKS AND RECREATION OPEN SPACEPLAN; UPDATING THE CAPITAL FACILITIES ELEMENT AND WITHIN ADOPTING VIA REFERENCE THE 2018 WATER, WASTE WATER AND STORM WATER FUNCTIONAL PLAN UPDATES; DIRECTING STAFF TO CONTINUE PROCESSING PL-COMP-17-0004 IN 2019; PROVIDING FOR SEVERABILITY AND ESTABLISHING AN EFFECTIVE DATE.

The full text of this Ordinance will be mailed upon request.

APPROVED by the City Council at their meeting of November 26, 2018.

BY: MOLLY M. TOWSLEE, CITY CLERK

SUMMARY OF ORDINANCE NO. 1400

of the City of Gig Harbor, Washington
On the 26th of November, the City Council of the City of Gig Harbor, passed Ordinance No. 1400, the main point of which may be summarized by its title as follows:

AN ORDINANCE OF THE CITY COUNCIL OF GIG HARBOR, WASHINGTON, RELATING TO GROWTH MANAGEMENT AND PLANNING; MAKING THE FOLLOWING AMENDMENTS TO THE CITY OF GIG HARBOR COMPREHENSIVE PLAN FOR THE 2017-2018 AMENDMENT CYCLE: UPDATING THE INTRODUCTION, LAND USE, ECONOMIC DEVELOPMENT, TRANSPORTATION AND ACTIVE TRANSPORTATION PLANELEMENTS IN RELATION TO RESOLUTION NO. 1037; REMOVING THE CURRENT TRANSPORTATION ELEMENT AND REPLACING WITH THE 2018 CONNECT THE BIG TRANSPORTATION ELEMENT; UPDATING THE CAPITAL FACILITIES ELEMENT AND PARKS AND RECREATION ELEMENT TO ENSURE CONSISTENCY WITH THE 2016 ADOPTED PARKS AND RECREATION OPEN SPACEPLAN; UPDATING THE CAPITAL FACILITIES ELEMENT AND WITHIN ADOPTING VIA REFERENCE THE 2018 WATER, WASTE WATER AND STORM WATER FUNCTIONAL PLAN UPDATES; DIRECTING STAFF TO CONTINUE PROCESSING PL-COMP-17-0004 IN 2019; PROVIDING FOR SEVERABILITY AND ESTABLISHING AN EFFECTIVE DATE.

The full text of this Ordinance will be mailed upon request.

APPROVED by the City Council at their meeting of November 26, 2018.

BY: MOLLY M. TOWSLEE, CITY CLERK

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"THE MARITIME CITY"

DEVELOPMENT SERVICES

RECEIVED BY
DEC 03 2018
CITY OF GIG HARBOR

CERTIFICATION OF PUBLIC NOTICE

DECLARATION OF POSTING

I, JEFF OLSEN (printed name), declare under penalty of perjury under the laws of the State of Washington and the United States of America that the foregoing is true and correct to the best of my knowledge:

On 12-6-18, 2018 I caused to be posted the notice board provided by the

City for the NOTICE OF APPLICATION on the following:

Project Name: ANCICH PARK PUBLIC LAUNCH FLOATS

Project Location: 3525 HARBORVIEW DR

Permit Number(s): PL-SDP-18-0003, PL-SPR-18-0009,
PL-DR-18-0179, PL-NCR-18-0007, PL-FLOOD-18-0002, PL-SEPA-18-
0013

the locations indicated below meeting the requirements of GHMC 19.03.001(A).

- ☒ _____
- ☒ _____

SIGNED at Gig Harbor, Washington, this 6 day of DEC, 2018.


DECLARANT (signature)

CERTIFICATION OF PUBLIC NOTICE

=====

DECLARATION OF PUBLISHING

I, Cindy Andrews (printed name), declare under penalty of perjury under the laws of the State of Washington and the United States of America that the foregoing is true and correct to the best of my knowledge:

On NOVEMBER 28TH, 2018, sent a true and correct copy of the NOTICE OF APPLICATION for publication

In the DECEMBER 6TH, 2018 edition of the Peninsula Gateway for the following:

Project Name: ANCICH PARK PUBLIC LAUNCH FLOATS

Project Location: 3525 HARBORVIEW DR,

Permit Number(s): PL-SDP-18-0003/PL-SPR-18-0009/PL-DR-18-0179/PL-NCR-18-0007/PL-FLOOD-18-0002/PL-SEPA-18-0013

SIGNED at Gig Harbor, Washington, this 28th day of NOV, 2018.

Cindy Andrews
DECLARANT (signature)

City of Gig Harbor
Transmittal Form

Routing for: NOA SEPA NOPH NOPM NOD

Notice Date: Dec 6th 2018

Project: Ancich Park Public Launch
Floats | PL-SDP-18-0003

Planner: PEJE

Routed to:
City Depts.

- ☐ Public Works-Operations
☐ Public Works-Engineering

- ☐ Building and Fire Safety
☐ Other _____

SEPA Agencies:
(NOA, SEPA)
Electronic Mail

- ☐ Washington Department of Ecology, SEPA Register
☐ Washington Department of Commerce, attn: Review Team
☐ Pierce Transit Land Use Review, attn: Kelly Haden, Monica Adams
☐ Washington State Department of Fish & Wildlife, attn: SEPA Desk
☐ Washington State Department of Natural Resources, attn: SEPA Center
☐ Washington State DAHP, attn: Gretchen Kaehler
☐ Puyallup Tribe of Indians Historic Preservation, attn: Judy Wright
☐ Puyallup Tribe Cultural Resources, attn: Brandon Reynon/Jeffrey Thomas
☐ PenMet Parks, attn: Elaine Sorenson
☐ Pierce County Fire District Number 5, attn: Eric Watson/Eric Waters
☐ Suquamish Tribe, attn: Dennis Lewarch
☐ Peninsula School District, attn: Vicki Smith
☐ Pierce County Planning and Land Services
☐ Washington State Department of Transportation, attn: Dale Severson / SEPA Reviews
☐ Squaxin Island Tribe, attn: Rhonda Foster
☐ Muckleshoot Tribe, attn: Laura Murphy
☐ Washington Department of Corrections, attn: Eric Heinitz
☐ Puget Sound Partnership, attn: Marsha Engel

Other Parties:
1st Class Mail

- ☐ Applicant/Owner/Agent (NOA, NOPH, NOPM, SEPA, NOD)
☐ DRB (NOA for Non-residential, Multi-family, Subdivisions, Public Projects)
☐ Parks Commission via Terri Reed (NOA)
☐ Property Owners within 300 feet of site: attached list (NOA, SEPA, NOPH, NOPM, NOD for Type II permits only)
☐ Parties of Record: attached list (NOPH, NOPM, NOD)
☐ Pierce County (NOA for Plats adjacent to City Limits)
☐ Pierce County Assessor-Treasurer (NOD)
☐ WA Transportation Secretary (NOA for Plats adj. to State ROW, or within 2 miles of Airport—approximately any plats south of Pioneer/Wollochet interchange)
☒ Other Gateway

CITY OF GIG HARBOR

NOTICE OF APPLICATION

December 6th, 2018

ANCICH PARK PUBLIC LAUNCH FLOATS

Type III Permit

Permit Number(s): PL-SDP-18-0003, PL-SPR-18-0009, PL-DR-18-0179, PL-NCR-18-0007, PL-FLOOD-18-0002, PL-SEPA-18-0013

Date Application was Submitted: November 20th, 2018

Date of Notice of Complete Application: November 27th, 2018

Name of Applicant: Nicole Foster, PND Engineers, 1736 Fourth Ave S, Suite A, Seattle, WA 98134

Name of Agent: City of Gig Harbor, 3510 Gig Harbor, WA 98335-1214

Project Location: 3525 Harborview Dr., site is located on the north side of Harborview Drive, approximately 300 feet west of the intersection with Novak Street.
Sec 05, Tw 21, R 2.

Description of Proposed Project: The proposal includes the construction and installation of a new ADA accessible pier and floating dock for launching human powered watercraft associated with the recently construction boat storage building.

Project Permits Included with Application: Shoreline Substantial Development Permit, Major Site Plan Review, Design Review, Nonconforming Use and Structure Review, Flood Hazard Review and SEPA Review.

Further Studies Being Required by Applicable Official: None at this time.

Other Required Permits Not Included in Application: Building permits.

Existing Environmental Documents which Evaluate Proposed Project:
SEPA Environmental Checklist, prepared by Nicole Foster, Environmental Scientist, dated November 16th, 2018; Critical Areas Report, prepared by PND Engineers, Inc,

dated November 2018; Biological Assessment, prepared by PND Engineers, Inc, dated November 2018

Tentative Public Meeting or Public Hearing Date: A hearing date has not been scheduled for this application.

Documents pertinent to this application are available for review and inspection at the City of Gig Harbor Planning Department, 3510 Grandview Street, Gig Harbor, WA 98335, during normal business hours, Monday through Friday. An open record public hearing will be held on this project, at this time the hearing has not been scheduled. A copy of the staff report on this project proposal will be available seven days prior to the public hearing.

Interested persons may comment on the above stated application or may request any notice of public hearing or a copy of the decision on this application, or participate in any public hearings. Requests for notification or written comments must be submitted to the Planning Department by no later than January 7th, 2019. All public comments or requests must be received at the Planning Department by no later than 5:00pm on the last date of the comment period.

Questions regarding the above stated application should be made to Peter Katich, Senior Planner, City of Gig Harbor Planning Department, 3510 Grandview St., Gig Harbor, WA 98335, or by calling 851-6170. Additional permit information can also be found at www.cityofgigharbor.net by clicking "Permit Portal" and entering the above permit numbers.

Cindy Andrews

From: Obits, Tac <obitlegalads@thenewstribune.com>
To: Cindy Andrews
Sent: Wednesday, November 28, 2018 4:38 PM
Subject: Read: Notice of Application ANCICH PARK PUBLIC LAUNCH FLOATS.docx

Your message

To: Obits, Tac
Subject: Notice of Application ANCICH PARK PUBLIC LAUNCH FLOATS.docx
Sent: 11/28/18, 4:52:22 PM CST

was read on 11/28/18, 6:38:18 PM CST

Order Confirmation

Customer

CITY OF GIG HARBOR

Customer Account

255175

Customer Address

3510 GRANDVIEW ST
GIG HARBOR WA 983351214 USA

Customer Phone

253-851-8136

Customer Fax

Sales Rep

lbastin@thenewstribune.com

Payor Customer

CITY OF GIG HARBOR

Payor Account

255175

Payor Address

3510 GRANDVIEW ST
GIG HARBOR WA 983351214 USA

Payor Phone

253-851-8136

Customer EMail

Order Taker

mлаufer@mcclatchy.com

PO Number

Payment Method

Invoice

Blind Box

Tear Sheets

0

Proofs

0

Affidavits

1

Net Amount

\$101.03

Tax Amount

\$0.00

Total Amount

\$101.03

Payment Amount

\$0.00

Amount Due

\$101.03

Ad Order Number

0003977656

Order Source

Ordered By

Special Pricing

Invoice Text

Promo Type

Package Buy

Materials

Ad Order Information

Ad Number

0003977656-01

Ad Type

TAC-Legal Liner

Production Method

AdBooker

Production Notes

External Ad Number

Ad Attributes

Ad Released

No

Pick Up

Ad Size

1 X 69 li

Color

Product

TAC-GW-Gateway

Placement

0300 - Legals Classified

Times Run

1

Schedule Cost

\$101.03

Run Schedule Invoice Text

CITY OF GIG HARBOR NOTICE OF APPLICATION

Position

0301 - Legals & Public Notices

Run Dates

12/06/2018



**PLANNING DEPARTMENT
INTERESTED PARTIES**

Project Name: ANY PROJECT PERMIT ACTIVITY

Location: 3525 HARBORVIEW DR

Applicant:

Associated Permits:

Associated Notices: —

Parties:

NANCY JERKOVICH

nancyjerkovich@gmail.com

6828 93rd St Ct N.W.

Gig Harbor, WA 98332

NICK JERKOVICH JR.

3710 Harborview Dr.

Gig Harbor, WA 98332

CAROL MORRIS

carol@carolmorrislaw.com

MORRIS LAW, P.C.

carol_a_morris@msn.com

P.O. BOX 948

Parties:

Seabeck, WA 98380

Please refer to Gig Harbor Municipal Code (GHMC), Title 19, for any questions relative to the administration of the development code.

This list should not be considered an exhaustive list of all those parties who may be interested in this project. This list represents only those parties who have commented at some point during the permit project and/or who have explicitly requested that they are included in project related correspondence.

This list does not represent Parties of Record as defined in GHMC 19.06.003, however some may qualify as such.



**Ancich Waterfront Park
Community Paddler's Dock**

**PL-SDP-18-0003 et al
Hearing Examiner**

Exhibit I

COMMUNITY DEVELOPMENT DEPARTMENT
PLANNING DIVISION

**Mitigated Determination of Nonsignificance (MDNS)
W.A.C. 197-11-970**

Environmental Review Application No.: PL-SEPA-18-0013

Parcel Number: 5970000244

Action: Ancich Community Paddler's Dock – Shoreline Substantial Development
Permit #PL-SDP-18-0003

Proposal: The proposal is for the redevelopment of the subject site through demolition of an existing dock system and installation of a replacement dock. The proposed action will consist of removing the existing gangway, floats, one (1) finger float, and fourteen (14) 16-inch diameter creosote-treated timber piles. A total of 1,096 square feet of overwater coverage is proposed for demolition. Pile removal will be completed from a barge in the harbor using a vibratory hammer. All other structures will be removed from the site without the need for heavy equipment.

The existing 1,096 square foot dock system, constructed almost entirely of solid decking, will be redeveloped with a 1,614 square foot dock constructed of grated decking creating a net 45% open area. The proposed development will result in a net increase of 518 square feet of overwater coverage. Five (5) steel guide piles will be driven to keep the floating dock in place. Piles will be driven with a vibratory hammer as far as possible. They will then be driven to final depth with an impact hammer. 24 grounding posts will be installed beneath the corners of the specified float modules ensuring that they do not ground onto the seabed at low tides. Grounding posts will be installed by driving short segments of 12-inch diameter steel pipe with a vibratory hammer. Grounding posts will be proofed with an impact hammer to verify bearing capacity. Pre-cast panels, beams and top plates will be welded or bolted onto the pile foundations to construct the new overwater dock system. Float modules will be fabricated offsite and delivered to the site via barge. The floats will be attached to the guide piles over the grounding posts at high tide. External pile hoops will bolt to the float modules. An 80-foot long gangway will be fabricated off-site, delivered via barge and lifted into position, connecting the fixed pier to the floating dock. Gangway connections will be installed without the need for heavy equipment.

Location: 3525 Harborview Drive, Gig Harbor, WA 98332

Proponent: City of Gig Harbor, 3510 Grandview Street, Gig Harbor, WA 98335

I. INCORPORATION BY REFERENCE:

The following documents contain information, studies and analysis that have been used in the review of this proposal and are hereby incorporated into this threshold determination by reference:

1. SEPA Environmental Checklist, prepared by Davido Consulting Group, Inc., signed by Jeff Langhelm, Public Works Director, City of Gig Harbor, dated November 16, 2020;
2. Compensatory Mitigation Plan and No Net Loss Analysis, prepared by Davido Consulting Group, Inc., dated November 11, 2020;
3. Biological Assessment for the Ancich Park Public Launch Floats Project, prepared by PND Engineers, Inc., dated September 2018;
4. Endangered Species Act Section 7(a)(2) Jeopardy Biological Opinion, Batch Consultation Reference No. WCRO-2020-01361, dated November 9, 2020;
5. Correspondence with National Marine Fisheries Service ("NMFS," often referred to as "NOAA Fisheries"), dates ranging from December 16, 2020 to January 6, 2021, together with correspondence between City Staff and Proponent's Agent dated December 24, 2018;
6. Recommended SEPA Mitigation and Conditions, prepared by Aaron Hulst, P.E., Senior Engineer, Public Works Department, Engineering Division, dated March 26, 2021;
7. Joint Aquatic Resources Permit Application (JARPA) Form, prepared for the Community Paddler's Dock proposal, prepared by Davido Consulting Group, Inc., dated November 18, 2020; and,
8. Cultural Resources Inventory for the Ancich Park Redevelopment Project, prepared by PND Engineers, Inc., dated June 2016.

II. ANALYSIS:

Plants & Animals: The subject site is located adjacent to Gig Harbor Bay, a designated Critical Fish and Wildlife Habitat Area per the Gig Harbor Shoreline Master Program. Further, the site is located within a FEMA-designated Special Flood Hazard Area.

The sites' uplands are retained by an existing concrete bulkhead and are developed with two existing pier structures, one boat storage structure, and the Ancich Brothers' historic netshed, in addition to related site landscaping. The existing pier located in the northwest corner of the site is associated with the Ancich Brothers' historic netshed; no impacts are proposed in relation to this pier. The scope of this proposal relates to the existing pier structure located along the eastern property line of the subject, on which the site's easterly neighbor has an existing 10-foot easement to access their privately-owned floating dock system located waterward of the Proponent's sublet portion of the pier structure. An area north of the site's tidelands has a documented presence of benthic sugar kelps, and surf smelt spawning is documented approximately 0.3 miles to the northeast of the subject site.

Per the applicant's Biological Assessment (Reference No. 3) submitted for City staff's review in 2018, the original design of the proposed site improvements and its associated proposed mitigation was found to likely adversely affect Puget Sound Steelhead Trout and Puget Sound Chinook species and their critical habitat located within regulated proximity of the proposed site improvements. As a result, to conform with Gig Harbor Municipal Code (GHMC) Section 18.10.100, Compliance with Endangered Species Act, the applicant provided to the City a letter from the National Marine Fisheries Service (NMFS) demonstrating the proposed project's concurrence through consultation under Section 7 of the Endangered Species Act. This concurrence is included as Reference No. 5 included with this MDNS.

Ecological mitigation will be provided through avoidance and minimization efforts and through compensatory mitigation proposed by the applicant. The applicant proposes to remove an estimated 3-5 cubic yards of intertidal debris over a 2,000 square foot area immediately west of the subject site. The applicant also proposes to remove fourteen (14) 16-inch creosote-treated pile presently installed on the subject site to mitigate for the project's impacts (see Reference No. 2). The removal of intertidal debris and 14 existing full-length (approximately 35-feet) creosote-treated piling will remove a pollutant source from the site and improve overall water quality for critical fish and wildlife species. Furthermore, the applicant has designed the site improvements to include grated overwater surfaces to allow for light penetration into the aquatic environment where there presently is none and has implemented the installation of grounding posts into its proposed design to prevent floats from resting on the substrate and scouring marine vegetation. The applicant's mitigation plan has been reviewed by NMFS and City staff who have confirmed that the proposed mitigation will result in a net enhancement of shoreline ecological function (Reference No. 5).

Transportation, Utilities & Circulation: The Public Works Recommended SEPA Mitigation and Conditions Memorandum ("the memo," Reference No. 6) addresses the review of the transportation, stormwater, and utility impacts associated with the proposed action. Any mitigation measures that are required to meet the city's adopted goals are set forth in the memo and are adopted by reference in this MDNS.

Using the substantive SEPA authority provided by GHMC Subsection 18.04.210.D.3.m, the city adopts by reference the critical area requirements of the GHSMP and requires the following mitigation measures to address the project's impact to the critical fish and wildlife habitat found within Gig Harbor Bay:

1. The applicant shall provide mitigation consistently with all representations set forth in the applicant's Compensatory Mitigation Plan and No Net Loss Analysis (Reference No. 2), to include performance standards.
2. The applicant shall adhere to the mitigation required by the Public Works Department as set forth in Reference No. 6 to this MDNS, as applicable.
3. The applicant shall adhere to the Best Management Practices (BMPs) described in Section 8A of the JARPA (Reference No. 7) completed by Davido Consulting Group, Inc. dated November 18, 2020.
4. Should archeological materials or human remains be observed during project activities, all work in the immediate vicinity shall stop. The State Department of Archeology and Historic Preservation, the City of Gig Harbor Planning Division, any affected Tribe, and the local coroner (as applicable) shall be contacted immediately to help assess the findings and determine how to preserve the resource(s). Compliance with all applicable laws pertaining to archeological resources (RCW 27.53, RCW 27.44, and WAC 25-48) is required.

IV. THRESHOLD DETERMINATION:

Lead Agency: City of Gig Harbor

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment, provided the mitigation measures specified above are imposed. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public upon request.

- [x] This MDNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date of this document. **Comments must be submitted by April 22, 2021.**

Any interested person may appeal the adequacy of this SEPA Threshold Determination to the City of Gig Harbor Hearing Examiner pursuant to the procedures set forth under Chapter 18.04 of the Gig Harbor Municipal Code if a written request for appeal is received within 21-days after the issuance of this MDNS, or **April 29, 2021**, whichever is later. The written appeal must be submitted with a filing fee of three hundred and twelve dollars (\$312.00).

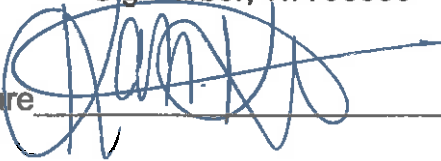
Contact Person: Kimberly Mahoney, Associate Planner; Phone: (253) 851-6170

Responsible Official: Katrina Knutson, AICP

Position Title: Community Development Director Phone: (253) 851-6170

Address: City of Gig Harbor
3510 Grandview Street
Gig Harbor, WA 98335

Signature



Date: April 8, 2021

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the [SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS \(part D\)](#). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [\[HELP\]](#)

1. Name of proposed project, if applicable:

Community Paddler's Dock

2. Name of applicant:

City of Gig Harbor

3. Address and phone number of applicant and contact person:

Applicants:

Jeff Langhelm, City of Gig Harbor
3510 Grandview Street
Gig Harbor, WA 98335
(253) 853-8253

Contact Person:

Nicole Foster, Davido Consulting Group, Inc.
9706 4th Ave NE #300
Seattle, WA 98115
(206) 523-0024 x144

4. Date checklist prepared:

November 11, 2020

5. Agency requesting checklist:

City of Gig Harbor

6. Proposed timing or schedule (including phasing, if applicable):

Start Date: July 15, 2021
End Date: February 15, 2022

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

Yes, the City of Gig Harbor has plans for a floating dock expansion off of the Ancich Pier for transient and commercial moorage.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

- Biological Evaluation
- JARPA
- Macrovegetation Survey
- Critical Areas Review

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

None known.

10. List any government approvals or permits that will be needed for your proposal, if known.

- USACE Section 10 Permit
- Hydraulic Project Approval
- Shoreline Substantial Development
- Flood Hazard Analysis
- No Net Loss Analysis
- Transportation Capacity Reservation Certificate (CRC) Application
- Major Site Plan (General Permit Application)

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The City of Gig harbor has recently constructed Ancich Park's boat storage building (Corps No. NWS-2016-733) and is now proposing to replace a portion of the neighbor's pier with a public, ADA accessible gangway and floats for launching human powered watercrafts. The proposed project consists of the following elements:

1. Demolition

Removal of the existing gangway, floats, a finger float, and (14) 16-inch diameter creosote treated timber piles. Pile removal will be completed from a barge in the harbor using a vibratory hammer. All other structures will be removed from the site without the need for heavy equipment.

2. Launch and Finger Float Installation

(5) steel guide piles will be driven to keep the floating dock in place. Piles will be driven with a vibratory hammer as far as possible. They will then be driven to final depth with an impact hammer. (24) grounding posts will be installed beneath the corners of the specified float modules ensuring that they do not ground onto the seabed at low tides. Grounding posts will be installed by driving short segments of 12-inch (nominal) diameter steel pipe with a vibratory hammer. Grounding posts will be proofed with an impact hammer to verify bearing capacity. The crew will then lift and place precast panels, beams and top plates from the barge and weld or bolt onto the pile foundations. Float modules will be fabricated offsite, brought in via barge and splashed with the crane. They will be attached to the guide piles, over the grounding posts at a high tide. External pile hoops will bolt to the float modules.

3. Gangway Installation

An 80-foot gangway will be fabricated offsite, brought in via barge and lifted into position, connecting the fixed pier to the floating dock. Gangway connections will be installed without the need for heavy equipment.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The project is located on the north side of Harborview Drive in Gig Harbor, Washington in Section 5, Township 21 North, and Range 02 West. The project coordinates are 47.333 N / - 122.586 W. The project site also extends into the waters of Gig Harbor. Site plan, vicinity, and topographic exhibits are included in the JARPA drawings set.

Direction from northbound WA 16:

- Take the exit ramp right towards Wollochet Drive NW (City Center)
- Keep straight on to Stinson Ave.
- Turn right onto Harborview Drive.
- Travel approximately 100 feet, Ancich Park will be on the left. If you have reached Novak Street, you've gone too far

B. Environmental Elements [\[HELP\]](#)

1. Earth [\[help\]](#)

a. General description of the site:

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

Vertical at bulkhead & retaining wall: Approximately 2V:5H

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

The upland boreholes completed for the geotechnical investigation generally encountered surficial deposits overlying poorly graded fine sands and silty sands consistent with glacial deposits. Surficial deposits consisted of very loose to medium dense layers of sands, silts, and clays. Glacial deposits contained varying amounts of gravel and were dense to very dense.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No.

- e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

There is no proposed grading.

- f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Erosion is not anticipated.

- g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Approximately 65% of the site will be covered with impervious surfaces before and after construction.

- h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Prior to start of any earthwork, a turbidity curtain will be installed in the water surrounding the project to contain turbidity during installation of the new structures.

2. Air [\[help\]](#)

- a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Air emissions during construction will be restricted to construction equipment being used on site. The project will require a barge mounted crane. After the construction is complete, it is not anticipated that operation and maintenance will have any associated emissions.

- b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No off site sources affecting the proposed project are known at this time.

- c. Proposed measures to reduce or control emissions or other impacts to air, if any:

No extraordinary emission controls are proposed for this project at this time.

3. Water [\[help\]](#)

- a. Surface Water: [\[help\]](#)

- 1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Yes, the project site is located in Gig Harbor (Puget Sound).

- 2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes, the project will occur in and above Gig Harbor. Work will extend waterward of the HTL for pier and float installation. The project work will take place within the agency mandated in-water work window between July 16th and February 15th. Prior to the start of work, a turbidity curtain will be installed in the water surrounding the project to contain any turbidity during pile driving.

- 3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

There is no proposed filling or dredging.

- 4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

The project will not require the withdrawal or diversion of surface waters.

- 5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

Yes.

- 6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No discharge of waste material is anticipated for this project.

b. Ground Water: [\[help\]](#)

- 1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

Groundwater will not be withdrawn for this project.

- 2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Waste material will not be discharged into groundwater on this project.

c. Water runoff (including stormwater):

- 1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

New surfaces will all be covered with permeable grating. Water will fall directly through the grating into the Harbor.

- 2) Could waste materials enter ground or surface waters? If so, generally describe.

Waste materials are not anticipated to enter ground or surface waters.

- 3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

The proposal will not alter drainage in the vicinity of the site.

- d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

None.

4. **Plants** [\[help\]](#)

- a. Check the types of vegetation found on the site:

☒ deciduous tree: alder, maple, aspen, other
☐ evergreen tree: fir, cedar, pine, other
☒ shrubs
☒ grass
☐ pasture
☐ crop or grain
☐ Orchards, vineyards or other permanent crops.
☐ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
☐ water plants: water lily, eelgrass, milfoil, other
☐ other types of vegetation

- b. What kind and amount of vegetation will be removed or altered?

No vegetation alterations are proposed.

- c. List threatened and endangered species known to be on or near the site.

There are no known threatened or endangered plant species on or near the site.

- d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

None.

- e. List all noxious weeds and invasive species known to be on or near the site.

Prior to construction, the following species were found on site: Japanese knotweed (*Polygonum cuspidatum*), Canadian thistle (*Cirsium arvense*), Himalayan blackberry (*Rubus armeniacus*), western dock (*Rumex occidentalis*), common tansy (*Tanacetum vulgare*), and field morning glory (*Convolvulus arvensis*).

5. Animals [\[help\]](#)

- a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: hawk, heron, eagle, songbirds, other:

mammals: deer, bear, elk, beaver, other:

fish: bass, salmon, trout, herring, shellfish, other _____

Gulls, harbor seals, salmonids, etc.

- b. List any threatened and endangered species known to be on or near the site.

1. Southern resident killer whale (*Orcinus orca*)
2. Puget Sound Chinook (*Oncorhynchus tshawytscha*)
3. Puget Sound steelhead (*Oncorhynchus mykiss*)
4. Yelloweye rockfish (*Sebastes ruberrimus*)
5. Bocaccio (*Sebastes paucispinis*)
6. Bull trout (*Salvelinus confluentus*)
7. Marbled murrelet (*Brachyramphus marmoratus*)
8. Humpback Whale (*Megaptera novaeangliae*)

- c. Is the site part of a migration route? If so, explain.

The site is part of salmonid migration routes and the Pacific Flyway Migration Route for birds.

- d. Proposed measures to preserve or enhance wildlife, if any:

1. Project will adhere to agency approved work windows so work occurs when few juvenile salmonids are present in the action area (July 15 - February 15).
2. If required by governing agencies, water quality monitoring will be conducted during excavation activities,
3. All manmade construction debris will be collected and not allowed to enter waters of the state.
4. If debris or spill material accidentally enters the waterway, immediate actions will be taken to remove the material.

5. All debris or spill material will be properly disposed of at an approved off-site disposal facility.
6. As piles are pulled from the sediments, they will be quickly placed upland to minimize potential releases of creosote, petroleum sheens, and turbidity to the waterway. Piles will be properly disposed of at an approved upland disposal facility.
7. Contractor will maintain a spill containment kit with floating sausage booms on site at all times.
8. A turbidity curtain surrounding the site (as shown in the drawings) will be deployed prior to start of construction to minimize potential water quality impacts.

e. List any invasive animal species known to be on or near the site.

No invasive animal species are known to be in the area.

6. Energy and Natural Resources [\[help\]](#)

- a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Electricity will be needed for pier lighting.

- b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

The project has been designed to be of a low profile. The surrounding sites should not be adversely affected in their ability to collect sunlight for solar power.

- c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

Modern electric lighting fixtures will be used. No extraordinary energy control measures are proposed at this time.

7. Environmental Health [\[help\]](#)

- a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

- 1) Describe any known or possible contamination at the site from present or past uses.

Some diesel was found in the upland and cleaned up during installation of the boat storage building foundation. No further upland ground disturbance is proposed. There is no known contamination at the project site.

- 2) Describe existing hazardous chemicals/conditions that might affect project development

and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

No known hazardous conditions exist in the project area.

- 3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

The project is not anticipated to store, use, or produce any toxic or hazardous chemicals over its life.

- 4) Describe special emergency services that might be required.

No special emergency services are anticipated to be needed.

- 5) Proposed measures to reduce or control environmental health hazards, if any:

None.

b. Noise

- 1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Traffic on Harborview Drive and recreational power boating noise is present.

- 2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Noise from construction equipment is expected over the short-term while the project is being built. Other than noise associated with use as a public space, no long-term noise will be generated by the project. Construction noises will be created during daylight hours only. Public use noises may occur any time due to daily use, special events, etc.

- 3) Proposed measures to reduce or control noise impacts, if any:

None.

8. Land and Shoreline Use [\[help\]](#)

- a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The primary uses of the site is a waterfront park which includes a working netshed for the fishing fleet and public watercraft storage. The site is listed by in the Gig Harbor Shoreline Master Program as Historic, Working Waterfront.

- b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

The project site has not been used as working farm or forestlands.

- 1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

The site will not affect or be affected by surrounding working farm or forest land.

- c. Describe any structures on the site.

The Ancich Brother's Pier and historic netshed is in the northwest corner of the property atop a new pier. On the eastern edge of the property is the South Ancich Pier, on which the Jerkovich family has a 10' easement across the property to access the Jerkovich private floating docks.

- d. Will any structures be demolished? If so, what?

Yes, the existing gangway, floats, and associated piles will be removed.

- e. What is the current zoning classification of the site?

Waterfront Millville

- f. What is the current comprehensive plan designation of the site?

Downtown Centers of Local Importance and Regional Business

- g. If applicable, what is the current shoreline master program designation of the site?

Historic working waterfront

- h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

Yes, near marine nearshore.

- i. Approximately how many people would reside or work in the completed project?

None.

- j. Approximately how many people would the completed project displace?

Zero.

- k. Proposed measures to avoid or reduce displacement impacts, if any:

None.

- l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

None.

- m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

None.

9. Housing [\[help\]](#)

- a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

Zero.

- b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

Zero.

- c. Proposed measures to reduce or control housing impacts, if any:

None.

10. Aesthetics [\[help\]](#)

- a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Light poles on the piers will reach an approximate height of elevation 32' to 35' MLLW.

- b. What views in the immediate vicinity would be altered or obstructed?

Views from west and east along the harbor shoreline will now include the pier extension and gangway.

- c. Proposed measures to reduce or control aesthetic impacts, if any:

City Council and public works are working closely together to match aesthetic of other piers in the area.

11. Light and Glare [\[help\]](#)

- a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

The proposed pier and floats will be illuminated for pedestrian and boater safety.

- b. Could light or glare from the finished project be a safety hazard or interfere with views?

No light or glare is intended to be a safety hazard or interfere with views.

- c. What existing off-site sources of light or glare may affect your proposal?

Street and business lighting is nearby, but is not expected to affect the project site negatively.

- d. Proposed measures to reduce or control light and glare impacts, if any:

Bollard lights are meant to keep the lighting level low.

12. Recreation [\[help\]](#)

- a. What designated and informal recreational opportunities are in the immediate vicinity?

Walking, jogging, and other recreation associated with streets and open areas in an urban environment. In addition, kayaking, canoeing, and other forms of boating are adjacent to the site in Gig Harbor.

- b. Would the proposed project displace any existing recreational uses? If so, describe.

The proposed project does not displace any existing recreational uses and is meant to enhance both land-based and water-based uses.

- c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

The project is centered around providing a better space to be used for water-based recreation.

13. Historic and cultural preservation [\[help\]](#)

- a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.

Yes. The Ancich Netshed is currently a structure near the project site. The netshed is a historic building that supported the historic fishing industry in Gig Harbor.

- b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

There are no landmarks, features, or other evidence of Indian or historic use or occupation on the site, but archival research identified an ethnographically reported Native American village within 0.5 mile of the proposed Project. No evidence of historical resources were documented during the daily archaeological monitoring of the Ancich Park site.

- c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Consultation with the tribes and the department of archeology and historic preservation was completed for the Ancich Park project as well as archaeological surveys during construction (Corps No. NWS-2016-733).

- d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

None.

14. Transportation [\[help\]](#)

- a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

Harborview Drive is adjacent to the project site. No changes are proposed to any roadways for the project.

- b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

The site is served by a nearby Pierce Transit stop. The stop is serviced by Pierce Transit route 100.

- c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

Zero.

- d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

No.

- e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

- f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

Zero.

- g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No.

- h. Proposed measures to reduce or control transportation impacts, if any:

None.

15. Public Services [\[help\]](#)

- a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

No.

- b. Proposed measures to reduce or control direct impacts on public services, if any.

None.

16. Utilities [\[help\]](#)

- a. Circle utilities currently available at the site:

electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system,
other _____

- b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Potable water and secondary electrical.

C. Signature [\[HELP\]](#)

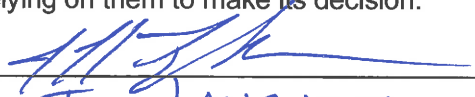
The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: _____

Name of signee _____

Position and Agency/Organization _____

Date Submitted: _____


JEFF LANGHEISER

PUBLIC WORKS DIRECTOR, CITY OF GIG HARBOR

11/16/2020

D. Supplemental sheet for nonproject actions [\[HELP\]](#)

(IT IS NOT NECESSARY to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?
Proposed measures to avoid or reduce such increases are:
2. How would the proposal be likely to affect plants, animals, fish, or marine life?
Proposed measures to protect or conserve plants, animals, fish, or marine life are:
3. How would the proposal be likely to deplete energy or natural resources?
Proposed measures to protect or conserve energy and natural resources are:
4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?
Proposed measures to protect such resources or to avoid or reduce impacts are:
5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?
Proposed measures to avoid or reduce shoreline and land use impacts are:
6. How would the proposal be likely to increase demands on transportation or public services and utilities?
Proposed measures to reduce or respond to such demand(s) are:
7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

Compensatory Mitigation Plan for

NWS-2018-981

Community Paddler's Dock (Ancich Park Public Launch Floats)

City of Gig Harbor

Gig Harbor, Washington

11/11/2020

Prepared by Nicole Foster

1. Project Description

Provide a brief description of the development project and the types of activities that will impact aquatic resources. If a more detailed project description is available in other documents in the application package, this section should just summarize the project description and cite the more detailed document(s).

The City of Gig harbor has recently constructed Ancich Park's boat storage building (Corps No. NWS-2016-733) and is now proposing to replace a portion of the neighbor's pier with a public, ADA accessible gangway and floats for launching human powered watercrafts.

The proposed project consists of the following elements:

1. Demolition

Removal of the existing gangway, floats, a finger float, and (14) 16-inch diameter creosote treated timber piles. Pile removal will be completed from a barge in the harbor using a vibratory hammer. All other structures will be removed from the site without the need for heavy equipment.

2. Launch and Finger Float Installation

(5) steel guide piles will be driven to keep the floating dock in place. Piles will be driven with a vibratory hammer as far as possible. They will then be driven to final depth with an impact hammer. (24) grounding posts will be installed beneath the corners of the specified float modules ensuring that they do not ground onto the seabed at low tides. Grounding posts will be installed by driving short segments of 12-inch (nominal) diameter steel pipe with a vibratory hammer. Grounding posts will be proofed with an impact hammer to verify bearing capacity. The crew will then lift and place precast panels, beams and top plates from the barge and weld or bolt onto the pile foundations. Float modules will be fabricated offsite, brought in via barge and splashed with the crane. They will be attached to the guide piles, over the grounding posts at a high tide. External pile hoops will bolt to the float modules.

3. Gangway Installation

An 80-foot gangway will be fabricated offsite, brought in via barge and lifted into position, connecting the fixed pier to the floating dock. Gangway connections will be installed without the need for heavy equipment.

2. Existing Conditions of Aquatic Resources

Provide brief description of aquatic resources (i.e., presence of vegetated shallows, presence and distribution of eelgrass and kelp and potential and documented forage fish spawning habitat, etc).

Ancich Waterfront Park is located in a heavily residentially, commercially developed, and heavily trafficked area of Gig Harbor. The property has a buffer of native shoreline plantings, a concrete bulkhead, two large piers, upland impervious and partially-impervious walkway areas, an upland building used for storage of canoes and kayaks and is situated between existing marinas. There is no eelgrass presence onsite, however benthic sugar kelps have been documented to the north the project site. Additionally, there is no documented forage fish spawning at the project site. However, surf smelt spawning is documented approximately 0.30 mile from the site, across the water on the northeast side of Gig Harbor.

3. Avoidance and Minimization of Aquatic Resource Impacts

Describe how adverse impacts, both direct and indirect, to aquatic resources will be avoided and minimized by the project to the greatest extent practicable. This should include consideration of project location, design, construction practices, monitoring efforts and/or other relevant factors.

Examples of avoidance and minimization measures: Retaining native vegetation along the bank where possible; relocating or reconfiguring pier, ramp, float, buoy to avoid eelgrass or kelp beds; minimizing width of structures; grating surfaces; working within established Corps work windows.

Note: If the project meets all construction specifications for the most current Regional General Permit Conditions or ESA Programmatic Consultation, simply state: The project meets all construction specifications for the most current Regional General Permit ## Conditions or ESA Programmatic Consultation for XX to avoid and minimize impacts.

- Use of grated surfaces to allow some light penetration into aquatic environment.
- Project revised from original plans to reduce total overwater coverage from 2,805 square feet to 1,614 square feet.
- Grounding posts will be used to prevent floats from resting on substrate and scouring marine vegetation.

4. Unavoidable Aquatic Resources Impact Acreage

Summarize the acreage of unavoidable aquatic resource impacts expected using a table similar to the following examples. Attach corresponding drawings.

Example Table 1
Expected Impacts to Aquatic Resources

Resource Identifier	Permanently Impacted Waters of the U.S. (sq ft)	Temporarily Impacted Waters of the U.S. (sq ft)	Permanently Impacted Riparian Area (sq ft)	Temporarily Impacted Riparian Area (sq ft)
High Tide Line – 13.59 feet	1,614 (area of installation)	1,096 (area of demolition)	--	--
High Tide Line – 13.59 feet	--	2,000 (area of beach clean-up)	--	--
TOTALS	1,614	3,096	--	--

5. Impacted Aquatic Resource Functions

Describe the functions that are expected to be lost or altered.

In the marine nearshore, overwater structures (OWS) may impede the nearshore movements of juvenile salmonids with fish stopping at the edge of the OWS and avoiding swimming into the shadow or underneath the structure which may force them temporarily into deeper habitat, thereby exposing them to increased piscivorous predation resulting in increased mortality. The reduced light regime under OWS could result in temporarily decreased visual ability and decreased feeding success for those juveniles that do swim under residential floats and in the short-term may result in decreased feeding success which could result in incrementally reduced growth and the decreased visual ability can lead to predation.

6. Mitigation Site Selection Rationale

If there is a Third Party Contractor (i.e., a salmon enhancement group), they should help you identify the location of their restoration site and its ecological relationship or ties to the resources at the location of the proposed OWS; for example, the relative close distance between the two sites; the similarity of resources and habitats, etc. Include a map showing the address and latitude and longitude of the mitigation site. Describe if it is part of a larger restoration project (i.e., your project is removal of 50 linear feet of a 300 linear foot bulkhead).

The intertidal debris to be removed is located in Gig Harbor, just west of the work site at lat/long 47.333928, -122.588564. The creosote piles to be removed are located onsite at Ancich Park. Mitigation was chosen via a watershed approach. There are no options for use of mitigation banks or in-lieu fee programs for marine impacts in Gig Harbor at this time. Additionally, onsite mitigation options were consistent with those described in Pierce County's "Key Peninsula, Gig Harbor and Islands Watershed Nearshore Salmon Habitat Assessment," one of the best available resources discussing mitigation options in the Gig Harbor watershed, including removal of derelict intertidal structure.

7. Mitigation Work Plan and Description of Aquatic Functions Provided at Mitigation Site

Provide a work description of the mitigation project and functions that are expected to be provided at the mitigation site. For example, "At the mitigation site, 100 linear feet of hardened bank protection will be removed and a natural shoreline will be restored. This will enhance and restore the nearshore habitat for juvenile salmonids and the improvements will offset the impacts to the nearshore by the proposed OWS". Include drawings and/or plans showing the mitigation work.

Removal of an estimated 3-5 cubic yards of intertidal debris over 2,000 square feet. Removal of 14 derelict full length creosote piles.

8. Site protection instrument. *A description of the legal arrangements and instrument, including site ownership, that will be used to ensure the long-term protection of the compensatory mitigation project site (see §332.7(a)). Examples could include a restrictive covenant, conservation easement, or listing on deed. If there is a Third Party Contractor (i.e., a salmon enhancement group), they can help you prepare these documents.*

The permit, work plans, and mitigation plan will be recorded on the property deed to ensure long-term protection of the compensatory mitigation.

9. Maintenance plan. *A description and schedule of maintenance requirements to ensure the continued viability of the resource once initial construction is completed. If there is a Third Party Contractor (i.e., a salmon enhancement group), they can help you prepare these plans.*

Because the nature of debris and structure removal as mitigation indicates only a one-time action, a maintenance plan is not indicated.

10. Performance standards. *Ecologically-based standards that will be used to determine whether the compensatory mitigation project is achieving its objectives. (See §332.5.) If the project is to remove structures, the one performance standard is that the structure will be removed to a location not in a water of the U.S. within a certain time period.*

Complete removal of 14 35-foot-long creosote piles and approximately 2,000 square feet of intertidal concrete debris. If any piles should break during removal and not allow full extraction they will be cut off below mudline.

11. Monitoring requirements. *A description of parameters to be monitored in order to determine if the compensatory mitigation project is on track to meet performance standards and if adaptive management is needed. A schedule for monitoring and reporting on monitoring results to the district engineer must be included. (See §332.6.) This may simply involve the submittal of as-built drawings and photographs.*

It is expected that a condition requiring reporting of complete mitigation to USACE will be included on the permit and fulfilled following completion of work. Because the nature of debris and structure removal as mitigation indicates only a one-time action, monitoring is otherwise not indicated.

12. Long-term management plan. *A description of how the compensatory mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management. (See §332.7(d).) Depending on the details of the site protection instrument, a long-term management plan may not be required.*

Because the nature of debris and structure removal as mitigation indicates only a one-time action, a long term management plan is not indicated.

No Net Loss Shoreline Ecological Functions Evaluation Form

1. Please provide a complete project description:

The objectives of the project, which are defined in City resolution 949 and the RCO grant application, are to preserve existing structures, restore the netshed, maintain community use, provide dock access for fishermen and personal/small non-motorized watercraft, access to the waterfront, and to provide restrooms and personal/small non-motorized watercraft storage.

Instructions: Please provide the requested information for each of the project-related questions set forth below. If the project doesn't include one or more of the development activities, indicate "not applicable" next to the topic. **Please note that the completed form must be submitted with the required shoreline permit application or shoreline permit exemption request in order for the application to be deemed complete.**

Shoreline Setback/Impervious Coverage

1. Existing Shoreline Setback (from the Ordinary High Water Mark): 30'
2. Proposed Shoreline Setback: N/A
3. Parcel Width (linear feet shoreline frontage): 200'
4. Proposed Shoreline Setback Area (sq. ft.): N/A
5. Number of existing accessory structures in setback area: 2
6. Number of accessory structures to be removed: 2
7. Net increase/decrease in impervious coverage: +518 SF over entire site

Native Vegetation (Areas in Sq. Ft.) within Shoreline Setback/Vegetation Conservation Area Buffer

1. Proposed Native Shrubs & Ground Cover: N/A
2. Proposed Lawn: N/A
3. Amount of Existing Lawn Removed: None
4. Amount of Existing Ornamental Shrubs Removed: None
5. Amount of Existing Invasive Species Removed: None
6. Amount of Aquatic Vegetation Removed: Minimal algae that is growing on the piers
7. Amount of Aquatic Vegetation Added: None

Shoreline Stabilization (Linear Feet)

1. Hard Shoreline Stabilization Added (wood/concrete vertical bulkhead, rock bulkhead, or riprap): 0'
2. Hard Shoreline Stabilization Removed: 0'
3. Hard Shoreline Stabilization Repaired: 0'

4. Hard Shoreline Stabilization Altered (setback landward): 0'
5. Geotech Report Provided (yes/no): No
6. Needs Assessment Required (yes/no): No
7. Soft Shoreline Stabilization Added: 0'
8. Soft Shoreline Stabilization Removed: 0'
9. Soft Shoreline Stabilization that replaced hard stabilization structure: 0'
10. Soft Shoreline Stabilization Altered: 0'

Overwater Coverage

1. Change in height of overwater structure (pier/dock): None
2. Amount of grating (sq. ft.): 1,614 SF
3. Amount of solid boards (decking) removed: 997 SF
4. Total length: 160'
5. Total Width: 6'-10'
6. Skirting removed (linear ft.): 0'
7. In-water structures removed: Floats and piles
8. Is a boat lift included in the proposal? No
9. Is the proposed overwater structure a "joint pier" used by more than one property owner: No

Biological Assessment
for the
Ancich Park Public Launch Floats Project
**The City of Gig Harbor and the Gig Harbor
Canoe & Kayak Racing Team**

September 2018

Submitted to:

U.S. Army Corps of Engineers
Seattle District Regulatory Branch
P.O. Box 3755
Seattle, Washington 98124

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ACRONYMS AND ABBREVIATIONS

• 3MP	Marine Mammal Monitoring Plan
• CFR	Code of Federal Regulations
• CV	Coefficient Variance
• dB	decibel
• DPS	Distinct Population Segment
• eDPS	Eastern Distinct Population Segment of Steller Sea Lion
• EFH	Essential Fish Habitat
• ESA	Endangered Species Act
• ESCA	Endangered Species Conservation Act
• FR	Federal Register
• MMPA	Marine Mammal Protection Act
• NMFS	National Marine Fisheries Service
• PSA	Proposed Similarity of Appearance
• PTS	Permanent Threshold Shift
• SEL	Sound Exposure Level
• USACE	United States Army Corps of Engineers
• USFWS	United States Fish and Wildlife Service
• WAC	Washington Administrative Code

1 Introduction

This Biological Assessment was prepared in accordance with Section 7(c) of the Endangered Species Act (ESA) regarding the potential effects on federally listed species and their habitats from the Ancich Park Public Launch Floats Project for the City of Gig Harbor and the Gig Harbor Canoe & Kayak Racing Team (hereafter, City). The proposed project is located within Gig Harbor, Washington. This project will include the installation of new human-powered watercraft launch floats, gangway, and access piers at Ancich Park. As this work will occur in the nearshore of Gig Harbor, the proposed project has the potential to impact species listed as threatened or endangered under the ESA and/or their critical habitat (Table 1). Additionally, the effects of the proposed project on essential fish habitat (EFH), pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the 1996 Sustainable Fisheries Act, are analyzed in Appendix I.

Table 1. Summary of Proposed Action Effects on ESA Listed Species and Their Critical Habitat

Species	Listing Status	Agency	Species Effects Determination	Critical Habitat in Action Area	Critical Habitat Effects Determination
Coastal Puget Sound Bull Trout (<i>Salvelinus confluentus</i>)	Threatened	USFWS	Not Likely to Adversely Affect	No	--
Dolly Varden (<i>Salvelinus malma</i>)	PSA Threatened	USFWS	Not Likely to Adversely Affect	No	--
Georgia Basin Bocaccio (<i>Sebastes paucispinis</i>)	Endangered	NMFS	Not Likely to Adversely Affect	Yes	Not Likely to Adversely Affect
Georgia Basin Yelloweye Rockfish (<i>Sebastes ruberrimus</i>)	Threatened	NMFS	Not Likely to Adversely Affect	Yes	Not Likely to Adversely Affect
Humpback Whale (<i>Megaptera novaeangliae</i>)	Threatened	NMFS	Not Likely to Adversely Affect	No	--
Marbled Murrelet (<i>Brachyramphus marmoratus</i>)	Threatened	NMFS	Not Likely to Adversely Affect	No	--
Puget Sound Chinook (<i>Oncorhynchus tshawytscha</i>)	Threatened	NMFS	Likely to Adversely Affect	Yes	Likely to Adversely Affect
Puget Sound Steelhead Trout (<i>Oncorhynchus mykiss</i>)	Threatened	NMFS	Likely to Adversely Affect	No	--
Southern Resident Killer Whale (<i>Orca orcinus</i>)	Endangered	NMFS	Not Likely to Adversely Affect	Yes	Not Likely to Adversely Affect

The status and occurrence of anadromous populations of bull trout in Puget Sound are subject to scientific debate surrounding separation of anadromous bull trout from the closely related anadromous Dolly Varden char (*Salvelinus malma*). Until further resolution is possible, the Washington Department of Fish and Wildlife has made a decision to manage all Puget Sound stocks as if they were a single bull trout/Dolly Varden complex (WDFW 2000). Therefore, no further mention of Dolly Varden char will be made in this document.

Several ESA listed species that could possibly occur in the project area are not evaluated further due to their rare or unconfirmed occurrence and lack of suitable/critical habitat in the action area. Therefore, the proposed project will have **no effect** on the following species: Canada Lynx (*Lynx canadensis*), Eulachon (*Thaleichthys pacificus*), Golden Paintbrush (*Castilleja levisecta*), Gray Wolf (*Canis lupus*), Green Sturgeon (*Acipenser medirostris*), Grizzly Bear (*Ursus arctos*), Leatherback Sea Turtle (*Dermochelys coriacea*), Northern Spotted Owl (*Stix occidentalis caurina*), Oregon Spotted Frog (*Rana pretiosa*), Streaked Horned Lark (*Eremophila alpestris strigata*), and Yellow-Billed Cuckoo (*Coccyzus americanus*).

2 Location

The project is located on the Gig Harbor waterfront in Gig Harbor, Washington (Section 5 of Township 21 of Range 2). Water quality in Gig Harbor, despite high development levels, is unimpaired (WDOE 2018). Two salmon-bearing streams, North Creek and Crescent Creek, drain into the harbor to the northwest of the project site. The project area includes the intertidal and subtidal zones (Figure 1).

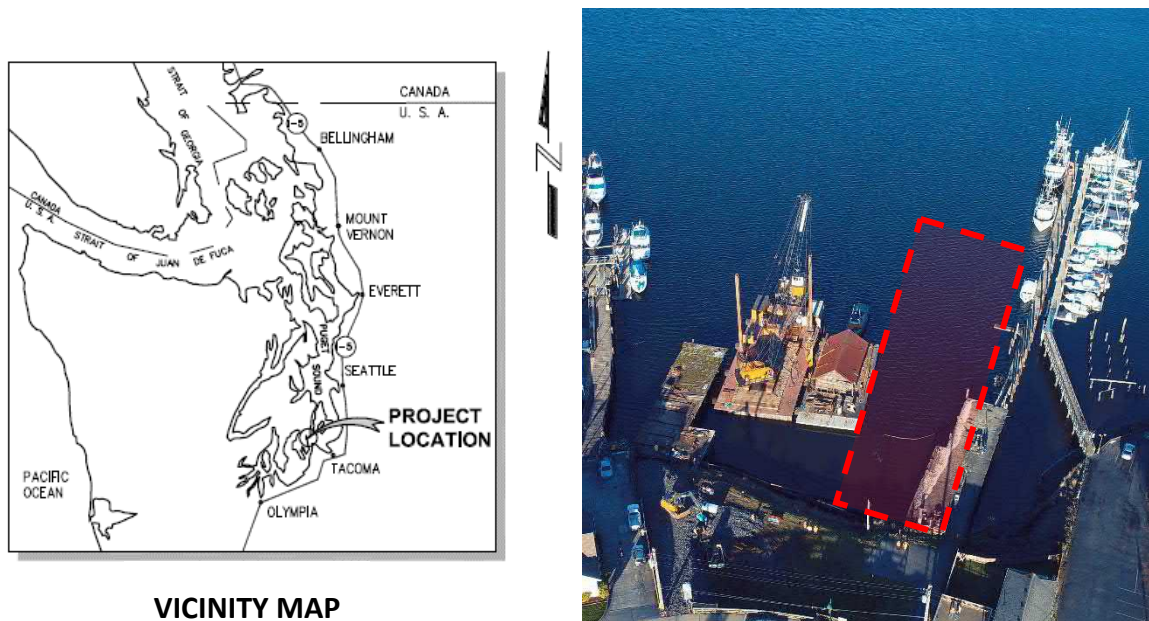


Figure 1. Vicinity Map & Project Location in Red

Two construction barges are present in the photo.

3 Project Description

The City of Gig Harbor has recently constructed Ancich Park's (Corps No. NWS-2016-733) new boat storage building for human-powered watercrafts. The City is now jointly proposing to incorporate ADA accessible, human-powered watercraft launch floats (Figure 2). The proposed project consists of the elements listed below, followed by summary tables (Tables 2 and 3):

1. Jerkovich Pier and Catwalk Demolition

The existing Jerkovich Pier and associated catwalk will be demolished. This will include the removal of (44) piles with a vibratory hammer.

2. South Ancich Pier and Extension Installation

(8) 12-inch (nominal) steel piles will be driven for the South Ancich Pier and Extension. All piles will be driven with a vibratory hammer as far as possible and then proofed with an impact hammer. Pile driving will be completed from a barge. Steel pile caps will be set from the barge and welded in place using scaffolding. Timber stringers, decking, rails, and accessories will be installed atop without the need for heavy equipment.

3. South Ancich Launch Floats Installation

(19) 12-inch (nominal) steel piles will be driven for the Launch Floats. Three of these piles will be used to ensure that the floats remain in place, and the remaining sixteen piles will be installed beneath the corners of the floats to ensure that they do not ground at low tides. These short piles are often referred to as 'grounding posts.' All piles will be driven with a vibratory hammer as far as possible and then proofed with an impact hammer. Pile driving will be completed from a barge. Float modules will be fabricated offsite, brought in via barge, and lowered into place with the crane.

4. South Ancich Gangway Installation

An 80-foot gangway will be fabricated offsite, brought in via barge and lifted into position, connecting the pier extension to the launch floats. Gangway connections will be installed without the need for heavy equipment.

5. Mitigation

a. Creosote-Treated Pile Removal

The project will remove (44) 12-inch- to 16-inch-diameter creosote timber piles along with the caps, stringers, and asphalt deck.

b. Beach Cleanup

The city also proposes to remove concrete debris from the beach northwest of Eddon Boat Park. The approximately 2,000 square feet of debris was identified during the initial mitigation proposal for NWS-2016-733.

c. Intertidal Shading

Upper intertidal shading will be reduced by approximately 1,455 square feet due to the removal of the remainder of the Jerkovich Pier, including its caps, stringers, and asphalt deck.



Figure 2. Aerial Image of Ancich Park Mid-Construction

Note that Jerkovich Pier has since been partially demolished per NWS-2016-733. –

Table 2. Pile Removal and Installation Summary

Structure	Piles Removed	Piles Installed	Net Change in Number of Piles
Jerkovich Pier	44 creosote-treated timber piles, 12-16" diameter each	8 steel piles, 12-inch (nominal) diameter each	-36
Launch Floats	0	19 steel piles, 12-inch (nominal) each	+19
Total	-44	+27	-17

Table 3. Overwater Coverage Summary

Structure	Net Change in Overwater Coverage
Jerkovich Pier Demolition	-1,455 SF (solid asphalt decking)
Catwalk Demolition	-912 SF (grated decking)
South Ancich Pier Installation	+830 SF (60% open area grating with 30% functional open area)
Pier Extension Installation	+720 SF (60% open area grating with 30% functional open area)
Gangway Installation	+480 SF (60% open area grating with 45% functional open area)
Launch Floats Installation	+775 SF (60% open area grating with 45% functional open area)
Total	+438 SF

3.1 Project Sequence

All in-water work will avoid the annual outmigration of juvenile salmonids and the breeding season for marbled murrelets. Per WAC Tidal Reference Area 4, the expected in-water work window is July 15 through February 15 of any year. The project is expected to occur over the course of one in-water work window, from July 2019 to February 2020. The City proposes the following general construction sequence, subject to adjustment by the construction contractor's means and methods:

1. Mobilize equipment
2. Remove catwalk
3. Demolish remaining decking of Jerkovich Pier
4. Pull up to 10 timber piles per day with a vibratory hammer
5. Drive up to 10 steel piles per day with vibratory and impact hammers
6. Install pier decking
7. Connect pier to gangway
8. Connect launch floats to gangway
9. Demobilize equipment

4 Impact Avoidance and Minimization Measures

The proposed project avoids impacts to the extent practicable, but some impacts cannot be avoided entirely as this project is dependent upon maritime access and construction activity. The following measures and best management practices will be incorporated by the applicant in order to avoid, reduce intensity, or otherwise minimize potential impacts:

- Potential adverse effects of this project on listed salmonids will be avoided or minimized through the adherence to agency-approved work windows when few juvenile salmonids are present in the action area (July 15 to February 15). When possible, pile removal and installation will occur during low tides so work can occur in the dry.
- Remove 44 creosote-treated timber piles from intertidal habitat, thus removing a potential source of contamination from the project area.
- Use a vibratory pile driver for pile removal and extract piles slowly to prevent breaking.
- All construction debris will be collected and not allowed to reenter waters of the state.
- The contractor will prepare a spill prevention control and countermeasures plan.
- If debris or spill material accidentally enters the waterway, immediate actions will be taken to remove the material, and proper entities will be notified.
- Care will be taken in all work to prevent debris, oils, and grease from entering the water.
- All debris or spill material will be properly disposed of at an approved off-site disposal facility.
- As piles are pulled from the sediments, they will be quickly placed onto a receiving barge or on land to minimize potential releases of creosote, petroleum sheens, and turbidity to the waterway. Any sediment plumes from this action will be temporary and will not extend beyond 200 feet from the project area.
- Piles will be properly disposed of at an approved upland disposal facility.
- Refueling will be conducted away from the project site in accordance with the Washington State Department of Ecology.

- All equipment will be checked daily for leaks and any necessary repairs will be made prior to commencement of work.
- Vessels will not be grounded.
- If fish are observed to be in distress or if a fish kill occurs, work will be stopped immediately. USACE and WDFW will be contacted by the City and work will not resume until approval is given by all of these agencies.
- A boom will be installed around the work area prior to removal of timber piles and related structures to contain and collect debris, which will be disposed of at an approved upland location.
- Every effort will be made to minimize release of adhering sediments when extracting piles that are pulled from the water.
- An agency-approved marine mammal monitoring plan (Appendix III) will be followed during vibratory and impact pile driving activities.

5 Action Area

The action area is defined by the ESA regulations (50 CFR 402.02) as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.” The action area is distinct from the project footprint and encompasses a larger area extending to where no measurable effects from the project are anticipated to occur. For this project, the action area includes the area within which project-related noise levels are ≥ 120 dB re $1 \mu PA_{rms}$ (i.e., the point where no take from the project would occur) in accordance with the NMFS’s threshold guidelines (Table 4).

Table 4. NMFS Interim Sound Threshold Guidance for Marine Mammals

Harassment Threshold		
Underwater (dB re: $1 \mu Pa$)		
Source	Cetaceans	Pinnipeds
Vibratory Installation (Non-impulsive Noise)	120	120
Impact Installation (Impulsive Noise)	160	160

NMFS has adopted the following Interim Criteria for injury and disturbance thresholds for fish (Stadler and Woodbury 2009):

Table 5. NMFS Interim Sound Threshold Guidance for Fish

Hearing Group	Pile Driving	
	Peak SEL	Accumulated SEL
Weight $\geq 2g$	206 dB	187 dB
Weight $< 2g$	--	183 dB

USFWS has adopted the following waterborne injury threshold for marbled murrelets:

Table 6. USFWS Interim Sound Threshold Guidance for Marbled Murrelets

Hearing Group	Impact Pile Driving	
	Auditory Injury Threshold	Non-Auditory Injury Threshold
Marbled Murrelets	202 dB SEL	208 dB SEL



Figure 3. Action Area in Red

Table 7 below calculates the disturbance zone based on the practical spreading loss model, per the interim guidance. The practical spreading loss model was used to determine the zones in which species have the potential to face behavioral disturbance from underwater noise. The formula for calculating practical spreading loss underwater is:

$$TL = GL \times \log \frac{R_1}{R_0}$$

Where TL is the transmission loss (dB) (i.e., the disturbance zone), GL is the geometric loss coefficient (15 is the only value allowed without real-time sound source verification), R1 is the range to the target sound pressure level (m), and R0 is the distance from the source of the initial measurement (m).

The maximum travel distance of underwater sound traveling from the pile driving is approximately 0.42 mi (0.68 km). The action area is constrained by the harbor topography.

Table 7. In-Water Injury and Disturbance Zones

Pile Size	Duration ¹	Source Levels (10 m from Pile) ²			Injury Zones and Acoustic Thresholds (meters)								Disturbance Zones (meters)		
		Peak (dB)	RMS (dB)	SEL (dB)	Fish, Peak	Fish (>2g)	Fish (≤2g)	Marbled Murrelet	Low- Frequency Cetacean	Mid- Frequency Cetacean	Phocid Pinniped	Otariid Pinniped	Fish	Marbled Murrelet	Marine Mammal
Vibratory Hammer															
Thresholds (dB SEL)					206	187	183	N/A	199	198	201	219	N/A	N/A	120 ³
12”(nom) steel	8 hrs/day	171	155	155	--	--	--	--	10.9	1.0	6.6	0.5	--	--	232.6
12”-16” timber	8 hrs/day	172	162	--	--	--	--	--	31.9	2.8	19.4	1.4	--	--	681.3
Impact Hammer															
Thresholds (dB SEL)					206	187	183	202	183	185	185	203	150	150 ⁴	160
12”(nom) steel	1,500 strikes/ day ⁵	192	169 ⁶	--	1	0	0	0	32.9	1.2	17.6	1.3	185	185	39.8

¹ Assumes up to 10 piles per day can be pulled or installed.

² Source levels were obtained from Caltrans (2015).

³ Ambient background levels at the site were recorded at 134.5 dB (Marine Mammal Monitoring Plan Attachment II).

⁴ USFWS considers this to be a guideline, not a threshold. In other words, murrelets may respond to sounds in this zone, but that response may not constitute an adverse effect.

⁵ Impact pile driving is particularly hard to estimate. There is not ample geotechnical information at the site and the seabed is not mapped for obstructions. It is assumed that 1,500 blows per day is a reasonable assumption, but this constraint will result in contractor shut downs if difficult pile driving occurs.

⁶ WSDOT (2018) has established an average reduction of 8-32 dB RMS with the use of a bubble curtain. To be conservative, a reduction of 8 dB RMS was used for impact pile driving only.

6 Species and Habitat Information

The ESA-listed species that may occur in the action area include Coastal Puget Sound bull trout, Georgia Basin bocaccio and yelloweye rockfish, humpback whale, marbled murrelet, Chinook salmon, steelhead trout, and Southern Resident Killer Whale. Critical habitat is present in the action area for Chinook salmon, Georgia Basin rockfishes, and Southern Resident Killer Whale.

6.1 Coastal Puget Sound Bull Trout

Gig Harbor bull trout are most likely from the White and Puyallup River Stocks, which includes an anadromous population (WRIA 10; WDFW 2004, Marks et al. 2014). However, there are no documented sightings or spawning habitat of bull trout in the action area. Only adult and sub-adult bull trout could potentially occupy the action area from spring through mid-summer (WDFW 2004). Following this season, bull trout migrate to freshwater river systems to overwinter. Therefore, it is unlikely bull trout will be present during construction (late-summer and into winter).

6.2 Georgia Basin Bocaccio and Yelloweye Rockfish

In central Puget Sound, bocaccio have historically been part of the recreational fishery with sharp population declines occurring in the late 1980s and 1990s. In Central Puget Sound and the Tacoma Narrows, available data on rockfish populations is based principally on recreational and some commercial harvest; much of which was collected in the 1960s and 1970s when the species were more common. Considering the absence of any bocaccio observations and lack of reports in the past decade, there is a strong possibility that the Distinct Population Segment (DPS) has been extirpated from most of its range, although a few individuals may be present in reserves or areas where all fishing is prohibited (NOAA Fisheries Species Information 2018). Juvenile bocaccio settle onto shallow nearshore waters in rocky or cobble substrate that support kelp growth at 3 to 6 months of age and move to progressively deeper waters as they grow (Love et al., 1991). Adults typically occupy waters deeper than 120 feet (Love et al., 2002). Yelloweye rockfish are more frequently observed in north Puget Sound. Their distribution most frequently coincides with high-relief, complex, rocky habitats deeper than 120 feet (NOAA Fisheries Species Information 2018, and Love et al., 2002). These habitats are not present in the action area. Juvenile yelloweye rockfish do not typically occupy intertidal waters and shallow habitats (Love et al., 1991). According to the EFH database (2018), juveniles are associated with a minimum water depth of 45 feet. Habitat in the action area is not optimal for adult rockfish or juvenile yelloweye due to a lack of deep water. Habitat in the action area is not optimal for juvenile bocaccio due to a lack of substrate that supports kelp. Based on the current known range of rockfish (northern Puget Sound) and narrow inlet into the harbor it is unlikely that that rockfish larva of either species would be present during construction; therefore, the effects would be discountable on all rockfishes.

6.2.1 Critical Habitat

The PCEs from 50 CFR Part 226 determined essential to the conservation of juvenile bocaccio include:

(1) Juvenile settlement habitats located in the nearshore with substrates such as sand, rock and/or cobble compositions that also support kelp are essential for conservation because these features enable forage opportunities and refuge from predators and enable behavioral and physiological changes needed for juveniles to occupy deeper adult habitats. Several attributes of these sites determine the quality of the area and are useful in considering the conservation value of the associated feature and in determining whether

the feature may require special management considerations or protection. These features also are relevant to evaluating the effects of an action in an ESA section 7 consultation if the specific area containing the site is designated as critical habitat. These attributes include:

(i) Quantity, quality, and availability of prey species to support individual growth, survival, reproduction, and feeding opportunities; and

- **Existing Conditions:** As the project is in a highly developed nearshore area, the quantity, quality, and availability of prey species is assumed to be severely degraded. This concurs with the statement by Frankenstein (2000) that “continuous cover of ulvoid macroalgae is impairing aquatic life from identified human causes at Gig Harbor.”
- **Effects to PCE:** The presence of overwater structures slightly reduces production of benthic and epibenthic macroinvertebrates in the action area. However, the long-term effect of overwater structures will be minimized with the addition of grating. Based on the small scale and brevity of habitat effects, it is expected that no appreciable loss of function will occur.

(ii) Water quality and sufficient levels of dissolved oxygen to support growth, survival, reproduction, and feeding opportunities.

- **Existing Conditions:** The condition of water quality in the action area is limited by several factors, including developed shorelines and the presence of creosote-treated timber piles.
- **Effects to PCE:** The project could result in some short-term increases in turbidity during construction, thereby temporally affecting water quality. However, an overall long-term improvement to water quality is expected with the removal of creosote-treated timber piles.

(2) Nearshore areas are contiguous with the shoreline from the line of extreme high water out to a depth no greater than 30 meters (98 ft) relative to mean lower low water.

- **Existing Conditions:** The action area is characteristic of an urban setting along a waterfront with a highly developed shoreline.
- **Effects to PCE:** The project will not alter the current discontinuous nature of the shoreline.

The PCEs from 50 CFR Part 226 determined essential to the conservation of adult bocaccio and adult and juvenile yelloweye rockfish include:

Benthic habitats and sites deeper than 30 m (98 ft) that possess or are adjacent to areas of complex bathymetry consisting of rock and or highly rugose habitat are essential to conservation because these features support growth, survival, reproduction, and feeding opportunities by providing the structure for rockfish to avoid predation, seek food and persist for decades. Several attributes of these sites determine the quality of the habitat and are useful in considering the conservation value of the associated feature, and whether the feature may require special management considerations or protection. These attributes are also relevant in the evaluation of the effects of a proposed action in an ESA section 7 consultation if the specific area containing the site is designated as critical habitat. These attributes include:

(1) Quantity, quality, and availability of prey species to support individual growth, survival, reproduction, and feeding opportunities;

- **Existing Conditions:** As the project is in a highly developed nearshore area, the quantity, quality, and availability of prey species is assumed to be severely degraded. This concurs with the statement by Frankenstein (2000) that “continuous cover of ulvoid macroalgae is impairing aquatic life from identified human causes at Gig Harbor.”
- **Effects to PCE:** The presence of overwater structures slightly reduces production of benthic and epibenthic macroinvertebrates in the action area. However, the long-term effect of overwater structures will be minimized with the addition of grating. Based on the small scale and brevity of habitat effects, it is expected that no appreciable loss of function will occur.

(2) Water quality and sufficient levels of dissolved oxygen to support growth, survival, reproduction, and feeding opportunities; and

- **Existing Conditions:** The condition of water quality in the action area is limited by several factors, including developed shorelines and the presence of creosote-treated timber piles.
- **Effects to PCE:** The project could result in some short-term increases in turbidity during construction, thereby temporally affecting water quality. However, an overall long-term improvement to water quality is expected with the removal of creosote-treated timber piles.

(3) The type and amount of structure and rugosity that supports feeding opportunities and predator avoidance.

- **Existing Conditions:** Benthic habitats and sites deeper than 30 m (98 ft) that possess or are adjacent to areas of complex bathymetry consisting of rock and or highly rugose habitat are not present in the action area.
- **Effects to PCE:** This PCE will not change as a result of the project.

6.3 Humpback Whale

The humpback whale is distributed worldwide in all ocean basins. In the North Pacific, five District Population Segments (DPSs) breed in subtropical and tropical waters from Asia to Central America then migrate north to feed in highly productive North Pacific feeding grounds (Bettridge *et al.* 2015). Humpback whales use coastal habitats because of their productivity and typically remain within about 50 nautical miles of shore (Evans 1987; Calambokidis and Steiger 1995). Humpbacks are not routinely present in Puget Sound due to a lack of appropriate habitat and food availability. However, sightings in the spring and summer have increased in recent years, but none within Gig Harbor. All Puget Sound sightings of humpback whales have occurred in May or July months with one occurrence in September (The Whale Museum 2018). Therefore, whale presence is unlikely during the proposed area from late-summer and into winter. Additionally, Gig Harbor is relatively shallow, and its inlet constricted; hence their occurrence in the harbor is expected to be extremely rare.

6.4 Marbled Murrelet

Marbled murrelets are small marine birds in the alcidæ family that nest in the coastal old-growth forests of the Pacific Northwest. The breeding season of the marbled murrelet generally begins in April, with most egg laying occurring in late May and early June. By the end of August, chicks have fledged and dispersed from nesting areas (Marks and Bishop 1999). Marbled murrelets differ from other seabirds in that its primary nesting habitat is old-growth coniferous forest within 50 to 75 miles of the coast. The nest typically consists of a depression on a moss-covered branch where a single egg is laid. When not nesting, the birds live at sea, spending their days

feeding and then moving several miles offshore at night (SEI 1999). Information provided by the WDFW PHS program (WDFW PHS 2018) does not identify any nesting areas for marbled murrelets within the action area. The occurrence of marbled murrelets in the project and action areas is expected to be very low considering the developed nature of the area, the shallow habitat, and the lack of nesting habitat in or near the action area.

6.5 Puget Sound Chinook

Chinook salmon occurring in the action area most likely originate from Crescent Creek. Adults are expected to migrate through Gig Harbor from August to September and juveniles may enter the harbor between February and July to rear, forage, and begin migration to the Pacific Ocean. Through strict adherence to the work window, juvenile chinook will not be in the harbor during construction. Salmon from other stocks have been documented in the Gig Harbor estuary, including those from the White and Puyallup River stocks (WRIA 10) and the Nisqually River stocks (WRIA 11).

Juvenile salmon are known to be affected by overwater structures causing disorientation, schooling, and altered migration routes into deeper waters (and closer to predators) around the structures. It is also known that the presence of overwater structures slightly reduces production of benthic and epibenthic macroinvertebrates that juvenile Chinook salmon and other listed fish prey upon. This contrasts with adult Chinook salmon as they usually inhabit water much deeper than where the proposed structures will be located and do not frequent the nearshore.

6.5.1 Critical Habitat

(1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development;

- **Existing Conditions:** The action area does not encompass freshwater spawning sites.
- **Effects to PCE:** This PCE will not be affected.

(2) Freshwater rearing sites with:

(i) Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;

- **Existing Conditions:** The action area does not encompass freshwater rearing sites.
- **Effects to PCE:** This PCE will not be affected.

(ii) Water quality and forage supporting juvenile development; and

- **Existing Conditions:** The action area does not encompass freshwater rearing sites.
- **Effects to PCE:** This PCE will not be affected.

(iii) Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

- **Existing Conditions:** The action area does not encompass freshwater rearing sites.
- **Effects to PCE:** This PCE will not be affected.

(3) Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation,

large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival;

- **Existing Conditions:** The action area does not encompass freshwater migration corridors.
- **Effects to PCE:** This PCE will not be affected.

(4) Estuarine areas free of obstruction and excessive predation with:

(i) Water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater;

- **Existing Conditions:** The condition of water quality in the action area is limited by several factors, including developed shorelines and the presence of creosote-treated timber piles.
- **Effects to PCE:** The project could result in some short-term increases in turbidity during construction, thereby temporally affecting water quality. However, an overall long-term improvement to water quality is expected with the removal of creosote-treated timber piles.

(ii) Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and

- **Existing Conditions:** The condition of the nearshore water quality is limited by several factors, including: developed shorelines; lack of complex habitat to provide cover in the form of overhanging large wood, and side channels; and the presence of non-natural overwater structures.
- **Effects to PCE:** The project will degrade this PCE through an increase in overwater coverage. The sharp underwater light contrasts from overwater structures can cause delays in migration from disorientation, fish schooling (dispersal resulting in a loss of refugia), and altered migration routes around the structures. An increase in overwater cover will continue to preclude colonization of aquatic vegetation. However, the long-term effect of overwater structures will be minimized with the addition of grating.

(iii) Juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

- **Existing Conditions:** Based on expected diet of Chinook salmon, a disturbance of the benthic community is unlikely to adversely affect juvenile or adult salmonids because juvenile salmon feed on floating and drifting invertebrates and small fishes.
- **Effects to PCE:** This PCE will not be affected in the long term. Temporary impacts from an increase in turbidity may disrupt pre fields.

(5) Nearshore marine areas free of obstruction and excessive predation with:

(i) Water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and

- **Existing Conditions:** The condition of water quality in the action area is limited by several factors, including developed shorelines and the presence of creosote-treated timber piles.

- **Effects to PCE:** The project could result in some short-term increases in turbidity during construction, thereby temporally affecting water quality. However, an overall long-term improvement to water quality is expected with the removal of creosote-treated timber piles.

(ii) Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.

- **Existing Conditions:** The condition of the nearshore water quality is limited by several factors, including: developed shorelines; lack of complex habitat to provide cover in the form of overhanging large wood and side channels; and the presence of non-natural overwater structures.
- **Effects to PCE:** The project will degrade this PCE through an increase in overwater coverage. The sharp underwater light contrasts from overwater structures can cause delays in migration from disorientation, fish schooling (dispersal resulting in a loss of refugia), and altered migration routes around the structures. However, the long-term effect of overwater structures will be minimized with the addition of grating.

(6) Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

- **Existing Conditions:** The action area does not encompass an offshore area.
- **Effects to PCE:** This PCE will not be affected.

6.6 Puget Sound Steelhead Trout

The species exhibits perhaps the most complex suite of life-history traits of any of the Pacific salmon. Steelhead can be anadromous or freshwater residents and in some circumstances yield offspring of the opposite life-history form. The anadromous form can spend up to seven years in freshwater prior to smoltification, although two years is most common, and then spend up to four years in saltwater prior to first spawning. Unlike the Pacific salmon species, steelhead are iteroparous (individuals can spawn more than once). Steelhead that would be present in the action area are most likely East Kitsap winter steelhead from WRIA 15 stocks (WDFW 2018). Spawning occurs in Crescent and North creeks, which drain into the northwest and southwest corners of Gig Harbor, respectively. The adult winter steelhead run is generally from December to February, and spawning occurs from March through June (Wydoski and Whitney 2003). Juvenile steelhead outmigrate from April through June, and are not anticipated in the nearshore of the action area in large numbers because the majority of steelhead smolts migrate directly to the open ocean (i.e., they are not nearshore dependent) and do not rear extensively in the estuarine or coastal environments (Burgner et al. 1992). Therefore, through strict adherence to the work window, juvenile steelhead will not be in the harbor during construction. Similar to adult Chinook, steelhead usually inhabit water much deeper than where the proposed structures will be located and do not frequent the nearshore, but they may be in the action area.

6.7 Southern Resident Killer Whale

The Puget Sound Southern Resident Killer Whale spends more time in Puget Sound than transient orcas, travel in larger pods, and eat mostly fish (Krahn et al. 2004). These residents consist of three social groups, identified as the J, K, and L pods (NOAA Fisheries Species Information). In recent years, they have been regularly spotted as far south as central California during the winter months and as far north as Southeast Alaska (NOAA Fisheries Species Information). NOAA has designated three critical areas for Southern Resident Killer Whales by seasonal appearance. The action area is located in Area 2 - Fall/Winter (NMFS 2006). In 2018 there were multiple

sightings of killer whales off Vashon Island, but are mostly reported to be transient populations. Most sighting occurred in fall and none occurred within Gig Harbor (The Whale Museum 2018). Similar to the Humpback Whale, occurrence in the harbor is expected to be rare due to the relatively shallow bathymetry and constricted inlet.

6.7.1 Critical Habitat

The PCEs from 50 CFR Part 226 determined essential to the conservation of Southern Resident DPS Killer Whales (Area 2 – Puget Sound Area) are:

(1) Water quality to support growth and development.

- **Existing Conditions:** The condition of water quality in the action area is limited by several factors, including developed shorelines and the presence of creosote-treated timber piles.
- **Effects to PCE:** The project could result in some short-term increases in turbidity during construction, thereby temporally affecting water quality, but this effect will remain within the harbor. However, an overall long-term improvement to water quality is expected with the removal of creosote-treated timber piles.

(2) Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development as well as overall population growth.

- **Existing Conditions:** The project area provide refuge and support to prey species. As the project is in a highly developed nearshore area, the quantity, quality, and availability of prey species is assumed to be severely degraded. This concurs with the statement by Frankenstein (2000) that “continuous cover of ulvoid macroalgae is impairing aquatic life from identified human causes at Gig Harbor.”
- **Effects to PCE:** Water quality improvements to the harbor through the removal of creosote contaminants will benefit salmon. The project will not significantly decrease the number of adult salmon in South Puget Sound, and thus has no mechanism to affect prey base.

(3) Passage conditions to allow for migration, resting, and foraging.

- **Existing Conditions:** Gig Harbor is relatively shallow, and its inlet constricted; hence migration, resting, and foraging are unlikely to occur in the harbor.
- **Effects to PCE:** This PCE will not be affected.

7 Environmental Baseline

7.1 Terrestrial Habitat

The site consists of 0.42 acres of upland and two piers that extend over the intertidal and subtidal area of Gig Harbor. A concrete bulkhead runs along the length of the shoreline on the property (approximately 200 linear feet). Upland vegetation will consist of a City-maintained vegetated buffer along a concrete vertical bulkhead following completion of NWS-2016-733. At present, there is no upland vegetation due to construction. Plantings are expected to be installed by the end of 2018. Paved driveways with parking areas run along the eastern and western site boundaries. A personal/small non-motorized watercraft storage building is tucked into the existing hillside with a roof deck elevation matching the current sidewalk elevation. The building also has a chair lift to

provide ADA access to the park below and to each pier from the building, as the adjacent driveways are not to code. The Ancich Pier to the west has been replaced with new materials, including steel piles and timber planks to support the historic Ancich Brothers' Netshed. The remaining portion of the Jerkovich Pier is in disrepair from the asphalt surfacing atop the timber decking causing many structural failures. A catwalk has been installed overtop the existing structure that extends to the existing Jerkovich family floating moorage.

Dominant land use in the project vicinity is primarily urban and residential. The project area is zoned as Waterfront/Millville (City of Gig Harbor Municipal Code 17.48). The action area is characteristic of an urban setting along a waterfront. Vehicle traffic is moderately heavy along Harborview Road, and vessel traffic primarily consists of recreational vessels.



Figure 4. Ancich Park Shoreline September 2018

Ancich Pier and the Ancich Brothers' Netshed to the right and the turn-around area (NWS-2016-733) is to the left.

7.2 Aquatic Habitat

The shoreline of Gig Harbor is substantially altered with bulkheads, docks, and marinas. Water quality assessments from the Washington Department of Ecology show that water quality in Gig Harbor is not currently impaired (WDOE 2018). Temperature is rated as Category 1. Two major creeks drain into Gig Harbor, including Crescent Creek and North Creek. These creeks are known to be used by coho salmon, fall/winter chum, odd-year pink, and summer/winter steelhead (WDFW, 2018).

Both piers extend to approximately -3 feet MLLW. The backshore is hardened with a concrete bulkhead, the bottom of which is at +9 feet MLLW. The intertidal zone is gradually sloping, with a substrate of gravels transitioning to silty sand sub-tidally. A macrovegetation survey found no eelgrass or kelp habitat in the vicinity of the project (PND, 2018 and Hart Crowser, 2016).

8 Analysis of Effects

The effects of the project on ESA-listed species and their critical habitat are described in this section. The discussion describes how activities associated with the project will contribute to improvement, maintenance, or

degradation of habitats used by listed species. Potential disturbances caused by project activities are presented along with measurable indicators of habitat health.

8.1 Direct Impacts

Construction activities will likely have temporary direct impacts on habitat through increases in underwater sound from pile installation/removal and increases in turbidity. Best management practices and mitigation methods will be used to minimize these effects. The level of disturbance and habitat alteration in the project area will be insignificant and discountable, especially when considered in relation to the activity already taking place in developed harbor. While it is possible that species avoid the project area during pile driving, they are not likely to abandon the site altogether.

Pile installation will result in the burial of benthic habitat. This is a temporary effect, as the area will recolonize. Removal of such habitat may affect microorganisms such as zooplankton aggregation, but with no baseline data on their abundance, this will be an imperceptible impact of the project upon the prey food web.

A permanent and direct impact of the project will be an increase in overwater coverage by 1,845 square feet.

8.2 Indirect Impacts

Likely indirect effects of the proposed action on listed species may include disruption of prey fields and temporary behavioral responses to non-injurious noise from in-water construction activities. Physical elements of habitat will not be significantly affected by the proposed action. Underwater sounds will likely disaggregate schools of forage fish in the water column in the action area. Turbidity may also temporarily disperse prey in the water column, and burial of non-motile prey species will remove them from the prey field. ESA-listed species may experience some energetic cost from dispersal of prey, resulting in short-term expenditure of energy seeking other sources or browsing while waiting for prey to re-aggregate following noise and turbidity effects.

8.3 Cumulative Impacts

This section discusses how activities associated with project will contribute to improvement, maintenance, or degradation of habitats used by ESA-listed species in the project area. Potential disturbances caused by project activities are presented along with measurable indicators of habitat health. Net effect is considered to be the overall effect on the species and habitat in the long term. If short term adverse conditions occur when few or no listed species are present in the action area, and if those conditions are no longer present when listed species return to the area, those conditions do not constitute adverse modification of the indicator of habitat quality.

Table 8. Effects of Project Activities on Habitats in the Project and Action Areas

Project Activities	Habitat Indicator	Effects of Action		
		Improve ¹	Maintain ²	Degrade ³
Construction Disturbances	Noise		X	
	Entrainment		X	
	Stranding		X	
Water Quality Disturbance	Turbidity		X	
	Chemical Contamination/Nutrients	X		
	Temperature		X	
	Dissolved Oxygen		X	
Sediment	Sedimentation Sources/Rates		X	

Disturbance	Sediment Quality		X	
Habitat Disturbance	Fish Access/Refugia		X	
	Depth		X	
	Substrate		X	
	Slope		X	
	Shoreline		X	
	Riparian Conditions		X	
	Flow And Hydrology/Current Patterns/ Saltwater-Freshwater Mixing Patterns		X	
	Overwater Structures			X
	Disturbance		X	
Biota Disturbance	Prey (Epibenthic And Pelagic Zooplankton)		X	
	Prey (Forage Fish)		X	
	Infauna		X	
	Aquatic/Wetland Vegetation		X	
	Nonindigenous Species		X	
	Ecological Diversity		X	

1 Action will contribute to long-term improvement, over existing conditions, of the habitat indicator.

2 Action will maintain existing conditions.

3 Action will contribute to long-term degradation, over existing conditions, of the habitat indicator.

9 Conclusions and Effect Determinations

The effects determination is the conclusion of the analysis of potential direct or indirect effects of the proposed activity on listed species and critical habitat. The conclusions that could result from the effects analysis for the effects determination include:

- **No Effect.** The appropriate conclusion when the action agency determines its proposed action will not affect listed species or critical habitat.
- **May Affect, is Not Likely to Adversely Affect.** The appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects on the species. Insignificant effects relate to the size of the impact and should never reach the scale at which take occurs. Discountable effects are those extremely unlikely to occur. Using best judgment, a person would not (1) be able to meaningfully measure, detect, or evaluate insignificant effects or (2) expect discountable effects to occur.
- **May Affect, is Likely to Adversely Affect.** The appropriate conclusion if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial (see definition of “may affect, is not likely to adversely affect”).

A key factor in making an effect determination and distinguishing between a significant and insignificant effect is determining whether the effect would be significant enough to cause a take.

9.1 Coastal Puget Sound Bull Trout

Based on the guidance and definitions provided above and the previously discussed project effects, the project may affect coastal Puget Sound bull trout because waterborne sound levels will exceed disturbance criteria during pile driving and removal operations. However, the project is not likely to adversely affect bull trout because sound levels that exceed disturbance criteria will only occur within Gig Harbor, where bull trout are very unlikely to be present during the proposed construction timeframe. Therefore, the effect determination is that this project **may affect, but is not likely to adversely affect**, bull trout.

9.2 Georgia Basin Bocaccio and Yelloweye Rockfish

Based on the guidance and definitions provided above and the previously discussed project effects, the project may affect coastal Georgia Basin bocaccio and yelloweye rockfish and their critical habitat because of a slight reduction in benthic and epibenthic macroinvertebrates prey. However, the project is not likely to adversely affect rockfish due to a lack of preferred habitat and a very unlikely presence during the work window. Therefore, the effect determinations are that this project **may affect, but is not likely to adversely affect** bocaccio and yelloweye rockfish and their critical habitat.

9.3 Humpback Whale

Based on the guidance and definitions provided above and the previously discussed project effects, the project may affect humpback whales because waterborne sound levels will exceed disturbance criteria during pile driving and removal operations. However, the project is not likely to adversely affect humpback whales because sound levels that exceed disturbance criteria will only occur within Gig Harbor, where humpback whales are very unlikely to be present during the proposed construction timeframe. Therefore, the effect determination is that this project **may affect, but is not likely to adversely affect**, humpback whales.

9.4 Marbled Murrelet

Based on the guidance and definitions provided above and the previously discussed project effects, the project may affect marbled murrelets because sound levels will exceed disturbance criteria during pile driving and removal operations. However, the project is not likely to adversely affect marbled murrelets because sound levels that exceed disturbance criteria will only occur within Gig Harbor, where marbled murrelets are very unlikely to be present during the proposed construction timeframe. Therefore, the effect determination is that this project **may affect, but is not likely to adversely affect**, marbled murrelets.

9.5 Puget Sound Chinook

Based on the guidance and definitions provided above and the previously discussed project effects, the project **is likely to adversely affect** Puget Sound Chinook salmon and their critical habitat due to an increase in nearshore overwater coverage disorienting, schooling, and altering migration patterns of juveniles and a slight reduction in benthic and epibenthic macroinvertebrates prey. However, the long-term effect of overwater structures will be minimized with the addition of grating. Additionally, overall long-term improvement to water quality is expected with the removal of creosote-treated timber piles.

9.6 Puget Sound Steelhead Trout

Based on the guidance and definitions provided above and the previously discussed project effects, the project **is likely to adversely affect** Puget Sound steelhead trout due to a slight reduction in benthic and epibenthic



macroinvertebrates prey. However, overall long-term improvement to water quality is expected with the removal of creosote-treated timber piles.

9.7 Southern Resident Killer Whale

Based on the guidance and definitions provided above and the previously discussed project effects, the project may affect Southern Resident Killer Whales and their critical habitat because waterborne sound levels will exceed disturbance criteria during pile driving and removal operations. But the project is not likely to adversely affect Southern Resident Killer Whales and their critical habitat because temporary sound levels that exceed disturbance criteria will only occur within Gig Harbor, where Southern Resident Killer Whales are very unlikely to be present during the proposed construction timeframe. Therefore, the effect determination is that this project **may affect, but is not likely to adversely affect** Southern Resident Killer Whales and their critical habitat.

10 References

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APPENDIX I – ESSENTIAL FISH HABITAT ASSESSMENT



ESSENTIAL FISH HABITAT ASSESSMENT

Action Agency: U.S. Army Corps of Engineers

Project Name: Ancich Park Public Launch Floats Project

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires federal agencies, such as the USACE, to consult with NOAA Fisheries on activities that may adversely affect essential fish habitat (EFH). The EFH provision aims to identify and protect habitats for federally managed fish species covered under Fishery Management Plans. The federally managed species that are documented in Gig Harbor include species from the following fisheries: Coastal Pelagic, Groundfish, and Salmonids (Table 1). For further discussion on the effects of the proposed action and conservation measures, please refer to the Biological Assessment.

Table 1. Essential Fish Habitat Species Documented in Gig Harbor

Coastal Pelagic Species	
Chub Mackerel, <i>Scomber japonicus</i>	Northern Anchovy, <i>Engraulis mordax</i>
Jack Mackerel, <i>Trachurus symmetricus</i>	Pacific Sardine, <i>Sardinops sagax</i>
Market Squid, <i>Loligo opalescens</i>	
Groundfish Species	
Arrowtooth Flounder, <i>Atheresthes stomias</i>	Pacific Sanddab, <i>Citharichthys sordidus</i>
Big Skate, <i>Raja binoculata</i>	Petrale Sole, <i>Eopsetta jordani</i>
Lingcod, <i>Ophiodon elongatus</i>	Quillback Rockfish, <i>S. maliger</i>
Black Rockfish, <i>Sebastes melanops</i>	Redbanded Rockfish, <i>S. babcocki</i>
Bocaccio, <i>S. paucispinis</i>	Redstripe Rockfish, <i>S. proriger</i>
Brown Rockfish, <i>S. auriculatus</i>	Rex Sole, <i>Errex zachirus</i>
Butter Sole, <i>Pleuronectes isolepis</i>	Rock Sole, <i>Pleuronectes bilineata</i>
Cabazon, <i>Scorpaenichthys marmoratus</i>	Rosethorn Rockfish, <i>S. helvomaculatus</i>
California Skate, <i>R. inornata</i>	Rosy Rockfish, <i>S. rosaceus</i>
Canary Rockfish, <i>S. pinniger</i>	Rougheye Rockfish, <i>S. aleutianus</i>
China Rockfish, <i>S. nebulosus</i>	Sablefish, <i>Anoplopoma fimbria</i>
Copper Rockfish, <i>S. caurinus</i>	Sand Sole, <i>Psettichthys melanostictus</i>
Curlfin Sole, <i>Pleuronichthys decurrens</i>	Sharpchin Rockfish, <i>S. zacentrus</i>
Darkblotched Rockfish, <i>S. crameri</i>	Shortspine Thornyhead, <i>Sebastolobus alascanus</i>
Dover Sole, <i>Microstomus pacificus</i>	Spiny Dogfish, <i>Squalus acanthias</i>
English Sole, <i>Pleuronectes vetulus</i>	Splitnose Rockfish, <i>S. diploproa</i>
Flathead Sole, <i>Hippoglossoides elassodon</i>	Spotted Ratfish, <i>Hydrolagus coliei</i>
Greenstriped Rockfish, <i>S. elongatus</i>	Starry Flounder, <i>Platichthys stellatus</i>
Jack Mackerel, <i>Trachurus symmetricus</i>	Stripetail Rockfish, <i>S. saxicola</i>
Kelp Greenling, <i>Hexagrammos decagrammus</i>	Tiger Rockfish, <i>S. nigrocinctus</i>
Longnose Skate, <i>R. rhina</i>	Vermilion Rockfish, <i>S. miniatus</i>
Pacific Cod, <i>Gadus macrocephalus</i>	Yelloweye Rockfish, <i>S. ruberrimus</i>
Pacific Hake, <i>Merluccius productus</i>	Yellowtail Rockfish, <i>S. flavidus</i>
Pacific Ocean Perch, <i>S. alutus</i>	
Salmonid Species	
Chinook Salmon, <i>Oncorhynchus tshawytscha</i>	Puget Sound Pink Salmon, <i>O. gorbuscha</i>
Coho Salmon, <i>O. kisutch</i>	

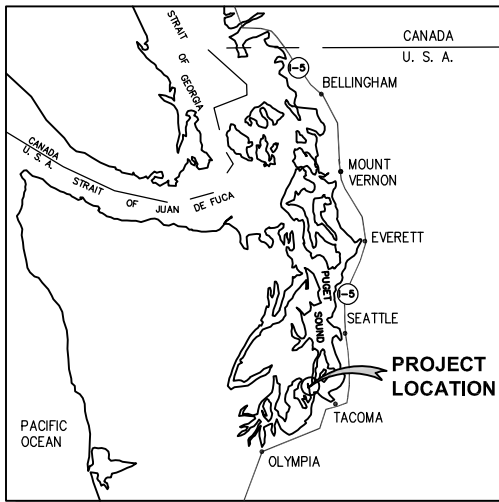


Conclusion and Effect Determination

Based on the guidance above and the previously discussed project effects and conservation measures, this project will have **no adverse effect** on designated EFH in the project and action areas



APPENDIX II – DRAWING SET



VICINTY MAP

VERTICAL DATUM CONVERSION

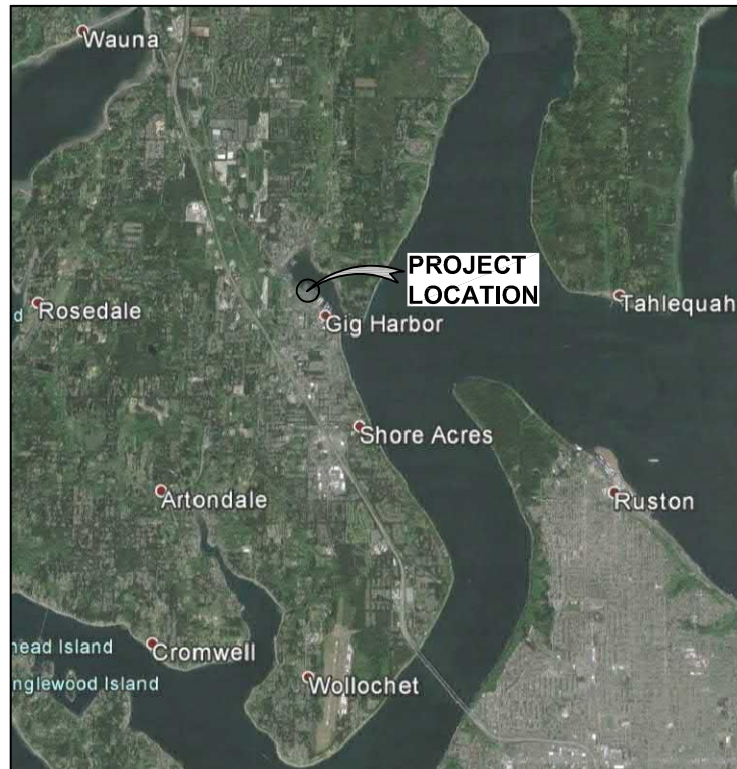
(FEMA BFE = +14 NAVD 88)

MLLW	NGVD 29	NAVD 88	DATUM PLANE
+17.00	+10.54	+14.00	- FEMA FLOOD ELEV.
+13.80	+7.34	+10.80	- HIGHEST OBSERVED
+12.80	+6.34	+9.80	- ORDINARY HIGH WATER
+11.80	+5.34	+8.80	- MEAN HIGHER HIGH WATER
+11.00	+4.54	+8.00	- MEAN HIGH WATER
+6.90	+0.44	+3.90	- MEAN TIDE LEVEL
+2.80	-3.66	-0.20	- MEAN LOW WATER
0.00	-6.46	-3.00	- MEAN LOWER LOW WATER
-4.30	-10.76	-7.30	- LOWEST OBSERVED

SOURCES:

MLLW: US ARMY CORPS OF ENGINEERS' SOUTH PUGET SOUND REGION TIDAL DATUM #72 - GIG HARBOR

NGVD 29 AND NAVD 88: NOAA's VERTICAL DATUM TRANSFORMATION (v3.3) AT JERISICH DOCK (LAT 47.3310, LONG -122.5816)



LOCATION MAP

PURPOSE: INSTALL PUBLIC ACCESS PIER AND LAUNCH FLOATS.

DATUM: 0.0' M.L.L.W.

ADJACENT PROPERTY OWNERS:

1. CAROLYN S. BERG
2. FRISBIE ROBERT G
3. TARABOCHIA DOMINICH J JR AND ANCICH LLC
4. PUBLIC RIGHT OF WAY

ANCICH PARK PUBLIC LAUNCH FLOATS

VICINITY AND SITE MAP

CITY OF GIG HARBOR
3525 HARBORVIEW DR.
GIG HARBOR, WA 98335

PROPOSED: PIER AND LAUNCH FLOATS.

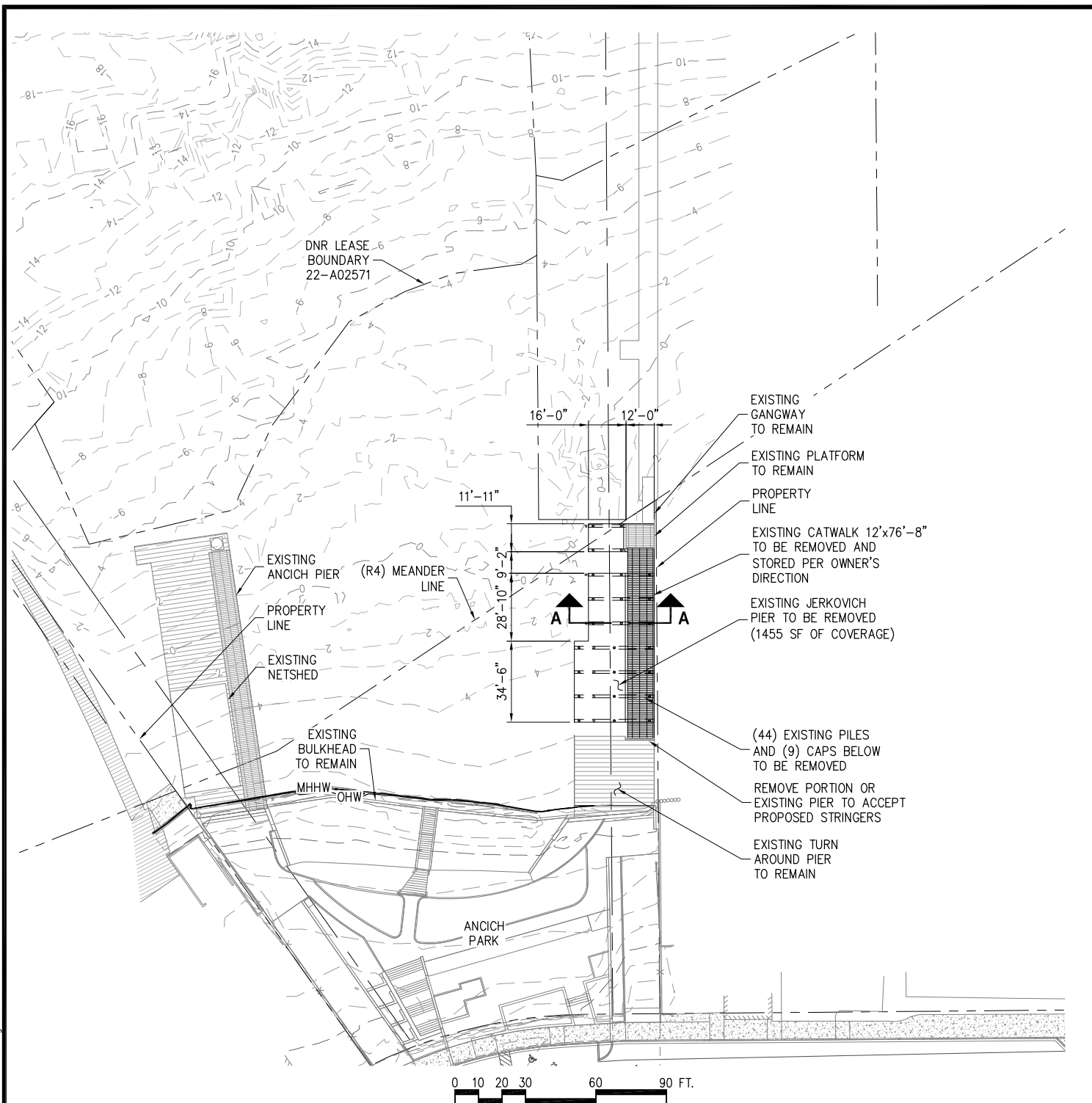
IN: GIG HARBOR

AT: GIG HARBOR, WA, PIERCE CO. SEC. 5, T21N, R2E

APPLICATION BY:

CITY OF GIG HARBOR

SHEET 1 of 11 DATE: SEPT. 2018



PURPOSE: INSTALL PUBLIC ACCESS PIER AND LAUNCH FLOATS.

DATUM: 0.0' M.L.L.W.

ADJACENT PROPERTY OWNERS:

1. CAROLYN S. BERG
2. FRISBIE ROBERT G
3. TARABOCHIA DOMINICH J JR AND ANCICH LLC
4. PUBLIC RIGHT OF WAY

ANCICH PARK PUBLIC LAUNCH FLOATS

EXISTING CONDITIONS AND DEMOLITION PLAN

CITY OF GIG HARBOR
3525 HARBORVIEW DR.
GIG HARBOR, WA 98335

PROPOSED: PIER AND LAUNCH FLOATS.

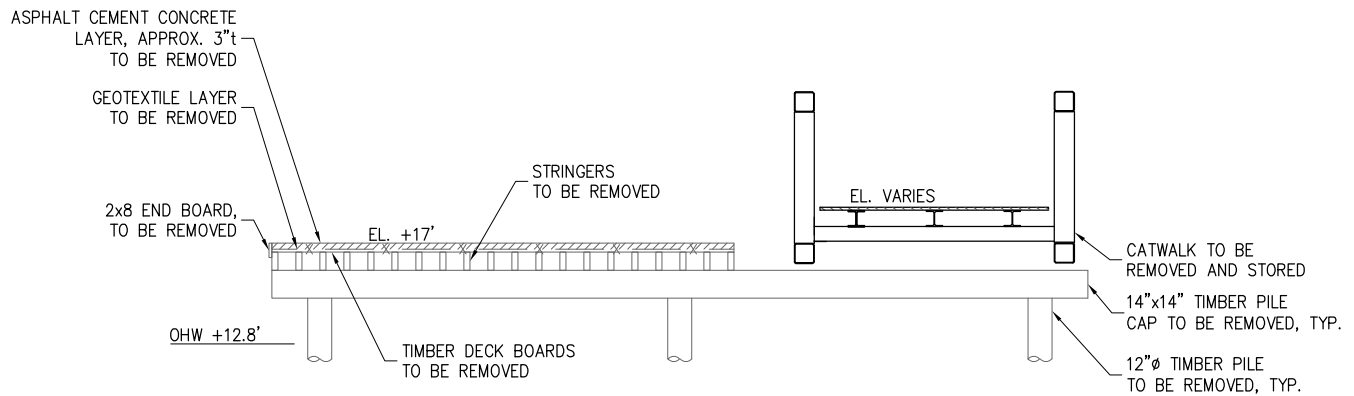
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AT: GIG HARBOR, WA, PIERCE CO. SEC. 5, T21N, R2E

APPLICATION BY:

CITY OF GIG HARBOR

SHEET 2 of 11 DATE: SEPT. 2018



SECTION A-A

PURPOSE: INSTALL PUBLIC ACCESS PIER AND LAUNCH FLOATS.

DATUM: 0.0' M.L.L.W.

ADJACENT PROPERTY OWNERS:

1. CAROLYN S. BERG
2. FRISBIE ROBERT G
3. TARABOCHIA DOMINICH J JR AND ANCICH LLC
4. PUBLIC RIGHT OF WAY

ANCICH PARK PUBLIC LAUNCH FLOATS

DEMOLITION SECTION

CITY OF GIG HARBOR
3525 HARBORVIEW DR.
GIG HARBOR, WA 98335

PROPOSED: PIER AND LAUNCH FLOATS.

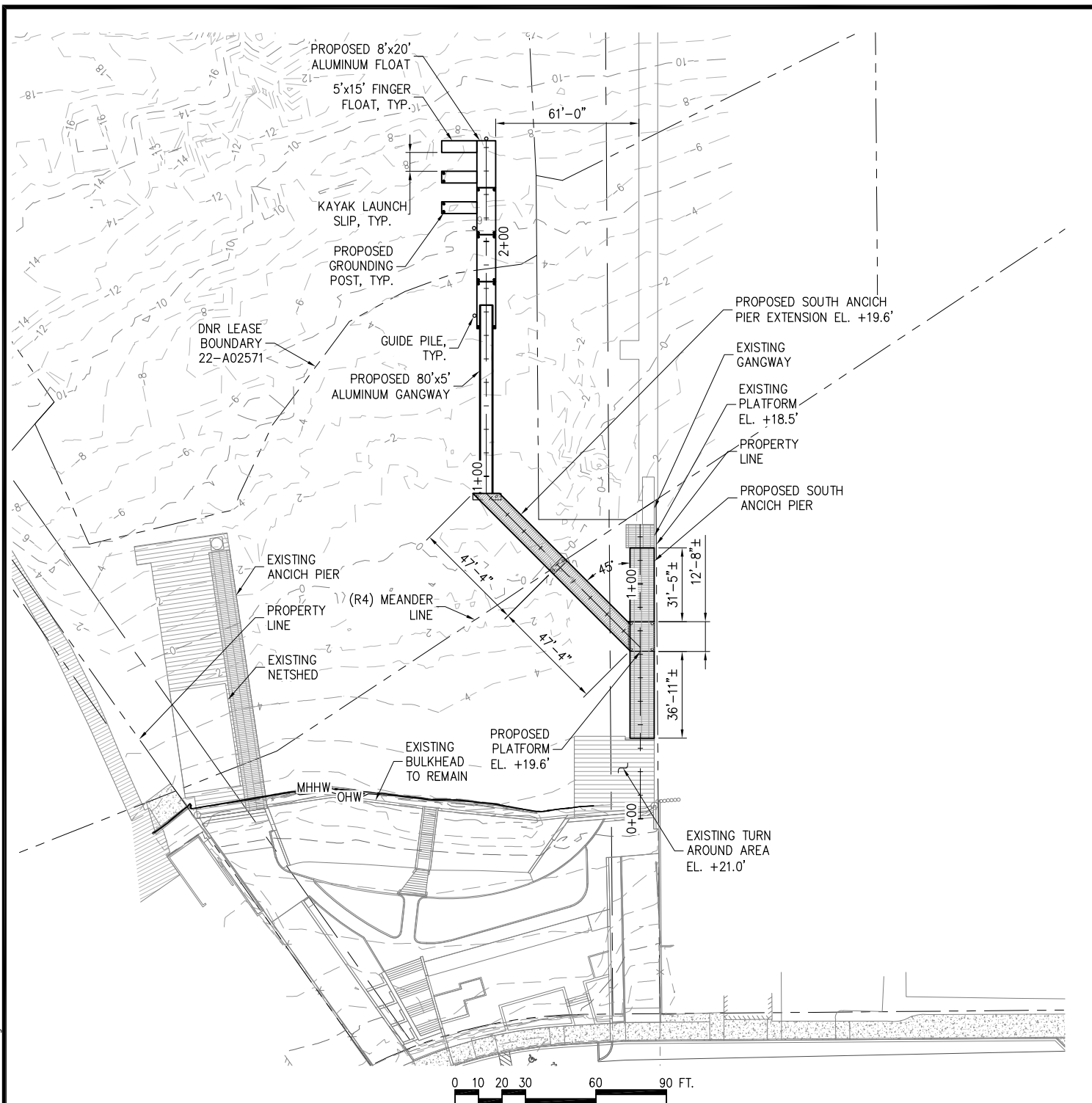
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APPLICATION BY:

CITY OF GIG HARBOR

SHEET 3 of 11 DATE: SEPT. 2018



PURPOSE: INSTALL PUBLIC ACCESS PIER AND LAUNCH FLOATS.

DATUM: 0.0' M.L.L.W.

ADJACENT PROPERTY OWNERS:

1. CAROLYN S. BERG
2. FRISBIE ROBERT G
3. TARABOCHIA DOMINICH J JR AND ANCICH LLC
4. PUBLIC RIGHT OF WAY

ANCICH PARK PUBLIC LAUNCH FLOATS

PROPOSED CONDITIONS

CITY OF GIG HARBOR
3525 HARBORVIEW DR.
GIG HARBOR, WA 98335

PROPOSED: PIER AND LAUNCH FLOATS.

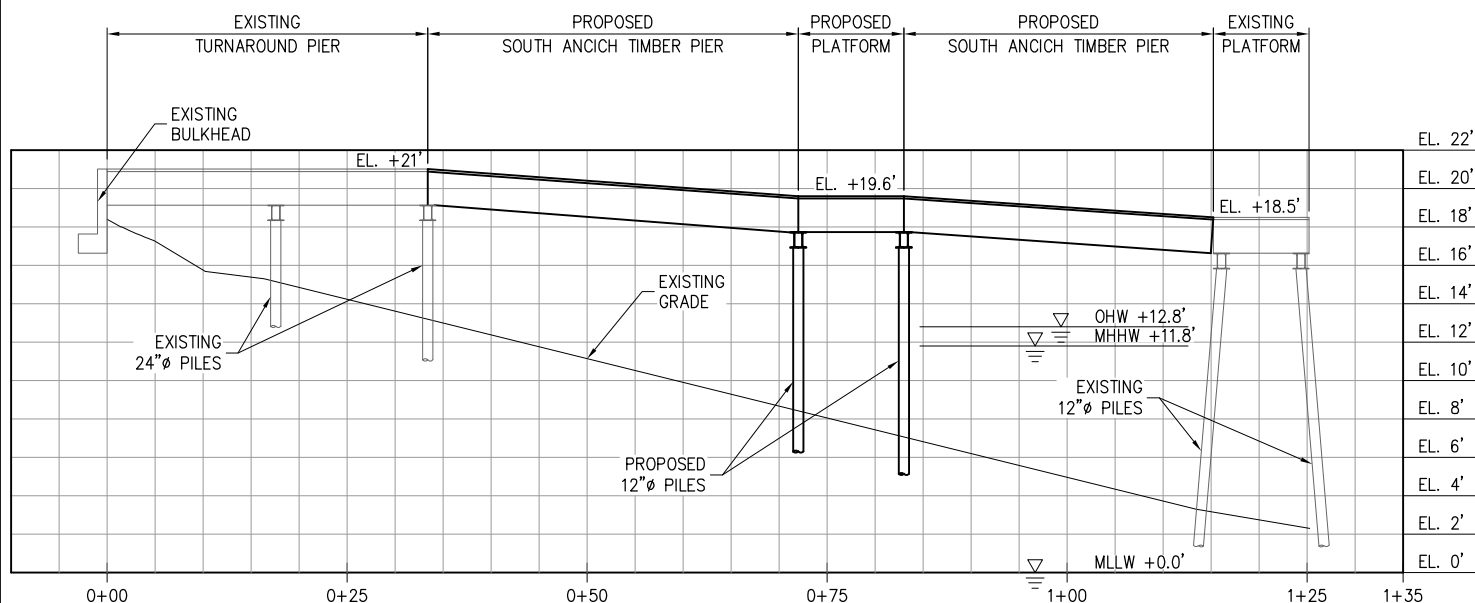
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AT: GIG HARBOR, WA, PIERCE CO. SEC. 5, T21N, R2E

APPLICATION BY:

CITY OF GIG HARBOR

SHEET 4 of 11 DATE: SEPT. 2018



SOUTH ANCICH PIER PROFILE

EXAGGERATION=1H: 2V
GUARDRAIL NOT SHOWN FOR CLARITY.

PURPOSE: INSTALL PUBLIC ACCESS PIER AND LAUNCH FLOATS.

DATUM: 0.0' M.L.L.W.

ADJACENT PROPERTY OWNERS:

1. CAROLYN S. BERG
2. FRISBIE ROBERT G
3. TARABOCHIA DOMINICH J JR AND ANCICH LLC
4. PUBLIC RIGHT OF WAY

ANCICH PARK PUBLIC LAUNCH FLOATS

PROPOSED PROFILE

CITY OF GIG HARBOR
3525 HARBORVIEW DR.
GIG HARBOR, WA 98335

PROPOSED: PIER AND LAUNCH FLOATS.

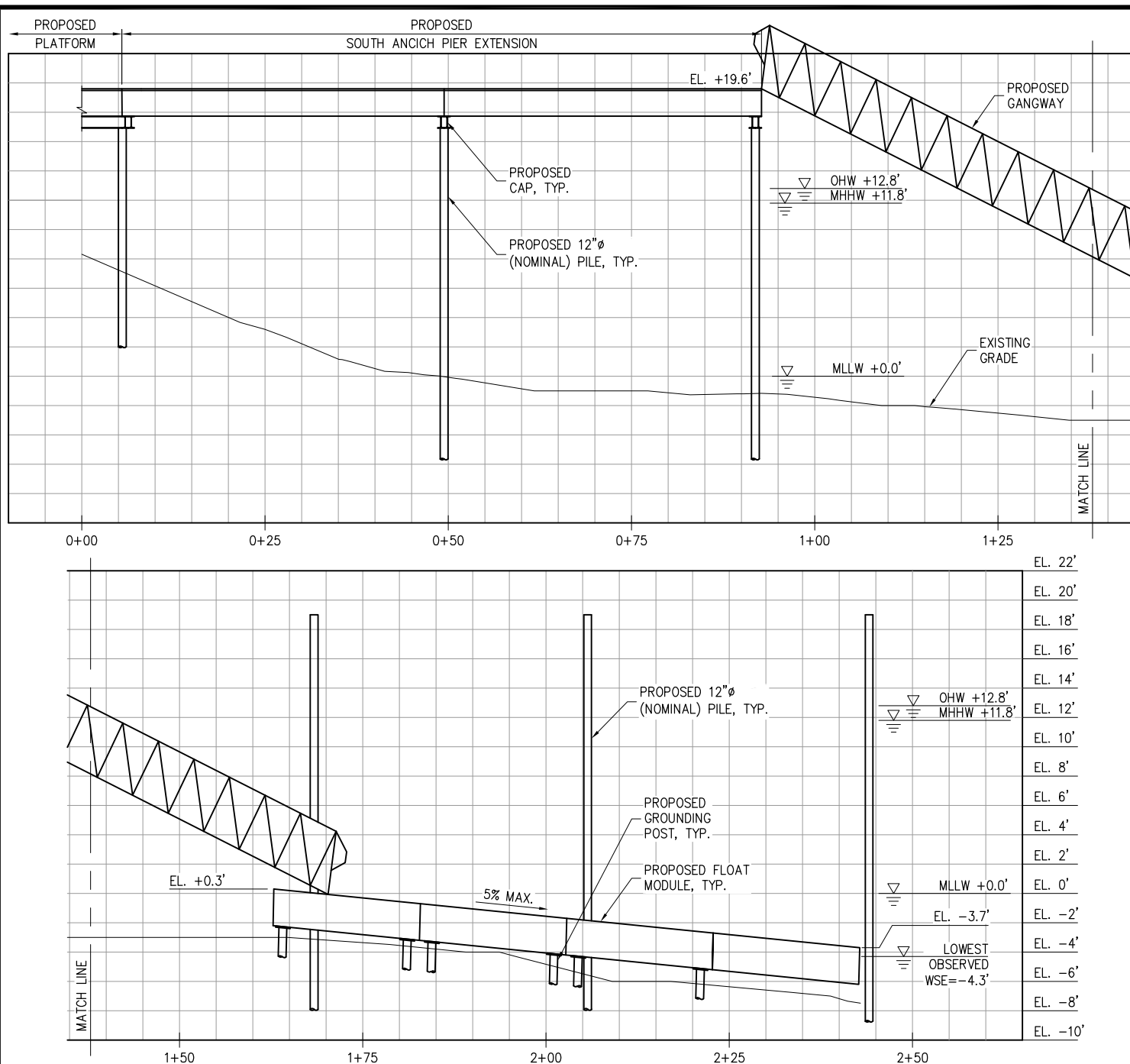
IN: GIG HARBOR

AT: GIG HARBOR, WA, PIERCE CO. SEC. 5, T21N, R2E

APPLICATION BY:

CITY OF GIG HARBOR

SHEET 5 of 11 DATE: SEPT. 2018



SOUTH ANCICH PIER PROFILE

EXAGGERATION=1H:2V
GUARDRAIL NOT SHOWN FOR CLARITY.

PURPOSE: INSTALL PUBLIC ACCESS PIER AND LAUNCH FLOATS.

DATUM: 0.0' M.L.L.W.

ADJACENT PROPERTY OWNERS:

1. CAROLYN S. BERG
2. FRISBIE ROBERT G
3. TARABOCHIA DOMINICH J JR AND ANCICH LLC
4. PUBLIC RIGHT OF WAY

ANCICH PARK PUBLIC LAUNCH FLOATS

PROPOSED PROFILE

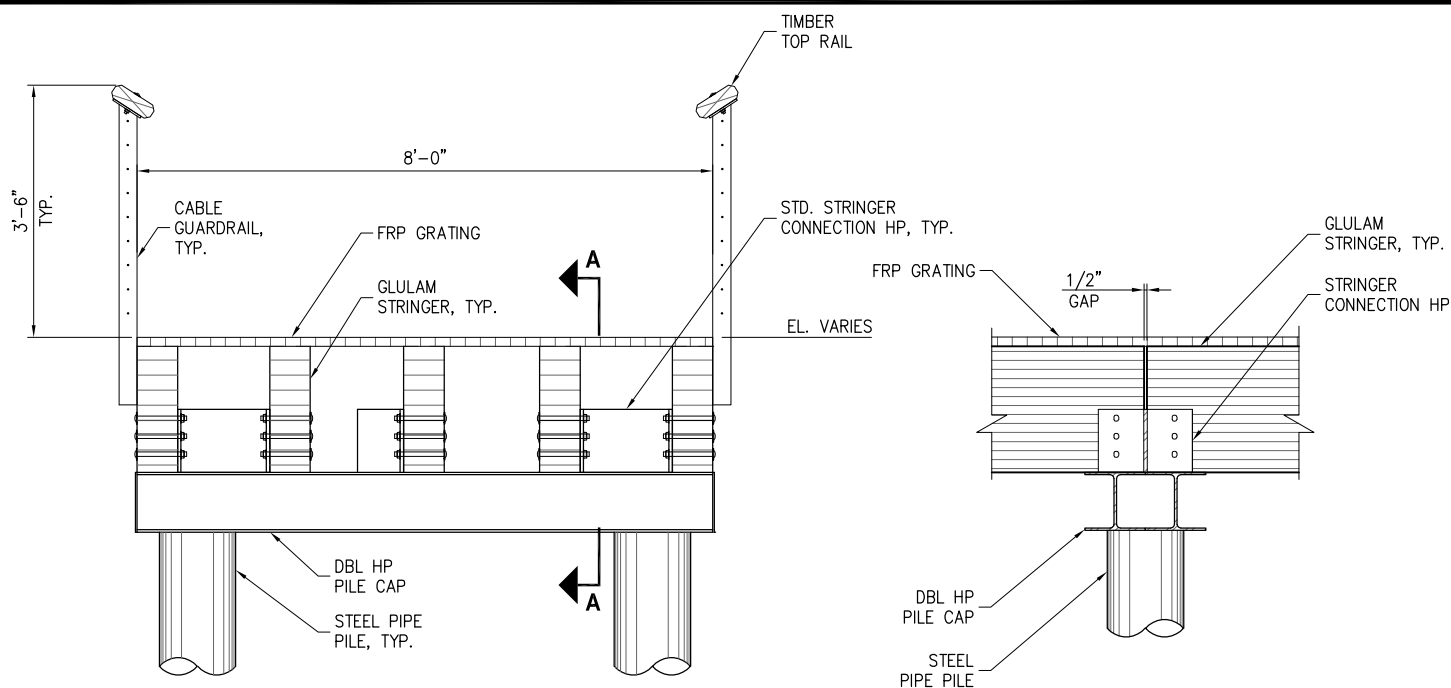
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GIG HARBOR, WA 98335

PROPOSED: PIER AND LAUNCH FLOATS.

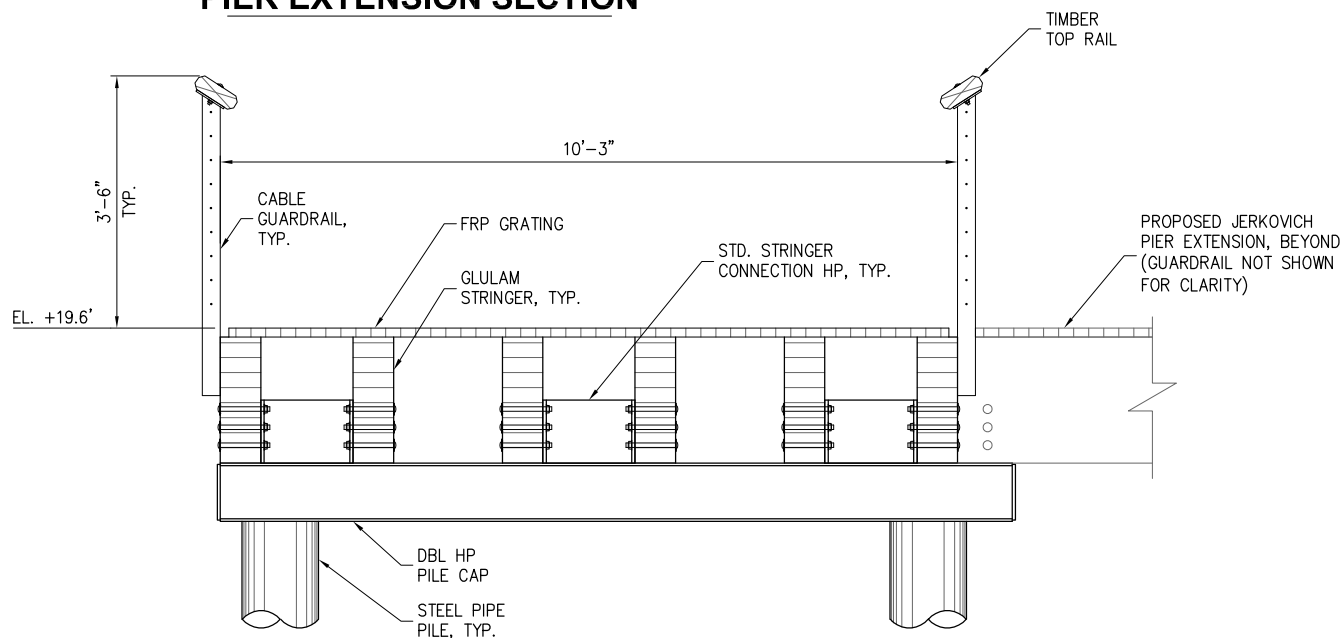
IN: GIG HARBOR
AT: GIG HARBOR, WA, PIERCE CO. SEC. 5, T21N, R2E

APPLICATION BY:
CITY OF GIG HARBOR

SHEET 6 of 11 DATE: SEPT. 2018



PROPOSED SOUTH ANCICH PIER EXTENSION SECTION



PROPOSED SOUTH ANCICH PIER SECTION

PURPOSE: INSTALL PUBLIC ACCESS PIER AND LAUNCH FLOATS.

DATUM: 0.0' M.L.L.W.

ADJACENT PROPERTY OWNERS:

1. CAROLYN S. BERG
2. FRISBIE ROBERT G
3. TARABOCHIA DOMINICH J JR
AND ANCICH LLC
4. PUBLIC RIGHT OF WAY

ANCICH PARK PUBLIC LAUNCH FLOATS

SECTIONS AND DETAILS

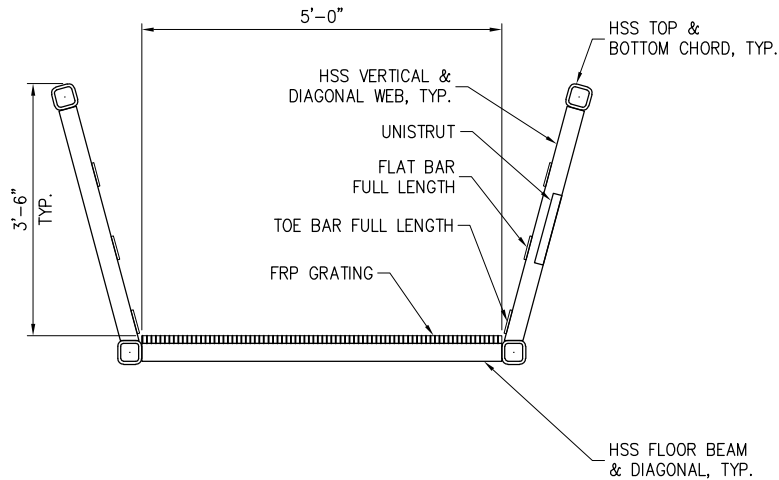
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3525 HARBORVIEW DR.
GIG HARBOR, WA 98335

PROPOSED: PIER AND LAUNCH FLOATS.

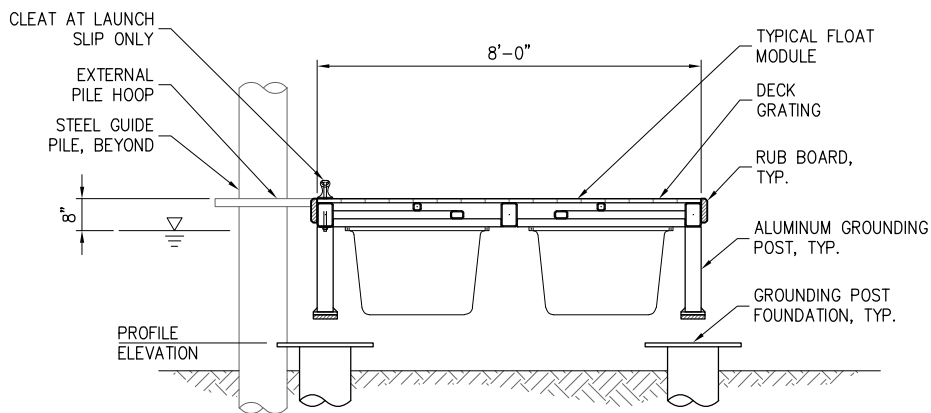
IN: GIG HARBOR
AT: GIG HARBOR, WA, PIERCE CO.
SEC. 5, T21N, R2E

APPLICATION BY:
CITY OF GIG HARBOR

SHEET 7 of 11 DATE: SEPT. 2018



**PROPOSED ALUMINUM
GANGWAY SECTION**



**PROPOSED
FLOAT SECTION**

PURPOSE: INSTALL PUBLIC ACCESS PIER AND LAUNCH FLOATS.

DATUM: 0.0' M.L.L.W.

ADJACENT PROPERTY OWNERS:

1. CAROLYN S. BERG
2. FRISBIE ROBERT G
3. TARABOCHIA DOMINICH J JR AND ANCICH LLC
4. PUBLIC RIGHT OF WAY

ANCICH PARK PUBLIC LAUNCH FLOATS

SECTIONS AND DETAILS

CITY OF GIG HARBOR
3525 HARBORVIEW DR.
GIG HARBOR, WA 98335

PROPOSED: PIER AND LAUNCH FLOATS.

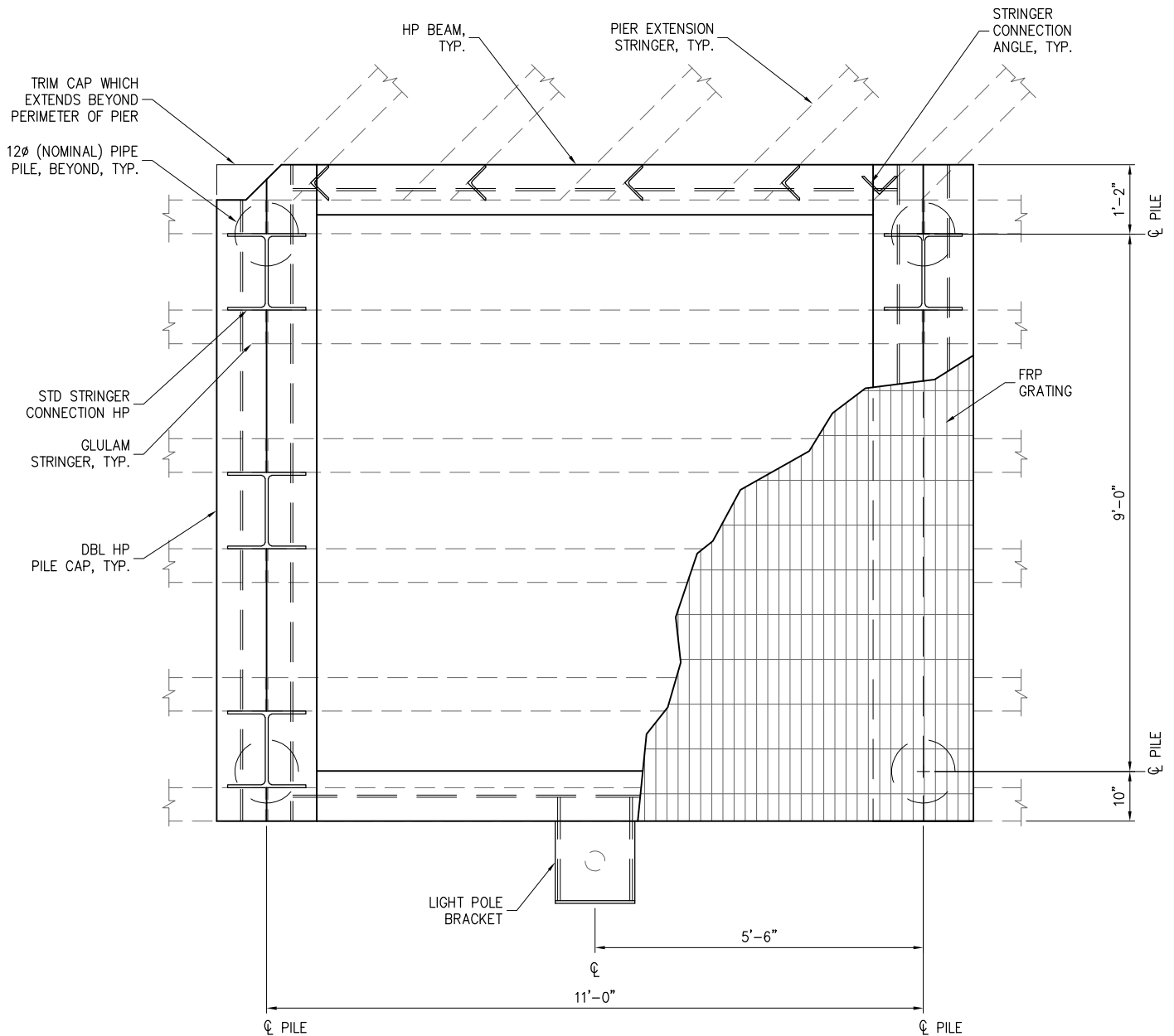
IN: GIG HARBOR

AT: GIG HARBOR, WA, PIERCE CO. SEC. 5, T21N, R2E

APPLICATION BY:

CITY OF GIG HARBOR

SHEET 8 of 11 DATE: SEPT. 2018



PROPOSED LANDING PLATFORM FRAMING PLAN

GUARDRAIL NOT SHOWN

PURPOSE: INSTALL PUBLIC ACCESS PIER AND LAUNCH FLOATS.

DATUM: 0.0' M.L.L.W.

ADJACENT PROPERTY OWNERS:

1. CAROLYN S. BERG
2. FRISBIE ROBERT G
3. TARABOCHIA DOMINICH J JR AND ANCICH LLC
4. PUBLIC RIGHT OF WAY

ANCICH PARK PUBLIC LAUNCH FLOATS

LANDING PLATFORM

CITY OF GIG HARBOR
3525 HARBORVIEW DR.
GIG HARBOR, WA 98335

PROPOSED: PIER AND LAUNCH FLOATS.

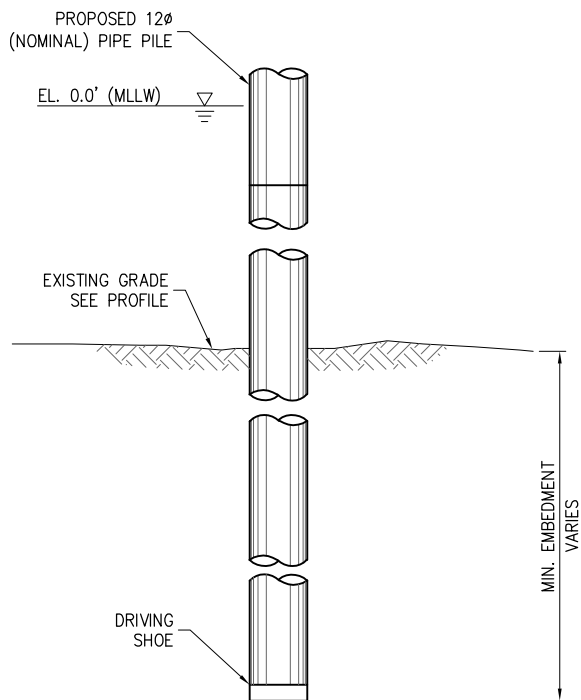
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AT: GIG HARBOR, WA, PIERCE CO. SEC. 5, T21N, R2E

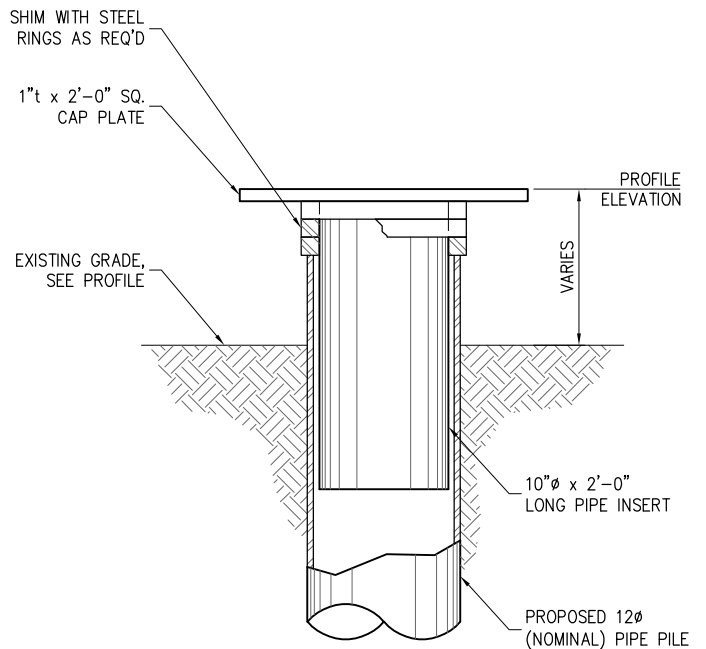
APPLICATION BY:

CITY OF GIG HARBOR

SHEET 9 of 11 DATE: SEPT. 2018



TYPICAL PIPE PILE INSTALLATION



PROPOSED GROUNDING POST FOUNDATION

PURPOSE: INSTALL PUBLIC ACCESS PIER AND LAUNCH FLOATS.

DATUM: 0.0' M.L.L.W.

ADJACENT PROPERTY OWNERS:

1. CAROLYN S. BERG
2. FRISBIE ROBERT G
3. TARABOCHIA DOMINICH J JR AND ANCICH LLC
4. PUBLIC RIGHT OF WAY

ANCICH PARK PUBLIC LAUNCH FLOATS

PILE DETAILS

CITY OF GIG HARBOR
3525 HARBORVIEW DR.
GIG HARBOR, WA 98335

PROPOSED: PIER AND LAUNCH FLOATS.

IN: GIG HARBOR

AT: GIG HARBOR, WA, PIERCE CO. SEC. 5, T21N, R2E

APPLICATION BY:

CITY OF GIG HARBOR

SHEET 10 of 11 DATE: SEPT. 2018



SITE PLAN

0 25 50 100 200 300 FT



DEBRIS TO
BE REMOVED

SITE PHOTO

PURPOSE: INSTALL PUBLIC ACCESS PIER AND LAUNCH FLOATS.

DATUM: 0.0' M.L.L.W.

ADJACENT PROPERTY OWNERS:

1. CAROLYN S. BERG
2. FRISBIE ROBERT G
3. TARABOCHIA DOMINICH J JR AND ANCICH LLC
4. PUBLIC RIGHT OF WAY

ANCICH PARK PUBLIC LAUNCH FLOATS

BEACH CLEANUP

CITY OF GIG HARBOR
3525 HARBORVIEW DR.
GIG HARBOR, WA 98335

PROPOSED: PIER AND LAUNCH FLOATS.

IN: GIG HARBOR

AT: GIG HARBOR, WA, PIERCE CO. SEC. 5, T21N, R2E

APPLICATION BY:

CITY OF GIG HARBOR

SHEET 11 of 11 DATE: SEPT. 2018



APPENDIX III – MARINE MAMMAL MONITORING PLAN

Marine Mammal Monitoring Plan
for the
Ancich Park Public Launch Floats Project
The City of Gig Harbor and the Gig Harbor
Canoe & Kayak Racing Team

September 2018

Submitted to:

U.S. Army Corps of Engineers
Seattle District Regulatory Branch
P.O. Box 3755
Seattle, Washington 98124

Prepared by:

PND Engineers, Inc.
1736 Fourth Ave S, Suite A
Seattle, Washington 98134





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ATTACHMENT II – HYDROACOUSTIC MONITORING RESULTS FOR THE ANCICH PARK PROJECT



ACRONYMS AND ABBREVIATIONS

- 3MP Marine Mammal Monitoring Plan
- dB decibel
- ESA Endangered Species Act
- GL Geometric Loss Coefficient
- NMFS National Marine Fisheries Service
- SEL Sound Exposure Level
- TL Transmission Loss
- USACE United States Army Corps of Engineers

1 Introduction

This marine mammal monitoring plan (3MP) has been prepared to fulfill National Marine Fishery Service (NMFS) requirements to monitor for marine mammals in the defined area of potential waterborne sound effects from the Ancich Park Public Launch Floats Project for the City of Gig Harbor and the Gig Harbor Canoe & Kayak Racing Team (hereafter, City). The proposed project is located within Gig Harbor, Washington. This project will include the installation of human-powered watercraft launch floats, gangway, and access pier at Ancich Park. This work does have the potential to impact species of marine mammals protected under Marine Mammal Protection Act in the Action Area as defined by the Biological Assessment (Table 1).

Table 1. Marine Mammal Species Likely to Occur in the Project Area

Common Name	Scientific Name
Dall's Porpoise	<i>Phocoenoides dalli</i>
Harbor Porpoise	<i>Phocoena phocoena</i>
Harbor Seal	<i>Phoca vitulina</i>
Humpback Whale	<i>Megaptera novaeangliae</i>
Southern Resident Killer Whale	<i>Orcinus orca</i>
Steller Sea Lion	<i>Eumetopias jubatus</i>

2 Project Description

The City of Gig Harbor has recently constructed Ancich Park's (Corps No. NWS-2016-733) new boat storage building for human-powered watercrafts. The City is now jointly proposing to incorporate ADA accessible, human-powered watercraft launch floats (Figure 2). The proposed project consists of the elements listed below, followed by summary tables (Tables 2 and 3):

1. Jerkovich Pier and Catwalk Demolition

The existing Jerkovich Pier and associated catwalk will be demolished. This will include the removal of (44) piles with a vibratory hammer.

2. South Ancich Pier and Extension Installation

(8) 12-inch (nominal) steel piles will be driven for the South Ancich Pier and Extension. All piles will be driven with a vibratory hammer as far as possible and then proofed with an impact hammer. Pile driving will be completed from a barge. Steel pile caps will be set from the barge and welded in place using scaffolding. Timber stringers, decking, rails, and accessories will be installed atop without the need for heavy equipment.

3. South Ancich Launch Floats Installation

(19) 12-inch (nominal) steel piles will be driven for the Launch Floats. Three of these piles will be used to ensure that the floats remain in place, and the remaining sixteen piles will be installed beneath the corners of the floats to ensure that they do not ground at low tides. These short piles are often referred to as 'grounding posts.' All piles will be driven with a vibratory hammer as far as possible and then proofed with an impact hammer. Pile driving will be completed from a barge. Float modules will be fabricated offsite, brought in via barge, and lowered into place with the crane.

4. South Ancich Gangway Installation

An 80-foot gangway will be fabricated offsite, brought in via barge and lifted into position, connecting the pier extension to the launch floats. Gangway connections will be installed without the need for heavy equipment.

5. Mitigation

a. Creosote-Treated Pile Removal

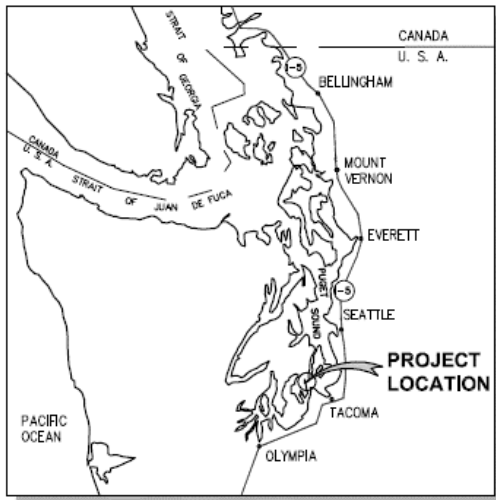
The project will remove (44) 12-inch- to 16-inch-diameter creosote timber piles along with the caps, stringers, and asphalt deck.

b. Beach Cleanup

The city also proposes to remove concrete debris from the beach northwest of Eddon Boat Park. The approximately 2,000 square feet of debris was identified during the initial mitigation proposal for NWS-2016-733.

c. Intertidal Shading

Upper intertidal shading will be reduced by approximately 1,455 square feet due to the removal of the remainder of Jerkovich Pier, including its caps, stringers, and asphalt deck.



VICINITY MAP



Figure 1. Vicinity Map & Project Location in Red

Two construction barges are present in the photo.

3 Methodology

As discussed in Section 3.4, a boat-based, trained observer will be located on-site before and during in-water construction activity at a location appropriate for monitoring marine mammals within and approaching the action area. During observation periods, the observer will continuously scan the area for marine mammals using binoculars and the naked eye. The observer will collect data including, but not limited to, environmental conditions (e.g., sea state, precipitation, glare), marine mammal sightings (e.g., species, numbers, location, behavior, responses to construction activity), and construction activity at the time of sighting. The observer will conduct observations, meet training requirements, fill out data forms, and report findings in accordance with this 3MP.

The observer will implement mitigation measures including monitoring of the proposed action area and shutdown procedures. They will be in continuous contact with the construction personnel via two-way radio. A cellular phone with local service will be used as back-up communications and for safety purposes. An employee of the construction contractor will be identified as the main point of contact for the observer.

3.1 Observer Qualifications

Monitoring will be conducted by one qualified, trained marine mammal observer. In order for an observer to be considered qualified, the following requirements must be met:

1. Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance;
2. Physical capability of performing essential duties, including sitting or standing for long periods, using binoculars or other field aid, and documenting observations;
3. Experience and ability to conduct field observations and collect data according to assigned protocols;
4. Experience or training in the field identification of marine mammals and marine mammal behavior, including the ability to accurately identify marine mammals in Washington waters;
5. Sufficient training, orientation, or experience with the construction operation to provide for identification of concurrent activities and for personal safety during observations;
6. Writing skills sufficient to prepare reports of observations; and
7. Ability to communicate orally, by radio and in person, with project personnel to provide real-time information on marine mammals observed in the area and the appropriate mitigation response for the circumstances.

3.2 Data Collection

The observer will use an Observation Record (Attachment I) which will be completed for each survey day. Observation Records will be used by the observer to record the following:

- Date and time that permitted construction activity begins or ends;
- Weather parameters (e.g. percent cloud cover, percent glare, visibility) and sea state with the Beaufort Wind Force Scale;
- Species, numbers, and, if possible, sex and age class of observed marine mammals;
- Construction activities occurring during each sighting;
- Marine mammal behavior patterns observed, including bearing and direction of travel;
- Specific focus should be paid to behavioral reactions just prior to, or during, soft-start and shutdown procedures;
- Location of marine mammal, distance from observer to the marine mammal, and distance from pile driving activities to marine mammals;
- Record of whether an observation required the implementation of mitigation measures, including shutdown procedures and the duration of each shutdown; and
- Other human activity in the area.

3.3 Equipment

The following equipment will be required to conduct observations for this project:

- Appropriate Personal Protective Equipment including, but not limited to, a life jacket and hearing protection;
- Portable radios and headsets for the observer to communicate with the contractors' monitoring coordinator;
- Cellular phone as backup to radio communication;
- Contact information for the contractors' monitoring coordinator, the U.S. Army Corps of Engineers (USACE) representative, and National Marine Fisheries Service (NMFS) representative;
- Daily tide tables for the project area;
- Watch or chronometer;
- Binoculars (quality 7x50 or better) with built-in rangefinder or reticles (rangefinder may be provided separately);
- Hand-held GPS unit, map and compass, or grid map to record locations of marine mammals;
- Copies of MMMP and/or other relevant permit requirement specifications in sealed clear plastic cover; and
- Notebook with pre-standardized monitoring Observation Record forms on waterproof paper.

3.4 Observer Monitoring Location

In order to effectively monitor the pile driving and pulling shutdown zone (Figure 2), the marine mammal observer will be positioned at the best practical vantage point. The observer will be placed at a suitable location in order to observe the action area. This will allow for both an unobstructed view of the pile driving and pulling, and also of the shutdown zone. The monitoring position of the observer will have the following characteristics:

1. Unobstructed view of pile being driven;
2. Unobstructed view of all water within the shutdown zone;
3. Clear view of pile-driving operator or construction foreman in the event of radio failure; and
4. Safe distance from pile driving activities in the construction area.

The observer will record all marine mammal sightings, provided it does not interfere with their effectiveness at carrying out the shutdown procedures. If visibility does not allow for full clearance of the observation zone, additional stations or vantage points will be sought.

The marine mammal shutdown zone (action area) will be monitored during and immediately before pile driving and pulling activity. Pile driving and pulling will not be initiated, or will be temporarily suspended, if marine mammal enters the shutdown zone (as determined in Table 2).



Figure 2. Shutdown Zone in Red

Table 2 below calculates the disturbance zone based on the practical spreading loss model, per the interim guidance. The practical spreading loss model was used to determine the zones in which pinnipeds and cetaceans have the potential to face behavioral disturbance from underwater noise. The formula for calculating practical spreading loss underwater is:

$$TL = GL \times \log \frac{R_1}{R_0}$$

Where TL is the transmission loss (dB) (i.e., the disturbance zone), GL is the geometric loss coefficient (15 is the only value allowed without real-time sound source verification), R_1 is the range to the target sound pressure level (m), and R_0 is the distance from the source of the initial measurement (m).

Table 2. In-water Injury and Disturbance Zones

Pile Size	Duration ¹	Source Levels (10m from pile) ²			Injury Zones and Acoustic Thresholds (meters)				Marine Mammal Disturbance Zone (meters)
		Peak (dB)	RMS (dB)	SEL (dB)	Low-Frequency Cetacean	Mid-Frequency Cetacean	Phocid Pinniped	Otariid Pinniped	
Vibratory Hammer									
Thresholds (dB SEL)					199	198	201	219	120 ³
12''(nom) steel	8 hrs/day	171	155	155	10.9	1.0	6.6	0.5	232.6
12''-16" timber	8 hrs/day	172	162	--	31.9	2.8	19.4	1.4	681.3
Impact Hammer									
Thresholds (dB SEL)					183	185	185	203	160
12''(nom) steel	1,500 strikes/day ⁴	192	169 ⁵	--	32.9	1.2	17.6	1.3	39.8

3.5 Monitoring Techniques

The observer will collect sighting data and behaviors of marine mammal species that are spotted in the action area during periods of pile driving or pulling. The observer will have no other construction-related tasks while conducting monitoring. Observation necessitates that daylight is sufficient for the observer to visualize the entirety of the action area, so observations will commence and complete during daylight hours. Monitoring of shutdown and observation zones will take place from 30 minutes prior to initiation and through all pile driving and removal activities.

3.5.1 Pre-Activity Monitoring

The following survey methodology will be implemented prior to commencing permitted activities:

- Prior to the start of permitted activities, the observer will monitor the shutdown and monitoring zones for 30 minutes. They will ensure that no marine mammals are present within action area before permitted activities begin.
- The shutdown zone will be cleared when marine mammals have not been observed within zone for that 30-minute period. If a marine mammal is observed within the shutdown zone, a soft-start cannot proceed until the animal has left the zone or has not been observed for 15 minutes.

¹ Assumes up to 10 piles per day can be pulled or installed.

² Source levels were obtained from Caltrans (2015).

³ Ambient background levels at the site were recorded at 134.5 dB (Attachment II).

⁴ Impact pile driving is particularly hard to estimate. There is not ample geotechnical information at the site and the seabed is not mapped for obstructions. It is assumed that 1,500 blows per day is a reasonable assumption, but this constraint will result in contractor shut downs if difficult pile driving occurs.

⁵ WSDOT (2018) has established an average reduction of 8-32 dB RMS with the use of a bubble curtain. To be conservative, a reduction of 8 dB RMS was used for impact pile driving only.



- When the action area is cleared, the observer will radio the contractors' monitoring coordinator. Permitted activities will not commence until the monitoring coordinator receives verbal confirmation the zones are clear.
- In case of fog or reduced visibility, the observer must be able to see the entirety of shutdown and monitoring zones before permitted activities can be initiated.

3.5.2 Soft Start Procedures

When all marine mammals in the disturbance zone have been documented, the observer will instruct the contractor to initiate the ramp-up procedure for pile driving. This procedure consists of initiating the vibratory hammer for 15 seconds at reduced energy followed by a 1-minute waiting period. This procedure will be repeated for a total of three sequences before vibratory pile driving begins. For impact driving, a ramp up procedure of three soft starts using the weight of the hammer followed by a 1-minute waiting period will be required prior to driving. For impact driving to proof the piles, a ramp up procedure of three soft starts using the weight of the hammer will be required prior to driving.

3.5.3 During-Activity Monitoring

The following survey methodology will be implemented during permitted activities:

- The observer will search continuously for marine mammals with the naked eye and with the aid of binoculars and spotting scopes.
- All observations of marine mammals will be documented in a Marine Mammal Observation Record Form.
- When a marine mammal is observed, its location will be determined using a rangefinder to verify distance and a GPS or compass to verify heading.

3.5.4 Shutdown

If any cetaceans or pinnipeds are observed within the disturbance zones, or if entry into the zone is eminent, pile-driving activities will be immediately halted. The observer will immediately radio to alert the contractor, requiring an immediate "all-stop." Pile-driving activities will resume when the animal has voluntarily left the disturbance zone or 15 minutes have passed without re-sighting the animal in the zone. The observer will continue to monitor the animal after it has left the disturbance zone.

3.5.5 Breaks in Work

During an in-water construction delay, the shutdown and monitoring zones will continue to be monitored. No exposures will be recorded for permitted species in the monitoring zone if there are no concurrent permitted construction activities.

If permitted activities cease for more than 30 minutes and monitoring has not continued, pre-activity monitoring and soft start procedures must recommence. This includes breaks due to scheduled or unforeseen construction practices or breaks due to permit-required shutdown. Following 30 minutes of monitoring, work can begin according to the pre-activity monitoring protocols. Work cannot begin if an animal is within the shutdown zone or if visibility is not clear throughout the shutdown and monitoring zones.



4 Reporting

4.1 Modifications

In the event that the City needs to modify terms of this MMMP, the USACE and NMFS representatives will be promptly contacted for discussion of the requested modification.

4.2 Injured or Dead Marine Mammals

If the City finds an injured, sick, or dead marine mammal, a county representative will notify the NMFS representative and provide the species or description of the animal(s), condition of the animal or carcass, location, date and time of first discovery, observed behaviors (if alive), and photo or video (if available).

- If marine mammal's condition is a direct result of the project, notification will be made and work will stop until NMFS is able to review the circumstances of the prohibited take.
- If cause of death is unclear, the City shall immediately report the incident. Construction activities may continue while NMFS reviews the circumstances of the incident and makes a final determination on the cause of the reported injury or death. NMFS will work with the City to determine whether additional mitigation measures or modifications to the activities are appropriate.

Care should be taken in handling dead specimens to preserve biological materials in the best possible state for later analysis of cause of death, if that occurs. In preservation of biological materials from a dead animal, the finder (i.e., marine mammal observer) has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed.

4.3 Monitoring Report

A monitoring report will be prepared upon request by the USACE and/or NMFS representatives.



5 References

Buehler, David P.E.; Oestman, Rick; Reyff, James; Pommerenck, Kieth; Mitchell, Bill (2015). Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. Prepared for the California Department of Transportation, Sacramento, California. Cited as Caltrans (2015).

WSDOT (2018). Biological Assessment Guidance Advanced Training Manual. Accessed September 2018. www.wsdot.wa.gov/Environment/Biology/BA/BAGuidance.htm



ATTACHMENT I – OBSERVATION RECORD

Marine Mammal Observation Record Form										Observer(s):		Date:	
Boat Name/Location:				Time Effort Initiated:									
				Time Effort Completed:						Page _____ of _____ Pages			
Project Name	Sighting #	Sighting Time	Latitude	Longitude	Species	# of Anim	Dist/Dir to Anim	Beh Type(s)	Const Type	Dist to Pile	Weath Cond	Beauf	Notes

Behavior Codes

Code	Behavior	Definition
BR	Breaching	Leaps clear of water
CD	Change Direction	Suddenly changes direction of travel
CH	Chuff	Makes loud, forceful exhalation of air at surface
DI	Dive	Forward dives below surface
DE	Dead	Shows decomposition or is confirmed as dead by investigation
DS	Disorientation	An individual displaying multiple behaviors that have no clear direction or purpose
FI	Fight	Agonistic interactions between two or more individuals
FO	Foraging	Confirmed by food seen in mouth
MI	Milling	Moving slowly at surface, changing direction often, not moving in any particular direction
PL	Play	Behavior that does not seem to be directed towards a particular goal; may involve one, two or more individuals
PO	Porpoising	Moving rapidly with body breaking surface of water
SL	Slap	Vigorously slaps surface of water with body, flippers, tail etc.
SP	Spyhopping	Rises vertically in the water to "look" above the water
SW	Swimming	General progress in a direction. Note general direction of travel when last seen [Example: "SW (N)" for swimming north]
TR	Traveling	Traveling in an obvious direction. Note direction of travel when last seen [Example: "TR (N)" for traveling north]
UN	Unknown	Behavior of animal undetermined, does not fit into another behavior
AWA	Approach Work Area	Approaching the work area
LWA	Leave Work Area	Leaving the work area
Pinniped only		
EW	Enter Water (from haul out)	Enters water from a haul-out for no obvious reason
FL	Flush (from haul out)	Enters water in response to disturbance
HO	Haul out (from water)	Hauls out on land
RE	Resting	Resting onshore or on surface of water
LO	Look	Is upright in water "looking" in several directions or at a single focus
SI	Sink	Sinks out of sight below surface without obvious effort (usually from an upright position)
VO	Vocalizing	Animal emits barks, squeals, etc.
Cetacean only		
LG	Logging	Resting on surface of water with no obvious signs of movement

Visibility (NOTES SECTION)

Code	Distance Visible
B	Bad (<0.5km)
P	Poor (0.5 – 0.9km)
M	Moderate (0.9 – 3km)
G	Good (3 - 10km)
E	Excellent (>10km)

Attenuation Type (NOTES SECTION)

Code	Activity Type
SS	Soft Start
BC	Bubble Curtain
DE	Delay onset of In-Water Work
SD	Shut Down In-Water Work

Sighting Cues (NOTES SECTION)

Code	Distance Visible
BL	Blow
BO	Body
BR	Breach
DF	Dorsal Fin
SA	Surface Activity
OTHR	Other

Beaufort Wind Scale

Beaufort Number (Wind Force)	Wind Velocity (Knots)	Wind Description	Sea Conditions
0	<1	Calm	Smooth and mirror like
1	1-3	Light Air	Scaly ripples, no foam crests
2	4-6	Light Breeze	Small wavelets, glassy, no breaking
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps

4	11-16	Moderate Breeze	Small waves, numerous whitecaps
---	-------	-----------------	---------------------------------

Construction Type

Code	Activity Type
V	Vibratory Pile Driving
I	Impact Pile Driving
ST	Stabbing
NOWC	No Over-Water Construction
NONE	No Construction
OTHR	Other

Marine Mammal Species

Code	Marine Mammal Species
CSL	California Sea Lion
DP	Dall's Porpoise
GW	Gray Whale
HP	Harbor Porpoise
HS	Harbor Seal
HW	Humpback Whale
KW	Killer Whale
MW	Minke Whale
SST	Steller Sea Lion

Weather Conditions

Code	Weather Condition
S	Sunny
PC	Partly Cloudy
L	Light Rain
R	Steady Rain
F	Fog
OC	Overcast
SN	Snow
HR	Heavy Rain



ATTACHMENT II – HYDROACOUSTIC MONITORING RESULTS FOR THE ANCICH PARK PROJECT

**UNDERWATER SOUND LEVELS ASSOCIATED WITH PILE
DRIVING DRING ANCICH PARK RESTORATION PROJECT
GIG HARBOR, WASHINGTON**



January 26th, 2018

For:

**P|N|D Engineers, Inc.
Seattle, Washington**

By:

**Delphis Technical Support and Solutions, LLC.
13332 69th DR SE
Snohomish, WA 98296**



DTSS Project No. DTSS 201710

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(At end of text)

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- B. **Hydro Acoustic Monitoring Data Sheet**
- C. **Photos - Ancich Park Pile Driving – January 26th, 2018**



UNDERWATER SOUND LEVELS ASSOCIATED WITH PILE DRIVING DRING ANCICH PARK RESTORATION PROJECT

January 26th, 2018

Executive Summary

Four 24-inch diameter piles were monitored for noise generated while driving piles as part of the Ancich Park and Restoration Project on January 26th, 2018. These piles were driven into the sediment using impact pile driving methods. Where practical, the piles were driven using a vibratory hammer to reduce the number of blows needed to proof the piles. Piles monitored on January 26th had previously been driven into their respective positions and near embedment depth of 30-feet using a vibratory hammer. They required the impact driving to drive the piles approximately 1-foot to achieve the design compression capacity of 400 kips. All in-water activity was mitigated using a single-level bubble curtain. The cSEL did not exceeded the limit of 204 dB re 1 $\mu\text{Pa}^2 \cdot \text{sec}$ at 10-meters as NMFS directed for this site. Underwater acoustic measurements were recorded in mid-water depth as close to possible to 10-meters and concurrently at approximately 20-meters (or closer) from the pile being driven. The maximum cSEL recorded was 200 dB re 1 $\mu\text{Pa}^2 \cdot \text{sec}$ during 73 blows over 110 seconds on Pile C1. The highest peak SPL recorded from all pile driving events was 205.9 dB re 1 μPa while driving Pile C1 as measured from 10-meters. The total allowable daily blow count for this site is 750. Total Blow Count monitored for this report for impact pile driving was 227 plus seven (7) soft start blows. Approximately 350 blows were made throughout the day to include proofing piles in shallower, intertidal zone requiring about 20 blows each to drive them at least 1-foot (on-site engineer). No marine animals or stressed fish were observed near the pile driving activity.

1.0 INTRODUCTION

The project area is located within Gig Harbor in southern Puget Sound as shown in Figure 1. The Ancich Park Site is being developed from its current condition to a landscaped park featuring public boat storage, bathrooms, utilities, lighting, and landscaped as part of the Upland Park Improvements and Netshed Restoration Project currently underway by the City of Gig Harbor. In this process approximately (139) 12-inch creosote covered timber piles will be removed. The Ancich Pier will be demolished and replaced with new materials including steel piles and timber planks. Ten 24-inch new steel foundation piles will be driven. In this process approximately thirty-nine 12-inch creosote covered timber piles will be removed. Additionally, because the new piles will be steel, less piles will be installed than currently exist. Delphis Technical Support and Solutions, LLC (DTSS) was contracted by P|N|D Inc. to monitor acoustic levels produced while driving 24-inch diameter piles at the site. This technical report presents the results of underwater sound levels and ancillary metrics measured during the driving of four (4) 24-inch diameter steel pipe piles as part of the Ancich Pier on January 26th, 2018 using a Delmag-32 impact hammer.



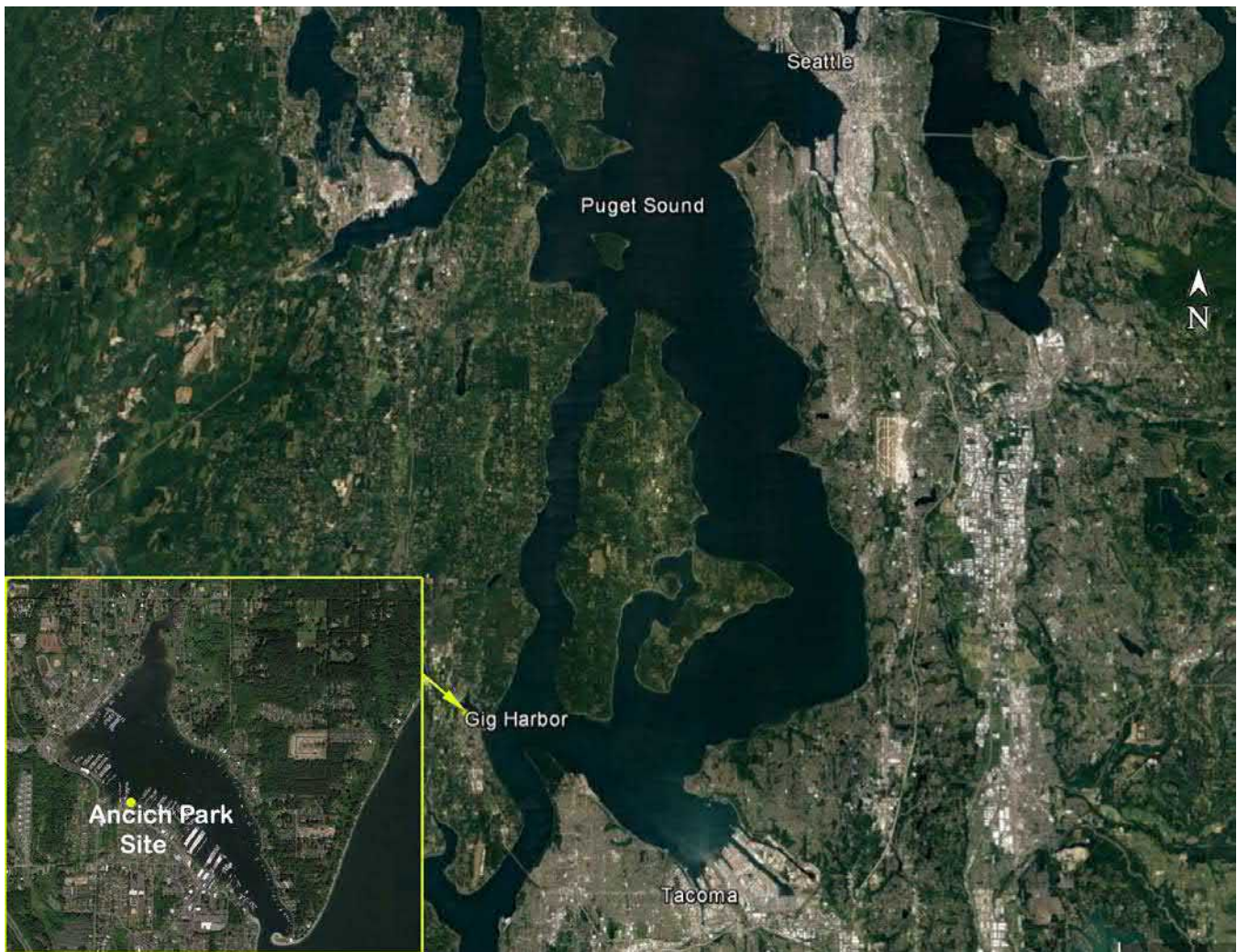


Figure 1 Ancich Park - Project location.

1.1 Characteristics and Metrics of Underwater Sound

Several descriptors are used to describe underwater noise metrics. Two common descriptors are the instantaneous peak sound pressure level (SPL) and the Root Mean Square (RMS) pressure level during the impulse wave. For this monitoring effort, the following standard metrics have been used for reporting received sound pressure levels from impulsive pile-driving noise ancillary metrics unique to each site and each blow (see ANSI S1.1-1994).

Peak Pressure

The peak pressure is the instantaneous maximum or minimum overpressure observed during an impulsive event. This report presents this metric in Pascals (Pa) or decibels (dB) referenced to a pressure of 1 micropascal (dB re: 1 μ Pa).

The equation to calculate the sound pressure level in water is:

$$\text{Sound Pressure Level (SPL)} = 20 \log (p/p_{\text{ref}}), \text{ where } p_{\text{ref}} \text{ is the reference pressure}$$



Root Mean Squared (RMS)

The RMS level is the square root of the squared pressure values divided by the duration. This level, presented in dB re: 1 μ Pa, is the mean square pressure level of the pulse (or overall duration). It has been used by National Marine Fisheries Service (NMFS) in criteria for judging impacts to marine mammals from underwater impulse-type sounds.

RMS_{90%} Sound Pressure Level

This metric is defined as the root-mean-square sound pressure level over a period T₉₀ of the impulse waveform that contains 90% of the pulse energy measured in dB re 1 μ Pa. This project reports RMS_{90%} for the maximum and minimum impulse waveforms during a steady pile driving event as well as the duration of all of blows per pile (hammer reset time removed from record).

Sound Exposure Level (SEL)

SEL is often used as a metric for a single acoustic event and is often used as an indication of the energy dose. SEL is calculated by summing the cumulative pressure squared (p^2), integrating over time, and normalizing to the time over which the pulse or event occurred. For a single pulse, the sound exposure is defined as the integral of the squared sound pressure over the duration of the pulse event (see section 3.54 of ANSI S1.1-1994): The units for SEL are dB re: 1 micropascal-squared-sec (re 1 μ Pa² · sec).

cSEL

The relationship between the SEL and the peak pressure is not consistent between pile strikes or between different types of piles for a given pile driving operation. The SEL for each impulsive noise event can be aggregated by summation to calculate the total SEL (or Cumulative-SEL) for the entire exposure duration. This metric is used to describe the noise dose which considers not only the peak pressure but also the duration of the exposure. This project reports cSEL for the maximum and minimum impulse waveforms as well as the aggregated summation of all of blows per pile.

cSEL_{90%}

This metric is defined as the cumulative sound exposure level level over a period T₉₀ of the impulse waveform that contains 90% of the pulse energy. This project reports cSEL_{90%} for the maximum and minimum impulse waveforms during a steady pile driving event as well as the aggregated summation of all of blows per pile (hammer reset time removed from record).

Continuous Noise or Background Level

Broadband ambient (background) noise levels from this study have been reported in terms of the 1 minute average continuous sound level (1 minute *RMS* dB re 1 μ Pa).



Figure 2 shows time series plot of a typical (mitigated) impulse waveform generated from a single hammer blow with some of the metrics as they relate to it.

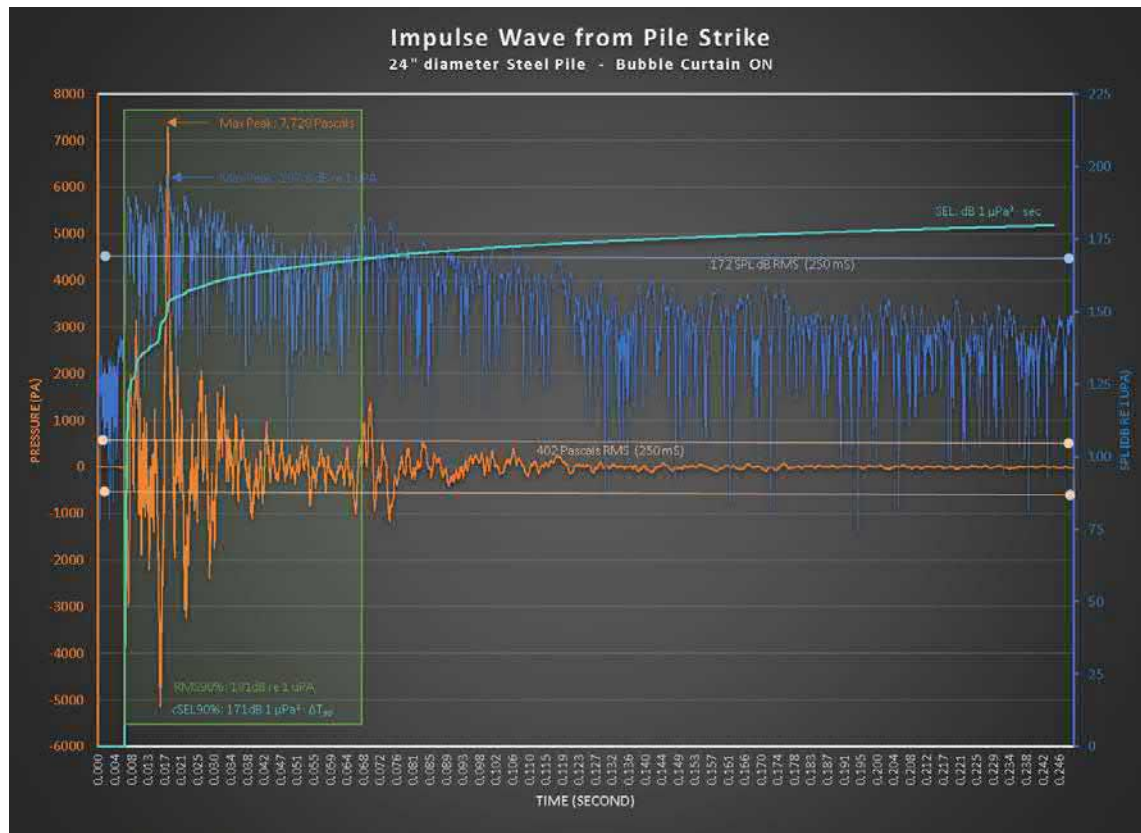


Figure 2 Measurements of an impulse wave associated with pile driving.

2.0 FIELD METHODS

2.1 Equipment

Acoustic Recording

Two (2) CR-1 hydrophones manufactured by Sensor Technology, LTD and assembled by Cetacean Research Technology were used to document the sound frequency spectrum and pressure levels generated by high impulse source levels such as those generated by the impact of the hammer on the pile transmitted through the water. These hydrophones were designed specifically with a 195 dB re 1v/mPa nominal sensitivity with overload pressure to 220 dB re 1mPa without the need for pre-amplification and calibrated over a frequency range of 10 Hz to 30 kHz. Each hydrophone has a maximum cable length of 30-meters.

The hydrophones were connected to their respective channels on a dual channel, DAQ-200 Precision Dynamic Signal Acquisition Interface manufactured by SpectraPLUS® interfaced directly into a field Toughbook laptop computer running SpectraPLUS-SC FFT Spectral Analysis System software.



Concurrent incoming analog signals are digitized from the hydrophone(s) and the real-time voltage signals are displayed on the computer as SPL and digitally stored for post-processing and analysis.

Note; this scope of work required the use of a hydrophone placed at 10-meters from the activity. A second hydrophone was placed at the same water depth at approximately twice the distance from the activity to observe any attenuation characteristics and to collect back-up data in case the primary hydrophone failed.

Positioning

A Bushnell Laser rangefinder was used to take a direct measurement from the pile to the monitoring location. Water depth was determined using the metered hydrophone anchor line as well as a CTD.

CTD Casts

A Hydrolab H20 equipped with conductivity, temperature, dissolved oxygen, turbidity and depth sensors was used to collect a profile of salinity/conductivity, temperature, and depth data to verify station depth and calculate the general speed of sound through the water column.

Air Measurements

A calibrated ExTech Type-II Sound Level Meter was used to record ambient air noise at the 10-meter location prior to pile driving, during vibratory pile driving, and during impact pile driving.

All equipment was mobilized, calibrated if required, and tested prior to their deployment to the site. The computer clock and CTD were coordinated to NIST time standard for Pacific Standard Time zone.

2.2 Site Overview

Ancich Park is located along the southern shore of Gig Harbor. Much of the area is restricted to public access due to the upland construction activity at the site. Arrangements were made to use the city skiff to record acoustic levels close to the pile from the water. However, a last-minute scheduling conflict arose limiting the amount of time the vessel operator could remain on site. Therefore, the best area to achieve a required distance of 10-meters from the hydrophone to the multiple pile driving events was along the starboard side of the contractor's barge while it was engaged in the pile driving activity. Figure 3 shows the general hydrophone location relative to the four piles that were monitored (Google Earth image date 5/22/2017, does not show current condition of the site presently under construction). The barge provided better stability, shelter, and protection for the equipment than the open skiff, however, higher acoustic background levels are usually recorded so close to the barge. Typically, placing hydrophones at set distances are very opportunistic to get within the required distance and remain safe. The barge is restricted in its positioning and orientation while driving the piles due to depth or obstructions such as the previously installed rows of piles. Operating from the barge limited precise



placement of the near-field hydrophone at the desired 10-meter distance while measuring the acoustic levels produced from impact driving Piles C1 and B4. Note: Piles B1 thru B4 plus C1, and Piles A1 thru A5 had been previously driven close to their final penetration depth using a vibratory hammer on previous days and required approximately one-foot of impact hammering to proof the piles to their ratings. Both hydrophones were moved fore and aft along the side of the barge to attempt to achieve optimal ranges between the pile and the respective hydrophone. There were instances where line of sight between the hydrophone(s) and pile being driven may be obstructed by the new dock pilings. The seafloor slopes upward from about -4-feet MLLW to approximately +10-feet MLLW from the deeper C1 and A5 Piles to the shoreward B1 and A1 Piles (approximately 140-feet distance).



Figure 3 Ancich Pile Driving - Location of piles and hydrophones on barge.

Figure 4 shows the general layout of the deployed hydrophones with respect to the barge and piles during the monitoring. The depth of the hydrophone deployment location was sounded using the metered (1-ft increments) anchor line. The hydrophone mooring bracket was set at the desired mid-water elevation. To maintain a near constant orientation between the hydrophone and pile driving operation (no free turning, sagging, or strumming), the hydrophone is set at its vertical depth along the tight ¼" nylon-chord anchor line. With the top of the anchor tied to a fixed structure on the barge and the weight on the bottom, the mooring bracket suspends the hydrophone perpendicularly, 1-ft away from the anchor line reducing any ringing or shading caused by suspension lines. Tension is checked periodically to compensate any change due to tide. The hydrophone is secure within the bracket and dampened from any contact of the hard surface using closed cell foam to prevent additional transient vibrations or signals transmitted through the hard plastic from contaminating the data. Excess



hydrophone cable is placed into its foam case to isolate it from direct contact with the barge deck for similar reasons. The hydrophone cable is suspended from the surface and helps to maintain the orientation of the mooring bracket.

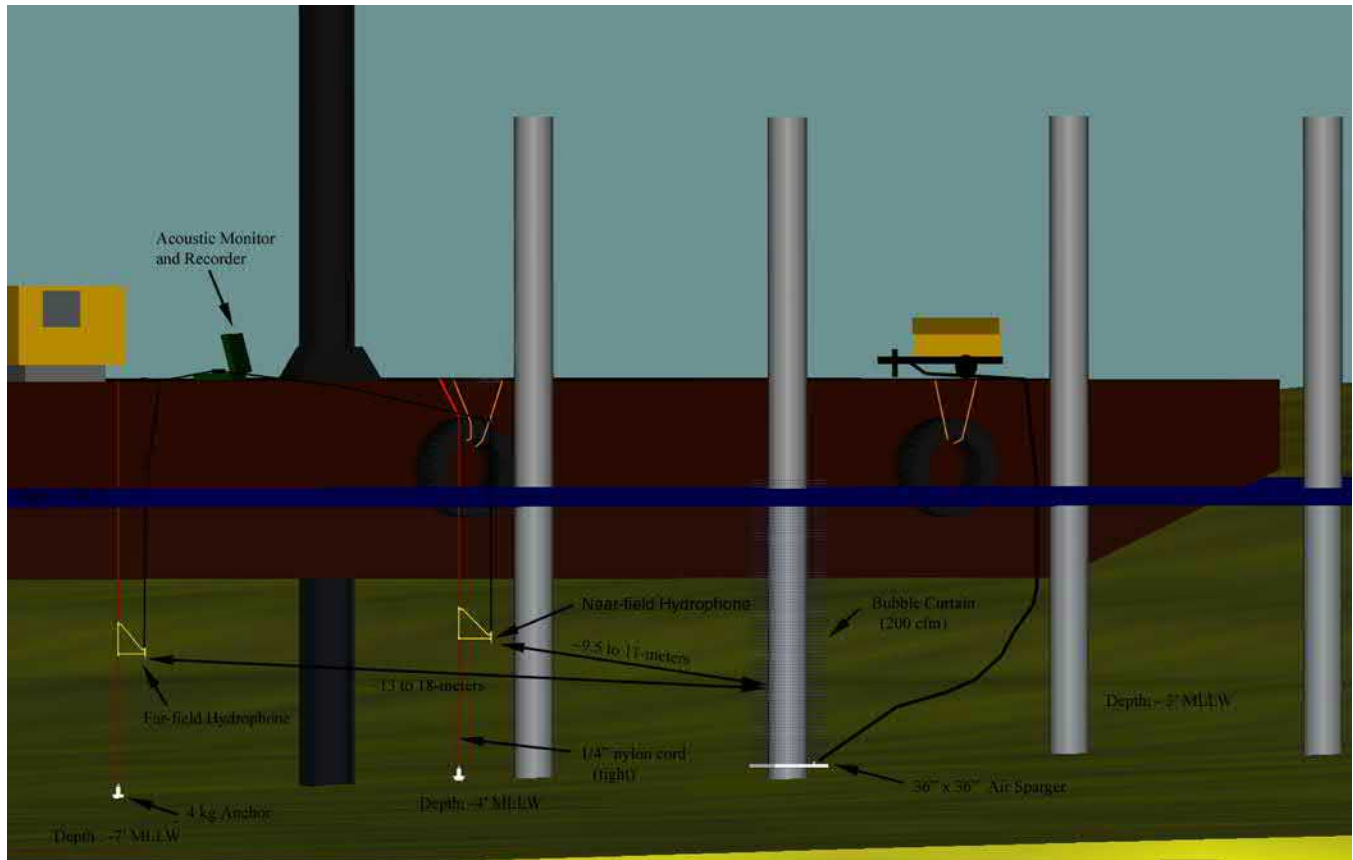


Figure 4 Hydrophone deployment and structures.

The near-field and far-field hydrophones are recorded concurrently on separate channels. The technician can observe the sound pressure levels and spectrum in real time on the monitor.

All impact pile driving was mitigated using a single-level bubble curtain expelling air at approximately 200 cfm.

2.3 Measurements

The technician would check the water level periodically to ensure the hydrophones were deployed at mid-water depth. Prior to starting any pile driving, the Contractor Lead would signal the acoustic technician they were ready. The technician would recheck the distance from pile to hydrophone was correct using the laser rangefinder then check the general area around each hydrophone for any debris or potential interference. The technician would start the recording just prior to the pile driving and before the bubble curtain was activated if possible to record the ramp up of activity from ambient to fully



active. The signals were monitored in real-time to ensure the hydrophones were collecting data at good levels (not over-pressure or under-pressure).

Each 24-bit, two channel recording had a sampling rate of 48,000 Hz (frequency limit 24,000 Hz) with an FFT size of 8192 samples. This provides a spectral resolution of 5.859 Hz.

Following the completion of the activity and shut down of the bubble curtain, the technician would stop the recording and quickly assess the general SPL of the activity as well as the cSEL to determine if additional mitigation was required. Data was saved and backed up on an external hard drive following each event.

2.4 Ancillary Measurements

Discrete air noise readings were taken at the 10-meter location with a Type-II Sound Level Meter to record the maximum A-weighted SPL from background, vibratory and impact pile driving. Results were recorded in logbook.

A CTD cast was conducted at the end of the day to collect a profile of salinity/ conductivity, temperature, and depth data to verify station depth and calculate the general speed of sound through the water column.

3.0 DATA PROCESSING

3.1 Signal Processing

All signals were recorded as broadband encompassing a frequency range from 11.7 Hz to 22.16 kHz. Most of the processing is performed in the field as the SpectraPLUS-SC FFT Spectral Analysis System software records and displays the data. Additional processing of each event included trimming each file to remove extra recording time such as the bubble curtain start up and soft start blows that are not included (per Engineer) as part of the blows per pile record or “event”. From the trimmed record containing only the actual blows per pile, the maximum, minimum, and mean SPLs were extracted and plotted as a time series plot. SpectraPLUS-SC was used to determine the RMS and cSEL over the entire event.

The software was used to determine the T_{90} for each wave (approximately 45mS to 60mS) by trimming each pile strike impulse waveform per event to T_{90} and removing the hammer reset time (~1.4 seconds) between strikes then aggregated to determine $RMS_{90\%}$ and $cSEL_{90\%}$ for the entire event as well as the metrics from the maximum and minimum waveforms from each event. All data was processed as broadband between 12 Hz and 20 KHz.

Plots generated from the field data that include SPL amplitude as Linear and logarithmic times series plots as well as Spectrum and cSEL plots are included in Appendix A of this report.



4.0 RESULTS

4.1 Underwater Acoustic Results

Four (4) 24-inch piles were recorded overall that included that were driven using an impact hammer. All events were recorded on the near-field and far-field hydrophones. The time series plots in Figure 5 and Figure 6 summarize the Peak SPLs recorded for each strike during each event using an Impact Hammer.

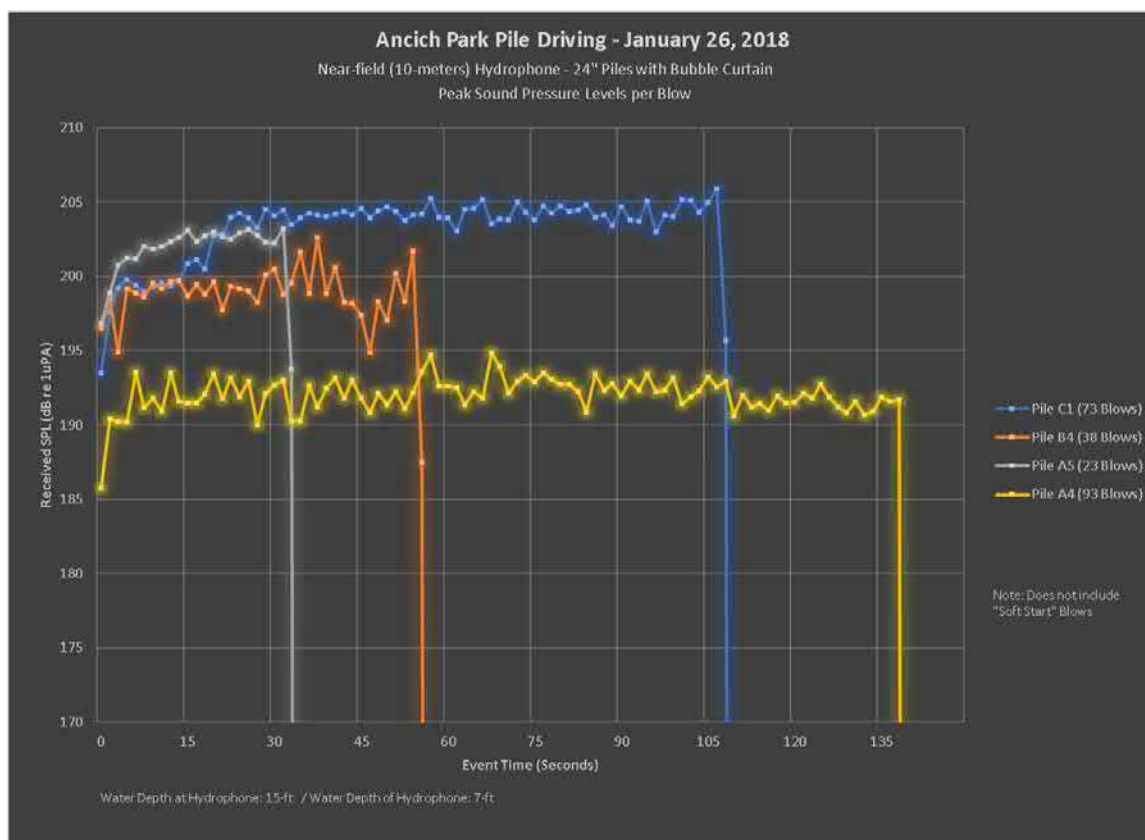


Figure 5 Peak SPLs at approximately 10-meters during impact pile driving.



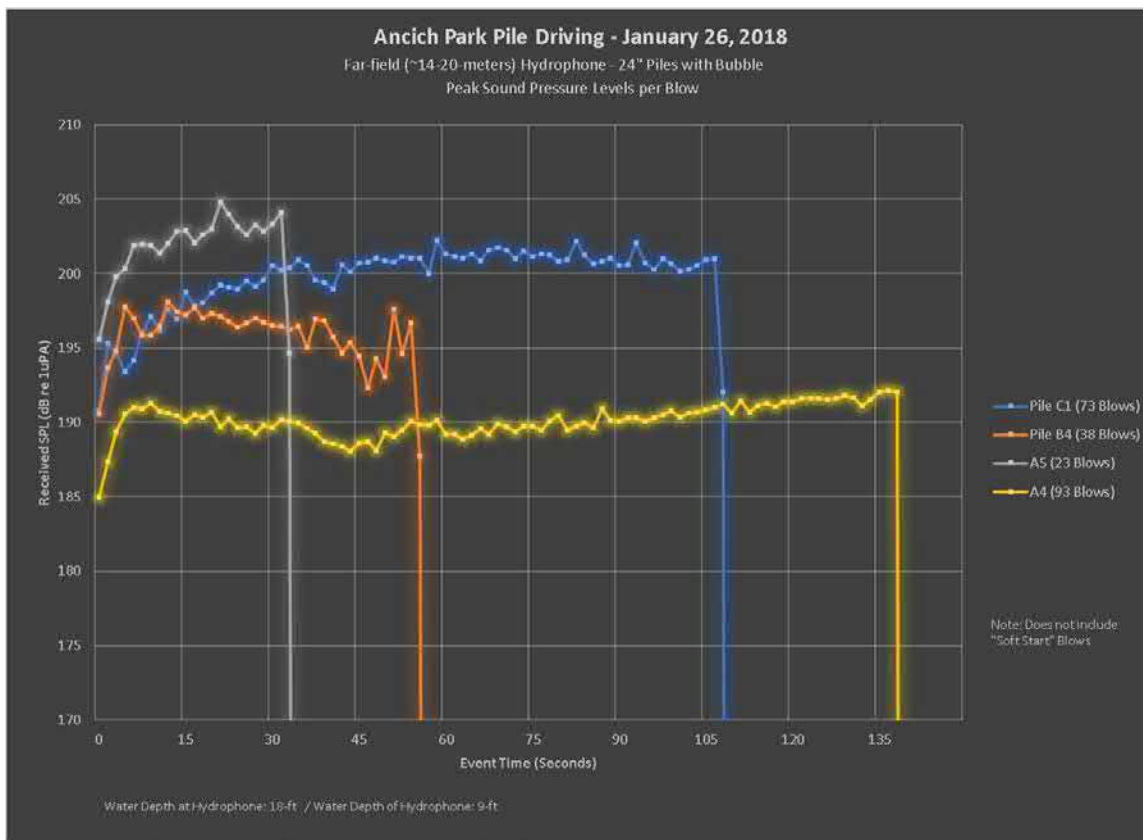


Figure 6 Peak SPLs at approximately 20-meters during impact pile driving.

An average background underwater noise level of 134.5 dB re 1 uPa (RMS over 1 Min) was measured on both hydrophones without any in-water work being performed. Since the hydrophone were placed near the barge at different locations, it is reasonable to assume they were receiving noise propagating from the barge at different levels. These levels were elevated to 138.3 dB re 1 uPa (1 Min) (RMS over 1 Min) when the bubble curtain was in operation. This also corresponded with the start-up of the hammer power-pack and air compressor on the barge deck and other activity such as crane operation.

The highest SPL recorded from the four measured pile driving events was 205.9 dB re 1 μ Pa while driving Pile C1 as measured from 10-meters. The SPL of the same strike was measured as 201.0 dB re 1 μ Pa at the far-field hydrophone and would be nearly consistent with the sound attenuation over a doubling distance assuming a loss of about 3 dB re 1 μ Pa using the cylindrical spreading law ($TL=10 \log(R)$; where TL is Transmission Loss and R is Range (m)) for shallow water. This trend is generally visible over most of the recorded events. Note: constant doubling distance hydrophone relationship could not be maintained during this monitoring effort. Obstructed line-of-sight from other structures such as installed piles, also affected received impulses on either hydrophone.

Out of the four (4) impact events, Pile C1 also produced the highest cSEL of $201.1 \text{ dB re } 1 \mu\text{Pa}^2 \cdot \text{sec}$ during 73 blows over 110 seconds.

The highest RMS recorded over the entire pile driving event was 176.2 dB re 1 uPa produced during 23 blows over 32 seconds while driving Pile A5.



The effectiveness of the bubble curtain used was probably limited in the shallow water as the SPLs are similar to 24-inch piles driven without mitigation. However, the cSEL did not exceed the National Marine Fisheries Service cSEL limit of 204 re $1 \mu\text{Pa}^2 \cdot \text{sec}$ per event requiring the Contractor to place a wood pad between the hammer and steel pile for all subsequent impact driving events. Extended out, continuous pile driving of C1 for approximately 9 minutes (approx. 350 blows) maintaining the same general levels would result in an cSEL of 204 dB re $1 \mu\text{Pa}^2 \cdot \text{sec}$. The allowable total daily blow count for this site is 750. Total Blow Count for impact pile driving was 227 plus seventeen (7) soft start blows. Piles B3 thru B1 and A3 thru A1 were embedded another 1-foot to their design capacity of 400 kips requiring approximately 20 blows each for another 120 blows this day. The shallowness of the water and positioning of the hydrophones on the barge would have resulted in poor data quality for those piles but they are not assumed to exceed the highest SPL recorded at C1 and its associated cSEL.

All reported acoustic metrics including SPLs produced during pile driving have been summarized and provided in Hydro Acoustic Monitoring Data Sheet in Appendix B.

4.2 Ancillary Data and Observations

Weather: Light rain occurred throughout the day.

Beaufort Scale: 0

Air Noise: Ambient On board barge, crane and compressors operating

66.7 dB-A weighted (Maximum over 60 seconds)

Impact Driving (steady at 10-meters, 24-inch pile)

102.0 dB-A weighted (Maximum over 60 seconds)

Visual Observations (Wildlife): No marine mammals were observed within the area.

No fish were observed around the piles before driving or distressed and on the surface following an event. Marine birds such as cormorants were observed diving near the marina to the east during pile driving operations and appeared to be unaffected by the noise levels. The mitigation device (bubble curtain) was ON anytime during pile driving activities.

Conductivity, Temperature, Depth (CTD) Data: The water was well mixed from the surface to approximately 13-feet water depth due to the agitation created by the bubble-curtain. Water depth at the time of the CTD cast was 17-feet corrected to a station depth of -8-feet Mean Lower Low Water (MLLW) based on predicted tides for the area at the time of the cast. Temperature



ranged from 7.9° C on the surface to 8.8°C on the seafloor. Likewise, the salinity ranged from 24.4 PPT on the surface to 29 PPT near the seafloor. Figure 6 shows a plot of the sound velocity calculated from the salinity, temperature, and pressure data measured at the near field station using the Del Grosso sound velocity equation. Sound velocity at the hydrophone was approximately 4,850 ft/sec. Depending on the position of the near-field hydrophone relative to the pile, the time difference between the wave arrival from the near-field hydrophone and the same wave at the far-field hydrophone varied from 0.003 seconds to 0.006 seconds, or 4.2-meters to 10.4-meters based on the sound velocity.

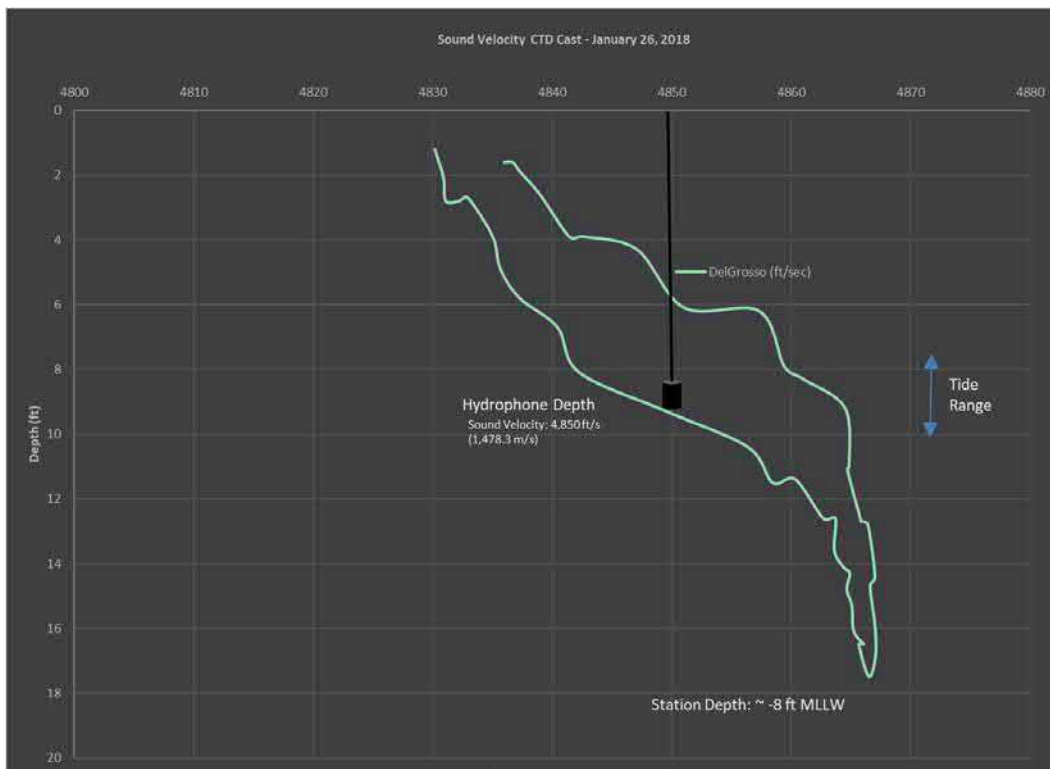


Figure 7 Sound velocity calculated from CTD cast values.

5.0 Data Quality

Collected data exceeded the scope of the monitoring effort for internal comparison and correlation. All data appeared to be within the general ranges expected produced during these types of pile driving operations. The data is of general good quality however is most likely contaminated slightly by the equipment and sounds generated by the barge. While the bubble curtain used did offer mitigation to some degree, the shallowness of the site and the low air delivery cfm does not really allow for a significant attenuation of the impulse wave. All acoustic data is archived for further review and processing.



APPENDIX A

Output Plots for Individual Pile Driving Events

Time Series SPL (Amplitude Linear: Pascals)

Time Series SPL (Amplitude Logarithmic: dB re 1 μ Pa)

Time Series cSEL (re 1 μ Pa² · sec)

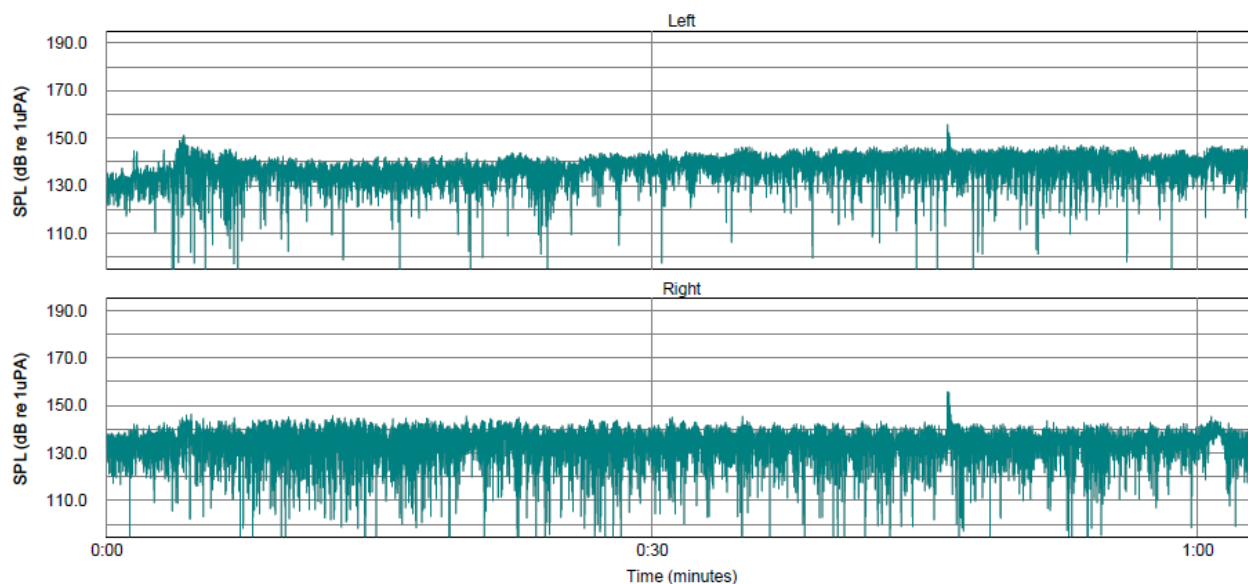
Spectrum (Average and Peak)



Both Left & Right
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 26, 2018 - Background

Printed By: SpectraPLUS-SC Sound Card Edition
Licensed To: Kevin Smith
Fri Feb 16 12:54:28 2018



Background levels measured on barge. Machinery on.
Right Channel: 133.6 dB re 1 uPa RMS 1 minute
Left Channel: 135.7 dB re 1 uPa RMS 1 minute

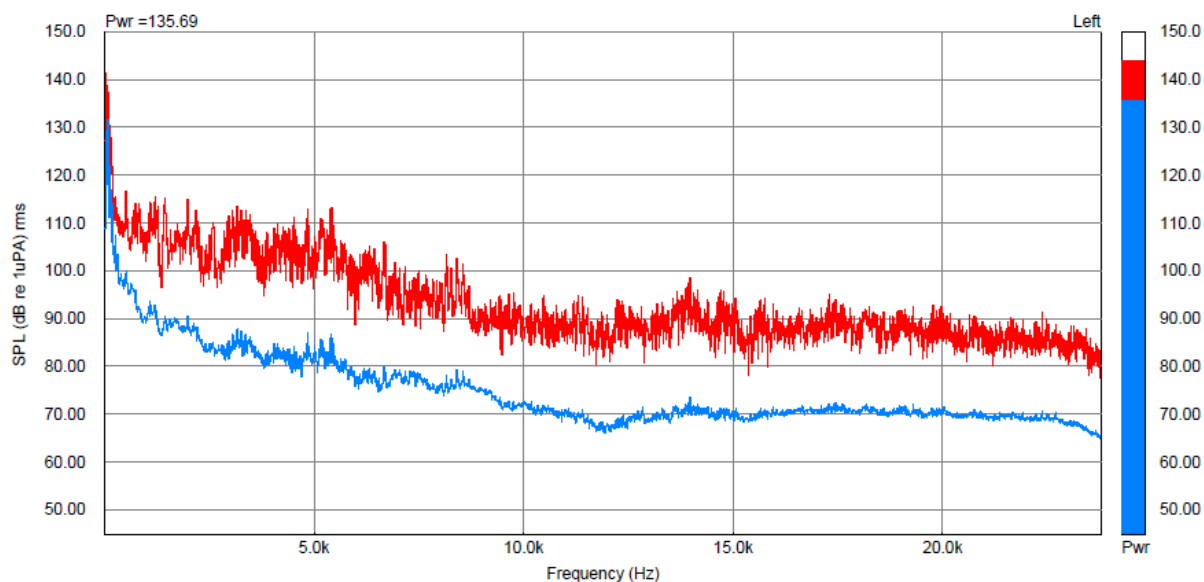
Right Channel at 10- Meters
Left Channel at 20-meters



Left Channel
 Sampling Rate: 48000
 FFT size: 8192
 Averaging: 100
 Window: Hanning

Ancich Park Pile Drive Monitoring
 January 26, 2018 - Background - Spectrum

Printed By: SpectraPLUS-SC Sound Card Edition
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 Fri Feb 16 13:01:20 2018



Background levels measured on barge. Machinery on.

Right Channel: 133.6 dB re 1 uPa RMS 1 minute
 Left Channel: 135.7 dB re 1 uPa RMS 1 minute

Hydrophone at mid-water depth

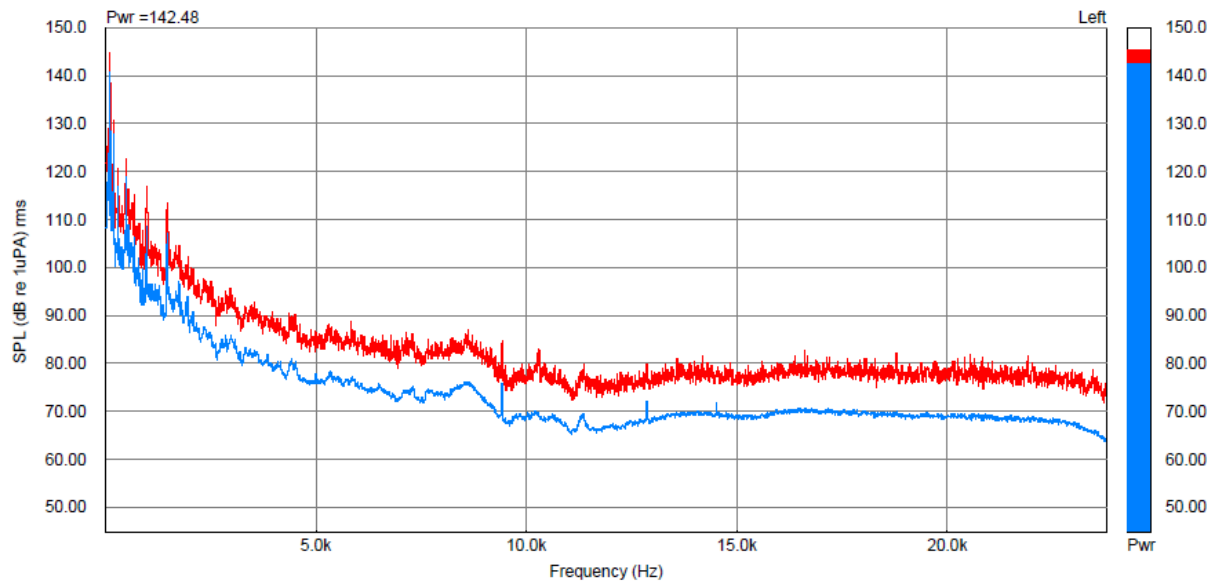
Red- Peak Hold over one minute
 Blue- Average over one minute



Left Channel
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 26, 2018 - Bubble Curtain- Spectrum

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Fri Feb 16 13:06:48 2018



Bubble curtain levels measured on barge. Machinery on.

Right Channel: 142.1 dB re 1 uPa RMS 1 minute
Left Channel: 133.1 dB re 1 uPa RMS 1 minute

Hydrophone at mid-water depth

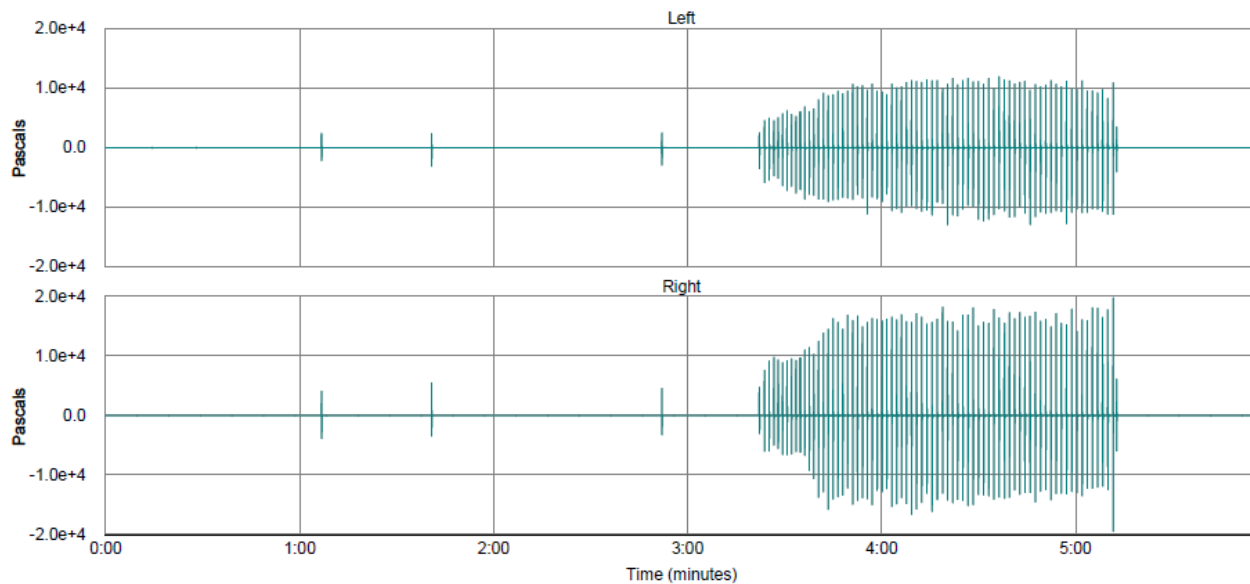
Red- Peak Hold over one minute
Blue- Average over one minute



Both Left & Right
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 26, 2018 - Pile C1

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Fri Feb 16 13:40:55 2018



Right Channel at 10-meters. Peak pressure 19.7 kPa (205.9 dB re 1 uPa)
Left Channel: at 20-meters. Peak pressure 12.9 kPa (202.2 dB re 1uPa)

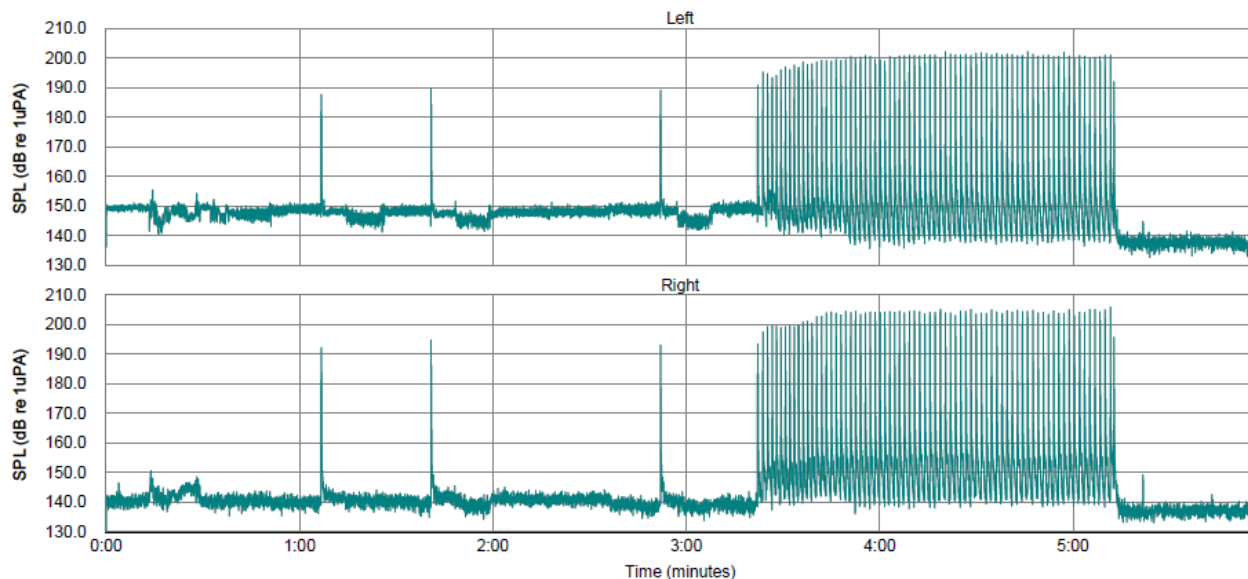
Hydrophone at mid-water depth



Both Left & Right
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 26, 2018 - Pile C1

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Fri Feb 16 13:39:34 2018



Right Channel at 10-meters. Peak pressure 19.7 kPa (205.9 dB re 1 uPa)
Left Channel: at 20-meters. Peak pressure 12.9 kPa (202.2 dB re 1 uPa)

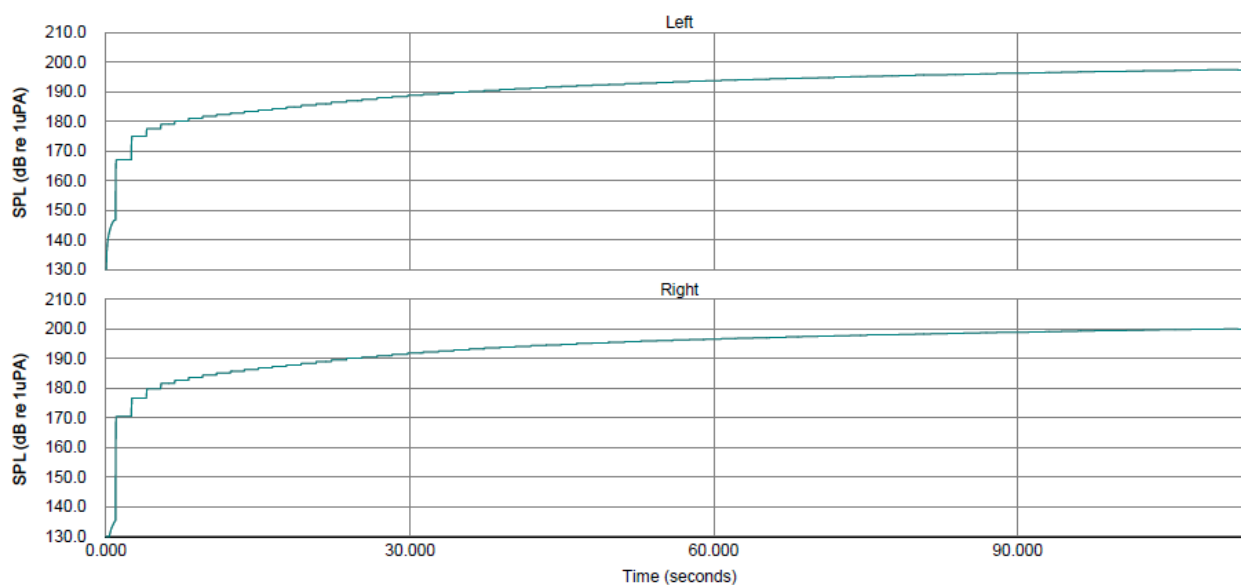
Hydrophone at mid-water depth



Both Left & Right
 Sampling Rate: 48000
 FFT size: 8192
 Averaging: 100
 Window: Hanning

Ancich Park Pile Drive Monitoring
 January 26, 2018 - Pile C1 - cSEL

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 Fri Feb 16 13:42:38 2018



Right Channel at 10-meters. Peak pressure 19.7 kPa (205.9 dB re 1 uPa)
 Left Channel: at 20-meters. Peak pressure 12.9 kPa (202.2 dB re 1uPa)

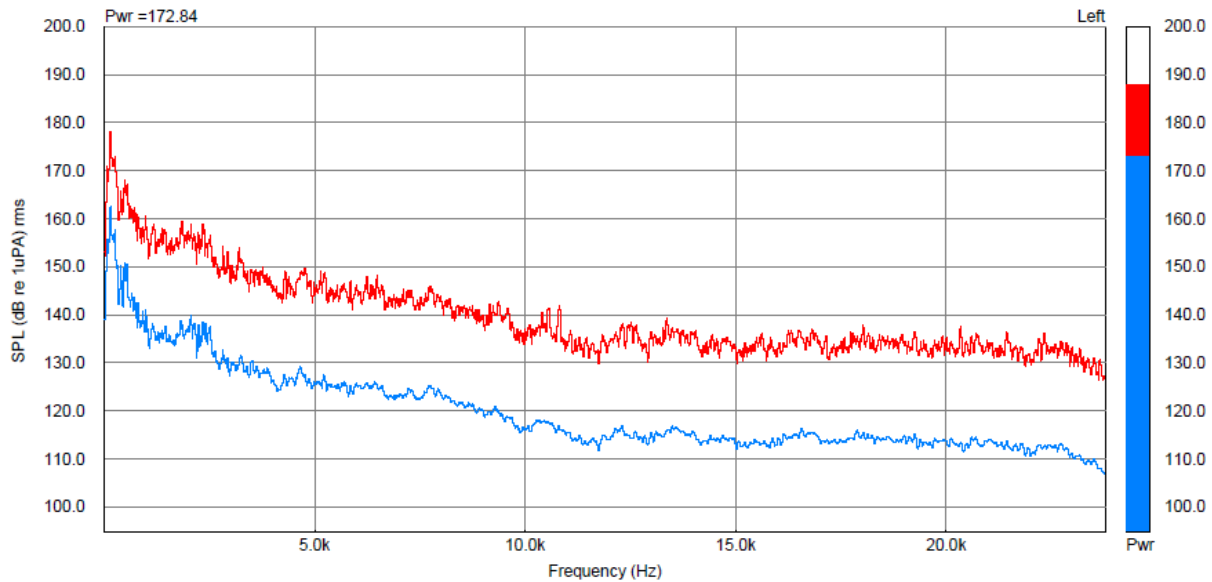
Hydrophone at mid-water depth



Left Channel
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 26, 2018 - Pile C1 - Spectrum

Printed By: SpectraPLUS-SC Sound Card Edition
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Fri Feb 16 14:15:34 2018



Near-field-meters

Hydrophone at Mid-water depth

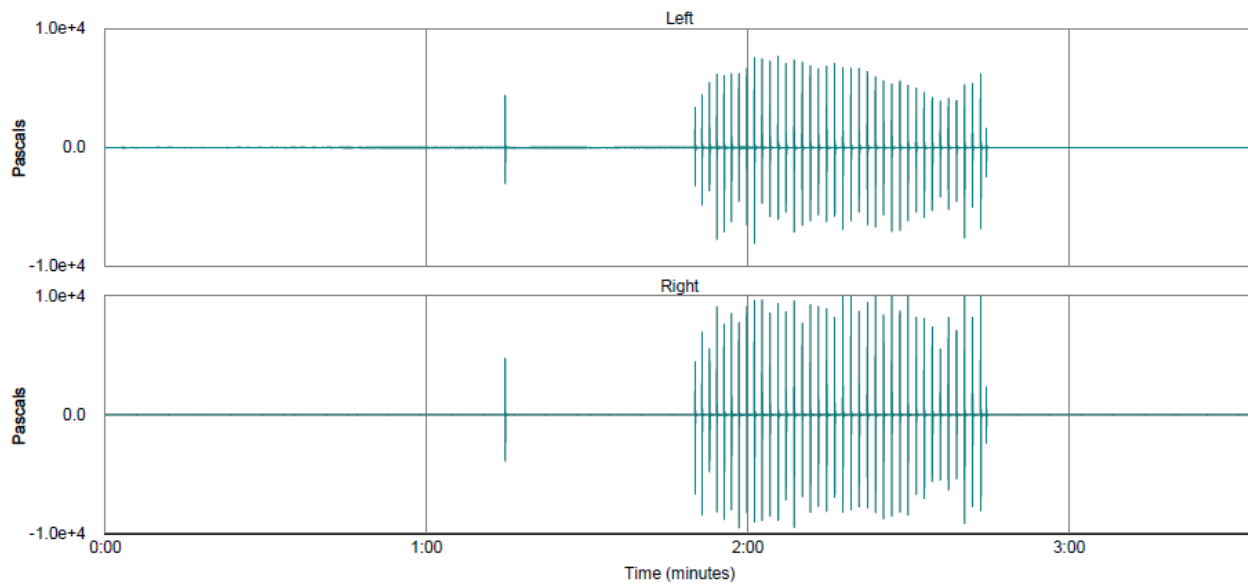
Red - Peak hold over duration of steady impact pile driving.
Blue - Average over duration of steady impact pile driving.



Both Left & Right
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 26, 2018 - Pile B4

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Fri Feb 16 13:31:10 2018



Right Channel at 10-meters. Peak pressure 13.5 kPa (202.6 dB re 1 uPa)
Left Channel: at 20-meters. Peak pressure 8.0 kPa (198.1dB re 1uPa)

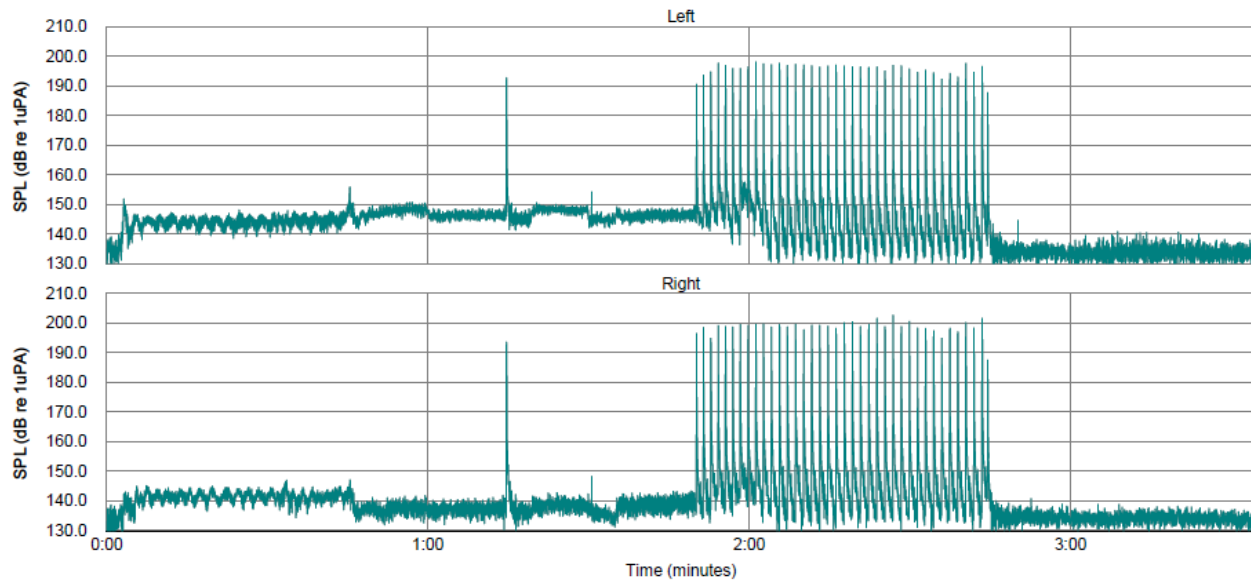
Hydrophone at mid-water depth



Both Left & Right
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 26, 2018 - Pile B4

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Fri Feb 16 13:32:31 2018



Right Channel at 10-meters. Peak pressure 13.5 kPa (202.6 dB re 1 uPa)
Left Channel: at 20-meters. Peak pressure 8.0 kPa (198.1 dB re 1 uPa)

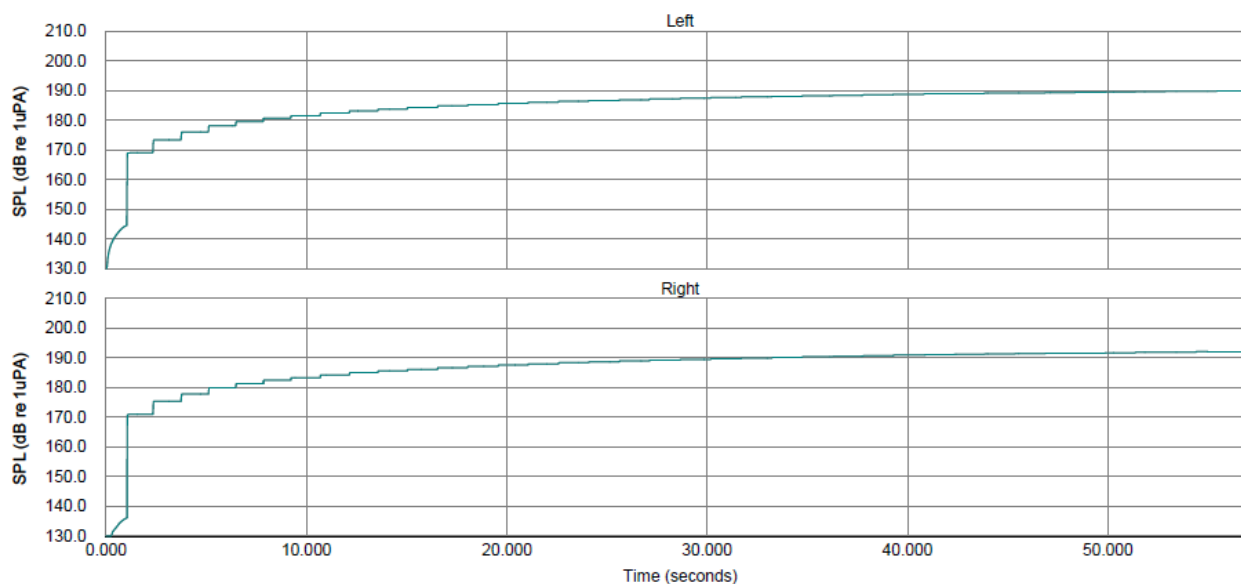
Hydrophone at mid-water depth



Both Left & Right
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 26, 2018 - Pile B4-cSEL

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Fri Feb 16 13:34:16 2018



Right Channel at 10-meters. Peak pressure 13.5 kPa (202.6 dB re 1 uPa)
Left Channel: at 20-meters. Peak pressure 8.0 kPa (198.1dB re 1uPa)

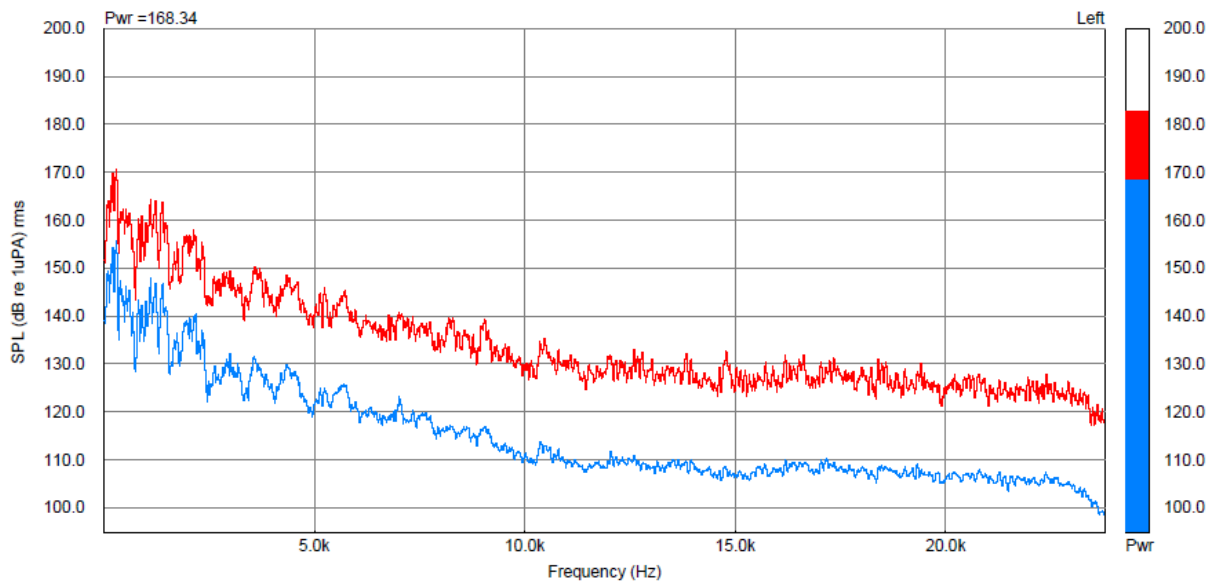
Hydrophone at mid-water depth



Left Channel
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 26, 2018 - Pile B4 - Spectrum

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Near-field-meters

Hydrophone at Mid-water depth

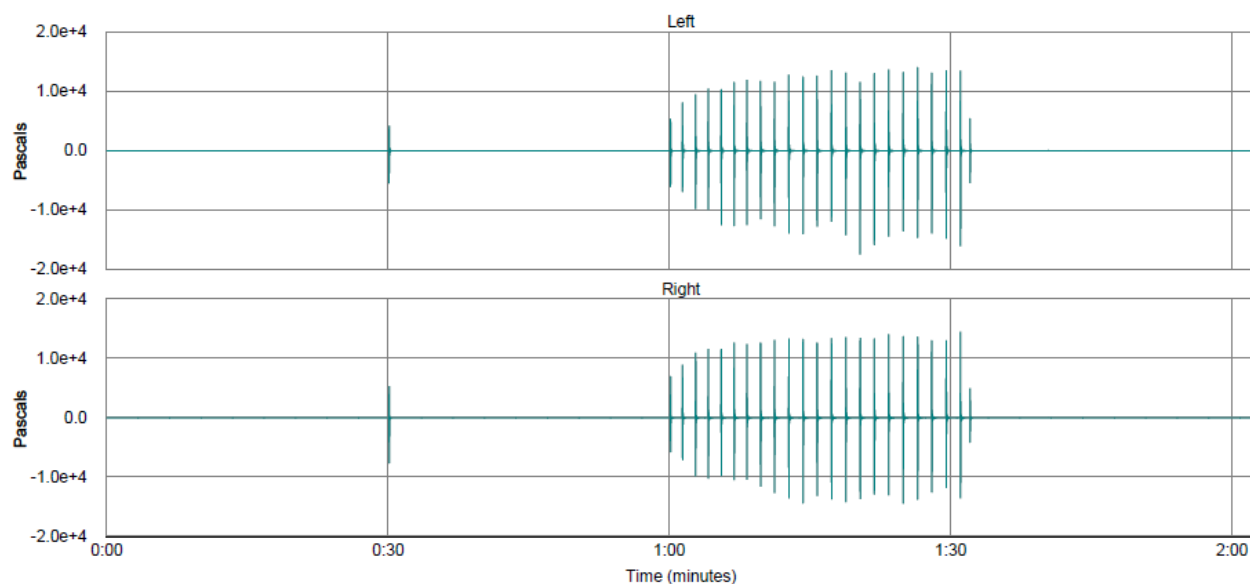
Red - Peak hold over duration of steady impact pile driving.
Blue - Average over duration of steady impact pile driving.



Both Left & Right
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 26, 2018 - Pile A5

Printed By: SpectraPLUS-SC Sound Card Edition
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Fri Feb 16 13:49:19 2018



Right Channel at 10.5-meters. Peak pressure 14.5 kPa (203.2 dB re 1 uPa)
Left Channel: at 14-meters. Peak pressure 17.4 kPa (204.8 dB re 1uPa)

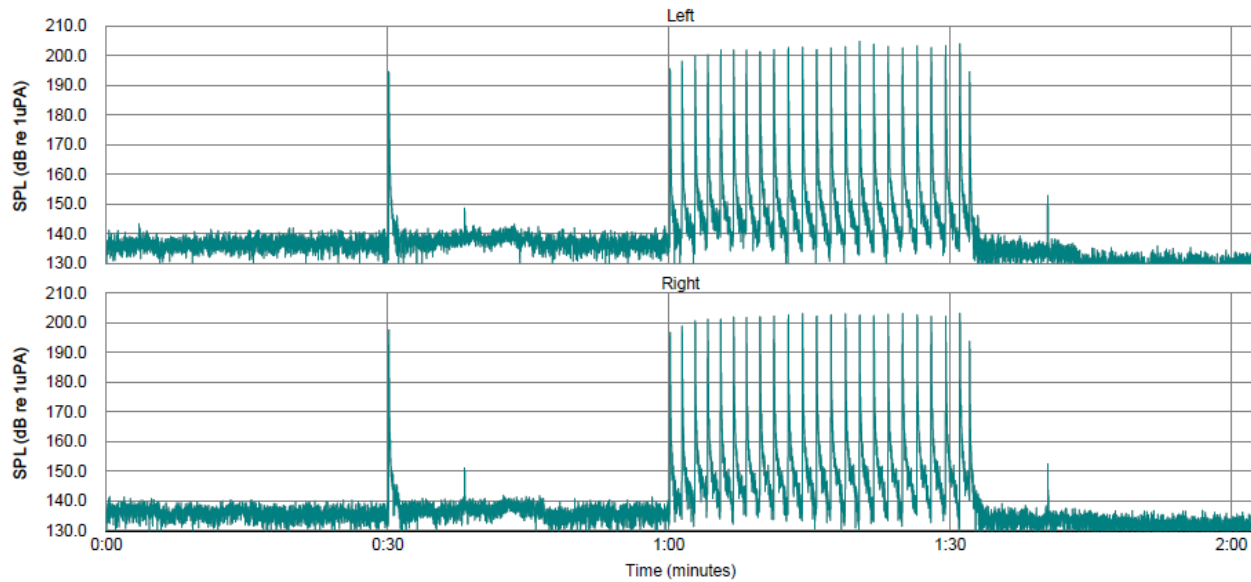
Hydrophone at mid-water depth



Both Left & Right
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 26, 2018 - Pile A5

Printed By: SpectraPLUS-SC Sound Card Edition
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Fri Feb 16 13:50:47 2018



Right Channel at 10.5-meters. Peak pressure 14.5 kPa (203.2 dB re 1 uPa)
Left Channel: at 14-meters. Peak pressure 17.4 kPa (204.8 dB re 1 uPa)

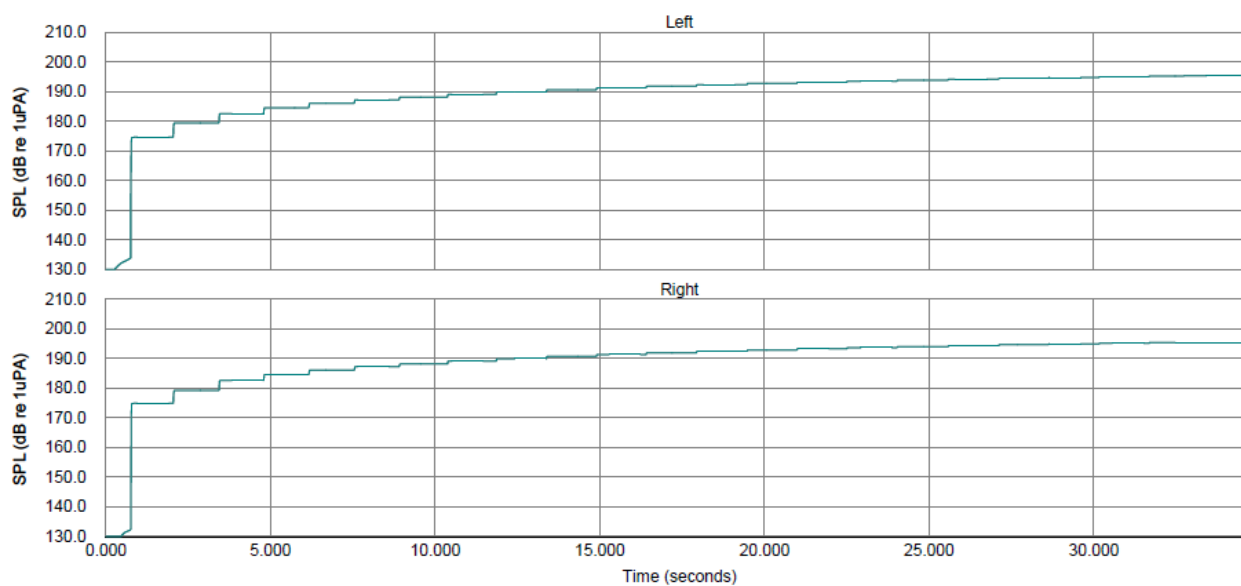
Hydrophone at mid-water depth



Both Left & Right
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 26, 2018 - Pile A5 - cSEL

Printed By: SpectraPLUS-SC Sound Card Edition
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Fri Feb 16 13:52:19 2018



Right Channel at 10.5-meters. Peak pressure 14.5 kPa (203.2 dB re 1 uPa)
Left Channel: at 14-meters. Peak pressure 17.4 kPa (204.8 dB re 1uPa)

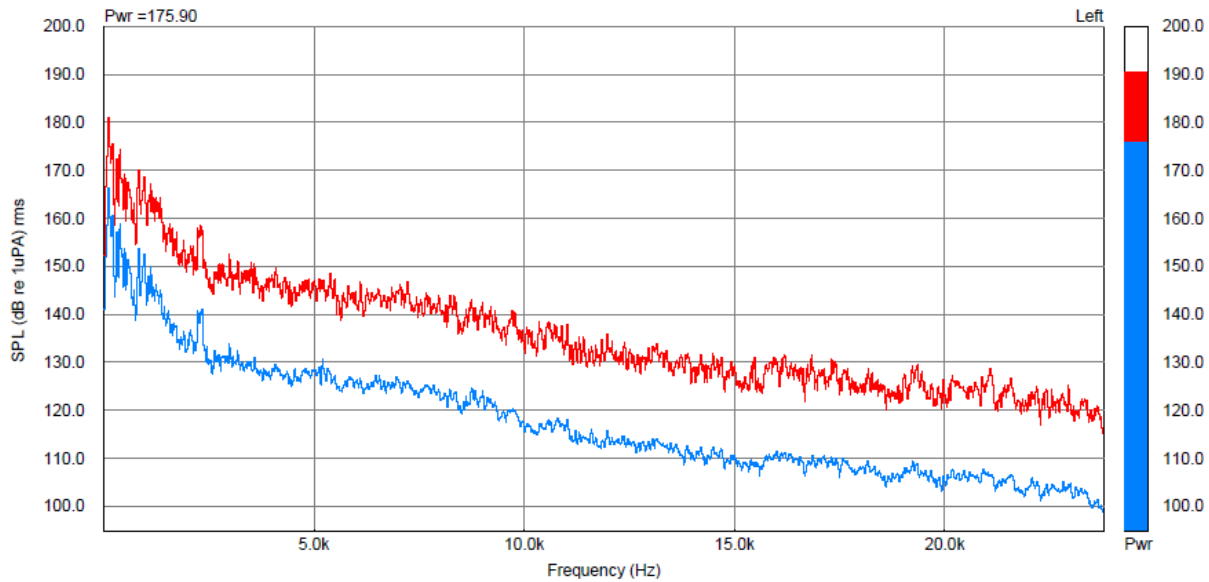
Hydrophone at mid-water depth



Left Channel
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 26, 2018 - Pile A5 - Spectrum

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Fri Feb 16 14:19:26 2018



Near-field-meters

Hydrophone at Mid-water depth

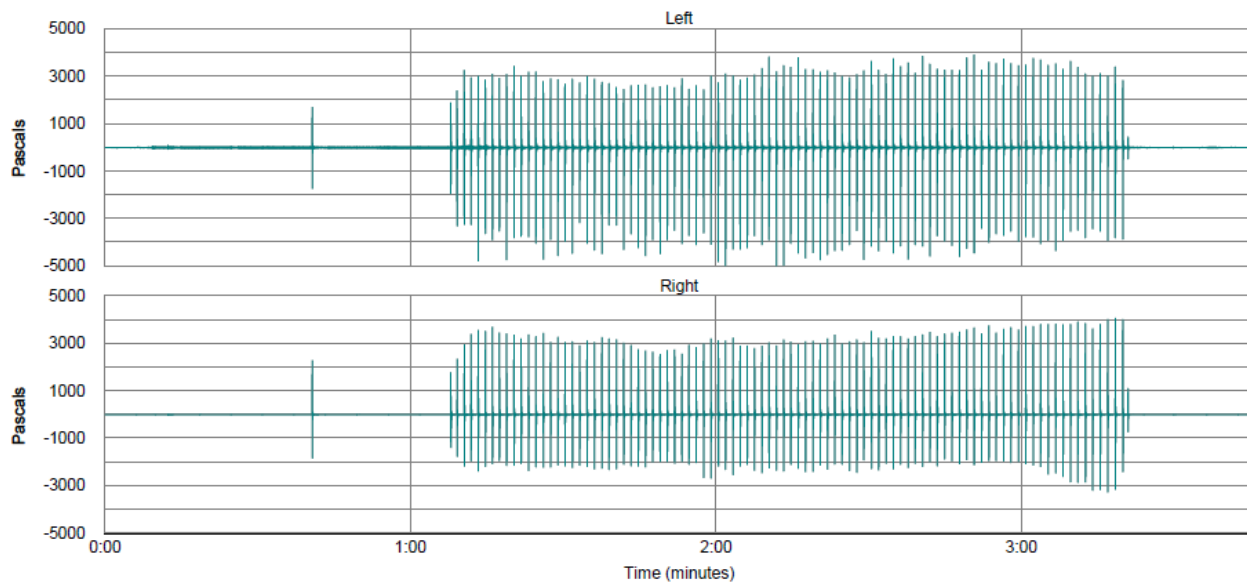
Red - Peak hold over duration of steady impact pile driving.
Blue - Average over duration of steady impact pile driving.



Both Left & Right
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 26, 2018 - Pile A4

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Fri Feb 16 15:32:14 2018



Left Channel at 9.4-meters. Peak pressure 5.5 kPa (194.8 dB re 1 uPa)
Right Channel: at 15-meters. Peak pressure 4.1 kPa (192.2 dB re 1uPa)

!!! Obstructed line of sight due to A5

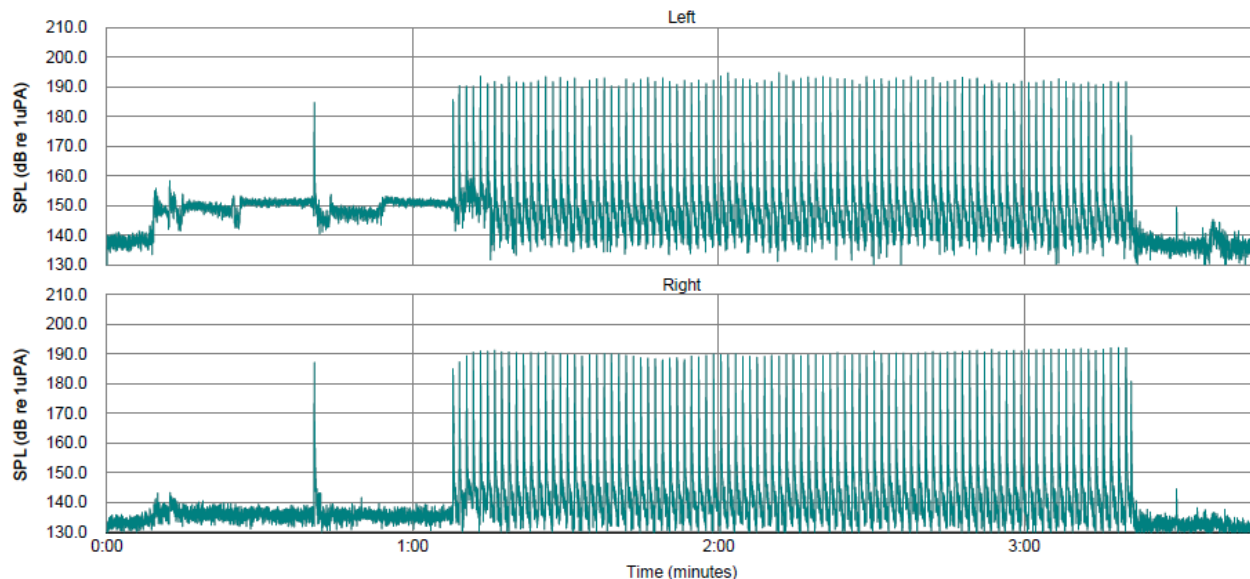
Hydrophone at mid-water depth



Both Left & Right
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 26, 2018 - Pile A4

Printed By: SpectraPLUS-SC Sound Card Edition
Licensed To: Kevin Smith
Fri Feb 16 15:28:45 2018



Left Channel at 9.4-meters. Peak pressure 5.5 kPa (194.8 dB re 1 uPa)
Right Channel: at 15-meters. Peak pressure 4.1 kPa (192.2 dB re 1 uPa)

!!! Obstructed line of sight due to A5

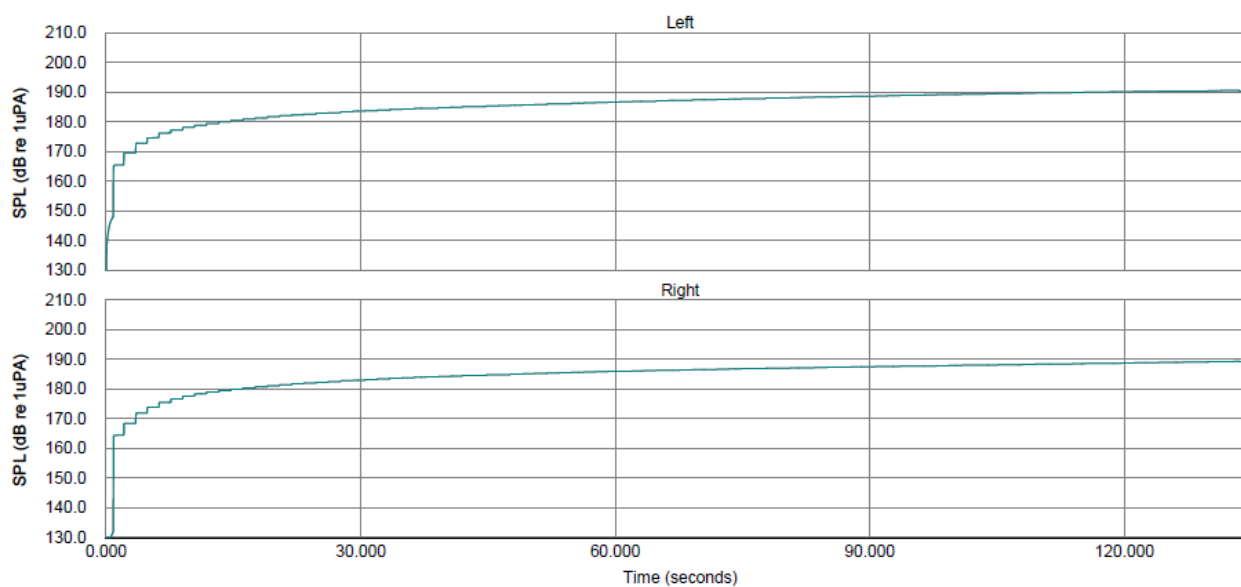
Hydrophone at mid-water depth



Both Left & Right
 Sampling Rate: 48000
 FFT size: 8192
 Averaging: 100
 Window: Hanning

Ancich Park Pile Drive Monitoring
 January 26, 2018 - Pile A4 - cSEL

Printed By: SpectraPLUS-SC Sound Card Edition
 Licensed To: Kevin Smith
 Fri Feb 16 15:30:12 2018



Left Channel at 9.4-meters. Peak pressure 5.5 kPa (194.8 dB re 1 uPa)
 Right Channel: at 15-meters. Peak pressure 4.1 kPa (192.2 dB re 1uPa)

!!! Obstructed line of sight due to A5

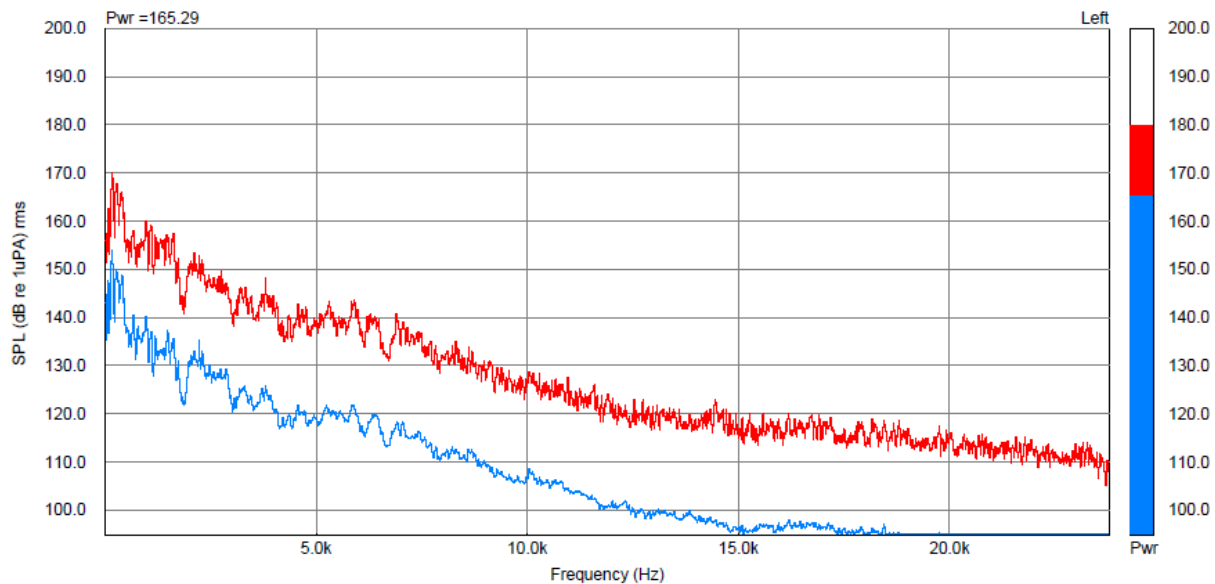
Hydrophone at mid-water depth



Left Channel
Sampling Rate: 48000
FFT size: 8192
Averaging: 100
Window: Hanning

Ancich Park Pile Drive Monitoring
January 25, 2018 - Pile A4 - Spectrum

Printed By: SpectraPLUS-SC Sound Card Edition
Licensed To: Kevin Smith
Fri Feb 16 14:21:06 2018



Near-field-meters

Hydrophone at Mid-water depth

Red - Peak hold over duration of steady impact pile driving.
Blue - Average over duration of steady impact pile driving.



APPENDIX B

Hydro Acoustic Monitoring Data Sheet

Ancich Park – January 26th, 2018



HydroAcoustic Monitoring Data Sheet

Site: Ancich Park - Gig Harbor, WA.

Date: 1/26/2018

Pile Type: Galv. Steel (0.5" wall)

Pile Diameter: 24"

Substrate: Dense Silty-sand w/ Gravel

Mitigation: Single Sparger - Bubble curtain

Background Level (RMS): 134.5 dB re 1 uPa (1 Min)

BubbleCurtain Level (RMS): 138.3 dB re 1 uPa (1 Min)

Hydrophone 1 Depth: Mid-Water (adjusted)

Hydrophone 2 Depth: Mid-Water (adjusted)

Time (PST)		Pile ID	Impact or Vibratory	No. of Blows ¹	Time To Drive (s) ²	Average BPM	Distance to Pile (m) ³	Water Depth ⁴		Peak (dB re 1 uPa)			SEL _{90%} (re 1 μPa ² · sec) ⁵			Event cSEL ⁶ (re 1 μPa ² · sec)	RMS _{90%} (dB re 1 uPa) ⁷			Event RMS ⁸ (dB re 1 uPa)	Notes
Start	Finish							At Pile (m)	At H-Phone (m)	Max	Min	Mean	Max Blow	Min Blow	cSEL _{90%}		Max Blow	Min Blow	Mean		
10:05	10:08	C1	Impact	73	110	40	10.1	4.6	4.6	205.9	193.5	203.2	182.1	170.4	200.0	200.1	191.2	180.1	190.2	175.5	Maximum and Minimum
10:25	10:28	B4	Impact	38	54	42	12	4.6	4.6	202.6	187.5	198.6	176.7	165.7	192.1	192.1	180.5	173.1	180.1	170.6	Blow values not always
10:43	10:44	A5	Impact	23	32	43	10.5	3.1	3.7	203.2	193.8	201.6	183.1	172.2	195.2	195.4	189.2	182.1	188.5	176.2	same blow on near
10:51	10:52	A4 ⁹	Impact	93	137	41	9.4	3.1	3.7	194.8	185.0	190.1	167.5	163.9	188.7	190.6	1732	170.1	175.6	165.3	and far-feild
10:05	10:08	C1	Impact	73	110	40	20.1	4.6	5.5	202.2	190.8	199.7	179.5	166.3	197.1	197.4	188.8	176.1	187.5	172.9	Maximum and Minimum
10:25	10:28	B4	Impact	38	54	42	21	4.6	5.5	198.1	187.8	195.8	172.6	163.9	189.1	189.8	177.5	171.0	177.2	168.3	Blow values not always
10:43	10:44	A5	Impact	23	32	43	14	3.1	4.6	204.8	194.7	201.7	182.8	171.8	194.4	194.6	188.6	181.7	188.1	176	same blow on near
10:51	10:52	A4 ⁹	Impact	93	137	41	15	3.1	4.6	192.2	185.8	192.0	167.7	163.7	187.5	189.3	174.2	165.2	174.2	163.9	and far-feild

¹ Does not include Soft Start (S.S.) Blows

² Steady Pile Driving

³ 10 meter Hydrophone adjusted to range. Far-field hydrophone positioned opportunistically. Note: Occassions of obstructed line of sight to either hydrophone due to other installed piles.

⁴ Water depth at pile depth estimate provided by Contractor. Hydrophone Station depth MLLW determined by CTD Cast. Corrected based on tide predictions for site. Hydrophone adjusted to mid-water level.

⁵ SEL_{90%} Determined for the waveform producing 90% of the energy on the Maximumstrike and Minimum strike. Event cSEL_{90%} is a cumulative sum of the SEL_{90%} waveforms for the event without hammer reset time.

⁶ Event cSEL is the cumulative Sound Exposure Level over the entire event including hammer reset time.

⁷ RMS_{90%} Determined for the waveform producing 90% of the energy on the Maximumstrike and Minimum strike. RMS mean is the resulting RMS value of the RMS_{90%} waveforms for the event without hammer reset time.

⁸ Event RMS is the RMS value of the pressure waveforms produced through the entirety of the impact event including hammer reset time.

⁹ Obstructed line of site between pile and hydrophones due to Pile A5.



APPENDIX C

Photos

Ancich Park Pile Driving – January 26th, 2018





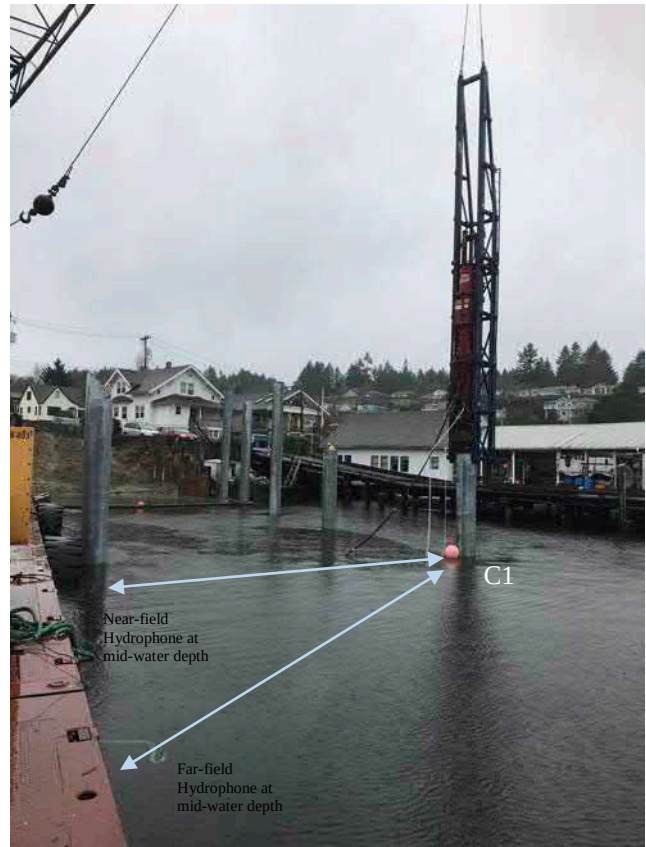
Delmag 32 impact hammer



Bubble Curtain Sparger (2"x 2" tube)



Pile Driving B4 (Bubble curtain ON)



Hydrophone locations on barge (adjusted)





Monitored Piles at Ancich Site (C1,B4, A5, B3).





APPENDIX VI – MACROVEGETATION SURVEY

September 24, 2018

PND No. 184055

SUBJECT: ANCICH PARK PUBLIC LAUNCH FLOATS MACROVEGETATION SURVEY

To Whom It May Concern:

Purpose

The City of Gig harbor has recently constructed Ancich Park's new boat storage building (Corps No. NWS-2016-733) for human-powered watercraft. The Gig Harbor Canoe and Kayak Racing Team and the City are jointly proposing this project that will install a new ADA accessible pier and floating dock for launching human-powered watercraft associated with the recently constructed building.

Ancich Park is classified as working waterfront with water dependent uses in the City Shoreline Code. Resolution 949 by the City Council directed that launching small personal craft be accommodated at a facility not shared by commercial or motorized recreational vehicles at this site.

Background

On June 3, 2016, Hart Crowser biologists initiated a survey to document macrovegetation, wildlife, and substrates along the waterfront of Ancich Park. This survey concluded that no eelgrass or kelp was present at the site (Attachment I – 2016 Macrovegetation Survey). The intent of this memo is to re-verify those results, as they are less than 3 years old, per the recommendations of the 2018 U.S. Army Corps of Engineers *Components of a Complete Eelgrass Delineation Report*.

Methods

On September 18, 2018, a PND Engineers' biologist covered the area of the public launch floats using visual surveys and snorkeling within 25 horizontal feet of the proposed site. The surveys occurred between the OHWM and -10 feet mean lower low water (MLLW). The tide at the time of survey was approximately +6 feet. Above +5 feet MLLW, the area was visually observed by walking the intertidal zone. Below +2 feet a biologist snorkeled to document habitat that is not observable at the water surface during low tides.

Analysis

The preliminary survey began at approximately 10:40 a.m. Weather was clear and sunny, and water clarity was poor with visibility approximately 1–5 feet across the majority of the site. Eight tracks parallel to the shore were surveyed and approximately 1,240 linear feet were documented.

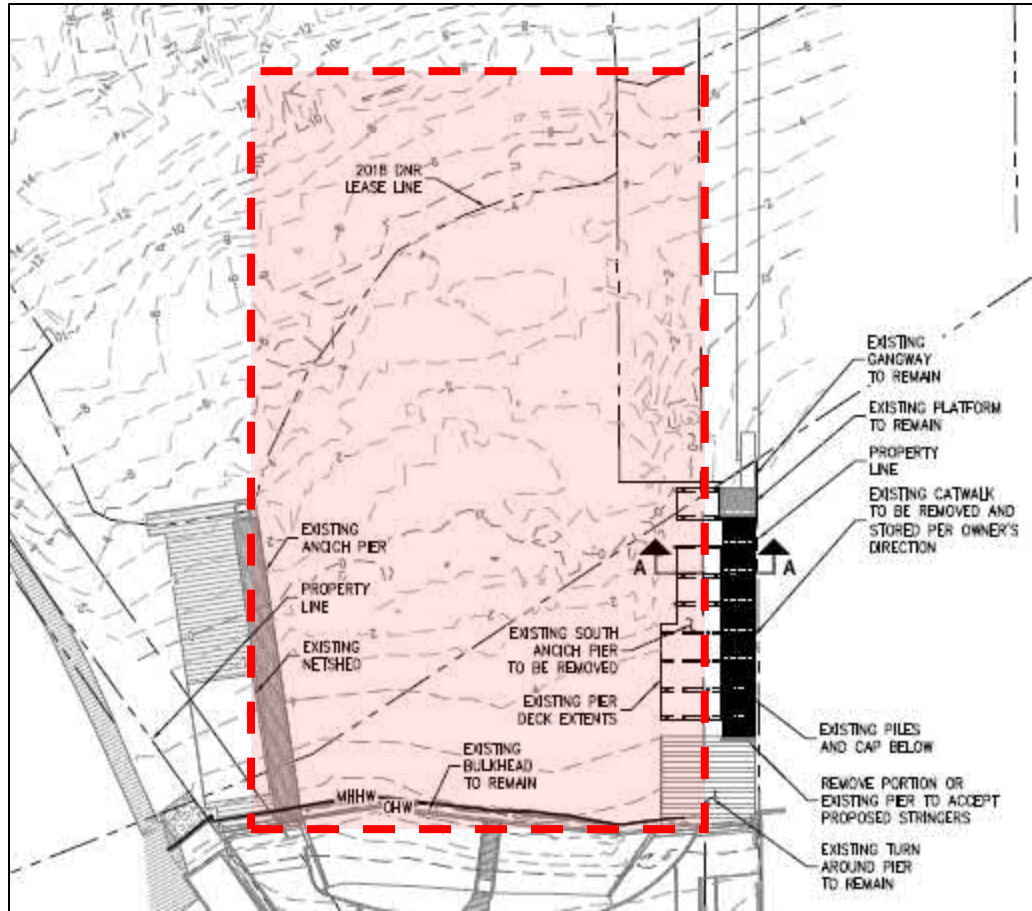


Figure 1. Approximate Survey Area

Between OHWM and -8 feet MLLW, the slope was approximately 5 percent. Sediment at the foot of the bulkhead included newly placed pea-gravel (per NWS-2016-733) overtop silty sand with shell debris (Image 1). Beyond -8 feet MLLW, the slope was much steeper. The lower intertidal and shallow subtidal zone between +OHWM and -10 feet MLLW was sparsely covered with macrovegetation. Patches of *Enteromorpha* spp. and *Ulva* spp. were observed between OHWM and -2 feet MLLW, with the highest densities in the upper intertidal. Rockweed (*Fucus* sp.) was also present. There was no eelgrass or kelp observed in the surveyed area (Attachment II – Field Log).



Image 1. Intertidal Zone along Ancich Park Facing Southeast

Conclusion

The project as proposed will have no effect on eelgrass or kelp. Typical habitat for eelgrass or kelp was not observed. Some macroalgal habitat will be temporarily impacted by the project, but these species should recolonize following construction activities.

Sincerely,

PND Engineers, Inc. | Seattle Office

Nicole L. White

Nicole White, Environmental Scientist

Attachments:

I – 2016 Macrovegetation Survey

II – Field Logs



ATTACHMENT I – 2016 MACROVEGETATION SURVEY

June 29, 2016

Steve Robert
PND Engineers, Inc.
1736 4th Avenue South
Seattle, WA 98134

Re: Ancich Park and Netshed Restoration Macrovegetation Survey
12132-35

Dear Mr. Robert:

This survey has been prepared to assess the potential effects of the Ancich Park and Netshed Restoration Project (Project) on existing macrovegetation resources. The Project is located in the City of Gig Harbor, in Pierce County, Washington in Section 05 of Township 21 North, Range 2 East and consists of three tax parcels (Pierce County Tax Parcel Numbers 5970000243, 5970000251, and 5970000252) (Figure 1).

Project Description

The City of Gig Harbor (City) is proposing to make improvements to the property at 3658 Harborview Drive and turn it into Ancich Park, featuring public boat storage, bathrooms, and landscaped areas. As part of this project, the City seeks to replace the existing bulkhead, and restore the historic Ancich Netshed which includes maintaining the existing pier. The Ancich Netshed will be temporarily relocated while the existing pier is improved. The new pier will be within the same footprint as the existing pier, resulting in no net increase in overwater coverage. The new bulkhead will be set back further than the existing bulkhead above the ordinary high water mark (OHWM).

Methods

The macrovegetation survey was conducted using the Washington Department of Fish and Wildlife (WDFW) Eelgrass/Macroalgae Habitat Interim Survey Guidelines dated June 16, 2008. As per protocols, the survey was initiated as a preliminary-level survey.

On June 3, 2016, Hart Crowser biologists covered the area of the pier replacement using visual surveys and snorkeling within 25 horizontal feet of the Ancich and Jerkovich pier. The visual and snorkel surveys occurred between the OHWM and –8 feet mean lower low water (MLLW) (Figure 2). Above –1.5 feet MLLW, the area was visually observed by walking the intertidal zone. Below –1.5 feet biologists snorkeled and used a GoPro camera to document habitat and a Trimble® GeoExplorer® 6000 Series GeoXH™ (Trimble) to georeference the snorkel survey. Recorded video footage was reviewed to



document eelgrass, other macrovegetation, wildlife, and substrates not observable at the water surface during low tides.

Results

The preliminary survey began at approximately 10:00 a.m. on June 3, 2016. Weather was clear and sunny with a light breeze. A low tide of -1.8 feet occurred at 10:37 a.m. Water clarity was poor with visibility only 1–2 feet.

Benthos and Macrovegetation

Four tracks parallel to the shore were surveyed and approximately 1,029 linear feet were documented during the survey (Figure 2). Between $+8$ and -8 feet MLLW, the slope was approximately 5 percent and the sediment was silty sand with shell debris (Photograph 1). Beyond -8 feet MLLW, the slope was much steeper.

The lower intertidal and shallow subtidal zone between $+10$ feet and -8 feet MLLW in the vicinity of the pier was sparsely covered with macrovegetation. Small patches of green algae (*Ulva* spp.) and red algae (*Gracilaria* spp.) were observed between -1.5 and -6 feet MLLW (Photographs 2 and 3). Between -1.5 feet MLLW and $+8$ feet MLLW, green ulvoid algae was the only observed algae, with the highest densities in the upper intertidal. At $+8$ to $+10$ feet MLLW, the brown algae, rockweed (*Fucus* sp.) was also present, growing on the bulkhead in areas not shaded by the pier. (Photograph 4). There was no eelgrass or kelp observed in the surveyed area.



Photograph 1 – Typical substrate in the project area



Photograph 2 – Patch of ulvoid in upper subtidal



Photograph 3 – Patch of red algae in upper subtidal



Photograph 4 – Ulvoid and rockweed algae in the upper intertidal along the bulkhead at +8 to +10 feet MLLW

Invertebrate Fauna

During the survey, between –1.5 and –8 feet MLLW, the only mobile invertebrate fauna observed were graceful crabs (*Metacarcinus gracilis*) (Photograph 5). Mysid shrimp (Mysidae family) were also observed floating in the water column. Between +10 feet and –8 feet, sessile invertebrate fauna were observed attached to the pier pilings and along the substrate. In substrate above the water level, water squirting was observed, indicating presence of horse clams (*Tresus* sp.) and bent-nose clams (*Macoma nasuta*) in the substrate. Shells from non-native Pacific oysters (*Crassostrea gigas*) and manila clams (*Venerupis philippinarum*) were also present. A few plumose anemones (*Metridium farcimen*) were observed attached to the pier pilings and one attached to submerged debris (Photograph 6).



Photograph 5 – Graceful crab in green algae



Photograph 6 – Plumose anemone on debris

Vertebrate Fauna

No vertebrate fauna were observed during the snorkel survey. However, small (2–3 inches) sculpin (Cottitidae family) were observed along the substrate when wading. Additionally, two harbor seals (*Phoca vitulina*) were floating approximately 50 feet north of the project for about 10 minutes.



Anthropogenic Elements

Anthropogenic materials were noted during the survey. Several wooden piles are in the intertidal zone between 0 and +8 feet MLLW (Photograph 7). Other debris observed included piping (Photograph 8), and cabling (Photograph 4). If mitigation becomes necessary during construction, these items should be removed.



Photograph 7 – Piles in the intertidal



Photograph 8 – Metal pipe at -5 feet MLLW west of pier

Conclusion

No eelgrass or kelp was observed during the walking or snorkel survey of the existing pier and surrounding areas. Macroalgal habitat was sparse and dominated by ulvoids and *Gracilaria* sp. in the subtidal zone between -1.5 and -6 feet MLLW. The intertidal zone was dominated by ulvoids, with rockweed growing in the upper intertidal along the bulkhead.



PND Engineers, Inc.
June 29, 2016

12132-35
Page 5

The project as proposed will have no effect on eelgrass or kelp. Typical habitat for eelgrass or kelp was not observed. Some macroalgal habitat will be temporarily impacted by the project particularly on the bulkhead, but these species should recolonize following construction activities.

Sincerely,

HART CROWSER, INC.

A handwritten signature in black ink, reading "James A. Shannon".

JIM SHANNON
Senior Biologist

A handwritten signature in black ink, reading "Maria Sandercock".

MARIA SANDERCOCK
Marine Biologist

Attachments:

Figure 1 – Site Map

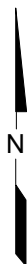
Figure 2 – Macrovegetation Survey Tracks

\\\\edmsrv\data\\NOTEBOOKS\\1213235_Ancich Upland Park Netshed Restoration\\Deliverables\\Reports\\1213235_Ancich Park and Netshed
Restoration Macroveg Survey_20160629.docx

R:\NOTEBOOKS\1213235_Ancich Upland Park Netshed Restoration\GIS\MapDocuments\Macroveg\Figure1.mxd



0 25 50 100 Feet



PND Engineers
Gig Harbor, Washington

Site Map

12132-35

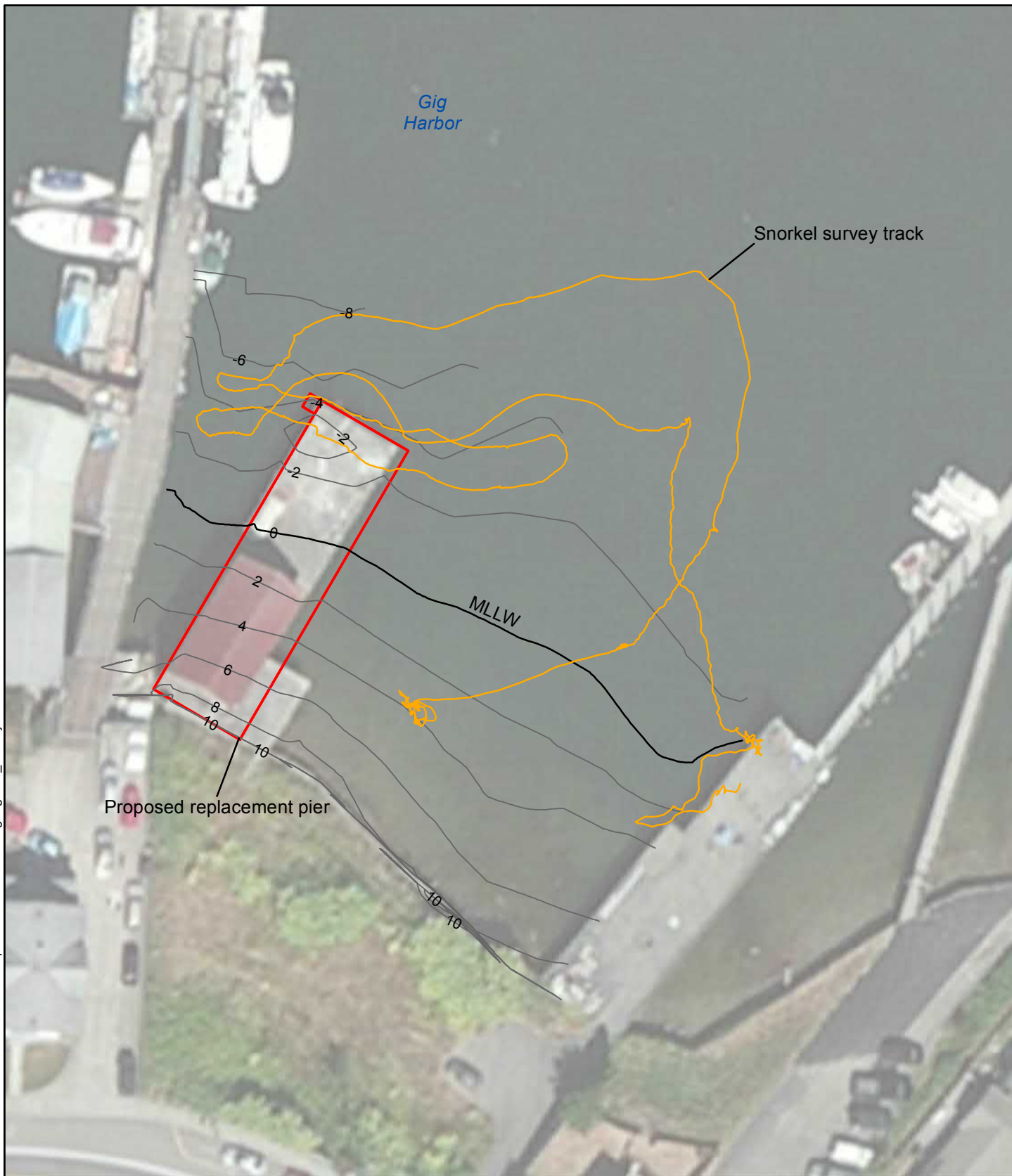
6/16



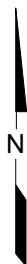
Figure

1

R:\NOTEBOOKS\1213235_Ancich Upland Park Netshed Restoration\GIS\MapDocuments\Macroveg\Figure2_Survey.mxd



0 25 50 100
Feet



PND Engineers
Gig Harbor, Washington

Macrovegetation Survey Tracks

12132-35

6/16



Figure

2

Contours and pier footprint from PND Engineers, Inc.
Aerial imagery from ESRI.



ATTACHMENT II – FIELD LOGS

[illegible]

PL-SEPA-18-0013
MDNS
REFERENCE 4



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1201 NE Lloyd Boulevard, Suite 1100
PORTLAND, OR 97232-1274

Refer to NMFS No:
WCRO-2020-01361 (Batch Consultation Reference No.)

November 9, 2020

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

Re: Endangered Species Act Section 7(a)(2) Jeopardy Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Issuance of Permits for 39 Projects under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for Actions related to Structures in the Nearshore Environment of Puget Sound

Dear Ms. Walker:

Between May 1, 2018, and March 27, 2020, we received 39 letters from the U.S. Army Corps of Engineers, Seattle District, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 *et seq.*) for the Corps' permitting replacements of, repairs to, or new construction of in-water, overwater, and nearshore structures. Based on the locations of the proposed projects and their similar impacts on ESA-listed species and their critical habitat designated under the ESA, specifically in the nearshore of Puget Sound, and in an effort to expedite and streamline the ESA consultation processes, we have batched these actions into a single biological opinion. This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402, 84 FR 45016).

We have determined that the Corps' proposed action, to permit the 39 projects, will jeopardize the continued existence of listed Puget Sound (PS) Chinook salmon and Southern Resident killer whales (SRKW). The proposed action will also adversely modify those species' designated critical habitats. We also determined that the proposed action will not jeopardize listed PS steelhead, PS/Georgia Basin bocaccio rockfish, yelloweye rockfish, or Hood Canal Summer-run Chum salmon or adversely modify designated critical habitat for those four species.

Our opinion includes a Reasonable and Prudent Alternative (RPA) to the proposed action that, if implemented, will not jeopardize PS Chinook salmon or SRKW or adversely modify those species' designated critical habitats. Twelve of the proposed projects batched in this consultation are not subject to the requirements of the RPA because their projects, as proposed, do not need to provide any additional conservation offsets to achieve the RPA's goal of avoiding jeopardy by offsetting the permanent loss of nearshore habitat quality and quantity.

WCRO-2020-01361



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

We look forward to working with you and your staff to assist in the implementation of the RPA and complete this consultation. Please contact Elizabeth Babcock of our North Puget Sound Branch (Elizabeth.Babcock@noaa.gov) or Jennifer Quan of our Central Puget Sound Branch (Jennifer.Quan@noaa.gov) if you have any questions concerning this consultation or if you would like additional information.

Sincerely,

A handwritten signature in blue ink, appearing to read "Barry A. Thom", with a stylized flourish at the end.

Barry A. Thom
Regional Administrator

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

Issuance of 39 Permits under Section 404 of the Clean Water Act and/or Section 10 of the Rivers
and Harbors Act for New, Replacement, or Repaired Structures in the Nearshore Environment of
Puget Sound

NMFS Consultation Number: WCRO-2020-01361

Action Agency: United States Corps of Engineers, Seattle District

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely To Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Puget Sound Steelhead	Threatened	Yes	No	NA	NA
Puget Sound Chinook	Threatened	Yes	Yes	Yes	Yes
Hood Canal Summer-run Chum	Threatened	Yes	No	Yes	No
Puget Sound/Georgia Basin Yelloweye Rockfish	Threatened	Yes	No	Yes	No
Puget Sound/Georgia Basin Bocaccio	Endangered	Yes	No	Yes	No
Southern Resident Killer whale (<i>Orcinus orca</i>)	Endangered	Yes	Yes	Yes	Yes
Southern Distinct Population of Sturgeon (<i>Acipenser medirostris</i>)	Threatened	No	NA	No	NA

Consultation Conducted By: National Marine Fisheries Service
West Coast Region

Issued By:


Barry A. Thom
Regional Administrator

Date: November 9, 2020

WCRO-2020-01361

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List of Acronyms

ACZA	Ammoniacal copper zinc arsenate
BMP	Best Management Practices
BRT	Biological Review Team
CA	California
CFR	Code of Federal Regulations
CH	Critical Habitat
CHART	Critical Habitat Review Team
COE	U.S. Army COE of Engineers
CRMC	Coastal Resources Management Council
CY	Cubic Yards
CP	Conservation Points
cSEL	Cumulative Sound exposure level
dB	Decibel
DDE	Dichlorodiphenyldichloroethylene
DDD	Dichlorodiphenyltrichloroethane
DIP	Demographically independent populations
DO	Dissolved Oxygen
DNA	Deoxyribonucleic acid
DPS	Distinct Population Segment
DQA	Data Quality Act
DZ	Deep Shore Zone
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Units
FMP	Fisheries Management Plan
FPRP III	Fish Passage and Restoration Action Programmatic Biological Opinion III
FR	Federal Register
HAPC	Habitat Areas of Particular Concern
HAT	Highest Astronomical Tide
HC	Hood Canal
HCCC	Hood Canal Coordinating Council
HCSR	Hood Canal Summer Run Chum
HEA	Habitat Equivalency Analysis
HPA	Hydraulic Project Approval
HSRG	Hatchery Scientific Review Group
HTL	High Tide Line
HUC	Hydrologic Unit Code
ITS	Incidental Take Statement

Km	kilometer
LAA	Likely to Adversely Affect
lf	Linear foot
LSZ	Lower Shore Zone
m	meter
Mg/L	milligrams per liter
MHHW	Mean Higher High Water
Mi	mile
MM	Millimeter
MMPA	Marine Mammal Monitoring Plan
MLLW	Mean Lower Low Water
MPG	Major Population Group
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NHVM	Nearshore Habitat Values Model
NLAA	Not Likely To Adversely Affect
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRKW	Northern Resident killer whales
NTU	National Turbidity Units
NWFSC	NOAA's Northwest Fisheries Science Center
NWP	Nationwide Permit
NWTRC	U.S. Navy's Northwest Training Range Complex
OHWM	Ordinary High Water Mark
Opinion	Biological Opinion
OWS	Overwater Structure
PA	Proposed Action
PAH	Polycyclic aromatic hydrocarbons
PAL	Passive aquatic listeners
PBDE	Polybrominated diphenyl ethers
PBF	Physical or biological features
PBO	Programmatic Biological Opinion
PCBs	PolyChlorinated Biphenyls
PCE	Primary Constituent Element
PDO	Pacific Decadal Oscillation
PFMC	Pacific Fishery Management Council
pH	Power of Hydrogen
PPB	Parts per billion
PRF	Pier Ramp and Float
PS	Puget Sound
PSDDA	Puget Sound Dredge Disposal Analysis
PS/GB	Puget Sound/Georgia Basin
PSP	Puget Sound Partnership
PST	Pacific Salmon Treaty
PSTRT	Puget Sound Technical Recovery Team
PVA	Population Viability Analyses
PVC	Polyvinyl Chloride

RCW	Revised Code of Washington
RMS	Root Mean Squared
RPA	Reasonable and Prudent Alternative
RPM	Reasonable and Prudent Measures
SAV	Submerged Aquatic Vegetation
SEAK	Southeast Alaska
SEL	Sound Exposure Level
SIMP	Structure in Marine Waters Programmatic
SRKW	Southern Resident Killer Whale
SSNP	Salish Sea Nearshore Programmatic
SPSAA	South Puget Sound Action area
SQ FT	Square foot
SWFSC	NOAA's Southwest Fishery Science Center
TACT	Trouble-shooting, Action planning, Course correction, Tracking Monitoring
TRT	Technical Review Tram
TSS	Total Suspended Solids
T&C's	Terms and Conditions
µg/L	Micrograms/liter
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VSP	Viable Salmonid Populations
WCRO	West Coast Regional Office
WDF	Washington Department of Fisheries
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WDOE	Washington State Department of Ecology
WQ	Water Quality
WRIA	Water Resource Inventory

1. INTRODUCTION

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

1.1 Background

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

In 2019, following a 30+ day federal government lapse in appropriations, NMFS informed the U.S. Army Corps of Engineers (USACE) of a redeployment of NMFS resources, which would result in a delay of completion of individual consultations on a suite of (nearshore) projects, to work with the USACE on development and completion of a programmatic consultation to address that high workload and efficiently accommodate in- and overwater- new, repair and replacement structures. This programmatic has a working title of “the Salish Sea Nearshore Programmatic” or SSNP. However, because of delays in achieving a mutually agreeable consultation product, it became unattainable to evaluate the pending 39 subject projects through SSNP, which is still under development at this time.

Thus, in order to bring these open consultations to conclusion, NMFS provides here a batched review of 39 proposed projects and their effects on listed species and designated critical habitat. In order to preserve project proponent privacy, certain details of each applicant’s specific project are identified separately, and necessary project-specific information is provided as separate attachments (when necessary) to this Opinion. Every attempt to remove applicant-identifying details and preserve this privacy have been made.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within two weeks at the NOAA Library Institutional Repository [<https://repository.library.noaa.gov/welcome>]. A complete record of this consultation is on file in Lacey, Washington.

1.2 Consultation History

Between May 1, 2018, and March 20, 2020, The USACE requested consultation on its proposed authorization of 39 projects (Table 1). The proposed projects would construct new overwater or nearwater structures or repair or replace existing in- or overwater or nearwater structures. The proposed projects would occur within the designated critical habitat for one or more of the following species: Puget Sound (PS) Chinook salmon, PS/GB bocaccio rockfish, Hood Canal (HC) summer-run chum, PS/GB yelloweye rockfish, and Southern Resident killer whales (SRKWs). All of the projects are located in the Puget Sound geographic area.

Table 1. Project reference number, NMFS (WCRO or INQ) consultation identification number, USACE identification number (NWS), project structure type, and consultation request date for each project.

NMFS Consultation #	USACE Identification # (NWS #)	Project Structure Type	Consultation Request Date
INQ-2018-00038	NWS-2017-796	Commercial Dock	5/1/2018
INQ-2018-00012	NWS-2017-587	Residential Bulkhead	6/8/2018
INQ-2018-00014	NWS-2018-963	Residential PRF & Dredge	11/21/2018
INQ-2018-00016	NWS-2018-229	Residential Bulkhead	12/12/2018
INQ-2018-00017	NWS-2018-465	Residential Bulkhead	12/12/2018
INQ-2018-00018	NWS-2018-53	Residential Bulkhead	12/12/2018
INQ-2019-00029	NWS-2018-636	Commercial Marina	1/30/2019
INQ-2019-00033	NWS-2017-955	Residential Bulkhead	1/31/2019
INQ-2019-00034	NWS-2018-760	Commercial Dock	1/31/2019
INQ-2019-00036	NWS-2017-840	Residential Bulkhead	7/25/2018
WCRO-2019-00196	NWS-2018-981	Commercial Marina	1/31/2019
INQ-2019-00052	NWS-2018-1143	Residential Bulkhead	5/2/2019
INQ-2019-00053	NWS-2018-570	Commercial Dock	5/2/2019
INQ-2019-00056	NSW-2018-1165	Residential OWS Home	5/2/2019
INQ-2019-00084	NWS-2017-573	Commercial Boat Ramp	5/22/2019
INQ-2019-00101	NWS-2018-382	Residential Bulkhead	6/5/2019
INQ-2019-00193	NWS-2019-207	Commercial Dock	7/11/2019
INQ-2019-00221	NWS-2019-552	Residential Bulkhead	8/8/2019
INQ-2019-00292	NWS-2019-676	Commercial Dock	10/17/2019
INQ-2019-00337	NWS-2019-526	Commercial Marina	12/17/2019
WCRO-2019-01871	NWS-2018-750	Commercial Marina	9-27-18 (original) 7-8-19 (New Date)

NMFS Consultation #	USACE Identification # (NWS #)	Project Structure Type	Consultation Request Date
WCRO-2019-01922	NWS-2018-39	Commercial Boat Ramp	9-24-18 (original) 7-24-19 (New Date)
WCRO-2019-01683	NWS-2019-491	Commercial Ramp/Float	7/3/2019
WCRO-2019-03766	NWS-2019-664	Bulkhead	1/2/2020
WCRO-2019-02497	NWS-2019-336	Commercial Dock	9/9/2019
WCRO-2019-03069	NWS-2018-525	Commercial Marina	10-17-18 (original) 10-3-19 (New Date)
WCRO-2018-01246	NWS-2018-492	Bulkhead, jetty, riprap	11-21-18 (original) 8-13-19 (New Date)
WCRO-2019-03474	NWS-2019-478	Dredging/maintain access marina and docks	11/19/2019
INQ-2020-00030	NWS-2019-956	Bulkhead	2/27/2020
INQ-2020-00034	NWS-2019-0883	Commercial pier	3/11/2020
WCRO-2020-00704	NWS-2019-728	Residential concrete steps	3/27/2020
INQ-2020-00045	NWS-2019-690	Residential boat ramp, deck piles, bulkhead	3/25/2020
INQ-2020-00072	NWS-2019-0703	Public pier/park	4/16/2020
INQ-2020-00073	NWS-2020-0204	Commercial dock, bulkhead	4/16/2020
INQ-2019-00055	NWS-2017-550	Commercial Dock	5/2/2019
INQ-2019-00114	NWS-2019-101	Commercial Dock	6/18/2019
INQ-2019-00338	NWS-2019-832	Residential PRF	12/18/2019
WCRO-2019-00642	NWS-2017-427	Moorage	6/3/2019
WCRO-2020-00074	NWS-2019-983	Boat Ramp Armoring	1/17/2020

In addition to being located within designated critical habitat for one or more species, the projects are all located within areas of habitat utilized by PS steelhead. However, the majority of project impacts are on nearshore habitat in Puget Sound. Nearshore areas are not designated as critical habitat for PS steelhead.

In April 2020, after protracted discussion with USACE in which no immediate agreement was reached on how to proceed with development of SSNP, NMFS redirected resources to develop a batch consultation on these 39 nearshore projects. This was determined to be the most efficient and expedient path forward to clear the backlog of projects.

As of July 1, 2020, the consultation initiation package for only one of the projects (WCRO–2018-01246) listed in Table 1 had provided all of the data necessary to complete a detailed analysis. The remainder of the proposed project initiation packages contained some gaps in information. To complete consultation, NMFS has reviewed and made reasonable assumptions that would allow for a complete analysis for this Opinion. In this review, all of the projects as currently described are expected to have adverse effects on ESA-listed species and their critical habitat (Table 2).

Table 2. Adversely affected-ESA listed species and Designated Critical Habitat (denoted with and “X,”) by proposed USACE projects.

NWS#	PS Steelhead	Critical Habitat	PS Chinook	Critical Habitat	HC S-R Chum	Critical Habitat	PS/GB bocaccio	Critical habitat	Yelloweye rockfish	Critical Habitat	SR Killer whale	Critical Habitat
NWS-2017-796	X		X	X	X	X	X	X	X	X	X	
NWS-2017-587	X		X	X			X	X	X	X	X	
NWS-2018-963	X		X	X			X	X	X	X	X	
NWS-2018-229	X		X	X			X	X	X	X	X	X
NWS-2018-465	X		X	X			X	X			X	X
NWS-2018-53	X	X	X	X	X	X	X	X	X	X	X	
NWS-2018-636	X		X	X			X	X	X		X	X
NWS-2017-955	X		X	X			X	X	X	X	X	
NWS-2018-760	X		X	X			X	X	X	X	X	X
NWS-2017-840	X		X	X			X	X	X		X	
NWS-2018-981	X		X	X			X	X	X		X	
NWS-2018-1143	X		X	X			X	X	X		X	
NWS-2018-570	X		X	X			X	X	X		X	
NSW-2018-1165	X		X	X			X	X	X		X	
NWS-2017-573	X		X	X	X	X	X	X	X		X	
NWS-2018-382	X		X	X			X	X	X		X	
NWS-2019-207	X		X	X	X	X	X	X	X		X	
NWS-2019-552	X		X	X			X	X	X		X	
NWS-2019-676	X		X	X			X	X	X		X	
NWS-2019-526	X		X	X			X	X	X		X	
NWS-2018-750	X		X	X	X		X	X	X		X	
NWS-2018-39	X		X	X	X	X	X	X	X		X	
NWS-2019-491	X		X	X			X	X	X		X	
NWS-2019-664	X		X	X			X	X	X		X	
NWS-2019-336	X		X	X			X	X	X		X	
NWS-2018-525	X		X	X			X	X	X		X	

NWS#	PS Steelhead	Critical Habitat	PS Chinook	Critical Habitat	HC S-R Chum	Critical Habitat	PS/GB bocaccio	Critical habitat	Yelloweye rockfish	Critical Habitat	SR Killer whale	Critical Habitat
NWS-2018-492	X		X	X	X		X	X	X		X	
NWS-2019-478	X		X	X	X		X	X	X		X	
NWS-2019-956	X		X	X			X	X	X		X	
NWS-2019-0883	X		X	X			X	X	X		X	
NWS-2019-728	X		X	X			X	X	X		X	
NWS-2019-690	X		X	X	X	X	X	X	X		X	
NWS-2019-0703	X		X	X			X	X	X		X	
NWS-2020-0204	X		X	X			X	X	X		X	
NWS-2017-550	X		X	X			X	X	X		X	
NWS-2019-101	X		X	X			X	X	X		X	
NWS-2019-832	X		X	X			X	X	X		X	
NWS-2017-427	X		X	X			X	X	X		X	
NWS-2019-983	X		X	X			X	X	X		X	

On May 28, 2020, NMFS transmitted a “Discussion Draft” of this Opinion that included a draft Reasonable and Prudent Alternative (RPA) to the USACE. On June 11, 2020, the USACE and NMFS met to discuss this draft and NMFS agreed to deliver a formal draft Opinion that the USACE could share with the project applicants.

On July 2, 2020, NMFS transmitted a draft of this Opinion that included a draft reasonable and prudent alternative (RPA) to the proposed action to the USACE for review.

On July 8, 2020, for the USACE’s administrative ease, NMFS provided 39 project specific letters to the USACE that included summary sheets from the Nearshore Habitat Values Models (NHVM) outputs or “conservation calculators” and depicted draft debit/credit output for each project. The USACE distributed the letters and the July 2, 2020, draft Opinion to the applicants. Many applicants requested access to a working spreadsheet version the NHVM related to their project and on July 20, 2020, NMFS transmitted to the USACE project specific individual spreadsheets, which in turn the USACE transmitted to the applicants.

Between July 8, 2020, to approximately August 12, 2020, the USACE and NMFS staff met with project applicants to determine the need for project updates and review of the draft RPA in the July 2, 2020 version of the Opinion. During that timeframe, NMFS staff engaged in over 40 meetings with applicants, exchanged 100s of emails and re-ran Nearshore Habitat Values Model Calculators for all of the proposed projects.

On August 12, 2020, the USACE provided comments on the draft Opinion. This letter is included here as Appendix 1 as it in part establishes the USACE proposed process/request for implementing the RPA that the NMFS will incorporate by reference later in this final Opinion. In response, on September 16, 2020, NMFS transmitted updated documents to the USACE that included an updated draft of the RPA, a draft Incidental Take Statement (ITS), draft Reasonable and Prudent Measures (RPMs) and draft Terms and Conditions (T&C's).

As of September 23, 2020, NMFS had received updated project information, and project amendments (additional proposed conservation offsets) from 38 of the 39 applicants. As a result of the applicant meetings, the final debit calculation, which includes offsets that have been proposed by applicants to meet the terms of the RPA, had reduced ~ 38% compared to what was calculated in the Draft Batch Opinion. In addition, the number of projects subject to the RPA has been reduced from 37 to 27. These overall reductions are largely due to:

- Project clarification: For most projects updates resulted in reduced debit output except for 5 projects that it resulted in increased credits (outlined below)
- Projects that amended the original proposed action to provided sufficient conservation offsets
- Proposed (but yet-to-be-finalized) additional conservation offsets
- Refinements to the calculator (based on applicant/consultant feedback). Refinements in the calculator did not result in increased debits and did result in some decrease in debits.

One applicant was unresponsive to the USACE and NMFS communication request and as such we have assumed there are no updates relative to their projects.

On October 1, 2020, the USACE provided comments in response to the NMFS September 16, 2020, RPA, RMP and T&C's and on Oct 16, 2020, NMFS replied to these comments. The comments and responses are attached to this Opinion as Appendix 2.

On October 23, 2020, NMFS transmitted to the USACE as second set of "Administrative Ease Letters" and enclosures that the USACE then transmitted to project applicants. Those letters described the status of each project, and included the updated NHVM calculator spreadsheet, the updated draft RPA for projects subject to the RPA, and draft RMP's and draft T&C's that would be used in conclusion of this consultation. NMFS also provided a Questions and Answer document (Appendix 3) to address many of the questions that had arisen over the course of engagement with the applicants. NMFS also provided the opportunity for applicant to meet with NMFS staff the following week (and beyond) to seek clarification on the process both before and after the Opinion was signed. The updated NHVM calculators transmitted with these letters were used to complete the analysis for this Opinion, with one exception (see below), and as such will not be attached final Opinion.

Prior to the Opinion being signed, between October 27, 2020, and October 30, 2020, NMFS met with or received response from 23 applicants to explain RPA implementation after finalization of the Opinion. Many applicants provided additional project updates. This Opinion reflects these updates where the new information informed the take surrogates. Per NMFS October 23, 2020 letter to the USACE, proposed project changes that would impact the NHVM calculator outputs

are not reflected in this Opinion and will be further processed as part of RPA implementation. One project warranted an exception as it was not subject to the RPA and updated project updates would reduce the likelihood of re-initiation for this project.

During the course of this batch consultation the USACE requested four project be either withdrawn or undergo emergency consultation:

- NWS- 2019-664: On June 26, 20020, the USACE notified NMFS that this project would need to undergo emergency consultation. NMFS informed the USACE that we would continue to include this project in the consultation and that a final RPA could still apply.
- NWS-2019-690: On September 22, 2020, the USACE requested that NWS-2019-690 be withdrawn from consultation. Never-the-less, given that this project had already undergone extensive analysis, this Opinion concludes consultation on that project.
- NWS-2018-0703: On October 6, 2020, the USACE declared an emergency on a portion of NWS-2018-0703 (Pier 58). On September 13, 2020, Pier 58 collapsed. NMFS informed the USACE that we would continue to include this project in the consultation and that a final RPA could still apply.
- NWS-2019-478: On October 19, 2020, the USACE declared an emergency for NWS-2019-478. NMFS informed the USACE that we would continue to include this project in the consultation and that a final RPA could still apply.

When the emergency projects are submitted for after-the-fact consultation, NMFS will review the situation to determine if the degraded conditions of the structure would have been eligible for the 10-year useful life assumptions applied in this Opinion (see section 1.3 “Proposed Federal Action”).

1.3 Proposed Federal Action

Under the ESA, “action” means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies (50 CFR 402.02).

For the purposes of this biological Opinion, the proposed action is the USACE’s issuance of 39 permits in Tables 1. The USACE permits would authorize 39 projects (Table 3) under the Clean Water Act and/or Rivers and Harbors Act. While some of the proposed projects contain new or expanded nearshore or overwater structure, a majority of the proposed projects are repair and replacement of existing structures, or components of existing structures. As described more fully in Section 2.3.2, Distinguishing Baseline from Effects of the Action, the effects of this action are the consequence caused by the Corps’ decision to grant a permit that would not occur but for that decision and that are reasonably certain to occur. For permits allowing structures to be repaired and replaced, the proposed action generally results in an extension of the time the existing structures will exist on the landscape. At the same time, the currently existing, to-be-repaired, rebuilt and/or replaced structures are part of the environmental baseline conditions, and in most cases, would persist for some period of time regardless of the current request for a USACE

permit. Thus, for purposes of this analysis, we must differentiate between effects that are part of the baseline and effects that are caused by the proposed action. To do so, NMFS assumes the following:

- The proposed repair and replacement structures are in compliance with state and federal requirements and received a USACE permit when they were originally built. Or, the structures were built at a time when USACE authorization was unnecessary (i.e., prior to then enactment of the Clean Water Act).
- If the USACE has previously issued a permit for the structure, that permit authorized the structure with no end date. For the structure to remain in compliance with the original USACE permit, at some point(s) during the life of the structure the owner will seek a future USACE permit(s) to repair or replace some or all components of the structure.
- If the applicant did not request the permit the USACE is proposing to issue as part of the proposed action for this consultation, the existing structure could remain in a structurally sound condition¹ and not need any additional USACE permit for some remaining “useful life period.” For this consultation, we assume that the remaining “useful life period” is 10 years.² As such, we consider the existing structure (without the proposed repair or replacement) to be part of the environmental baseline and assume that absent the proposed action, the respective projects’ current impacts would continue to persist for 10 years.

We discuss these assumptions further in the description of the Environmental Baseline (Section 2.3) below, and provide additional details and explanatory graphs in Appendix 5.

Carrying this forward to the consequences of the proposed action, and based on our assumption that the existing structure would have remained in its current state for a remaining “useful life period” (that we assume is 10 years), there are two kinds of effects we consider a consequence, or effect, of the proposed action. First are any positive effects that result from removing the structure for any remaining “useful life period.” Second, are the effects of the proposed (replace/repared, and often environmentally friendlier) structure. At its simplest, the repair and replacement projects will extend the life of part or all of the structures. Here, based on what we know about the life of the structures, we assume these repaired and replaced structures (or parts of structures) will establish a new³ “useful life period” for the structure, or the part of the structure being repaired or replaced, as follows:

² The “10-year” time period is a default assumption for this consultation. NMFS developed this assumption through input from marine industry stakeholders and the Corps while working to implement the mitigation calculator that currently supports the Structure in Marine Waters Programmatic (SIMP) (NMFS 2016a). In some cases where there is immediate need of replacement or repair (e.g., in the upcoming in-water work window), there might be no remaining “useful life period”—NWS-664 referenced in the consultation history is an example of this situation. In other cases (e.g., where an applicant is upgrading a relatively new structure, say one less than 10 years old) it may be reasonable to assume a remaining “useful life period” greater than 10 years. Any change to the 10-year assumption would be determined on a case-by-case basis. However, for this consultation we applied the 10-year assumption for all projects except as noted in the consultation history.

³ NMFS based the assumed duration of the new “useful life periods” on SIMP, as referenced in footnote 1, as

- Over water structures: 40-year useful life period
- Bank stabilization: 50-year useful life period

We discuss this approach in more detail in the Effects of the Action Section 2.4 below, and similarly provide additional details and explanatory graphs in Appendix 5.

Two projects included replacement of stormwater outfalls or newly configured stormwater conveyance as part of their proposed action. Both projects will discharge stormwater from parking lots into the Puget Sound. For these two projects, stormwater discharged from those outfall and conveyances that would not occur “but for” the USACE action and has therefore been analyzed in this Opinion as a consequence of the proposed action.

Two projects include maintenance dredging in whole or as part of the proposed action. Maintenance dredging occurs because the depth of the dredge channel has filled in with sediments. The dredge channel at its existing elevation (filled in with sediment) is considered in the environmental baseline, and the proposed action resulting is a deeper channel (the deeper channel would not occur “but for” the USACE action).

Mechanical dredging typically involves a barge-mounted crane with clamshell bucket, but may also include the use of barge-mounted excavator or backhoe with a digging bucket at the end of an articulated arm. A crane dredge consists of a large construction crane with a steel bucket with two hinged jaws that is suspended by a winch cable under the crane boom. Typically, a sediment transport barge is positioned alongside the dredge barge during active dredging.

During dredging, the digging bucket is lowered to the bottom where it sinks into channel sediments and is then closed, taking a “bite” of sediment. The crane then raises the bucket and swings it over a sediment transport barge, where the bucket is dumped. When the transport barge is full, a tug takes it to the disposal site.

The dredging material is disposed of at designated multi-user open-water disposal sites (open-water disposal sites) that are managed under the Dredge Material Management Program (DMMP) <https://www.nws.usace.army.mil/Missions/Civil-Works/Dredging/>. The effects of sediment disposal at DMMP open-water disposal sites have already been considered in the programmatic formal consultation for their continued use through 2040 (NMFS 2015a). Therefore, the use of DMMP open-water disposal sites for disposal of sediments are not considered a part of the proposed action.

well as input from consultants that regularly assist applicants through permitting processes. Depending on design, engineering, and materials, these useful life periods could also be shorter or longer. However, for this consultation we applied the 40 or 50-year assumptions as described above.

Table 3. Abbreviated permit action description by USACE identification number (NWS #).

NWS#	Abbreviated Permit Description
NWS-2017-796	This permit includes the routine maintenance of the existing dock and mooring facilities. Repair work will be conducted over a five-year period. This work includes the replacement of deteriorated decking, decking stringers, bull rails, dock bearing pilings, dolphin pilings, and debris wall timbers in order to maintain the dock and mooring facilities in operational status. Existing structures will be replaced and no expansion of the dock and mooring facilities will occur. Impact pile driving and some in-water work will be required for the proposed project. The project includes a temporary erosion and sediment control plan, as well as other conservation measures specific to listed endangered or threatened species and water quality. The project also includes removal of 4,765 sq. ft. of derelict structures and 136 creosote piles in Glen Cove. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps for 40 years).
NWS-2017-587	Replace 110 linear foot riprap bulkhead with new larger size-rock riprap bulkhead. At the project site there is mapped kelp and documented surf smelt spawning. Project is near start of approximately 2 mile long right to left drift cell; affects approximately 1.75 miles of shoreline. Proposed conservation measures include one-time beach nourishment. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year “useful life period” (i.e., not in need of another Corps for 50 years).
NWS-2018-963	This permit includes the replacement of an existing pier, ramp and float (PRF), maintenance dredging of the mooring area, removal of beach debris and installation of shoreline plantings. The existing PRF is 1,240 square-foot, U-shaped and solid-decked, supported by 15 creosote piles and 3 steel piles. The 1,200 square-foot, U-shaped, proposed replacement PRF consists of a 6-foot by 50-foot grated pier, a 4-foot by 50-foot grated gangway, a 4-foot by 60-foot grated finger float, a 4-foot by 65-foot grated finger float, and a 4-foot by 27-foot connecting grated float, all supported by a total of (14) 10-inch steel piles. Proposed dredging would remove 485 cubic yards of sediment from an area of 3,407-square feet, down 3 to 4 feet, within an existing, 50-foot by 100-foot dredge prism. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps for 40 years).
NWS-2018-229	The permit proposes to replace an existing 63-linear foot concrete bulkhead with a 30-linear foot rock bulkhead, install a helical anchored mooring buoy, and remove a mooring pile. Removal and replacement of a mooring buoy. Approximately 1,757 sqft of invasive and non-native vegetation will be removed and re-planted with native vegetation and shade producing trees. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year “useful life period” (i.e., not in need of another Corps for 50 years).

NWS#	Abbreviated Permit Description
NWS-2018-465	Remove and replace 75-linear foot concrete bulkhead with 75-linear foot of angular rock bulkhead. All work will be completed from grounded barge. The work will require 14 days of work and will be done in 3 phases: (1) removing backfill behind bulkhead to prevent sedimentation in the aquatic environment; (2) removal of 75-linear foot of concrete bulkhead, and (3) installation of angular rock bulkhead, filter fabric, and quarry spalls. Additionally, 373 cubic feet of beach nourishment. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year “useful life period” (i.e., not in need of another Corps for 50 years).
NWS-2018-53	Repair 26-foot failed section of existing 150-foot concrete bulkhead. Existing cinderblock cap on the entire length of bulkhead will be removed and replaced with a 3-foot-tall concrete lift along the entire bulkhead length. Waterward of the failed section of bulkhead, approximately 300 sq. ft. is currently potentially inundated by high tides (below HAT), providing aquatic habitat under existing conditions. A stair wing wall will also be reinforced. At project site there is mapped eelgrass, and surf smelt and Pacific herring spawning. Proposed conservation measures include one-time beach nourishment and removal of debris from failed section of bulkhead. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year “useful life period” (i.e., not in need of another Corps for 50 years).
NWS-2018-636	Replace the existing 2,574 square foot solid-decked marina with a 2,514 square foot grated floating dock system, and to replace 15 creosote-treated piles with 15 12-inch diameter steel piles with a vibratory driver. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps for 40 years).
NWS-2017-955	Replace an existing 140 LF concrete bulkhead with a new angular rock bulkhead approximately three foot landward of removed structure. A grounded barge (in the dry) will be present from which construction equipment (i.e., excavator) will operate throughout removal and replacement activities. Approximately 150 cy of materials will be used for the replacement bulkhead. Additionally, 105 sq. ft. of solid deck and four creosote piles will be removed, 700 cubic feet of beach nourishment, and 1560 sq. ft. of RZ planting. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year “useful life period” (i.e., not in need of another Corps for 50 years).
NWS-2018-760	Replacement of 4 piles. Replacement float will be 490 square feet with 240 square feet of grating and approximately 37% (89 square feet) open area, for an increase of 171 square feet. They will also pull 5 damaged derelict creosote piles and dispose of them off site. A second grated gangway will be installed on the western end of the southern pier face. The gangway structure will be approximately 18 feet above the water line and will be folded in when not in use. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps for 40 years).

NWS#	Abbreviated Permit Description
NWS-2017-840	Repair an existing 6.5' tall rock bulkhead. 136 lineal feet of bulkhead will be restacked. The proposed bulkhead repair will be in the same footprint as the existing bulkhead. No waterward encroachment will occur. Add 25 cubic yards of fine sand and pea gravel (50/50 mix) beach nourishment waterward of the bulkhead. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year “useful life period” (i.e., not in need of another Corps for 50 years).
NWS-2018-981	The existing Pier and associated catwalk will be demolished. This will include the removal of (44) creosote-treated piles with a vibratory hammer. (8) 12-inch (nominal) steel piles will be driven for the South Pier and Extension. All piles will be driven with a vibratory hammer as far as possible and then proofed with an impact hammer. Pile driving will be completed from a barge. Steel pile caps will be set from the barge and welded in place using scaffolding. Timber stringers, decking, rails, and accessories will be installed atop without the need for heavy equipment. (19) 12-inch (nominal) steel piles will be driven for the Launch Floats. Three of these piles will be used to ensure that the floats remain in place, and the remaining sixteen piles will be installed beneath the corners of the floats to ensure that they do not ground at low tides. These short piles are often referred to as ‘grounding posts.’ All piles will be driven with a vibratory hammer as far as possible and then proofed with an impact hammer. Pile driving will be completed from a barge. Float modules will be fabricated offsite, brought in via barge, and lowered into place with the crane. An 80-foot gangway will be fabricated offsite, brought in via barge and lifted into position, connecting the pier extension to the launch floats. Gangway connections will be installed without the need for heavy equipment. The project will remove (44) 12-inch- to 16-inch-diameter creosote timber piles along with the caps, stringers, and asphalt deck. The city also proposes to remove concrete debris from the beach northwest of Eddon Boat Park. The approximately 2,000 square feet of debris was identified during the initial mitigation proposal for NWS-2016-733. Upper intertidal shading will be reduced by approximately 1,455 square feet due to the removal of the remainder of the Pier, including its caps, stringers, and asphalt deck. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps for 40 years).
NWS-2018-1143	This permit includes the replacement of 60-linear feet of concrete bulkhead with an inset, concrete stair set with an inset, large angular rock stair set, as well as 15-linear feet of wing wall at the south end of the bulkhead. The new bulkhead would be 7 feet above grade, and keyed up to 24 inches below existing grade. The bulkhead would be backfilled with quarry spall and filter fabric. The project would account for the removal of up to 40 cubic yards of material, and the placement of up to 155 cubic yards of new material. The new bulkhead would be constructed behind the existing bulkhead first, then the existing bulkhead would be removed. The project also consist of 300 cubic feet of beach nourishment. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year “useful life period” (i.e., not in need of another Corps for 50 years).

NWS#	Abbreviated Permit Description
NWS-2018-570	This permit includes: replacement of an existing 5,273 square foot overwater structure (shellfish processing building with solid decking) with a new overwater structure that would consist of a 3,000 square foot building (1,298 square feet will be overwater, with solid decking), installation of a 2,411 square foot grated working platform (waterward), a new 60 square foot grated pier, 292 square foot grated ramp, and 142 square foot partially grated float, and a 1,160 square foot pier and platform, and a 96 square foot float. The project would also replace 388 linear feet of creosote timber bulkhead with 56 linear feet of new rockery bulkhead and the remaining 330 linear feet of the replacement would be constructed of concrete. To extend the existing breakwater by reconfiguring an adjacent 600 square foot float and two piles to attach to the existing breakwater. All piles would be driven and removed utilizing a barge mounted vibratory pile driver, operating during high tide, which would not be allowed to ground. The bulkhead removal and replacement would occur during low tides and be conducted from the uplands. Additionally, 507.5 cubic feet of beach nourishment. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year “useful life period” (i.e., not in need of another Corps for 50 years).
NSW-2018-1165	The proposed re-development project at the subject site is to repair and replace an existing single family dwelling constructed over water. Included is replacement of decaying wooden support pilings with a foundation system consisting of prefabricated galvanized steel footings and coated galvanized steel columns and bracing. No pile driving is involved. A 115 sf solid float will be removed but other existing auxiliary dock structures will remain. There will be no increase in number of the number of dwelling units, no increase in overwater coverage, and no appreciable change in configuration. The footprint of the proposed residence is smaller than and is contained within the footprint of the existing residence. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year “useful life period” (i.e., not in need of another Corps for 50 years).
NWS-2017-573	This permit allows the applicant to construct an elevated concrete boat ramp measuring 48 ft. wide by 264 ft. long. An 8 ft. wide float with 50% functional grating (60% open area) would extend 44 ft. waterward of the end of the boat ramp. 68 (12-inch diameter) closed-end steel piles would be used to support the ramp and six (12-inch diameter) open end piles would be used to secure the floating dock. All ramp support piles will be driven within a cofferdam, using a vibratory pile driver to refusal and then proofed with an impact hammer. Float piles will be installed with a vibratory hammer only. Most of the piles will be driven during low tide from the existing boat ramp and the remaining piles will be driven from a barge. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps for 40 years).

NWS#	Abbreviated Permit Description
NWS-2018-382	This permit is for the replacement of a 125-linear foot, failing, creosote timber bulkhead with a 125-linear foot, large angular rock bulkhead. Work would be conducted with an excavator staged from a grounded barge. The barge would be grounded to allow work to occur in dry and because steep upland conditions do not allow for upland machinery access to the project site. All 17.86 tons of removed creosote would be disposed of appropriately upland. Additionally, 300 sq. ft. of beach nourishment is proposed. To minimize impacts to ESA-listed species, work may be performed July 16 through February 15 in any year the permit is valid. Prior to commencing any work, including grounding the barge, a forage fish spawning survey will be completed by a qualified biologist with a negative result. After confirming that no forage fish spawning is occurring, the applicant will have two weeks to complete the proposed work. After two weeks, another forage fish spawning survey will be completed, with a negative result, before work may continue. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year “useful life period” (i.e., not in need of another Corps for 50 years).
NWS-2019-207	This permit is to replace the existing 4,168 ft² creosote-treated wood and foam solid-decked floats with 4,168 ft² of new floats for commercial private use and recreational boat moorage. The proposed floating dock consists of (1) 8’x25’ float, 1 8’x178’11” float, and 1 8’x317’2” float. The proposed floats will have 50% grated surface and pre-stressed concrete surface. Replacement floats will use the existing piling and will not involve the installation of new or additional piling. The new floats will be attached to the existing ramp and pier using hand tools. A small boat will remove the existing floats offsite and tow in the replacement floats where they will be connected to the existing piling using hand tools. Marine Floats performs all work from a construction barge that is not allowed to ground out at any time. All floats are constructed at the Marine Floats facility in Tacoma and are comprised of 50% fiberglass grating with and 50% Recycled Plastic Decking with High Density Polycarbonate flotation drums. Dock assembly is from the water, never on land. Construction materials are transported by boat/barge via water to the project site. All materials removed from the project site will be transported to the Marine Floats facility for dismantling and taken to an approved upland disposal site. 1) All new floats will have 50% grated surface and 50% pre-stressed surface 2) Replacement floats will replace the current overwater area and will be attached to the existing steel piling. 3) All floats are designed to meet current regulatory standards. 4) Floats are manufactured at Marine Floats facility. The floats will be placed into the waterway and towed by a boat to be installed using hand tools in the marina. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps for 40 years).
NWS-2019-552	The permit is to repair the bottom portion of an existing timber bulkhead by installing approximately 237 linear feet of new timber lagging on the waterward side of the bulkhead and backfilling the void created behind with gravel. Along approximately 70 linear feet of the bulkhead, new galvanized sheet piling will be driven with a vibratory hammer along the waterward side of the bulkhead. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year “useful life period” (i.e., not in need of another Corps for 50 years).

NWS#	Abbreviated Permit Description
NWS-2019-676	This permit is to repair 5 piles by installing polymer fiber jackets. The pile work will occur in the water body, in shallow water (9 ft. MLLW) near the seawall. One 14" diameter creosote timber pile will be removed. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year "useful life period" (i.e., not in need of another Corps permit for 40 years).
NWS-2019-526	This permit includes removing an existing 3,476 sq. ft. solid decked marina and replacing it with 3,216 sq. ft. of grated surfaces. Removal will include (8) 10" creosote pier piles, (12) 12" creosote float piles, (2) 10" creosote float piles, and (1) 10" steel float pile. Installation will include (2) 10" steel pier piles and (10) 12" steel float piles. Total reduction in overwater coverage equals 286 sq. ft. Planting 5000 sq. ft. in the RZ is proposed. This proposed repaired and replaced component of the structure are expected to remain in place with a new 40 "useful life period" (i.e., not in need of another Corps permit for 40 years).
NWS-2018-750	Replace ninety 12 to 14-inch diameter creosote piles with ninety 12-inch diameter steel piles and replace 31,744 square feet of solid wood and concrete float systems with 31,744 square feet of 50% grated and concrete floats (69% open space), all within the existing footprint. This proposed repaired and replaced component of the structure are expected to remain in place with a new 40 "useful life period" (i.e., not in need of another Corps permit for 40 years).
NWS-2018-39	Replacement of 1,440 ft2 joint-use boat ramp within Hood Canal. Additionally, removal of approximately 600 sq. ft. of sediment from the boat ramp per year will be continued for 50 years. The boat ramp acts as a sediment barrier. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year "useful life period" (i.e., not in need of another Corps permit for 50 years).
NWS-2019-491	Install an 18-foot wide by 63-foot long kayak launch ramp to provide for public small craft launches and an additional floating dock adjacent to the existing Port of Bellingham structure at the site. Overall a 1,292sf floating dock expansion and 1000sf launch ramp installation. The dock decking "will allow light penetration." Construction will require a small (150 level) track hoe, a small rubber mounted loader, and a standard dump truck. This proposed repaired and replaced component of the structure are expected to remain in place with a new 40 "useful life period" (i.e., not in need of another Corps permit for 40 years).
NWS-2019-664	Repair and replace a failing bulkhead by constructing a total of 360 linear feet of new poured in placed concrete within forms at the waterward face of the existing and failing bulkhead. Construction will include digging two to three feet into beach substrate, directly abutting the existing bulkhead, and install a footer with 12 inch rebar centers to support concrete panels 8-inches thick by 4-feet wide and extending 12-feet upwards with a 16 inch thick lip at the top; two-feet of the 12-foot panel wall would be installed below grade. The concrete toe of the existing bulkhead will be removed and 66.7 cubic yards of beach nourishment be added. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year "useful life period" (i.e., not in need of another Corps permit for 50 years).

NWS#	Abbreviated Permit Description
NWS-2019-336	Replace up to 248 fender piles over a 10-year period as conditions warrant and as the operating budget allows. A maximum of 100 fender piles will be replaced in any given year over the life of the program. This Program proposes the required repair and maintenance for all existing fender piles, as they are reaching the end of their design life or are damaged from vessel operations. This Program will remove 196 creosote-treated timber fender piles, which provides a direct benefit to the environment. It will also remove 41 damaged steel piles as needed. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps permit for 40 years).
NWS-2018-525	Replacement of 12,178 ft ² of solid deck floats, 360 ft ² pier and ramp. Remove 13 creosote piles and replace with 13 steel piles. Pier will be fully grouted, floats will have 30 percent grouted area. 11 timber piles (not creosote) will be removed permanently. Project located within pocket estuary and covers a significant portion of the area. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps permit for 40 years).
NWS-2018-492	This permit is to remove 842 linear feet (LF) of existing creosote timber bulkhead, 33,052 square feet (SF) of existing riprap, and 148 LF of existing breakwater. The removed riprap and structures would be replaced with 834 LF steel sheet pile bulkhead, 4,010 SF of riprap, and 148 LF of new breakwater. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year “useful life period” (i.e., not in need of another Corps permit for 50 years).
NWS-2019-478	Remove up to 7,500 cubic yard of accumulated sediment through maintenance dredging. Maintenance dredging is proposed to the authorized depth of -13 feet mean lower low water plus 2 feet of over dredge allowance.
NWS-2019-956	Replacement of a 130 linear-foot creosote pile and timber bulkhead with a 130 linear-foot large rock riprap bulkhead. The existing bulkhead would be removed and then the new bulkhead would be placed within footprint of existing bulkhead. Due to the steep topography, all demolition and installation work will likely occur from a barge using a crane during a period of 3-5 days to complete the bulkhead removal and reconstruction. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year “useful life period” (i.e., not in need of another Corps permit for 50 years).
NWS-2019-0883	Performance of maintenance activities on a petroleum distribution and storage terminal over the next five years as needed, including the replacement of up to 23 piles with piles of the same diameter, and in-kind replacement of up to 100 square feet of timber and concrete decking. As needed, repair and replace pile caps, replace wooden bracing with untreated wood, repair loose timber and/or damaged chains on dolphins, repair/replace fenders, repair building components like roofing and siding, and repair machinery on the dock including heating equipment, meters, valves, transfer arms, pipes and electrical equipment. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps permit for 40 years).

NWS#	Abbreviated Permit Description
NWS-2019-728	Remove up to 5 feet of existing concrete steps and replace with rock steps in-kind. Additional work would include the removal of 5 cubic yards of fallen riprap and adding 324 cubic feet of WDFW specified beach nourishment. A construction barge will be used to deliver equipment and materials to the site. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year “useful life period” (i.e., not in need of another Corps permit for 50 years).
NWS-2019-690	Remove a 552 sq. ft. concrete boat ramp and replace it with a new 200 sq. ft. concrete slab using an excavator. Replace 40 ft. of bulkhead, 35 of which are below HAT. Remaining 140 ft. of proposed log bulkhead is above HAT. Four existing creosote pilings which support an overwater deck, would be removed and replaced with four 6-inch-diameter steel pilings. 200 sq. ft. of solid deck would be replaced with 200 sq. ft. of grated deck. Additional removal of 999.75 sq. ft. of shoreline debris. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps permit for 40 years).
NWS-2019-0703	Remove the existing Pier 58 (48,320 square feet), including 490 piles (365 timber piles, 81 steel monotube piles that may be filled with concrete, and 44 steel H-piles), railings, decking, stringers, pile caps, and bracing. An unknown number of remnant piles and debris from previous pier configurations will also be removed. Replacement pier will be 48,200 square feet and will include installation of 186 permanent 36-inch steel piles. The decking will consist of both pre-cast concrete panels and a cast-in-place concrete deck slab. Grating will be installed along the western edge of the pier (500 square feet) and along the southern corner of the pier at the nearshore (500 square feet). The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps permit for 40 years). Existing pier 63 (35,108 square feet) will be removed, including removal of 900 timber piles that are approximately 14 inches in diameter. An unknown number of remnant piles and debris from previous pier configurations will be removed. Replacement pier will be 26,436 square feet (net reduction in overwater cover of 30 square feet) and will include the installation of 170 permanent 36-inch steel piles, concrete pile caps, and concrete deck planks. Remove approximately 8,672 square feet of the pier, 60 linear feet from the seawall, to create an area of open water to provide natural lighting of the intertidal habitat near the shore (located at approximately -10 feet mean lower low water (MLLW)). Approximately 2,000 square feet of the open water habitat area was previously permitted to be grating as part of the Pier 62 Reconstruction Project (USACE Reference No. NWS-2016-296-WRD). Total net increase of open water habitat area at Pier 63 will be approximately 6,672 square feet for this project. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps permit for 40 years).
NWS-2020-0204	Install fiberglass or high-density polyethylene (HDPE) jackets on up to 218 corroded steel pipe piles, repair or replace steel float covers, timber fender panels, recoating steel pile caps and braces, wales, brackets, and non-skid wearing surfaces, and repairs to the 330 ft. bulkhead. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps permit for 40 years).

NWS#	Abbreviated Permit Description
NWS-2017-550	This permit allows the applicant to hire a waterfront contractor to use a barge-mounted crane and pile-driving equipment to remove 200 14-inch creosote-treated piles and replace up to 200 12-inch steel piling located no more than approximately 450 feet from the shoreline. The replacement piling would be installed beneath the dock in waters down to -55 Mean Lower Low Water (MLLW) or approximately 65 feet of water. This allows for barge and ship draft depths up to the needed 43 feet at the face of the dock. This project provides continued safe mooring for ships and barges transporting materials for Alon Asphalt. Norwest Engineering provided inspection support to determine pile size, location, condition, and replacement recommendation. A vibratory hammer would be used to vibrate the old piles out and the new piles into the substrate; the 12-inch steel pile will be driven to a maximum depth of -75 feet MLLW, 20 feet into the substrate. The piling will be installed plumb below the dock. The overall project installation would occur between July 15 through December 31 and January 1 through February 15 over the course of the 10-year permit. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps permit for 40 years).
NWS-2019-101	This permit involves maintenance and repairs to the wharf substructure, including piling, bracing, girts, sash, and firewalls. Proposed work also includes superstructure elements including pile caps, stringers, decking, railing, and fender chains. Approximately 149 piles require repair. All top of pile repairs will occur above the waterline. Cathodic protection system components will be replaced. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps permit for 40 years).
NWS-2019-832	This permit is for the replacement of an existing pier and float, and the replacement and expansion of an existing boat ramp. The existing pier and float consist of a solid-decked, five-foot by 95-foot pier and a solid-decked 12-foot by 22-foot float, supported by 23 creosote piles. The proposed structure consists of a four-foot by 56-foot, 100-percent grated pier, a 3-foot by 40-foot, 100-percent grated ramp, and a 12-foot by 22-foot, 50-percent grated float, supported by eight 8-inch galvanized steel piles. The existing boat ramp is 35 feet by 12 feet (156 square feet waterward of Mean Higher High Water (MHHW)). The replacement boat ramp would be 75 feet by 12 feet (528 square feet waterward of MHHW) and would be constructed of precast concrete panels. Excavation to a maximum depth 6 inches would occur prior to placing the panels. On-site compensatory mitigation includes removal of 23 creosote piles, removal of intertidal debris including brick and tires from a 2,075 square foot area, and placement of 25 cubic yards of spawning sediment over 1,400 square feet. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps permit for 40 years).
NWS-2017-427	This permit is to replace two concrete float anchors with a 36-inch diameter steel pile. The proposed repaired and replaced components of the structure are expected to remain in place with a new 40-year “useful life period” (i.e., not in need of another Corps permit for 40 years).

NWS#	Abbreviated Permit Description
NWS-2019-983	This permit includes: LWD placement as habitat enhancement, beach nourishment, installation of coir lifts along the eroded area for stability and reduction of erosion, installation of drainage system to collect runoff prior to reaching the bank and convey runoff to Hogum Bay at a localized outfall, and articulated concrete mats will be placed around the existing boat ramp. For habitat improvements and offsets, 27 piles from a previously removed pier are to be removed. The piles are located south of the existing boat ramp. The proposed repaired and replaced components of the structure are expected to remain in place with a new 50-year “useful life period” (i.e., not in need of another Corps permit for 50 years).

For the proposed permits, the USACE has proposed the following best management practices:

1. All project proponents will comply with the Washington State Department of Fish and Wildlife’s Hydraulic Project Approval (HPA) work windows for all projects to reduce the amount exposure of listed salmonids and forage fish to construction effects.
2. Where vessels are used as staging locations for equipment, no ground-out will be allowed, to reduce effects on benthic communities.
3. Where bulkhead repair, replace, or new construction is proposed, work will occur at low tides/in the dry to limit turbidity and suspended sediment.
4. All project that include impact or vibratory pile driving which will exceed harmful noise levels (120dbRMS) will have a NOAA-approved Marine Mammal Monitoring Plan (MMMP) in place before any work can commence in waters of the U.S.⁴ The MMMP must meet the requirements of NOAA’s guidance for MMMPs found on NOAA’s website:
http://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/monitoring_plan_guidance.html

⁴ As clarified by the USACE as part of the recommended revisions to the description of the proposed action.

a. Projects for which this BMP would apply:

NWS-2018-963
NWS-2018-636
NWS-2018-760
NWS-2018-981
NWS-2018-570
NWS-2017-573
NWS-2019-552
NWS-2019-526
NWS-2018-750
NWS-2019-336
NWS-2018-525
NWS-2019-0883
NWS-2019-0703
NWS-2017-550
NWS-2019-101
NWS-2019-832
NWS-2017-427
NWS-2018-492
NWS-2017-796

Additionally some of the projects have proposed minimization and conservation measure to offset impacts of the projects authorized under the 30 permits. They are summarized in Table 4.

Table 4. Minimization and Conservation Proposed by Permit

Summary Project Totals (where relevant)						
	13	4	12	6	1	25
	Minimization/Conservation Proposed					
NWS#	Debris Removal	Boat Ramp Removal	Beach Nourish	Planting	Manmade Groin Removal	Creosote Removal
NWS-2017-796	x					x
NWS-2017-587			x	x		
NWS-2018-963	x	x		x	x	x
NWS-2018-229				x		x
NWS-2018-465			x			
NWS-2018-53	x		x	x		
NWS-2018-636						x
NWS-2017-955			x	x		x
NWS-2018-760						x
NWS-2017-840			x			
NWS-2018-981	x					x
NWS-2018-1143			x			
NWS-2018-570	x		x			x
NSW-2018-1165						x
NWS-2017-573		x				
NWS-2018-382			x			x
NWS-2019-207						x
NWS-2019-552	x					
NWS-2019-676						x
NWS-2019-526				x		x
NWS-2018-750						x

Summary Project Totals (where relevant)

NWS-2018-39		x				
NWS-2019-491						
NWS-2019-664			x			
NWS-2019-336						x
NWS-2018-525						x
NWS-2018-492	x					x
NWS-2019-478						
NWS-2019-956						x
NWS-2019-0883						x
NWS-2019-728	x		x			
NWS-2019-690	x	x				x
NWS-2019-0703	x					x
NWS-2020-0204						
NWS-2017-550						x
NWS-2019-101						x
NWS-2019-832	x		x			x
NWS-2017-427	x					
NWS-2019-983	x		x			x

We also considered whether the proposed action would cause any other activities, effects, or consequences and determined that projects involving overwater structures such as pier, dock, float, ramp, wharf, or marinas would cause recreational and/or commercial boat use to continue at current levels or increase. Twenty-six of the projects included in this Opinion are either residential commercial or industrial structures that support motorized boating that extend through Puget Sound (discussed further below).

1.4 Action Area

“Action area” means all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02).

The USACE’s action is the exercise of its permit authorities for the 39 projects (Table 1). The proposed action would cause a range of effects, as described in Section 2.4, Effects of the Action, including:

Temporary effects related to construction:

1. underwater sound from pile installation and removal,
2. generation of suspended sediment, and
3. noise from the operation of construction vessels such as barges.

Enduring effects including related to the proposed structures:

1. creation of overwater shade that increases predation and suppresses aquatic vegetation,
2. migration delays,
3. interruption of habitat forming processes from shoreline stabilization, and
4. interruption of drift cell formation.

Intermittent effects caused by marine vessels that use the proposed structures:

1. noise,
2. propeller wash, and
3. degradation of water quality through the introduction of a small amount of contaminants (i.e., fuel).

As further explained in our analysis below, enduring effects caused by the proposed structures would result in a reduction in nearshore habitat quality. This reduction in habitat quality would reduce survival of juvenile PS Chinook salmon. This in turn would reduce the abundance of adult PS Chinook salmon, resulting in less forage for SRKWs. SRKWs forage for Chinook salmon in four regions along the West Coast: (1) The Strait of Georgia, (2) the Strait of Juan de Fuca, (3) Puget Sound, and (4) coastal areas from Vancouver Island south to Northern California (Hanson et al. in review, Hanson et al. 2010). In the straits of Georgia and Juan de Fuca, SRKWs primarily prey on Chinook salmon from the Fraser River. PS Chinook salmon comprise only a small portion of the Chinook salmon consumed in the straits. (Hanson et al. in review, Hanson et al. 2010). In coastal areas, SRKWs prey on Chinook salmon from multiple areas including the Columbia River and the California Central Valley. PS Chinook salmon only represent a small portion of the Chinook salmon consumed by SRKWs in coastal areas (Hanson et al. in review, Hanson et al. 2010). In contrast, in Puget Sound itself, PS Chinook salmon represent a much larger portion of

the Chinook salmon consumed by SRKWs. Hanson et al. in review found that 67% of Chinook salmon found in SRKW diet samples collected in Puget Sound were estimated to have originated from Puget Sound. The reduction in forage for SRKWs that would be caused by the proposed action manifests predominantly within Puget Sound.

Construction of new overwater structures and the repair or replacement of existing overwater structures is included in many of the 39 projects. The purpose of many of these structures, such as residential pier, ramp, and floats, marinas, and commercial wharfs, is to provide mooring locations for commercial and recreational vessels. Because the primary purpose of these structures is to provide moorage for vessels, it is reasonably certain that the structures will generate some future vessel operation. As identified earlier, intermittent impacts from these vessels would include noise, propeller wash, and the introduction of a small amount of contaminants (i.e., fuel).

Recreational and commercial vessels use caused by the proposed structures would be most concentrated around the structures themselves. However, the vessels can travel throughout Puget Sound. We expect this to be particularly true for vessels using commercial structures and larger recreational vessels moored at marinas. Given the number of vessels mooring at some of the project sites and the variety of reasons for vessel use including commercial shipping, fishing, site seeing, and wildlife watching, we expect the vessel use to be well spread out through the Puget Sound. Notable landmarks or location indicators and expected vessel use, if applicable, is indicated in Table 5.

When all of the areas affected by the proposed action are considered collectively, Puget Sound proper becomes the action area for this consultation. Puget Sound proper is the body of water east of Deception Pass and to the south and east of Admiralty Head-encompassing South-Central Puget Sound, Whidbey Basin, and Hood Canal.

Table 5. Notable landmark/water body indicator, and vessel use, by USACE number

NWS#	Notable Land Mark Indicator (City, Island, etc.)	Vessel Use
NWS-2017-796	Port Townsend	Commercial and Industrial Vessels
NWS-2017-587	Peale Passage	NA - Bulkhead
NWS-2018-963	Gig Harbor	Recreational Vessel
NWS-2018-229	Burien	NA - Bulkhead
NWS-2018-465	Gig Harbor	NA - Bulkhead
NWS-2018-53	Hood Canal	NA - Bulkhead
NWS-2018-636	Gig Harbor	Commercial and Recreational Vessels
NWS-2017-955	Lakebay	NA - Bulkhead
NWS-2018-760	Pier 69	Commercial and Industrial Vessels
NWS-2017-840	Burien	NA - Bulkhead
NWS-2018-981	Bellingham	Commercial and Recreational Vessels

NWS#	Notable Land Mark Indicator (City, Island, etc.)	Vessel Use
NWS-2018-1143	Pitt Passage	NA - Bulkhead
NWS-2018-570	Shelton	Commercial and Industrial Vessels
NSW-2018-1165	Seattle	NA - Bulkhead
NWS-2017-573	Hood Canal	Commercial and Recreational Vessels
NWS-2018-382	Case Inlet	NA - Bulkhead
NWS-2019-207	Shaw Island	Commercial and Recreational Vessels
NWS-2019-552	Ferndale	NA - Bulkhead
NWS-2019-676	Seattle, PS waterfront	Commercial and Industrial Vessels
NWS-2019-526	Gig Harbor	Commercial and Recreational Vessels
NWS-2018-750	Indian Island	Commercial and Recreational Vessels
NWS-2018-39	Tahuya	Commercial and Recreational Vessels
NWS-2019-491	Squalicum	Commercial and Recreational Vessels
NWS-2019-664	Anacortes	NA - Bulkhead
NWS-2019-336	Harbor Island	Commercial and Industrial Vessels
NWS-2018-525	Indian Cove	Commercial and Recreational Vessels
NWS-2018-492	Des Moines	Commercial and Recreational Vessels
NWS-2019-478	Des Moines	Commercial and Recreational Vessels
NWS-2019-956	Fox Island	NA - Bulkhead
NWS-2019-0883	Foss Waterway/ Tacoma	Commercial and Industrial Vessels
NWS-2019-728	Seattle, PS waterfront	Recreational Vessel
NWS-2019-690	Discovery Bay	NA - Bulkhead
NWS-2019-0703	Seattle, PS waterfront	Commercial and Recreational Vessels
NWS-2020-0204	Bellingham	Commercial and Industrial Vessels
NWS-2017-550	Point Wells	Commercial and Industrial Vessels
NWS-2019-101	Anacortes	Commercial and Industrial Vessels
NWS-2019-832	Vaughn	Recreational Vessel

NWS#	Notable Land Mark Indicator (City, Island, etc.)	Vessel Use
NWS-2017-427	Shelton	Commercial and Industrial Vessels
NWS-2019-983	Nisqually Reach	Recreational Vessel

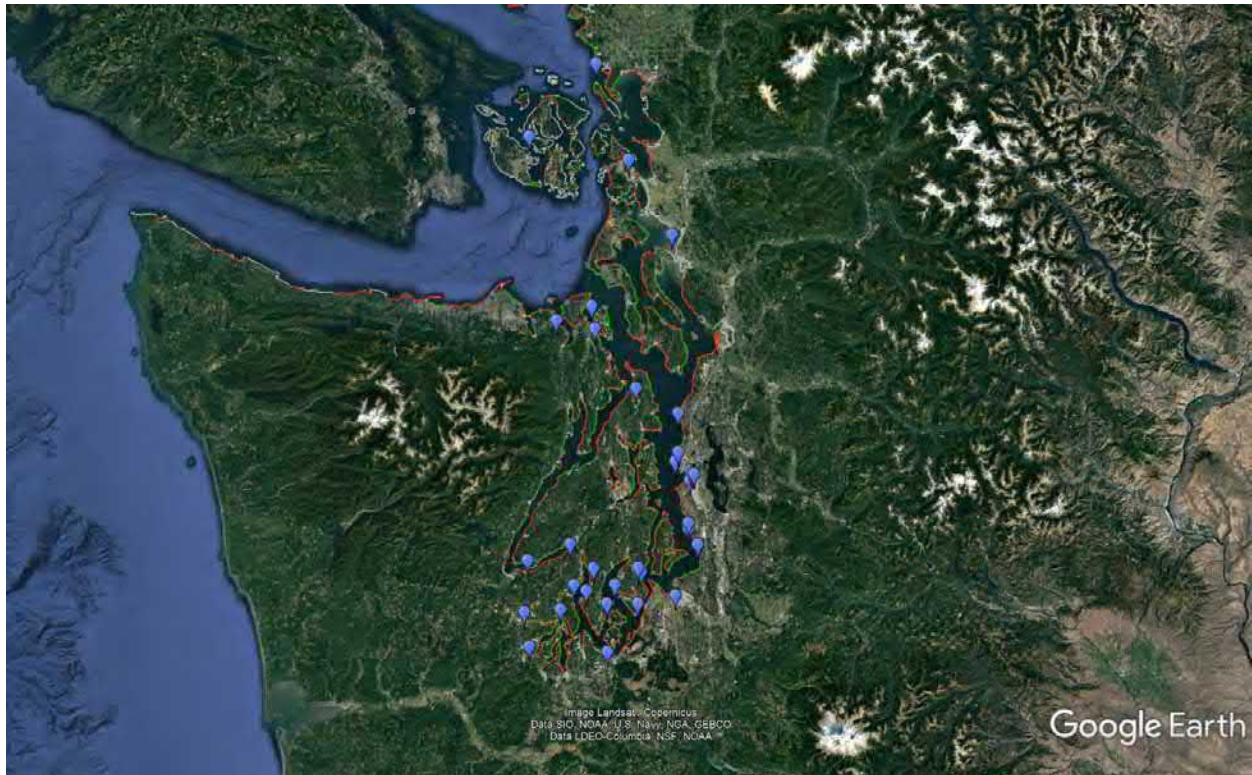


Figure 1. Image of Puget Sound with Approximate Project Locations

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

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

2.1 Analytical Approach

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

This biological opinion relies on the definition of “destruction or adverse modification,” which “means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species” (50 CFR 402.02).

The designation(s) of critical habitat for (species) use(s) the term primary constituent element (PCE) or essential features. The 2016 critical habitat regulations (50 CFR 424.12) replaced this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a “destruction or adverse modification” analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this biological opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

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

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

- Evaluate the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.
- Evaluate the environmental baseline of the species and critical habitat.
- Evaluate the effects of the proposed action on species and their habitat using an exposure-response approach.
- Evaluate cumulative effects.
- In the integration and synthesis, add the effects of the action and cumulative effects to the environmental baseline, and, in light of the status of the species and critical habitat, analyze whether the proposed action is likely to: (1) directly or indirectly reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species, or (2) directly or indirectly result in an alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.
- If necessary, suggest a reasonable and prudent alternative to the proposed action.

For this consultation, NMFS evaluated each project that was part of the proposed action using a Habitat Equivalency Analysis (HEA)⁵ and the Puget Sound Nearshore Habitat Values Model (NHVM) that we adapted from Ehinger et al. 2015. We developed an input calculator (“conservation calculator”) that serves as a user-friendly interface to simplify model use. Ecological equivalency that forms the basis of HEA is a concept that uses a common currency to express and assign a value to functional habitat loss and gain. Ecological equivalency is traditionally a service-to-service approach where the ecological functions and services for a species or group of species lost from an impacting activity are fully offset by the services gained from a conservation activity. In this case, we use this approach to calculate the “cost” and “benefit” of the proposed actions, as well as the impacts of the existing environmental baseline, using the NHVM.

The NHVM includes a debit/credit factor of two applied to new structures to account for the fact that impacts on unimpaired habitat have been found to be more detrimental than future impacts to already impaired habitat at sites with existing structures (Roni et al., 2002). To rephrase, given the current condition of nearshore habitat, impacts from new structures on relatively unimpaired habitat are more harmful than impacts resulting from the repair or replacement of existing structures, and the model accounts for this difference.

NMFS developed the NHVM based specifically on the designated critical habitat of listed salmonids in Puget Sound, scientific literature, and our best professional judgement. The model, run by inputting project specific information into the conservation calculator, produces numerical outputs in the form of conservation credits and debits. Credits (+) indicate positive environmental results to nearshore habitat quality, quantity, or function. Debits (-) on the other hand indicate a loss of nearshore habitat quality, quantity, or function. The model can be used to assess credits and debits for nearshore development projects and restoration projects; in the past, we have used this approach in the Structures in Marine Waters Programmatic consultation (NMFS 2016a). As explained above, model outputs for new or expanded projects account for impacts to a “pristine” environment and are calculated at a higher debit rate (2 times greater) than those calculated for replace/repair projects, that assume that some function has already been lost from the existing structure. In sum, outputs from the NHVM accounts for the following consequences of the action:

- Beneficial aspects of proposed projects, including any positive effects that would result from removing a structure, or piece of a structure, prior to the end of the remaining “useful life period”;

⁵ A common “habitat currency” to quantify habitat impacts or gains can be calculated using Habitat Equivalency Analysis (HEA) methodology when used with a tool to consistently determine the habitat value of the affected area before and after impact. NMFS selected HEA as a means to identify section 7 project related habitat losses, gains, and quantify appropriate mitigation because of its long use by NOAA in natural resource damage assessment to scale compensatory restoration (Dunford et al. 2004; Thur 2006) and extensive independent literature on the model (Milon and Dodge 2001; Cacula et al. 2005; Strange et al. 2002). In Washington State, NMFS has also expanded the use of HEA to calculate conservation credits available from fish conservation banks (NMFS 2008, NMFS 2015b)), from which “withdrawals” can be made to address mitigation for adverse impacts to ESA species and their designated CH.

- Minimization incorporated through project design improvements (e.g., credit is given for removal of, or replacement of creosote piles with steel piles as steel piles typically have less impact on water quality);
- Adverse effects that would occur for the duration of a new “useful life period” that would result from the proposed expanded, new, or repaired or replaced structure (or components of an existing structure).

We also describe the nature of these outputs earlier in the Proposed Federal Action (Section 1.3), in the Effects of the Action (Section 2.4), and in Appendix 5. Specific project outputs from each proposed project are included with this Opinion are included as 39 separate attachments designated by Corps identification number. Each attachment contains a summary sheet of overall credits of the proposed project as well as remaining debits. Following the summary sheets are detailed model output that describe how remaining “useful life periods” (i.e., a 10-year credit for removal of an existing structure) and new “useful life periods” (impacts of the proposed project for 40 or 50 years) are determined.

The NHVM is also used to assess critical habitat impacts resulting from maintenance dredging. The NHVM quantifies the number of and extent to which PCE’s are impacted by the proposed dredging. Maintenance dredging occurs at regular intervals; depending on the location every 2 to 5 years (Krenz 2020). After dredging, the dredged area starts to silt back in and the habitat functions of the migratory corridor gradually increase. Note—the NHVM only assess the temporal impacts critical habitat impacts. The shorter-term effects like elevated suspended sediments and re-suspended contaminants are addressed qualitatively in the Effect of the Action in Section 2.4 below.

The model’s accounting includes a selection of applicable SAV conditions prior to dredging and no SAV after impact, and a 2-year impact to prey base from disrupted sediment and substrate. Additionally, a reduction in migratory corridor function of 4 years is assumed. Further, the impact assessment is based on assuming linear recovery of migratory corridor function and prey base over the respective time horizons.

2.2 Rangewide Status of the Species and Critical Habitat

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

One factor affecting the status of ESA-listed species considered in this opinion, and aquatic habitat at large, is climate change. Climate change is likely to play an increasingly important role

in determining the abundance and distribution of ESA-listed species, and the conservation value of designated critical habitats, in the Pacific Northwest. These changes will not be spatially homogeneous across the Pacific Northwest. The largest hydrologic responses are expected to occur in basins with significant snow accumulation, where warming decreases snow pack, increases winter flows, and advances the timing of spring melt (Mote et al. 2014; Mote et al. 2016). Rain-dominated watersheds and those with significant contributions from groundwater may be less sensitive to predicted changes in climate (Tague et al. 2013; Mote et al. 2014).

During the last century, average regional air temperatures in the Pacific Northwest increased by 1-1.4°F as an annual average, and up to 2°F in some seasons (based on average linear increase per decade; Abatzoglou et al. 2014; Kunkel et al. 2013). Recent temperatures in all but two years since 1998 ranked above the 20th century average (Mote et al. 2014). Warming is likely to continue during the next century as average temperatures are projected to increase another 3 to 10°F, with the largest increases predicted to occur in the summer (Mote et al. 2014).

Decreases in summer precipitation of as much as 30 percent by the end of the century are consistently predicted across climate models (Mote et al. 2014). Precipitation is more likely to occur during October through March, less during summer months, and more winter precipitation will be rain than snow ([ISAB 2007](#); Mote et al. 2013). Earlier snowmelt will cause lower stream flows in late spring, summer, and fall, and water temperatures will be warmer ([ISAB 2007](#); [Mote et al. 2014](#)). Models consistently predict increases in the frequency of severe winter precipitation events (i.e., 20-year and 50-year events), in the western United States (Dominguez et al. 2012). The largest increases in winter flood frequency and magnitude are predicted in mixed rain-snow watersheds (Mote et al. 2014).

The combined effects of increasing air temperatures and decreasing spring through fall flows are expected to cause increasing stream temperatures; in 2015 this resulted in 3.5-5.3°C increases in Columbia Basin streams and a peak temperature of 26°C in the Willamette (NWFSC 2015). Overall, about one-third of the current cold-water salmonid habitat in the Pacific Northwest is likely to exceed key water temperature thresholds by the end of this century ([Mantua et al. 2009](#)).

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

As more basins become rain-dominated and prone to more severe winter storms, higher winter stream flows may increase the risk that winter or spring floods in sensitive watersheds will damage spawning redds and wash away incubating eggs (Goode et al. 2013). Earlier peak stream

flows will also alter migration timing for salmon smolts, and may flush some young salmon and steelhead from rivers to estuaries before they are physically mature, increasing stress and reducing smolt survival (McMahon and Hartman 1989; Lawson et al. 2004).

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

Moreover, as atmospheric carbon emissions increase, increasing levels of carbon are absorbed by the oceans, changing the pH of the water. A 38 percent to 109 percent increase in acidity is projected by the end of this century in all but the most stringent CO₂ mitigation scenarios, and is essentially irreversible over a time scale of centuries (IPCC 2014). Regional factors appear to be amplifying acidification in Northwest ocean waters, which is occurring earlier and more acutely than in other regions and is already impacting important local marine species (Barton et al. 2012; Feely et al. 2012). Acidification also affects sensitive estuary habitats, where organic matter and nutrient inputs further reduce pH and produce conditions more corrosive than those in offshore waters (Feely et al. 2012; Sunda and Cai 2012).

Global sea levels are expected to continue rising throughout this century, reaching likely predicted increases of 10-32 inches by 2081-2100 (IPCC 2014). These changes will likely result in increased erosion and more frequent and severe coastal flooding, and shifts in the composition of nearshore habitats (Tillmann and Siemann 2011; Reeder et al. 2013). Estuarine-dependent salmonids such as chum and Chinook salmon are predicted to be impacted by significant reductions in rearing habitat in some Pacific Northwest coastal areas (Glick et al. 2007). Historically, warm periods in the coastal Pacific Ocean have coincided with relatively low abundances of salmon and steelhead, while cooler ocean periods have coincided with relatively high abundances, and therefore these species are predicted to fare poorly in warming ocean conditions ([Scheuerell and Williams 2005](#); [Zabel et al. 2006](#)). This is supported by the recent observation that anomalously warm sea surface temperatures off the coast of Washington from 2013 to 2016 resulted in poor coho and Chinook salmon body condition for juveniles caught in those waters (NWFSC 2015). Changes to estuarine and coastal conditions, as well as the timing of seasonal shifts in these habitats, have the potential to impact a wide range of listed aquatic species (Tillmann and Siemann 2011; Reeder et al. 2013).

The adaptive ability of these threatened and endangered species is depressed due to reductions in population size, habitat quantity and diversity, and loss of behavioral and genetic variation. Without these natural sources of resilience, systematic changes in local and regional climatic conditions due to anthropogenic global climate change will likely reduce long-term viability and sustainability of populations in many of these ESUs (NWFSC 2015). New stressors generated by climate change, or existing stressors with effects that have been amplified by climate change,

may also have synergistic impacts on species and ecosystems (Doney et al. 2012). These conditions will possibly intensify the climate change stressors inhibiting recovery of ESA-listed species in the future.

2.2.1 Status of the Species

For Pacific salmon, steelhead, and certain other species, we commonly use the four “viable salmonid population” (VSP) criteria (McElhany et al. 2000) to assess the viability of the populations that, together, constitute the species. These four criteria (spatial structure, diversity, abundance, and productivity) encompass the species’ “reproduction, numbers, or distribution” as described in 50 CFR 402.02. When these parameters are collectively at appropriate levels, they maintain a population’s capacity to adapt to various environmental conditions and allow it to sustain itself in the natural environment.

“Spatial structure” refers both to the spatial distributions of individuals in the population and the processes that generate that distribution. A population’s spatial structure depends on habitat quality and spatial configuration, and the dynamics and dispersal characteristics of individuals in the population.

“Diversity” refers to the distribution of traits within and among populations. These range in scale from DNA sequence variation in single genes to complex life history traits (McElhany et al. 2000).

“Abundance” generally refers to the number of naturally produced adults (i.e., the progeny of naturally spawning parents) in the natural environment (e.g., on spawning grounds).

“Productivity,” as applied to viability factors, refers to the entire life cycle (i.e., the number of naturally-spawning adults produced per parent). When progeny replace or exceed the number of parents, a population is stable or increasing. When progeny fail to replace the number of parents, the population is declining. McElhany et al. (2000) use the terms “population growth rate” and “productivity” interchangeably when referring to production over the entire life cycle. They also refer to “trend in abundance,” which is the manifestation of long-term population growth rate.

For species with multiple populations, once the biological status of a species’ populations has been determined, we assess the status of the entire species using criteria for groups of populations, as described in recovery plans and guidance documents from technical recovery teams. Considerations for species viability include having multiple populations that are viable, ensuring that populations with unique life histories and phenotypes are viable, and that some viable populations are both widespread to avoid concurrent extinctions from mass catastrophes and spatially close to allow functioning as metapopulations (McElhany et al. 2000).

The summaries that follow describe the status of the six ESA-listed species, and their designated critical habitats, that occur within the geographic area of this proposed action and are considered in this Opinion. More detailed information on the status and trends of these listed resources, and their biology and ecology, are in the listing regulations and critical habitat designations published in the Federal Register. See Table 6.

Table. 6 Listing status, status of critical habitat designations and protective regulations, and relevant Federal Register (FR) decision notices for ESA-listed species considered in this Opinion. Listing status: ‘T’ means listed as threatened; ‘E’ means listed as endangered; ‘P’ means proposed for listing or designation.

Species	Listing Status	Critical Habitat
Chinook salmon (<i>Oncorhynchus tshawytscha</i>)		
Puget Sound	T 6/28/05; 70 FR 37160	9/02/05; 70 FR 52630
Chum salmon (<i>O. keta</i>)		
Hood Canal summer-run	T 6/28/05; 70 FR 37160	9/02/05; 70 FR 52630
Steelhead (<i>O. mykiss</i>)		
Puget Sound	T 5/11/07; 72 FR 26722	2/24/16; 81 FR 9252
Yelloweye Rockfish (<i>Sebastes ruberrimus</i>)		
Puget Sound/Georgia Basin	T 4/28/10; 75 FR 22276	2/11/15; 79 FR 68041
Bocaccio (<i>S. paucispinis</i>)		
Puget Sound/Georgia Basin	T 4/28/10; 75 FR 22276	2/11/15; 79 FR 68041
Killer Whale (<i>Orcus orcinus</i>)		
Southern Resident	11/18/2005; 70 FR 69903	11/29/06; 79 FR 69054

Status of PS Chinook Salmon

The Puget Sound Chinook salmon evolutionarily significant unit (ESU) was listed as threatened on June 28, 2005 (70 FR 37160). We adopted the recovery plan for this ESU in January 2007. The recovery plan consists of two documents: the Puget Sound salmon recovery plan (SSPS 2007) and a supplement by NMFS (2006). The recovery plan adopts ESU and population level viability criteria recommended by the Puget Sound Technical Recovery Team (PSTRT) (Ruckelshaus et al. 2002). The PSTRT’s biological recovery criteria will be met when all of the following conditions are achieved:

- The viability status of all populations in the ESU is improved from current conditions, and when considered in the aggregate, persistence of the ESU is assured;
- Two to four Chinook salmon populations in each of the five biogeographical regions of the ESU (Table 6) achieve viability, depending on the historical biological characteristics and acceptable risk levels for populations within each region;
- At least one population from each major genetic and life history group historically present within each of the five biogeographical regions is viable;
- Tributaries to Puget Sound not identified as primary freshwater habitat for any of the 22 identified populations are functioning in a manner that is sufficient to support an ESU-wide recovery scenario;
- Production of Chinook salmon from tributaries to Puget Sound not identified as primary freshwater habitat for any of the 22 identified populations occurs in a manner consistent with ESU recovery; and

- Populations that do not meet the viability criteria for all VSP parameters are sustained to provide ecological functions and preserve options for ESU recovery.

Spatial Structure and Diversity. The Puget Sound Chinook salmon ESU includes all naturally spawning populations of Chinook salmon from rivers and streams flowing into Puget Sound including the Straits of Juan De Fuca from the Elwha River, eastward, including rivers and streams flowing into Hood Canal, South Sound, North Sound and the Strait of Georgia in Washington. The ESU also includes the progeny of numerous artificial propagation programs (NWFSC 2015). The PSTRT identified 22 extant populations, grouped into five major geographic regions, based on consideration of historical distribution, geographic isolation, dispersal rates, genetic data, life history information, population dynamics, and environmental and ecological diversity. The PSTRT distributed the 22 populations among five major biogeographical regions, or major population groups (MPG), that are based on similarities in hydrographic, biogeographic, and geologic characteristics (Table 7).

Between 1990 and 2014, the proportion of natural-origin spawners has trended downward across the ESU, with the Whidbey Basin the only MPG with consistently high fractions of natural-origin spawner abundance. All other MPG have either variable or declining spawning populations with high proportions of hatchery-origin spawners (NWFSC 2015).

Table 7. Extant PS Chinook salmon populations in each biogeographic region and the 2-year trend (2012-2014) (Ruckelshaus et al. 2002, NWFSC 2015)

Biogeographic Region	Population (Watershed)	Population trend (% change)
Strait of Georgia	North Fork Nooksack River	Negative (-30)
	South Fork Nooksack River	Positive (+8)
Strait of Juan de Fuca	Elwha River	Positive (+93)
	Dungeness River	Negative (-6)
Hood Canal	Skokomish River	Positive (+34)
	Mid Hood Canal River	Positive (+257)
Whidbey Basin	Skykomish River	Negative (-31)
	Snoqualmie River	Negative (-42)
	North Fork Stillaguamish River	Negative (-1)
	South Fork Stillaguamish River	Negative (-15)
	Upper Skagit River	Negative (-32)
	Lower Skagit River	Negative (-35)
	Upper Sauk River	Positive (+67)
	Lower Sauk River	Negative (-24)
	Suiattle River	Positive (+38)
	Upper Cascade River	Positive (+1)
Central/South Puget Sound Basin	Cedar River	Positive (+31)
	North Lake Washington/ Sammamish River	Negative (-16)
	Green/Duwamish River	Negative (-32)
	Puyallup River	Negative (-41)
	White River	Negative (-35)
	Nisqually River	Positive (+31)

Abundance and Productivity. Available data on total abundance since 1980 indicate that although abundance trends have fluctuated between positive and negative for individual populations, there are widespread negative trends in natural-origin Chinook salmon spawner abundance across the ESU (NWFSC 2015). Productivity remains low in most populations, and hatchery-origin spawners are present in high fractions in most populations outside of the Skagit watershed. Available data now shows that most populations have declined in abundance over the past 7 to 10 years. Further, escapement levels for all populations remain well below the TRT planning ranges for recovery, and most populations are consistently below the spawner-recruit levels identified by the TRT as consistent with recovery (NWFSC 2015).

Limiting Factors. Limiting factors for this species include:

- Degraded floodplain and in-river channel structure
- Degraded estuarine conditions and loss of estuarine habitat
- Riparian area degradation and loss of in-river large woody debris
- Excessive fine-grained sediment in spawning gravel
- Degraded water quality and temperature
- Degraded nearshore conditions
- Impaired passage for migrating fish
- Altered flow regime

PS Chinook Salmon Recovery Plan. Nearshore areas serve as the nursery for juvenile PS Chinook salmon. Riparian vegetation, shade and insect production, and forage fish eggs along marine shorelines and river deltas help to provide food, cover and thermoregulation in shallow water habitats. Forage fish spawn in large aggregations along shorelines with suitable habitat, which produce prey for juvenile PS Chinook salmon. Juvenile salmon commonly occupy “pocket estuaries” where freshwater inputs provide salinity gradients that make adjusting to the marine environment less physiologically demanding. Pocket estuaries also provide refugia from predators. As the juvenile salmon grow and adjust, they move out to more exposed shorelines such as eelgrass, kelp beds and rocky shorelines where they continue to grow and migrate into the ocean environment. Productive shoreline habitats of Puget Sound are necessary for the recovery of Puget Sound salmon (SSPS 2007).

The Puget Sound Recovery Plan (Volumes 1 and 2) includes specific recovery actions for each of the 22 extant populations of PS Chinook salmon. General protection and restoration actions summarized from the plan include:

- Aggressively protect functioning drift cells and feeder bluffs that support eelgrass bands and depositional features;
- Counties should pass strong regulations and policies limiting increased armoring of these shorelines and offering incentives for protection;
- Aggressive protect areas, especially shallow water/low gradient habitats and pocket estuaries, within 5 miles of river deltas;
- Protect the forage fish spawning areas;

- Conduct limited beach nourishment on a periodic basis to mimic the natural sediment transport processes in select sections where corridor functions may be impaired by extensive armoring;
- Maintain the functioning of shallow, fine substrate features in and near 11 natal estuaries for Chinook salmon(to support rearing of fry);
- Maintain migratory corridors along the shores of Puget Sound;
- Maintain the production of food resources for salmon;
- Maintain functioning nearshore ecosystem processes (i.e., sediment delivery and transport; tidal circulation) that create and support the above habitat features and functions;
- Increase the function and capacity of nearshore and marine habitats to support key needs of salmon;
- Protect and restore shallow, low velocity, fine substrate habitats along marine shorelines, including eelgrass beds and pocket estuaries, especially adjacent to major river deltas;
- Protect and restore riparian areas;
- Protect and restore estuarine habitats of major river mouths;
- Protect and restore spawning areas and critical rearing and migration habitats for forage fish;
- Protect and restore drift cell processes (including sediment supply, e.g., from feeder bluffs, transport, and deposition) that create and maintain nearshore habitat features such as spits, lagoons, bays, beaches.

Development of shoreline and estuary areas of Puget Sound is expected to continue to adversely impact the quality of marine habitat for PS Chinook salmon. Projected changes in nearshore and estuary development based on documented rates of developed land cover change in Bartz et al. (2015) show that between 2008 and 2060, an additional 14.7 hectares of development of shoreline areas and 204 hectares of estuary development can be expected.⁶

Status of Hood Canal Summer-run Chum Salmon

We adopted a recovery plan for Hood Canal summer-run (HCSR) chum salmon in May of 2007. The recovery plan consists of two documents: the Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Salmon Recovery Plan (Hood Canal Coordinating Council 2005) and a supplemental plan by NMFS (2007a). The recovery plan adopts ESU and population level viability criteria recommended by the PSTRT (Sands et al. 2009). The PSTRT's biological recovery criteria will be met when the following conditions are achieved:

- Spatial Structure: (1) Spawning aggregations are distributed across the historical range of the population. (2) Most spawning aggregations are within 20 km of adjacent aggregations. (3) Major spawning aggregations are distributed across the historical range of the population and are not more than approximately 40 km apart. Further, a viable population has spawning, rearing, and migratory habitats that function in a manner that is consistent with population persistence

⁶ Memorandum from Tim Beechie, Northwest Fisheries Science Center, to Kim Kratz, et al. NMFS, regarding projected developed land cover change in Puget Sound nearshore and estuary zones. (June 23, 2020)

- Diversity: Depending on the geographic extent and ecological context of the population, a viable population includes one or more persistent spawning aggregations from each of the two to four major ecological diversity groups historically present within the two populations (see also McElhany et al. 2000).
- Abundance and Productivity: Achievement of minimum abundance levels associated with persistence of HCSR Chum ESU populations that are based on two assumptions about productivity and environmental response (Table 8).

Despite substantive gains towards meeting viability criteria in the Hood Canal and Strait of Juan de Fuca summer chum salmon populations, the ESU still does not meet all of the recovery criteria for population viability at this time (NWFSC 2015).

Table 8. Hood Canal summer-run chum ESU abundance and productivity recovery goals (Sands et al. 2009).

Population	Low Productivity Planning Target for Abundance (productivity in parentheses)	High Productivity Planning Target for Abundance (productivity in parentheses)
Strait of Juan de Fuca	12,500 (1.0)	4,500 (5.0)
Hood Canal	24,700 (1.0)	18,300 (5.0)

Spatial Structure and Diversity. The ESU includes all naturally spawning populations of summer-run chum salmon in Hood Canal tributaries as well as populations in Olympic Peninsula rivers between Hood Canal and Dungeness Bay, Washington, as well as several artificial propagation programs. The Puget Sound Technical Recovery Team identified two independent populations for the Hood Canal summer chum, one which includes the spawning aggregations from rivers and creeks draining into the Strait of Juan de Fuca, and one which includes spawning aggregations within Hood Canal proper (Sands et al. 2009).

Spatial structure and diversity measures for the HCSR chum recovery program have included the reintroduction and sustaining of natural-origin spawning in multiple small streams where summer chum spawning aggregates had been extirpated. Supplementation programs have been very successful in both increasing natural spawning abundance in 6 of 8 extant streams (Salmon, Big Quilcene, Lilliwaup, Hamma Hamma, Jimmycomelately, and Union) and increasing spatial structure due to reintroducing spawning aggregations to three streams (Big Beef, Tahuya, and Chimacum). Spawning aggregations are present and persistent within five of the six major ecological diversity groups identified by the PS TRT (Table 9). As supplementation program goals have been met in most locations, they have been terminated except in Lilliwaup/Tahuya, where supplementation is ongoing (NWFSC 2015). Spatial structure and diversity viability parameters for each population have increased and nearly meet the viability criteria.

Table 9. Seven ecological diversity groups as proposed by the PSTRT for the Hood Canal Summer Chum ESU by geographic region and associated spawning aggregation.

Geographic Region(population)	Proposed Ecological Diversity Groups	Spawning aggregations: Extant* and extinct**
Eastern Strait of Juan de Fuca	Dungeness	Dungeness R (unknown status)
	Sequim-Admiralty	Jimmycomelately Cr* Salmon Cr* Snow Cr* Chimacum Cr**
Hood Canal	Toandos	Unknown
	Quilcene	Big Quilcene R* Little Quilcene R*
	Mid-West Hood Canal	Dosewallips R* Duckabush R*
	West Kitsap	Big Beef Cr** Seabeck Cr** Stavis Cr** Anderson Cr** Dewatto R** Tahuya R** Mission Cr** Union R*
	Lower West Hood Canal	Hamma Hamma R* Lilliwaup Cr* Skokomish R*

Abundance and Productivity. Smoothed trends in estimated total and natural population spawning abundances for both Hood Canal and Strait of Juan de Fuca populations have generally increased over the 1980 to 2014 time period. The Hood Canal population has had a 25 percent increase in abundance of natural-origin spawners in the most recent 5-year time period over the 2005-2009 time period. The Strait of Juan de Fuca has had a 53 percent increase in abundance of natural-origin spawners in the most recent 5-year time period.

Trends in population productivity, estimated as the log of the smoothed natural spawning abundance in year t minus the smoothed natural spawning abundance in year (t-4), have increasing over the past five years, and were above replacement rates in the 2012 and 2013. However, productivity rates have been varied above and below replacement rates over the entire time period up to 2014. The Point No Point Treaty Tribes and the Washington State Department of Fish and Wildlife (PNPTT and WDFW 2014) provide a detailed analysis of productivity for the ESU, each population, and by individual spawning aggregation, and report that 3 of the 11 stocks exceeded the co-manager's interim productivity goal of an average of 1.6 Recruit/Spawner over 8 years. They also report that natural-origin Recruit/Spawner rates have been highly variable in recent brood years, particularly in the Strait of Juan de Fuca population. Only one spawning aggregation (Chimacum) meets the co-manager's interim recovery goal of 1.2 recruits per spawner in 6 of most recent 8 years. Productivity of individual spawning aggregates shows only two of eight aggregates have viable performance. (NWFSC 2015).

Limiting factors. Limiting factors for this species include (HCCC 2005):

- Reduced floodplain connectivity and function
- Poor riparian condition
- Loss of channel complexity (reduced large wood and channel condition, loss of side channels, channel instability)
- Sediment accumulation
- Altered flows and water quality

Mantua et al. (2010) suggested that the unique life history of Hood Canal summer-run chum salmon makes this ESU especially vulnerable to the climate change impacts because they spawn in small shallow streams in late summer, eggs incubate in the fall and early winter, and fry migrate to sea in late winter. Sensitivity during the adult freshwater stage and the early life history was ranked moderate. Predicted climate change effects for the low-elevation Hood Canal streams historically used by summer chum salmon include multiple negative impacts stemming from warmer water temperatures and reduced streamflow in summer, and the potential for increased redd-scouring from peak flow magnitudes in fall and winter. Exposure for stream temperature and summer water deficit were both ranked high, largely due to effects on returning adults and hatched fry. Likewise, sensitivity to cumulative life-cycle effects was ranked high.

Hood Canal Summer-run Chum Salmon Recovery Plan. The 2005 recovery plan for Hood Canal summer-run Chum Salmon currently guides habitat protection and restoration activities for chum Salmon recovery (HCCC 2005; NMFS 2007a). Human-caused degradation of Hood Canal summer-run chum salmon habitat has diminished the natural resiliency of Hood Canal/Strait of Juan de Fuca river deltas and estuarine habitats (HCCC 2005). Despite some improvement in habitat protection and restoration actions and mechanisms, concerns remain that given the pressures of population growth, existing land use management measures through local governments (i.e., shoreline management plans, critical area ordinances, and comprehensive plans) may be compromised or not enforced (SSPS 2007). “The widespread loss of estuary and lower floodplain habitat was noted by the BRT as a continuing threat to ESU spatial structure and connectivity” (NMFS 2003; 69 FR 33134).

The Hood Canal summer-run Chum Salmon recovery plan includes specific recovery actions for each stream (HCCC 2005). General protection and restoration actions summarized from those streams include:

- Incorporate channel migration zones within the protected areas of the Shoreline Master Plans of local governments.
- Acquire high priority spawning habitat
- Set back or remove levees in the lower rivers and in river deltas
- Restore upstream ecosystem processes to facilitate delivery of natural sediment and large wood features to lower river habitats
- Remove armoring along the Hood Canal shoreline, including private bulkheads, roadways, and railroad grades
- Restore large wood to river deltas and estuarine habitats
- Restore salt marsh habitats

Status of PS Steelhead

The PS Steelhead TRT produced viability criteria, including population viability analyses (PVAs), for 20 of 32 demographically independent populations (DIPs) and three major population groups (MPGs) in the DPS ([Hard et al. 2015](#)). It also completed a report identifying historical populations of the DPS ([Myers et al. 2015](#)). The DIPs are based on genetic, environmental, and life history characteristics. Populations display winter, summer, or summer/winter run timing ([Myers et al. 2015](#)). The TRT concludes that the DPS is currently at “very low” viability, with most of the 32 DIPs and all three MPGs at “low” viability.

The designation of the DPS as “threatened” is based upon the extinction risk of the component populations. Hard 2015, identify several criteria for the viability of the DPS, including that a minimum of 40 percent of summer-run and 40 percent of winter-run populations historically present within each of the MPGs must be considered viable using the VSP-based criteria. For a DIP to be considered viable, it must have at least an 85 percent probability of meeting the viability criteria, as calculated by Hard et al. (2015).

On December 27, 2019, we published a final recovery plan for PS steelhead (84 FR 71379) (NMFS 2019a). The plan indicates that within each of the three MPGs, at least fifty percent of the populations must achieve viability, *and* specific DIPs must also be viable:

- Central and South Puget Sound MPG: Green River Winter-Run; Nisqually River Winter-Run; Puyallup/Carbon Rivers Winter-Run, or the White River Winter-Run; and At least one additional DIP from this MPG: Cedar River, North Lake Washington/Sammamish Tributaries, South Puget Sound Tributaries, or East Kitsap Peninsula Tributaries.
- Hood Canal and Strait of Juan de Fuca MPG: Elwha River Winter/Summer-Run; Skokomish River Winter-Run; One from the remaining Hood Canal populations: West Hood Canal Tributaries WinterRun, East Hood Canal Tributaries Winter-Run, or South Hood Canal Tributaries WinterRun; and One from the remaining Strait of Juan de Fuca populations: Dungeness Winter-Run, Strait of Juan de Fuca Tributaries Winter-Run, or Sequim/Discovery Bay Tributaries Winter-Run.
- North Cascades MPG: Of the eleven DIPs with winter or winter/summer runs, five must be viable: One from the Nooksack River Winter-Run; One from the Stillaguamish River Winter-Run; One from the Skagit River (either the Skagit River Summer-Run and Winter-Run or the Sauk River Summer-Run and Winter-Run); One from the Snohomish River watershed (Pilchuck, Snoqualmie, or Snohomish/Skykomish River Winter-Run); and One other winter or summer/winter run from the MPG at large.

Of the five summer-run DIPs in this MPG, three must be viable representing in each of the three major watersheds containing summer-run populations (Nooksack, Stillaguamish, Snohomish Rivers); South Fork Nooksack River Summer-Run; One DIP from the Stillaguamish River (Deer Creek Summer-Run or Canyon Creek Summer-Run); and One DIP from the Snohomish River (Tolt River Summer-Run or North Fork Skykomish River Summer-Run)

Spatial Structure and Diversity. The PS steelhead DPS is the anadromous form of *O. mykiss* that occur in rivers, below natural barriers to migration, in northwestern Washington State that drain to Puget Sound, Hood Canal, and the Strait of Juan de Fuca between the U.S./Canada border and the Elwha River, inclusive. The DPS also includes six hatchery stocks that are considered no more than moderately diverged from their associated natural-origin counterparts: Green River natural winter-run; Hamma Hamma winter-run; White River winter-run; Dewatto River winter-run; Duckabush River winter-run; and Elwha River native winter-run (USDC 2014, [79 FR 20802](#)). Steelhead are the anadromous form of *Oncorhynchus mykiss* that occur in rivers, below natural barriers to migration, in northwestern Washington State (Ford 2011). Non-anadromous “resident” *O. mykiss* occur within the range of PS steelhead but are not part of the DPS due to marked differences in physical, physiological, ecological, and behavioral characteristics (Hard et al. 2007).

DIPs can include summer steelhead only, winter steelhead only, or a combination of summer and winter run timing (e.g., winter run, summer run or summer/winter run). Most DIPs have low viability criteria scores for diversity and spatial structure, largely because of extensive hatchery influence, low breeding population sizes, and freshwater habitat fragmentation or loss (Hard et al. 2007). In the Central and South Puget Sound and Hood Canal and Strait of Juan de Fuca MPGs, nearly all DIPs are not viable (Hard et al. 2015). More information on PS steelhead spatial structure and diversity can be found in NMFS’ technical report (Hard et al. 2015).

Abundance and Productivity. Abundance of adult steelhead returning to nearly all Puget Sound rivers has fallen substantially since estimates began for many populations in the late 1970s and early 1980s. Smoothed trends in abundance indicate modest increases since 2009 for 13 of the 22 DIPs. Between the two most recent five-year periods (2005-2009 and 2010-2014), the geometric mean of estimated abundance increased by an average of 5.4 percent. For seven populations in the Northern Cascades MPG, the increase was 3 percent; for five populations in the Central & South Puget Sound MPG, the increase was 10 percent; and for six populations in the Hood Canal & Strait of Juan de Fuca MPG, the increase was 4.5 percent. However, several of these upward trends are not statistically different from neutral, and most populations remain small. Inspection of geometric means of total spawner abundance from 2010 to 2014 indicates that 9 of 20 populations evaluated had geometric mean abundances fewer than 250 adults and 12 of 20 had fewer than 500 adults. Between the most recent two five-year periods (2005-2009 and 2010-2014), several populations showed increases in abundance between 10 and 100 percent, but about half have remained in decline. Long-term (15-year) trends in natural spawners are predominantly negative (Table 10, NWFSC 2015).

There are some signs of modest improvement in steelhead productivity since the 2011 review, at least for some populations, especially in the Hood Canal & Strait of Juan de Fuca MPG. However, these modest changes must be sustained for a longer period (at least two generations) to lend sufficient confidence to any conclusion that productivity is improving over larger scales across the DPS. Moreover, several populations are still showing dismal productivity, especially those in the Central & South Puget Sound MPG (NWFSC 2015).

Little or no data is available on summer-run populations to evaluate extinction risk or abundance trends. Because of their small population size and the complexity of monitoring fish in headwater holding areas, summer steelhead have not been broadly monitored.

Limiting factors. In our 2013 proposed rule designating critical habitat for this species (USDC 2013, 78 FR 2725), we noted that the following factors for decline for PS steelhead persist as limiting factors:

- The continued destruction and modification of steelhead habitat
- Widespread declines in adult abundance (total run size), despite significant reductions in harvest in recent years
- Threats to diversity posed by use of two hatchery steelhead stocks (Chambers Creek and Skamania)
- Declining diversity in the DPS, including the uncertain but weak status of summer run fish
- A reduction in spatial structure
- Reduced habitat quality through changes in river hydrology, temperature profile, downstream gravel recruitment, and reduced movement of large woody debris
- In the lower reaches of many rivers and their tributaries in Puget Sound where urban development has occurred, increased flood frequency and peak flows during storms and reduced groundwater-driven summer flows, with resultant gravel scour, bank erosion, and sediment deposition
- Dikes, hardening of banks with riprap, and channelization, which have reduced river braiding and sinuosity, increasing the likelihood of gravel scour and dislocation of rearing juveniles.

Table 10. Extant PS Steelhead populations in each biogeographic region and the percent change 1990-2014 (Ruckelshaus et al. 2002, NWFSC 2015)

Biogeographic Region	Population (Watershed)	Population trend (% change)
Hood Canal and Strait of Juan de Fuca	East Hood Canal Tribs	Negative (-3)
	Sequim/Discovery Bay Tribs	Positive (+12)
	Elwha River	-
	Dungeness River	-
	Skokomish River	Positive (+65)
	South Hood Canal Tribs	Negative (-43)
	West Hood Canal Tribs	Negative (-50)
	Strait of Juan de Fuca Tribs	Negative (-40)
Northern Cascades	Snohomish/Skykomish River	Negative (-70)
	Snoqualmie River	Negative (-46)
	Stillaguamish River	Positive (+20)
	Nooksack River	-
	Skagit River	Positive (+7)
	Pilchuck River	Positive (+3)
	Sammish/Bellingham Bay Tribs	Positive (+58)
	Tolt River	Positive (44)
Central/South Puget Sound Basin	Cedar River	Negative (-67)
	North Lake Washington/ Sammamish River	-
	Green River	Negative (-23)
	Puyallup/Carbon River	Negative (-42)
	White River	Positive (+136)
	Nisqually River	Positive (+18)

PS steelhead Recovery Plan. Juvenile Puget Sound steelhead are less dependent on nearshore habitats for early marine rearing than Chinook or Chum Salmon; nevertheless, nearshore, estuarine, and shoreline habitats provide important features necessary for the recovery of steelhead. Puget Sound steelhead spend only a few days to a few weeks migrating through the large fjord, but mortality rates during this life stage are critically high (Moore et al. 2010; Moore and Berejikian 2017). Early marine mortality of Puget Sound steelhead is recognized as a primary limitation to the species' survival and recovery (NMFS 2019a). Factors in the marine environment influencing steelhead survival include predation, access to prey (primarily forage fish), contaminants (toxics), disease and parasites, migration obstructions (e.g., the Hood Canal bridge), and degraded habitat conditions which exacerbate these factors.

The PS steelhead recovery plan identifies ten ecological concerns that directly impact salmon and steelhead:

- Habitat quantity (anthropogenic barriers, natural barriers, competition);
- Injury and mortality (predation, pathogens, mechanical injury, contaminated food);
- Food (altered primary productivity, food-competition, altered prey species composition and diversity);
- Riparian condition (riparian condition, large wood recruitment);

- Peripheral and transitional habitats (side channel and wetland condition, estuary conditions, nearshore conditions);
- Channel structure and form (bed and channel form, instream structural complexity);
- Sediment conditions (decreased sediment quantity, increased sediment quantity);
- Water quality (temperature, oxygen, gas saturation, turbidity, pH, salinity, toxic contaminants);
- Water quantity (increased water quality, decreased water quality, altered flow timing); and
- Population-level effects (reduced genetic adaptiveness, small population effects, demographic changes, life history changes).

The Puget Sound steelhead recovery plan and its associated appendix 3 includes specific recovery actions for the marine environment. General protection and restoration actions summarized from the plan include:

- Continue to improve the assessments of harbor seal predation rates on juvenile steelhead;
- Remove docks and floats which act as artificial haul-out sites for seals and sea lions;
- Consistent with the MMPA, test acoustic deterrents and other hazing techniques to reduce steelhead predation from harbor seals;
- Develop non-lethal actions for “problem animals and locations” to deter predation;
- Increase forage fish habitat to increase abundance of steelhead prey;
- Remove bulkheads and other shoreline armoring to increase forage fish;
- Acquire important forage fish habitat to protect high forage fish production areas;
- Add beach wrack to increase forage fish egg survival;
- Protect and restore aquatic vegetation (e.g., eelgrass and kelp);
- Remove creosote pilings to reduce mortality of herring eggs;
- Increase the assessment of migratory blockages, especially the Hood Canal bridge, where differential mortality has been documented;
- Identify and remedy sources of watershed chemical contaminants (e.g., PBDEs and PCBs).

Status of Rockfish

NMFS adopted a recovery plan for both PS/GB bocaccio and yelloweye rockfish in 2017. There are no estimates of historic or present-day abundance of yelloweye rockfish, or PS/GB bocaccio across the full DPSs area. In 2013, the WDFW published abundance estimates from a remotely operated vehicle survey conducted in 2008 in the San Juan Island area (Pacunski et al. 2013). This survey was conducted exclusively within rocky habitats and represents the best available abundance estimates to date for one basin of the DPS. The survey produced estimates of 47,407 (25 percent variance) yelloweye rockfish, and 4,606 (100 percent variance) PS/GB bocaccio in the San Juan area (Tonnes et al. 2016).

Further, data suggest that total rockfish declined at a rate of 3.1 to 3.8 percent per year from 1977 to 2014 or a 69 to 76 percent total decline over that period. The two listed DPSs declined over-proportional compared to the total rockfish assemblage. Therefore, long-term population growth

rate for the listed species was likely even lower (more negative) than that for total rockfish. Finally, there is little to no evidence of recent recovery of total rockfish abundance to recent protective measures.

Mature females of each listed species produce from several thousand to over a million eggs annually (Love et al. 2002). In rockfish the number of embryos produced by the female increases with size. For example, female copper rockfish that are 20 cm in length produce 5,000 eggs while a female 50 cm in length may produce 700,000 eggs (Palsson et al. 2009). These specific observations come from other rockfish, not the two listed species. However, the generality of maternal effects in *Sebastes* suggests that some level of age or size influence on reproduction is likely for all species.

Larval rockfish rely on nearshore habitat. The nearshore is generally defined as habitats contiguous with the shoreline from extreme high water out to a depth no greater than 98 feet (30 m) relative to mean lower low water. This area generally coincides with the maximum depth of the photic zone and can contain physical or biological features essential to the conservation of many fish and invertebrate species, including PS/GB bocaccio. Approximately 27 percent of Puget Sound's shoreline has been modified by armoring (Simenstad et al. 2011). Nearshore habitats throughout the greater Puget Sound region have been affected by a variety of human activities, including agriculture, heavy industry, timber harvest, and the development of sea ports and residential property (Drake et al. 2010).

Juvenile yelloweye rockfish are not typically found in intertidal waters (Love et al. 1991; Studebaker et al. 2009). A few juveniles have been documented in shallow nearshore waters (Love et al. 2002; Palsson et al. 2009), but most settle in habitats along the shallow range of adult habitats in areas of complex bathymetry and rocky/boulder habitats and cloud sponges in waters greater than 98 feet (30 m) (Richards 1986; Love et al. 2002; Yamanaka et al. 2006). In British Columbia, juvenile yelloweye rockfish have been observed at a mean depth of 239 feet (73 m), with a minimum depth of 98 feet (30 m) (Yamanaka et al. 2006). Juvenile yelloweye rockfish occur in similar habitats as adults, though in areas with smaller crevices, including cloud sponge formations, crinoid aggregations on top of rocky ridges, and over cobble substrates (Weispenning 2006; Yamanaka et al. 2006; Banks 2007).

Young-of-year juvenile bocaccio occur on shallow rocky reefs and nearshore areas (Moser 1967; Anderson 1983; Kendall and Lenarz 1986; Carr 1991; Love et al. 1991; Love 1996; Murphy et al. 2000; Love et al. 2002). Young bocaccio associate with macroalgae, especially kelps (*Laminariales*), and sandy areas that support seagrasses. They form aggregations near the bottom in association with drift algae and throughout the water column in association with canopy-forming kelps. It is likely that nearshore habitats used by juvenile bocaccio and other rockfish juveniles offer a beneficial mix of warmer temperatures, food, and refuge from predators (Love et al. 1991). Habitat formed by kelp provides structure for feeding, refuge from predators, and reduced currents that enable energy conservation for juvenile bocaccio.

The alteration of Puget Sound shorelines has been found to impact a variety of marine life, ranging from invertebrate fauna (Sobocinski 2003) to surf smelt egg viability (Rice 2006), but consequences of the alteration of Puget Sound shorelines on rockfish habitat such as kelp are less

understood. Some areas around Puget Sound have shown a large decrease in kelp. Areas with floating and submerged kelp (families Chordaceae, Alariaceae, Lessoniaceae, Costariaceae, and Laminaricea) support the highest densities of most juvenile rockfish species (Matthews 1989; Halderson and Richards 1987; Carr 1983; Hayden-Spear 2006). Kelp habitat provides structure for feeding, predation refuge, and reduced currents that enable energy conservation for juveniles. Although loss of nearshore habitat quality is a threat to rockfish, the recovery plan for this species list the severity of this threat as low (NMFS 2017a).

A study of rockfish in Puget Sound found that larval rockfish appeared to occur in two peaks (early spring, late summer) that coincide with the main primary production peaks in Puget Sound. Both measures indicated that rockfish ichthyoplankton essentially disappeared from the surface waters by the beginning of November. Densities also tended to be lower in the more northerly basins (Whidbey and Rosario), compared to Central and South Sound (Greene and Godersky 2012).

Status of PS/GB Bocaccio

The PS/GB bocaccio distinct population segment (DPS) was listed as endangered on April 28, 2010 (75 FR 22276). In April 2016, we completed a 5-year status review that recommended the DPS retain its endangered classification (Tonnes et al. 2016), and we released a recovery plan in October 2017 (NMFS 2017a). Though PS/GB bocaccio were never a predominant segment of the multi-species rockfish population within the Puget Sound/Georgia Basin, their present-day abundance is likely a fraction of their pre-contemporary fishery abundance. Most PS/GB bocaccio within the DPS may have been historically spatially limited to several basins within the DPS. They were apparently historically most abundant in the Central and South Sound with no documented occurrences in the San Juan Basin until 2008. The apparent reduction of populations of PS/GB bocaccio in the Main Basin⁷ and South Sound represents a further reduction in the historically spatially limited distribution of PS/GB bocaccio, and adds significant risk to the viability of the DPS.

The VSP criteria described by McElhaney et al. (2000), and summarized at the beginning of Section 2.2, identified spatial structure, diversity, abundance, and productivity as criteria to assess the viability of salmonid species because these criteria encompass a species' "reproduction, numbers, or distribution" as described in 50 CFR 402.02. These viability criteria reflect concepts that are well founded in conservation biology and are generally applicable to a wide variety of species because they describe demographic factors that individually and collectively provide strong indicators of extinction risk for a given species (Drake et al. 2010), and are therefore applied here for PS/GB bocaccio.

⁷ The U.S. portion of the Puget Sound/Georgia Basin that is occupied by yelloweye rockfish and PS/GB bocaccio can be divided into five areas, or Basins, based on the distribution of each species, geographic conditions, and habitat features. These five interconnected Basins are: (1) The San Juan/Strait of Juan de Fuca Basin, (2) Main Basin, (3) Whidbey Basin, (4) South Puget Sound, and (5) Hood Canal. See 79 FR 68041, Nov. 13, 2014 (Puget Sound/Georgia Basin Distinct Population Segments of Yelloweye Rockfish, Canary Rockfish and Bocaccio; Designation of Critical Habitat).

General Life History: The life history of PS/GB bocaccio includes a larval/pelagic juvenile stage that is followed by a juvenile stage, and subadult and adult stages. As with other rockfish, PS/GB bocaccio fertilize their eggs internally and the young are extruded as larvae that are about 4 to 5 mm in length. Females produce from several thousand to over a million offspring per spawning (Love et al. 2002). The timing of larval parturition in PS/GB bocaccio is uncertain, but likely occurs within a five- to six-month window that is centered near March (Greene and Godersky 2012; NMFS 2017a; Palsson et al. 2009). Larvae are distributed by prevailing currents until they are large enough to actively swim toward preferred habitats, but they can pursue food within short distances immediately after birth (Tagal et al. 2002). Larvae are distributed throughout the water column (Weis 2004), but are also observed under free-floating algae, seagrass, and detached kelp (Love et al. 2002; Shaffer et al. 1995). Unique oceanographic conditions within Puget Sound likely result in most larvae staying within the basin where they are released rather than being broadly dispersed (Drake et al. 2010).

At about 3 to 6 months old and 1.2 to 3.6 inches (3 to 9 cm) long, juvenile PS/GB bocaccio gravitate to shallow nearshore waters where they settle and grow. Rocky or cobble substrates with kelp is most typical, but sandy areas with eelgrass are also utilized for rearing (Carr 1983; Halderson and Richards 1987; Hayden-Spear 2006; Love et al. 1991 and 2002; Matthews 1989; NMFS 2017a; Palsson et al. 2009). Young of the year rockfish may spend months or more in shallow nearshore rearing habitats before transitioning toward deeper water habitats (Palsson et al. 2009). As PS/GB bocaccio grow, their habitat preference shifts toward deeper waters with high relief and complex bathymetry with rock and boulder-cobble complexes (Love et al. 2002), but they also utilize non-rocky substrates such as sand, mud, and other unconsolidated sediments (Miller and Borton 1980; Washington 1977). Adults are most commonly found between 131 to 820 feet (40 to 250 m) (Love et al. 2002; Orr et al. 2000). The maximum age of PS/GB bocaccio is unknown, but may exceed 50 years, and they reach reproductive maturity near age six.

Spatial Structure and Diversity: The PS/GB bocaccio DPS includes all PS/GB bocaccio from inland marine waters east of the central Strait of Juan de Fuca and south of the northern Strait of Georgia. The waters of Puget Sound and Straits of Georgia can be divided into five interconnected basins that are largely hydrologically isolated from each other by relatively shallow sills (Burns 1985; Drake et al. 2010). The basins within US waters are: (1) San Juan, (2) Main, (4) South Sound, and (4) Hood Canal. The fifth basin consists of Canadian waters east and north of the San Juan Basin into the Straights of Georgia (Tonnes et al. 2016). Although most individuals of the PS/GB bocaccio DPS are believed to remain within the basin of their origin, including larvae and pelagic juveniles, some movement between basins occurs, and the DPS is currently considered a single population.

Abundance and Productivity: The PS/GB bocaccio DPS exists at very low abundance and observations are relatively rare. No reliable range-wide historical or contemporary population estimates are available for the PS/GB bocaccio DPS. It is believed that prior to contemporary fishery removals, each of the major PS/GB basins likely hosted relatively large, though unevenly distributed, populations of PS/GB bocaccio. They were likely most common within the South Sound and Main Basin, but were never a predominant segment of the total rockfish abundance within the region (Drake et al. 2010). The best available information indicates that between 1965 and 2007, total rockfish populations have declined by about 70 percent in the Puget Sound

region, and that PS/GB bocaccio have declined by an even greater extent (Drake et al. 2010; Tonnes et al. 2016; NMFS 2017a).

Limiting Factors: Factors limiting recovery for PS/GB bocaccio include:

- Fisheries removals (commercial and recreational bycatch)
- Derelict fishing gear in nearshore and deep-water environments
- Degraded water quality (chemical contamination, hypoxia, nutrients)
- Climate change
- Habitat disruption

Status of PS/GB Yelloweye Rockfish

Spatial Structure PS/GB Yelloweye rockfish occupy the waters of the Pacific coast from California to Alaska. Yelloweye rockfish in the waters of the Puget Sound/Georgia Basin were determined to be a Distinct Population Segment (DPS) (75 Fed. Reg. 22276). The Puget Sound/Georgia Basin DPS of yelloweye rockfish was listed as “threatened” under the ESA on April 28, 2010 (75 FR 22276). The DPSs include all yelloweye rockfish found in waters of Puget Sound, the Strait of Georgia, and the Strait of Juan de Fuca east of Victoria Sill. Critical habitat was designated for all species of listed rockfish in 2014 under section 4(a)(3)(A) of the ESA (79 FR 68041, November 13, 2014).

Diversity New collection and analysis of PS/GB yelloweye rockfish tissue samples reveal significant genetic differentiation between the inland (DPS) and coastal samples. These new data are consistent with and further support the existence of a population of Puget Sound/Georgia Basin yelloweye rockfish that is discrete from coastal populations (Ford 2015; Tonnes et al. 2016). In addition, yelloweye rockfish from Hood Canal were genetically differentiated from other Puget Sound/Georgia Basin, indicating a previously unknown degree of population differentiation within the DPS (Ford 2015; Tonnes et al. 2016). Other genetic analysis has found that yelloweye rockfish in the Georgia Basin had the lowest molecular genetic diversity of a collection of samples along the coast (Siegle et al. 2013). Although the adaptive significance of such microsatellite diversity is unclear, it may suggest low effective population size, increased drift, and thus lower genetic diversity in the Puget Sound/Georgia Basin DPS.

Abundance Yelloweye rockfish within the Puget Sound/Georgia Basin (in U.S. waters) are very likely the most abundant within the San Juan Basin of the DPS. Yelloweye rockfish spatial structure and connectivity is threatened by the apparent reduction of fish within each of the basins of the DPS. This reduction is probably most acute within the basins of Puget Sound proper. The severe reduction of fish in these basins may eventually result in a contraction of the DPS’ range. Recent research has found evidence for two populations of yelloweye rockfish within the DPS—one in Hood Canal and one within the rest of the Puget Sound/Georgia Basin.

In Puget Sound, catches of PS/GB yelloweye rockfish have declined as a proportion of the overall rockfish catch (Figure 2 and Figure 3, from Drake et al. 2010). Analysis of SCUBA surveys, recreational catch, and WDFW trawl surveys indicated total rockfish populations in the Puget Sound region are estimated to have declined between 3.1 and 3.8 percent per year for the

past several decades, which corresponds to a 69 to 76 percent decline from 1977 to 2014 (Tonnes et al. 2016)

Productivity Life history traits of yelloweye rockfish and PS/GB bocaccio suggest generally low levels of inherent productivity because they are long-lived, mature slowly, and have sporadic episodes of successful reproduction (Musick 1999; Tolimieri and Levin 2005). Yelloweye rockfish productivity may also be impacted by an Allee effect. This situation arises when reproductive adults are removed from the population and remaining individuals are eventually unable to encounter mates. This process then further reduces population density and can lead to extinction. Adult PS/GB yelloweye rockfish typically occupy relatively small ranges (Love et al. 2002), and the extent to which they may move to find suitable mates is unknown. However, there is insufficient information to determine that this is currently occurring for yelloweye rockfish and further research is needed (Hutchings and Reynolds 2004).

Status of Southern Resident Killer Whales (SRKWs)

The SRKW DPS, composed of J, K, and L pods, was listed as endangered under the ESA on November 18, 2005 (70 FR 69903). A 5-year review under the ESA completed in 2016 concluded that SRKWs should remain listed as endangered and includes recent information on the population, threats, and new research results and publications (NMFS 2016b). NMFS considers SRKWs to be currently among eight of the most at-risk species as part of the Species in the Spotlight initiative⁸ because of their endangered status, declining population trend, and they are high priority for recovery based on conflict with human activities and recovery programs in place to address threats. The population has relatively high mortality and low reproduction unlike other resident killer whale populations that have generally been increasing since the 1970s (Carretta et al. 2019).

The limiting factors described in the final recovery plan included reduced prey availability and quality, high levels of contaminants from pollution, and disturbances from vessels and sound (NMFS 2008a). This section summarizes the status of SRKWs throughout their range and summarizes information taken largely from the recovery plan (NMFS 2008a), most recent 5-year review (NMFS 2016b), the PFMC SRKW Ad Hoc Workgroup's report (PFMC 2020a), as well as newly available data.

Abundance, Productivity, and Trends

Killer whales—including SRKWs—are a long-lived species and sexual maturity can occur at age 10 (review in NMFS (2008a)). Females produce a small number of surviving calves ($n < 10$, but generally fewer) over the course of their reproductive life span (Bain 1990; Olesiuk et al. 1990). Compared to Northern Resident killer whales (NRKW), which are a resident killer whale population with a sympatric geographic distribution ranging from coastal waters of Washington State and British Columbia north to Southeast Alaska, SRKW females appear to have reduced fecundity (Ward et al. 2013; Vélez-Espino et al. 2014), and all age classes of SRKW have

⁸ <https://www.fisheries.noaa.gov/resource/document/species-spotlight-priority-actions-2016-2020-southern-resident-killer-whale>

reduced survival compared to other fish-eating populations of killer whales in the Northeast Pacific (Ward et al. 2013).

Since the early 1970s, annual summer censuses in the Salish Sea using photo-identification techniques have occurred (Bigg et al. 1990; Center for Whale Research 2019). The population of SRKW was at its lowest known abundance in the early 1970s following live-captures for aquaria display ($n = 68$). The highest recorded abundance since the 1970s was in 1995 (98 animals), though the population declined from 1995-2001 (from 98 whales in 1995 to 81 whales in 2001). The population experienced a growth between 2001 and 2006 and have been generally declining since then. However, in 2014 and 2015, the SRKW population increased from 78 to 81 as a result of multiple successful pregnancies ($n = 9$) that occurred in 2013 and 2014. At present, the SRKW population has declined to near historically low levels (Figure 2). As of April 2020, the population is 72 whales (one whale is missing and presumed dead since the 2019 summer census), including 22 whales in J pod, 17 whales in K pod, and 33 whales in L pod. Two new calves were born to J pod in September 2020. The previously published historical estimated abundance of SRKW is 140 animals (NMFS 2008a). This estimate (~ 140) was generated as the number of whales killed or removed for public display in the 1960s and 1970s (summed over all years) added to the remaining population at the time the captures ended.



Figure 2. Population size and trend of Southern Resident killer whales, 1960-2019. Data from 1960-1973 (open circles, gray line) are number projections from the matrix model of Olesiuk et al. (1990). Data from 1974-2019 (diamonds, black line) were obtained through photo-identification surveys of the three pods (J, K, and L) in this community and were provided by the Center for Whale Research (unpublished data) and NMFS (2008a). Data for these years represent the number of whales present at the end of each calendar year.

Based on an updated pedigree from new genetic data, many of the offspring in recent years were sired by two fathers, meaning that less than 30 individuals make up the effective reproducing portion of the population. Because a small number of males were identified as the fathers of many offspring, a smaller number may be sufficient to support population growth than was previously thought (Ford et al. 2011; Ford et al. 2018). However, the consequence of this means inbreeding may be common amongst this small population, with a recent study by Ford et al. (2018) finding several offspring resulting from matings between parents and their own offspring. The fitness effects of this inbreeding remain unclear and are an effort of ongoing research (Ford et al. 2018).

Seasonal mortality rates among Southern and Northern Resident whales may be highest during the winter and early spring, based on the numbers of animals missing from pods returning to inland waters each spring and standings data. Olesiuk et al. (2005) identified high neonate mortality that occurred outside of the summer season, and multiple new calves have been documented in winter months that have not survived the following summer season (CWR unpublished data). Stranding rates are higher in winter and spring for all killer whale forms in Washington and Oregon (Norman et al. 2004).

The NWFSC continues to evaluate changes in fecundity and mortality rates, and has updated the population viability analyses conducted for the 2004 Status Review for SRKWs and the 2011 science panel review of the effects of salmon fisheries (Krahn et al. 2004; Hilborn et al. 2012; Ward et al. 2013). According to the updated analysis, the model results now suggests a downward trend in population size projected over the next 50 years. As the model projects out over a longer time frame (50 years) there is increased uncertainty around the estimates. The downward trend is in part due to the changing age and sex structure of the population. If the population of SRKW experiences demographic rates (e.g. fecundity and mortality) that are more similar to 2016 than the recent 5-year average (2011-2016), the population will decline faster as shown in Figure 3 (NMFS 2016b). There are several demographic factors of the SRKW population that are cause for concern, namely (1) reduced fecundity, (2) a skewed sex ratio toward male births in recent years, (3) a lack of calf production from certain components of the population (e.g. K pod), (4) a small number of adult males acting as sires (Ford et al. 2018) and (5) an overall small number of individuals in the population (review in NMFS 2016b).

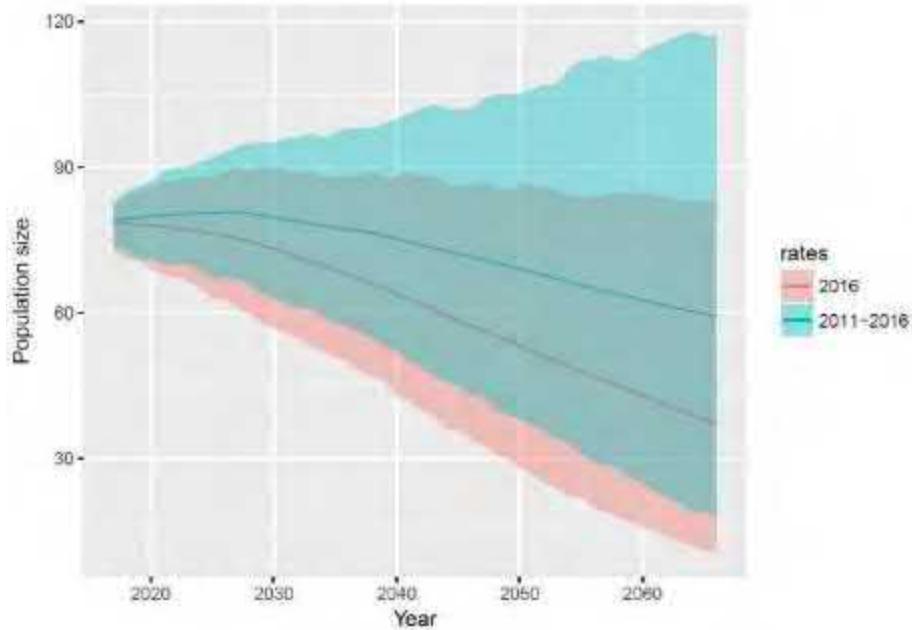


Figure 3. Southern Resident killer whale population size projections from 2016 to 2066 using two scenarios: (1) projections using demographic rates held at 2016 levels, and (2) projections using demographic rates from 2011 to 2016. The pink line represents the projection assuming future rates are similar to those in 2016, whereas the blue represents the scenario with future rates being similar to 2011 to 2016 (Figure 2, NMFS (2016b)).

Because of the whales' small population size, the population is also susceptible to increased risks of demographic stochasticity—randomness in the pattern of births and deaths among individuals in a population. Several sources of demographic variance (e.g. differences between individuals or within individuals) can affect small populations and contribute to variance in a population's growth and increased extinction risk. Sources of demographic variance can include environmental stochasticity, or fluctuations in the environment that drive changes in birth and death rates, and demographic heterogeneity, or variation in birth or death rates of individuals because of differences in their individual fitness (including sexual determinations). In combination, these and other sources of random variation combine to amplify the probability of extinction, known as the extinction vortex (Gilpin and Soulé 1986; Fagan and Holmes 2006; Melbourne and Hastings 2008). The larger the population size, the greater the buffer against stochastic events and genetic risks.

Population-wide distribution of lifetime reproductive success can be highly variable, such that some individuals produce more offspring than others to subsequent generations, and male variance in reproductive success can be greater than that of females (e.g. Clutton-Brock 1998; Hochachka 2006). For long-lived vertebrates such as killer whales, some females in the population might contribute less than the number of offspring required to maintain a constant population size ($n = 2$), while others might produce more offspring. The smaller the population, the more weight an individual's reproductive success has on the population's growth or decline (Coulson et al. 2006). For example, from 2010 through July 2019, only 15 of the 28 reproductive aged females successfully reproduced, resulting in 16 calves. There were an additional 10

documented non-viable calves, and likely more undocumented, born during this period (CWR unpubl. data). A recent study indicated pregnancy hormones (progesterone and testosterone) can be detected in SRKW feces and have indicated several miscarriages, particularly in late pregnancy (Wasser et al. 2017). The fecal hormone data have shown that up to 69 percent of the detected pregnancies do not produce a documented calf (Wasser et al. 2017). Recent aerial imagery corroborates this high rate of loss (Fearnbach and Durban unpubl. data). The congruence between the rate of loss estimates from fecal hormones and aerial photogrammetry suggests the majority of the loss is in the latter half of pregnancy when photogrammetry can detect anomalous shape after several months of gestation (Durban et al. 2017).

Geographic Range and Distribution

SRKWs occur throughout the coastal waters off Washington, Oregon, and Vancouver Island and are known to travel as far south as central California and as far north as Southeast Alaska (NMFS 2008a; Carretta et al. 2019; Ford et al. 2017) (Figure 4). SRKW are highly mobile and can travel up to approximately 86 miles (160 km) in a single day (Erickson 1978; Baird 2000), with seasonal movements likely tied to the migration of their primary prey, salmon. During the spring, summer, and fall months, SRKWs have typically spent a substantial amount of time in the inland waterways of the Strait of Georgia, Strait of Juan de Fuca, and Puget Sound (Bigg 1982; Ford et al. 2000; Krahn et al. 2002; Hauser et al. 2007). During fall and early winter, SRKWs, and J pod in particular, expand their routine movements into Puget Sound, likely to take advantage of chum, coho, and Chinook salmon runs (Osborne 1999; Hanson et al. 2010; Ford et al. 2016). Although seasonal movements are somewhat predictable, there can be large inter-annual variability in arrival time and days present in inland waters from spring through fall, with late arrivals and fewer days present in recent years (Hanson and Emmons 2010; The Whale Museum unpubl. data).

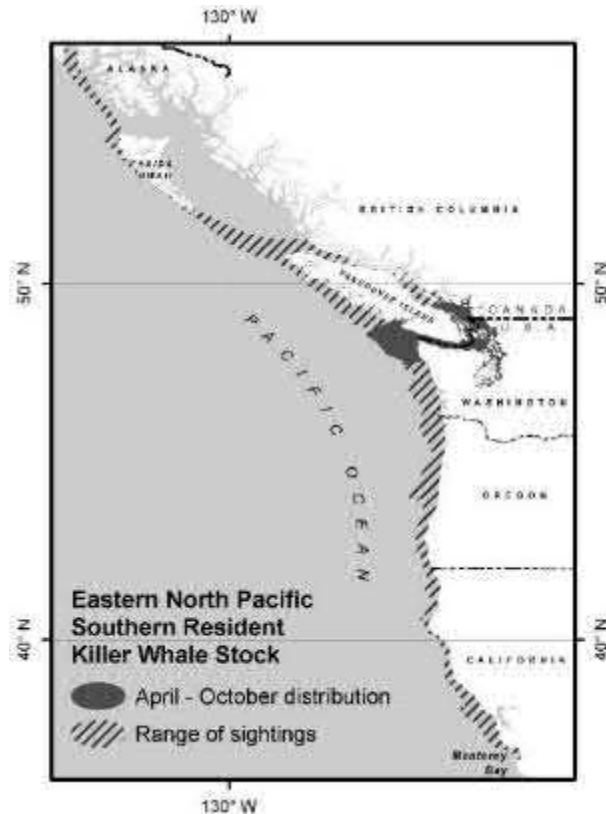


Figure 4. Approximate April–October distribution of Southern Resident killer whales (shaded area) and range of sightings (diagonal lines) (reprinted from Carretta et al. (2019)).

Land- and vessel-based opportunistic and survey-based visual sightings, satellite tracking, and passive acoustic research conducted have provided an updated estimate of the whales’ coastal range that extends from the Monterey Bay area in California, north to Chatham Strait in southeast Alaska. Since 1975, confirmed and unconfirmed opportunistic SRKW sightings from the general public or researchers have been collected off British Columbia, Washington, Oregon, and California. Because of the limitations of not having controlled and dedicated sampling efforts, these confirmed opportunistic sightings have provided only general information on the whales’ potential geographic range during this period of time (*i.e.*, there are no data to describe the whales’ general geographic range prior to 1975). Together, these SRKW sightings have confirmed their presence as far north as Chatham Strait, southeast Alaska and as far south as Monterey Bay, California (NMFS 2019b).

As part of a collaborative effort between NWFSC, Cascadia Research Collective and the University of Alaska, satellite-linked tags were deployed on eight male SRKW (three tags on J pod members, two on K pod, and three on L pod) from 2012 to 2016 in Puget Sound or in the coastal waters of Washington and Oregon (Table 11). The tags transmitted multiple locations per day to assess winter movements and occurrences of SRKW (Hanson et al. 2017).

Over the course of the study, the satellite tagging resulted in data range of duration days, from 3 days to 96 days depending on the tag, of monitoring with deployment durations from late

December to mid-May (Table 11). The winter locations of the tagged whales included inland and coastal waters. The inland waters range occurs across the entire Salish Sea, from the northern end of the Strait of Georgia and Puget Sound, and coastal waters from central west coast of Vancouver Island, British Columbia to northern California (Hanson et al. 2017). J pod had high use areas (defined as 1 to 3 standard deviations) in the northern Strait of Georgia and the west entrance to the Strait of Juan de Fuca where they spent approximately 30 percent of their time there (Figure 5). K/L pods occurred almost exclusively on the continental shelf during December to mid-May, primarily on the Washington coast, with a continuous high use area between Grays Harbor and the Columbia River and off Westport and spending approximately 53 percent of their time there (Figure 6) (Hanson et al. 2017, 2018). The tagging data provide general information on the home range and overlap of each pod from 2012 to 2016.

Satellite tagging can also provide details on preferred depths and distances from shore. Approximately 95 percent of the SRKW locations were within 34 km of the shore and 50 percent of these were within 10 km of the coast (Hanson et al. 2017). Only 5 percent of locations were greater than 34 km away from the coast, but no locations exceeded 75 km. Most locations were in waters less than 100m in depth.

Table 11. Satellite-linked tags deployed on Southern resident killer whales 2012-2016. (Hanson et al. 2018). This was part of a collaborative effort between NWFSC, Cascadia Research Collective, and the University of Alaska.

Whale ID	Pod association	Date of tagging	Duration of signal contact (days)
J26	J	20 Feb. 2012	3
L87	J	26 Dec. 2013	31
J27	J	28 Dec. 2014	49
K25	K	29 Dec. 2012	96
L88	L	8 Mar. 2013	8
L84	L	17 Feb. 2015	93
K33	K	31 Dec. 2015	48
L95	L	23 Feb. 2016	3

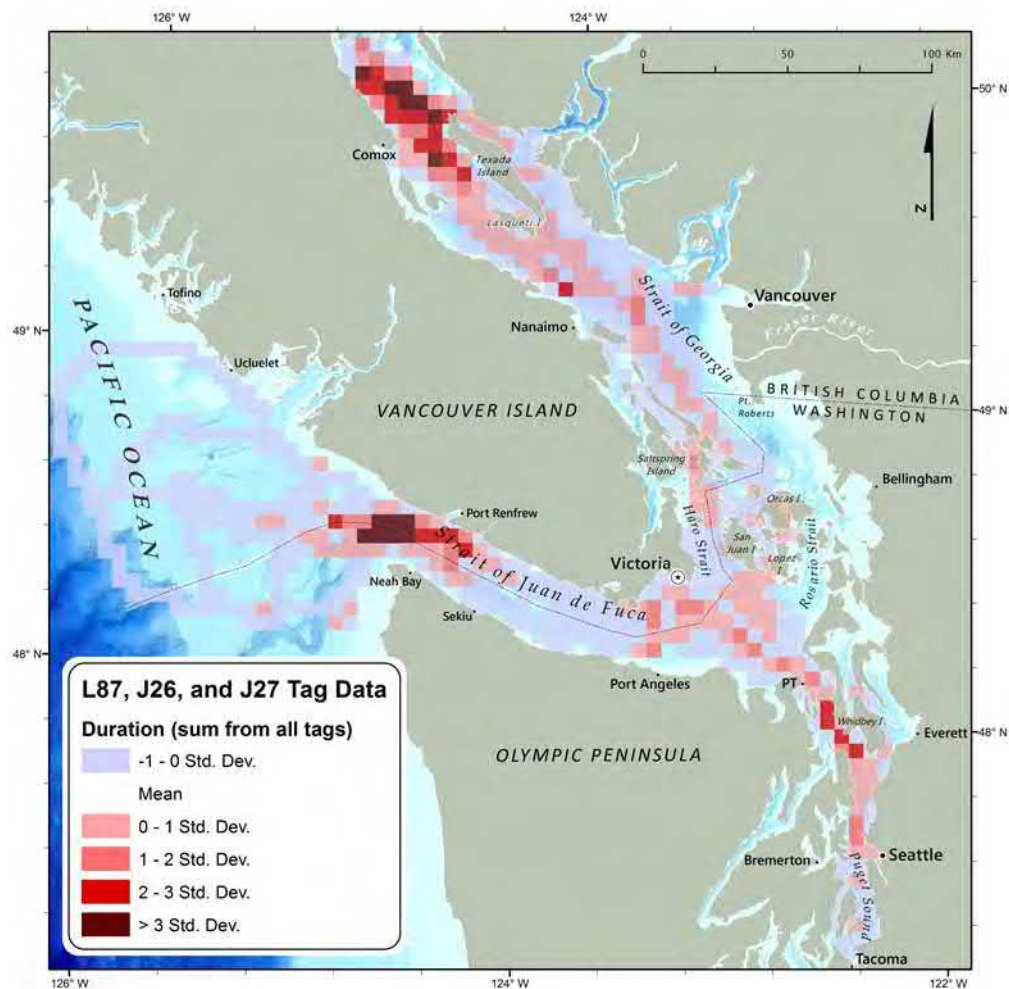


Figure 5. Duration of occurrence model output for J pod tag deployments (Hanson et al. 2017). “High use areas” are illustrated by the 0 to > 3 standard deviation pixels.

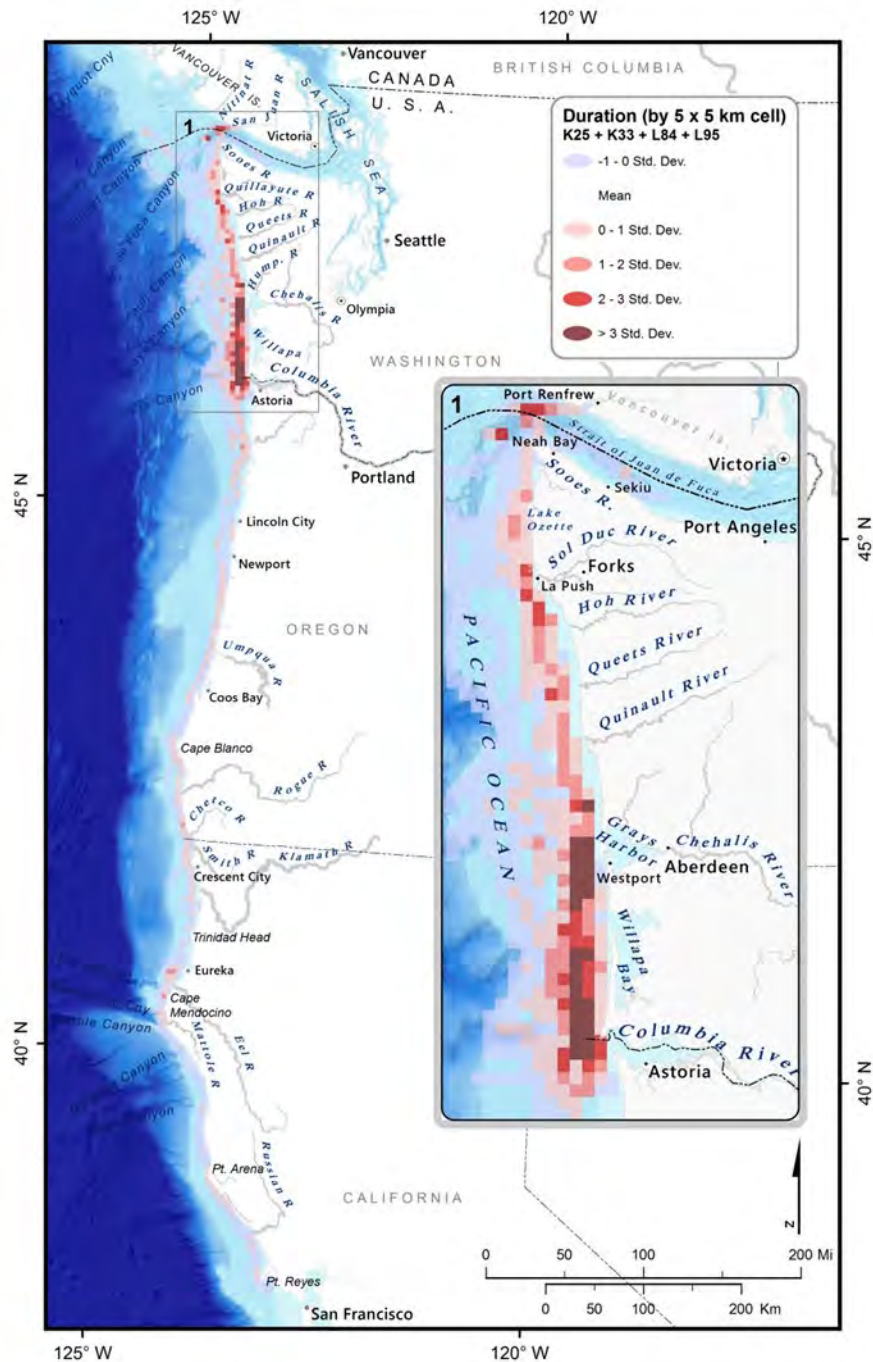


Figure 6. Duration of occurrence model for all unique K and L pod tag deployments (Hanson et al. 2017). “High use areas” are illustrated by the 0 to > 3 standard deviation pixels.

Passive acoustic recorders were deployed off the coasts of California, Oregon and Washington in most years since 2006 to assess their seasonal uses of these areas via the recording of stereotypic calls of the SRKW (Hanson et al. 2013; Emmons et al. 2019). Passive aquatic listeners (PALs) were originally deployed from 2006–2008. Since 2008, four to seventeen Ecological Acoustic

Recorders (EARs) have been deployed. From 2006–2011, passive acoustic listeners and recorders were deployed in areas thought to be of frequent use by SRKW based on previous sightings, where enhanced productivity was expected to be concentrated, and in areas with a reduced likelihood of fisheries interactions (Figure 7; Hanson et al. (2013)). The number of recorder sites off the Washington coast increased from 7 to 17 in the fall of 2014 and locations were selected based on “high use areas” identified in the duration of an occurrence model (Figure 8), and sites within the U.S. Navy’s Northwest Training Range Complex (NWTRC) in order to determine if SRKW used these areas in other seasons when satellite-linked tags were not deployed (Hanson et al. 2017; Emmons et al. 2019). “High use areas” for the SRKW in winter were determined to be primarily located in three areas: (1) the Washington coast, particularly between Grays Harbor and the mouth of the Columbia River (primarily for K/L pods); (2) the west entrance to the Strait of Juan de Fuca (primarily for J pod); and (3) the northern Strait of Georgia (primarily for J pod). It is important to note that recorders deployed within the NWTRC were designed to assess spatial use off Washington coast and thus the effort was higher in this area (i.e., the number of recorders increased in this area) compared to off Oregon and California.

There were acoustic detections off Washington coast in all months of the year (Figure 9), with greater than 2.4 detections per month from January through June and a peak of 4.7 detections per month in both March and April, indicating that the SRKW may be present in Washington coastal waters at nearly any time of year, and in other coastal waters more often than previously believed (Hanson et al. 2017). Acoustic recorders were deployed off Newport, Fort Bragg, and Port Reyes between 2008 through 2013 and SRKW were detected 28 times (Emmons et al. 2019).

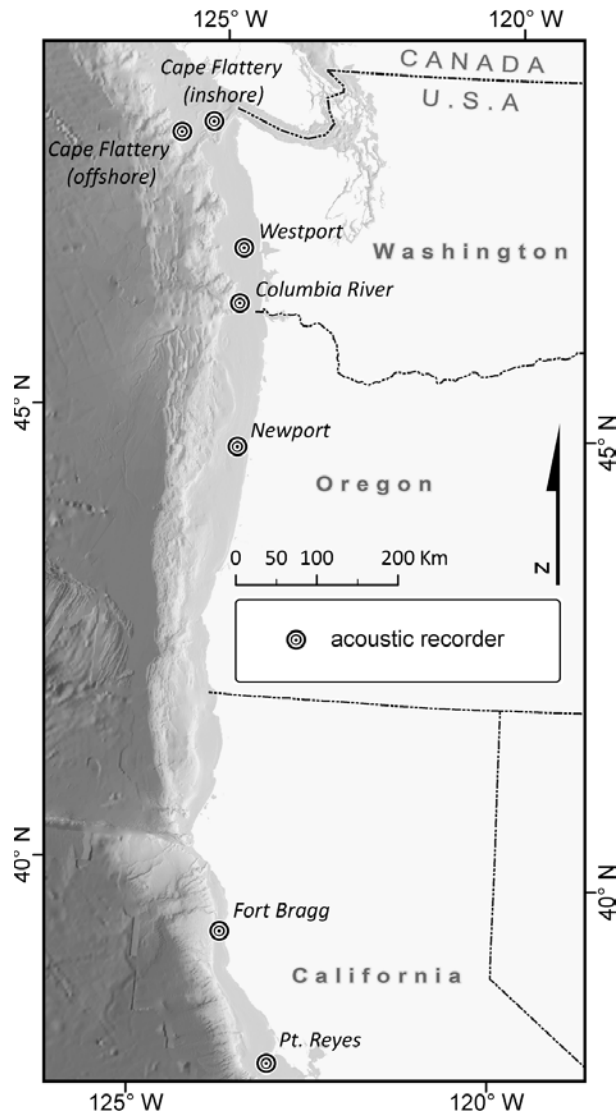


Figure 7. Deployment locations of acoustic recorders on the U.S. west coast from 2006 to 2011 (Hanson et al. 2013).

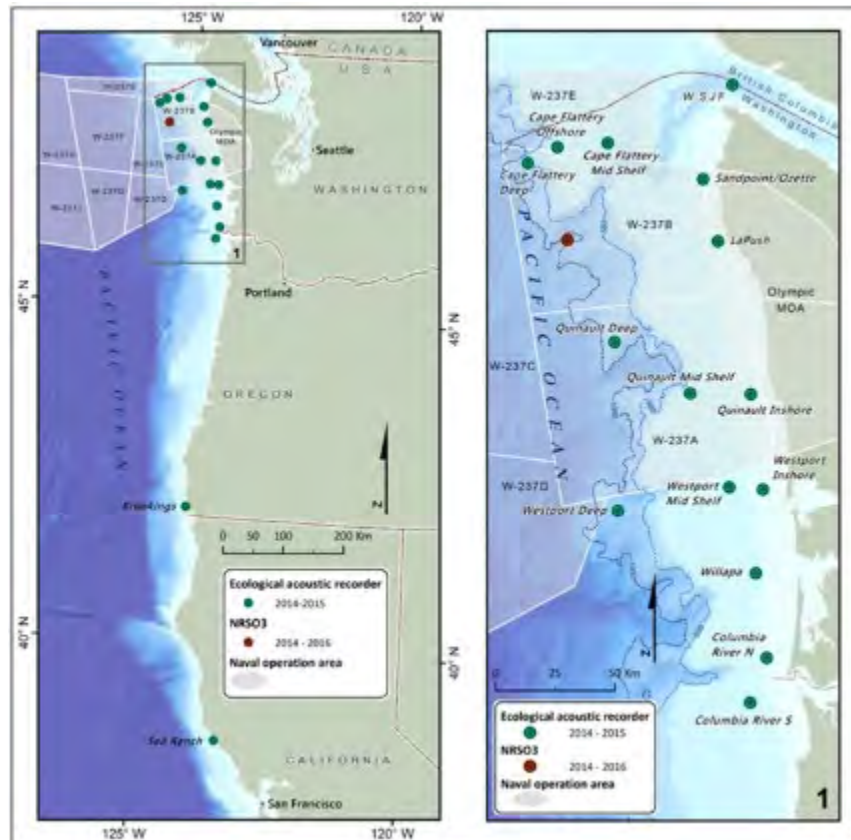


Figure 8. Locations of passive acoustic recorders deployed beginning in the fall of 2014 (Hanson et al. 2017).

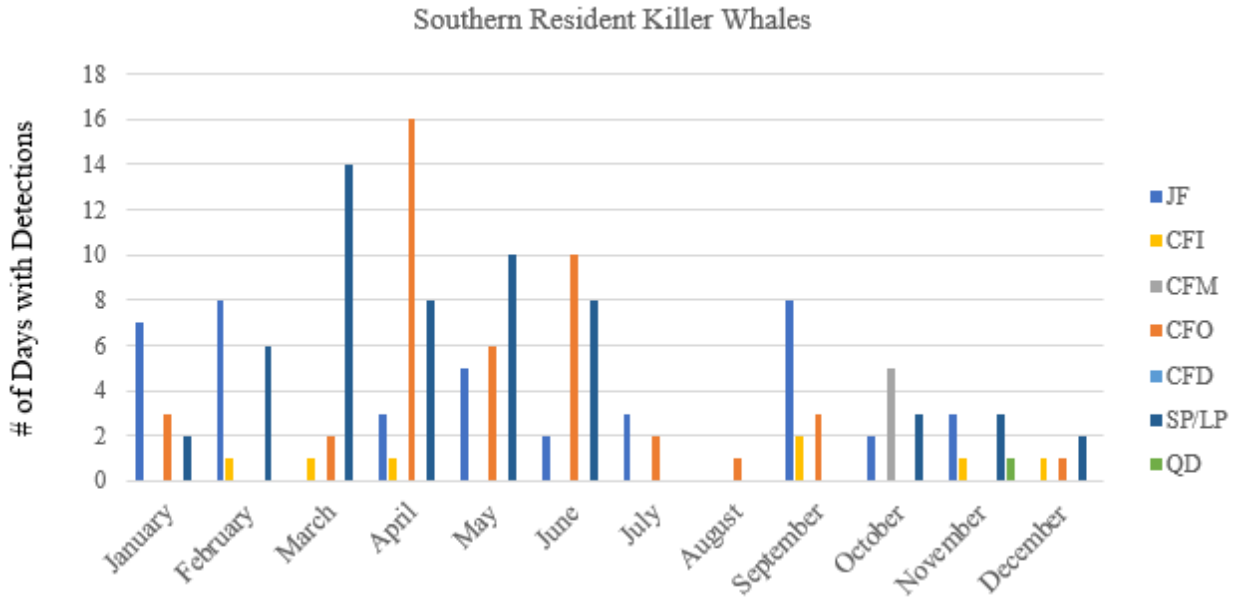


Figure 9. Counts of detections at each northern recorder site by month from 2014-2017 (Emmons et al. 2019). Areas include Juan de Fuca (JF); Cape Flattery Inshore (CFI); Cape Flattery Mid Shelf (CFM); Cape Flattery Offshelf (CFO); Cape Flattery Deep (CFD); Sand Point and La Push (SP/LP); and Quinault Deep (QD).

In a recent study, researchers collected data using an autonomous acoustic recorder deployed at Swiftsure Bank from August 2009 to July 2011 to assess how this area is used by Northern Resident and Southern Residents as shown in Figure 10 (Riera et al. 2019). SRKW were detected on 163 days with 175 encounters (see Figure 11 for number of days of acoustic detections for each month). All three pods were detected at least once per month except for J pod in January and November and L pod in March. K and L pods were heard more often (87 percent of calls and 89 percent of calls, respectively), between May and September. J pod was heard most often during winter and spring (76 percent of calls during December and February through May; Riera et al. 2019). K pod had the longest encounters in June, with 87 percent of encounters longer than 2 hours occurring between June and September. L pod had the longest encounters in May, with 79 percent of encounters longer than two hours occurring during the summer (May through September). The longest J pod encounters were during winter, with 72 percent of encounters longer than 2 hours occurring between December and May (Riera et al. 2019).

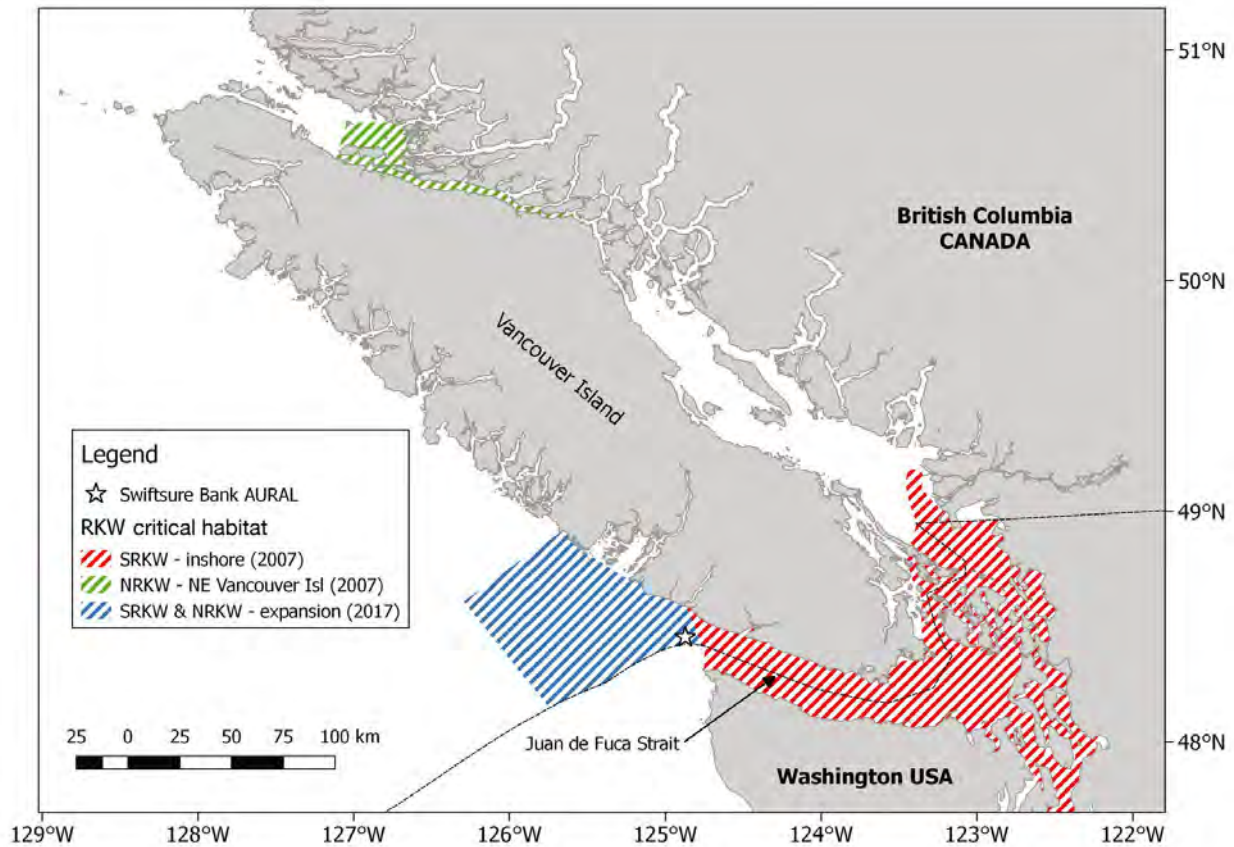


Figure 10. Swiftsure Bank study site off the coast of British Columbia, Canada in relation to the 2007 Northern Resident critical habitat (NE Vancouver Island) and 2007 Southern Resident killer whale critical habitat (inshore waters) and the 2017 Northern Resident and Southern Resident expansion of critical habitat (Riera et al. 2019).

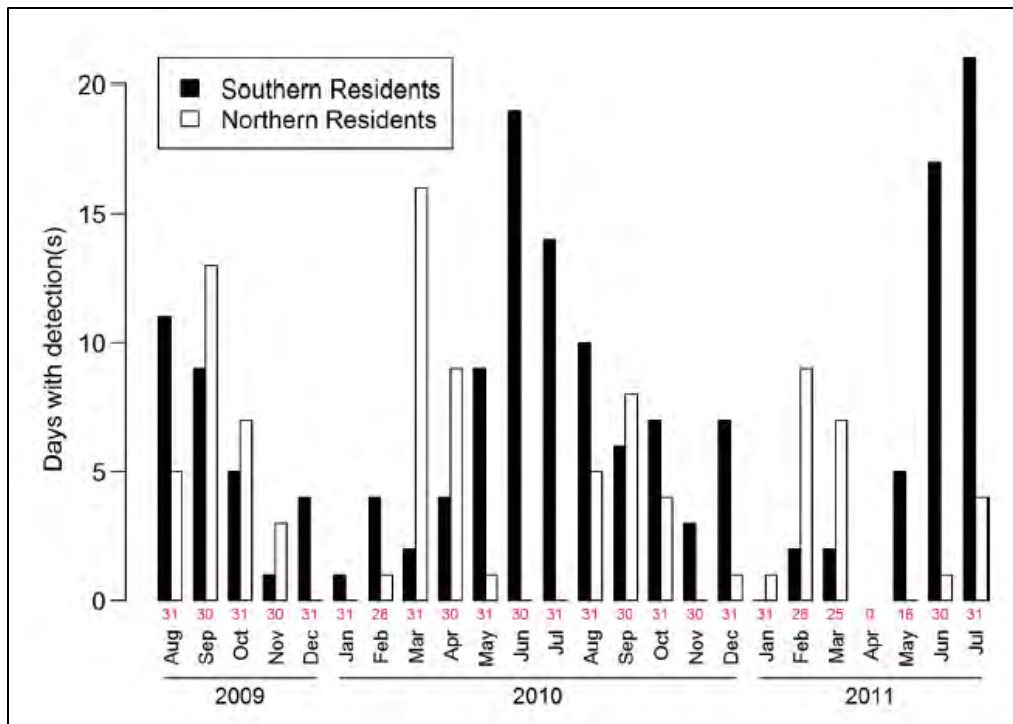


Figure 11. Number of days with acoustic detections of SRKWs at Swiftsure Bank from August 2009–July 2011. Red numbers indicate days of effort. (Riera et al. 2019).

Limiting Factors and Threats

Several factors identified in the recovery plan for SRKW may be limiting recovery. The recovery plan identified three major threats including (1) the quantity and quality of prey, (2) toxic chemicals that accumulate in top predators, and (3) impacts from sound and vessels. Oil spills and disease as well as the small population size are also risk factors. It is likely that multiple threats are acting together to impact SRKWs. Modeling exercises have attempted to identify which threats are most significant to survival and recovery (e.g. Lacy et al. 2017) and available data suggest that all of the threats are potential limiting factors (NMFS 2008a).

Quantity and Quality of Prey

SRKWs have been documented to consume a variety of fish species (22 species) and one species of squid (Ford et al. 1998; Ford et al. 2000; Ford and Ellis 2006; Hanson et al. 2010; Ford et al. 2016), but salmon are identified as their primary prey. SRKWs are the subject of ongoing research, the majority of which has occurred in inland waters of Washington State and British Columbia, Canada during summer months and includes direct observation, scale and tissue sampling of prey remains, and fecal sampling. The diet data suggest that SRKWs are consuming mostly larger (i.e., generally age 3 and up) Chinook salmon (Ford and Ellis 2006). Chinook salmon is their primary prey despite the much lower abundance in comparison to other salmonids in some areas and during certain time periods (Ford and Ellis 2006). Factors of potential importance include the species' large size, high fat and energy content, and year-round

occurrence in the SRKW's geographic range. Chinook salmon have the highest value of total energy content compared to other salmonids because of their larger body size and higher energy density (kilocalorie/kilogram (kcal/kg)) (O'Neill et al. 2014). For example, in order for a SRKW to obtain the total energy value of one adult Chinook salmon, they would need to consume approximately 2.7 coho, 3.1 chum, 3.1 sockeye, or 6.4 pink salmon (O'Neill et al. 2014). Research suggests that SRKWs are capable of detecting, localizing, and recognizing Chinook salmon through their ability to distinguish Chinook echo structure as different from other salmon (Au et al. 2010). The degree to which killer whales are able to or willing to switch to non-preferred prey sources (i.e., prey other than Chinook salmon) is also largely unknown, and likely variable depending on the time and location.

Over the last forty years, predation on Chinook salmon off the West Coast of North America by marine mammals has been estimated to have more than doubled (Chasco et al. 2017). In particular, southern Chinook salmon stocks ranging south from the Columbia River have been subject to the largest increases in predation, and Chasco et al. (2017) suggested that SRKWs may be the most disadvantaged compared to other more northern resident killer whale populations given the northern migrations of Chinook salmon stocks in the ocean and this competition may be limiting the growth of the SRKW population.

May–September

Scale and tissue sampling from May to September in inland waters of Washington and British Columbia, Canada indicate that the SRKW's diet consists of a high percentage of Chinook salmon (monthly proportions as high as >90 percent) (Hanson et al. 2010; Ford et al. 2016). Genetic analysis of the Hanson et al. (2010) samples from 2006–2010 indicate that when SRKW are in inland waters from May to September, they primarily consume Chinook stocks that originate from the Fraser River (80–90 percent of the diet in the Strait of Juan de Fuca and San Juan Islands; including Upper Fraser, Mid Fraser, Lower Fraser, North Thompson, South Thompson and Lower Thompson), and to a lesser extent consume stocks from Puget Sound (North and South Puget Sound) and Central British Columbia Coast and West and East Vancouver Island. This is not unexpected as all of these stocks are returning to streams proximal to these inland waters during this timeframe. Few diet samples have been collected in summer months outside of the Salish Sea.

DNA quantification methods are also used to estimate the proportion of different prey species in the diet from fecal samples (Deagle et al. 2005). Recently, Ford et al. (2016) confirmed the importance of Chinook salmon to SRKWs in the early to mid-summer months (May–August) using DNA sequencing from SRKW feces collected in inland waters of Washington and British Columbia. Salmon and steelhead made up greater than 98 percent of the inferred diet, of which almost 80 percent were Chinook salmon. Coho salmon and steelhead are also found in the diet in inland waters of Washington and British Columbia in spring and fall months when Chinook salmon are less abundant. Specifically, coho salmon contribute to over 40 percent of the diet in September in inland waters, which is evidence of prey shifting at the end of summer towards coho salmon (Ford et al. 1998; Ford and Ellis 2006; Hanson et al. 2010; Ford et al. 2016). Less than 3 percent each of chum salmon, sockeye salmon, and steelhead were observed in fecal DNA samples collected in the summer months (May through September) in inland waters.

October–December

Prey remains and fecal samples collected in U.S. inland waters during October through December indicate Chinook and chum salmon are primary contributors of the whale's diet during this time (NWFSC unpublished data). Diet data for the Strait of Georgia and coastal waters is limited.

January–April

Observations of SRKWs overlapping with salmon runs (Wiles 2004; Zamon et al. 2007) and collection of prey and fecal samples have also occurred in coastal waters in the winter and spring months. Although fewer predation events have been observed and fewer fecal samples collected in coastal waters, recent data indicate that salmon, and Chinook salmon in particular, remains an important dietary component when the SRKWs occur in outer coastal waters during these timeframes. Prior to 2013, only three prey samples for SRKW on the U.S. outer coast had been collected (Hanson et al. in prep). From 2013 to 2016, satellite tags were used to locate and follow the whales to obtain predation and fecal samples. A total of 55 samples were collected from northern California to northern Washington (Figure 12). Results of the 55 available prey samples indicate that, as is the case in inland waters, Chinook are the primary species detected in diet samples on the outer coast, although steelhead, chum, lingcod, and halibut were also detected in samples. Despite J pod utilizing much of the Salish Sea—including the Strait of Georgia—in winter months (Hanson et al. 2018), few diet samples have been collected in this region in winter.

The occurrence of K and L pods off the Columbia River in March suggests the importance of Columbia River spring runs of Chinook salmon in their diet (Hanson et al. 2013). Chinook genetic stock identification from samples collected in winter and spring in coastal waters from California through Washington included 12 U.S. west coast stocks, and showed that over half the Chinook salmon consumed originated in the Columbia River (Hanson et al. in prep). Columbia River, Central Valley, Puget Sound, and Fraser River Chinook salmon collectively comprised over 90 percent of the 55 diet samples collected for SRKW's in coastal areas.

As noted, most of the Chinook prey samples opportunistically collected in coastal waters were determined to have originated from the Columbia River basin, including Lower Columbia Spring, Middle Columbia Tule, and Upper Columbia Summer/Fall. In general, we would expect to find these stocks given the diet sample locations (Figure 12). However, the Chinook stocks included fish from as far north as the Taku River (Alaska and British Columbia stocks) and as far south as the Central Valley California.

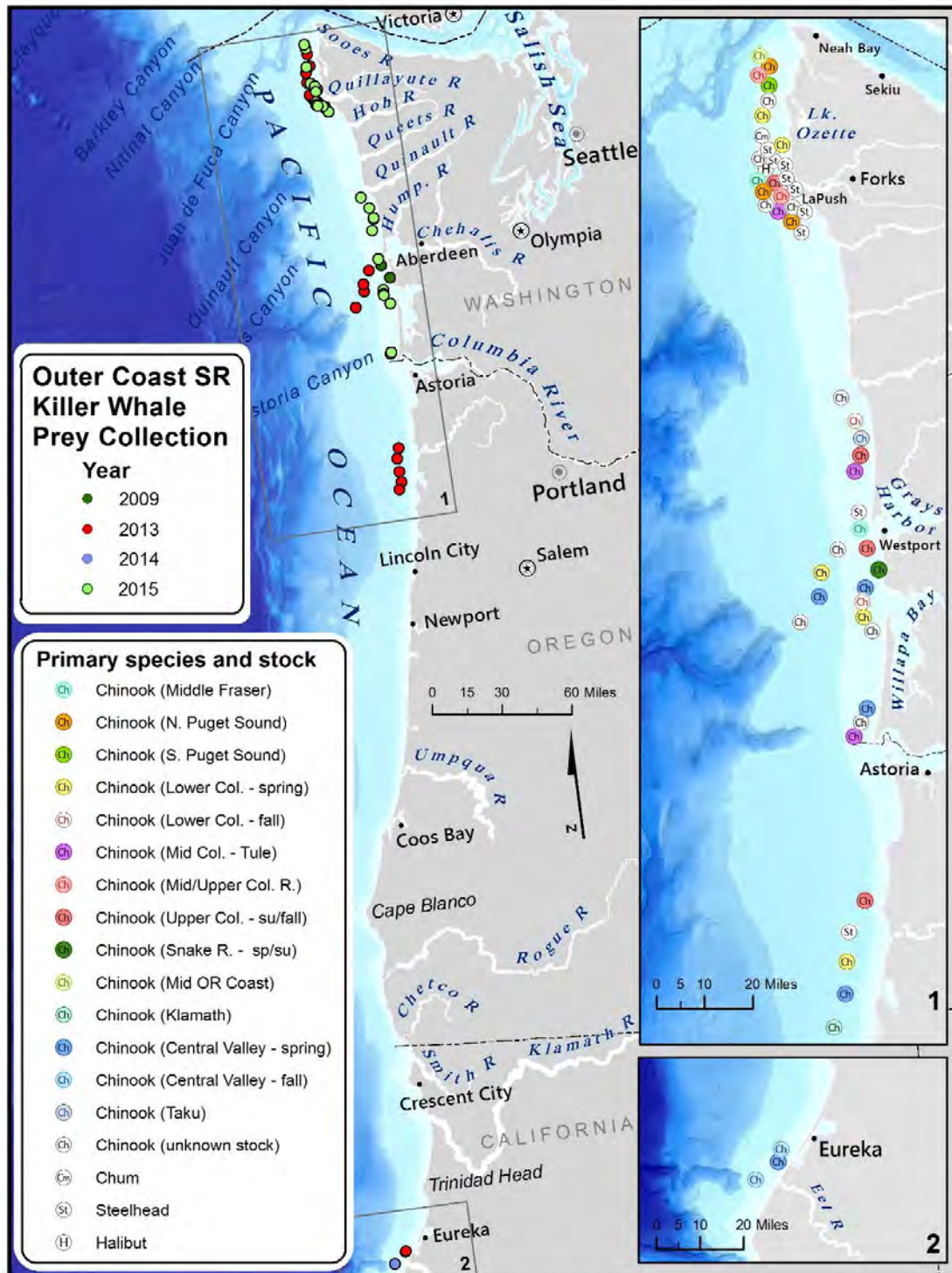


Figure 12. Location and species for scale/tissue samples collected from Southern Resident killer whale predation events in outer coastal waters (NMFS 2019b).

In an effort to prioritize recovery efforts such as habitat restoration and help inform efforts to use fish hatcheries to increase the whales' prey base, NMFS and WDFW developed a report

identifying Chinook salmon stocks thought to be of high importance to SRKW along the West Coast (NOAA and WDFW 2018).⁹ Scientists and managers from the U.S. and Canada reviewed the model at a workshop sponsored by the National Fish and Wildlife Foundation (NFWF), where the focus was on assisting NFWF in prioritizing funding for salmon related projects. The priority stock report was created using observations of Chinook salmon stocks found in scat and prey scale/tissue samples, and by estimating the spatial and temporal overlap with Chinook salmon stocks ranging from Southeast Alaska (SEAK) to California (CA). Puget Sound Chinook salmon are considered a top priority prey stock.

Hatchery production is a significant component of the salmon prey base returning to watersheds within the range of SRKWs (Barnett-Johnson et al. 2007; NMFS 2008a). The release of hatchery fish has not been identified as a threat to the survival or persistence of SRKWs and there is no evidence to suggest the whales prefer wild salmon over hatchery salmon. Increased Chinook abundance, including hatchery fish, benefit this endangered population of whales by enhancing prey availability to SRKWs and hatchery fish often contribute significantly to the salmon stocks consumed (Hanson et al. 2010, Hanson et al. in prep). Currently, hatchery fish play a mitigation role of helping sustain Chinook salmon numbers while other, longer term, recovery actions for natural fish are underway. Although hatchery production has contributed some offset of the historical declines in the abundance of natural-origin salmon within the range of the whales, hatcheries also pose risks to natural-origin salmon populations (Nickelson et al. 1986; Ford 2002; Levin and Williams 2002; Naish et al. 2007). Healthy natural-origin salmon populations are important to the long-term maintenance of prey populations available to Southern Residents because it is uncertain whether a hatchery dominated mix of stocks is sustainable indefinitely and because hatchery fish can differ, relative to natural-origin Chinook salmon, for example, in size and hence caloric value and in availability/migration location and timing.

Nutritional Limitation and Body Condition

When prey is scarce or in low density, SRKWs likely spend more time foraging than when prey is plentiful or in high density. Increased energy expenditure and prey limitation can cause poor body condition and nutritional stress. Nutritional stress is the condition of being unable to acquire adequate energy and nutrients from prey resources and as a chronic condition, can lead to reduced body size of individuals and to lower reproductive or survival rates in a population (Trites and Donnelly 2003). During periods of nutritional stress and poor body condition, cetaceans lose adipose tissue behind the cranium, displaying a condition known as “peanut-head” in extreme cases (Pettis et al. 2004; Bradford et al. 2012; Joblon et al. 2014). Between 1994 and 2008, 13 SRKWs were observed from boats to have a pronounced “peanut-head”; and all but two subsequently died (Durban et al. 2009; Center for Whale Research unpublished data). None of the whales that died were subsequently recovered, and therefore definitive cause of death could not be identified. Both females and males across a range of ages were found in poor body condition.

Since 2008, NOAA’s Southwest Fishery Science Center (SWFSC) have used aerial photogrammetry to assess the body condition and health of SRKWs, initially in collaboration

⁹https://www.westcoast.fisheries.noaa.gov/publications/protected_species/marine_mammals/killer_whales/recovery/srkw_priority_chinook_stocks_conceptual_model_report___list_22june2018.pdf

with the Center for Whale Research and the Vancouver Aquarium. Aerial photogrammetry studies have provided finer resolution for detecting poor condition, even before it manifests in “peanut-head” that is observable from boats. Annual aerial surveys of the population from 2013-2017 (with exception of 2014) have detected declines in condition before the death of seven SRKWs (L52 and J8 as reported in Fearnbach et al. (2018); J14, J2, J28, J54, and J52 as reported in Durban et al. (2017)), including five of the six most recent mortalities (Trites and Rosen 2018). These data have provided evidence of a general decline in SRKW body condition since 2008, and documented members of J pod being in poorer body condition in May compared to September of the previous year (at least in 2016 and 2017) (Trites and Rosen 2018). Other pods could not be reliably photographed in both seasonal periods.

Data collected from three SRKW strandings in recent years have also contributed to our knowledge of the health of the population and the impact of the threats to which they are exposed. Transboundary partnerships have supported thorough necropsies of L112 in 2012, J32 in 2014, and L95 in 2016, which included testing for contaminant load, disease and pathogens, organ condition, and diet composition¹⁰. In fall 2016 another young adult male, J34, was found dead in the northern Georgia Strait (Carretta et al. 2019). The necropsy indicated that the whale died of blunt force trauma to the head and the source of trauma is still under investigation.

Previous scientific review investigating nutritional stress as a cause of poor body condition for SRKWs concluded “Unless a large fraction of the population experienced poor condition in a particular year, and there was ancillary information suggesting a shortage of prey in that same year, malnutrition remains only one of several possible causes of poor condition” (Hilborn et al. 2012). Body condition in whales can be influenced by a number of factors, including prey availability or limitation, increased energy demands, disease, physiological or life history status, and variability over seasons or across years. Body condition data collected to date has documented declines in condition for some animals in some pods and these occurrences have been scattered across demographic and social groups (Fearnbach et al. 2018).

It is possible that poor nutrition could contribute to mortality through a variety of mechanisms. To exhibit how this is possible, we reference studies that have demonstrated the effects of energetic stress (caused by incremental increases in energy expenditures or incremental reductions in available energy) on adult females and juveniles, which have been studied extensively (e.g., adult females: Gamel et al. 2005), Schaefer 1996, Daan et al. 1996, juveniles: Trites and Donnelly 2003). Small, incremental increases in energy demands should have the same effect on an animal’s energy budget as small, incremental reductions in available energy, such as one would expect from reductions in prey. Malnutrition and persistent or chronic stress can induce changes in immune function in mammals and may be associated with increased bacterial and viral infections, and lymphoid depletion (Mongillo et al. 2016; Neale et al. 2005; Maggini et al. 2018). Ford and Ellis (2006) report that SRKWs engage in prey sharing about 76 percent of the time. Prey sharing presumably would distribute more evenly the effects of prey limitation across individuals of the population than would otherwise be the case (i.e., if the most successful foragers did not share with other individuals).

¹⁰ Reports for those necropsies are available at:
http://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/killer_whale/rpi_strandings.html

Toxic Chemicals

Various adverse health effects in humans, laboratory animals, and wildlife have been associated with exposures to persistent pollutants. These pollutants have the ability to cause endocrine disruption, reproductive disruption or failure, immunotoxicity, neurotoxicity, neurobehavioral disruption, and cancer (Reijnders 1986; Subramanian et al. 1987; de Swart et al. 1996; Bonefeld-Jørgensen et al. 2001; Reddy et al. 2001; Schwacke et al. 2002; Darnerud 2003; Legler and Brouwer 2003; Viberg et al. 2003; Ylitalo et al. 2005; Fonnum et al. 2006; Darnerud 2008; Legler 2008). SRKWs are exposed to a mixture of pollutants, some of which may interact synergistically and enhance toxicity, influencing their health, and reproduction. Relatively high levels of these pollutants have been measured in blubber biopsy samples from SRKWs compared to other resident killer whales in the North Pacific (Ross et al. 2000; Krahn et al. 2007; Krahn et al. 2009; Lawson et al. 2020), and more recently, these pollutants were measured in fecal samples collected from SRKWs providing another potential opportunity to evaluate exposure to these pollutants (Lundin et al. 2016a; Lundin et al. 2016b).

Southern Resident killer whales are exposed to persistent pollutants primarily through their diet. For example, Chinook salmon contain higher levels of some persistent pollutants than other salmon species, but only limited information is available for pollutant levels in Chinook salmon (Krahn et al. 2007; O'Neill and West 2009; Veldhoen et al. 2010; Mongillo et al. 2016). These harmful pollutants, through consumption of prey species that contain these pollutants, are stored in the blubber and can later be released; when the pollutants are released, they are redistributed to other tissues when the SRKWs metabolize the blubber, for example, responses to food shortages or reduced acquisition of food energy as one possible stressor. The release of pollutants can also occur during gestation or lactation. Once the pollutants mobilize from the blubber in to circulation, they have the potential to cause a toxic response. Therefore, nutritional stress from reduced Chinook salmon populations may act synergistically with high pollutant levels in SRKWs and result in adverse health effects.

In April 2015, NMFS hosted a 2-day Southern Resident killer whale health workshop to assess the causes of decreased survival and reproduction in the killer whales. Following the workshop, a list of potential action items to better understand what is causing decreased reproduction and increased mortality in this population was generated and then reviewed and prioritized to produce the Priorities Report (NMFS 2015c). The report also provides prioritized opportunities to establish important baseline information on Southern Resident and reference populations to better assess negative impacts of future health risks, as well as positive impacts of mitigation strategies on Southern Resident killer whale health.

Disturbance from Vessels and Sound

Killer whales rely on their highly developed acoustic sensory system for navigating, locating prey, and communicating with other individuals. While in inland waters of Washington and British Columbia, SRKWs are the principal target species for the commercial whale watch industry (Hoyt 2001; O'Connor et al. 2009) and encounter a variety of other vessels in their urban environment (e.g., recreational, fishing, ferries, military, shipping). Several main threats from vessels include direct vessel strikes (which can result in injury or mortality (Gaydos and

Raverty 2007)), the masking of echolocation and communication signals by anthropogenic sound, and behavioral changes (NMFS 2008a). There is a growing body of evidence documenting effects from vessels on small cetaceans and other marine mammals. Research has shown that SRKWs spend more time traveling and performing surface active behaviors and less time foraging in the presence of all vessel types, including kayaks, and that noise from motoring vessels up to 400 meters away has the potential to affect the echolocation abilities of foraging whales (Holt 2008; Lusseau et al. 2009; Noren et al. 2009; Williams et al. 2010). Individual energy balance may be impacted when vessels are present because of the combined increase in energetic costs resulting from changes in whale activity with the decrease in prey consumption resulting from reduced foraging opportunities (Williams et al. 2006; Lusseau et al. 2009; Noren et al. 2009; Noren et al. 2012).

At the time of the SRKW's listing under the ESA, NMFS reviewed existing protections for the whales and developed recovery actions, including vessel regulations, to address the threat of vessels to SRKWs. NMFS concluded it was necessary and advisable to adopt regulations to protect SRKWs from disturbance and sound associated with vessels, to support recovery of SRKWs. Federal vessel regulations were established in 2011 to prohibit vessels from approaching SRKWs within 200 yards (182.9m) and from parking in the path of SRKWs within 400 yards (365.8m). These regulations apply to all vessels in inland waters of Washington State with exemptions to maintain safe navigation and for government vessels in the course of official duties, ships in the shipping lanes, research vessels under permit, and vessels lawfully engaged in commercial or treaty Indian fishing that are actively setting, retrieving, or closely tending fishing gear (76 FR 20870, April, 14, 2011).

In the final rule implementing these regulations, NMFS committed to reviewing the vessel regulations to evaluate effectiveness, and also to study the impact of the regulations on the viability of the local whale watch industry. In December 2017, NMFS completed a technical memorandum evaluating the effectiveness of regulations adopted in 2011 to help protect endangered SRKWs from the impacts of vessel traffic and noise (Ferrara et al. 2017). In the assessment, Ferrara et al. (2017) used five measures: education and outreach efforts, enforcement, vessel compliance, biological effectiveness, and economic impacts. For each measure, the trends and observations in the five years leading up to the regulations (2006-2010) were compared to the trends and observations in the five years following the regulations (2011-2015). The memo finds that some indicators suggested the regulations have benefited SRKWs by reducing impacts without causing economic harm to the commercial whale-watching industry or local communities, whereas some indicators suggested that vessel impacts continue and that some risks may have increased. The authors also find room for improvement in terms of increasing awareness and enforcement of the regulations, which would help improve compliance and further reduce biological impacts to the whales.

In addition to vessels, underwater sound can be generated by a variety of other human activities, such as dredging, drilling, construction, seismic testing, and sonar (Richardson et al. 1995; Gordon and Moscrop. 1996; National Research Council 2003). Impacts from these sources can range from serious injury and mortality to changes in behavior. In other cetaceans, hormonal changes indicative of stress have been recorded in response to intense sound exposure (Romano et al. 2003). Chronic stress is known to induce harmful physiological conditions including

lowered immune function, in terrestrial mammals and likely does so in cetaceans (Gordon and Moscrop. 1996).

Oil Spills

In the Northwest, SRKWs are the most vulnerable marine mammal population to the risks imposed by an oil spill due to their small population size, strong site fidelity to areas with high oil spill risk, large group size, late reproductive maturity, low reproductive rate, and specialized diet, among other attributes (Jarvela-Rosenberger et al. 2017). Oil spills have occurred in the range of SRKWs in the past, and there is potential for spills in the future. Oil can be discharged into the marine environment in any number of ways, including shipping accidents, refineries and associated production facilities, and pipelines. Despite many improvements in spill prevention since the late 1980s, much of the region inhabited by SRKWs remains at risk from serious spills because of the heavy volume of shipping traffic and proximity to petroleum refining centers.

Repeated ingestion of petroleum hydrocarbons by killer whales likely causes adverse effects; however, long-term consequences are poorly understood. In marine mammals, acute exposure to petroleum products can cause changes in behavior and reduced activity, inflammation of the mucous membranes, lung congestion and disease, pneumonia, liver disorders, neurological damage, adrenal toxicity, reduced reproductive rates, and changes in immune function (Schwacke et al. 2013; Venn-Watson et al. 2015; de Guise et al. 2017; Kellar et al. 2017), potentially death and long-term effects on population viability (Matkin et al. 2008; Ziccardi et al. 2015). For example, 122 cetaceans stranded or were reported dead within 5 months following the Deepwater Horizon spill in the Gulf of Mexico (Ziccardi et al. 2015). An additional 785 cetaceans were found stranded from November 2010 to June 2013, which was declared an Unusual Mortality Event (Ziccardi et al. 2015). Previous polycyclic aromatic hydrocarbons (PAH) exposure estimates suggested SRKWs can be occasionally exposed to concerning levels (Lachmuth et al. 2011). More recently, Lundin et al. (2018) measured PAHs in whale fecal samples collected in inland waters of Washington between 2010 and 2013 and found low concentrations of the measured PAHs (<10 parts per billion (ppb), wet weight). However, PAHs were as high as 104 ppb in the first year of their study (2010) compared to the subsequent years. Although it is unclear the cause of this trend, higher levels were observed prior to the 2011 vessel regulations that increased the distance vessels could approach the whales. In addition, oil spills have the potential to adversely impact habitat and prey populations, and, therefore, may adversely affect SRKWs by reducing food availability.

Climate change and other ecosystem effects

Overwhelming data indicate the planet is warming (IPCC 2014), which poses a threat to many species. Climate change has the potential to impact species abundance, geographic distribution, migration patterns, timing of seasonal activities (IPCC 2014), and species viability into the future. Changes in climate and ocean conditions happen on several different time scales and have had a profound influence on distributions and abundances of marine and anadromous fishes.

Climate change is expected to impact anadromous fish during all stages of their complex life cycle. In addition to the direct effects of rising temperatures, indirect effects include alterations

in stream flow patterns in freshwater and changes to food webs in freshwater, estuarine and marine habitats. There is high certainty that predicted physical and chemical changes will occur; however, the ability to predict biological changes to fish or food webs in response to these physical/chemical changes is extremely limited, leading to considerable uncertainty.

Pacific Northwest anadromous fish inhabit as many as three marine ecosystems during their ocean residence period: the Salish Sea, the California Current, and the Gulf of Alaska (Brodeur et al. 1992; Weitkamp and Neely 2002; Morris et al. 2007). The response of these ecosystems to climate change is expected to differ, although there is considerable uncertainty in all predictions. Columbia River and Puget Sound anadromous fish also use coastal areas of British Columbia and Alaska, and mid-ocean habitats in the Gulf of Alaska, although their fine-scale distribution and marine ecology during this period are poorly understood (Morris et al. 2007; Pearcy and McKinnell 2007). Increases in temperature in Alaskan marine waters have generally been associated with increases in productivity and salmon survival (Mantua et al. 1997; Martins et al. 2012).

Warmer streams, loss of coastal habitat due to sea level rise, ocean acidification, lower summer stream flows, higher winter stream flows, and changes in water quality and freshwater inputs are projected to negatively affect salmon (e.g. Mauger et al. 2015). The persistence of cold water “refugia” within rivers and the diversity among salmon populations will be critical in helping salmon populations adapt to future climate conditions. More detailed discussions about the likely effects from climate change in freshwater systems on salmonids can be found in biological Opinions such as the implementation of the Mitchell Act (NMFS 2017b).

In marine waters, increasing temperatures are associated with observed and predicted poleward range expansions of fish and invertebrates in both the Atlantic and Pacific oceans (Lucey and Nye 2010; Asch 2015; Cheung et al. 2015). Rapid poleward species shifts in distribution in response to anomalously warm ocean temperatures have been well documented in recent years, confirming this expectation at short time scales. Range extensions were documented in many species from southern California to Alaska during unusually warm water associated with “the blob” in 2014 and 2015 (Bond et al. 2015; Di Lorenzo and Mantua 2016), and past strong El Nino events (Percy 2002; Fisher et al. 2015).

The potential impacts of climate and oceanographic change on whales and other marine mammals will likely involve effects on habitat availability and food availability. For species that depend on salmon for prey, such as SRKWs, the fluctuations in salmon survival that occur with these changes in climate conditions can have negative effects. Site selection for migration, feeding, and breeding may be influenced by factors such as ocean currents and water temperature. For example, there is some evidence from Pacific equatorial waters that sperm whale feeding success and, in turn, calf production rates are negatively affected by increases in sea surface temperature (Smith and Whitehead 1993; Whitehead 1997). Different species of marine mammals will likely react to these changes differently. MacLeod (2009) estimated, based on expected shifts in water temperature, 88% of cetaceans would be affected by climate change, with 47% likely to be negatively affected. Range size, location, and whether or not specific range areas are used for different life history activities (e.g. feeding, breeding) are likely to affect how each species responds to climate change (Learmonth et al. 2007).

2.2.2 Status of the Critical Habitats

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

Salmon and Steelhead Critical Habitat

For salmon and steelhead, NMFS ranked watersheds within designated critical habitat at the scale of the fifth-field hydrologic unit code (HUC₅) in terms of the conservation value they provide to each listed species they support.¹¹ The conservation rankings are high, medium, or low. To determine the conservation value of each watershed to species viability, NMFS's critical habitat analytical review teams (CHARTs) evaluated the quantity and quality of habitat features (for example, spawning gravels, wood and water condition, side channels), the relationship of the area compared to other areas within the species' range, and the significance to the species of the population occupying that area (NOAA Fisheries 2005). Thus, even a location that has poor quality of habitat could be ranked with a high conservation value if it were essential due to factors such as limited availability (e.g., one of a very few spawning areas), a unique contribution of the population it served (e.g., a population at the extreme end of geographic distribution), or if it serves another important role (e.g., obligate area for migration to upstream spawning areas).

The physical or biological features of freshwater spawning and incubation sites, include water flow, quality and temperature conditions and suitable substrate for spawning and incubation, as well as migratory access for adults and juveniles (Table 12). These features are essential to conservation because without them the species cannot successfully spawn and produce offspring. The physical or biological features of freshwater migration corridors associated with spawning and incubation sites include water flow, quality and temperature conditions supporting larval and adult mobility, abundant prey items supporting larval feeding after yolk sac depletion, and free passage (no obstructions) for adults and juveniles. These features are essential to conservation because they allow adult fish to swim upstream to reach spawning areas and they allow larval fish to proceed downstream and reach the ocean.

¹¹ The conservation value of a site depends upon "(1) the importance of the populations associated with a site to the ESU [or DPS] conservation, and (2) the contribution of that site to the conservation of the population through demonstrated or potential productivity of the area" (NOAA Fisheries 2005).

Table 12. Primary constituent elements (PCEs) of critical habitats designated for ESA-listed salmon and steelhead species considered in this Opinion and corresponding species life history events.

Primary Constituent Elements Site Type	Primary Constituent Elements Site Attribute	Species Life History Event
Freshwater spawning	Substrate Water quality Water quantity	Adult spawning Embryo incubation Alevin growth and development
Freshwater rearing	Floodplain connectivity Forage Natural cover Water quality Water quantity	Fry emergence from gravel Fry/parr/smolt growth and development
Freshwater migration	Free of artificial obstruction Natural cover Water quality Water quantity	Adult sexual maturation Adult upstream migration and holding Kelt (steelhead) seaward migration Fry/parr/smolt growth, development, and seaward migration
Estuarine areas	Forage Free of artificial obstruction Natural cover Salinity Water quality Water quantity	Adult sexual maturation and “reverse smoltification” Adult upstream migration and holding Kelt (steelhead) seaward migration Fry/parr/smolt growth, development, and seaward migration
Nearshore marine areas	Forage Free of artificial obstruction Natural cover Water quantity Water quality	Adult growth and sexual maturation Adult spawning migration Nearshore juvenile rearing

CHART Salmon and Steelhead Critical Habitat Assessments. The CHART for each recovery domain assessed biological information pertaining to occupied habitat by listed salmon and steelhead, determine whether those areas contained PCEs essential for the conservation of those species and whether unoccupied areas existed within the historical range of the listed salmon and steelhead that are also essential for conservation. The CHARTs assigned a 0 to 3 point score for the PCEs in each HUC₅ watershed for:

- Factor 1. Quantity,
- Factor 2. Quality—Current Condition,
- Factor 3. Quality—Potential Condition,
- Factor 4. Support of Rarity Importance,
- Factor 5. Support of Abundant Populations, and
- Factor 6. Support of Spawning/Rearing.

Thus, the quality of habitat in a given watershed was characterized by the scores for Factor 2 (quality—current condition), which considers the existing condition of the quality of PCEs in the

HUC₅ watershed; and Factor 3 (quality—potential condition), which considers the likelihood of achieving PCE potential in the HUC₅ watershed, either naturally or through active conservation/restoration, given known limiting factors, likely biophysical responses, and feasibility.

Puget Sound Recovery Domain. Critical habitat has been designated in Puget Sound for PS Chinook salmon, PS steelhead, and HCSR chum salmon (HCSRC). Major tributary river basins in the Puget Sound basin include the Nooksack, Samish, Skagit, Sauk, Stillaguamish, Snohomish, Lake Washington, Cedar, Sammamish, Green, Duwamish, Puyallup, White, Carbon, Nisqually, Deschutes, Skokomish, Duckabush, Dosewallips, Big Quilcene, Elwha, and Dungeness rivers and Soos Creek.

Critical habitat for PS Chinook salmon was designated on September 2, 2005 (70 FR 52630). Critical habitat includes 1,683 miles of streams, 41 square mile of lakes, and 2,182 miles of nearshore marine habitat in Puget Sounds. The Puget Sound Chinook salmon ESU has 61 freshwater and 19 marine areas within its range. Of the freshwater watersheds, 41 are rated high conservation value, 12 low conservation value, and eight received a medium rating. Of the marine areas, all 19 are ranked with high conservation value.

Critical habitat for HCSRC was designated on September 2, 2005 (70 FR 52630). Critical habitat includes 79 miles of rivers and 377 miles of nearshore marine habitat in Hood Canal. Most freshwater rivers in HCSRC designated critical habitat are in fair to poor condition (Table 13). Many nearshore areas are degraded, but some areas, including Port Gamble Bay, Port Ludlow, and Kilisut Harbor, remain in good condition (Daubenberger et al 2017, Garono and Robinson, 2002).

Critical habitat for PS steelhead was designated on February 24, 2016 (81 FR 9252). Critical habitat includes 2,031 stream miles. Nearshore and offshore marine waters were not designated for this species. There are 66 watersheds within the range of this DPS. Nine watersheds received a low conservation value rating, 16 received a medium rating, and 41 received a high rating to the DPS. Critical habitat for PS steelhead includes freshwater spawning sites, freshwater rearing sites, and freshwater migration corridors.

Critical habitat is designated for PS Chinook salmon and Hood Canal Summer run chum in estuarine and nearshore areas. Designated critical habitat for PS steelhead does not include nearshore areas, as this species does not make extensive use of these areas during juvenile life stage.

The following discussion is general to salmon and steelhead critical habitat in the Puget Sound basin. More specific information for each individual species' critical habitat is presented after the general discussion.

Landslides can occur naturally in steep, forested lands, but inappropriate land use practices likely have accelerated their frequency and the amount of sediment delivered to streams. Fine sediment from unpaved roads has also contributed to stream sedimentation. Unpaved roads are widespread on forested lands in the Puget Sound basin, and to a lesser extent, in rural residential areas.

Historical logging removed most of the riparian trees near stream channels. Subsequent agricultural and urban conversion permanently altered riparian vegetation in the river valleys, leaving either no trees, or a thin band of trees. The riparian zones along many agricultural areas are now dominated by alder, invasive canary grass and blackberries, and provide substantially reduced stream shade and large wood recruitment (SSPS 2007).

Diking, agriculture, revetments, railroads and roads in lower stream reaches have caused significant loss of secondary channels in major valley floodplains in this region. Confined main channels create high-energy peak flows that remove smaller substrate particles and large wood. The loss of side-channels, oxbow lakes, and backwater habitats has resulted in a significant loss of juvenile salmonid rearing and refuge habitat. When the water level of Lake Washington was lowered 9 feet in the 1910s, thousands of acres of wetlands along the shoreline of Lake Washington, Lake Sammamish and the Sammamish River corridor were drained and converted to agricultural and urban uses. Wetlands play an important role in hydrologic processes, as they store water that ameliorates high and low flows. The interchange of surface and groundwater in complex stream and wetland systems helps to moderate stream temperatures. Forest wetlands are estimated to have diminished by one-third in Washington State (FEMAT 1993; Spence et al. 1996; SSPS 2007).

Loss of riparian habitat, elevated water temperatures, elevated levels of nutrients, increased nitrogen and phosphorus, and higher levels of turbidity, presumably from urban and highway runoff, wastewater treatment, failing septic systems, and agriculture or livestock impacts, have been documented in many Puget Sound tributaries (SSPS 2007).

Peak stream flows have increased over time due to paving (roads and parking areas), reduced percolation through surface soils on residential and agricultural lands, simplified and extended drainage networks, loss of wetlands, and rain-on-snow events in higher elevation clear cuts (SSPS 2007). In urbanized Puget Sound, there is a strong association between land use and land cover attributes and rates of coho spawner mortality likely due to runoff containing contaminants emitted from motor vehicles (Feist et al. 1996).

Dams constructed for hydropower generation, irrigation, or flood control have substantially affected PS salmon and steelhead populations in a number of river systems. The construction and operation of dams have blocked access to spawning and rearing habitat (e.g., Elwha River dams block anadromous fish access to 70 miles of potential habitat) changed flow patterns, resulted in elevated temperatures and stranding of juvenile migrants, and degraded downstream spawning and rearing habitat by reducing recruitment of spawning gravel and large wood to downstream areas (SSPS 2007). These actions tend to promote downstream channel incision and simplification (Kondolf 1997), limiting fish habitat. Water withdrawals reduce available fish habitat and alter sediment transport. Hydropower projects often change flow rates, stranding and killing fish, and reducing aquatic invertebrate (food source) productivity (Hunter 1992).

Juvenile mortality occurs in unscreened or inadequately screened diversions. Water diversion ditches resemble side channels in which juvenile salmonids normally find refuge. When diversion headgates are shut, access back to the main channel is cut off and the channel goes dry. Mortality can also occur with inadequately screened diversions from impingement on the screen,

or mutilation in pumps where gaps or oversized screen openings allow juveniles to get into the system (WDFW 2009). Blockages by dams, water diversions, and shifts in flow regime due to hydroelectric development and flood control projects are major habitat problems in many Puget Sound tributary basins (SSPS 2007).

The nearshore marine habitat has been extensively altered and armored by industrial and residential development near the mouths of many of Puget Sound's tributaries. A railroad runs along large portions of the eastern shoreline of Puget Sound, eliminating natural cover along the shore and natural recruitment of beach sand (SSPS 2007).

Degradation of the near-shore environment has occurred in the southeastern areas of Hood Canal in recent years, resulting in late summer marine oxygen depletion and significant fish kills. Circulation of marine waters is naturally limited, and partially driven by freshwater runoff, which is often low in the late summer. However, human development has increased nutrient loads from failing septic systems along the shoreline, and from use of nitrate and phosphate fertilizers on lawns and farms. Shoreline residential development is widespread and dense in many places. The combination of highways and dense residential development has degraded certain physical and chemical characteristics of the near-shore environment (HCCC 2005; SSPS 2007).

In summary, critical habitat for salmon and steelhead throughout the Puget Sound basin has been degraded by numerous management activities, including hydropower development, loss of mature riparian forests, increased sediment inputs, removal of large wood, intense urbanization, agriculture, alteration of floodplain and stream morphology (i.e., channel modifications and diking), riparian vegetation disturbance, wetland draining and conversion, dredging, armoring of shorelines, marina and port development, road and railroad construction and maintenance, logging, and mining. Changes in habitat quantity, availability, and diversity, and flow, temperature, sediment load and channel instability are common limiting factors in areas of critical habitat.

The PS recovery domain CHART for PS Chinook salmon and HCSR chum salmon (NOAA Fisheries 2005) determined that only a few watersheds with PCEs for Chinook salmon in the Whidbey Basin (Skagit River/Gorge Lake, Cascade River, Upper Sauk River, and the Tye and Beckler rivers) are in good-to-excellent condition with no potential for improvement. Most HUC₅ watersheds are in fair-to-poor or fair-to-good condition. However, most of these watersheds have some or a high potential for improvement (Table 13).

Table 13. Puget Sound Recovery Domain: Current and potential quality of HUC₅ watersheds identified as supporting historically independent populations of ESA-listed Chinook salmon (CK) and Hood Canal summer- run chum salmon (CM) (NOAA Fisheries 2005). Watersheds are ranked primarily by “current quality” and secondly by their “potential for restoration.”

Current PCE Condition	Potential PCE Condition
3 = good to excellent	3 = highly functioning, at historical potential
2 = fair to good	2 = high potential for improvement
1 = fair to poor	1 = some potential for improvement
0 = poor	0 = little or no potential for improvement

Watershed Name(s) and HUC ₅ Code(s)	Listed Species	Current Quality	Restoration Potential
Strait of Georgia and Whidbey Basin #1711000xxx			
Skagit River/Gorge Lake (504), Cascade (506) & Upper Sauk (601) rivers, Tye & Beckler rivers (901)	CK	3	3
Skykomish River Forks (902)	CK	3	1
Skagit River/Diobsud (505), Illabot (507), & Middle Skagit/Finney Creek (701) creeks; & Sultan River (904)	CK	2	3
Skykomish River/Wallace River (903) & Skykomish River/Woods Creek (905)	CK	2	2
Upper (602) & Lower (603) Suitttle rivers, Lower Sauk (604), & South Fork Stillaguamish (802) rivers	CK	2	1
Samish River (202), Upper North (401), Middle (402), South (403), Lower North (404), Nooksack River; Nooksack River (405), Lower Skagit/Nookachamps Creek (702) & North Fork (801) & Lower (803) Stillaguamish River	CK	1	2
Bellingham (201) & Birch (204) bays & Baker River (508)	CK	1	1
Whidbey Basin and Central/South Basin #1711001xxx			
Lower Snoqualmie River (004), Snohomish (102), Upper White (401) & Carbon (403) rivers	CK	2	2
Middle Fork Snoqualmie (003) & Cedar rivers (201), Lake Sammamish (202), Middle Green River (302) & Lowland Nisqually (503)	CK	2	1
Pilchuck (101), Upper Green (301), Lower White (402), & Upper Puyallup River (404) rivers, & Mashel/Ohop(502)	CK	1	2
Lake Washington (203), Sammamish (204) & Lower Green (303) rivers	CK	1	1
Puyallup River (405)	CK	0	2
Hood Canal #1711001xxx			
Dosewallips River (805)	CK/CM	2	1/2
Kitsap – Kennedy/Goldsborough (900)	CK	2	1
Hamma Hamma River (803)	CK/CM	1/2	1/2
Lower West Hood Canal Frontal (802)	CK/CM	0/2	0/1
Skokomish River (701)	CK/CM	1/0	2/1
Duckabush River (804)	CK/CM	1	2
Upper West Hood Canal Frontal (807)	CM	1	2
Big Quilcene River (806)	CK/CM	1	1/2
Deschutes Prairie-1 (601) & Prairie-2 (602)	CK	1	1
West Kitsap (808)	CK/CM	1	1
Kitsap – Prairie-3 (902)	CK	1	1
Port Ludlow/Chimacum Creek (908)	CM	1	1
Kitsap – Puget (901)	CK	0	1
Kitsap – Puget Sound/East Passage (904)	CK	0	0
Strait of Juan de Fuca Olympic #1711002xxx			
Dungeness River (003)	CK/CM	2/1	1/2
Discovery Bay (001) & Sequim Bay (002)	CM	1	2
Elwha River (007)	CK	1	2
Port Angeles Harbor (004)	CK	1	1

Puget Sound Rockfish Critical Habitat

NMFS designated critical habitat for PS/GB yelloweye and PS/GB bocaccio rockfish on November 13, 2014 (79 FR 68042). Critical habitat is not designated in areas outside of United States jurisdiction; therefore, although waters in Canada are part of the DPSs' ranges for both species, critical habitat was not designated in that area. The U.S. portion of the Puget Sound/Georgia Basin that is occupied by PS/GB yelloweye rockfish and PS/GB bocaccio can be divided into five areas, or Basins, based on the distribution of each species, geographic conditions, and habitat features. These five interconnected Basins are: (1) The San Juan/Strait of Juan de Fuca Basin, (2) Main Basin, (3) Whidbey Basin, (4) South Puget Sound, and (5) Hood Canal.

Based on the natural history of PS/GB bocaccio and their habitat needs, NMFS identified two physical or biological features, essential for their conservation: (1) Deepwater sites (>30 meters) that support growth, survival, reproduction, and feeding opportunities; and (2) Nearshore juvenile rearing sites with sand, rock and/or cobbles to support forage and refuge. Habitat threats include degradation of rocky habitat, loss of eelgrass and kelp, introduction of non-native species that modify habitat, and degradation of water quality.

We have determined that approximately 644.7 square miles (1,669.8 sq km) of nearshore habitat for juvenile PS/GB bocaccio and 438.5 square miles (1,135.7 sq km) of deepwater habitat for PS/GB yelloweye rockfish and PS/GB bocaccio meet the definition of critical habitat. Critical habitat for adult PS/GB bocaccio includes 590.4 square miles of nearshore habitat and 414.1 square miles of deep water habitat.

Nearshore critical habitat for PS/GB bocaccio at juvenile life stages is defined as areas that are contiguous with the shoreline from the line of extreme high water out to a depth no greater than 98 feet (30 m) relative to mean lower low water. The PBFs of nearshore critical habitat include settlement habitats with sand, rock, and/or cobble substrates that also support kelp. Important site attributes include: (1) Quantity, quality, and availability of prey species to support individual growth, survival, reproduction, and feeding opportunities; and (2) Water quality and sufficient levels of dissolved oxygen (DO) to support growth, survival, reproduction, and feeding opportunities.

Deep water critical habitat includes marine waters and substrates of the U.S. in Puget Sound east of Green Point in the Strait of Juan de Fuca, and serves both adult PS/GB bocaccio, and both juvenile and adult PS/GB yelloweye rockfish. Deepwater critical habitat is defined as areas at depths greater than 98 feet (30 m) that supports feeding opportunities and predator avoidance.

The federal register notice for the designation of rockfish critical habitat in Puget Sound notes that many forms of human activities have the potential to affect the essential features of listed rockfish species, and specifically calls out, among others, (1) Nearshore development and in-water construction (e.g., beach armoring, pier construction, jetty or harbor construction, pile driving construction, residential and commercial construction); (2) dredging and disposal of dredged material; (3) pollution and runoff (79 FR 68041;11/13/14). Water quality throughout Puget Sound is degraded by anthropogenic sources within the Sound (e.g. pollutants from

vessels) as well as upstream sources (municipal, industrial, and nonpoint sources). Nearshore habitat degradation exists throughout the Puget Sound from fill and dredge to create both fastland and navigational areas for commerce, from shore hardening to protect both residential and commercial waterfront properties, and from overwater structures that enable commercial and recreational boating.

NMFS's 2016 status update identifies recommended future actions including protection and restoration of nearshore habitat through removal of shoreline armoring, and protecting and increasing kelp coverage.

DPS Basin	Nearshore sq. mi. (for juvenile bocaccio only)	Deepwater sq. mi. (for adult and juvenile yelloweye rockfish and adult bocaccio)	Physical or Biological Features		Activities
San Juan/ Strait of Juan de Fuca	349.4	203.6	Deepwater sites <30 meters) that support growth, survival, reproduction and feeding opportunities	Nearshore juvenile rearing sites with sand, rock and/or cobbles to support forage and refuge	1, 2, 3, 6, 9, 10, 11
Whidbey Basin	52.2	32.2			1, 2, 3, 4, 6, 9, 10, 11
Main Basin	147.4	129.2			1, 2, 3, 4, 6, 7, 9, 10, 11
South Puget Sound	75.3	27.1			1, 2, 3, 4, 6, 7, 9, 10, 11
Hood Canal	20.4	46.4			1, 2, 3, 6, 7, 9, 10, 11

Figure 13. Image of a table indicating Physical or Biological Features of Rockfish Critical Habitat

Management Considerations Codes: (1) Nearshore development and in-water construction (e.g., beach armoring, pier construction, jetty or harbor construction, pile driving construction, residential and commercial construction); (2) dredging and disposal of dredged material; (3) pollution and runoff; (4) underwater construction and operation of alternative energy hydrokinetic projects (tidal or wave energy projects) and cable laying; (5) kelp harvest; (6) fisheries; (7) non-indigenous species introduction and management; (8) artificial habitats; (9) research; (10) aquaculture; and (11) activities that lead to global climate change and ocean acidification. Commercial kelp harvest does not occur presently, but would probably be concentrated in the San Juan/Georgia Basin. Artificial habitats could be proposed to be placed in each of the Basins. Non-indigenous species introduction and management could occur in each Basin.

SRKW Critical Habitat

Critical habitat for the Southern Resident killer whale DPS was designated on November 29, 2006 (71 FR 69054). Critical habitat includes approximately 2,560 square miles of inland waters of Washington in three specific areas: (1) the Summer Core Area in Haro Strait and waters

around the San Juan Islands; (2) Puget Sound; and (3) the Strait of Juan de Fuca. Based on the natural history of SRKW's and their habitat needs, NMFS identified the following physical or biological features essential to conservation: (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.

In 2006, few data were available on SRKW's distribution and habitat use in coastal waters of the Pacific Ocean. Since the 2006 designation, additional effort has been made to better understand the geographic range and movements of SRKW's. For example, opportunistic visual sightings, satellite tracking, and passive acoustic research conducted since 2006 have provided an updated estimate of the whales' coastal range that extends from the Monterey Bay area in California, north to Chatham Strait in southeast Alaska (NMFS 2019b).

On September 19, 2019, NMFS proposed to revise the critical habitat designation for the SRKW DPS under the ESA by designating six new areas along the U.S. West Coast (84 FR 49214). Specific new areas proposed along the U.S. West Coast include 15,626.6 square miles (mi²) (40,472.7 square kilometers (km²)) of marine waters between the 6.1-meter (m) depth contour and the 200-m depth contour from the U.S. international border with Canada south to Point Sur, California). In the proposed rule (84 FR 49214), NMFS states that the "proposed areas are occupied and contain physical or biological features that are essential to the conservation of the species and that may require special management considerations or protection." The three physical or biological features essential to conservation in the 2006 designated critical habitat were also identified for the six new areas along the U.S. West Coast.

Water Quality

Water quality supports SRKW's ability to forage, grow, and reproduce free from disease and impairment. Water quality is essential to the whales' conservation, given the whales' present contamination levels, small population numbers, increased extinction risk caused by any additional mortalities, and geographic range (and range of their primary prey) that includes highly populated and industrialized areas. Water quality is especially important in high-use areas where foraging behaviors occur and contaminants can enter the food chain. The absence of contaminants or other agents of a type and/or amount that would inhibit reproduction, impair immune function, result in mortalities, or otherwise impede the growth and recovery of the SRKW population is a habitat feature essential for the species' recovery. Water quality in Puget Sound, in general, is degraded as described in the Puget Sound Partnership 2018-2022 Action Agenda and Comprehensive (Puget Sound Partnership 2018). For example, toxicants in Puget Sound persist and build up in marine organisms including SRKW's and their prey resources, despite bans in the 1970s of some harmful substances and cleanup efforts. Water quality varies in coastal waters from Washington to California. For example, as described in NMFS (2019b), high levels of DDTs have been found in SRKW's, especially in K and L pods, which spend more time in California in the winter where DDTs still persist in the marine ecosystem (Sericano et al. 2014).

Exposure to oil spills also poses additional direct threats as well as longer term population level impacts; therefore, the absence of these chemicals is of the utmost importance to SRKW conservation and survival. Oil spills can also have long-lasting impacts on other habitat features. Oil spill risk exists throughout the SRKW's coastal and inland range. From 2002-2016, the highest-volume crude oil spill occurred in 2008 off the California coast, releasing 463,848 gallons (Stephens 2017). In 2015 and 2016, crude oil spilled into the marine environment off the California coast totaled 141,680 gallons and 44,755, respectively; no crude oil spills were reported off the coasts of Oregon or Washington in these years (Stephens 2015, Stephens 2017). Non-crude oil spills into the marine environment also occurred off California, Oregon, and Washington in 2015 and 2016 (Stephens 2015, Stephens 2017). The Environmental Protection Agency and U.S. Coast Guard oversee the Oil Pollution Prevention regulations promulgated under the authority of the Federal Water Pollution Control Act. There is a Northwest Area Contingency Plan, developed by the Northwest Area Committee, which serves as the primary guidance document for oil spill response in Washington and Oregon. In 2017, the Washington State Department of Ecology published a new Spill Prevention, Preparedness, and Response Program Annual Report describing the Spills Program as well as the performance measures from 2007 – 2017 (WDOE 2017).

Prey Quantity, Quality, and Availability

Most wild salmon stocks throughout the whales' geographic range are at fractions of their historic levels. Beginning in the early 1990s, 28 ESUs and DPSs of salmon and steelhead in Washington, Oregon, Idaho, and California were listed as threatened or endangered under the ESA. Historically, overfishing, habitat losses, and hatchery practices were major causes of decline. Poor ocean conditions over the past two decades have reduced populations already weakened by the degradation and loss of freshwater and estuary habitat, fishing, hydropower system management, and hatchery practices. While wild salmon stocks have declined in many areas, hatchery production has been generally strong.

Contaminants and pollution also affect the quality of SRKW prey in Puget Sound and in coastal waters of Washington, Oregon, and California. Contaminants enter marine waters and sediment from numerous sources, but are typically concentrated near areas of high human population and industrialization. Once in the environment these substances proceed up the food chain, accumulating in long-lived top predators like SRKWs. Chemical contamination of prey is a potential threat to SRKW critical habitat, despite the enactment of modern pollution controls in recent decades, which were successful in reducing, but not eliminating, the presence of many contaminants in the environment. The size of Chinook salmon is also an important aspect of prey quality (i.e., SRKWs primarily consume large Chinook) so changes in Chinook size may affect the quality of this component critical habitat. In addition, vessels and sound may reduce the effective zone of echolocation and reduce availability of fish for the whales in their critical habitat (Holt 2008).

Passage

Southern Residents are highly mobile and use a variety of areas for foraging and other activities, as well as for traveling between these areas. Human activities can interfere with movements of

the whales and impact their passage. In particular, vessels may present obstacles to whale passage, causing the whales to swim further and change direction more often, which can increase energy expenditure for whales and impacts foraging behavior (review in NMFS (2010), Ferrara et al. (2017))

2.3 Environmental Baseline

The “environmental baseline” refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultations, and the impact of state or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency’s discretion to modify are part of the environmental baseline (50 CFR 402.02).

2.3.1 Current Status of Puget Sound

Puget Sound can be generally described as nearshore and deepwater areas. NMFS has identified the several nearshore and deepwater physical or biological features essential to conservation for salmon, rockfish and SRKW in Section 2.2.2.

The nearshore is the zone where marine water, fresh water, and terrestrial landscapes interact in a complex mosaic of habitats and processes. The nearshore encompasses the shoreline from the top of the upland bank or bluff on the landward side down to the depth of water that light can penetrate and where plants can photosynthesize, called the photic zone. The upper extent of the nearshore covers the terrestrial upland that contributes sediment, shade, organic material like leaf litter, and even the insects that fish eat. The lower range of the photic zone depends on water clarity; in Puget Sound, underwater vegetation can be found to depths of 30 to 100 feet below Mean Lower Low Water (MLLW) (Williams and Thom 2001). The nearshore includes a variety of environments: marine shallows, eelgrass meadows, kelp forests, mudflats, beaches, salt marshes, rocky shores, river deltas, estuaries, barrier islands, spits, marine riparian zones, and bluffs. This wide range of habitats supports many species. The nearshore forms the basis for the biologic productivity of the Puget Sound basin.

Nearshore habitat in Hood Canal, a historically fragile area, has been plagued by an increase in hypoxia, however many inter- and subtidal areas evaluated in a 2002 study were found to be dominated by the dense eelgrass and sand habitat classes, suggesting multiple areas of high habitat quality were present in Hood Canal nearshore (Garono et al. 2002). Daubenberger et al. 2017 document that Port Gamble Bay, Port Ludlow, and Kilisnoe Harbor are relatively shallow and enclosed, within the greater Hood Canal system. These shallow areas permit for a highly productive aquatic environment allowing for the presence of eelgrass and attached macroalgae. These three embayments consistently had higher densities of single target detections that may be explained by the presence of abundant zooplankton and larval forage fish. Port Gamble Bay, Port

Ludlow, and Kilisut Harbor include productive spawning grounds for Pacific herring, surf smelt, and sand lance, which leads to high densities of larvae that are high energy prey items for juvenile salmonids. Additionally, juvenile chum, pink, and Chinook salmon prey heavily upon crab zoea and megalops, which were found in high densities in these three embayments, likely due to the presence of vegetated habitat (Fernandez et al. 1993).

Although shoreline modifications occur and are typically evaluated on the site scale, the aggregate of these individual impacts diminish and disrupt entire ecosystems at the landscape scale. Shoreline modification can cause fragmentation of the landscape that disrupts connectivity and reduces the productivity and biological diversity of Puget Sound watersheds. These impacts leave ecosystems less resilient.

Recent studies have estimated the loss of nearshore habitat in Puget Sound at close to 85 percent or more (Brophy et al. 2019). Throughout Puget Sound, the nearshore areas have been modified by human activity, disrupting the physical, biological, and chemical interactions that are vital for creating and sustaining the diverse ecosystems of Puget Sound. The shoreline modifications are usually intended for erosion control, flood protection, sediment management, or for commercial, navigational, and recreational uses. Seventy-four percent of shoreline modification in Puget Sound consists of shoreline armoring (Simenstad et al. 2011), which usually refers to bulkheads, seawalls, or groins made of rock, concrete, or wood. Other modifications include jetties and breakwaters designed to dissipate wave energy, and structures such as tide gates, dikes, and marinas, overwater structures, including bridges for railways, roads, causeways, and artificial fill. An analyses conducted in 2011 though the Puget Sound Nearshore Ecosystem Restoration Project (Fresh et al, 2011; Simenstad et al 2011) found that since 1850, of the approximately 2,470 miles of Puget Sound shoreline:

- Shoreline armoring has been installed on 27 percent of Puget Sound shores (Table 14).
- One-third of bluff-backed beaches are armored along half their length. Roads and nearshore fill have each affected about 10 percent of the length of bluff-backed beaches.
- Forty percent of Puget Sound shorelines have some type of structure that impacts habitat quality.
- Conversion of natural shorelines to artificial shoreforms occurred in 10 percent of Puget Sound (Table 15).
- There has been a 93 percent loss of freshwater tidal and brackish marshes. The Duwamish and Puyallup rivers have lost nearly all of this type of habitat.
- A net decline in shoreline length of 15 percent as the naturally convoluted and complex shorelines were straightened and simplified. This represents a loss of 1,062 km or 660 miles of overall shoreline length.
- Elimination of small coastal embayments has led to a decline of 46 percent in shoreline length in these areas.
- A 27 percent decline in shoreline length in the deltas of the 16 largest rivers and a 56 percent loss of tidal wetlands in the deltas of these rivers.

Table 14. Total area of over water structures by sub-basin observed in aerial photo review between 2013 and 2016 (Beechie et al. 2017).

Marine Basin	Acres
Hood Canal	233
North Puget Sound	281
South Central Puget Sound	817
Strait of Juan de Fuca	65
Whidbey Basin	186
Total	1581

The distribution and sizes of over water structures (OWS) in the nearshore¹² are detailed further in Schlenger et al. (2011) and (Simenstad et al. 2011).

Table 15. Length of shoreline armored as a percent of total shoreline length (Simenstad et al. 2011) by Marine Basin (Beechie et al. 2017).

Marine Basin	Armoring (miles)	Shoreline Length (miles)	Percent Armored
Hood Canal	63.9	359.7	17.7%
North Puget Sound	103.3	720.4	14.3%
South Central Puget Sound	397.0	832.6	47.7%
Strait of Juan de Fuca	33.0	210.3	15.7%
Whidbey Basin	68.3	343.4	19.9%
Grand Total	665.3	2466.3	27.0%

Puget Sound nearshore and deep marine waters are fundamental to many life histories of salmon and steelhead and particularly crucial for PS Chinook salmon juvenile (parr, fry, sub-yearling), and sub adult life stages. Juvenile salmon use nearshore habitat extensively during the early marine period (Duffy et al. 2005), a critical time for salmon growth, as larger, faster-growing fish have increased probabilities of surviving to adulthood (Beamish et al. 2003; Duffy and Beauchamp 2011). Loss of nearshore habitat is considered a factor in the loss of PS salmon abundance and productivity. Reduction in nearshore habitat quality has reduced survival at multiple life stages. Marine survival rates of PS Chinook salmon in Puget Sound have declined drastically since 1980 (Ruggerone and Goetz 2004, Sharma et al. 2012). Smolt-to-adult survival rates for hatchery-reared sub-yearling Chinook Salmon within Puget Sound have averaged less than 1% over the past three decades (Kilduff et al. 2014).

There is also evidence that loss of nearshore habitat quality may be eliminating PS Chinook salmon life history strategies that make use of nearshore areas during the early life stages. Campbell et al. (2017) found < 3 % of adults returning to the Green and Puyallup to exhibit the

¹² The nearshore area includes the area from the deepest part of the photic zone (approximately 10 meters below Mean Lower Low Water [MLLW]) landward to the top of shoreline bluffs, or in estuaries upstream to the head of tidal influence (Clancy et al. 2009).

fry migrant life history while approximately 95 percent of their estuary habitat has been eliminated. The converse was true from the Skagit and Nooksack estuaries where ~ 50 % of the estuary remained in a natural state (Beechie et al. 2017) and 36 and 24 % of the adult population we examined returned from small fry sized fish, respectively.

From 2005 to 2011, in Puget Sound an average of 1.1 miles per year of new shoreline armoring was permitted in and 2.3 miles per year of replacement armoring was permitted (Johannessen et al 2014). These figures do not include unpermitted structures, which can exceed those constructed with permits. For example, in the Green/Duwamish River Watershed (Water Resources Inventory Area 9), permitted structures comprised only 38 percent of the all the armoring physically surveyed in 2012 and 2013 (King County 2014).

Residential parcels make up 57 percent of Puget Sound shorelines and 48 percent of these are armored. In some areas, armoring is even more prevalent: more than 50 percent of the residential parcels are armored in King, Kitsap, Pierce, Snohomish, Mason, and Thurston counties. Overall, 26 percent of residential parcels are in forage fish spawning grounds and 58 percent of those are armored (PSMNGP 2014). In a survey of HPAs issued by WDFW in Puget Sound between January 2005 and December 2010 the data recorded the installation of 6.5 miles of new armor and 14.45 miles of replacement armor. This starkly contrasts with data from that same time period that shows only 0.61 miles of armor were removed (Carman et al 2011). More recent studies have suggested a less dramatic rate of new armoring, but those studies were limited in their geographic scope and types of shoreline modification.¹³ The studies have, however, corroborated that the bulk of permitted shoreline armoring activities continue to be repair and replacement. This demonstrates that the lifecycle of structures that includes the repair or replacement of aging armoring and other in- or over-water structures in Puget Sound extends the duration of degraded baseline conditions and retains limits on habitat features and corresponding carrying capacity.

The duration of impairment of habitat condition and function that derive from decades of persistent anthropogenic changes in the amount of and character of estuarine habitat, is made more detrimental due to the compounding nature of these effects, occurring because: (1) regulatory and permitting measures do not avoid all impacts and largely fail to include methods to rectify unavoided impacts, (2) Development pressure continues to impact habitat in the marine and freshwater portion of the range; (3) improvements in human use patterns to minimize resource impacts are slow at best; and (3) few of the 2020 improvement targets identified by the Puget Sound Partnership (PSP)¹⁴ have been reached (Puget Sound Partnership 2018). In more detail, this most recent report points out the following issues:

- Chinook salmon, steelhead and SRKW: ongoing decline.
- Herring stocks: declining
- Loss of non-federal forested land cover to developed land cover: continuing. Loss of 1,196 acres of non-federal forested land per year between 2006 and 2011.

¹³ Shoreline Permitting Through TACT (Spring 2015) (TACT is an acronym for: Trouble-Shooting, Action Planning, Course Correction, and Tracking and Monitoring).

¹⁴ The PSP Action Agenda is an EPA-approved recovery plan under the National Estuary Program.

- Shoreline armoring: Stable between 2011 and 2014. No recent net increase, restoration actions balance out increase from private shoreline armoring. However, this could be related to poor economic conditions. More years of data are needed to determine trend.
- Accelerated conversion/loss of vegetation cover on ecologically important lands: 1.116 percent loss for 2006-2011. This is even more loss than the cautious 2020 Target: Basin-wide loss of vegetation cover on ecologically important lands under high pressure from development does not exceed 0.15 percent of the total 2011 baseline land area over a 5- year period.
- Marine water quality: Overall, trends have been getting worse with closures of beaches and shellfish harvest in some bays. While there has been some increase between 2011 and 2014 in the amount of shellfish beds open to harvest, about 19 percent are still closed. PCB levels in fish⁷ are still high.
- Native Eelgrass (*Z. marina*) abundance seems stable comparing 2011 to 2013 data to baseline from 2000 to 2008. This does not account for losses that occurred prior to 2000.
- Human Sound Behavior Index: No change in average behavior. Thus, an increase in human population is likely to continue to degrade habitat quality. (The Sound Behavior Index tracks 28 human use practices¹⁵ that likely affect habitat and water quality and quantity).
- Over Water Structure (OWS): not assessed by PSP. Current percent of nearshore coverage is 0.63 percent for all of Puget Sound, as detailed below.

The PSP concludes the overall decline in habitat conditions and native species abundance in the Puget Sound has been caused by development and climate change pressures. Over the last 150+ years, 4.5 million people have settled in the Puget Sound region. With the level of infrastructure development associated with this population growth the Puget Sound nearshore has been altered significantly. Major physical changes documented include the simplification of river deltas, the elimination of small coastal bays, the reduction in sediment supplies to the foreshore due to beach armoring, and the loss of tidally influenced wetlands and salt marsh (Fresh et al. 2011).

In addition to beach armoring, other shoreline changes including OWS, marinas, roads, and railroads reduce habitat quality. The amount of these changes varies, and their source varies by region, generally correlating with development, but overall is staggering (, Simenstad et al. 2011). The simplification of the largest river deltas has caused a 27 percent decline in shoreline length compared to historical conditions. Of 884 historic small embayments, 308 have been eliminated. About 27 percent of PS's shorelines are armored and only 112 of 828 shoreline segments remain in properly functioning condition. The loss of tidal wetlands in the largest deltas averages 26 percent (Fresh et al. 2011). Each of these habitat changes is related to development and overall reduces the quality and quantity of PS Chinook and HC summer-run, in the Puget Sound nearshore.

¹⁵ Human use practices include among others: (a) Number of residents with native vegetation on banks of waterways; (b) number of residents using pump stations for boat wastewater; (c) residents using herbicides and pesticides; and (d) pasture practices for residents with livestock.

Existing shoreline armoring on nearshore and intertidal habitat function has diminished sediment supply, diminished organic material (e.g. woody debris and beach wrack) deposition, diminished overwater (riparian) and nearshore in-water vegetation (SAV), diminished prey availability, diminished aquatic habitat availability, diminished invertebrate colonization, and diminished forage fish populations (see Toft et al. 2007; Shipman et al. 2010; Sobocinski et al. 2010; Morley et al. 2012; Toft et al. 2013; Munsch et al. 2014; Dethier et al. 2016). In some locations shoreline armoring has caused increased beach erosion waterward of the armoring, which, in turn, has created beach lowering, coarsening of substrates, increases in sediment temperature, and reductions in invertebrate density (Fresh et al. 2011; Morley et al. 2012; Dethier et al. 2016).

Shoreline armoring has reduced suitable habitat for forage species (Pacific sand lance and surf smelt) spawning and likely has reduced their abundance and productivity. Bulkheads alter habitat conditions for the duration that they are present and simultaneously diminish or eliminate intertidal habitat for forage species including sand lance, an obligate upper intertidal spawner (Whitman et al. 2014). As stated in Fresh et al. (2011) “we can only surmise how much forage fish spawning habitat we have lost because we lack comprehensive historical data on spawning areas.” Considering that these forage fish are an essential food source for salmon, beach armoring has multiple negative effects on salmon including reductions in prey and reductions in access to shallow water rearing habitat and refuge.

Dredging

The 1988 Environmental Impact Statement (EIS) for the Puget Sound Dredge Disposal Analysis (PSDDA) documented 34 port districts within the Puget Sound region (<https://www.nws.usace.army.mil/Missions/Civil-Works/Dredging/Reports/>) (this is the most recent information that could be located). This EIS identifies 50 miles of navigation channels, about 50 miles of port terminal ship berths, and more than 200 small boat harbors that must be periodically dredged to maintain the commercial and recreational services provided by these facilities.

Between 1996 to 2014, maintenance dredging resulted in at least 25 million cubic yards of sediment removed from nearshore environments and disposed in multi-user disposal by Puget Sound harbors and waterways by various dredgers (Table 16). These included private developers and public entities (e.g., federal and state agencies, ports, and local governments) responsible for funding and undertaking dredging projects.

Table 16. Multiuser Disposal Site Volumes by Year (in cubic yards)

Dredging Year ¹	Bellingham Bay	Port Gardner	Elliott Bay	Commencement Bay	Anderson Ketron	Rosario Strait	Port Townsend	Port Angeles	South Jetty	Annual Total
1996	44,800	121,246	95,302	460,684	0	205,500	0	22,344	1,674,267	2,626,139
1997	0	102,531	18,982	0	0	0	0	0	959,249	1,082,759
1998	1,200	0	110,465	693,540	0	53,000	4,000	0	780,181	1,644,384
1999	0	0	414,794	140,319	0	140,761	1,986	0	1,153,621	1,853,480
2000	0	0	360,577	893,776	0	0	0	0	1,282,663	2,539,016
2001	0	248,965	557,340	265,867	0	10,419	0	0	358,873	1,443,465
2002	0	45,919	133,270	0	0	0	0	0	475,199	656,390
2003	0	0		710,675	0	38,223	0	0	824,694	1,575,595
2004	0	0	15,602	1,205,993	5,772	230,747	0	0	1,166,089	2,626,207
2005	0	0	77,838	949,399	8,180	23,847	0	0	740,910	1,802,179
2006	0	722,185	3,801	811,000	0	150,921	0	0	196,893	1,886,806
2007	0	4,400	24,250	1,324,254	10,407	20,970	10,996	0	389,127	1,786,411
2008	0	17,393	172,999	214,858	97,310	0	0	0	0	504,568
2009	0	10,450	20,133	18,803	0	188,580	6,856	0	21,088	267,919
2010	0	371,500	96,046	14,812	0	0	9,048	0	0	493,416
2011	0	44,196	11,486	179,160	0	45,865	0	0	1,012,127	1,294,845
2012	0	34,143	165,700	3,489	10,579	180	0	0	320,985	537,088
2013	0	104,199	15,266	1,673	0	144,206	0	0	0	267,357
2014	0	0	117,593	0	6,093	0	0	0	0	125,700

25,013,724

1. Dredging Year: 16 June through June 15 (e.g. DY 2014 began on June 16, 2013 and ended June 15, 2014).

Data from: USACE Biological Evaluation for the Continued Use of Multiuser Dredge Material Disposal Sites in Puget Sound and Grays Harbor. Available at: <https://usace.contentdm.oclc.org/utils/getfile/collection/p266001coll1/id/9083>, last visited October 21, 2020.

These dredging activities are generally limited to the nearshore environments. Regular dredging maintenance result in periodic short-term water quality degradation suspending sediments above background levels and and re-suspended contaminants. This also results in periodic removal of sediment that support invertebrate prey and forage species for salmon and rockfish (Jones and Stokes 1998, McCabe et al 1998). Usually, a dredged area recolonizes within a maximum of 2 years (Boese et al 2009, Dethier and Schoch 2005). Maintenance dredging increases depth and maintains increased depth. This results in a reduction of shallow habitat and obstruction of the migratory corridor for rearing and migrating juvenile salmonids.

Marine Vessels

Commercial, recreational, military, and public ferry vessel traffic occurs throughout Puget Sound. Vessels range in size from massive commercial shipping container ships to kayaks. Vessels can access Puget Sound through the Strait of San Juan de Fuca, the Strait of Georgia, ports, public and private marinas, naval bases, single-family piers, public boat ramps, and freshwater piers and marinas. Several studies have shown fish to respond physiologically and biologically to increased noise (Mueller 1980; Scholik and Yan 2002; Picciulin et al. 2010). Xie et al. (2008) report that adult migrating salmon avoid vessels by swimming away. Graham and Cooke (2008) studied the effects of three boat noise disturbances (canoe paddling, trolling motor, and combustion engine (9.9 horsepower) on the cardiac physiology of largemouth bass (*Micropterus salmoides*). Exposure to each of the treatments resulted in an increase in cardiac output in all fish, associated with a dramatic increase in heart rate and a slight decrease in stroke volume, with the most extreme response being to that of the combustion engine treatment (Graham and Cooke 2008). Recovery times were the least with canoe paddling (15 minutes) and the longest with the power engine (40 minutes). They postulate that this demonstrates that fish experienced sublethal physiological disturbances in response to the noise propagated from recreational boating activities. The existing levels of vessel traffic likely cause sublethal physiological stress to listed fish species.

Recent evidence indicates that for SRKW, vessel disturbance imposes an energetic cost on surface active behaviors and vocal effort (Williams et al. 2006; Noren et al. 2012; Noren et al. 2013; Holt et al. 2015). For example, Williams et al. (2006) estimated that changes in activity budgets in Northern Resident killer whales in inland waters in the presence of vessels result in an approximate 3% increase in energy expenditure compared to when vessels are not present. However, this increased energy expenditure may be less important than the reduced time spent feeding and the resulting potential reduction in prey consumption (Ferrara et al. 2017). Southern Resident killer whales spent 17 to 21% less time foraging in inland waters in the presence of vessels for 12 hours, depending on vessel distance (see Ferrara et al. 2017). Although the impacts of short-term behavioral changes on population dynamics is unknown, it is likely that because SRKWs are exposed to vessels the majority of daylight hours they are in inland waters, there may be biologically relevant effects at the population level (Ferrara et al. 2017).

Additionally, there is growing concern about the effect of increasing ocean noise levels due to anthropogenic sources on marine organisms, particularly marine mammals. Effects of noise exposure on marine organisms can be characterized by the following range of physical and behavioral responses (Richardson *et al.* 1995):

1. Behavioral reactions—Range from brief startle responses, to changes or interruptions in feeding, diving, or respiratory patterns, to cessation of vocalizations, to temporary or permanent displacement from habitat.
2. Masking—Reduction in ability to detect communication or other relevant sound signals due to elevated levels of background noise.
3. Temporary threshold shift—Temporary, fully recoverable reduction in hearing sensitivity caused by exposure to sound.
4. Permanent threshold shift—Permanent, irreversible reduction in hearing sensitivity due to damage or injury to ear structures caused by prolonged exposure to sound or temporary exposure to very intense sound.
5. Non-auditory physiological effects—Effects of sound exposure on tissues in non-auditory systems either through direct exposure or as a consequence of changes in behavior, (*e.g.*, resonance of respiratory cavities or growth of gas bubbles in body fluids).

Researchers measured underwater sound pressure levels for 1,582 unique ships that transited the core critical habitat of the SRKWs during 28 months between March, 2011, and October, 2013. Median received spectrum levels of noise from 2,809 isolated transits were found to be elevated relative to median background levels not only at low frequencies (20–30 dB re 1 $\mu\text{Pa}^2/\text{Hz}$ from 100 to 1,000 Hz), but also at high frequencies (5–13 dB from 10,000 to 96,000 Hz). Thus, noise received from ships at ranges less than 3 km extended to frequencies used by odontocetes (toothed whales, including SRKW). The researchers found that most ship classes show a linear relationship between source level and vessel speed with a slope near +2 dB per m/s (+1 dB/knot). Mean ship speeds during measurements were 7.3 ± 2.0 m/s (14.1 ± 3.9 knots).

Although the hearing range of killer whales and other mid-frequency odontocetes (*e.g.* sperm whales) is believed to extend between 150 and 160,000 Hz, their peak sensitivity is between about 15,000 and 20,000 Hz, and acoustic sensitivity falls off sharply below 600 Hz and above 114,000 Hz (Branstetter *et al.* 2017). Viers *et al.*, 2015, found that noise from large ships extends into frequencies used by SRKWs for echolocation. Thus, tanker-related noise has the potential to result in some type of behavioral disturbance or harassment, including displacement, site abandonment (Gard 1974; Reeves 1977; Bryant *et al.* 1984), and masking (Richardson *et al.* 1995). These disturbances could be causing minor, short-term displacement and avoidance, alteration of diving or breathing patterns, and less responsiveness when feeding.

Another concern for vessel noise is the potential to cause acoustically induced stress (Miksis *et al.* 2001) which can cause changes in heart rate, blood pressure, and gastrointestinal activity. Stress can also involve activation of the pituitary-adrenal axis, which stimulates the release of more adrenal corticoid hormones. Stress-induced changes in the secretion of pituitary hormones have been implicated in failed reproduction (Moberg 1987, Rivest and Rivier 1995) and altered metabolism (Elasser *et al.* 2000), immune competence (Blecha 2000) and behavior.

Larger tanker-type vessel traffic in Puget Sound generally stay in shipping lanes within the inland waters, they are not targeting or following whales and as the ships are moving while making noise means that the noise is also transitory. As such co-occurrence with large tanker-type traffic is expected to be short-term and transitory when whale presence overlaps with ship presence.

This means vessels not targeting the whales can still cause disturbance and impair the whales' ability to find food and interact with each other. Given this information, tanker-type vessels can cause ongoing low level disturbance of SRKW periodically in the action area. However, we are not currently able to meaningfully measure responses specific to this noise.

Fishing vessels are also found in close proximity to the whales in inland waters and were responsible for 13% of the incidents inconsistent with the Be Whale Wise Guidelines and non-compliant with federal regulations in 2019 (Shedd 2019). These activities included entering a voluntary no-go zone and fishing within 200 yards of the whales. A number of recommendations to improve compliance with guidelines and regulations are being implemented in inland waters by a variety of partners to further reduce vessel disturbance (Ferrara et al. 2017).

The majority of vessels in close proximity to SRKW in inland waters are commercial whale watching vessels and recreational whale watching vessels and the average number of boats accompanying whales can be high during the summer months (i.e., from 2013 to 2017 an average of 12 to 17 boats (Seely 2020)).

Vessels are subject to existing federal regulations prohibiting approach closer than 200 yards or positioning in the path of the whales within 400 yards (with exemptions for vessels lawfully engaged in commercial or treaty Indian fishing that are actively setting, retrieving, or closely tending fishing gear). State regulations also mandate protections for SRKWs (see RCW 77.15.740, mandating 300-400 yard approach limits, 7 knots or less speed within ½ nautical mile of the whales). NMFS and other partners have outreach programs in place to educate vessel operators on how to avoid impacts to whales. The average number of vessels with the whales decreased in 2018 and 2019 due to decreased viewing effort on SRKWs by commercial whale watching vessels, with an average of 10 and 9 vessels with the whales at any given time, respectively (Shedd 2020).

Stormwater

Mackenzie et al. 2017 found that stormwater is the most important pathway to Puget Sound for most toxic contaminants, transporting more than half of the Sound's total known toxic load (Ecology & King County 2011). During a robust Puget Sound monitoring study, toxic chemicals were detected more frequently and at higher concentrations during storm events compared with baseflow for diverse land covers, pointing to stormwater pollution (Ecology 2011). The Puget Sound basin has over 4,500 unnatural surface water and stormwater outfalls, 2,121 of which discharge directly into the Sound (WDNR 2015).

In general, the pollutants in the existing stormwater discharge are diverse. The discharge itself comes from rainfall or snowmelt moving over and through the ground, also referred to here as "runoff." As the runoff travels along its path, it picks up and carries away natural and anthropogenic pollutants (U.S. EPA 2016b). Pollutants in stormwater discharge typically include

- Excess fertilizers, herbicides, insecticides and sediment from landscaping areas.
- Chemicals and salts from de-icing agents applied on sidewalks, driveways, and parking areas.

- Oil, grease, PAHs and other toxic chemicals from roads and parking areas used by motor vehicles.
- Bacteria and nutrients from pet wastes and faulty septic systems.
- Metals (arsenic, copper, chromium, lead, mercury, and nickel) and other pollutants from the pesticide use in landscaping, roof runoff (WDOE 2014), decay of building and other infrastructure, and as airborne particles from street and tire wear.
- Atmospheric deposition from surrounding land uses.
- Metals, PAHs, PBDEs, and phthalates from roof runoff.
- Erosion of sediment and attached pollutants due to hydromodification.

(Buckler and Granato 1999; Colman *et al.* 2001; Driscoll *et al.* 1990; Kayhanian *et al.* 2003; Van Metre *et al.* 2006).

When considered at the landscape scale, the baseline condition of Puget Sound nearshore habitat is a degraded state overall, with reduced water quality, reduced forage and prey availability, reduced quality of forage and prey communities, reduced amount of estuarine habitat, reduced quality of nearshore and estuarine habitat, and reduced condition of migration habitat due to structures noise and vessel perturbations. Each of these conditions of the baseline exerts downward pressure on all cohorts of all populations of each listed species considered in the Opinion for the duration of their time in the action area. Loss of production of Chinook salmon from habitat degradation reduces available forage for SRKWs. The baseline currently constrains the carrying capacity of the action area and limits its potential for serving recovery of these species. Overall, the nearshore is impacted in many areas by the degradation from coastal development and pollution. The status of deep water habitat is impacted by remaining derelict fishing gear and degraded water quality among other factors. The input of pollutants affects water quality, sediment quality, and food resources in the nearshore and deep-water areas of critical habitat.

NMFS's management strategy for conservation and recovery of listed salmonids in the West Coast has long been premised on reducing adverse effects among all of the "4 Hs" namely, Hatcheries, Hydropower, Harvest, and Habitat. Each has had a role in the factors for decline of west coast salmonids, each has been the subject of section 7 consultations, and each has been found to have continuing negative influence on species' viability. Example dams such as White River Dam, previously operated by Puget Sound Energy, Mud Mountain Dam (NMFS 2014) operated by the USACE for the purpose of flood control operations, and as needed to facilitate maintenance activities at the downstream White River diversion dam, and Howard Hanson Dam (NMFS 2019c) operated by the USACE for downstream flood damage reduction, have each been found to jeopardize ESA listed fish, and in the case of Mud Mountain and Howard Hanson, jeopardy to PS Chinook salmon posed a secondary threat of jeopardy to SRKW.

The outcomes of those jeopardy opinions include the surrender of the White River FERC license. Puget Sound Energy retired the hydro project in 2004. Cascade Water Alliance purchased it from the company in 2009 and intends to complete a habitat conservation plan for its water. Passage improvements at Mud Mountain Dam have already reduced fish mortality, and while new passage is being designed for Howard Hanson Dam, the USACE is evaluating modifications to

its retention and release schedule of water to benefit egg in spawning areas downstream of the dam. In each case, modifications to avoid jeopardizing listed species are being undertaken.

The environmental baseline would also include the projected effects of climate change for the time period commensurate with the effects of the proposed actions. Mauger et al (2015) predict that circulation in Puget Sound is projected to be affected by declining summer precipitation, increasing sea surface temperatures, shifting streamflow timing, increasing heavy precipitation, and declining snowpack. While these changes are expected to affect mixing between surface and deep waters within Puget Sound, it is unknown how these changes will affect upwelling. Changes in precipitation and streamflow could shift salinity levels in Puget Sound by altering the balance between freshwater inflows and water entering from the North Pacific Ocean. In many areas of Puget Sound, variations in salinity are also the main control on mixing between surface and deep waters. Reduced mixing, due to increased freshwater input at the surface, can reduce phytoplankton growth, impede the supply of nutrients to surface waters, and limit the delivery of dissolved oxygen to deeper waters. Patterns of natural climate variability (e.g., El Niño/La Niña) can also influence Puget Sound circulation via changes in local surface winds, air temperatures, and precipitation.

All three ESA-listed Puget Sound salmonids were classified as highly vulnerable to climate change in a recent climate vulnerability assessment (Crozier et al. 2019). In estuarine environments, the two greatest concerns associated with climate change are rates of sea-level rise and temperature warming (Wainwright and Weitkamp 2013, Limburg et al. 2016). While the effects of climate change-induced ocean acidification on invertebrate species are well known, the direct exposure effects on salmon remains less certain (Crozier et al. 2019).

The world's oceans are becoming more acidic as increased atmospheric CO₂ is absorbed by water. The North Pacific Ocean is already acidic compared to other oceans, making it particularly susceptible to further increases in acidification (Lemmen et al. 2016). Laboratory and field studies of ocean acidification show it has the greatest effects on invertebrates with calcium-carbonate shells, and relatively little direct influence on finfish; see reviews by Haigh et al. (2015) and Mathis et al. (2015). Consequently, the largest impact of ocean acidification on salmon is likely to be its influence on marine food webs, especially its effects on lower trophic levels, which are largely composed of invertebrates such as pteropods, larval crabs, and krill, which play a significant role in some salmon diets (Haigh et al. 2015, Mathis et al. 2015, Wells et al. 2012). Marine invertebrates fill a critical gap between freshwater prey and larval and juvenile marine fishes, supporting juvenile salmon growth during the important early-ocean residence period (Daly et al. 2009, 2014).

Physiological effects of acidification may also impair olfaction, which could hinder homing ability (Munday et al. 2009), along with other developmental effects (Ou et al. 2015). Using the criteria of Morrison et al. (2015) for scoring, PS Chinook salmon, HC Chum salmon, and PS steelhead had low-to-moderate sensitivity to ocean acidification (Crozier et al. 2019).

The same document states that “sea level rise is projected to expand the area of some tidal wetlands in Puget Sound but reduce the area of others, as water depths increase and new areas become submerged. For example, the area covered by salt marsh is projected to increase, while

tidal freshwater marsh area is projected to decrease. Rising seas will also accelerate the eroding effect of waves and surge, causing unprotected beaches and bluffs to recede more rapidly. The rate of sea level rise in Puget Sound depends both on how much global sea level rises and on regionally-specific factors such as ocean currents, wind patterns, and the distribution of global and regional glacier melt. These factors can result in higher or lower amounts of regional sea level rise (or even short-term periods of decline) relative to global trends, depending on the rate and direction of change in regional factors affecting sea level” (Mauger et al. 2015).

Fisheries

Puget Sound salmon fisheries for Chinook, coho, chum, and Fraser River sockeye and pink salmon are managed by the State of Washington and the Indian tribes with treaty rights to fish in Puget Sound. These fisheries are managed consistent with the provisions of the Pacific Salmon Treaty, an international agreement between the U.S. and Canada, which also governs fisheries in South East Alaska (SEAK), those off the coast of British Columbia, the Washington and Oregon coasts, and the Columbia River. Canadian and SEAK salmon fisheries impact salmon stocks from the states of Washington, Oregon, and Idaho as well as salmon originating in SEAK and Canadian waters. Fisheries off the coast of Washington and Oregon and in inland waters, such as the Puget Sound, harvest salmon originating in U.S. West Coast and Canadian river systems. The PST provides a framework for the management of salmon fisheries in these U.S. and Canada waters that fall within the PST’s geographical scope. The overall purpose of the fishing regimens, is to accomplish the conservation, production, and harvest allocation objectives set forth in the PST (<https://www.psc.org/publications/pacific-salmon-treaty/>). The PST provides for the U.S. and Canada to each manage their own fisheries to achieve domestic conservation and allocation priorities, while remaining within the overall limits agreed to under the PST. In 2018, U.S. and Canadian representatives reached agreement to amend versions of five expiring Chapters of Annex IV (Turner and Reid 2018); both countries have since executed this agreement.

Because the Puget Sound Chinook salmon are listed under the ESA and are subject to management under the PST, objectives for Puget Sound salmon fisheries are designed to be consistent with both of these laws. Generally, objectives for Puget Sound Chinook populations are agreed by the State and tribes, in coordination with NMFS. In recent years, NMFS has consulted with the BIA on that agency’s assistance to the tribes in managing Puget Sound fisheries; in the resulting biological opinions NMFS has considered the effects of the proposed state and tribal fisheries for the year on Puget Sound Chinook and SRKW. The most recent opinion was issued in May 2020 concluded the fisheries were not likely to jeopardize Puget Sound Chinook or SRKW, and not likely to adversely modify their critical habitat.

The new PST Agreement includes reductions in harvest impacts for all Chinook fisheries within its scope and refines the management of coho salmon caught in these areas. The new Agreement includes reductions in the allowable annual catch of Chinook salmon in the SEAK and Canadian West Coast of Vancouver Island and Northern British Columbia fisheries by up to 7.5 and 12.5 percent, respectively, compared to the previous agreement. The level of reduction depends on the Chinook abundance in a particular year. This comes on top of the reductions of 15 and 30 percent for those same fisheries that occurred as a result of the prior 10-year agreement (2009

through 2018). Harvest rates on Chinook salmon stocks caught in southern British Columbia and U.S. salmon fisheries, including those under the jurisdiction of the PFMC are reduced by up to 15% from the previous agreement (2009 through 2018). Beginning in January 2020 this will result in an increased proportion of abundances of Chinook salmon migrating to waters more southerly. Although provisions of the updated agreement are complex, they were specifically designed to reduce fishery impacts in all fisheries to respond to conservation concerns for a number of U.S. and Canadian stocks.

In 2019, NMFS consulted on impacts to ESA-listed species from several U.S. domestic actions associated with the new PST agreement (NMFS 2019d) including federal funding of a conservation program for critical Puget Sound salmon stocks and SRKW prey enhancement. The 2019 Opinion (NMFS 2019d) included a programmatic consultation on the PST funding initiative. In Fiscal Year 2020, Congress appropriated \$35.1 million dollars for implementation of U.S. domestic activities associated with implementation of the new PST agreement, of which \$5.6 million is being used for increased hatchery production to support prey abundance for SRKW and \$13.5 million is being used in support of Puget Sound Critical Stock Conservation and Habitat Restoration and Protection, consistent with the funding initiative. The beneficial effects of these activities (i.e., increases in the abundance of Chinook salmon available as prey to SRKW, hatchery conservation programs to support critical Puget Sound Chinook populations, and improved habitat conditions for those populations) are expected to begin in the next 3-5 years. Subsequent specific actions (i.e., hatchery production programs) will undergo separate consultations, tiered from the programmatic consultations (NMFS 2019d) to assess effects for site-specific actions. The harvest management provisions of the new Agreement and the appropriations to initiate the conservation activities are in place.

Hatcheries

Hatcheries can provide benefits to the status of Puget Sound Chinook and steelhead by reducing demographic risks and preserving genetic traits for populations at low abundance in degraded habitats. In addition, hatcheries help to provide harvest opportunity, which is an important contributor to the meaningful exercise of treaty rights for the Northwest tribes. Hatchery-origin fish may also pose risk to listed species through genetic, ecological, or harvest effects. Seven factors may pose positive, negligible, or negative effects to population viability of naturally produced salmon and steelhead. These factors are:

- (1) the hatchery program does or does not remove fish from the natural population and use them for hatchery broodstock,
- (2) hatchery fish and the progeny of naturally spawning hatchery fish on spawning grounds and encounters with natural-origin and hatchery fish at adult collection facilities,
- (3) hatchery fish and the progeny of naturally spawning hatchery fish in juvenile rearing areas,
- (4) hatchery fish and the progeny of naturally spawning hatchery fish in the migration corridor, estuary, and ocean,
- (5) research, monitoring, and evaluation that exists because of the hatchery program,
- (6) the operation, maintenance, and construction of hatchery facilities that exist because of the hatchery program, and

- (7) fisheries that exist because of the hatchery program, including terminal fisheries intended to reduce the escapement of hatchery-origin fish to spawning grounds.

Beginning in the 1990s, state and tribal co-managers took steps to reduce risks identified for Puget Sound hatchery programs as better information about their effects became available (PSIT and WDFW 2004), in response to reviews of hatchery programs (e.g., Busack and Currens (1995), HSRG (2000), Hatchery Scientific Review Group (2002)), and as part of the region-wide Puget Sound salmon recovery planning effort (SSPS 2005). The intent of hatchery reform is to reduce negative effects of artificial propagation on natural populations while retaining proven production and potential conservation benefits. The goals of conservation programs are to restore and maintain natural populations. Hatchery programs in the Pacific Northwest are phasing out use of broodstocks that differ substantially from natural populations, such as out-of-basin or out-of-ESU stocks, and replacing them with fish derived from, or more compatible with, locally adapted populations. The reforms proposed are to ensure that existing natural salmonid populations are preserved, and that hatchery-induced genetic and ecological effects on natural populations are minimized.

About one-third of the hatchery programs in Puget Sound incorporate natural-origin Chinook salmon as broodstock for supportive breeding (conservation) or harvest augmentation purposes. Use of natural-origin fish as broodstock for conservation programs is intended to impart viability benefits to the total, aggregate population by bolstering total and naturally spawning fish abundance, preserving remaining diversity, or improving population spatial structure by extending natural spawning into unused areas. Integration of natural-origin fish for harvest augmentation programs is intended to reduce genetic diversity reduction risks by producing fish that are no more than moderately diverged from the associated, donor natural population. Incorporating natural-origin fish as broodstock for harvest programs produces hatchery fish that are genetically similar to natural-origin fish, reducing risks to the natural population that may result from unintended straying and spawning by unharvested hatchery-origin adults in natural spawning areas. To allow monitoring and evaluation of the performance and effects of programs incorporating natural-origin fish as broodstock, all juvenile fish are marked prior to release with Coded Wire Tags (CWTs) and/or with a clipped adipose fin so that they can be differentiated and accounted for separately from juvenile and returning adult natural-origin fish.

Chinook salmon stocks are artificially propagated through 41 programs in Puget Sound. Currently, the majority of Chinook salmon hatchery programs produce fall-run (also called summer/fall) stocks for fisheries harvest augmentation purposes. Supplementation programs implemented as conservation measures to recover early returning Chinook salmon operate in the White (Appleby and Keown 1994), Dungeness (Smith and Sele 1995), and North Fork Nooksack rivers, and for summer Chinook salmon on the North Fork Stillaguamish and Elwha Rivers (Fuss and Ashbrook 1995; Myers et al. 1998). Supplementation or re-introduction programs are in operation for early Chinook in the South Fork Nooksack River, fall Chinook in the South Fork Stillaguamish River (Tynan 2010) and spring and late-fall Chinook in the Skokomish River (Redhorse 2014; Speaks 2017).

Conservation hatchery programs, under the PST critical stock program, are currently operating in the Nooksack, Dungeness, and Stillaguamish rivers. A new program is being developed for Mid-

Hood Canal. A programmatic consultation on the PST funding initiative was included in the consultation on SEAK fisheries (NMFS 2019d) and the 2020 funding already appropriated provides a level of certainty these programs will continue. NMFS previously reviewed both the Dungeness and Stillaguamish programs through a section 7 consultation and approved them under the 4(d) rule for threatened Chinook salmon (NMFS 2016c; 2019e). Review of the Nooksack program and development of the Mid-Hood Canal program is currently ongoing. The latter two programs will be subject to further consultation once the site specific details are fully described. Modifications to the Dungeness and Stillaguamish programs could trigger reinitiation of those site specific consultations. Consistent with the programmatic consultation on the PST funding initiative, the likely effects of these programs are described in general terms here.

Conservation programs are designed to preserve the genetic resources of salmon populations and protect against demographic risks while the factors limiting anadromous fish viability are addressed. In this way, hatchery conservation programs reduce the risk of extinction (NMFS 2005; Ford et al. 2011a). However, hatchery programs that conserve vital genetic resources are not without risk to the natural salmonid populations. These programs can affect the genetic structure and evolutionary trajectory of the natural population that the hatchery program aims to conserve by reducing genetic diversity and fitness (HSRG 2014; NMFS 2014a). More details on how hatchery programs can affect ESA-listed salmon and steelhead can be found in Appendix C of NMFS (2018a), incorporated here by reference, and summarized below.

In addition, there are new initiatives to increase hatchery production to further enhance the SRKW's prey base. As described above and in the 2019 biological Opinion on domestic actions associated with implementation of the new PST agreement (NMFS 2019f), additional hatchery production of Chinook funded through the PST funding initiative is expected to result in increased available prey throughout the SRKW's geographic range. The increases in the abundance of Chinook salmon available as prey to SRKW as a result from the funded hatchery production are expected to occur in the next 3–5 years as adult Chinook return to the action area. As site-specific actions under the PST funding initiative are identified, the effects will be analyzed through subsequent section 7 consultations, unless the activities and effects have already been analyzed through an existing consultation.

In the programmatic assessment of the PST funding initiative NMFS (2019d), we described our expectations for increased prey abundance for SRKWs through increases in the abundance of age 3-5 Chinook salmon in the times and areas most important to SRKWs. The expectations included increased abundance in inside areas (Puget Sound) in the summer and outside areas (Coast) during the winter (Dygert et al. 2018) resulting in a minimum increase of adult fish abundance by 4-5 percent in both inside areas in the summer and coastal areas in the winter. We estimated accomplishing this would require the release of 20 million smolts from hatcheries located in Puget Sound, the Columbia River, and coastal Washington areas.

2.3.2 Distinguishing Baseline from Effects of the Action

As described in more detail below in Section 2.4, and above in this Section 2.3, the effects of an action are the consequences to listed species or critical habitat that would not occur but for the proposed action and are reasonably certain to occur, whereas the environmental baseline refers to

the condition of the listed species or its designated critical habitat in the action area without the consequences caused by the proposed action. 50 CFR 402.02. Distinguishing these for new structures is relatively straightforward. Repair or replacement projects require a bit more explanation. As relative to this consultation, we must distinguish what impacts from existing structures are properly attributed to the baseline compared with what future impacts are consequences of the proposed action. At its most basic, a repair or replacement project extends the life of the part of the structure being repaired or replaced. The impacts of the structure for the duration of that new life would not occur but for the USACE permit approval and so we consider them a consequence of the action. We explain additional nuances below.

As an initial matter, NMFS acknowledges that when the USACE originally permits a structure, or a part of a structure, there is no “end date” on the permit that would require the future removal of that structure, or the piece of the structure. Further, to facilitate the existence of a permitted and structurally intact structure into perpetuity, regular maintenance will be necessary. Some future maintenance will require an additional USACE permit, and other future maintenance may occur without any additional authorization. The types of expected maintenance that will not require an additional USACE permit are included as part of the proposed action section above, and the effects of that kind of maintenance are considered below as part of the consequences of the proposed action. Future maintenance that will require an additional USACE permit is not part of this proposed action and thus effects stemming from that kind of maintenance are therefore not covered, nor analyzed by, this consultation. Finally, it is within the Corps’ discretionary authority to grant or deny the 39 permits that form the basis of this consultation. See Appendix 1 at 3 (explaining that if the applicants request the Corps make a permit decision based on the findings of the final Opinion and “. . . [if] the applicant is unwilling to meet the RPA requirements, the likely outcome would be a permit denial”).

The expected issuance of future permits to facilitate work on, and maintain the structural integrity of, the structures that are part of this proposed action allows us to make reasonable assumptions about the maximum amount of time certain types of structures will exist before the owner will seek a new USACE permit. The maximum expected number of years before another USACE permit will be needed to perform maintenance (hereafter, useful life period), as explained next, allows NMFS to limit our analysis to those expected time frames. Limiting NMFS’s analysis of the impacts of a structure to incremental periods, helps solve a practical problem too: NMFS cannot reasonably predict all future effects of a structure in perpetuity but it can predict effects during the useful life of a structure as described next.

Two main assumptions form the basis of our analysis. First, we expect existing structures to have a maximum “useful life” for the following number of years before requiring an additional USACE permit to maintain their structural integrity: 40 years for overwater structures (residential pier, ramps and floats, marinas and other commercial structures) and 50 years for shoreline bulkheads. Similarly, we assume that the repairs or replacements being authorized by the USACE will extend the life of the portion of the structure being worked on by 40 to 50 years, respectively. Second, we assume that an owner will typically request a USACE permit ten years before the existing “useful life” time period elapses. Thus, absent information to the contrary and for structures in average condition, we assume that existing nearshore and overwater structures that are part of this proposed action would have remained on the landscape in their current state,

with no change in usage, for ten more years if the applicant had not requested a USACE permit at this time. Our assumptions are based on our experience in previous consultations showing that applicants typically seek USACE authorization to replace or significantly repair a structure when it nears the end of its useful life but before the structure is compromised to the point it is unsafe or not usable.

As introduced above, there is an increment of future impacts stemming from the existing structures that we are considering as part of the environmental baseline. Specifically, we expect that the existing structures that are part of this proposed action could typically persist in the environment and cause the same effects for some additional years left of the structure's *original* useful life. Here, based on the above assumptions, for this consultation we assume that the remaining useful life period for any of the existing structures (or piece of structure) being repaired or replaced, is ten years absent evidence to the contrary. In these instances where useful life remains, we will consider the future impacts of an existing structure for the remaining part of its original useful life period as part of the environmental baseline.

With this in mind, we consider the difference (or “delta”) between the expected impacts during the remaining useful life of an existing structure (or piece of a structure) in its current state (the environmental baseline) and the impacts of the part of the structure proposed to be repaired or replaced for that same time period in its repaired or replaced state to be “effects of the action.” Since the proposed replacements or repairs considered in this consultation are typically, although not always, more environmentally friendly than the existing structures they replace or repair, the difference between the future impacts of the existing structure during the remaining useful life period and the impacts during that same time-frame are mostly positive. Stated differently, the proposed actions generally result in some reduction of impacts during the remaining useful life that would not occur but for the proposed actions. Based on the above assumptions and absent information to the contrary, we assume the temporal extent of the difference in impacts is ten years. We then consider all impacts caused by the replaced or repaired structure that occur *beyond* the remaining, original useful life period, for a total future useful life of 40 or 50 years, respectively—along with any associated short-term impacts, such as construction related activities, that are a direct result of the proposed action—to be an “effect of the action” and analyze all of these in the following section.

To be clear, in some instances, the proposed action will authorize the repair or replacement of only a small portion of a structure (e.g., a few piles or the replacement of floats). In all instances where the repair or replacement is something less than the entire structure, unless requested otherwise, we have limited our effects of the action and baseline analysis for this consultation to only those parts being repaired or replaced. In all repair or replacement cases, we assume, absent information to the contrary, that the portion being repaired had ten years of useful life remaining, and that the repair extended the life of that part of the structure, from the date of this Biological Opinion, by an additional 40 years for overwater structures (residential pier, ramps and floats, marinas and other commercial structures) and 50 years for shoreline bulkheads, for a total useful life of 40 or 50 years, respectively.

To account for the remaining “useful life period,” which we assumed was 10 years for all the proposed actions that contain existing structures being analyzed as part of this consultation with

the exceptions noted in the consultation history, the NHVM (introduced in the Analytical Approach (Section 2.1), also see Appendix 5) has calculated and ascribed, a 10-year “credit” for projects that are removing and replacing existing structures in part or in whole. This particular credit, along with any credit for improving conditions as a result of a change in project design, is detailed more below in Section 2.4. Also, more detailed information on this particular credit as it applies to each proposed project is found in the attachments designated by USACE identification number at the end of this Opinion.

During the preparation of this Opinion, the USACE and some applicants have asserted that NMFS should also consider potential effects associated with the future degradation of all existing structures as part of the baseline. They argue that but for the current permit, an existing structure would degrade over time. We disagree that our analysis needs to consider those kinds of theoretical effects for two reasons. First, NMFS acknowledges that for existing structures there could be multiple scenarios relative to how an existing nearshore, in- and/or overwater structures would persist and degrade in the marine shoreline environment if the owner ceased to perform any maintenance. This range of potential outcomes is exponential, to the point it is not reasonable to assume them all, nor is there currently enough data or analysis that would support such an analysis. In general, for scenarios where structures are left to degrade beyond a useable point, we acknowledge that such degradation could take more than 10 years. Further, the range of possible scenarios could result in impacts associated with a degrading structure that overtime would be both negative (e.g., decomposing creosote impacts to water quality) and positive (e.g., overwater cover is no longer obstructing migration). This could also mean that at some point, the structure would fall out of compliance with the USACE original permit (and at the very least state and local permits). Failure to maintain nearshore, in- and/or overwater structures is not unheard of (Patterson et al 2014, King County 2019). However there is also a preponderance of evidence (including the 39 nine projects evaluated in this Opinion and thousands of redevelopment consultations that have occurred with the USACE since salmon were listed) that demonstrate that owners of nearshore, in- and overwater structures do at some point in time apply for USACE permit before the structure falls into a less-than useful state. As the proposed applicants all have demonstrated a desire to maintain their structures by applying for a USACE permit, NMFS has assumed that is reasonably likely that regular maintenance will occur before complete degradation. Moreover, granting the requested permits is within the Corps’ discretionary authority (Appendix 1) and therefore the consequences of the issuance of these permits—namely, impacts associated with a prolonged life of structures in a usable state for an additional 40 to 50 years—is properly considered a consequence that would not occur but for the proposed action. For these reasons, we appropriately declined to consider a range of possible outcomes that might occur absent regular maintenance.

Second, even if we were to consider what might happen to a structure absent the proposed repair or replacement, and such impacts should be attributed to the baseline, those impacts are still part of the calculus, they have just been moved out in time to occur after the new useful life (rather than the existing useful life). The basic consequence of the currently proposed actions is to extend the life of the part of the structure being worked on. Any effects of a possible degradation, instead of occurring now, will occur, if at all, after the new useful life expires. In that way, the potential effects that might occur should the applicant cease maintenance are still part of the baseline.

2.4 Effects of the Action

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

The effects of the USACE’s issuance of permits for the 39 projects for nearshore construction will include effects ranging from temporary (typically related to the impacts of construction activity), to persistent and intermittent (from the use or operation of the permitted structures), to enduring (from effects of the structures on the environment and their impacts on habitat features that might be diminished during the new “useful life” period). Also included in this section, are any positive effects of project design features, designed to reduce the impact of a structure, during any of its remaining useful life (the “credits” described in the Environmental Baseline Section 2.3.2). Figure 14 and 15 illustrate this approach and also depict the NHVM’s differing treatment of already impacted vs. untouched habitat and its assessment of lesser impacts for repaired or replacement projects compared with greater impacts (2x’s) expected for expansions to an existing structure or an entirely new structure (Appendix 5 further describes how the model calculates the effects of the action in light of the environmental baseline). Table 17 summarizes the quantitative, project-specific credits and any debits the model generated for the projects as currently proposed.

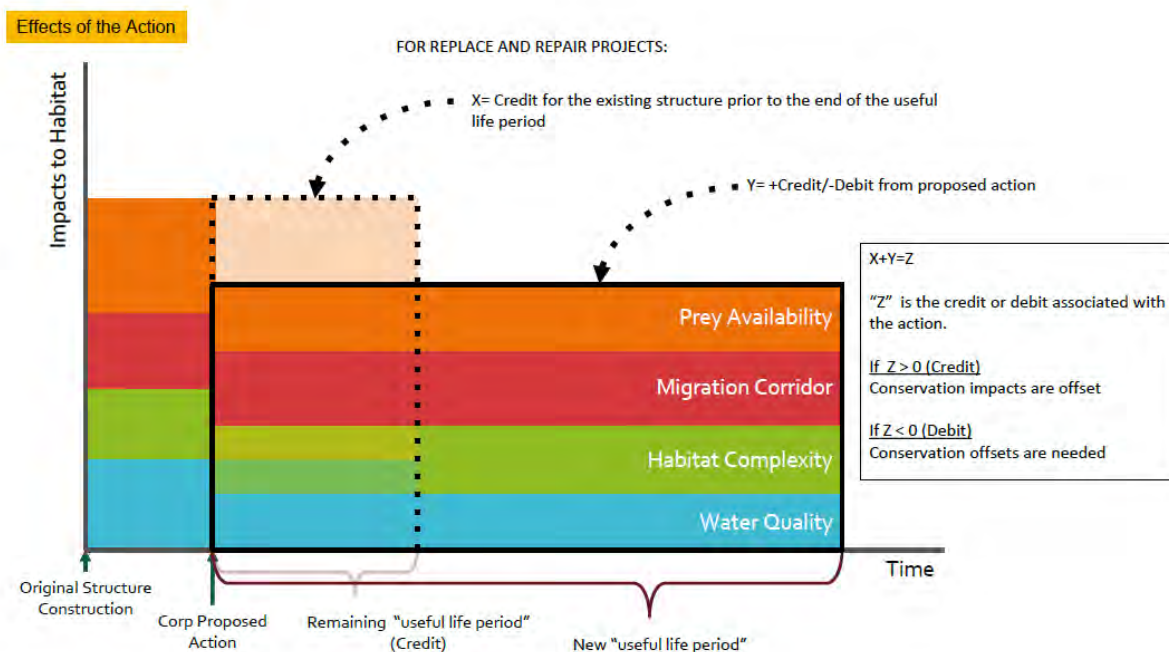


Figure 14 Effects of the Action: Illustration depicts “credit” for early removal of and existing structure plus effects of a proposed replacement structure. Note the scale of time for original structure is condensed for the sake of readability.

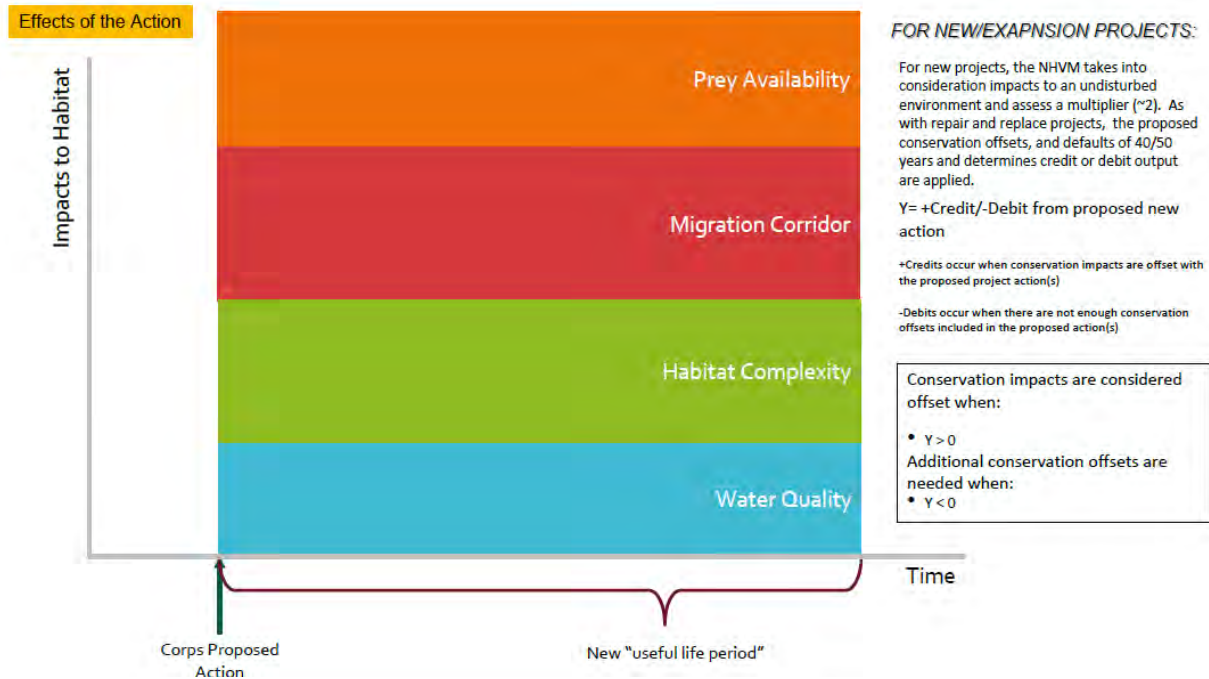


Figure 15. Effects of the Action: Illustration depicts debits for a new or expanded component of a nearshore structure.

Table 17. NWS number, proposed conservation credits for removing existing structure and improved project design, and net conservation credit resulting from the proposed action and proposed offsets as of Oct 23, 2020, for each project.

NWS#	Proposed Conservation Credits (10-yr credit for removing existing structure and any improved project design)	Effects of the Action - Resulting conservation credit (+)/debit(-) from proposed action, impacts resulting from new “useful life period” added to the proposed conservation credits in adjacent column)
NWS-2017-796	831.2	-252.1
NWS-2017-587	103.3	-131.6
NWS-2018-963	103.6	23.2
NWS-2018-229	91.6	1.8
NWS-2018-465	64.1	-82.3
NWS-2018-53	140.4	-352.3
NWS-2018-636	62.7	-20.8
NWS-2017-955	107.9	-101.8
NWS-2018-760	16.9	-54.4
NWS-2017-840	54.5	-87.1
NWS-2018-981	84.8	-1.9
NWS-2018-1143	79.6	3
NWS-2018-570	724.3	-329.2
NSW-2018-1165	30	16.4
NWS-2017-573	45.8	-1045.2
NWS-2018-382	91.8	-39.6
NWS-2019-207	211.7	-80.7
NWS-2019-552	2	-374.8
NWS-2019-676	3.5	0
NWS-2019-526	169.3	15.5
NWS-2018-750	559.9	-146.2
NWS-2018-39	13.4	-28.3
NWS-2019-491	0	-260.7
NWS-2019-664	51.6	-550.1
NWS-2019-336	634.7	-530.5
NWS-2018-525	271.5	-202.3
NWS-2018-492	2351.1	-2043.14
NWS-2019-478	0	-9.3
NWS-2019-956	154.6	-212.05
NWS-2019-0883	39.5	14.3
NWS-2019-728	14.6	7.8
NWS-2019-690	62.8	-37.7

NWS#	Proposed Conservation Credits (10-yr credit for removing existing structure and any improved project design)	Effects of the Action - Resulting conservation credit (+)/debit(-) from proposed action, impacts resulting from new “useful life period” added to the proposed conservation credits in adjacent column)
NWS-2019-0703	4017.6	957.4
NWS-2020-0204	0	-1185.6
NWS-2017-550	557.1	440.2
NWS-2019-101	319.1	208.8
NWS-2019-832	65.3	30
NWS-2017-427	0.1	-2.1
NWS-2019-983	152	78.6
Total	12283.9	-6364.79

All of the proposed actions have similar project components that resulted in co-occurrence of listed ESA-species or designated critical habitat and are therefore addressed collectively in this effects analysis section. Table 18 summarizes respective project components.

Table 18. The components of the proposed actions that were relevant to the effects analysis by USACE project.

Project totals:	22	22	2	6	2	26	16	2
	Components of the proposed actions relative to the effect analysis							
NWS #	Installed Piling	Removed Piling	Installed Mooring Buoy(s)	Boat Ramp Installed	Dredging	OWS, New/Removed & Replaced/Installed	Bulkhead New Removed/ Replaced	Stormwater outfall or conveyance
NWS-2017-796	x	x	x			x		
NWS-2017-587							x	
NWS-2018-963	x	x			x	x		
NWS-2018-229							x	
NWS-2018-465							x	
NWS-2018-53							x	
NWS-2018-636	x	x				x		
NWS-2017-955		x				x	x	
NWS-2018-760	x	x				x		
NWS-2017-840							x	
NWS-2018-981	x	x				x		
NWS-2018-1143							x	
NWS-2018-570	x	x				x	x	
NSW-2018-1165	x	x				x		
NWS-2017-573	x			x		x		
NWS-2018-382							x	
NWS-2019-207						x		
NWS-2019-552	x						x	
NWS-2019-676		x				x		
NWS-2019-526	x	x				x		
NWS-2018-750	x	x				x		
NWS-2018-39				x		x		
NWS-2019-491				x		x		
NWS-2019-664							x	
NWS-2019-336	x	x				x		
NWS-2018-525	x	x				x		
NWS-2018-492	x	x					x	x

Project totals:	22	22	2	6	2	26	16	2
	Components of the proposed actions relative to the effect analysis							
NWS #	Installed Piling	Removed Piling	Installed Mooring Buoy(s)	Boat Ramp Installed	Dredging	OWS, New/Removed & Replaced/Installed	Bulkhead New Removed/ Replaced	Stormwater outfall or conveyance
NWS-2019-478					x			
NWS-2019-956							x	
NWS-2019-0883	x	x				x		
NWS-2019-728							x	
NWS-2019-690	x	x		x		x	x	
NWS-2019-0703	x	x				x		
NWS-2020-0204	x					x	x	
NWS-2017-550	x	x				x		
NWS-2019-101	x	x				x		
NWS-2019-832	x	x		x		x		
NWS-2017-427	x	x	x			x		
NWS-2019-983		x		x		x		x

The effects analyses in this section will include both an overarching description of effects caused by the construction and presence of over- and in-water structures as well as a specific analyses of the effects we expect as a result of each proposed project. Table 19 provides project-specific summaries of effects and is intended to supplement the general effects descriptions in this Section. This section also analyzes effects resulting from actions intended to offset the impacts of a proposed structure (e.g., removal of creosote piles).

Table 19. Summary of effect by USACE project.

Project Totals	34	32	26	4	8	5	18	15	18
	Effects/Disruptions to listed species and critical habitat								
NWS#	Noise (Pile Driving, construction vessel noise)	Water Quality (Suspended Sediments & Contaminant, Stormwater, Vessel Discharge)	Nearshore migration corridors (OWS)	Feeder Bluff	Estuary	Pocket Estuary	Forage Fish Spawning	Submerged Aquatic Vegetation (SAV)	Drift Cell
NWS-2017-796	x	x	x						x
NWS-2017-587		x				x	x	x	
NWS-2018-963	x		x			x		x	
NWS-2018-229	x	x					x		x
NWS-2018-465	x	x							x
NWS-2018-53	x				x		x		x
NWS-2018-636	x	x	x					x	
NWS-2017-955	x	x	x						x
NWS-2018-760	x	x	x		x				
NWS-2017-840	x	x				x			x
NWS-2018-981	x	x	x						
NWS-2018-1143	x	x							
NWS-2018-570	x	x	x						x
NSW-2018-1165	x	x	x		x				
NWS-2017-573	x	x	x			x	x	x	x
NWS-2018-382	x	x							
NWS-2019-207	x		x			x	x	x	
NWS-2019-552	x	x	x				x		x
NWS-2019-676	x	x	x						x
NWS-2019-526	x	x	x				x	x	
NWS-2018-750	x	x	x					x	
NWS-2018-39			x				x	x	x

Project Totals	34	32	26	4	8	5	18	15	18
	Effects/Disruptions to listed species and critical habitat								
NWS#	Noise (Pile Driving, construction vessel noise)	Water Quality (Suspended Sediments & Contaminant, Stormwater, Vessel Discharge)	Nearshore migration corridors (OWS)	Feeder Bluff	Estuary	Pocket Estuary	Forage Fish Spawning	Submerged Aquatic Vegetation (SAV)	Drift Cell
NWS-2019-491		X	X		X				X
NWS-2019-664				X					X
NWS-2019-336	X	X	X		X		X		
NWS-2018-525	X	X	X				X		
NWS-2018-492	X	X	X						
NWS-2019-478	X							X	
NWS-2019-956	X	X		X			X		X
NWS-2019-0883	X	X	X		X				
NWS-2019-728	X	X		X			X	X	X
NWS-2019-690		X	X		X				
NWS-2019-0703	X	X	X					X	
NWS-2020-0204	X	X	X				X	X	X
NWS-2017-550	X	X	X				X	X	
NWS-2019-101	X	X	X				X	X	
NWS-2019-832	X	X	X				X		
NWS-2017-427	X						X		X
NWS-2019-983	X	X		X	X		X	X	X

In addition to the positive effects accounted for as credits in Table 17, this effects section also takes into account beneficial effects that will occur as a result of the removal of creosote pilings. A total of 25 proposed projects will remove 3,693 tons of creosote (Table 20). While the short-term effects of removing creosote is adverse (resuspension of containments), the removal will result in improved benthic conditions in the long run and is discussed further below.

Table 20. USACE projects that propose to remove creosote piles and number of creosote piles removed.

Total	3693
NWS#	Estimated Tons of Creosote Removed
NWS-2017-796	148
NWS-2018-963	11
NWS-2018-229	1
NWS-2018-636	15
NWS-2017-955	1
NWS-2018-760	1
NWS-2018-981	22
NWS-2018-570	179
NWS-2018-1165	10
NWS-2018-382	18
NWS-2019-207	20
NWS-2019-676	1
NWS-2019-526	22
NWS-2018-750	120
NWS-2019-336	196
NWS-2018-525	13
NWS-2018-492	198
NWS-2019-956	15
NSW-2019-0883	11
NWS-2019-690	4
NWS-2019-0703	2232
NWS-2017-550	272
NWS-2019-101	167
NWS-2019-832	12
NWS-2019-983	5

2.4.1 Temporary Effects During Construction of Structures

Authorization of construction of new or repairs to, or replacement of structures, or dredging, despite the use of BMPs to reduce suspended sediments and vessel grounding, will include (a) water quality reductions; (b) increases re-suspended contaminants; (c) increased noise in the aquatic environment; and (d) reduction of prey/forage (benthic prey, forage fish, prey fishes). Additionally, dredging activities can entrain fish.

Water Quality

Water quality is likely to be affected during in-water work associated with, replacement, expansion, or new in- and over-water structures and shoreline armoring and dredging projects. Water quality effects during construction are likely to include turbid conditions, decreased dissolved oxygen, and suspension of contaminated materials.

Turbidity: Turbid conditions can be created during pile installation, pile removal, boat ramp repairs, and excavation to install, replace or repair bulkheads. In estuaries, state water quality regulations (WAC173-201A-400) establish a mixing zone of 200 feet plus the depth of water over the discharge port(s) as measured during mean lower low water. For non-dredging activities it is expected that during the days that construction activities occur in the water, elevated suspended sediment levels could occur within this area.

Dredging activities unavoidably disturb the sediment substrates and where contaminants are present increase contaminant concentrations by re-suspending particulates, thereby allowing more contaminants to advect into the water column. Consequently, in these cases elevated water column contaminant concentration occur in the vicinity of the (upstream and downstream or upstream from) dredging, depending on the tidal stage during the dredging activity. For dredging activities that occur estuary environments, Washington state water quality regulations (WAC173-201A-400) establish a mixing zone not to extend to a downstream direction for a distance from the discharge port(s) greater than three hundred feet plus the depth of water over the discharge port(s), or extend upstream for a distance of over one hundred feet. For dredging activities it is expected that during the days that dredging occurs, elevated suspended sediment levels within this area.

Reduced Dissolved Oxygen (DO): Suspension of anoxic sediment compounds during in water work can result in reduced DO in the water column within the mixing zone area as the sediments oxidize. Based on a review of six studies on the effects of dredging on DO levels, LaSalle (1988) concluded that, when relatively low levels of suspended material are generated and counterbalancing factors such as flushing exist, anticipated DO depletion around in water work activities will be minimal. High levels of turbidity could have contemporaneous reduction in dissolved oxygen within the same affected area.

For non-dredging activities, as with suspended sediments, reduced DO is not expected to exceed the established mixing zone of 200 feet plus the depth of water over the discharge port(s) as measured during mean lower low water.

For dredging activities, as with suspended sediments, reduced DO is not expected to exceed the established mixing zone of three hundred feet plus the depth of water over the discharge port(s), or extend upstream for a distance of over one hundred feet.

Re-suspended Contaminants

In some of the proposed locations, in water work is likely to include resuspension of contaminated sediments, including the incidental discharge of contaminated materials when

creosote treated wood materials are being removed. Creosote-treated piles contaminate the surrounding sediment up to two meters away with PAHs (Evans et al. 2009). The removal of the creosote-treated piles mobilizes these PAHs into the surrounding water and sediments (Smith et al. 2008; Parametrix 2011). Projects can also release PAHs directly from creosote-treated timber during the demolition of overwater timber and if any of the piles break during removal (Parametrix 2011). The concentration of PAHs released into surface water rapidly dilutes. Smith et al. (2008) reported concentrations of total PAHs of 101.8 µg/l 30 seconds after creosote-pile removal and 22.7 µg/l 60 seconds after. However, PAH levels in the sediment after pile removal can remain high for six months or more (Smith et al. 2008). Romberg (2005) found a major reduction in sediment PAH levels three years after pile removal contaminated an adjacent sediment cap. For some of the projects, removal of creosote timber piles will reduce leaching of chemical compounds into nearshore and marine sediments, which can cause toxic conditions for organisms that use these areas (DNR 2014).

Barges and tugs will be used to construct many of the projects as well as some work associated with the offsetting habitat conservation measures. Discharge of hydraulic fluid, oils, or fuels from construction equipment would constitute an unlawful discharge and are not considered here. However, the operation of these vessels at each location are likely to have small incidental discharges caused by drippage from engines, which will introduce very small amounts of fuels, oils, or lubricants into the water. Incidental discharge of oils or fuels, and polycyclic aromatic hydrocarbons (PAHs)¹⁶ may also result from exhaust from these kinds of construction vessels, or from accidental introduction of oils or fuels from equipment in contact with water. These incidental discharges are likely at any site where such vessels are used to stage construction equipment or materials. We expect these PAHs and other contaminants to be introduced into the water column during and immediately following the proposed activity. Because these materials can disperse quickly, they can become quite widespread at very low concentration. PAHs from the exhaust of these vessels have a similar pattern of dispersal. The environmental fate of each type of PAH depends on its molecular weight. In surface water, PAHs can volatilize, photolyze, oxidize, biodegrade, bind to suspended particles or sediments, or accumulate in aquatic organisms, with bioconcentration factors often in the 10-10,000 range.

For non-dredging activities, as with suspended sediments, re-suspended contaminants are not expected to be detectable beyond background levels beyond the establish a mixing zone of 200 feet plus the depth of water over the discharge port(s) as measured during mean lower low water.

Often, dredge sites in the Puget Sound occur in highly industrialized environments that have known hazardous substances in and near the dredge sites. Contaminants in sediments and dissolved in water can have varying levels of toxicity, most often occurring as sub-lethal effects. Some of these chemicals of concern include metals (mercury, arsenic, zinc, and tri-butyl tin (TBT)), polychlorinated biphenyls (PCBs), dioxin, polycyclic aromatic hydrocarbons (PAHs), pesticides, butyl benzyl phthalate, benzyl alcohol, and benzoic acid. For dredging activities, as with suspended sediments, re-suspended contaminants are not expected to be detectable beyond background levels beyond the established mixing zone of three hundred feet plus the depth of water over the discharge port(s), or extend upstream for a distance of over one hundred feet.

¹⁶ PAH are a class of chemicals that occur naturally in coal, crude oil, and gasoline. They also are produced when coal, oil, and gas are burned.

Noise in aquatic habitat generated during in-water work

Noise is expected as a short-term consequence from construction activities during in-water work to build, repair, and replace structures and from dredging activities.

Pile Driving. Pile driving can cause high levels of underwater sound; the use of a confined or unconfined bubble curtain results in only a 10dB reduction. Pile driving can significantly increase sound waves in the aquatic habitat. The sound pressure levels from pile driving and extraction will occur contemporaneous with the work and radiate outward; the effect attenuates with distance. Cumulative sound exposure level (SEL) is a measure of the sound energy integrated across all of the pile strikes. The Equal Energy Hypothesis, described by NMFS (2007b), is used as a basis for calculating cumulative SEL (cSEL). The number of pile strikes is estimated per continuous work period. This approach defines a work period as all the pile driving between 12-hour breaks. NMFS uses the practical spreading model to calculate transmission loss, and define the area affected. Both vibratory noise and impact noise can create sufficient disturbance to affect the suitability of habitat from a behavioral and physiological sense for listed species.

Twenty of the proposed projects include pile driving activities (Table 21). Some projects proposed multiple pile types and diameter sizes, and proposed either vibratory or impacts driving for installation. To accurately assess the greatest potential for harm and exposure to listed species and their habitat we will focus this analysis on the pile type and size that will produce the greatest amount of energy for each installation method (vibratory and impact) for each project. Table 22 provides the assumptions used in the practical spreading model for each project.

Table 21. NWS number, total piles, pile type, largest pile diameter, pile installation method, maximum piles driven per day, minutes per pile, and minutes per day for each project with proposed pile driving.

NWS#	Total Piles	Pile Type	Largest Pile Diameter	Pile Installation Method	Bubble Curtain proposed	Maximum Pilings/Day	Maximum (Impact) Strikes/Pile	Maximum Pile (Impact) Strikes/Day	Minutes/Pile (Vibratory)	Minutes/Day (Vibratory)
NWS-2017-796	83	Steel	14	Impact	No	6	500	3000	0	0
NWS-2018-963	14	Steel	10	Vibratory	No	14	0	0	20	280
NWS-2018-636	15	Steel	12	Vibratory	No	7	0	0	20	140
NWS-2018-760	4	Steel	24	Vibratory	No	4	0	0	20	80
NSW-2018-981	27	Steel	12	Impact and Vibratory Combo	No	8	500	4000	20	160
NWS-2018-570	54	Steel	16	Vibratory	No	8	0	0	20	160
NWS-2017-573	52	Steel	12	Impact and Vibratory Combo	Yes	4	100	400	14	160
NWS-2019-552	29	Steel sheet pile (3.2 sf footprint)	NA	Vibratory	No	5	0	0	20	100
NWS-2019-526	12	Steel	12	Vibratory	No	8	0	0	20	160
NWS-2018-750	90	Steel	12	Vibratory	No	2	0	0	20	160
NWS-2019-336	248	Steel	30	Vibratory	No	8	0	0	20	160
NWS-2018-525	13	Steel	14	Vibratory	Yes	8	0	0	20	160
NWS-2018-492	188	Steel sheet pile (850 lf); steel pipe pile	30	Vibratory for steel sheet pile and impact for steel piles	Yes	5	4500	22500	20	100
NWS-2019-0883	23	Steel	14	Vibratory, impact if necessary	Yes	4	25	100	10	40

NWS#	Total Piles	Pile Type	Largest Pile Diameter	Pile Installation Method	Bubble Curtain proposed	Maximum Pilings/Day	Maximum (Impact) Strikes/Pile	Maximum Pile (Impact) Strikes/Day	Minutes/Pile (Vibratory)	Minutes/Day (Vibratory)
NWS-2019-0703	295	Steel	36	Vibratory with impact proofing	No	9	1200	10800	45	405
NWS-2017-550	200	Steel	12	Vibratory with impact proofing	Yes (or wood/Micarta block)	7	35	245	20	140
NWS-2019-101	127	ACZA	16	Vibratory with impact proofing	No	8	500	4000	10	80
NWS-2019-832	8	Steel	8	Vibratory	Yes	8			20	160
NWS-2019-690	4	Steel	6	Hand Dug	No	6	NA	NA	NA	NA
NWS-2017-427	1	Steel	36	Impact and Vibratory Combo	Yes	1	600	600	20	20

Given the assumptions above, underwater sound from the piles driving could exceed behavioral and injury thresholds. Table 22 details this for each project that will pile drive for each sound threshold.

Table 22. Fish and marine mammal behavioral responses to proposed pile driving.

NWS#	Pile Driving Response: Behavioral for fish (150dBRMS) (meters)	Pile Driving Response: Injury Fish $\geq$ 2g (187dBcumSE L) (meters)	Pile Driving Response: Injury Fish $<$ 2g (183dBcumSE L) (meters)	Vibratory Pile Driving Response: Behavioral for SRKW and (120dBRMS) (km)	Impact Pile Driving Response: Behavioral for SRKW and (160dBRMS) (meters)	Vibratory Pile Driving Injury for mid-frequency SRKW (198cumSEL) (meters)	Impact Pile Driving Injury for mid-frequency SRKW (185cumSEL) (meters)
NWS-2017-796	1848	283	398	NA	398	NA	18.6
NWS-2018-963	NA	NA	NA	1.8	NA	0.7	NA
NWS-2018-636	NA	NA	NA	2.2	NA	0.4	NA
NWS-2018-760	NA	NA	NA	4.6	NA	0.6	NA
NWS-2018-981	631	117	136	2.2	136	0.5	7.7
NWS-2018-570	NA	NA	NA	2.2	NA	0.5	NA
NWS-2017-573	136	16	29	2.2	29	0.5	0.4
NWS-2019-552	NA	NA	NA	10	NA	1.6	NA
NWS-2019-526	NA	NA	NA	2.2	NA	0.5	NA
NWS-2018-750	NA	NA	NA	2.2	NA	0.5	NA
NWS-2019-336	NA	NA	NA	10	NA	2.2	NA
NWS-2018-525	NA	NA	NA	2.2	NA	0.5	NA
NWS-2018-492	1000	136	136	10	22	1.6	178.6
NWS-2019-0883	398	6	12	2.2	1000	0.2	0.4
NWS-2019-0703	4642	1000	1000	21.5	46	8.6	109.5
NWS-2017-550	136	6	11	2.2	5	0.4	0.4
NWS-2019-101	215	40	46	3.4	7	0.5	2.6
NWS-2019-832	NA	NA	NA	2.2	NA	0.5	NA
NWS-2017-427	1585	83	153	21.5	341	1.2	5.4

Construction vessels. Barges and tugs will be used to construct many of the proposed projects and are expected to have adverse effects similar to those articulated for vessel impacts in the Environmental Baseline section of this Opinion. Barges will increase the amount of noise in an area surrounding each construction site and their transit paths.

Benthic Communities and Forage Species Diminishment

Areas where sediment is disturbed by pile driving, pile removal, dredging other in-or near water work such as boat ramp or bulkhead construction, repair, or replacement, and from vessels in shallow water areas to facilitate construction will disturb and diminish benthic prey communities. In areas where suspended sediment settles on the bottom, some smothering can occur which also disrupts the benthic communities. The speed of recovery by benthic communities is affected by several factors, including the intensity of the disturbance, with greater disturbance increasing the time to recovery (Dernie et al., 2003). Additionally, the ability of a disturbed site to recolonize is affected by whether or not adjacent benthic communities are nearby that can re-seed the affected area. Thus recovery can range from several weeks to many months.

Entrainment

Mechanical dredges entrain organisms that are captured within the clamshell bucket. Mechanical dredges commonly entrain slow-moving and sessile benthic epifauna along with burrowing infauna that are removed with the sediments. They also entrain algae and aquatic vegetation.

Fish entrainment is be dependent upon the likelihood of fish occurring within the dredge prism, dredge depth, fish densities, the entrainment zone (water column of the clamshell impact), location of dredging within the estuary, type of equipment operations, time of year, and species life stage. Listed fish could be entrained however, forage fish species for salmon, such as sand lance, or demersal fish like sculpins, and pricklebacks are most likely to be entrained as they reside on or in the bottom substrates with life-history strategies of burrowing or hiding in the bottom substrate (Nightingale and Simenstad 2001a). If listed fish are entrained, they are likely to be injured or killed during the entrainment. However, the total number of salmon steelhead or rockfish entrained is expected to be low.

2.4.2 Intermittent Effects From Use and Maintenance

The use and operation and maintenance of the pier, ramp, float, wharf, dock or marina structures authorized by the USACE, as part of this batch of 39 projects, will generate several types of episodic habitat effects, which will occur while the structures are present in the environment: (a) water quality reductions from vessel use and discharge of stormwater from pollution generating impervious surfaces; (b) noise from vessel operation; (c) scour from vessel operation. Each are episodic and persistent effects, co-extensive with the respective design lives of the new, expanded, repaired or replaced wharfs, piers, docks, floats, and structures.

Impacts from future maintenance that does not require a USACE permit would also be considered effects of the action. These effects are expected to be relatively minor as they are

unlikely to include in-water construction. Future maintenance would likely include activities such as replacing decking, painting, and minor repairs to shoreline bulkheads. These types of activities are not expected to have any direct impacts on listed species. However, these activities would slightly extend the life of structures, consistent with the USACE' position that their proposed authorization of near- and in-water structures includes minor maintenance that would not require additional USACE permits.

Water Quality

The proposed actions generally causes reduction in water quality stemming from vessels and/or unmanaged stormwater from upland areas as follows. A single proposed project would use ACZA-treated wood piles. These piles contribute small amounts of PAHs and metals to the surrounding waters throughout the life of the structure. The water quality impacts, caused by migration of wood preservatives, are a subset of those described, below, for stormwater. Pollutants in the post-construction stormwater runoff produced at projects that include impervious surface will come from many diffuse sources, but is most likely to occur at large commercial or municipal facilities with larger areas of impervious surface that supports vehicular traffic. The runoff itself comes from rainfall or snowmelt moving over, where it picks up and carries away natural and anthropogenic pollutants, finally depositing them into, coastal waters, (Dressing et al. 2016). Pollutants in post-construction stormwater runoff typically include:

- Excess fertilizers, herbicides, insecticides and sediment from landscaping areas;
- Oil, grease, PAHs and other toxic chemicals from roads and parking areas used by motor vehicles;
- Bacteria and nutrients from pet wastes and faulty septic systems;
- Metals (arsenic, copper, chromium, lead, mercury, and nickel) and other pollutants from the decay of building and other infrastructure;
- Atmospheric deposition from surrounding land uses; and
- Erosion of sediment and attached pollutant due to hydromodification.

(Buckler and Granato 1999; Colman et al. 2001; Driscoll et al. 1990; Kayhanian et al. 2003; Van Metre et al. 2005). Those pollutants will become more concentrated on impervious surfaces until they either degrade in place or are transported by wind, precipitation, or active site management. Although stormwater discharge from most proposed projects will be small in comparison to the flow of the nearby waterways, it will have an incremental impact on pollutant levels. The adverse effects of stormwater runoff from the projects covered by the USACE will occur primarily at the basin scale due to persistent additions of pollutants or the compounding effects of many environmental processes.

Two projects will result in stormwater runoff from new or replacement impervious surface or replacement of stormwater outfalls. Effects caused by these projects are considered intermittent as stormwater runs off occurs during and after rain events.

The following brief summaries from toxicological profiles (ATSDR 1995; ATSDR 2004a; ATSDR 2004b; ATSDR 2005; ATSDR 2007) show how the environmental fate of each contaminant and the subsequent exposure of listed species and critical habitats varies widely,

depending on the transport and partitioning mechanisms affecting that contaminant, and the impossibility of linking a particular discharge to specific water body impairment (NRC 2009):

- DDT and its metabolites, dichlorodiphenyldichloroethylene (DDE) and dichlorodiphenyltrichloroethane (DDD) (all collectively referred to as DDx) may be transported from one medium to another by the processes of solubilization, adsorption, remobilization, bioaccumulation, and volatilization. In addition, DDx can be transported within a medium by currents, wind, and diffusion. These chemicals are only slightly soluble in water, therefore loss of these compounds in runoff is primarily due to transport of particulate matter to which these compounds are bound. For example, DDx have been found to fractionate and concentrate on the organic material that is transported with the clay fraction of the wash load in runoff. Sediment is the sink for DDx released into water where it can remain available for ingestion by organisms, such as bottom feeders, for many years.
- The environmental fate of each type of PAH depends on its molecular weight. In surface water, PAHs can volatilize, photolyze, oxidize, biodegrade, bind to suspended particles or sediments, or accumulate in aquatic organisms, with bioconcentration factors often in the 10-10,000 range. In sediments, PAHs can biodegrade or accumulate in aquatic organisms or non-living organic matter. Some evaporate into the air from the surface but most do not easily dissolve in water, some evaporate into the air from surface waters, but most stick to solid particles and settle into sediments. Changes in pH and hardness may increase or decrease the toxicity of PAHs, and the variables of organic decay further complicate their environmental pathway (Santore et al. 2001).
- PCBs are globally transported and present in all media. Atmospheric transport is the most important mechanism for global dispersion of PCBs. PCBs are physically removed from the atmosphere by wet deposition (i.e., rain and snow scavenging of vapors and aerosols); by dry deposition of aerosols; and by vapor adsorption at the air-water, air-soil, and air-plant interfaces. The dominant source of PCBs to surface waters is atmospheric deposition; however, redissolution of sediment-bound PCBs also accounts for water concentrations. PCBs in water are transported by diffusion and currents. PCBs are removed from the water column by sorption to suspended solids and sediments as well as from volatilization from water surfaces. Higher chlorinated congeners are more likely to sorb, while lower chlorinated congeners are more likely to volatilize. PCBs also leave the water column by concentrating in biota. PCBs accumulate more in higher trophic levels through the consumption of contaminated food.
- Due to analytical limitations, investigators rarely identify the form of a metal present in the environment. Nonetheless, much of the copper discharged into waterways is in particulate matter that settles out. In the water column and in sediments, copper adsorbs to organic matter, hydrous iron and manganese oxides, and clay. In the water column, a significant fraction of the copper is adsorbed within the first hour of introduction, and in most cases, equilibrium is obtained within 24 hours.
- For zinc, sorption onto hydrous iron and manganese oxides, clay minerals, and organic material is the dominant reaction, resulting in the enrichment of zinc in suspended and bed sediments. The efficiency of these materials in removing zinc from solution varies according to their concentrations, pH, redox potential, salinity, nature and concentrations of complexing ligands, cation exchange capacity, and the concentration of zinc.

Precipitation of soluble zinc compounds appears to be significant only under reducing conditions in highly polluted water.

- A significant fraction of lead carried by river water occurs in an undissolved form, which can consist of colloidal particles or larger undissolved particles of lead carbonate, lead oxide, lead hydroxide, or other lead compounds incorporated in other components of surface particulate matters from runoff. Lead may occur either as sorbed ions or surface coatings on sediment mineral particles, or it may be carried as a part of suspended living or nonliving organic matter in water. The ratio of lead in suspended solids to lead in dissolved form has been found to vary from 4:1 in rural streams to 27:1 in urban streams. Sorption of lead to polar particulate matter in freshwater and estuarine environments is an important process for the removal of lead from these surface waters.

Pollutants travel long distances when in solution, adsorbed to suspended particles, or else they are retained in sediments, particularly clay and silt, which can only be deposited in areas of reduced water velocity until they are mobilized and transported by future sediment moving flows (Alpers et al. 2000a; Alpers et al. 2000b; Anderson et al. 1996). Santore et al. (2001) indicates that the presence of natural organic matter and changes in pH and hardness affect the potential for toxicity (both increase and decrease). Additionally, organics (living and dead) can adsorb and absorb other pollutants such as PAHs. The variables of organic decay further complicate the path and cycle of pollutants.

Noise from Commercial and Recreational Boat and Ship Operation

During consultation, NMFS identified boat use associated with new, repaired, and replacement piers, wharfs, marinas, docks, and boat ramps as a consequence of the associated use of such structures. NMFS has found that although boat use is already common in the general vicinity of existing structures, a level of boat use that is commensurate with the useful life of the structure attributable to the proposed action will be a consequence of the underlying action of repairing, replacing, or expanding existing docks, piers, wharfs, ramps, floats and marinas. We assume new boat use will occur in association with new structures of these types.

Similar to what is described in the section on boat noise from construction vessels, above, underwater sound from boat motors is known to cause physiological stress to fish. Recreational boating activity is another known cause of underwater sound. Boating sound effects are expected intermittently for short periods (minutes) with each episode of use for recreational vessels, and NMFS anticipates these effects will be primarily during late spring, summer, and early fall when leisure boating typically occurs. For vessels using commercial structures, such episodic noise is expected year round.

We assume that for each repair and replace project proceeding under this consultation, vessel traffic extending beyond the remaining useful life period would be a consequence of the proposed actions, while new and expanded projects will likely incrementally increase the amount of vessel traffic, and the associated noise created by those vessels.

Scour of nearshore areas from prop wash

Associated commercial and recreational boat use adversely affects submerged aquatic vegetation (SAV) where it is present, and inhibits its recruitment where not present, by frequently churning water and sediment in the shallow water environment. Additionally, the turbidity from boat propeller wash decreases light levels (Eriksson et al. 2004). Shafer (1999; 2002) provides background information on the light requirements of seagrasses and documents the effects of reduced light availability on seagrass biomass and density, growth, and morphology. Decreased ambient light typically results in lower overall productivity, which is ultimately reflected in lower shoot density and biomass (Shafer 1999; 2002). Areas where sediment is routinely disturbed by prop wash will also experience repeated disruption of benthic prey communities, suppressing this forage source. Consistent with our analytical approach in this Opinion, these impacts are considered co-extensive with the effects of the repaired, replaced or new OWS themselves (see *Response to Habitat Disruptions from In-Water and Overwater Structures* below).

2.4.3 Enduring Effects of Inwater, Overwater and Nearshore Structures

Most of the projects included in the proposed action install, expand, repair and replace over-or in water or nearshore structures (Table 18 and Table 23).

Table 23. Summary of Installed and replaced in- and overwater and nearshore structures resulting from the proposed action.

	Enduring Effects - Totals		
	# of projects	Installed (new)/Replaced	New "Useful life Period"
Bulkhead (Linear Feet)	16	3,125	50 Years
Overwater Structure (Square Feet)	24	215,182	40 Years

In- and overwater structures and nearshore structures influence habitat functions and processes for the duration of the time they are present in habitat areas. The effects include: (a) altered predator/prey dynamics, (b) disrupted migration, and (c) modified shore processes related to bank armoring. These effects are chronic, persistent, and co-extensive with the design life, or useful life, of the structure.

Predator/Prey Dynamics

OWSs adversely affect SAV, if present, and inhibit the establishment of SAV where absent, by creating enduringly shaded areas. (Kelty and Bliven 2003). Decreased ambient light typically results in lower overall productivity, which is ultimately reflected in lower shoot density and biomass (Shafer 1999; 2002). In contrast to other studies in the Pacific Northwest, Shafer (2002) specifically considers small residential OWS and states, “much of the research conducted in Puget Sound has been focused on the impacts related to the construction and operation of large ferry terminals. Although some of the results of these studies may also be applicable to small, single-family docks, there are issues of size, scale, and frequency of use that may require

separate sets of standards or guidelines. Notwithstanding, any overwater structure, however small, is likely to alter the marine environment.”

Fresh et al. (2006) researched the effects of grating in residential floats on eelgrass. They reported a statistically significant decline in eelgrass shoot density underneath six of the 11 studied floats in northern Puget Sound. We could not find studies examining the effect of OWS on SAV other than eelgrass and kelp (Mumford 2007). However, the physiological pathways that result in the reduction in shoot density and biomass from shading applies to all SAV. Thus, it is reasonable to assume that shading from OWS adversely affects all SAV.

In addition to reduced SAV biomass and shoot density, shading also has been shown to be correlated with reduced density of the epibenthic forage under OWS's (Haas et al. 2002). While the reduction in light and SAV were likely a cause for the reduction in epibenthos, changes in grain size due to boat action and current alteration also may have contributed (Haas et al. 2002). Eelgrass is a substrate for herring spawning, and herring spawn is Chinook salmon forage species. The likely incremental reduction in epibenthic prey associated with OWS projects will reduce forage for listed fish.

Obstructions in Migration Areas

Juvenile Chinook and juvenile HCSR chum migrate along shallow nearshore habitats, and OWS's will disrupt their migration and increase their predation risk. Every juvenile Chinook and juvenile HCSR chum will encounter OWSs during their out-migration. We cannot estimate the number of individuals that will experience migration delays and increased predation risk from the proposed OWSs. Adult Chinook, adult and juvenile steelhead, and adult chum, do not explicitly rely on shallow nearshore habitats; OWS are not considered to be a significant obstruction to their movements.

Overwater structures cause delays in migration for PS Chinook salmon from disorientation, fish school dispersal (resulting in a loss of refugia), and altered migration routes (Simenstad 1999). Juvenile salmonids stop at the edge of the structures and avoid swimming into their shadow or underneath them (Heiser and Finn 1970; Able et al. 1998; Simenstad 1988; Southard et al. 2006; Toft et al. 2013). Swimming around structures lengthens the migration distance and is correlated with increased mortality. Anderson et al. (2005) found migratory travel distance rather than travel time or migration velocity has the greatest influence on the survival of juvenile spring Chinook salmon migrating through the Snake River 2005.

Juvenile salmon, in both the marine nearshore and in freshwater, migrate along the edge of shadows rather than through them (Nightingale and Simenstad 2001b; Southard et al. 2006; Celedonia et al. 2008a; Celedonia et al. 2008b; Moore et al. 2013; Munsch et al. 2014). In freshwater, about three-quarters of migrating Columbia River fall Chinook salmon smolts avoided a covered channel and selected an uncovered channel when presented with a choice in an experimental flume setup (Kemp et al. 2005). In Lake Washington, actively migrating juvenile Chinook salmon swam around structures through deeper water rather than swimming underneath a structure (Celedonia et al. 2008b). Structure width, light conditions, water depth,

and presence of macrophytes influenced the degree of avoidance. Juvenile Chinook salmon were less hesitant to pass beneath narrower structures (Celedonia et al. 2008b).

In the marine nearshore, there is substantial evidence that OWS impede the nearshore movements of juvenile salmonids (Heiser and Finn 1970; Able et al. 1998; Simenstad 1999; Southard et al. 2006; Toft et al. 2007). In the Puget Sound nearshore, 35 millimeter to 45 millimeter juvenile chum and pink salmon were reluctant to pass under docks (Heiser and Finn 1970). Southard et al. (2006) snorkeled underneath ferry terminals and found that juvenile salmon were not underneath the terminals at high tides when the water was closer to the structure, but only moved underneath the terminals at low tides when there was more light penetrating the edges. These findings show that overwater-structures can disrupt juvenile salmon migration in the Puget Sound nearshore.

An implication of juvenile salmon avoiding OWS is that some of them will swim around the structure (Nightingale and Simenstad 2001b). This behavioral modification will cause them to temporarily utilize deeper habitat, thereby exposing them to increased piscivorous predation. Hesitating upon first encountering the structure, as discussed, also exposes salmonids to avian predators that may use the floating structures as perches. Typical piscivorous juvenile salmonid predators, such as flatfish, sculpin, and larger juvenile salmonids, being larger than their prey, generally avoid the shallowest nearshore waters that outmigrant juvenile salmonids prefer—especially in the earliest periods of their marine residency. When juvenile salmonids temporarily leave the relative safety of the shallow water, their risk to being preyed upon by other fish increases. This has been shown in the marine environment where juvenile salmonid consumption by piscivorous predators increased fivefold when juvenile pink salmon were forced to leave the shallow nearshore (Willette 2001).

Further, swimming around OWS lengthens the salmonid migration route, which has been shown to be correlated to increased mortality. Migratory travel distance rather than travel time or migration velocity has been shown to have the greatest influence on survival of juvenile spring Chinook salmon migrating through the Snake River (Anderson et al. 2005). In summary, NMFS anticipates that the increase in migratory path length from swimming around OWS as well as the increased exposure to piscivorous predators in deeper water likely will result in proportionally increased juvenile PS Chinook salmon and HCSR chum mortality. Steelhead are not nearshore dependent and thus the presence of these structures is unlikely to affect their behavior.

Disrupted Shore Processes

A total of 16 projects will result in a new 50-year useful life for ~3,125 linear feet of bulkhead (Table 18 and Table 23) throughout Puget Sound. The effects that these structures exert on habitat features and functions also will persist for the same duration. The impacts of hard armor along shorelines are well documented.¹⁷ Armoring of the nearshore can reduce or eliminate shallow water habitats through the disruption of sediment sources and sediment transport. Bulkheads, whether new, repaired, or replacement are expected to result in a higher rate of beach erosion water ward of the armoring from higher wave energy compared to a natural shoreline. This leads to beach lowering, coarsening of substrates, increases in sediment temperature, and

¹⁷ Marine Shoreline Design Guidelines at 2-1.

decreased SAV, leading to reductions in primary productivity and invertebrate density within the intertidal and nearshore environment (Bilkovic and Roggero 2008; Fresh et al. 2011; Morley et al. 2012; Dethier et al. 2016).

In addition to higher rates of beach erosion and substrate coarsening by increased wave energy, bulkheads would also prevent input of sediment from landward of the bulkhead to the beach, further diminishing the supply of fine sediment. Finer material like gravel and sand provide important spawning substrate for sand lance and surf smelt. Therefore, a reduction to this substrate type within the intertidal and nearshore zone as a result of the bulkhead would reduce potential spawning habitat availability and fecundity of both species (Rice 2006; Parks et al. 2013), which are both important prey species of PS Chinook salmon. As a result of deepening of the intertidal zone adjacent to the bulkhead, as well as increased wave energy, the repaired, replaced, or new bulkhead would also be expected to reduce SAV (Patrick et al. 2014). This would be expected to cause a reduction in potential spawning habitat (i.e., eelgrass) for Pacific herring, another forage species of Chinook salmon. A total of 18 projects (Table 19) are expected impact forage fish spawning areas.

Along with physical loss of habitat, the impacts of nearshore modification include the loss of functions such as filtration of pollutants, floodwater absorption, shading, sediment sources, and nutrient inputs. The greatest impacts to the nearshore are from shoreline armoring; roads and artificial fill are also significant, and these stressors often occur together or with other modifications (Fresh et al. 2011). Shoreline armoring generally reduces the sediment available for transport by disconnecting the sediment source, e.g. a feeder bluff, from the drift cell, potentially causing loss of beach width and height as transport of material outpaces supply. This can occur at the site of the structure or down the drift cell. Structures in the intertidal zone change the hydrodynamics of the waves washing up on the beach. Hard structures reflect waves without dissipating their energy the way a natural beach would, especially if vegetation is present. This energy can lower the beach, make it steeper, and wash away fine sediments. Dikes and fill reduce estuarine wetlands and other habitat for salmon, forage fish, and eelgrass.

When the physical processes are altered, there is also a shift in the biological communities. The number and types of invertebrates, including shellfish, can change; forage fish lose spawning areas; and juvenile salmon and forage fish lose the feeding grounds that they use as they migrate along the shore (Shipman et al. 2010). Native shellfish and eelgrass have specific substrate requirements and altered geomorphic processes can leave shellfish beds and eelgrass meadows with material that is too coarse or with too much clay exposed. Shoreline armoring can also physically bury forage fish spawning beaches when structures are placed in or too close to the intertidal zone. When shoreline development removes vegetation, the loss of shading and organic material inputs can increase forage fish egg mortality (Penttila 2007). Surf smelt, for example, use about 10 percent of Puget Sound shorelines for spawning and many bulkheads are built in forage fish spawning habitat, threatening their reproductive capacity (Penttila 2007). The effects of nearshore modification cascade through the Puget Sound food web. The consequences can be seen in the population declines of a variety of species that depend on these ecosystems, from shellfish, herring, and salmon to orcas, great blue heron, and eelgrass.

Armoring of the nearshore can reduce or eliminate shallow water habitats via two distinct mechanisms. First, bulkheads cause a higher rate of beach erosion waterward of the armoring because there is higher wave energy, compared to a natural shoreline. This leads to beach lowering, coarsening of substrates, increases in sediment temperature, leading to reductions in primary productivity and invertebrate density within the intertidal and nearshore environment (Bilkovic and Roggero 2008; Fresh et al. 2011; Morley et al. 2012; Dethier et al. 2016). As a result of deepening of the intertidal zone adjacent to the bulkhead, as well as increased wave energy, bulkheads also reduce SAV (Patrick et al. 2014). We expect reduced SAV to cause a reduction in potential spawning habitat (i.e., eelgrass) for Pacific herring, another forage species of Chinook salmon and juvenile PS/GB bocaccio. Reduced SAV also diminishes habitat for larval rockfish, which in their pelagic stage rely on SAV for prey and cover for several months. Second, bulkheads located within the intertidal zone (below HAT) prevent upper intertidal zone and natural upper intertidal shoreline processes such as accumulation of beach wrack (Sobocinski et al. 2010; Dethier et al. 2016). This is an additional mechanism that reduces primary productivity within the intertidal zone and diminishes invertebrate populations associated with beach wrack (Sobocinski et al. 2010; Morley et al. 2012; Dethier et al. 2016). Reductions in forage from bulkheads then affect primary productivity and invertebrate abundance in both the intertidal and nearshore environments. Invertebrates are an important food source for juvenile PS/GB bocaccio and PS Chinook salmon and for forage fish prey species of salmonids.

In addition to loss of shallow areas through higher rates of beach erosion and substrate coarsening by increased wave energy, bulkheads also prevent the input of sediment from sources landward of the bulkhead to the beach, further diminishing the supply of fine sediment. Finer material like gravel and sand provide important spawning substrate for sand lance and surf smelt. Therefore, a reduction to this substrate type within the intertidal and nearshore zone as a result of the bulkhead would reduce potential spawning habitat availability and fecundity of both species (Rice 2006; Parks et al. 2013), which are both important prey species of PS Chinook salmon, and juvenile PS/GB bocaccio, both of which depend on nearshore areas for forage. As a result of deepening of the intertidal zone adjacent to the bulkhead, as well as increased wave energy, the new, repaired or replaced bulkhead would also be expected to reduce SAV (Patrick et al. 2014). This would be expected to cause a reduction in potential spawning habitat (i.e., eelgrass) for Pacific herring, another forage species of Chinook salmon and juvenile PS/GB bocaccio. Thus, the loss of material below bulkheads, together with the loss of upland sources of material from above the bulkheads, over time, can affect the migration and growth of juvenile salmonids (primarily PS Chinook salmon) by reducing the amount of available shallow habitat that juveniles rely on for food and cover, and by preventing access to habitat upland of bulkheads at high tides. Both salmonids and juvenile bocaccio are affected the loss of prey communities. Larval rockfish of both species—PS/GB bocaccio and PS/GB yelloweye—are affected by the loss of SAV.

2.4.4 Effects on Critical Habitat

Critical habitat for PS chinook, Hood Canal Summer Run Chum, PS/GB Bocaccio and PS/GB Yelloweye Rockfish, and Southern Resident Killer Whales all occur within the action area. PS Steelhead do not have nearshore or marine habitat areas designated as critical. NMFS reviews effects on critical habitat affected by a proposed action by examining how the PBFs of critical habitat will be altered, and the duration of such changes, and the influence of these changes on the potential for the habitat to serve the conservation values for which it was designated.

In estuarine and marine areas the features of designated habitat common to each of these listed species, with the exception of Puget Sound steelhead, are (a) water quality and (b) forage or prey. For Chinook and chum salmon (c) safe migration areas are a feature of critical habitat. For juvenile PS/GB bocaccio, and PS Chinook salmon, (d) nearshore habitat with suitable conditions for growth and maturation, including sub-aquatic vegetation, is a feature of critical habitat. Table 19 summarizes by projects the adverse effects to these functions, while Table 23 quantifies the aerial extent of impacts by structure.

Water Quality

Designated critical habitat for each species will experience temporary, episodic, and enduring declines in water quality (a PBF of Chinook, chum, PS/GB bocaccio, yelloweye, and SRKW habitats).

The temporary water quality reductions from increased turbidity and corollary decrease in dissolved Oxygen (DO), and re-suspended contaminants—are both expected to persist with the in-water work period of each project, and then to return to baseline within hours (turbidity) to days (DO) after work ceases. Based on these factors, the temporary turbidity and DO changes from construction related impairment of this PBF will not reduce the conservation value of the habitat for salmon, salmon prey species or rockfish.

Temporary water quality reductions from sound occur during any period in which pile driving, either vibratory or impact, occurs. Sound pressure waves transmitted through the water diminish this habitat for the species that are present and detect this disturbance, by altering the behaviors, or injuring the species (all species addressed in this Opinion), within the affected zone. This reduction in the aquatic habitat value ceases when pile driving stops. The effects of pile driving sound are more fully described in the effects on species section later in this document.

Episodic reductions in water quality that occur with use or maintenance. Increased levels of PAHs, PCBs, and other contaminants re-suspended in the water column will also occur with the removal of creosote material sites such as marinas or commercial wharfs or piers. However, these water quality effects are expected to abate as the contaminated materials settle out, at which point they become persistent in the substrate, which will be described below. Because exposure to such contaminants can have chronic or sublethal effects, this aspect of water quality degradation could temporarily impair the value of critical habitat for growth and maturation of the listed species. Similarly, the frequent episodes of noise in the aquatic environment from vessel use associated with each of the in- and overwater structures is likely to create a chronic

condition that reduces the suitability of the habitat for key behaviors necessary for all listed species considered in this Opinion to thrive.

The *enduring effects on water quality* include the chronic and system-wide introduction and extended existence of pollutants from boating activity associated with both commercial and recreational vessels, and upland stormwater, particularly at larger structures (e.g., marinas or commercial wharfs and piers). Increased levels of PAHs, oils, and other contaminants will be widely dispersed, and can have detrimental effect at very low levels of exposure either directly or indirectly through the consumption of prey contaminated by their own exposure in the water column. This will impair the value of critical habitat for growth and maturation of each of the listed species.

Accordingly, we consider the combined effects of temporary intermittent and enduring effects on water quality will create an incremental but chronic diminishment of the water quality PBF for all of the listed species with designated critical habitat in the action area, throughout the new useful life period (40 to 50 years depending on the structure).

Forage and Prey

Designated critical habitat for each species will experience temporary, episodic, and enduring declines in forage or prey communities (a PBF of Chinook, chum, PS/GB bocaccio, yelloweye and SRKW).

Forage for Fish. Disturbing sediment will simultaneously disrupt the benthic communities that live within those sediments, reducing prey availability in the footprint of the in-water work and adjacent areas where suspended sediment settles out. Among prey fishes, short-term and intermittent exposure to reduced water quality could result in minor reductions in forage species via gill damage of forage fishes. Suspended sediment will eventually settle in the area adjacent disturbance from pile removal or placement, bulkhead construction, removal, or replacement, or vessel prop wash, which can smother benthic prey species, and if the sediments are contaminated, then sublethal toxicity of benthic prey species could occur within 200 feet of these non-dredging activities.

Designated critical habitat will have enduring diminishment of SAV and benthic communities in rearing areas of juvenile PS/GB bocaccio, and migration areas of juvenile salmonids, underneath OWS. We anticipate impacts to SAV and epibenthic forage will be diminished, or fail to establish due to the shade produced by overwater structures, and in some cases from shade when vessels are moored at the structures for extended periods, and from prop wash from vessels leaving and arriving at these structures. OWS will reduce this PBF of adult and juvenile Chinook, chum, and juvenile PS/GB bocaccio. SAV is important in providing cover and a food base for juvenile PS Chinook salmon, HCSR chum salmon, and juvenile PS/GB bocaccio. OWSs shade SAV (Kelty and Bliven 2003) which creates a reduction to the primary production of SAV beds, and in turn is likely to incrementally reduce the food sources for juvenile PS Chinook salmon, HCSR chum salmon, and juvenile PS/GB bocaccio. The reduction in food sources includes epibenthos (Haas et al. 2002) as well as forage fish. The repeated episodes of disturbance, together with the enduring reduction at the OWS locations, will create an

incremental systemic decline in prey, with the potential to increase competition among every cohort of each population of each listed species, with the exception of yelloweye rockfish, and adult PS/GB bocaccio, based on their reliance on deepwater areas where the effects of nearshore development are unlikely to be discernible.

Dredging activities causes a short-term change in the characteristics of the benthic in-faunal biota, of which the majority are expected to recover within a few months to two years after dredging, based on the results of studies in other areas. For example, Romberg et al. (1995), studying a subtidal sand cap placed to isolate contaminated sediments in Elliott Bay, identified 139 species of invertebrates five months after placement of the cap. The benthic community reached its peak population and biomass approximately two and one-half years after placement of the cap, and then decreased, while the number of species increased to 200 as long-lived species recruited to the population (Wilson and Romberg 1996).

Prey for SRKW. For SRKW discharge events would reduce quality and quantity of prey including juvenile chinook. As PS Chinook salmon are a PBF of SRKW critical habitat, their repeated/chronic exposure to contaminants in successive cohorts, directly through diminished water quality, and via contaminated prey, both described above, results in a diminishment of the forage PBF of SRKW critical habitat. Both quantity and quality of prey will slightly decline, as these fish are likely to have latent health effects that slightly reduce adult abundance, and also reduce the quality of adult fish that do return and serve as prey, due to bioaccumulated contaminant.

Given the total quantity of prey available to Southern Resident killer whales throughout their range numbers in the millions, the reduction in prey related to short-term construction effects from the proposed action is extremely small. Therefore, NMFS anticipates that the short-term reduction of Chinook salmon from temporary effects would have little effect on Southern Resident killer whales. However, episodic and enduring declines of SRKW's prey as a result of the proposed actions are also expected. Sufficient quantity, quality and availability of prey are an essential feature of the critical habitat designated for Southern Residents. Increasing the risk of a permanent reduction in the quantity and availability of prey, and the likelihood for local depletions in prey populations in multiple locations over time, reduces the conservation value of critical habitat for SRKWs.

Migration/Passage

Designated critical habitat will experience enduring incremental diminishment of safe migration for Chinook and Hood Canal Summer run chum salmon. In the marine nearshore, there is substantial evidence that OWS impede the nearshore movements of juvenile salmonids (Heiser and Finn 1970; Able et al. 1998; Simenstad 1999; Southard et al. 2006; Toft et al. 2007). In the Puget Sound nearshore, 35 millimeter to 45 millimeter juvenile chum and pink salmon were reluctant to pass under docks (Heiser and Finn 1970). Southard et al. (2006) snorkeled underneath ferry terminals and found that juvenile salmon were not underneath the terminals at high tides when the water was closer to the structure, but only moved underneath the terminals at low tides when there was more light penetrating the edges. These findings show that overwater-structures can disrupt juvenile migration in the Puget Sound nearshore, reducing the value of the

critical habitat for its designated purpose of juvenile salmonid migration in estuarine and nearshore ocean environments.

Maintenance dredging in the nearshore can result in periodic deepening of shallow water migratory corridors for listed juvenile salmonids. This effect could persist from between 1 and 4 years, depending on how long it takes for the dredge channel to fill back in.

Migration values are not expected to be impaired for PS/GB yelloweye rockfish, PS/GB bocaccio, as these species do not rely on the nearshore area for migration.

The proposed action has the potential to affect passage conditions in SRKW designated critical habitat. Effects of the proposed action include the potential for exposure to the physical presence and sound generated by vessels associated with the proposed action and noise from construction and pile driving activities. The increase in vessel presence and sound in SRKW critical habitat contribute to total effects on passage conditions. However, vessels associated with the proposed action do not target whales and disturbance would likely be transitory, including small avoidance movements away from vessels. The number and spread of vessels is not expected to result in blocking movements of the whales in their travel corridors. Therefore, it is unlikely that any small transitory disturbance from vessels that might occur would have more than a very minor effect on passage in designated critical habitat. Lastly, given all projects that include impact or vibratory pile driving will include a Marine Mammal Monitoring Plan that is sufficient to ensure pile driving ceases before marine mammals enter the area where sound will exceed 120 dBRMS, effects from these activities on passage in SRKW critical habitat is likely minor.

Shoreline Armoring Projects will Reduce Available Nearshore Habitat

Bank armoring degrades sediment conditions, forage base, and access to shallow water waterward of the structures; access to forage and shallow water habitat upland of the structures is prevented during high tides.

Degraded sediment condition. As described above, shoreline armoring coarsens sediments waterward of bulkheads by concentrating marine energy and washing away finer sediments. Because bulkheads will be located within the intertidal zone (below HAT), they would prevent upper intertidal zone and natural upper intertidal shoreline processes such as deposition and accumulation of beach wrack (Sobocinski et al. 2010; Dethier et al 2016).

As a result, this would further reduce primary productivity within the intertidal zone and diminish invertebrate populations associated with beach wrack (Sobocinski et al. 2010; Morley et al. 2012; Dethier et al. 2016). Reductions in forage may result from bulkhead effects on primary productivity and invertebrate abundance in the intertidal and nearshore environments. Invertebrates provide an important food source for juvenile PS/GB bocaccio and PS Chinook salmon and for forage fish prey species of salmonids.

The loss of marine shoreline material, over time, can affect the migration areas of juvenile salmonids by reducing the amount of available shallow habitat that juveniles, both by steepening

shore areas waterward of bulkheads, and, particularly during high tides, creating a physical barrier that obstructs water from reaching high shore areas.

Critical Habitat Summary

The chronic, episodic, and enduring diminishment of critical habitat created by nearshore in water and overwater structures to water quality, migration areas, shallow water habitat, forage base, and SAV has and will continue to incrementally degrade the function of critical habitat, for each fish species considered in this analysis with the exception of PS steelhead, which do not have critical habitat designated in the action area. The effects further constrain the carrying capacity for critical life stages (larval and juvenile) for multiple listed species within the action area, reducing conservation values and/or preventing conservation values from being improved.

SRKW critical habitat PBFs of water quality and prey base will be impaired. The continued decline and reduced potential for recovery of the PS Chinook salmon as a PBF of SRKW critical habitat is likely to alter the abundance and distribution of migrating salmon and increase the likelihood of localized depletions in prey, with adverse effects on the SRKWs' ability to meet their energy needs. SRKWs could abandon depleted areas in search of more abundant prey, and end up expending substantial effort only to find depleted prey resources elsewhere. Increasing the risk of a permanent reduction in the quantity and availability of prey, and the likelihood for local depletions in prey populations in multiple locations over time, reduces the conservation value of critical habitat for SRKWs.

In summary, the proposed action, in the 40–50 year useful life period of the projects, reduces available nearshore feeding, rearing and safe migration for juvenile salmon impacting juvenile salmon survival rates, limiting the life-history's (fry contribution to returning adults Chinook) (Beechie et al. 2017), and ultimately contribute to low adults salmon returns. This would reduce the potential for recovery of PS Chinook salmon that would likely lead to nutritional stress that results in reduced body size and condition which can also lower reproductive and survival rates. Therefore, poor nutrition from the reduction of prey as a PBF could contribute to additional mortality in this population, and affect reproduction and immune function. This would be a significant reduction in the conservation role of this PBF for SRKWs.

2.4.5 Effects on Listed Species

Effects on listed species is a function of (1) the numbers of animals exposed to habitat changes or direct effects of an action; (2) the duration, intensity, and frequency of exposure to those effects; and (3) the lifestage at exposure. This section presents an analysis of exposure and response.

As noted above in the effects to critical habitat, the projects have temporary, episodic, and enduring effects. Our exposure and response analysis identifies the multiple life stages of listed species that use the action area, and whether they would encounter these effects, as different life-stages of a species may not be exposed to all effects, and when exposed, can respond in different ways to the same habitat perturbations.

Period of Exposure

As described in Section 1.3 (Proposed Action), all in-water work would occur only between July 16 and February 15 in any year the permit is valid.

Juvenile Puget Sound Chinook salmon generally emigrate from freshwater natal areas to estuarine and nearshore habitats from January to April as fry, and from April through early July as larger sub-yearlings. However, juveniles have been found in PS neritic waters between April and November (Rice et al. 2011). The work window avoids peak juvenile Chinook presence from mid-February through mid-July, but does not fully avoid exposure in January through the first half of February. Additionally, a percentage of Chinook salmon rear in Puget Sound without migrating to ocean areas.

Juvenile PS steelhead primarily emigrate from natal streams in April and May, and appear to move directly out into the ocean to rear, spending little time in the nearshore zone (Goetz et al. 2015). However, steelhead smolts have been found in low abundances in the marine nearshore, outside of their natal estuary, between May and August (Brennan et al. 2004), which overlaps with the in-water work window. Juvenile steelhead will therefore be present in Puget Sound during the early part of the work window, July 15 through August, however, because they enter the Sound after a longer freshwater residency, they are larger and less dependent on nearshore locations where work is going to occur. The proposed work window would minimize overlap of temporary construction effects with the presence in nearshore habitat of juvenile PS steelhead in the action area, but will not avoid all exposure.

Larval and Juvenile Rockfish. Larval rock fish presence peaks twice in the spawning period, once in spring and once in late summer. The in-water work window (July 15 to February 15) that is adhered to for salmon species makes it likely that during the fall spawning period a large numbers of larval rockfish, both PS/GB bocaccio and yelloweye, will be exposed to construction effects, and thus exposed to sound and high turbidity and any associated contaminants or low DO.

Juvenile Hood Canal Summer run chum. In late winter, juvenile chum can spend up to one month in estuarine shallow waters (all salinity zones) before moving to the ocean. After leaving estuaries, juveniles may exhibit extended residency within Puget Sound before migrating, and may even overwinter in the sound (Salo 1991, Johnson et al. 1997). Wait et al (2018) show widespread use of nearshore habitat by summer run chum, even at sites that are distant from natal streams. Migration rates of chum salmon in nearshore areas are variable and depend upon fish size, foraging success, and environmental conditions (currents and prevailing winds). Small chum salmon fry (< 50-60 mm) appear to migrate primarily along the shoreline in shallow water less than 2 meters in depth. Use of shallow water habitats relates to predator avoidance and prey availability. When present in shallow water habitats, juvenile chum salmon less than 60 mm consume primarily epibenthic invertebrates, particularly harpacticoid copepods and gammarid amphipods. These epibenthic prey are primarily associated with protected, fine-grained substrates, and often eelgrass, and are especially abundant early in the year in some locations. This suggests that these habitat types are especially important to small, early migrating chum

salmon, some of which are presumably summer chum salmon. Exposure is likely among Hood Canal Summer run chum (Fresh 2006).

Juvenile Summary. Because exposure cannot be fully excluded by in-water work timing for juvenile salmonids, juvenile bocaccio, or larval bocaccio and yelloweye, we evaluate other factors influencing potential presence of these fish, and if present, the potential duration of their exposure. Juvenile Chinook salmon are however, have the longest period in which they are nearshore oriented (Fresh 2006) and thus, although numbers are expected to be low at any given time, individuals of this species are likely more often per individual to encounter the intertidal and nearshore area where construction and enduring structure effects are anticipated.

Adult salmonids. The presence of adult PS Chinook salmon and PS steelhead in PS overlaps with the proposed in-water construction window. Like adult PS Chinook salmon, adult PS steelhead occupy deep water, generally deeper than the location where the structures are proposed. Thus, we expect the direct habitat effects from the structures to create little exposure or response among adult PS Chinook salmon and PS steelhead as they do not rely on the nearshore. However, some data suggests that up to 70% of PS Chinook salmon spend their adult period in Puget Sound without migrating to the ocean (Kagley et al. 2016), suggesting that most adult PS Chinook will experience far reaching effects such as sound from pile driving, vessel noise, some water quality diminishments and reduced prey.

Adult Rockfish. The presence of adult PS/GB bocaccio and yelloweye in the action area is extremely low. Suitable habitat for this lifestage is extremely limited based on preferred habitat depths and features such as rugosity. However, given the ability of this species to move throughout the marine environment, we cannot conclude that they would not ever occur within the action area, during a construction action or over the a proposed structure's useful life.

Southern Resident Killer Whales. Between the three pods that comprise this DPS, identified as J, K, and L, some members of the DPS are present in Puget Sound at any time of the year though data on observations since 1976 generally shown that all three pods are in Puget Sound June through September, which means that all are likely present in the designated work window that begins on July 15. As discussed in the Status section, the whales' seasonal movements are only somewhat predictable because there can be large inter-annual variability in arrival time and days present in inland waters from spring through fall. Late arrivals and fewer days present in inland waters have been observed recent years. The likelihood of exposure to the temporary effects of construction are high (Olson et al. 2018).

Species Response to Temporary Effects

Water Quality

In-water work and nearshore work (bulkhead removal, excavation, and construction) would cause short-term and localized increases in turbidity and total suspended solids (TSS), potential declines in DO, and temporary increases in pollutants such as PAHs. For the 30 projects, the area of elevated turbidity and TSS levels during construction could extend up to 200 feet radially from each project location (~1.6 acre/ projects and ~48 acres total) during construction, and

would return to background levels shortly after the end of construction (hours to days). Two dredging projects could have elevated turbidity and TSS levels during construction that extend up to 300 feet radially from each project location (~3.25 acres/project and ~6.5 acres total).

Fish Species Response

The effects of suspended sediment on fish increase in severity with sediment concentration and exposure time and can progressively include behavioral avoidance and/or disorientation, physiological stress (e.g., coughing), gill abrasion, and death—at extremely high concentrations. Newcombe and Jensen (1996) analyzed numerous reports on documented fish responses to suspended sediment in streams and estuaries, and identified a scale of ill effects based on sediment concentration and duration of exposure, or dose. Exposure to concentrations of suspended sediments expected during the proposed in-water construction activities could elicit sublethal effects such as a short-term reduction in feeding rate or success, or minor physiological stress such as coughing or increased respiration. Studies show that salmonids have an ability to detect and distinguish turbidity and other water quality gradients (Quinn 2005; Simenstad 1988), and that larger juvenile salmonids are more tolerant to suspended sediment than smaller juveniles (Servizi and Martens 1991; Newcombe and Jensen 1996).

Despite being present during a portion of the work window, juvenile PS steelhead are not nearshore dependent and so are not expected to be in the shallow water in large numbers. Those present are expected to be only briefly in the area where elevated suspended sediment would occur (within a 200-foot radius to account for the point of compliance for aquatic life turbidity criteria) and to have strong capacity as larger juveniles to avoid areas of high turbidity. To the degree that there is a contemporary decrease in DO within the same footprint, because steelhead are expected to have only brief exposure to the affected area, we do not anticipate a significant response to reduced DO. We accordingly consider their exposure to the temporary effects will not be sufficient to cause any injury or harmful behavioral response to juvenile PS steelhead.

Juvenile PS Chinook salmon are likely to be present during in-water construction activities and likely to be exposed to the temporary construction effects, most notably elevated levels of suspended sediment. The proposed minimization measures (i.e. only working in the dry) indicate that TSS levels will be only slightly elevated near the construction area and only during tidal inundations of the site during the project and during the first tidal inundation after completion of the project. Turbidity and TSS levels would return to background levels quickly and be localized to the in-water construction areas (200-foot radius turbidity mixing zone and 300-foot radius for dredging projects). Again, decreased DO is expected to be contemporaneous with and in the same footprint of the suspended sediment. While juvenile PS Chinook salmon are likely to encounter these areas, they can detect and avoid areas of high turbidity, and exposure is expected to be brief. Thus, duration and intensity of exposure of juvenile PS Chinook is also unlikely to cause injury or a harmful response.

While there is little information regarding the habitat requirements of rockfish larvae, other marine fish larvae biologically similar to rockfish larvae are vulnerable to low dissolved oxygen levels and elevated suspended sediment levels that can alter feeding rates and cause abrasion to gills (Boehlert 1984; Boehlert and Morgan 1985; Morgan and Levings 1989). Because the work

window will overlap with one peak in larval presence, which is a several month pelagic stage without significant capacity for avoidance behavior (larval rockfish can swim at a rate of roughly 2 cm per second (Kashef et al. 2014) but are likely passively distributed with prevailing currents (Kendall and Picquelle 2003)), we can assume that 39 sites will have areas of high turbidity, and that larvae can be present in significant numbers (PS/GB bocaccio) that will be adversely affected.

Benthic conditions/forage communities

Fish Species Response

For non-dredging projects, the area (~30 acres total) in which benthic forage base is temporarily diminished by disturbed substrate is very small, and because benthic prey recruits from adjacent area via tides and currents, the prey base can re-establish in a matter of weeks. We expect only the cohorts of PS Chinook salmon and PS steelhead that are present in the action area to be exposed to this temporary reduction of prey, and we expect that because prey is abundant in close proximity, feeding, growth, development and fitness of the individuals that are present during this brief habitat disruption from construction would not be affected. Therefore, we consider the temporary effects on any juvenile PS Chinook salmon and PS steelhead in the action area to be unlikely to cause injury at the individual scale.

For dredging projects the area (~6 acres), disruption of normal feeding behaviors in this area is expected to occur for up to two years which is the amount of time expected for the benthic community to recover.

On the other hand, juvenile PS/GB bocaccio feed on the young of other rockfish, surfperch, and jack mackerel in nearshore areas (Love et al. 1991; Leet et al. 1992). Juveniles also eat all life stages of copepods and euphausiids (MacCall et al. 1999). Because juvenile rockfish are less able to access adjacent areas compared with salmon species, reductions in benthic prey communities, and in SAV from disturbance in work areas will reduce available forage for PS/GB bocaccio in their nearshore settlements, reducing growth and fitness of affected individuals at each location.

SRKW Response

The reduction in prey (PS Chinook salmon) from the temporary construction effects of the proposed actions is extremely small even when considered across all 39 action areas, due to the application of work windows to avoid peak presence of this species at the juvenile life stage and the other reasons discussed above. Given the total quantity of prey available to SRKWs throughout their range, this short-term reduction in prey that results from the temporary construction effects is extremely small. Because the annual reduction is so small, there is also a low probability that any of the Chinook salmon killed from implementation of the proposed action would be intercepted by the killer whales across their vast range in the absence of the proposed action. Therefore, NMFS anticipates that the short-term reduction of Chinook salmon during construction would have little effect on Southern Resident killer whales.

Response to noise in aquatic habitat from pile driving and construction vessels

Fish Species Response

A total of 22 projects (Table 22) include pile driving activities. Only those that have impact pile driving will generate sound loud enough to directly injure or kill fish. Vibratory pile driving can generate noise levels that fish detect and respond to, including above the 150 Db behavioral threshold but well below the thresholds for physical injury (Erbe and McPherson 2017). Fish may exhibit behavioral response to vibratory driving.

Where piles are to be replaced, the piles may be installed either a vibratory or an impact hammer or a combination of both. When impact driving or proofing steel piles, a bubble curtain will be used to attenuate the energy. Some projects may exclusively use a vibratory hammer to drive the piles. However, in order to ensure that the pile will be able to support the weight of construction equipment or to overcome difficult substrates, applicants may finish driving each pile with an impact hammer.

Pile driving can cause high levels of underwater sound. This noise from impact pile driving can injure or kill fish and alter behavior (Turnpenny et al. 1994; Turnpenny and Nedwell 1994; Popper 2003; Hastings and Popper 2005). Death from barotrauma can be instantaneous or delayed up to several days after exposure. Even when not enough to kill fish, high sound levels can cause sublethal injuries. Fish suffering damage to hearing organs may suffer equilibrium problems, and may have a reduced ability to detect predators and prey (Turnpenny et al. 1994; Hastings et al. 1996). Hastings (2007) determined that a cumulative Sound Exposure Level (cSEL) as low as 183 dB (re: 1 μ Pa²-sec) was sufficient to injure the non-auditory tissues of juvenile spot and pinfish with an estimated mass of 0.5 grams.

Cumulative SEL is a measure of the sound energy integrated across all of the pile strikes. The Equal Energy Hypothesis, described by NMFS (2007b), is used as a basis for calculating cumulative SEL. The number of pile strikes is estimated per continuous work period. This approach defines a work period as all the pile driving between 12-hour breaks. NMFS uses the practical spreading model to calculate transmission loss. In 2008, the Fisheries Hydroacoustic Working Group (FHWG) developed interim criteria to minimize potential impacts to fishes (FHWG 2008). The interim criteria identify the following thresholds for the onset of physical injury using peak sound pressure level (SPL) and cSEL:

- Peak SPL: levels at or above 206 dB from any hammer strike; and
- cSEL: levels at or above 187 dB for fish sizes of 2 grams or greater, or 183 dB for fish smaller than 2 grams.

Adverse effects on survival and fitness can occur even in the absence of overt injury. Exposure to elevated noise levels can cause a temporary shift in hearing sensitivity (referred to as a temporary threshold shift), decreasing sensory capability for periods lasting from hours to days (Turnpenny et al. 1994; Hastings et al. 1996). Popper et al. (2005) found temporary threshold shifts in hearing sensitivity after exposure to cSELs as low as 184 dB. Temporary threshold

shifts reduce the survival, growth, and reproduction of the affected fish by increasing the risk of predation and reducing foraging or spawning success.

We cannot predict the number of individual fish that will be exposed because of high variability in species presence at any given time. Furthermore, not all exposed individuals will experience adverse effects. We expect that some individuals of listed fish species will experience sublethal effects, such as temporary threshold shifts, or behavior responses to underwater noise for each of the projects that includes pile driving.

With regard to vibratory driving and noise from construction vessels, the behavioral effects from anthropogenic sound exposure remains poorly understood for fishes, especially in the wild. NMFS applies a conservative threshold of 150 dB rms (re 1 μ Pa) to assess potential behavioral responses of fishes from acoustic stimuli. Fewtrell (2003) observed fish exposed to air gun noise exhibited alarm responses from sound levels of 158 to 163 dB (re 1 μ Pa). More recently, Fewtrell and McCauley (2012) exposed fishes to air gun sound between 147-151 dB SEL and observed alarm responses in fishes.

The above-discussed criteria specifically address fish exposure to impulsive sound. Stadler and Woodbury (2009) make it clear that the thresholds likely overestimate the potential for impacts on fish from non-impulsive sounds (e.g., vibratory pile driving). Non-impulsive sounds have less potential to cause adverse effects in fish than impulsive sounds. Impulsive sources cause short bursts of sound with very fast rise times and the majority of the energy in the first fractions of a second. Whereas, non-impulsive sources cause noise with slower rise times and sound energy that is spread across an extended period of time; ranging from several seconds to many minutes in duration. Regarding noise from boat motors, some fish species have been noted to not respond to outboard engines, others respond with increased stress levels, and sufficient avoidance as to decrease density (Whitfield and Becker 2014).

Work windows are generally designed to prevent work from occurring during peak presence of salmonids, but do not guarantee that exposure will not occur. Juvenile Chinook will have the most exposure due to their extensive use of nearshore habitats. Juvenile chum also depend on estuarine and nearshore habitats, but they migrate more rapidly out of Puget Sound. Adult Chinook, adult and juvenile steelhead, and adult chum make little use of nearshore habitats, and will be exposed to injurious levels of underwater sound in very small numbers. Larval yelloweye rockfish and larval and juvenile PS/GB bocaccio will also be exposed in uncertain numbers. During the in-water work window (July 15 to February 15), all exposed PS Chinook salmon, PS steelhead, and adult HCSR chum individuals will be at least two grams, which reduces the likelihood of lethal response. Larval rockfish, younger juvenile PS/GB bocaccio, and younger chum salmon will be less than two grams, making them more vulnerable to lethal response.

We cannot estimate the number of individuals from any species that will experience adverse effects from underwater sound, nor predict the specific responses among the fish exposed. Not all exposed individuals will experience adverse effects, some will experience sublethal effects, such as temporary threshold shifts, some merely behavior responses such as startle. Physical injury from barotrauma, and death are also possible. However, because the projects will occur across a variety of locations in Puget Sound, we anticipate that multiple individual fish from

multiple populations of the various species will be adversely affected, up to and including death of some individuals.

SRKW Response

Southern Resident killer whales could be injured or disturbed by sound pressure generated by pile driving. NMFS uses conservative thresholds of sound pressure levels from broad band sounds that cause behavioral disturbance (160dBrms re: 1μPa for impulse sound and 120 dBrms re: 1μPa for continuous sound) and injury (for impulsive: peak SPL flat weighted 230 dB, weighted cumulative SEL 185 dB; for non-impulsive: weighted cumulative SEL 198 dB) (NMFS 2018). However, criteria for monitoring and stop-work on sighting of SRKW is intended to ensure that SRKW will not experience duration or intensity of pile driving, either impact or vibratory, that would result in disturbance or harm to any individual of this species. Per the best management practices listed in in Section 1.3 the following permits are assumed to have a Marine Mammal Monitoring Plan (MMPA) that would detect listed marine mammals before they would come into a zone on behavioral impact.

NWS-2018-963
NWS-2018-636
NWS-2018-760
NWS-2018-981
NWS-2018-570
NWS-2017-573
NWS-2019-552
NWS-2019-526
NWS-2018-750
NWS-2019-336
NWS-2018-525
NWS-2019-0883
NWS-2019-0703
NWS-2017-550
NWS-2019-101
NWS-2019-832
NWS-2017-427
NWS-2018-492
NWS-2017-796

Species Response to Enduring Effects

As was detailed in the effects to critical habitat section above, the proposed structures would cause an array of negative impacts to intertidal and nearshore habitat availability and function, along with more system-wide detriments associated with the use of the structures. Once repaired, replaced, or newly constructed, the structures would be expected to remain in the aquatic environment for a 40-50 year useful life period. Thus, multiple cohorts of the multiple populations of PS Chinook salmon, PS steelhead, Hood Canal Summer run Chum, PS/GB

bocaccio rockfish, PS/GB Yelloweye rockfish, and SRKW would experience the long-term habitat modifications associated with the presence of the structures.

Effects on listed species is a function of: (1) the numbers of fish exposed to habitat changes or direct effects of an action; (2) the duration, intensity, and frequency of exposure to those effects; and (3) the life stage at exposure. This section presents an analysis of exposure and response both to habitat effects, and some effects that occur directly on species.

Response to Water Quality Reductions—Suspended Sediments

Fish Species Response

A total of 26 (Table 5) projects will support vessels transit to and from ports, marinas, docks and piers. On-going and chronic increases in turbidity and TSS levels associated with propwash can occur at any time, in multiple PS locations, and are not constrained to periods when species presence or vulnerable life stages are low. For this reason, individual juvenile and adult salmonids, larval rockfish, and juvenile PS/GB bocaccio are all likely to be exposed at any time, and multiple exposures at individual and population scales are reasonably expected.

The effects of suspended sediment on fish increase in severity with sediment concentration and exposure time and can progressively include behavioral avoidance and/or disorientation, physiological stress (e.g., coughing), gill abrasion, and death (at extremely high concentrations). Newcombe and Jensen (1996) analyzed numerous reports on documented fish responses to suspended sediment in streams and estuaries, and identified a scale of ill effects based on sediment concentration and duration of exposure, or dose. Exposure to concentrations of suspended sediments expected during the proposed in-water construction activities could elicit sublethal effects such as a short-term reduction in feeding rate or success, or minor physiological stress such as coughing or increased respiration. Studies show that salmonids have an ability to detect and distinguish turbidity and other water quality gradients (Quinn 2005; Simenstad 1988), and that larger juvenile salmonids are more tolerant to suspended sediment than smaller juveniles (Servizi and Martens 1991; Newcombe and Jensen 1996).

We cannot estimate the number of individuals that will experience adverse effects from suspended sediment with any meaningful level of accuracy. We cannot predict the number or duration of each pulse of sediment, nor the number of individual fish that will be exposed to each pulse. Furthermore, not all exposed individuals will experience direct adverse effects. We expect that some individuals of listed fish species will experience sublethal effects such as stress and reduced prey consumption, some may respond with avoidance behaviors, and some may be injured. Those that engage in avoidance behaviors or with raised cortisol levels may have decreased predator detection and avoidance. Consistent with our analytical approach in this Opinion, these impacts are considered co-extensive with the effects of the repaired, replaced or new OWS themselves (see *Response to Habitat Disruptions from In-Water and Overwater Structures* below).

Because the distribution of projects occurs across Puget Sound, and the nature of sediment delivery is episodic and chronic, we expect sediment impacts will adversely affect all listed fish

species at multiple life stages, with the exception of adult PS/GB bocaccio, and juvenile and adult PS/GB yelloweye rockfish.

Response to Water Quality Reduction—Reduced Dissolved Oxygen

As stated above, increases of TSS can also produce localized reductions in DO. Sub-lethal effects of DO levels below saturation can include metabolic, feeding, growth, behavioral, and productivity effects. Behavior responses can include avoidance and migration disruption (NOAA Fisheries 2005). These effects are likely to occur contemporaneously with a subset of the events described above. As such it is expected that low DO exposure will occur in multiple locations each year, will adversely affect multiple listed fish species at multiple life stages with the exception of adult PS/GB bocaccio, and juvenile and adult PS/GB yelloweye rockfish.

Response to Water Quality Reduction—Contaminants

Fish Species Response

Increased stormwater discharge. For two projects (Table 18), polluted stormwater will be discharged to the Puget Sound from parking lots (~ 1.9 acres of pollution generating impervious surface (PGIS) that would not occur but for the proposed permit). Stormwater can discharge at any time of year, with the potential to expose of individual PS Chinook (juvenile and adult), and PS/GB bocaccio and yelloweye (larval, juvenile, and adult) within this action area. The increased levels of stormwater discharged from the two projects during rain and run-off events. All stormwater discharge is expected to contain concentration levels of constituents and chemical mixtures that are toxic to fish and aquatic life (NMFS 2012). The Oregon Toxics Opinion concluded that for chronic saltwater criteria for metal compounds, fish exposed to multiple compounds, versus a single compound exposure, are likely to suffer toxicity greater than the assessment effects (*e.g.*, 50 percent mortality) such as mortality, reduced growth, impairment of essential behaviors related to successful rearing and migration, cellular trauma, physiological trauma, and reproductive failure.

The highest concentration levels are expected to occur at the point of discharge and that they will be diluted as they enter the point of discharge into the Puget Sound. The effects of the dilution will be such that the individual copper, lead and zinc levels and the chemical mixtures in the discharge will be indistinguishable from background levels.

Concentration levels and toxicity of chemical mixtures will also be seasonally affected. First-flush rain events after long antecedent dry periods (periods of no rain) that most typically occur in September are also expected to have extremely high levels of copper, lead and zinc. Higher concentrations are also expected to occur between March and October in any given year—as there will be more dry periods during rain events. However, the occurrence of these events will occur with less frequency. Most discharge will occur between October and March, concurrent with when the region will receive the most rain.

In an examination of effect on juvenile salmon, McIntyre et al (2015) exposed sub yearling Coho salmon to urban stormwater. 100% of the juveniles exposed to untreated highway runoff died

within 12 hours of exposure. McIntyre et al (2018) later examined the prespawn mortality rate of coho salmon exposed to urban stormwater runoff. In their experiments 100% of coho salmon exposed to stormwater mixtures expressed abnormal behavior (lethargy, surface respiration, loss of equilibrium, and immobility within 2 to 6 hours after exposure.

We cannot estimate the number of individuals that will experience adverse effects from exposure to stormwater any meaningful level of accuracy. We cannot predict the number or duration of each pulse of discharge events, nor the number of individual fish that will be exposed during those events. Furthermore, not all exposed individuals will experience immediate adverse effects. We expect that every year some individuals PS Chinook (juvenile and adult), and PS/GB bocaccio and yelloweye (larval, juvenile, and adult) will experience sublethal effects such as stress and reduced prey consumption, some may respond with avoidance behaviors that disrupt feeding and migratory behavior, and some experience reduced growth, impairment of essential behaviors related to successful rearing and migration, cellular trauma, physiological trauma, reproductive failure, and mortality.

Cresote. A total of 25 proposed projects (Table 20) will remove creosote-treated piles and other creosote-treated timber. Creosote-treated piles contaminate the surrounding sediment up to two meters away with PAHs (Evans et al. 2009). The removal of the creosote-treated piles mobilizes these PAHs into the surrounding water and sediments (Smith et al. 2008; Parametrix 2011). Projects can also release PAHs directly from creosote-treated timber during the demolition of overwater timber and if any of the piles break during removal (Parametrix 2011). The concentration of PAHs released into surface water rapidly dilutes. Smith et al. (2008) reported concentrations of total PAHs of 101.8 µg/l 30 seconds after creosote-pile removal and 22.7 µg/l 60 seconds after. However, PAH levels in the sediment after pile removal can remain high for six months or more (Smith et al. 2008). Romberg (2005) found a major reduction in sediment PAH levels three years after pile removal contaminated an adjacent sediment cap.

Because they are shoreline-oriented and spend a greater amount of time within the action area, juvenile Chinook salmon will have the highest probability of exposure to PAHs. Juvenile chum also depend on estuarine and nearshore habitats, but they migrate more rapidly out of Puget Sound. We cannot discount the probability of adult and juvenile steelhead and adult Chinook and chum salmon exposure. Larval and juvenile PS/GB bocaccio and larval yelloweye rockfish could also be exposed. We cannot predict the number of fish that will be exposed to PAHs. The numbers of each species within the action area varies year to year. NMFS also cannot, with any meaningful level of accuracy, estimate the proportion of fish each year that will enter the impact zones. The magnitude of the exposure among some fish will greatly increase during the removal of these structures. We expect increased PAHs in the water column and sediments will remain within the area of increased suspended sediment caused by the project within 200 feet of creosote pile removal and structure demolition, and we do not expect fish to engage in avoidance behaviors within this area once suspended sediment from construction effects have dropped to baseline levels. Within three years after construction, the removal of the creosote-treated timber will begin to reduce the intensity of exposure of listed-fish, and exposure to PAHs at these sites would continue to decline over the long-term.

Vessels. Species will also be exposed to contaminants in oils and fuels, and PAHs from vessel operations, whether commercial or recreational, that transit to and from each of marinas, piers, wharfs, docks, floats, or boat ramps. These exposures are likely to be highest in the areas where use is concentrated, and more dilute throughout the remainder of the Sound where the vessels transit. Many individuals with each cohort of each species will be exposed annually via exhaust and incidental introduction of fuels and oils from vessels. These impacts are considered co-extensive with the presence of the OWS themselves (see *Response to Habitat Disruptions from In-Water and Overwater Structures* below).

There are two pathways for PAH exposure to listed fish species in the action area, direct uptake through the gills and dietary exposure (Lee and Dobbs 1972; Neff et al. 1976; Karrow et al. 1999; Varanasi et al. 1993; Meador et al. 2006; McCain et al. 1990; Roubal et al. 1977). Fish rapidly uptake PAHs through their gills and food but also efficiently remove them from their body tissues (Lee and Dobbs 1972; Neff et al. 1976). Juvenile Chinook salmon prey, including amphipods and copepods, uptake PAHs from contaminated sediments (Landrum and Scavia 1983; Landrum et al. 1984; Neff 1982). Varanasi et al. (1993) found high levels of PAHs in the stomach contents of juvenile Chinook salmon in the Duwamish estuary. The primary response of exposed salmonids, from both uptake through their gills and dietary exposure, are immunosuppression and reduced growth. Karrow et al. (1999) characterized the immunotoxicity of creosote to rainbow trout (*O. mykiss*) and reported a lowest observable effect concentration for total PAHs of 17 µg/l. Varanasi et al. (1993) found greater immune dysfunction, reduced growth, and increased mortality compared to control fish. In order to isolate the effects of dietary exposure of PAHs on juvenile Chinook salmon, Meador et al. (2006) fed a mixture of PAHs intended to mimic those found by Varanasi et al. (1993) in the stomach contents of field-collected fish. These fish showed reduced growth compared to the control fish. Of the listed fish exposed to PAHs and other contaminants, all are likely to have some degree of immunosuppression and reduced growth, which, generally, increases the risk of death.

SRKW Response

Water quality supports SRKW's ability to forage, grow, and reproduce free from disease and impairment. Water quality is essential to the whales' conservation, given the whales' present contamination levels, small population numbers, increased extinction risk caused by any additional mortalities, and geographic range (and range of their primary prey) that includes highly populated and industrialized areas. Water quality is especially important in high-use areas where foraging behaviors occur and contaminants can enter the food chain. Water quality impaired by contaminants can inhibit reproduction, impair immune function, result in mortalities, or otherwise impede the growth and the species' recovery. The proposed action exposes SRKW to contaminants.

SRKW can be exposed to contaminants directly (e.g. oil spills), or indirectly when their prey are contaminated through their own exposure to reduced water quality. For example, Chinook salmon contain higher levels of some persistent pollutants than other salmon species, but only limited information is available for pollutant levels in Chinook salmon (Krahn et al. 2007; O'Neill and West 2009; Veldhoen et al. 2010; Mongillo et al. 2016). These harmful pollutants, through consumption of prey species that contain these pollutants, are stored in the killer whale's blubber and can later be released; when the pollutants are released, they are redistributed to other tissues when the whales metabolize the blubber in response to food shortages or reduced acquisition of food energy that could occur for a variety of other reasons. The release of pollutants can also occur during gestation or lactation. Once the pollutants mobilize in to circulation, they have the potential to cause a toxic response. Therefore, nutritional stress from reduced Chinook salmon populations may act synergistically with high pollutant levels in Southern Residents and result in adverse health effects.

Various adverse health effects in multiple species have been associated with exposures to persistent pollutants. These pollutants have the ability to cause endocrine disruption, reproductive disruption or failure, immunotoxicity, neurotoxicity, neurobehavioral disruption, and cancer (Reijnders 1986, de Swart et al. 1996, Subramanian et al. 1987, de Boer et al. 2000; Reddy et al. 2001, Schwacke et al. 2002; Darnerud 2003; Legler and Brouwer 2003; Viberg et al. 2003; Ylitalo et al. 2005; Fonnum et al. 2006; Viberg et al. 2006; Darnerud 2008; Legler 2008; Bonefeld-Jørgensen et al. 2011). Southern Residents are exposed to a mixture of pollutants, some of which may interact synergistically and enhance toxicity, influencing their health. High levels of these pollutants have been measured in blubber biopsy samples from Southern Residents (Ross et al. 2000; Krahn et al. 2007; Krahn et al. 2009), and more recently, these pollutants were measured in fecal samples collected from Southern Residents (Lundin et al. 2016a; Lundin et al. 2016b).

It is expected that SRKW prey species in the action area (i.e., PS Chinook salmon) will be exposed to and bio-accumulate contaminants through the proposed actions TSS, creosote pile removal and storm water discharge (a pathway for exposure of persistent pollutants such as PCBs). The majority of SRKWs have high levels of PCBs (Ross et al. 2000; Krahn et al. 2007, 2009) that exceed a health-effects threshold (17,000 ng/g lipid) derived by Kannan et al. (2000) and Ross et al. (1996) for PCBs in marine mammal blubber. The PCB health-effects threshold is associated with reduced immune function and reproductive failure in harbor seals (Reijnders 1986; de Swart et al. 1996; Ross et al. 1996; Kannan et al. 2000). Moreover, juvenile Southern Resident killer whales have blubber concentrations that are currently 2 to 3.6 times higher than the established health-effects threshold (Krahn et al. 2009).

Since the contaminate exposure is considered to be a chronic and on-going, it is also expected a SRKW will consume at least some of the exposed and contaminated fish, adversely impacting SRKW health and fitness. The proposed action reduces the time until persistent pollutants (e.g. PCBs from stormwater) will surpass a health-effects threshold (i.e., PCB accumulation over the lifetime of a killer whale will occur more rapidly with the action than without it). Increasing persistent pollutant levels in the whales only further exacerbates their current susceptibility to adverse health effects.

Response to Noise in Aquatic Habitat from Vessels

Fish Species Response

The increase in noise related to commercial vessel traffic and recreational boating caused by the proposed action is likely to adversely affect Chinook salmon, HCSR chum, steelhead, and rockfish. Increased background noise has been shown to increase stress in fish (Mueller 1980; Scholik and Yan 2002; Picciulin et al. 2010). Recreational boat noise diminished the ability of resident red-mouthed goby (*Gobius cruentatus*) to maintain its territory (Sebastianutto et al. 2011). Xie et al. (2008) report that adult migrating salmon avoid vessels by swimming away. Graham and Cooke (2008) studied the effects of three boat noise disturbances (canoe paddling, trolling motor, and combustion engine (9.9 horsepower) on the cardiac physiology of largemouth bass (*Micropterus salmoides*). Exposure to each of the treatments resulted in an increase in cardiac output in all fish, associated with a dramatic increase in heart rate and a slight decrease in stroke volume, with the most extreme response being to that of the combustion engine treatment (Graham and Cooke 2008). Recovery times were the least with canoe paddling (15 minutes) and the longest with the power engine (40 minutes). Graham and Cooke (2008) postulate that the fishes' reactions demonstrate that the fish experienced sublethal physiological disturbances in response to the noise propagated from recreational boating activities. There are few published studies that assess mortality from vessel traffic on fishes, but studies thus far indicate that ichthyoplankton, which could include rockfish, may be susceptible to mortality because they are unable to swim away from traffic and thus may be harmed by propellers and turbulence. One study found low overall mortality from traffic, but that larvae loss was size dependent and that smaller larvae were more susceptible to mortality (Tonnes et al. 2016).

We expect juvenile and adult life history stages of Chinook salmon, HCSR chum salmon, steelhead, will be exposed; larval and juvenile PS/GB bocaccio will be exposed to noise from vessel. Each species at each of these life stages will experience sublethal physiological stress. Adult PS/GB bocaccio, and all lifestages of yelloweye are not expected to experience stressful levels of noise from vessels because these species/lifestages occur along the sea floor in deep water, where we expect noise to have dissipated to ambient levels.

Some fish that encounter boating noise will likely startle and briefly move away from the area. A study of motorboat noise on damselfish noted an increase in mortality by predation (Simpson et al. 2016). While some fish species have been noted to not respond to outboard engines, others respond with increased stress levels, and sufficient avoidance as to decrease density (Whitfield and Becker, 2014), while others experience reduced forage success (Voellmy et al 2014) either by reducing foraging behavior, or because of less effective foraging behavior. When fish startle and avoid preferred habitats, both the predator and prey detection may be impaired for a short period of time (minutes up to one hour) following that response.

Taken together, it can be assumed that juvenile salmonids are likely to respond to episodes of motor boat noise with a stress and startle reaction that can diminish both predator and prey detection for a short period of time with each episode. Because of the intermittent nature of the disturbance and the ability for fish to recuperate when it occurs, we do not expect this effect to be meaningful to survival in adult or juvenile fish in every location where they encounter noise

from recreational boating, though growth and fitness could be slightly diminished if they encounter frequent episodes of boat noise, such as at marinas, public boat launches, or commercial piers or wharfs.

As described in the baseline section, commercial and recreational vessel traffic occurs throughout Puget Sound. We expect all life history stages of Chinook salmon, HCSR chum salmon, steelhead, and juvenile PS/GB bocaccio will be exposed to vessel traffic and will experience sublethal physiological stress. Given that adult yelloweye rockfish occur along the sea floor in deep water, we do not expect adult PS/GB bocaccio and yelloweye rockfish to be affected by noise from vessel traffic.

SRKW Response

The proposed action will result in vessel use and noise as described in the Environmental Baseline Section 2.3. While larger tanker-type industrial vessels can generate sound that is detectable that is within the range of the SRKW, and the co-occurrence of SRKW and transiting ships is expected to be short-term and transitory, such that we do not expect to be able to meaningfully detect a measurable impact from tanker-type traffic.

Smaller fishing, recreational and commercial vessels are subject to existing federal regulations prohibiting approach to SRKW closer than 200 yards or positioning in the path of the whales within 400 yards (with exemptions for vessels lawfully engaged in commercial or treaty Indian fishing that are actively setting, retrieving, or closely tending fishing gear). State regulations also mandate protections for SRKWs (see RCW 77.15.740, mandating 300-400 yard approach limits, 7 knots or less speed within ½ nautical mile of the whales). Additionally, NMFS and other partners have outreach programs in place to educate vessel operators on how to avoid impacts to whales. As a result, we expect that any vessels in the vicinity of SRKWs are not likely to disrupt normal behavioral patterns nor have the potential to disturb by causing disruption of behavioral patterns.¹⁸

Response to Habitat Disruptions from In-Water and Overwater Structures

Fish Species Response

Migration Disruption. In and overwater structures cause delays in migration for PS Chinook salmon from disorientation, fish school dispersal (resulting in a loss of refugia), and altered migration routes (Simenstad 1999). Juvenile salmonids stop at the edge of the structures and avoid swimming into their shadow or underneath them (Heiser and Finn 1970; Able et al. 1998; Simenstad 1988; Southard et al. 2006; Toft et al. 2013). Swimming around structures lengthens the migration distance and is correlated with increased mortality. Anderson et al. (2005) found migratory travel distance rather than travel time or migration velocity has the greatest influence on the survival of juvenile spring Chinook salmon migrating through the Snake River 2005.

Juvenile salmon, in both the marine nearshore and in freshwater, migrate along the edge of shadows rather than through them (Nightingale and Simenstad 2001b; Southard et al. 2006;

¹⁸ No 'take' as defined in the ESA or MMPA, of SRKWs, is expected to result from vessel-related impacts.

Celedonia et al. 2008a; Celedonia et al. 2008b; Moore et al. 2013; Munsch et al. 2014). In freshwater, about three-quarters of migrating Columbia River fall Chinook salmon smolts avoided a covered channel and selected an uncovered channel when presented with a choice in an experimental flume setup (Kemp et al. 2005). In Lake Washington, actively migrating juvenile Chinook salmon swam around structures through deeper water rather than swimming underneath a structure (Celedonia et al. 2008b). Structure width, light conditions, water depth, and presence of macrophytes influenced the degree of avoidance. Juvenile Chinook salmon were less hesitant to pass beneath narrower structures (Celedonia et al. 2008b).

In the marine nearshore, there is also substantial evidence that OWS impede the nearshore movements of juvenile salmonids (Heiser and Finn 1970; Able et al. 1998; Simenstad 1999; Southard et al. 2006; Toft et al. 2007). In the Puget Sound nearshore, 35 millimeter to 45 millimeter juvenile chum and pink salmon were reluctant to pass under docks (Heiser and Finn 1970). Southard et al. (2006) snorkeled underneath ferry terminals and found that juvenile salmon were not underneath the terminals at high tides when the water was closer to the structure, but only moved underneath the terminals at low tides when there was more light penetrating the edges. These findings show that overwater-structures can disrupt juvenile migration in the Puget Sound nearshore.

Juvenile Chinook and juvenile HCSR chum migrate along shallow nearshore habitats, and OWSs will disrupt their migration and increase their predation risk. Every juvenile Chinook and juvenile HCSR chum will encounter OWSs during their out-migration, and because the projects in this consultation are across Puget Sound, these structures will continue to be part of that migration disruption for fish in every year that they are present in the marine environment. Adult Chinook, adult and juvenile steelhead, adult chum, and juvenile PS/GB bocaccio do not migrate along shallow nearshore habitats. Therefore, OWS will not obstruct their movements. Impacts to SAV and epibenthic forage at these structures will affect both adult and juvenile Chinook, chum steelhead, and juvenile PS/GB bocaccio, however, by reducing forage at each site.

Increased Predation Risk. An implication of juvenile salmon avoiding OWS is that some of them will swim around the structure (Nightingale and Simenstad 2001b). This behavioral modification will cause them to temporarily utilize deeper habitat, thereby exposing them to increased piscivorous predation. Hesitating upon first encountering the structure, as discussed, also exposes salmonids to avian predators that may use the floating structures as perches. Typical piscivorous juvenile salmonid predators, such as flatfish, sculpin, and larger juvenile salmonids, being larger than their prey, generally avoid the shallowest nearshore waters that outmigrant juvenile salmonids prefer—especially in the earliest periods of their marine residency. When juvenile salmonids temporarily leave the relative safety of the shallow water, their risk to being preyed upon by other fish increases. This has been shown in the marine environment where juvenile salmonid consumption by piscivorous predators increased fivefold when juvenile pink salmon were forced to leave the shallow nearshore (Willette 2001).

Further, swimming around OWS lengthens the salmonid migration route, which has been shown to be correlated to increased mortality. Migratory travel distance rather than travel time or migration velocity has been shown to have the greatest influence on survival of juvenile spring Chinook salmon migrating through the Snake River (Anderson et al. 2005). In summary, NMFS

assumes that the increase in migratory path length from swimming around OWS as well as the increased exposure to piscivorous predators in deeper water likely will result in proportionally increased juvenile PS Chinook and HCSR chum mortality.

Decreased Prey and Cover. OWS and associated boat use adversely affects SAV, if present. SAV is important in providing cover and a food base for juvenile PS Chinook, HCSR chum salmon, PS steelhead, and juvenile PS/GB bocaccio. Bax et al. (1978) determined the abundance of chum fry was positively correlated with the size of shallow nearshore zones, and sublittoral eelgrass beds have been considered to be the principal habitat utilized by the smaller. Overwater structures shade SAV (Kelty and Bliven 2003). Additionally, the turbidity from boat propeller wash decreases light levels (Eriksson et al. 2004). Shafer (1999; 2002) provides background information on the light requirements of seagrasses and documents the effects of reduced light availability on seagrass biomass and density, growth, and morphology.

Fresh et al. (2006) researched the effects of grating in residential floats on eelgrass, a substrate for herring spawning, a Chinook salmon forage species. They reported a statistically significant decline in eelgrass shoot density underneath six of the 11 studied floats in northern Puget Sound. We could not find studies examining the effect of OWS on SAV other than eelgrass and kelp (Mumford 2007). However, the physiological pathways that result in the reduction in shoot density and biomass from shading applies to all SAV. Thus, it is reasonable to assume that shading from OWS adversely affects all SAV. A reduction to the primary production of SAV beds is likely to incrementally reduce the food sources and cover for juvenile PS Chinook, HCSR chum salmon, PS steelhead, and juvenile PS/GB bocaccio. The reduction in food source includes epibenthos (Haas et al. 2002) as well as forage fish. This reduction occurs in areas where smoltified salmonids have entered salt water and require abundant prey for growth, maturation and fitness for their marine life history stage.

The incremental reduction in epibenthic prey associated with the OWS projects will continue to reduce forage for listed fish production at each site for the new 40-year useful life period. When salmonids from multiple cohorts from all populations have reduced prey availability and increased competition, it is reasonable to assume that the carrying capacity is constrained and abundance of these listed species will be curtailed or reduced. As these species, particularly Chinook salmon as returning adults are prey of SRKW, this reduction constrains the prey availability for SRKW as well.

When PS/GB bocaccio rockfish reach sizes of 1 to 3.5 in (3 to 9 cm) or 3 to 6 months old, they settle into shallow, intertidal, nearshore waters in rocky, cobble and sand substrates with or without kelp (Love et al. 1991; Love et al. 2002). This habitat feature offers a beneficial mix of warmer temperatures, food, and refuge from predators (Love et al. 1991). Areas with floating and submerged kelp species support the highest densities of juvenile PS/GB bocaccio rockfish. OWS, then, by reducing prey communities and impairing SAV growth, diminish both values for PS/GB bocaccio, impairing their survival, growth, and fitness.

As described in the baseline section, there are 1,581 acres of overwater structure in the nearshore of Puget Sound. The authorization for a new 40- to 50- year useful life period of the overwater structures considered in this opinion contributes to stasis in that number. While this could be

interpreted to not exert a change in the area of overwater cover, we do interpret that the stasis in the amount of overwater coverage means that overwater coverage will not meaningfully decrease for the foreseeable future, areas of diminished habitat in an around each structure will not improve for the foreseeable future, carrying capacity near these structures will not improve for the foreseeable future, and overall abundance and productivity for the populations listed species that rely on these areas at juvenile lifestages will also not improve for the foreseeable future. This would be particularly true of juvenile Puget Sound Chinook salmon from all populations, annually for 40–50 years (new useful life period), and larval and juvenile PS/GB bocaccio for the same time frame.

Species Response to Shoreline Armoring

Fish Species Response

Juvenile Chinook and juvenile HCSR chum migrate along shallow nearshore habitats, and bulkheads will degrade nearshore habitats and increase their predation risk. Every juvenile Chinook and juvenile HCSR chum will encounter armored beaches during their out-migration. As described in the effects on critical habitat, shoreline armoring reduces several nearshore habitat values, including reduced feeding opportunity, increased predation risk, and lack of shallow habitat areas particularly during high tides. We cannot estimate the number of individuals that will experience these effects from the shoreline armoring projects covered in this consultation.

Given that out-migrating juvenile salmonids (particularly Chinook salmon) use shallow-water habitats for rearing, foraging, and migration, bulkheads may potentially reduce growth and fitness of juvenile salmonid during this phase of their life history. In turn, the aggregate impact of this disruption among individuals over each year that these structures are in their habitat for the new 50-year useful life period) and will amount to an overall reduction in survival rate because forcing juveniles into deeper water (when shore processes steepen beaches and truncate access to shallows during high tides), potentially affects their survival by exposing them to greater risk of predation while simultaneously limiting their prey resource availability along the shoreline (shallow littoral zone), thereby decreasing their feeding success and growth rate.

In addition, the alignment of some bulkheads will create or continue shading along the face of the wall, which further camouflages predators holding there from prey moving along the wall in waters lit by the sun. Such shaded areas create hiding areas for predators and prey that conceal them from fish in the lighted zone outside of the area impacted by the shaded area. Such behavior by fish creates a temporal and spatial overlap of predators and prey in the shaded zone, as well as enhancing the success of predator ambush attacks on prey outside of the shaded zone (Kahler et al. 2000, Carrasquero 2001).

Adult Chinook, adult and juvenile steelhead, adult chum, and juvenile PS/GB bocaccio do not migrate along shallow nearshore habitats. Therefore, bulkheads will not directly affect them. Impacts to SAV and epibenthic communities from shore steepening, and sediment coarsening will affect adult and juvenile Chinook, chum steelhead, and juvenile PS/GB bocaccio by

available reducing forage. To the degree that rockfish spawn depends on SAV, their survival will also be reduced.

Species Response to Forage Reduction

Fish Species Response

Temporary, episodic, and enduring reductions in forage base, whether benthic prey communities or forage fish, will occur as a chronic additional reduction over the baseline condition from the proposed repairs, replacements, expansions, or new construction of in and overwater structures and shoreline armoring. When the reductions are widespread throughout Puget Sound, it increases the likelihood that many individual fish from most populations, from all future cohorts of all species, with the exception of yelloweye rockfish and adult PS/GB bocaccio, will experience increased competition with a decrease in carrying capacity of the action area. This would result in slight but chronic reductions in abundance from each cohort of each population, but at levels impossible to predict or measure. The long-term effect of downward abundance would be an overall reduction in productivity, spatial structure, and diversity of the various fish species.

SRKW Response

When prey is scarce, SRKW likely spend more time foraging than when prey is plentiful. Increased energy expenditure and prey limitation can cause poor body condition and nutritional stress. Nutritional stress is the condition of being unable to acquire adequate energy and nutrients from prey resources and as a chronic condition, can lead to reduced body size of individuals and to lower reproductive or survival rates in a population (Trites and Donnelly 2003). During periods of nutritional stress and poor body condition, cetaceans lose adipose tissue behind the cranium, displaying a condition known as “peanut-head” in extreme cases (Pettis et al. 2004; Bradford et al. 2012; Joblon et al. 2014). This individual stress and diminished body condition of individuals would lead to an overall decline in the fitness of the species.

NMFS qualitatively evaluated long-term effects on the SRKW from the anticipated reduction in PS Chinook salmon. We assessed the likelihood for localized depletions, and long-term implications for SRKW’ survival and recovery, resulting from the proposed action presenting risks to the continued existence of PS Chinook salmon and reducing the ability for the ESU to expand and increase in abundance. In this way, NMFS can determine whether the reduced likelihood for survival and recovery of prey species is also likely to appreciably reduce the likelihood of survival and recovery of Southern Residents. Viability at the population level is a foundational necessity for PS Chinook salmon persistence and recovery.

Hatchery programs, which account for a large portion of the production of this ESU, may provide a short-term buffer, but it is uncertain whether hatchery-only stocks could be sustained indefinitely. The loss of this Chinook salmon population would also preclude the potential for the ESU level future recovery to healthy, more substantial numbers. The weakened ESU demographic structure, with declines in abundance, spatial structure, and diversity, will result in a long-term suppression, if not decline, in the total prey available to Southern Residents. In this

consultation, the long-term effects are specifically: fewer populations contributing to Southern Residents' prey base, reduced diversity in life histories, spatial structure, resiliency of prey base, greater ESU level risk relative to stochastic events, and diminished redundancy that is otherwise necessary to ensure there a margin of safety for the salmon and Southern Residents to withstand catastrophic events.

Differences in adult salmon life histories and locations of their natal streams likely affect the distribution of salmon across the Southern Residents' geographic range. The continued decline and reduced potential for recovery of the PS Chinook salmon, and consequent interruption in the geographic continuity of salmon-bearing watersheds in the Southern Residents' critical habitat, is likely to alter the distribution of migrating salmon and increase the likelihood of localized depletions in prey, with adverse effects on the Southern Residents' ability to meet their energy needs. A fundamental change in the prey base within critical habitat is likely to result in Southern Residents abandoning areas in search of more abundant prey or expending substantial effort to find depleted prey resources. This potential increase in energy demands should have the same effect on an animal's energy budget as reductions in available energy, such as one would expect from reductions in prey.

Lastly, the long-term reduction of PS Chinook salmon is likely to lead to nutritional stress in the whales. Nutritional stress can lead to reduced body size and condition of individuals and can also lower reproductive and survival rates. Prey sharing would distribute more evenly the effects of prey limitation across individuals of the population that would otherwise be the case. Therefore, poor nutrition from the reduction of prey could contribute to additional mortality in this population. Food scarcity could also cause whales to draw on fat stores, mobilizing contaminants stored in their fat and affecting reproduction and immune function.

Effects on Population Viability

Fish Species Response

We assess the importance of effects in the action area to the Evolutionarily Significant Units (ESUs)/Distinct Population Segments (DPS) by examining the relevance of those effects to the characteristics of Viable Salmon Populations (VSPs). The characteristics of VSPs are sufficient abundance, population growth rate (productivity), spatial structure, and diversity. While these characteristics are described as unique components of population dynamics, each characteristic exerts significant influence on the others. For example, declining abundance can reduce spatial structure of a population when habitats are less varied diversity among the population declines. We expect a persistent, chronic, negative effect from the proposed action, especially on the survival of juvenile PS Chinook salmon and larval and juvenile PS/GB bocaccio.

Abundance. While numbers cannot be ascertained, it is certain that at each site, there will be temporary, episodic and enduring effects that diminish water quality, forage base, and safe migration, as habitat effects, as well as sound and entrainment that can cause direct injury and mortality. Because these effects at each location, for each year they are in place, have the potential to reduce fitness and survival among individuals from the listed fish species that use the action area, we find it likely that there will be reductions survival and thus abundance from each

cohort of each population of the listed species. This effect will be most influential on the abundance of PS Chinook salmon and PS/GB bocaccio given their greater reliance on nearshore areas during juvenile life stages. Because of the chronic nature of these reductions in survival, we expect that over time, productivity will also be diminished.

Productivity. We cannot quantify the effects of degraded habitat on the listed rockfish because these effects are poorly understood. However, there is sufficient evidence to indicate that ESA-listed rockfish productivity may be negatively impacted by the habitat structure and water quality stressors discussed above (Drake et al. 2010). While it is impossible to attribute the decline in returning cohorts to specific causes of death at marine life stages, it is likely that declines in abundance of juvenile salmonids while in Puget Sound allows fewer fish, and less fit fish, to reach an ocean life stage. Typical sources of mortality while in their ocean life stage then work against smaller entering cohorts, and further reduce the numbers of fish that ultimately return to spawn, which we recognize as decreased productivity.

Spatial structure. As abundance and productivity decline, the spatial extent of habitat utilized for spawning may also decline.

Diversity. Once juvenile Chinook salmon leave estuarine/delta habitats and enter Puget Sound, they distribute widely and probably can be found along all stretches of shoreline at some point during the year. Data from coded wire tag recoveries of hatchery juvenile Chinook salmon suggest that some fish from each population may distribute broadly within Puget Sound before leaving, thus we anticipate that over the life of the structures, every population of PS Chinook salmon will have multiple members from each cohort exposed to the habitat effects in the nearshore, irrespective of proximity to natal streams (Fresh 2006).

Salmonids have complex life histories and changes in the nearshore environment have a greater effect on specific life-history traits that make prolonged use of the nearshore. The proposed in-water construction would occur when most juvenile PS Chinook salmon and PS steelhead have moved away from the nearshore, utilizing deeper water. However, annually many juvenile PS Chinook salmon and some PS steelhead would be exposed to long-term impacts of the enduring structures on habitat conditions. The impacts are expected to be greatest on juvenile PS Chinook salmon because they spend a longer period of time in nearshore environments (i.e. rearing) and on PS/GB bocaccio because their larval and juvenile life stages rely on nearshore features.

Over time, selective pressure on one component of a life-history strategy tends to eliminate that divergent element from the population, reducing diversity in successive generations and the ability of the population to adapt to new environmental changes (McElhany et al. 2000). Any specific populations that experience increased mortality or survival from the proposed action would have their life-history strategy selected against or for, respectively. The long-term effects of the proposed enduring structures would likely result in a slight decline in PS Chinook salmon diversity, proportional to the limited habitat alteration, by differentially affecting specific populations that encounter the armored shorelines (e.g. with bulkheads) within and adjacent to the action area, with greater frequency during their early marine life-history. We are unable to determine which specific populations of PS Chinook salmon most frequently utilize resources within the action area.

Because nearshore areas are not relied on to the same degree by PS steelhead, Hood Canal summer-run Chum salmon, or yelloweye rockfish, while effects will be chronic and adverse and will cause some detriments in survival, we do not expect their declines in abundance to occur at a level that will impair productivity.

SRKW Response

We review the population level effects on SRKW using the same parameters for viability, namely abundance, productivity, spatial structure, and distribution. This distinct population segment comprises three groups, J, K, and L pods. Abundance is low, (J pod = 22, K pod = 17, L pod = 33) as of July 1st, 2020. Productivity is likely to be impaired by the relatively high number of males to females. Spatial distribution has high inter-annual variability, and diversity is at risk because of the low abundance.

These threats were reviewed by Murray et al. (2019), who found a “cumulative effects” model was better at determining population impacts compared to individual threats. The “cumulative effects” model indicated that Chinook salmon abundance was the most sensitive model parameter, however they highlighted the importance of considering threats collectively. Lacy et al. (2017) developed a population viability assessment (PVA) developed a model that attempts to quantify and compare the three primary threats affecting the whales (e.g. prey availability, vessel noise and disturbance, and high levels of contaminants). The Lacy et al. (2017) model also found that Chinook salmon abundance was the most important threat to SRKW population growth; however, . They also emphasized that prey increases alone would likely not be sufficient to recover the whales and that the other threats would need to be addressed as well.

The most recent effort to review the relationships of SRKW vital rates and Chinook salmon abundance was conducted by an Ad Hoc Workgroup through the Pacific Fisheries Management Council (PFMC 2020). However, the Workgroup did not assess the cumulative threats, and found that the small population size limited their ability to detect a quantitative relationship between Chinook salmon abundance and SRKW demographic metrics (e.g. fecundity and survival) to input into their PVA and the relationship is likely not linear or not constant over time (PFMC 2020). Although there are challenges to detecting quantitative relationships and others have cautioned against overreliance on correlative studies (see Hilborn et al. 2012), given the status of the species (endangered with low abundance and productivity), and their strong preference for Chinook salmon prey, the continued existence and potential for recovery of the species is highly dependent on healthy numbers of Chinook salmon throughout its range.

Short-term reduction of Chinook salmon abundance associated with the temporary effects of the proposed action would result in an insignificant reduction in adult equivalent prey resources for SRKW. However, the long-term effects of the action include the suppression of productivity among (i.e., reduced survival of juvenile) PS Chinook populations during a 40-50 year time period, and spatial and temporal depletions in Chinook presence. This in turn limits the number of adult PS Chinook available as prey for SRKW over the long-term, as well as causing SRKW to expend energy to seek prey in other locations due to spatial and temporal depletions. These effects of the proposed action are likely to be experienced by all members of this species relies on published correlations using outdated data, assumes the correlations represent a causative

relationship, and models SRKW demographic trajectories assuming that the relationship is constant over time. These assumptions (correlation represent causation, etc.) were previously criticized by a panel of experts and they cautioned against overreliance on correlative studies (Hilborn et al. 2012). The most recent effort to review the relationships of SRKW vital rates and Chinook salmon abundance was conducted by an Ad Hoc Workgroup through the Pacific Fisheries Management Council (PFMC 2020). The small population size limits the ability to detect a relationship to input into a PVA and the relationships are not constant over time (NMFS 2020).

These are consistent with several factors identified in the final recovery plan for Southern Resident killer whales that may be limiting recovery: quantity and quality of prey, toxic chemicals that accumulate in top predators, and disturbance from sound and vessels. It is likely that multiple threats are acting together, and while it is not clear which threat or threats are most significant to the survival and recovery of Southern Residents, all of the threats are important to address. Effects of the proposed action on Southern Residents would be due to the project's adverse effects on Chinook salmon, the whales preferred prey. Given the status of the species (endangered with low abundance and productivity), and their strong preference for Chinook salmon prey, the continued existence and potential for recovery of the species is highly dependent on healthy numbers of Chinook salmon throughout its range.

The reduction in the number of adult PS Chinook available as prey for SRKW over the long-term would likely result in additional stress and a lower likelihood of survival and reproduction for individual whales. In response to decreased prey availability, the Southern Residents would likely increase foraging effort or abandon areas in search of more abundant prey. Reductions in prey or a resulting requirement of increased foraging efficiency would increase the likelihood of physiological effects. The Southern Residents would likely experience nutritional, reproductive, or other health effects (e.g., reduced immune function from drawing on fat stores and mobilizing contaminants in the blubber) from this reduced prey availability. These effects would lead to reduced body size and condition of individuals and can also lower reproductive and survival rates. In particular, the reduction in available prey is likely to put further stress on SRKW juveniles, pregnant females, and nursing females, with likely mortality (decrease in abundance) and decreased fecundity (decreased productivity).

Because of this population's small size, it is susceptible to rapid decline due to demographic stochasticity, and genetic deterioration. Small populations are inherently at risk because of the unequal reproductive success of individuals within the population. The more individuals added to a population in any generation, the more chances of adding a reproductively successful individual. Random chance can also affect the sex ratio and genetic diversity of a small population, leading to lowered reproductive success of the population as a whole. For these reasons, the failure to add even a few individuals to a small population in the near term can have long-term consequences for that population's ability to survive and recover into the future. A delisting criterion for the Southern Resident killer whale DPS is an average growth rate of 2.3% for 28 years (NMFS 2008). In light of the current average annual growth rate of 0.1%, this recovery criterion and the risk of stochastic events and genetic issues described above underscore the importance for the population to grow quickly.

Particularly in light of the small population size and the associated risks, the enduring effects of the proposed action could limit survival and impede the recovery of the PS Chinook salmon ESU by reducing the potential for population growth and increasing the likelihood of additional loss of individual whales. Further reductions in Southern Resident prey quantity, or spatial or temporal depletions would reduce the representation of diversity in SRKW life histories, resiliency in withstanding stochastic events, and redundancy to ensure there is a margin of safety for the salmon and Southern Residents to withstand catastrophic events. Long-term prey reductions affect the fitness of individual whales and their ability to both survive and reproduce. Reduced fitness of individuals increases the mortality and extinction risk of Southern Residents and reduces the likelihood of recovery of the DPS.

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 ESA.

The action area, all waters of Puget Sound from Olympia, Washington at its southern end, to north of Bellingham, Washington, and to but not including the Strait of Juan de Fuca, is influenced by actions in the nearshore, along the shoreline, and also in tributary watersheds of which effects extend into the action area. Future actions in the nearshore and along the shoreline of Puget Sound likely include port and ferry terminal expansions, residential and commercial development, shoreline modifications, road and railroad construction and maintenance, and agricultural development. The repair, replacement, construction and removal, of bulkheads above the HTL that may not require federal authorization will continue. Based on current trends, there could continue to be a net reduction in the total amount of shoreline armoring in Puget Sound (PSP 2018). Changes in tributary watersheds that are likely to affect the action area include reductions in water quality, water quantity, and sediment transport. Future actions in the tributary watersheds whose effects are likely to extend into the action area include operation of hydropower facilities, flow regulations, timber harvest, land conversions, disconnection of floodplain by maintaining flood-protection levees, effects of transportation infrastructure, and growth-related commercial and residential development. Some of these developments will occur without a federal nexus, however, activities that occur waterward of the OHWM require a USACE permit and therefore involve federal activities.

All such future non-federal actions, in the nearshore as well as in tributary watersheds, will cause long-lasting environmental changes and will continue to harm ESA-listed species and their critical habitats. Especially relevant effects include the loss or degradation of nearshore habitats, pocket estuaries, estuarine rearing habitats, wetlands, floodplains, riparian areas, and water quality. We consider human population growth to be the main driver for most of the future negative effects on salmon and steelhead and their habitat.

When we consider a generic design life of structures in the proposed action, we can anticipate that docks, piers, ramps, and bulkheads, when maintained, are likely to remain in the

environment for roughly 50 years. Thus, to gauge the cumulative effects accurately, we consider the non-federal effects that will occur in the action area within that same timeframe. As mentioned above, human populations are expected to increase within the Puget Sound region, and if population growth trends remain relatively consistent with recent trends, we can anticipate future growth at approximately 1.5 percent per year.

The human population in the PS region increased from about 1.29 million people in 1950 to about 3.84 million in 2014, is expected to reach 4.17 million by 2020, and nearly 5 million by 2040 (Puget Sound Regional Council 2020). As of the date of this biological opinion, human population in the Puget Sound Region is 4.2 million, slightly exceeding projections. Thus, future private and public development actions are very likely to continue in and around PS. As the human population continues to grow, demand for agricultural, commercial, and residential development and supporting public infrastructure is also likely to grow. We believe the majority of environmental effects related to future growth will be linked to these activities, in particular land clearing, associated land-use changes (i.e., from forest to impervious, lawn or pasture), increased impervious surface, and related contributions of contaminants to area waters. Land use changes and development of the built environment that are detrimental to salmonid habitats are likely to continue under existing regulations. Though the existing regulations minimize future potential adverse effects on salmon habitat, as currently constructed and implemented, they still allow systemic, incremental, additive degradation to occur.

In June 2005, the Shared Strategy presented its recovery plan for PS Chinook salmon and the Hood Canal Coordinating Council presented its recovery plan for Hood Canal summer-run chum salmon to NMFS who adopted and expanded the recovery plans to meet its obligations under the ESA. Together, the joint plans comprise the 2007 PS Chinook and Hood Canal summer-run chum Recovery Plan. Several not for profit organizations and state and federal agencies are implementing recovery actions identified in these recovery plans.

For the inland waters of Washington, federal rules on vessel traffic to protect SRKW from vessel effects were adopted in 2011 (76 FR 20870). Outreach and enforcement of these regulations will reduce the vessel effects (as described in Ferrara et al. (2017)) of recreational and commercial whale watching vessels in U.S. waters of the action area. There is currently a voluntary ¼ mile “Whalewatch Exclusion Zone” along the west side of San Juan Island from Mitchell Bay to Eagle Point (and ½ mile around Lime Kiln) as part of the San Juan County Marine Resources Committee Marine Stewardship Area; these are key summer foraging areas for the whales. San Juan County expanded this area to include a ¼ mile no vessel zone to Cattle Point starting in 2018 and WDFW has been increasing education and outreach regarding this area, including with the fishing community.

On March 14, 2018, WA Governor’s Executive Order 18-02 was signed and it orders state agencies to take immediate actions to benefit SRKW and established a Task Force to identify, prioritize, and support the implementation of a longer-term action plan need for Southern Resident killer whale recovery. The Task Force provided recommendations in a final Year 1 report in November 2018.¹⁹ In 2019, a new state law was signed that increases vessel viewing

¹⁹ Available at:
https://www.governor.wa.gov/sites/default/files/OrcaTaskForce_reportandrecommendations_11.16.18.pdf, last

distances from 200 to 300 yards to the side of the whales and reduces vessel speed within ½ nautical mile of the whales to seven knots over ground. SB 5918 amends RCW 79A.60.630 to require the state’s boating safety education program to include information about the Be Whale Wise guidelines, as well as all regulatory measures related to whale watching, which is expected to decrease the effects of vessel activities to whales in state waters. NMFS initiated scoping in 2019 to evaluate the need to revise existing federal regulations.

On November 8, 2019, the task force released its Year 2 report²⁰ that assessed progress made on implementing Year 1 recommendations, identified outstanding needs and emerging threats, and developed new recommendations. Some of the progress included increased hatchery production to increase prey availability. In response to recommendations of the Washington State Southern Resident Killer Whale Task Force, the Washington State Legislature provided approximately \$13 million in funding “prioritized to increase prey abundance for southern resident orcas” (Engrossed Substitute House Bill 1109) for the 2019-2021 biennium (July 2019 through June 2021). Hatcheries are in the midst of enumerating the spring 2020 releases, but the planned production associated with this legislative action is a release of an additional 13.5 million Chinook salmon (approximately 6.4 million from Puget Sound facilities, approximately 5.6 million from Washington coastal facilities, and approximately 1.5 million from Columbia River facilities). A similar level of Chinook production funded by this legislative action is anticipated in the spring of 2021. The released smolts would return as adults and be part of the prey base 3–5 years later.

The state passed House Bill 1579 that addresses habitat protection of shorelines and waterways (Chapter 290, Laws of 2019 (2SHB 1579)), and funding was included for salmon habitat restoration programs and to increase technical assistance and enforcement of state water quality, water quantity, and habitat protection laws. Other actions included providing funding to the Washington State Department of Transportation to complete fish barrier corrections. Although these measures won’t improve prey availability in 2020/2021, they are designed to improve conditions in the long term.

Notwithstanding the beneficial effects of ongoing habitat restoration actions, the cumulative effects associated with continued development are likely to have ongoing adverse effects on all the listed species populations addressed in this Opinion salmon and abundance and productivity that outpace the effects of restoration activities. Only improved low-impact development actions together with increased numbers of restoration actions, watershed planning, and recovery plan implementation would be able to address growth related impacts into the future. To the extent that non-federal recovery actions are implemented and offset ongoing development actions, adverse cumulative effects may be minimized, but will probably not be completely avoided.

visited May 26, 2019.

²⁰ Available at:

https://www.governor.wa.gov/sites/default/files/OrcaTaskForce_FinalReportandRecommendations_11.07.19.pdf, last visited May 26, 2019.

2.6 Integration and Synthesis

The Integration and Synthesis section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action (Section 2.5) to the environmental baseline (Section 2.4) and the cumulative effects (Section 2.6), taking into account the status of the species and critical habitat (Section 2.2), to formulate the agency's biological Opinion as to whether the proposed action is likely to: (1) Reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminish the value of designated or proposed critical habitat as a whole for the conservation of the species.

2.6.1 Integration for Critical Habitat

At the designation scale, the quality of PS Chinook salmon critical habitat is generally poor with only a small amount of freshwater and nearshore habitat remaining in good condition. Most critical habitat for this species is degraded but nonetheless maintains a high importance for conservation of the species, based largely on its restoration potential. Loss of freshwater and nearshore critical habitat quality is limiting factor for this species. Development of shoreline and estuary areas of Puget Sound is expected to continue to adversely impact the quality of critical habitat PBFs for PS Chinook salmon.

The quality of PS steelhead critical habitat also varies, with a small amount of habitat remaining in good condition. Unlike PS Chinook salmon, PS steelhead critical habitat is only designated in freshwater rivers and streams. Nearshore marine areas are not designated because juvenile steelhead do not use nearshore areas extensively. Poor quality of freshwater critical habitat quality is a limiting factor for PS steelhead.

Critical habitat for HCSR chum salmon is designated in stream, rivers, and nearshore areas of the Hood Canal basin. Although some critical habitat for this species is degraded, several nearshore areas of critical habitat remain in good condition. Implementation of recovery plan actions for HCSR chum salmon, including development of an in-lieu fee program for projects that impact critical habitat for this species, represent positive steps toward addressing habitat limiting factors for this species.

Critical habitat for PS/GB bocaccio and yelloweye rockfish includes hundreds of square miles of deep-water areas in Puget Sound. Large areas of nearshore habitat are also designated, but only for juvenile bocaccio. Juvenile bocaccio use shallow nearshore areas extensively during life history while yelloweye rockfish do not. The quality of nearshore critical habitat for PS/GB bocaccio has been degraded by nearshore development and in-water construction, dredging and disposal of dredged material, pollution and runoff.

Critical habitat for SRKWs is designated in Puget Sound and proposed in certain areas outside Puget Sound. Only the designated area will be affected by the proposed actions. Within Puget Sound, the quality of critical habitat for SRKWs has been negatively affected by degradation of water quality, vessel noise, and a reduction of prey availability. Over the past several years, the

reduced and declining SRKW status has become a serious concern. PS Chinook salmon, a key part of the prey PBF for SRKW critical habitat, is a concern for this consultation.

PS steelhead critical habitat is not designated in nearshore areas and will not be meaningfully affected by the proposed actions. Similarly, critical habitat for yelloweye rockfish is designated only in deep water areas of Puget Sound and will not be significantly affected by the proposed actions. We can therefore conclude that the proposed actions will not diminish the value of critical habitat for the conservation of the PS steelhead and yelloweye rockfish.

The effects of the proposed actions would primarily impact nearshore areas of the critical habitats for PS Chinook salmon, HCSR chum salmon, and PS/GB bocaccio. For SRKWs, the impact of the proposed action is primarily on the prey PBF. This impact is caused by the loss of nearshore habitat quality that results in a reduction in the abundance of PS Chinook salmon. The remainder of our integration and synthesis for critical habitat will focus on how the effects of the proposed actions, when added to environmental baseline and cumulative effects, impact the ability of PBFs to support conservation of PS Chinook salmon, HCSR chum salmon, PS/GB bocaccio, and SRKWs.

Modification of nearshore habitat in Puget Sound has resulted in a substantial decrease in critical habitat quality for PS Chinook salmon and PS/GB bocaccio. The effect on critical habitat for HCSR chum salmon is similar, but more of the critical habitat for this species remains in good condition. As noted in Section 2.3, shoreline development is the primary cause of this decline in habitat quality. Development includes shoreline armoring, filling of estuaries and tidal wetlands, and construction of overwater structures. Currently, only 31 percent of Puget Sound's shorelines remain undeveloped.

Once developed, shoreline areas tend to remain developed due to the high residential, commercial, and industrial demand for use of these areas. New development continues and as infrastructure deteriorates, it is rebuilt. Shoreline bulkheads, marinas, residential PRFs, and port facilities are quickly replaced as they reach the end of their useful life. Although designs of replacement infrastructure are often more environmentally friendly, replacement of these structures ensures their physical presence will cause adverse on nearshore habitat into the future. This is evidenced by the continued requests for consultation on these types of actions. As a result, shoreline development causes a "press disturbance" in which habitat perturbations accumulate without periods of ecosystem recovery. This interrupts the natural cycles of habitat disturbance and recovery crucial for maintenance of critical habitat quality over time. Although the occasional restoration project will improve nearshore habitat quality, the area impacted by these projects is tiny compared to the developed area. The general trend of nearshore habitat quality is downward and is unlikely to change given current management of these areas.

Nearshore habitat modification has caused broad-scale ecological changes, reducing the ability of critical habitat to support PS Chinook salmon juvenile migration and rearing. The loss of submerged aquatic vegetation, including eelgrass and kelp, has reduced cover, an important PBF of critical habitat for PS Chinook salmon. Degradation of sand lance and herring spawning habitat has reduced the quality of the forage PBF. Construction of overwater structures throughout Puget Sound has degraded PS Chinook salmon critical habitat by creating artificial

obstructions to free passage in the nearshore marine area. Habitat modification reduces juvenile survival and in some cases, has eliminated PS Chinook salmon life history strategies that rely on rearing in nearshore areas during early life history. Under the current environmental baseline, critical habitat for PS Chinook salmon is not able to support survival and recovery of this species.

These impacts on the survival of juvenile PS Chinook salmon translate to reduction of adult PS Chinook salmon, the prey PBF for SRKW critical habitat. As observed during recent years, the SRKW's population has declined. Under the current environmental baseline and proposed action, critical habitat for SRKWs would be unable to support the conservation of this species. In particular, critical habitat would be unable to produce enough Chinook salmon to ensure survival and recovery of SRKWs.

Changes to nearshore areas in Puget Sound have also reduced the ability of critical habitat to support juvenile life stages of PS/GB bocaccio. Loss of submerged aquatic vegetation has reduced cover available for larval and juvenile rockfish. Changes in physical character of nearshore areas and loss of water quality reduce the amount of prey available for juvenile rockfish. Although loss of nearshore habitat quality is a threat to bocaccio, the recovery plan for this species lists the severity of this threat as low (NMFS 2017a). Other factors, such as overfishing, are more significant threats to PS/GB bocaccio.

Given the rate of expected population growth in the Puget Sound area, cumulative effects are expected to result in mostly negative impacts on critical habitat quality. While habitat restoration and advances in best management practices for activities that affect critical habitat could lead to some improvement of PBFs, adverse impacts created by the intense demand for future development is likely to outpace any improvements. Current state and local regulations do not prevent much of the development that degrades the quality of nearshore critical habitats. There is no indication these regulations are reasonably certain to change in the foreseeable future.

The proposed actions would result in some positive as well as number of adverse effects on the quality of Puget Sound nearshore habitat critical habitat for PS Chinook salmon, bocaccio, and SRKWs including:

- Removal of creosote treated piles and bulkheads would improve water quality by removing these chronic sources of contaminants (Table 20).
- Conversion of solid wood decking to grated decking on replacement structures would reduce the amount of shade under overwater structures, compared to current conditions.
- Set back of bulkheads would reduce negative effects of structures by decreasing the structure's impact on nearshore habitat-forming processes.
- In the short term, the proposed construction activities can kill, injure, or disturb normal behavior patterns of fish close to the project site.
- Construction of new or replacement overwater structures would create shade, suppress submerged aquatic vegetation, interrupt migration of juvenile PS Chinook salmon, and provide cover for predatory fish that eat juvenile salmon.
- Replacement of shoreline armoring would prevent development of shoreline vegetation, and impede sediment and organic material supply to beaches.

- In some locations, replacement of shoreline armoring would cause beach erosion water ward of the armoring, which, in turn, would lower beaches, coarsen substrate, increase sediment temperature, and reduce invertebrate density.
- Replacement of shoreline armoring would prevent development of suitable habitat for forage fish spawning and likely reduce abundance and productivity of these important salmon prey items.
- Replacement of vessel-related overwater structures would ensure current or greater levels of vessel use in Puget Sound.

On balance, the positive and negative effects of the proposed actions result in a net decrease in critical habitat quality over time, see Table 17. As explained in Section 2.4 *Effects of the Action*, authorization of the construction of new structures degrades the quality of PBFs as described above. The proposed authorization of replacement structures would ameliorate some effects as compared to the baseline condition and result in a decrease of 0.25 acres of nearshore area covered by overwater structures. However, because the USACE intends that these structures are maintained in perpetuity, the future consequences of the proposed actions include adverse effects caused by the replacement structures to the extent they are extending the life of that structure. Those adverse effects include the impacts listed above. These effects prevent the development of critical habitat PBFs for PS Chinook, salmon, HCSR chum salmon, PS/GB bocaccio, and SRKWs. Additionally, under the proposed actions, there is a net increase in the amount of shoreline armoring, with 2237 feet of bulkhead proposed for removal and 3208 feet proposed for installation.

For PS/GB bocaccio critical habitat, the proposed actions would degrade the quality of PBFs in the nearshore. This would likely reduce juvenile survival in some areas of affected critical habitat. However, given the low severity of this threat, in context with other limiting factors for this species, we do not expect the adverse effects of the proposed action to be significant enough to reduce the conservation value of critical habitat for this species.

Critical habitat for HCSR chum salmon has been degraded by development but some areas of nearshore habitat remain in good condition. For this batched consultation, there are 3 projects that occur in areas that would affect critical habitat for this species. Although these projects result in some loss of critical habitat quality, the aggregate impacts of these projects is small. We expect, given the current status of critical habitat and the implementation of recovery actions that address habitat limiting factors, that this impact is not significant enough to reduce the conservation value of critical habitat for HCSR chum salmon.

The adverse effects of the proposed actions would exacerbate limiting factors identified in the recovery plans for PS Chinook salmon and SRKWs. For SRKWs, loss of prey is one of three major threats identified in this species' recovery plan. The proposed actions would degrade the quality of the prey PBF of critical habitat, further reducing available prey (Chinook salmon). By supporting boating and vessel traffic into the future, the proposed actions would also modestly exacerbate the other two major limiting factors, toxic chemicals that accumulate in top predators and impacts from sound and vessels. For PS Chinook salmon, degraded nearshore conditions are listed as a limiting factor. The proposed actions exacerbate this factor by degrading or impeding the development of nearshore critical habitat PBFs essential for the conservation of this species.

The proposed actions are also inconsistent with recovery actions identified in the PS Chinook salmon recovery plan. The following recommend actions from the PS Chinook salmon recovery plan speak to the need to protect or restore nearshore habitat:

- Aggressively protect functioning drift cells and feeder bluffs that support eelgrass bands and depositional features;
- Counties should pass strong regulations and policies limiting increased armoring of these shorelines and offering incentives for protection;
- Aggressive protect areas, especially shallow water/low gradient habitats and pocket estuaries, within five miles of river deltas;
- Protect the forage fish spawning areas;
- Maintain the functioning of shallow, fine substrate features in and near 11 natal estuaries for Chinook salmon (to support rearing of fry);
- Maintain migratory corridors along the shores of Puget Sound;
- Maintain the production of food resources for salmon;
- Maintain functioning nearshore ecosystem processes (i.e., sediment delivery and transport; tidal circulation) that create and support the above habitat features and functions;
- Increase the function and capacity of nearshore and marine habitats to support key needs of salmon;
- Protect and restore shallow, low velocity, fine substrate habitats along marine shorelines, including eelgrass beds and pocket estuaries, especially adjacent to major river deltas;

Numerous factors have led to the decline of PS Chinook salmon including overharvest, freshwater and marine habitat loss, hydropower development, and hatchery practices. Adjustments can, and have been made in the short term to ameliorate some of the factors for decline. Harvest can be adjusted on yearly or even in-season basis. Since PS Chinook salmon were listed, harvest in state and federal fisheries has been reduced in an effort to increase the number of adults returning to spawning grounds. Likewise, hatchery management can, and has been adjusted relatively quickly when practices are detrimental to listed species. To address needed improvements in hydropower, NMFS has issued biological opinions with reasonable and prudent alternatives to improve fish passage at existing hydropower facilities. Unlike the other factors, however, loss of critical habitat quality is much more difficult to address in the short term. Once human development causes loss of critical habitat quality, that loss tends to persist for decades or longer. The condition of critical habitat will improve only through active restoration or natural recovery following the removal of human infrastructure. As noted throughout this Opinion, future effects of climate change on habitat quality throughout Puget Sound are expected to be negative.

In summary, the status of critical habitat for PS Chinook salmon is poor and current quality of PBFs in nearshore areas cannot support conservation of this species. The prey quality and quantity PBF of critical habitat for SRKWs is at a fraction of historical levels. Under the current environmental baseline, the PBFs of critical habitat cannot support the biological requirements of PS Chinook salmon. This is evidenced by low survival of PS Chinook salmon juveniles in nearshore of Puget Sound. The condition of the environmental baseline is such that additional long term and chronic negative impacts on the quality of critical habitat PBFs (nearshore habitat

for PS Chinook salmon and prey availability for SRKWs) is likely to impair the ability of critical habitat to support conservation of these species. The net result of the proposed actions would further reduce the quality and further perpetuate poor conditions of nearshore PBFs for PS Chinook salmon and prey availability for SRKWs. The proposed actions would also exacerbate habitat limiting factors identified by the PS Chinook salmon and SRKW recovery plans and are inconsistent with recovery action listed in these plans. Due to demand for future human development, cumulative effects on critical habitat quality are expected to be mostly negative. When the net effects of the proposed actions are added to the environmental baseline and cumulative effects, the proposed actions are likely to appreciably diminish the value of critical habitat as a whole for the conservation of PS Chinook salmon and SRKWs.

For the reasons described earlier, the proposed actions will not appreciably diminish the value of critical habitat for PS steelhead, PS/GB yelloweye rockfish, PS/GB bocaccio, or HCSR chum salmon.

Another possible approach to this analysis would include giving greater consideration to the quality of critical habitat at each project site. At first glance, one might conclude that if nearshore habitat quality were high at a particular project site, this could lead to a finding that the particular project would not diminish the value of critical habitat for PS Chinook salmon or SRKWs. The basis of this analysis would be that any high quality critical habitat at a project site would be able to absorb the impact of the adverse effects caused by the proposed project. Or, stated differently, a relatively small increment of adverse effect on high quality critical habitat is not as detrimental as the same increment of adverse effect on critical habitat that is already impaired.

However there are several flaws with this approach, making it inconsistent with the evaluation required by ESA section 7. When completing our analysis, we add the effects of the action and cumulative effects to the environmental baseline, and, *in light of the status of the species*, determine if the proposed action is likely to adversely modify critical habitat. The status of critical habitat for both PS Chinook salmon and SRKWs is poor and continuing to decline. As noted previously, the loss of nearshore habitat quality is a factor for decline for PS Chinook salmon. Given the negative trend in the quality of nearshore critical habitat for PS Chinook salmon and the risk that poses for SRKWs, protection of currently high-functioning habitat is critically important. The need to protect quality habitat is expressed in the recovery plan for PS Chinook salmon(SSPS 2005).

Additionally, the quality of nearshore critical habitat is expected to change in the future as a result of climate change. For example, increasing sea surface temperatures are expected to negatively affect salmon population viability (Mauger et al. 2015). This means that even if human development in nearshore areas ceased completely, currently well-functioning critical habitat is likely to decline in quality over time. For these reasons, even if we considered the presence of high quality nearshore critical habitat at a project site in a more isolated manner, it would not be sufficient to lead us to a different conclusion in this consultation.²¹

²¹ For similar reasons, even if we were to consider a proposed project through an individual consultation instead of together in this batched consultation, and the project's impacts were limited to affecting local, high-functioning habitat, we do not anticipate a different result for critical habitat or species. *See also* Section 1.4, Action Area, describing the area affected directly or indirectly by the action.

2.6.2 Integration for Species

PS Chinook salmon are currently listed as threatened with generally negative recent trends in status. Widespread negative trends in natural-origin spawner abundance across the ESU have been observed since 1980. Productivity remains low in most populations, and hatchery-origin spawners are present in high fractions in most populations outside of the Skagit watershed. Available data now shows that most populations have declined in abundance over the last evaluation period (NWFSC 2015). Most populations are consistently below the spawner-recruit levels identified by the recovery plan for this ESU. Development of shoreline and estuary areas of Puget Sound is expected to continue to adversely impact the quality of marine habitat for PS Chinook salmon.

HCSR chum salmon have made substantive gains towards meeting this species' recovery plan viability criteria. The most recent 5-year review for this ESU notes improvements in abundance and productivity for both populations that make up this ESU. However, the ESU still does not meet all of the recovery criteria for population viability at this time. Implementation of recovery plan actions for HCSR chum salmon, including development of an in-lieu fee program for projects that impact critical habitat for this species, represent positive steps toward addressing habitat limiting factors for this species.

The most recent 5-year review for PS steelhead notes some signs of modest improvement in productivity since the previous review, at least for some populations, especially in the Hood Canal and Strait of Juan de Fuca MPG. However, these modest changes must be sustained for a longer period (at least two generations) to lend sufficient confidence to any conclusion that productivity is improving over larger scales across the DPS. Moreover, several populations are still showing dismal productivity, especially those in the Central and South Puget Sound MPG (NWFSC 2015). Trends in abundance of natural spawners remain predominantly negative. Particular aspects of diversity and spatial structure, including natural spawning by hatchery fish and limited use of suitable habitat, are still likely to be limiting viability of most PS steelhead populations. In the near term, the outlook for conditions affecting PS steelhead is not optimistic. While harvest and hatchery production of steelhead in Puget Sound are currently at low levels and are not likely to increase substantially in the foreseeable future, some recent environmental trends not favorable to PS steelhead survival and production are expected to continue.

SRKWs are at risk of extinction in the foreseeable future. NMFS considers SRKWs to be currently among eight of the most at-risk species as part of the Species in the Spotlight initiative because of their endangered status, declining population trend, and they are high priority for recovery based on conflict with human activities and recovery programs in place to address threats. The population has relatively high mortality and low reproduction unlike other resident killer whale populations that have generally been increasing since the 1970s (Carretta et al. 2019). Reduced prey availability is a major limiting factor for this species.

PS/GB bocaccio are listed as endangered and abundance of this species likely remains low. PS/GB yelloweye rockfish are listed as threatened but likely persist at abundance levels somewhat higher than bocaccio. Lack of specific information on rockfish abundance in Puget Sound makes it difficult to generate accurate abundance estimates and productivity trends for

these two DPSs. Available data does suggest that total rockfish declined at a rate of 3.1 to 3.8 percent per year from 1977 to 2014 or a 69 to 76 percent total decline over that period. The two listed DPSs declined over-proportional compared to the total rockfish assemblage.

PS steelhead complete much of their early life history in freshwater and do not rely on nearshore areas of Puget Sound for rearing as Chinook and chum salmon do. Since the proposed actions primarily affect the quality of nearshore habitat, PS steelhead are spared from many of the adverse effects, especially the long-term effects. Short-term construction- related impacts such as elevated noise and turbidity would likely injure or kill a small number of PS steelhead but not enough to result in any population-level effects. Considering both short-term and potential long-term impacts, the proposed actions would not have any meaningful effects on PS steelhead population abundance, productivity, spatial structure, or diversity.

Juvenile yelloweye rockfish are not typically found in nearshore habitat and adults are found solely in deep water areas of Puget Sound. Larval yelloweye rockfish are found in nearshore areas and would likely be exposed to the short-term effects of the proposed construction. However, the proposed actions would only result in short-term impacts to larval rockfish and only a few cohorts of larval rockfish would be affected during the limited years of proposed construction. Given the low overall level of impact, the proposed action will not have any meaningful effect on the numbers, reproduction, or distribution of yelloweye rockfish.

The effects of the proposed actions would primarily impact nearshore areas of Puget Sound. This reduces survival of early life-stages of PS Chinook salmon, HCSR chum salmon, and PS/GB bocaccio. For SRKWs, the impact of the proposed action is primarily on their primary prey, Chinook salmon. The remainder of the integration and synthesis for our jeopardy determination will focus on how the effects of the proposed actions, when added to environmental baseline and cumulative effects, affect the likelihood of both the survival and recovery of PS Chinook salmon, HCSR chum salmon, PS/GB bocaccio, and SRKWs.

Modification of nearshore habitat in Puget Sound has resulted in a substantial decrease in habitat quality for PS Chinook salmon. This has resulted in decreased survival at early life history stages and lower population abundance and productivity. The effect on nearshore habitat used by HCSR chum salmon is similar, but more of the available habitat for this species remains in good condition. For PS/GB bocaccio, degradation of nearshore habitat quality has likely reduced juvenile survival. However, this is not considered to be a primary threat to this species.

As noted in Section 2.3, shoreline development is the primary cause of this decline in nearshore habitat quality. Development includes shoreline armoring, filling of estuaries and tidal wetlands, and construction of overwater structures. Currently, it is estimated that the loss of nearshore habitat in Puget Sound at close to 85 percent or more (Brophy et al. 2019).

As explained above in Section 2.6.1, once developed, shoreline areas tend to remain developed due to high residential, commercial, and industrial demand for use of these areas. New development continues and as infrastructure deteriorates, it is rebuilt. Shoreline bulkheads, marinas, residential PRFs, and port facilities are quickly replaced as they reach the end of their useful life. Although designs of replacement infrastructure are often more environmentally

friendly, replacement of these structures ensures their physical presence will cause adverse on nearshore habitat into the future. This is evidenced by the continued requests for consultation on these types of actions. As a result, shoreline development causes a “press disturbance” in which habitat perturbations accumulate without periods of ecosystem recovery. This interrupts the natural cycles of habitat disturbance and recovery crucial for maintenance of habitat quality over time. Although the occasional restoration project will improve nearshore habitat quality, the area impacted by these projects is tiny compared to the developed area. The general trend of nearshore habitat quality is downward and is unlikely to change given current management of these areas.

Nearshore habitat modification has caused broad-scale ecological changes, reducing the ability of critical habitat to support PS Chinook salmon juvenile migration and rearing. The loss of submerged aquatic vegetation, including eelgrass and kelp, has reduced cover, an important feature of habitat for PS Chinook salmon. Degradation of sand lance and herring spawning habitat has reduced the quantity of the forage for PS Chinook salmon. Construction of overwater structures throughout Puget Sound has degraded PS Chinook salmon habitat by creating artificial obstructions to free passage in the nearshore marine area. Habitat modification reduces juvenile survival and in some cases, has eliminated PS Chinook salmon life history strategies that rely on rearing in nearshore areas during early life history. Under the current environmental baseline, nearshore habitat is not able to support juvenile survival of PS Chinook salmon such that populations of this ESU can become viable.

As described in the section on Effects to the Species, the anticipated short-term (or annual) reduction of PS Chinook salmon, their primary prey, associated with the proposed action would result in a potentially minor reduction in prey resources for SRKWs. Over the long-term, however, the proposed action will inhibit recovery of PS Chinook salmon and would result in a greater reduction in prey quantity and affect availability in other ways (i.e., spatially and temporally). Fewer populations contributing to SRKW’s prey base will reduce the representation of diversity of life histories, resiliency in withstanding stochastic events, and redundancy to ensure there is a margin of safety for the salmon and SRKWs to withstand catastrophic events. These reductions increase the risk of extinction risk of SRKWs.

The chronic long-term impacts to PS Chinook salmon would reduce prey availability and increase the likelihood for local depletions of prey in particular locations and times. In response, the SRKWs would increase foraging effort or abandon areas in search of more abundant prey. Reductions in prey or a resulting requirement of increased foraging efficiency increase the likelihood of physiological effects. The SRKWs would likely experience nutritional, reproductive, or health effects (e.g. reduced immune function from drawing on fat stores and mobilizing contaminants in the blubber) from this reduced prey availability. These effects would lead to reduced body size and condition of individuals and can also lower reproductive and survival rates and thereby diminish the potential for SRKWs to recover.

Changes to nearshore areas in Puget Sound have also reduced the ability of this habitat to support juvenile life stages of PS/GB bocaccio. Loss of submerged aquatic vegetation has reduced cover available for larval and juvenile rockfish. Changes in physical character of nearshore areas and loss of water quality reduce the amount of prey available for juvenile rockfish. Although loss of

nearshore habitat quality is a threat to bocaccio, the recovery plan for this species list the severity of this threat as low (NMFS 2017a). Other factors, such as overfishing, are more significant threats to PS/GB bocaccio.

Given the rate of expected population growth in the Puget Sound area, cumulative effects are expected to result in mostly negative impacts on critical habitat quality. While habitat restoration and advances in best management practices for activities that affect critical habitat could lead to some improvement of PBFs, adverse impacts created by the intense demand for future development is likely to outpace any improvements. Current state and local regulations do not prevent much of the development that degrades the quality of nearshore critical habitats. There is no indication these regulations are reasonably certain to change in the foreseeable future.

The proposed actions would result in some positive as well as number of adverse effects on the quality of Puget Sound nearshore habitat including:

- Removal of creosote treated piles and bulkheads would improve water quality by removing these chronic sources of contaminants.
- Conversion of solid wood decking to grated decking on replacement structures would reduce the amount of shade under overwater structures, compared to current conditions.
- Set back of bulkheads would reduce negative effects of structures by decreasing the structure's impact on nearshore habitat-forming processes.
- In the short term, the proposed construction activities can kill, injure, or disturb normal behavior patterns of fish close to the project site.
- Construction of new or replacement overwater structures would create shade, suppress submerged aquatic vegetation, interrupt migration of juvenile PS Chinook salmon, and provide cover for predatory fish that eat juvenile salmon.
- Replacement of shoreline armoring would prevent development of shoreline vegetation, and impede sediment and organic material supply to beaches.
- In some locations, replacement of shoreline armoring would cause beach erosion water ward of the armoring, which, in turn, would lower beaches, coarsen substrate, increase sediment temperature, and reduce invertebrate density.
- Replacement of shoreline armoring would prevent development of suitable habitat for forage fish spawning and likely reduce abundance and productivity of these important salmon prey items.
- Replacement of vessel-related overwater structures would ensure current or greater levels of vessel use in Puget Sound.

On balance, the positive and negative effects of the proposed actions result in a net decrease in nearshore habitat quality over time. As explained in Section 2.4 *Effects of the Action*, authorization of the construction of new structures degrades the quality of nearshore habitat as described above. The proposed authorization of replacement structures would ameliorate some effects as compared to the baseline condition and result in a decrease of 0.25 acres of nearshore area covered by overwater structures. However, the future consequences of the proposed actions include adverse effects caused by the replacement structures that extend beyond the useful life of existing structures. Those adverse effects include the impacts listed above. These effects prevent

the development of habitat PBFs of PS Chinook, salmon, HCSR chum salmon, PS/GB bocaccio, and SRKWs.

As was discussed above for PS steelhead and yelloweye rockfish, the proposed actions would have short-term adverse effects on PS Chinook salmon, HCSR-chum salmon, and PS/GB bocaccio. These construction-related effects would include elevated turbidity, increased noise, and reduced dissolved oxygen. A small number of these fish species would be exposed to these effects at each project site. Although some fish could be injured or killed, the total fish affected is too small to result in any meaningful impact on abundance or productivity of any of the affected species. SRKWs are may be in project areas during construction and but Marine Mammal Monitoring plans will be implemented to avoid exposure of these short-term effects.

For PS/GB bocaccio critical habitat, the proposed actions would degrade the quality of PBFs in the nearshore. This would likely reduce juvenile survival in some areas of affected critical habitat. However, given the low severity of this threat, in context with other limiting factors for this species, we do not expect the adverse effects of the proposed action to be significant enough to reduce the conversation value of critical habitat for this species.

Habitat for HCSR chum salmon has been degraded by development but some areas of nearshore habitat remain in good condition. For this batched consultation, there are three projects that occur in areas that would affect this species' habitat in Hood Canal. Although these projects result in some loss of nearshore habitat quality, the aggregate impacts of these projects is small. We expect, given the current status of nearshore habitat and the implementation of recovery actions that address habitat limiting factors, that this impact is not significant enough to result in any meaningful effect on the abundance, productivity, spatial structure, or diversity of the HCSR chum salmon populations.

The adverse effects of the proposed actions would exacerbate limiting factors identified in the recovery plans for PS Chinook salmon and SRKWs. For SRKWs, loss of prey is one of three major threats identified in this species' recovery plan. The proposed actions would degrade the quality nearshore habitat, further reducing available prey (Chinook salmon). By supporting boating and vessel traffic into the future, the proposed actions would also modestly exacerbate the others two major limiting factors, toxic chemicals that accumulate in top predators and impacts from sound and vessels. For PS Chinook salmon, degraded nearshore conditions are listed as a limiting factor. The proposed actions exacerbate this factor by degrading or impeding the development of nearshore habitat features essential for the conservation of this species.

The proposed actions are also inconsistent with recovery actions identified in the PS Chinook salmon recovery plan. The following recommend actions from the PS Chinook salmon recovery plan speak to the need to protect or restore nearshore habitat:

- Aggressively protect functioning drift cells and feeder bluffs that support eelgrass bands and depositional features;
- Counties should pass strong regulations and policies limiting increased armoring of these shorelines and offering incentives for protection;

- Aggressive protect areas, especially shallow water/low gradient habitats and pocket estuaries, within five miles of river deltas;
- Protect the forage fish spawning areas;
- Maintain the functioning of shallow, fine substrate features in and near 11 natal estuaries for Chinook salmon (to support rearing of fry);
- Maintain migratory corridors along the shores of Puget Sound;
- Maintain the production of food resources for salmon;
- Maintain functioning nearshore ecosystem processes (i.e., sediment delivery and transport; tidal circulation) that create and support the above habitat features and functions;
- Increase the function and capacity of nearshore and marine habitats to support key needs of salmon;
- Protect and restore shallow, low velocity, fine substrate habitats along marine shorelines, including eelgrass beds and pocket estuaries, especially adjacent to major river deltas;

Numerous factors have led to the decline of PS Chinook salmon including overharvest, freshwater and marine habitat loss, hydropower development, and hatchery practices. Adjustments can be made in the short term to ameliorate some of the factors for decline. Harvest can be adjusted on yearly or even in-season basis. Likewise, hatchery management can be adjusted relatively quickly if practices are detrimental to listed species. To address needed improvements in hydropower, NMFS has issued biological opinions with reasonable and prudent alternatives to improve fish passage at existing hydropower facilities. Unlike the other factors, loss of habitat quality and resulting impacts on population abundance, productivity, spatial structure and diversity are much more difficult to address in the short term. Once human development causes loss of habitat quality, that loss tends to persist for decades or longer. The condition of habitat will improve only through active restoration or natural recovery following the removal of human infrastructure. As noted throughout this Opinion, future effects of climate change on habitat quality throughout Puget Sound are expected to be negative.

In summary, PS Chinook populations are far from meeting recovery goals and trends in abundance and productivity are mostly negative. Nearshore habitat quality is insufficient to support conservation of this ESU. SRKW prey is at a fraction of historical levels. Under the current environmental baseline, nearshore habitat in Puget Sound cannot support the biological requirements of PS Chinook salmon. This is evidenced by low survival of PS Chinook salmon juveniles in nearshore of Puget Sound. Fewer populations contributing to SRKW's prey base will reduce the representation of diversity of life histories, resiliency in withstanding stochastic events, and redundancy to ensure there is a margin of safety for the salmon and SRKWs to withstand catastrophic events. The condition of the environmental baseline is such that additional impacts on the quality of nearshore habitat is likely to impair the ability of that habitat to support conservation of these species. The proposed actions would further reduce the quality of nearshore habitat in Puget Sound. The proposed actions would also exacerbate habitat limiting factors identified by the PS Chinook salmon and SRKW recovery plans and are inconsistent with recovery action listed in these plans. Due to demand for future human development cumulative effects on nearshore habitat quality are expected to be mostly negative. When the effects of the proposed actions are added to the environmental baseline and cumulative effects, the proposed

actions would appreciably reduce the likelihood of both the survival and recovery of PS Chinook salmon and SRKW in the wild by reducing their numbers and reproduction.

Another possible approach to this analysis would include giving greater consideration to the quality of habitat at each project site. At first glance, one might conclude that if nearshore habitat quality were high at a particular project site, this could lead to a finding that the particular project would not appreciably reduce the likelihood of both the survival and recovery of PS Chinook salmon or SRKWs. The basis of this analysis would be that any high quality habitat at a project site would be able to absorb the impact of the adverse effects caused by the proposed project. Or stated differently, a relatively small increment of adverse effect on high quality habitat is not as detrimental as the same increment of adverse effect on habitat that is already impaired.

However there are several flaws with this approach, making it inconsistent with the evaluation required by ESA section 7. When completing our analysis, we add the effects of the action and cumulative effects to the environmental baseline, and, *in light of the status of the species*, determine if the proposed action is likely to jeopardize the continued existence of listed species. The status of both PS Chinook salmon and SRKWs is poor and continuing to decline. As noted previously, the loss of nearshore habitat quality is a factor for decline for PS Chinook salmon. Given the negative trend in status for PS Chinook salmon and the risk that poses for SRKWs, protection of currently high-functioning habitat is critically important. The need to protect quality habitat is expressed in the recovery plan for PS Chinook salmon (NMFS 2007).

Additionally, the quality of nearshore habitat is expected to change in the future as a result of climate change. For example, increasing sea surface temperatures are expected to negatively affect salmon population viability (Mauger et al. 2015). This means that even if human development in nearshore areas ceased completely, currently well-functioning habitat is likely to decline in quality over time. For these reasons, even if we considered the presence of high quality nearshore habitat at a project site in a more isolated manner, it would not be sufficient to lead us to a different conclusion in this consultation.

2.7 Conclusion

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

2.8 Reasonable and Prudent Alternative

“Reasonable and prudent alternatives” (RPA) refer to alternative actions identified during formal consultation that can be implemented in a manner consistent with the intended purpose of the

action, that can be implemented consistent with the scope of the federal agency’s legal authority and jurisdiction, that are economically and technologically feasible, and that would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat (50 CFR 402.02).

At the foundation of the jeopardy and adverse modification finding is the loss of nearshore habitat such that survival of juvenile Puget Sound Chinook is reduced to a level that will in turn limit this vital prey resource for SRKW. The RPA offered here utilizes the project calculator outputs (discussed in Section 2.8.2), employing the Habitat Equivalency Analysis methodology and the Nearshore Habitat Values Model to establish a RPA target of no-net-loss of critical habitat functions. NMFS has determined that this proposed action would result in habitat loss equivalent to -8,158.79 debits (Table 25). The RPA is designed to achieve, at a minimum, a reduction of these debits to zero (0) and provides a range of options for achieving this.

NMFS has determined that twelve (12) of the proposed permits (Table 24) batched in this consultation have provided sufficient conservation offsets either through the terms of their original or modified proposed action —per the NHVM result in credits—such that no additional action is needed to achieve the RPA’s goal of avoiding jeopardy by offsetting the loss of nearshore habitat quality and quantity caused by the proposed action. Therefore, projects listed in Table 24 are not subject to the requirements of this RPA. We reach this conclusion based on the expectation that those projects will complete their action and proposed offsets as documented.

Table 24. USACE Permits not subject to the RPA

NWS#	Credits
NWS-2018-963	23.2
NWS-2018-229	1.8
NWS-2018-1165	16.4
NWS-2019-676	0
NWS-2019-526	15.5
NWS-2019-0883	14.3
NWS-2019-728	7.8
NWS-2019-0703	957.4
NWS-2017-550	440.2
NWS-2019-101	208.8
NWS-2019-832	30
NWS-2019-983	19.8

The remaining twenty-seven (27) projects considered under this consultation, as currently designed, have a combined total of -8158.79 debits (Table 25). NMFS has determined that those remaining 27 projects are subject to the RPA to avoid jeopardizing the continued existence of PS Chinook salmon and SRKW, and destroying or adversely modifying those species’ designated critical habitat.

Table 25. Projects Subject to the RPA

NWS#	Debits
NWS-2017-796	-252.1
NWS-2017-587	-131.6
NWS-2018-465	-82.3
NWS-2018-53	-352.3
NWS-2018-636	-20.8
NWS-2017-955	-101.8
NWS-2018-760	-54.4
NWS-2017-840	-87.1
NWS-2018-981	-1.9
NWS-2018-1143	3
NWS-2018-570	-329.2
NWS-2017-573	-1045.2
NWS-2018-382	-39.6
NWS-2019-207	-80.7
NWS-2019-552	-374.8
NWS-2018-750	-146.2
NWS-2018-39	-28.3
NWS-2019-491	-260.7
NWS-2019-664	-550.1
NWS-2019-336	-530.5
NWS-2018-525	-202.3
NWS-2018-492	-2043.14
NWS-2019-478	-9.3
NWS-2019-956	-212.05
NWS-2019-690	-37.7
NWS-2020-0204	-1185.6
NWS-2017-427	-2.1
Total	-8158.79

Pursuant to 50 CFR 402.14(g)(5), NMFS must discuss with the USACE and the applicants the availability of RPA(s) that can be taken to avoid violation of USACE' ESA section 7(a)(2) responsibilities. Between July 2, 2020 and October 30, 2020, NMFS staff and the applicants conducted over 60 meetings to discuss and refine the RPA. This section presents the USACE and the project applicants with an RPA that can be implemented to avoid jeopardy to species and adverse modification of critical habitat, while meeting each of the other requirements identified in the first paragraph of this section above.

The RPA is reasonable and prudent. It is consistent with the USACE's legal authority and jurisdiction and allows the USACE to authorize the proposed projects such that the structures involved can serve their intended purpose. The range of options offered in the RPA could allow

the USACE to finalize a project permit as currently purposed (i.e., RPA 1.3 and 1.4), while others options would result in project amendments that may also require amendments to the current USACE permit proposals (i.e., RPA 1.1, 1.2 and 1.5). Regardless of which option a project applicant chooses, compliance with this RPA is expected to achieve no-net-loss for ESA species and critical habitat, while allowing the project to achieve its intended purpose.

This RPA is both technologically and economically feasible. As of signing, 12 of the proposed projects (Table 24) have already provided sufficient conservation credits through project design or additionally proposed conservation offsets such that they are not subject to this RPA. As mentioned above, pursuant to 50 CFR 402.14(g)(5), between July 2, 2020 and October 30, 2020, NMFS staff and the applicants conducted over 60 meetings to discuss and refine the RPA. As of October 20, 2020, approximately 90% of the applicants had identified an RPA option they could pursue. NMFS has determined that significant opportunities exist for project proponents to obtain conservation credits through on or off-site restoration and/or the purchase of conservation credits through collaborating with various stakeholders consistent with the RPA options listed below. For example, conservation credits can be obtained Puget Sound-wide through the Puget Sound Partnership. Some or all (subject to NMFS approval) mitigation credits obtained through the Hood Canal Coordinating Councils In-Lieu-Fee program for projects in Hood Canal (this option can be relevant to NWS-2017-573, NWS-2018-39, NWS-2018-53) may also be able to be used as conservation credits to fulfil the requirements of this RPA. The Blue Heron Slough Conservation Bank has conservation credits available for proposed projects in their currently approved service area that includes the estuary of the Snohomish River expanding into the marine waters around Vashon Island and south to approximately the city of Des Moines (applicants will need to contact that bank for exact locations).

If any of the applicants fail to implement the portion of the RPA applicable to their individual project, that project will be subject to reinitiation (see section 2.12 below) and will not be covered by the take exemption described in the Incidental Take Statement (ITS) for this Opinion, and could become subject to the “take” prohibitions under Section 9 of the ESA.

2.8.1 RPA 1. Compensatory Conservation Actions

This RPA requires projects in Table 25 to offset project debits with an equal (or greater) amount of conservation credits by taking one or more actions consistent with RPA 1.1-1.5. RPA parts 1.1, 1.2, 1.3, 1.4, and 1.5 may be used in any combination with each other to achieve the necessary conservation offsets so long as each project results in net zero conservation debits.

1. Implement on-site habitat improvements (at or in the immediate vicinity of the project site) that would result in conservation credits. On-site habitat improvements are those that would occur within the boundaries of the applicant’s property and that can be implemented with the full discretion and control of the applicant. Improvements that could result in credits include, but are not limited to:
 - Removal of existing over-water structures or piles;
 - Removal of derelict vessels or derelict structures;
 - Removal of shoreline armoring;
 - Planting or relocation of submerged aquatic vegetation (SAV);

- Shoreline planting of native (non-submerged) vegetation; and
- Beach nourishment or other kinds of enhancement of forage fish habitat.

The removal of pilings or overwater structures, or any removal of shoreline armoring that is already included as part of the proposed action has already been accounted for when NMFS calculated project debits and credits and thus would not be considered again as an action that would meet the terms of this RPA.

For applicants choosing RPA 1.1 to meet required conservation offsets in whole or in part, the following is required:

- a. A Habitat Improvement Plan. The plan must include a description of the type(s) of on-site habitat improvements, including:
 - i. A quantitative description of habitat improvements relative to the NHVM/calculator inputs (e.g., square foot (sq ft) of overwater structure removed, linear foot (lf) shoreline armoring removed, cubic yards of gravel placement);
 - ii. Where the improvements would occur;
 - iii. How the improvements would occur (e.g., any construction type actions); and
 - iv. When the improvements would occur.
 - b. A NHVM/calculator output documenting expected credit generation.
 - c. On-site habitat improvement projects must be completed within three years of the project's construction start date.
2. Implement off-site habitat improvements that would result in conservation credits through one or more of the following.
- Removal of pilings or overwater structures that would reduce the loss of nearshore habitat; and/or
 - Remove shoreline armoring to reduce the loss of nearshore habitat.

The removal of pilings or overwater structures, or any removal of shoreline armoring that is already included as part of the proposed action has already been accounted for when NMFS calculated project debits and credits and thus would not be considered again as an action that would meet the terms of this RPA.

Off-site habitat improvements proposed by the applicants must be stand-a-lone projects (e.g., discrete actions such as the removal of a specific number of piles). Projects may not be split between and/or applied to multiple applicants under RPA 1.2.

For applicants choosing RPA 1.2 to meet required conservation offsets in whole or in part, the following is required:

- a. A Habitat Improvement Plan. The plan must include a description of the type(s) of off-site habitat improvements, including:

- i. Quantitative description of habitat improvements relative to the NHVM/calculator inputs (e.g., sq ft of overwater structure removed, If shoreline armoring removed);
 - ii. Where the improvements would occur;
 - iii. How the improvements would occur (e.g., any construction type actions); and
 - iv. When the improvements would occur;
 - b. A NHVM/calculator output documenting expected credit generation; and
 - c. A written agreement with offsite landowner(s) (if improvements are not occurring on applicant-owned or controlled land) that documents the landowner(s)'s consent to the Habitat Improvement Plan.
 - d. Off-site habitat improvement projects must be completed within three years of the project's construction start date.
3. Provide funding to a habitat restoration "sponsor" (i.e., a state agency, Regional Organization, designated Lead Entity, Conservation District or Regional Fisheries Enhancement Group) to support a restoration project that will improve nearshore or estuarine habitat.

For applicants choosing RPA 1.3 to meet required conservation offsets in whole or in part, the following is required:

- a. A Habitat Improvement Plan. The plan must include a description of the type(s) of off-site habitat improvements, including:
 - i. Quantitative description of habitat improvements relative to the NHVM/calculator inputs (e.g., sq ft of overwater structure removed, If shoreline armoring removed, cubic yards of gravel placement);
 - ii. Where the improvements would occur;
 - iii. How the improvements would occur (e.g., any construction type actions); and
 - iv. When the improvements would occur;
 - b. A NHVM/calculator output documenting expected credit generation;
 - c. Documentation of a presale (or equivalent) agreement between restoration project sponsor and the applicant; and
 - d. Written assurances from the restoration project sponsor that the identified restoration project would occur within three years of the pre-sale (or equivalent) agreement date.
 - e. Funds must be paid to the habitat restoration partner within one year of the associated USACE permit issuance date.
4. Purchase conservation credits from a NMFS-approved conservation bank, in-lieu fee program, and/or crediting provider.

For applicants choosing RPA 1.4 to meet required conservation offsets in whole or in part, the following is required:

- a. Documentation of a presale (or equivalent) agreement between credit provider and applicant that identifies the number of credits the applicant intends to purchase.
 - b. Purchase of all credits must occur within one year of the associated USACE permit issuance date or as otherwise specified in NMFS-approved agreement (e.g. third party responsible, in-lieu fee, banking instrument).
- 5. Project modifications that reduce impacts to habitat function. Project modification that could result in reduced debit or increased credits include, but are not limited to:
 - Setback of bulkheads/shoreline armoring landward/above of the High Tide Line (HTL) and preferably above Highest Astronomical Tide (HAT)
 - “Soft-shore” bank armoring design
 - Reduced overwater footprint (e.g., less overwater structure (sq ft), fewer piles)
 - Increased grating in decking

For applicants choosing RPA 1.5 to meet required conservation offsets in whole or in part, the following is required:

- a. A Project Update. The plan must include a description of the type(s) of project updates compared to previous proposed action, including:
 - i. Quantitative description of project changes relative to the NHVM/calculator inputs (e.g., new vs. previously proposed location of shoreline armoring, new vs. previously proposed grating);
 - ii. Where the improvements would occur;
 - iii. How the improvements would occur (e.g., any construction type actions); and
 - iv. When the improvements would occur;
 - b. A NHVM/calculator output documenting expected credit/debit output;
 - c. Project modifications would be implemented as part of the associated USACE permit.
- 6. Applicant-proposed plans to comply with the requirements of this RPA shall be submitted to the USACE. The USACE must verify that proposed responses meet requirements listed above. After verification, the USACE shall then submit the proposed plans to NMFS for review. Within 30 calendar days of receipt of a proposed plan, NMFS will reply to the USACE and applicant as to whether the proposed plan meets the requirements of the RPA.

General Provisions

For any part of this RPA that requires updated NHVM calculator outputs, NMFS will respond to a request for technical assistance within 15 day of any such request.

The implementation of RPA’s 1.1-1.2 must meet the design, best management practices, and conservation measure requirements established in the Fish Passage and Restoration Action

Programmatic Biological Opinion (“FPRP III” WCR-2014-1857). Conservation projects administered through RPA 1.3 and 1.4 are expected to be covered by a separate existing (NWR-2006-5601²² and NWR 2007/08287²³), or future, separate ESA consultation. Modifications made per RPA 1.5, are not expected to result in effects not considered in this Opinion and are expected to result in a reduction in debits and therefore a reduction of impacts.

If the proposed project is located within five miles of a major river estuary, any offsite conservation offsets actions pursuant to RPA 1.2, 1.3, or 1.4 must take place within the marine basin or the estuary where the proposed project will take place (Figure 16). “Out-of-marine basin” or “out-of-service area” credits will not meet the requirements of this RPA. The only exception is for projects that occur in the Blue Heron Slough Conservation Bank currently designated service area, which occurs in two contiguously overlapping adjacent marine basins (Whidbey and South Central); projects within the Blue Heron Slough Conservation Bank’s currently designated service area may elect to purchase credits from the Blue Heron Slough.

The number of debits and credits required for each project, as currently designed, is also identified in individual attachments (Attachments 1-39).

²² NWR-2006-5601, NMFS consultation on qualification of the Washington State Habitat Restoration programs under limit 8 of the 4(d) protective rule for listed salmon and steelhead (56 FR 42422).

²³ NWR 2007/08287, NMFS Endangered Species Act Section 7 formal consultation and Magnuson-Stevens Fishery

Conservation and Management Act Essential Fish Habitat Consultation for the Blue Heron Slough Conservation Bank Construction, Snohomish County, Washington.



Figure 16. Marine basins of Puget Sound

2.8.1 The USACE's Implementation Decision

Because this biological Opinion has found jeopardy to PS Chinook salmon and SRKW, and destruction or adverse modification of PS Chinook salmon and SRKW designated critical habitat, and offers a reasonable and prudent alternative to avoid jeopardy and adverse modification of critical habitat, the USACE is required to notify NMFS of its final decision on whether it will implement the RPA (50 CFR 402.15(b)).

2.8.2 Analysis of the Effects of the Proposed Action As Modified by the RPAs

In this section we explain how implementing this RPA would ensure that the proposed action would avoid the likelihood of jeopardizing the continued existence of PS Chinook salmon and SRKW, as well as avoid the likelihood of destruction or adverse modification of their critical habitats. For PS/GB yelloweye rockfish, PS/GB bocaccio rockfish, HCSR chum salmon, and PS steelhead and their designated critical habitat, the RPA and its no-net loss approach to near-shore habitat will have similar positive results on the effects of the action as described below. As a result, the effects of the RPA does not change the “no jeopardy” and “no adverse modification” conclusions reached in Section 2.7, or the “Not Likely to Adversely Affect” for the southern DPS of green sturgeon made in Section 2.11.

Effects of Conservation Offset Activities Required by the RPA on PS Chinook salmon and SRKW and their Critical Habitats

As described above, proposed conservation offsets associated with RPA 1.1 and 1.2 must be implemented consistent with requirements established in the Fish Passage and Restoration Action Programmatic opinion (“FPRP III” WCR-2014-1857). Conservation projects administered through RPA 1.3 or 1.4 have undergone (NMFS consultations: NWR-2006-5601 and NWR-2007-8287), or will undergo, a separate ESA consultation. Conservation projects administered through RPA 1.4 would have undergone their own separate consultation and or are subject to the limitation on take prohibitions for actions conducted under Limit 8 of the 4(d) Rule for salmon and steelhead promulgated under the ESA (65 FR 42421; July 10, 2000)²⁴.

The precise restoration activities associated RPA 1.1 and 1.2 have yet to be determined. However, we can anticipate the effects of restoration projects are consistent with the requirements of FPRP III. For RPA 1.3 and 1.4, although subject to separate ESA consultation, we anticipate the restoration projects associated with those RPAs will meet requirements similar to those set forth in FPRP III and will have effects consistent with those described in FPRP III. Those expected effects for the RPA elements are described in sections 2.4, 2.4.1, and summarized in section 2.6, respectively, in the FPRP III Opinion, which NMFS incorporates here by reference. In FPRP III (WCR-2014-1857 section 2.6), NMFS concluded that restoration projects will have short-term impacts due to construction (i.e., suspended sediment, noise from pile driving and removal, and re-suspended contaminants). We expect the RPA-related restoration activities to cause similar short-term impacts here. To better define those short-term impacts related to this RPA for purposes of the incidental take statement, we are providing an estimate of the duration of the restoration-related construction. NMFS anticipates that the duration of the restoration construction required by this RPA will be proportionally linked to the amount of conservation credits restored (the greater the amount of credits required the longer it will take to achieve) and assumes the following:

²⁴ NMFS issued a biological opinion resulting for an intragency consultation on the establishment of this 4(d) limit. NMFS 2006/0560, February 28 2007.

Table 26. Estimated days associated with construction of RPA conservation offset projects relative to conservation credits.

Conservation Credits	Days to Construct Conservation Offset Projects
1 to 200	10 days
201 to 500	20 days
501 to 1000	30 days

The projects analyzed in FPRP III would be expected to have similar durational estimates. In FPRP III, NMFS concluded that restoration projects will have short-term impacts due to construction but long-term will contribute to reducing many of the factors limiting the recovery of these species. NMFS reaches the same conclusion for this batch Opinion.

As to RPA 1.5, some projects could be modified (e.g., relocation of a bulkhead above HTL or HAT, relocation away from a pocket estuary, reduction in size of structure) in way that reduces effects of the structure, reduces impacts on habitat functions and therefore result in a smaller output of NHVM debits. In some cases, a redesign could result in a conservation debits equaling zero or even a positive credit output. However, we expect the most common use of RPA 1.5 to be in conjunction with components of RPA 1.1 to 1.4. In general, for those projects that use RPA 1.5, we would expect the temporary construction effects as described above in Section 2.4.1 of FPRP III, and a smaller increment of intermittent and enduring impacts described above in Section 2.4.3 of FPRP III that would be offset with a smaller number of conservation credits gained through 1.1 to 1.4. In all these cases, we would still expect a no-net loss result.

The conservation offsets in the nearshore required by this RPA are expected to achieve a no-net-loss of habitat function in the Puget Sound nearshore as a result of this proposed action, which are needed to help ensure that PS Chinook do not continue to drop below the existing 1-2% percent juvenile survival rates (Kilduff et al. 2014, Campbell et al. 2017) and in turn will not further reduce available SRKW prey. As detailed above in the Section 2.3 above, PS Chinook salmon juvenile survival is directly linked to the quality and quantity of nearshore habitat. Campbell et al. 2016 has most recently added to the evidence and correlation of higher juvenile survival in areas where there is a greater abundance and quality of intact and restored estuary and nearshore habitat. Relatedly, there is emerging evidence that without sufficient estuary and nearshore habitat, significant life history traits within major population groups are being lost. And specific to this action area, there appear to be higher rates of mortality in the fry life stage in the more urbanized watersheds. By contrast, in watersheds where the estuaries are at least 50% functioning, fry out-migrants made up at least 30% of the returning adults, compared to the 3% in watersheds like the Puyallup and the Green Rivers, where 95% of the estuary has been lost.

This also means that for projects that occur in less developed areas and within stretches of functioning habitats, no net loss is even more crucial. It has been long understood that protection and conservation of existing unimpaired systems is more effective and efficient than full restoration of impaired systems (Cereghino et al. 2012, Goetz et al. 2004, Greiner 2010). Here, the RPA-required conservation offsets will not result in *adding* to the needed nearshore restoration, but they will ensure that the proposed action does not cause nearshore habitat conditions to get worse.

We expect conservation offsets implemented under RPA 1.1 to 1.5 to be in place within one to seven years²⁵ of Corp permit issuance, and expect that the offsetting effects of the restoration would begin to occur as soon as one year of restoration project completion. This expected time delay in achieving a conservation offset is acceptable for two reasons. First, significant evidence supports our assumption that ecosystem improvements restoration in nearshore environments will occur rapidly once restoration is complete. For example, Lee et al. (2018) documented strong and positive biotic restoration response within one year of the removal of shoreline armoring. In addition, following significant estuary restoration in the Nisqually River delta, salmon catch data indicated that smolts were using this newly accessible habitat as early as one year post-restoration (Ellings 2016). Second, as discussed in our effects analysis, most of the projects included in this consultation relate to existing structures that would continue to exist on the landscape for several years into the future even without the proposed modifications or upgrades. Our analysis assumed those projects would continue to exist for at least 10 years. However, within a span of just one to at most seven years, the conservation offsets of the RPA will begin to provide their conservation benefits offsetting the adverse effects of the existing structures. Additionally, the HEA methodology and NHVM calculator can adjust debit/credits to account for delayed implementation and or shorter periods of projected habitat benefits.

Additionally, there have been recent increases in production at conservation hatcheries and agreements to reduced harvest levels that are aimed at stemming the near-term population decline of Chinook and help ensure an immediate prey supply for SRKW. The conservation hatchery efforts for PS Chinook and reduced harvest levels will continue to help maintain current population levels of Chinook and SRKW while conservation offsets are implemented and conservation benefits realized.

Effects of the Proposed Action as Modified by the RPA on PS Chinook salmon and their Critical Habitat

The proposed action, as modified by the RPA, avoids jeopardy and adverse modification of critical habitat, despite climate change effects, because it requires the USACE and applicants to fully offset all adverse effects of the proposed projects on the quality of Puget Sound nearshore habitat (as described in section 2.1). Applying a “no-net loss” approach to the nearshore habitat affected by the projects will ensure that this limiting factor for the production of PS Chinook

²⁵ In general, NMFS agreements expect that conservation projects will be implemented within three years of conservation credits being purchased. However, in-case of in-lieu-fee type programs, additional time could be necessary for situations such as when credit demand is lower than expected, and the in-lieu fee program has not been able to collect enough funds to secure an in-lieu fee project site and plan and implement the compensatory offsets within the three years.

salmon and the PBFs of PS Chinook critical habitat will not continue to worsen as a result of these projects. In addition, stabilizing this limiting factor in the context of this consultation will help allow the expected benefits from other efforts such as modified harvest management, hatchery reform, improved fish passage at dams, and freshwater habitat restoration to have meaningful, positive impacts on PS Chinook salmon abundance, productivity, spatial structure, and diversity and their related critical habitat. Loss of Puget Sound nearshore habitat quality is among a subset of limiting factors for PS Chinook salmon that have yet to be addressed in a meaningful manner.

Effects of the Proposed Action as Modified by the RPA on SRKW and their Critical Habitat

The proposed action, as modified by the RPA, avoids jeopardy and adverse modification of critical habitat for SRKWs by applying a “no-net loss” approach to nearshore habitat affected by the projects. This habitat is important to the production of PS Chinook salmon. As explained above, applying a “no-net loss” approach to nearshore habitat (as also described in section 2.1) will ensure that this limiting factor for the production of PS Chinook salmon will not continue to worsen as a result of these projects. Stabilizing this limiting factor in the context of this consultation will help allow the expected benefits from other efforts such as modified harvest management, hatchery reform and production from conservation hatcheries, improved fish passage at dams, and freshwater habitat restoration to have a meaningful, positive impact on PS Chinook salmon abundance, productivity, spatial structure, and diversity. In turn, this addresses SRKW’s critical habitat requirement for prey species of sufficient quantity, quality and availability to support individual growth, reproduction and development, as well as overall population growth. The RPA avoids further reductions in prey that would otherwise be caused by the proposed action.

2.9 Incidental Take Statement

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

2.9.1 Amount or Extent of Take Anticipated

In this Opinion, including actions associated with implementation of the RPA 1.1, 1.2 and 1.5, NMFS determined that incidental take is reasonably certain to occur as:

- Harm of PS Chinook salmon (juvenile and adult), PS steelhead (juvenile and adult), HCSR chum salmon (juvenile and adult), PS/Georgia Basin DPSs of yelloweye rockfish and bocaccio (egg, larvae, juvenile, and adult) from temporary construction related actions²⁶; and
- Harm of individual PS Chinook salmon (juvenile and adult), PS steelhead (juvenile and adult), HCSR chum salmon (juvenile and adult), PS/Georgia Basin DPSs of yelloweye rockfish and bocaccio (egg, larvae, juvenile, and adult) and Southern Resident Killer Whales from intermittent and enduring impacts resulting from the repair or replacement of existing structures and the construction of new structures.

For this Opinion, even using the best available science, NMFS cannot predict with meaningful accuracy the number of listed species that are reasonably certain to be injured or killed annually by exposure to these stressors. The distribution and abundance of the fish that occur within the action area are affected by habitat quality, competition, predation, and the interaction of processes that influence genetic, population, and environmental characteristics. These biotic and environmental processes interact in ways that may be random or directional, and may operate across far broader temporal and spatial scales than are affected by a proposed action. Thus, the distribution and abundance of fish within the action area cannot be attributed entirely to habitat conditions, nor can NMFS precisely predict the number of fish that are reasonably certain to be injured or killed if their habitat is modified or degraded by the proposed action. Additionally, NMFS knows of no device or practicable technique that would yield reliable counts of individuals that may experience these impacts. Similarly, NMFS is unable to reliably quantify and monitor the number of individual SRKWs that may be harmed by the incidental take identified here. In such circumstances, NMFS uses the causal link established between the activity and the likely extent of timing, duration and area of changes in habitat conditions to describe the extent of take as a numerical level. Many of the take surrogates identified below could be construed as partially coextensive with the proposed action; however, they also function as effective re-initiation triggers. If any of the take surrogates established here and summarized in Tables 27, 28, 29, and 30 are exceeded, they are considered meaningful reinitiation triggers because the USACE has authority to conduct compliance inspections and to take actions to address non-compliance, including post-construction (33 CFR 326.4), and exceeding any of the surrogates would suggest a greater level of effect than was considered by NMFS in its analysis.

TAKE FROM CONSTRUCTION RELATED AND TEMPORARY EFFECTS

Construction Timing and Duration Surrogates

The timing (in-water work window) and duration (days) of in-water work is applicable to construction related stressors described below because the in-water work windows for specific geographic regions are designed avoid the expected peak presence of listed species in the action area. Construction outside of the in-water work window could increase the number of fish that would be exposed to construction related stressors, as would working for longer than planned. Therefore, for all stressors below that identify a timing and duration take surrogate, they will be

²⁶ The temporary nature of the construction related effect on SRKW prey resources are not expected to be detectable at the individual SRKW level, and therefore, as described in the effects analysis, we do not anticipate harm to SRKW from these activities.

synonymous with the defined in-water work window and number of in-water workdays identified in Table 27. The only exception to this is the days associated with pile installation and removal listed in Table 28. These surrogate measures of incidental take can be reasonably and reliably monitored by the applicants. Due to the nature of construction in the marine environment, there is the potential for a project to exceed these identified time frames.

We include construction-related impacts for RPA 1.1 and 1.2 where relevant and consistent with the estimated duration construction operations described above. Construction-related impacts from RPA 1.5 would have the same surrogates, however the magnitude will be the same or less than those specified for the proposed action in Table 27 and 28. For RPA 1.3 and 1.4, as discussed above, the construction impacts of the restoration actions associated with those RPAs will be covered by separate existing or future ESA consultations. Consistent with 50 CFR 402.16(i)(6), we are not including any amount or extent of take associated with those actions since any incidental take will be addressed in the consultations associated with those conservation offset mechanisms (project funding or credits).

Harm from Pile Driving Activities - Noise

PS Chinook salmon (juvenile and adult), PS steelhead (juvenile and adult), HCSR chum salmon (juvenile and adult), PS/Georgia Basin DPSs of yelloweye rockfish and bocaccio (egg, larvae, juvenile, and adult) will be exposed to construction-related noise resulting from pile installation and removal activities and construction vessels at the work sites. Disruption of normal feeding and migration, and injury and death can occur from this exposure. Additionally, implementation of the RPA 1.1 and 1.2 may result in additional removal of piles. The amount and extent of short-term take resulting from the proposed action, including actions taken to implement RPA 1.1 and 1.2, are accounted for and exempted in this take statement as reflected below in Table 27 and 28.

The maximum number of individual pile strikes per day, and time of vibratory pile driving per day (minutes) are the best available surrogates for the extent of take from exposure to pile removal and installation -related noise (see below Table 28).

The surrogates for take caused by underwater sound generated by pile driving and vessel use are proportional to the anticipated amount of take. These surrogates are also the most practical and feasible indicators to measure. In particular, the number of pile strikes with an impact hammer is directly correlated to the potential for harm due to hydroacoustic impacts, and thus the number of individuals harmed due to pile driving. Each pile strike creates underwater sound and a pressure wave that can kill, injure, or significantly impair behavior of listed species addressed by this Opinion. Numerous strikes occurring in temporal proximity also increase the likelihood of injury, death, or behavior modification due to cumulative exposure to underwater sound. Thus, the number of pile strikes is closely related to the amount of incidental take that would be caused by the proposed action. In some cases, persistent noise can make an affected area inhospitable for normal behaviors such as migrating and foraging. The duration of this disturbance is related to the number of animals potentially affected as well as the intensity of the disturbance. As the duration of noise increases, a larger number of animals migrating or traveling through the affected area are likely to be exposed. Likewise, the longer the noise persists, the longer the

affected area may remain incapable of supporting the normal behaviors of salmon, steelhead, and HCSR chum salmon.

Harm from Suspended Sediments and Contaminants

PS Chinook salmon (juvenile and adult), PS steelhead (juvenile and adult), HCSR chum salmon (juvenile and adult), PS/Georgia Basin DPSs of yelloweye rockfish and bocaccio (egg, larvae, juvenile, and adult), will be exposed to suspended sediments and re-suspended contaminants (specifically PAH's from creosote structures) in the sediments during pile removal, removal of debris in the nearshore, nearshore construction activities during removal and replacement of shoreline armoring and dredging. Impairment of normal patterns of behavior including rearing and migrating, potential injury such as gill abrasion, cough, PAH bioaccumulation or other transitory health effects can occur from this exposure (described in Section 2.4.1). Additionally implementation of the RPA 1.1, 1.2, and 1.5 may result in additional removal of piles, nearshore debris, shoreline armoring, and SAV relocation. The amount and extent of short-term take resulting from the proposed action, including actions taken to implement RPA 1.1 and 1.2, are accounted for and exempted in this take statement as reflected in Table 27.

The suspended sediments and re-suspended contaminants will occur contemporaneously—these action are triggered by the same stressor, will occur in the same time and place and can be measured and monitored in the same manner. The best available indicator for the extent of take from suspended sediments and contaminants are described below.

For non-dredging activities

The levels of suspended sediments and contaminants are expected to be proportional to the amount of injury that the proposed action is likely to cause through physiological stress from elevated suspended sediments and contaminants throughout the duration of the projects' in-water activities. In estuaries, state water quality regulations (WAC173-201A-400) establish a mixing zone of 200 feet plus the depth of water over the discharge port(s) as measured during mean lower low water. As such, NMFS expects that for projects with sediment disturbing activities, that elevated levels of suspended sediment and re-suspended contaminants resulting from construction actions will reach background levels within a 200-foot buffer from the point of suspended sediment generation. Listed fish and their prey resources can be harmed from a wide range of elevated sediment levels and expect that at the point where sediment levels return to background levels that the harm will cease. Thus, the maximum extent of take is defined as within the 200-foot buffer around the outer boundaries of each of the project footprint, where construction will suspend sediments and re-suspend contaminants. Elevated suspended sediment levels beyond 200-foot buffer would indicate exceedance of take. The 200-foot buffer extent of take surrogate also applies projects that implement RPA 1.1, 1.2, and 1.5.

For dredging activities

The levels and amounts of suspended sediments and contaminants are expected to be proportional to the amount of injury that the proposed action is likely to cause through physiological stress from elevated suspended sediments and contaminants throughout the duration of the projects' in-water activities. For dredging activities that occur estuary

environments, Washington state water quality regulations (WAC173-201A-400) establish a mixing zones not to extend to a downstream direction for a distance from the discharge port(s) greater than three hundred feet plus the depth of water over the discharge port(s), or extend upstream for a distance of over one hundred feet. As such, NMFS expects that for projects with dredging, that elevated levels of suspended sediment and re-suspended contaminants resulting from dredging actions will reach background levels within a 300-foot buffer from the point of suspended sediment generation. Listed fish and their prey resources can be harmed from a wide range of elevated sediment levels and expect that at the point where sediment levels return to background levels that the harm will cease. Thus, the maximum extent of take for dredging activities is defined as within the 300-foot buffer around the outer boundaries of each of the project footprint, where construction will suspend sediments and re-suspend contaminants. Elevated suspended sediment levels beyond 300-foot buffer would indicate exceedance of take.

The surrogate measures of incidental take identified in this section can be reasonably and reliably measured and monitored by applicants.

Harm from Entrainment from dredging operations (only applies to NWS-2018-963 and NWS-2019-478)

We expect PS Chinook salmon (juvenile), PS steelhead (juvenile), HCSR chum salmon (juvenile), and PS/Georgia Basin DPSs of yelloweye rockfish and bocaccio (egg, larvae, juvenile, and adult) to be captured by entrainment during the proposed dredging operations (clam shell or suction). Most listed species that are entrained will be injured or killed.

The exact number of listed species that would be entrained cannot be determined due to extensive variables. The best available indicator of take the amount of dredge material (cubic yards). The amount of dredge material is appropriate for this proposed action because it is directly related to the quantitative magnitude of take caused by entrainment during dredging. The applicant can measure and monitor the volume of material dredged. The amount and extent of take resulting from dredging associated with this proposed action is accounted for and exempted in this take statement as reflected in Table 27. Due to the nature of dredging in the marine environment, there is the potential for a project to exceed these identified indicators.

Table 27. Amount of take expressed by take surrogates: construction timing (fish window) and duration (in-water work days, area of suspended sediments from project site, re-suspended contaminants in tons of creosote removed and entrainment that would occur during dredging actions. Where appropriate, RPA 1.1 and 1.2 actions that result in take are explicitly delineated from take resulting from the Proposed Action (PA).

	Timing and Duration for all surrogates			Suspended Sediments and Contaminants			Entrainment From Dredging
NWS#	Work Window	# of Work Windows	Days (PA/RPA)	Non-Dredge	PAH	Dredge	Cubic Yards
				Square Foot (PA/RPA)	Minimum Ton Removal	Square Foot	
NWS-2017-796	July 16 - February 15	5	86/20	200/200	148	NA	NA
NWS-2017-587	July 16 - February 15	1	30/20	200/200	NA	NA	NA
NWS-2018-963	July 16 - February 15	1	30/NA	NA	11	300	713
NWS-2018-229	July 16 - February 15	1	30/NA	200/NA	1	NA	NA
NWS-2018-465	July 16 - February 15	1	14/10	200/200	NA	NA	NA
NWS-2018-53	July 16 - February 15	1	30/20	NA/200	NA	NA	NA
NWS-2018-636	July 16 - February 15	1	30/10	200/200	15	NA	NA
NWS-2017-955	July 16 - February 15	1	14/10	200/200	1	NA	NA

	Timing and Duration for all surrogates			Suspended Sediments and Contaminants			Entrainment From Dredging
NWS#	Work Window	# of Work Windows	Days (PA/RPA)	Non-Dredge	PAH	Dredge	Cubic Yards
				Square Foot (PA/RPA)	Minimum Ton Removal	Square Foot	
NWS-2018-760	July 16 - February 15	1	3/10	200/200	1	NA	NA
NWS-2017-840	July 16 - February 15	1	30/10	200/200	NA	NA	NA
NWS-2018-981	July 16 - February 15	1	30/10	200/200	22	NA	NA
NWS-2018-1143	July 16 - February 15	1	14/10	200/200	NA	NA	NA
NWS-2018-570	July 2 – March 2	1	30/20	200/200	179	NA	NA
NSW-2018-1165	July 16 - February 15	1	30/NA	200/NA	10	NA	NA
NWS-2017-573	July 16 - October 14	1	30/30	200/200	NA	NA	NA
NWS-2018-382	July 16 - January 15	1	30/10	200/200	18	NA	NA
NWS-2019-207	July 16 - February 15	1	1/10	NA/200	20	NA	NA
NWS-2019-552	August 1- January 31	1	15/20	200/200	NA	NA	NA

	Timing and Duration for all surrogates			Suspended Sediments and Contaminants			Entrainment From Dredging
NWS#	Work Window	# of Work Windows	Days (PA/RPA)	Non-Dredge	PAH	Dredge	Cubic Yards
				Square Foot (PA/RPA)	Minimum Ton Removal	Square Foot	
NWS-2019-676	July 16 - February 15	1	7/NA	200/NA	1	NA	NA
NWS-2019-526	July 16 - February 15	1	30/NA	200/NA	22	NA	NA
NWS-2018-750	July 16 - February 15	4	60/10	200/200	120	NA	NA
NWS-2018-39	July 16 - February 15	1	2/10	NA/200	NA	NA	NA
NWS-2019-491	July 16 - February 15	1	8/20	200/200	NA	NA	NA
NWS-2019-664	July 16 - February 15	1	30/30	NA/200	NA	NA	NA
NWS-2019-336	July 16 - February 15	10	31/30	200/200	196	NA	NA
NWS-2018-525	July 16 - February 15	1	30/20	200/200	13	NA	NA
NWS-2018-492	July 16 - February 15	3	60/30	200/200	198	NA	NA
NWS-2019-478	July 16 - February 15	1	20/10	NA	NA	300	7,500

	Timing and Duration for all surrogates			Suspended Sediments and Contaminants			Entrainment From Dredging
NWS#	Work Window	# of Work Windows	Days (PA/RPA)	Non-Dredge	PAH	Dredge	Cubic Yards
				Square Foot (PA/RPA)	Minimum Ton Removal	Square Foot	
NWS-2019-956	July 16 - February 15	1	30/20	200/200	15	NA	NA
NWS-2019-0883	July 16 - February 15	1	30/NA	200/NA	11	NA	NA
NWS-2019-728	August 1 - February 15	1	2/NA	200/NA	NA	NA	NA
NWS-2019-690	July 16 - January 15	1	30/10	200/200	4	NA	NA
NWS-2019-0703	September 1- February 15	5	119/NA	200/200	2,232	NA	NA
NWS-2020-0204	July 16 - February 15	2	100/30	200/200	NA	NA	NA
NWS-2017-550	July 16 - October 14	10	90/NA	200/NA	272	NA	NA
NWS-2019-101	August 1- January 31	5	30/NA	200/NA	167	NA	NA
NWS-2019-832	July 16 - February 15	1	30/NA	200/NA	12	NA	NA

	Timing and Duration for all surrogates			Suspended Sediments and Contaminants			Entrainment From Dredging
NWS#	Work Window	# of Work Windows	Days (PA/RPA)	Non-Dredge	PAH	Dredge	Cubic Yards
				Square Foot (PA/RPA)	Minimum Ton Removal	Square Foot	
NWS-2017-427	July 16 - October 14	1	5/10	NA	NA	NA	NA
NWS-2019-983	July 16 - February 15	1	30/NA	200/NA	5	NA	NA

Table 28. Amount of take expressed by take surrogate, by projects resulting from Temporary and Construction Effects for elevated construction noise associated with pile installation and removal.

NWS#	# of days of pile removal/install work	# of work windows	Max Impact Strikes/Day	Max Minutes Vibratory Hammer work/Day
NWS-2017-796	86	5	3,000	0
NWS-2018-963	2	1	0	280
NWS-2018-636	7	1	0	140
NWS-2018-760	2	1	0	80
NSW-2018-981	4	1	4,000	160
NWS-2018-570	8	1	0	160
NWS-2017-573	14	1	400	160
NWS-2019-552	6	1	0	100
NWS-2019-526	2	1	0	160
NWS-2018-750	60	4	0	160
NWS-2019-336	31	10	0	160
NWS-2018-525	2	1	0	160
NWS-2018-492	60	3	22,500	100
NWS-2019-0883	25	1	100	40
NWS-2019-0703	119	5	10,800	405
NWS-2017-550	90	10	245	140
NWS-2019-101	20	5	4,000	80
NWS-2019-832	7	1	0	160
NWS-2017-427	1	1	NA	NA

TAKE FROM INTERMITTENT AND ENDURING EFFECTS

Harm due to habitat-related effects

PS Chinook salmon (juvenile and adult), PS steelhead (juvenile and adult), HCSR chum salmon (juvenile and adult), PS/Georgia Basin DPSs of yelloweye rockfish and bocaccio (egg, larvae, juvenile, and adult) and SRKW will be exposed to reduction in the quantity and quality of nearshore habitat resulting from the replacement or repair (rebuilding) of existing structures and the placement of new structures. For SRKWs, the impact of the habitat-related effects is primarily on the reduction in prey. This impact is caused by the loss of nearshore habitat quality that results in a reduction in the abundance of PS Chinook salmon. Specifically addressed here are the reduction in habitat quality and quantity—including prey resources for PS Chinook and SRKW—that will result from in- and over-water structures and vessels using these structures,

and shoreline stabilization and bank armoring. The take associated with these impacts are summarized below in Table 29.

For In-Water and Over-Water Structures, Including Mooring Buoys

The physical size (sq feet) of an in- or over-water structure is the best available surrogates for the extent of take from exposure to the structure itself and also the accompanying vessel noise accommodated by the structure. This is because the likelihood of avoidance and the distance required to swim around the structure would both increase as the size of a structures and the intensity of its shadow increase, which would increase the number of juveniles that enter deeper water where forage efficiency would be reduced and vulnerability to predators would be increased. The amount of overwater structure directly determines the amount of shaded area, migration obstruction, reduced benthic productivity and submerged aquatic vegetation (SAV) distrusting and limiting feeding opportunities available at the project sites (effects further described in Section 2.4.3). The extent of these impacts would increase and decrease depending directly on structure size.

Also, as the size of a structure increases, the number of individual boats that could moor there increases; mooring buoys only allow for one boat to moor at a time and structure and slip sizes within marina would dictate the number of individual boats that could use these facilities. As the number of mooring buoys increase the number of boats using it will be expected to increase. As size and slip number increase the number of boats using a marina would also increase. As the number of boats increase, boating activity would likely increase, and the potential for ESA-listed species to be exposed to the related noise effects (as described in Section 2.3, 2.4.1 and 2.4.2) also increases.

For Shoreline Armoring and Bulkheads

The physical extent (length and width) of shoreline armoring and bulkheads, and placement on the shore below the high tide line (HTL) and highest astronomical tide (HAT) is the best available indicator for the extent of take from decreased habitat function caused by shoreline armoring and bulkhead structures (including stairs). Shoreline armoring restricts natural beach forming processes (natural erosive processes) by disrupting the supply and replenishment of sediments sources are the base of forage fish spawning habitat (effects described in Section 2.4.3). As forage fish reproduction is restricted or reduced, so is the availability of food for listed fish (salmon and bocaccio), limiting and reducing the numbers of listed fish that the action area can support. In turn, this limits the number of juveniles PS Chinook that will survive and return to the Puget Sound as adults that supply prey for SRKW. The loss of natural sediment deposition along the shoreline north and south of a structure that supports forage fish and other intertidal and nearshore habitat function are directly proportional to the physical area, length and width of shoreline armoring and bulkheads, and placement on the shore below the HTL and HAT. As the length and width of a bulkhead increases so does impacts to sediment inputs. Structures that are placed below the HTL and HAT directly eliminate forage fish habitat and feeding habitat for listed species. The further a structure is placed below HTL and HAT, the greater the loss of this habitat and thus impacts. Further, due to the variability of the marine environment and nature of project implementation, the potential exists for a project to exceed the structure's identified physical extent.

The surrogate measures of incidental take identified in this section can be reasonably and reliably measured and monitored and all serve as meaningful reinitiation triggers.

Table 29. Amount of take expressed by take surrogate, by projects resulting from Intermittent and Enduring Effects

	In-water and Over-water Structure	Bulkhead and Shoreline Armoring	
USACE Project #	Square Footage	Length (lf)	Average Elevation of Substrate at Toe of Armoring
NWS-2017-796	49,800	NA	NA
NWS-2017-587	NA	110	MHHW
NWS-2018-963	1,173	NA	NA
NWS-2018-229	NA	33	10 ft MLLW
NWS-2018-465	NA	75	2 ft below MHHW
NWS-2018-53	NA	26/124	5 ft below MHHW
NWS-2018-636	2,514	NA	NA
NWS-2017-955	NA	140	1.5 ft below MHHW
NWS-2018-760	1,460	NA	NA
NWS-2017-840	NA	136	1 ft below MHHW
NWS-2018-981	2,722	NA	NA
NWS-2018-1143	NA	60	1 ft below MHHW
NWS-2018-570	5,469	386	2 ft below MHHW
NSW-2018-1165	690	NA	NA
NWS-2017-573	8,138	NA	NA
NWS-2018-382	NA	125	MHHW
NWS-2019-207	4,168	NA	NA
NWS-2019-552	NA	307	2 feet below MHHW
NWS-2019-676	64	NA	NA
NWS-2019-526	3,615	NA	NA
NWS-2018-750	31,744	NA	NA
NWS-2018-39	NA	NA	NA
NWS-2019-491	2,292	NA	NA
NWS-2019-664	NA	360	MHHW
NWS-2019-336	240	NA	NA
NWS-2018-525	12,778	NA	NA
NWS-2018-492	NA	834	12 feet below MHHW
NWS-2019-478	NA	NA	NA
NWS-2019-956	NA	117/13	MHHW
NWS-2019-0883	1,000	NA	NA

	In-water and Over-water Structure	Bulkhead and Shoreline Armoring	
USACE Project #	Square Footage	Length (lf)	Average Elevation of Substrate at Toe of Armoring
NWS-2019-728	NA	4	MHHW
NWS-2019-690	220	35	1 ft below MHHW
NWS-2019-0703	74,636	NA	NA
NWS-2020-0204	4,124	330	3 ft below MHHW
NWS-2017-550	1,883	NA	NA
NWS-2019-101	1,139	NA	NA
NWS-2019-832	948	NA	NA
NWS-2017-427	7	NA	NA
NWS-2019-983	704	NA	NA

Harm from Stormwater Runoff

PS Chinook salmon (juvenile and adult), PS steelhead (juvenile and adult), HCSR chum salmon (juvenile and adult), PS/Georgia Basin DPSs of yelloweye rockfish and bocaccio (egg, larvae, juvenile, and adult) will be exposed to intermittent stormwater runoff associated with 2 projects. The take associated with these impacts are summarized below in Table 30.

For this consultation, the best available indicator for the extent of take expected due to storm water runoff is the physical extent (sq. ft.) of pollution generating impervious surface (PGIS) associated with the permitted structure (i.e., access roads and parking lots). Stormwater from PGIS will result in delivering a wide variety of pollutants to aquatic ecosystems, such as nutrients, metals, petroleum-related compounds, and sediment washed off the impervious surfaces. Stormwater inputs will result in short-term reduction of water quality and an increase in water quantity due to concentrated flows derived from impervious surfaces, which are reasonably certain to cause injury to fish depending on the level of exposure. Stormwater contaminants cause a variety of lethal and sublethal effects on fish, including disrupted behavior, reduced olfactory function, immune suppression, reduced growth, disrupted smoltification, hormone disruption, disrupted reproduction, cellular damage, and physical and developmental abnormalities (Fresh et al. 2005; Hecht et al. 2007; Lower Columbia River Estuary Partnership 2007). The amount of stormwater resulting from the project and pollutants in the stormwater are directly proportional to the amount of PGIS. As PGIS increases so would the amount of pollutants being discharged.

The surrogate measure of incidental take identified in this section can be reasonably and reliably measured and monitored and serves as meaningful reinitiation trigger.

Table 30. Pollutions Generating Surface from projects involving stormwater

	Stormwater Runoff
NWS#	Pollutions Generating Surface (sq ft)
NWS-2018-492	73,000
NWS-2019-983	8,269

2.9.2 Effect of the Take

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

2.9.3 Reasonable and Prudent Measures

The “reasonable and prudent measures” (RPMs) described below are non-discretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02).

1. The USACE shall minimize incidental take of listed species from construction related noise resulting from exposure to pile driving activities.
2. The USACE shall minimize incidental take of listed species resulting from dredging operations.
3. The USACE shall minimize incidental take of listed species resulting from suspended sediment and re-suspended contaminants during construction.
4. The applicant shall minimize incidental take of listed species resulting from stormwater.
5. The USACE and applicants shall implement monitoring and reporting programs to confirm that the RPA and RPM’s are implemented as required and take exemption for the proposed action is not exceeded, and that the terms and conditions are effective in minimizing incidental take.

2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and the USACE or any applicant must comply with them in order to implement the RPMs (50 CFR 402.14). The USACE or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in these Terms and Conditions (50 CFR 402.14). If the entity to whom a term and condition is directed does not

comply with the following terms and conditions, protective coverage for the proposed action likely would lapse.

1. The following terms and conditions implement RPM 1 (pile driving activities). To minimize incidental take from pile installation and removal for the relevant projects, the USACE shall require the applicant to:
 - a. Adhere to the applicable in-water work window (as specified in Table 27)
 - b. Utilize vibratory pile driving whenever sediment conditions allow.
 - c. Utilize sound attenuation measure(s) (double walled piles, wooden block, bubble curtain, etc.) for all steel impact pile driving.
2. The following terms and conditions implement RPM 2 (dredging). To minimize incidental take from dredging operation, the USACE shall require the applicant to:
 - a. Adhere to the applicable in-water work window (as specified in Table 27)
 - b. Comply with Washington State water quality standards by conducting water quality monitoring during dredging activities. At point of compliance (per state permit), turbidity levels shall not exceed 5 nephelometric turbidity units (NTUs) more than background turbidity when the background turbidity is 50 NTUs or less, or there shall not be more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTUs.
 - c. Dredge in a manner that minimizes spillage of excess sediments from the bucket and minimizes the potential entrainment of fish. This includes, but is not limited to:
 - i. Using effective materials such as hay bales or filter fabric on the barge to avoid contaminated sediment and water from being deposited back into the water.
 - ii. Avoiding the practice of washing contaminated material off the barge and back into the water. This can be accomplished by the use of hay bale and/or filter fabric.
 - iii. Using filter fabric or some other device (hay bales, eco-blocks, etc.) to minimize spillage of material into the water during the unloading of the barge to the upland facility.
 - d. Ensure dredging contractor utilizes the most current, accurate Global Positioning System (GPS) dredge positioning to control the horizontal and vertical extent of the dredge. A horizontal and vertical control plan will be prepared, submitted to the contractor, and adhered to by the dredge contractor to ensure dredging does not occur outside the limits of the dredge prism.
 - e. Ensure that an emergency cleanup plan is in place in the event the barge, truck, or railcar has an incident where contaminated material is spilled. This plan will be on-board the vehicle at all times.
3. The following terms and conditions implement RPM 3 (suspended sediment):
 - a. Adhere to the applicable in-water work window (as specified in Table 27)
 - b. To minimize incidental take from suspending sediment and re-suspended contaminants during structure removal and construction, the USACE shall require the applicant to:
 - i. Implement the best management practices and conservation measures to ensure compliance with Washington State water quality standards by conducting water quality monitoring during structure removal and construction activities. At point of compliance (per state permit), turbidity levels shall not exceed 5 nephelometric turbidity units (NTUs) more than background turbidity when the background turbidity

- is 50 NTUs or less, or there shall not be more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTUs
- ii. Removed creosote structures should be disposed at approved facilities.
[\(https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Dangerous-waste-guidance/Dispose-recycle-or-treat/Hiring-a-contractor\)](https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Dangerous-waste-guidance/Dispose-recycle-or-treat/Hiring-a-contractor)
4. The following terms and condition implement RPM 4 (stormwater discharge).
 - a. To minimized incidental take from discharge of stormwater the applicant shall:
 - i. Provide treatment for stormwater from pollution generating surfaces (e.g., parking lots, roads, support vehicle traffic, landscape areas subject to chemical maintenance) that will ensure that discharge meets Washington state water quality standards for pollution generating surfaces.
 - ii. Within 60 days of a project being completed, the applicant shall prepare and send to NMFS a project completion report that contains the following:
 - (1) Stormwater treatment plan
 - (2) Final square feet of actual replaced, repaired, or new impervious surface
 5. The following terms and conditions implement RPM 5 (Monitoring and Reporting). The USACE shall require the applicant to:
 - a. Before work begins, all contractors working on site must receive a complete list of the USACE permit special conditions, this biological Opinion's RPA and the ITS, including the RPMs and terms and conditions intended to minimize the amount and extent of take resulting from in-water work.
 - b. On the start date of the construction, the applicant (or designated agent) shall notify NMFS that construction has commenced: This notification should be sent to projectreports.wcr@noaa.gov and include:
 - i. Email subject line: "NOTIFICATION OF START DATE **WCRO-2020-01361**"
 - ii. Date project construction began
 - iii. USACE NWS project number
 - c. RPA implementation:
 - i. For applicants using RPA 1.1 to meet all or part of their RPA requirements, applicants shall, within three years from the project's construction start date do the following:
 - (1) Provide verification that on-site habitat improvement projects were implemented as proposed. At a minimum this verification should include:
 - (2) A description of the final design, and
 - (3) Before and after photographs.
 - (4) Upload project details that describe completed habitat improvements into the Puget Sound Info database found here: <https://www.pugetsoundinfo.wa.gov/>
 - ii. For applicants using RPA 1.2 to meet all or part of their RPA requirements, applicants shall, within three years from the project's construction start date do the following:
 - (1) Provide verification that off-site habitat improvement projects were implemented as proposed. At a minimum this verification should include:
 - (a) A description of the final design, and
 - (b) Before and after photographs.

- (c) Upload project details that describe completed habitat improvements into the Puget Sound Info database found here: <https://www.pugetsoundinfo.wa.gov/>
- iii. For applicants using RPA 1.3 to meet all or part of their RPA requirements, applicants shall, within one year from the date of the USACE permit issuance, provide proof of the proposed partnership and verification of the final sales agreement purchasing credits.
- iv. For applicants using RPA 1.4 to meet all or part of their RPA requirements, applicants shall, within one year from the date of the USACE permit issuance date, provide verification of the final sales agreement purchasing credits
- v. For applicants using RPA 1.5 to meet all or part of their RPA requirements, applicants shall implement any project modifications concurrent with the specifications of USACE permit.
- vi. For projects subject to this RPA, within 30 days of the Corp issuing the final permit, the USACE shall provide NMFS notice and a final copy of the USACE permit.
- d. Within 60 days of a project being completed, the USACE shall require the applicant to prepare and send to NMFS a project completion report that contains the following:
 - i. Project identification;
 - ii. Project name;
 - iii. Project location by 5th field U.S. Geological Survey (USGS) HUC and by latitude and longitude as determined from the appropriate 7- minute USGS quadrangle map;
 - iv. USACE contact person(s);
 - v. Timing and Duration of Project Work:
 - (1) Starting and ending dates for work completed;
 - (2) Number of days of in-water work for proposed action and when RPA 1.1 and 1.2 apply
 - vi. Evidence of Construction-Related Noise
 - (1) For Piles Installed, the final report must identify:
 - (a) Number days that pile installation activities occurred
 - (b) Number of Pile(s)
 - (c) Pile type(s)
 - (d) Pile size(s)
 - (e) Method(s) used for installation
 - (f) Daily records of impact hammer strikes
 - (g) Daily record of time that vibratory hammer was used
 - (2) For Piles Removed—for both the proposed action and when RPA 1.1 and 1.2 apply, the final report must identify:
 - (a) Number days that pile removal activities occurred
 - (b) Number of Pile(s)
 - (c) Pile type(s)
 - (d) Pile size(s)
 - (e) Method(s) used for removal
 - (f) Daily record of time that vibratory hammer was used
 - (3) Suspended Sediment and Contaminant Monitoring
 - (a) Report of BMPs used

- (b) Monitoring data collected, or use of BMPs that demonstrate that 200f buffer (for non-dredging actions) and 300 ft (for dredging) buffers were not exceeded
 - (c) For projects with creosote removal – copy of disposal receipt verifying tons of creosote disposed.
- (4) For Dredging Projects:
 - (a) Final amount of cubic yards dredged
- (5) For In-water and Overwater Structures:
 - (a) Final square feet (replaced/repared/new)
- (6) For Shoreline Armoring/Bank Stabilization:
 - (a) Final length in lf (replaced/repared/new)
 - (b) Final width in sq ft (replaced/repared/new)
 - (c) Placement of structure on the shoreline relative to HTL and HAT
- (7) Photo documentation.
 - (a) Photos of habitat conditions at the project site before, during and after project completion
 - (b) Include general views and close-ups showing details of the project and project site, including pre- and post-construction.
 - (c) Label each photo with date, time, project name, photographer's name, and the subject and project number.
- (8) A description of how the USACE successfully met the terms and conditions contained in this Opinion

Submit Reports. All reports shall contain the WCRO Tracking number and be sent by electronic copy to NOAA's reporting system email address at: projectreports.wcr@noaa.gov.

2.10 Conservation Recommendations

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

NMFS recommends that the USACE, per requirements in Section 7(a)(1) and (2), develop a program and complete a programmatic consultation with NMFS that will ensure nearshore projects contain adequate conservation offsets to avoid future jeopardy and adverse modification determinations.

2.11 “Not Likely to Adversely Affect” Determinations

2.11.1 Green Sturgeon and their Designated Critical Habitat

Critical habitat was designated for the southern DPS of green sturgeon in 2009 (74 FR 52299; October 9, 2009) In the designation documents, Puget Sound is identified as an occupied area possessing PBFs for this DPS of green sturgeon, however Puget Sound is excluded from the

designation for economic reasons. Observations of green sturgeon in Puget Sound are much less common compared to the other estuaries in Washington. Although two confirmed Southern DPS fish were detected there in 2006, the extent to which Southern DPS green sturgeon use Puget Sound remains uncertain. Puget Sound has a long history of commercial and recreational fishing and fishery-independent monitoring of other species that use habitats similar to those of green sturgeon, but very few green sturgeon have been observed there. In addition, Puget Sound does not appear to be part of the coastal migratory corridor that Southern DPS fish use to reach overwintering grounds north of Vancouver Island thus corroborating the assertion that Southern DPS do not use Puget Sound extensively. Because critical habitat is not designated in the action area, effects of the 39 projects on critical habitat is discountable.

As for any potential effect on the species, even if green sturgeon are present in the action area of Puget Sound, they rely on deep bottom areas for feeding and rearing, indicating that the effects of the 39 actions will be attenuated to the degree that exposure to effects will be at low enough levels that response will be insignificant. It is very unlikely that green sturgeon will occur in the action area or be exposed to stressors from the proposed action. Therefore, we conclude that the effects to the southern DPS green sturgeon are likely to be fully discountable, but if any exposure to project effects did occur, response would be insignificant.

2.12 Reinitiation of Consultation

This concludes formal consultation for the USACE' proposal to authorize 39 in-water, overwater, or nearshore activities in Puget Sound.

If any of the applicants fail to implement the portion of the RPA applicable to their individual project, that project will not be covered by the take exemption described in the Incidental Take Statement (ITS) for this Opinion, and could become subject to the "take" prohibitions under Section 9 of the ESA. This circumstance would not automatically trigger re-initiation requirements.

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

This consultation represents a combined review of 39 individual requests for consultation on proposed projects that may affect listed species and critical habitat in Puget Sound. If any of the re-initiation triggers identified above are reached, and the USACE retains discretionary involvement or control over the action, the USACE can request re-initiation on a project-by-project basis. In such a case, NMFS does not expect that reinitiation on a single project would trigger a need to reinitiate consultation on all of the projects addressed by this Opinion. Other projects may still meet the no net loss requirements of the RPA and be consistent with the analysis in this Opinion even if a single project does not.

Any request for re-initiation of consultation should be made to the NMFS Regional Office, Oregon Washington Coastal Offices, 7600 Sand Point Way NE, Seattle, WA 98115.

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

Section 305(b) of the MSA directs federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. The MSA (section 3) defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH.

This analysis is based, in part, on the EFH assessment provided by the USACE and descriptions of EFH for Pacific coast groundfish (PFMC 2005), coastal pelagic species (PFMC 1998), Pacific coast salmon (PFMC 2014) contained in the fishery management plans developed by the Pacific Fishery Management Council and approved by the Secretary of Commerce.

3.1 Essential Fish Habitat Affected by the Project

The entire action area fully overlaps with identified EFH for Pacific Coast salmon, Pacific Coast groundfish, and coastal pelagic species. Designated EFH for groundfish and coastal pelagic species encompasses all waters along the coasts of Washington, Oregon, and California that are seaward from the mean high water line, including the upriver extent of saltwater intrusion in river mouths to the boundary of the U. S. economic zone, approximately 230 miles (370.4 km) offshore (PFMC 1998a,b). Designated EFH for salmonid species within marine water extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone offshore of Washington, Oregon, and California, north of Point Conception to the Canadian border (PFMC 1999). Groundfish, coastal pelagic, and salmonid fish species that could have designated EFH in the action area are listed in Table 31.

Additionally, Puget Sound is a Habitat Area of Particular Concern (HAPC), based on importance of the ecological function provided by the habitat. The environmental effects of the proposed project may adversely affect EFH for [Pacific coast groundfish, coastal pelagic species, and Pacific coast salmon](#) in the HAPC for these species.

Table 31. EFH species potentially in the action area

Groundfish			
Common Name	Scientific Name	Common Name	Scientific Name
arrowtooth flounder	Atheresthes stomias	rosy rockfish	Sebastes rosaceus
big skate	Raja binoculata	rougeye rockfish	Sebastes aleutianus
black rockfish	Sebastes melanops	sablefish	Anoplopoma fimbria
bocaccio	Sebastes paucispinis	sand sole	Psettichthys melanostictus
brown rockfish	Sebastes auriculatus	sharpchin rockfish	Sebastes zacentrus
butter sole	Isopsetta isolepis	English sole	Parophrys vetulus
cabezon	Scorpaenichthys marmoratus	flathead sole	Hippoglossoides elassodon
California skate	Raja inornata	greenstriped rockfish	Sebastes elongatus
canary rockfish	Sebastes pinniger	hake	Merluccius productus
China rockfish	Sebastes nebulosus	kelp greenling	Hexagrammos decagrammus
copper rockfish	Sebastes caurinus	lingcod	Ophiodon elongatus
curlfin sole	Pleuronichthys decurrens	longnose skate	Raja rhina
darkblotch rockfish	Sebastes crameri	Pacific cod	Gadus macrocephalus
Dover sole	Microstomus pacificus	Pacific ocean perch	Sebastes alutus
Pacific sanddab	Ctlharichthys sordidus	shortspine thornyhead	Sebastolobus alascanus
petrale sole	Eopsetta jordani	spiny dogfish	Squalus acanthias
quillback rockfish	Sebastes maliger	splitnose rockfish	Sebastes diploproa
ratfish	Hydrolagus coliei	starry flounder	Platichthys stellatus
redbanded rockfish	Sebastes babcocki	stripetail rockfish	Sebastes saxicola
redstripe rockfish	Sebastes proriger	tiger rockfish	Sebastes nigrocinctus
rex sole	Glyptocephalus zachirus	vermillion rockfish	Sebastes miniatus
rock sole	Lepidopsetta bilineata	yelloweye rockfish	Sebastes ruberrimus
rosethorn rockfish	Sebastes helvomaculatus	yellowtail rockfish	Sebastes flavidus
Coastal Pelagic			
Common Name	Scientific Name		
market squid	Latigo opalescens		
northern anchovy	Engraulis mordax		
jack mackerel	Trachurus symmetricus		
Pacific mackerel	Scomber japonicus		
Pacific sardine	Sardinops sagax		
Salmonid Species			
Common Name	Scientific Name		
Chinook salmon	Oncorhynchus tshawytscha		
coho salmon	Oncorhynchus kisutch		
pink salmon	Oncorhynchus gorbuscha		

3.2 Adverse Effects on Essential Fish Habitat

The effects of the proposed project on ESA-listed species are described in section 2.4., above. The same mechanisms of effect are likely to affect all Pacific coast groundfish, coastal pelagic species, and Pacific coast salmon to varying degrees. These adverse effects include:

1. Water quality – both temporary (during construction) and permanent (during project operations). Examples include sound, turbidity, enduring PAHs, dissolved oxygen, and pollutants.

2. Forage reduction – disturbance and shading of SAV and resulting reduction in SAV density and abundance, and related primary production. Designated EFH will experience temporary, episodic, and enduring declines in forage or prey communities.
3. Migration and passage - Designated salmon EFH will experience enduring incremental diminishment of safe migration. As mentioned in Section 2.4 above, in the marine nearshore, there is substantial evidence that OWS impede the nearshore movements of juvenile salmonids.
4. Shoreline armoring projects will reduce available nearshore habitat - Reduction in quality of nearshore habitat through removal of riparian vegetation and resulting reduction of allochthonous input to the nearshore. Armoring also degrades sediment conditions, forage base, and access to shallow water waterward of the structures. Furthermore, access to forage and shallow water habitat upland of the structures is prevented during high tides.

The chronic, episodic, and enduring diminishments of EFH created by nearshore in water and overwater structures to water quality, migration areas, shallow water habitat, forage base, and SAV has and will continue to incrementally degrade the function of EFH. The effects further constrain the carrying capacity for life stages (larval and juvenile) for multiple species within the action area.

3.3 Essential Fish Habitat Conservation Recommendations

Fully implementing these EFH Conservation Recommendations (CRs) would protect, by avoiding or minimizing the adverse effects described in Section 3.2, above.

1. Adhere to the work window of July 15 to February 15.
2. Utilize vibratory pile driving whenever sediment conditions allow.
3. Utilize sound attenuation measure(s) (double walled piled, wooden block, bubble curtain, etc.) for all steel impact pile driving activities to keep source sound levels below the following thresholds at 10 meters distance.
4. Comply with Washington state water quality standards by conducting water quality monitoring during dredging activities. At point of compliance (per state permit), turbidity levels shall not exceed 5 NTUs more than background turbidity when the background turbidity is 50 NTUs or less, or there shall not be more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTUs.
5. Dredge in a manner that minimizes spillage of excess sediments from the bucket.
6. To minimize incidental take from suspending sediment during structure removal and construction, implement the best management practices and conservation measures and employ a suspended sediment (turbidity) monitoring plan.

3.4 Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, the USACE must provide a detailed response in writing to NMFS within 30 days after receiving these EFH CRs. 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 CRs unless NMFS and the federal agency have agreed to use alternative timeframes 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 the CRs, 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 CRs 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 CRs accepted.

3.5 Supplemental Consultation

The USACE must reinstitute 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 CRs (50 CFR 600.920(l)).

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

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

4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this Opinion is the USACE. Other interested users could include permit applicants, citizens of affected areas, and other parties interested in the conservation of the affected ESUs/DPS. Individual copies of this Opinion were provided to the USACE. The document will be available within two weeks at the NOAA Library Institutional Repository [<https://repository.library.noaa.gov/welcome>]. The format and naming adheres to conventional standards for style.

4.2 Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

4.3 Objectivity

Information Product Category: Natural Resource Plan

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

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

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

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

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6. ATTACHMENTS 1-39 AND APPENDICES 1-5

Summary of current status of **NWS-2017-796** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-252.1 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **86/5**
- Number of days that pile driving will occur/ number of work windows: **86/5**
- Impact pile driving activities - maximum number of pile strikes per day: **3000**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **147.9**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **49800**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2017-587** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-131.6 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **NA**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **NA**
- Bulkhead/bank armoring – maximum linear foot of structure: **110**
- Bulkhead/bank armoring – structure placement should not extend below: **MHHW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2018-963** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **No**
- Current Nearshore Habitat Values Model Output: **23.2** (- debits/+ credits)

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **2/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **280**
- Creosote removal – minimum tons removed (can remove more): **11**
- Dredging projects - maximum cubic yards dredge: **713**
- In and overwater structure – maximum square foot of overwater structure: **1173**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**
RPM 2 - **Required**
RPM 3 - **Required**
RPM 4 - **NA**
RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**
T&C 2 - **Required**
T&C 3 - **Required**
T&C 4 - **NA**
T&C 5 - **Required**

Summary of current status of **NWS-2018-229** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **No**
- Current Nearshore Habitat Values Model Output: **1.8 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **0.5**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **NA**
- Bulkhead/bank armoring – maximum linear foot of structure: **33**
- Bulkhead/bank armoring – structure placement should not extend below: **10 ft MLLW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2018-465** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-82.3 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **14/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **NA**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **NA**
- Bulkhead/bank armoring – maximum linear foot of structure: **75**
- Bulkhead/bank armoring – structure placement should not extend below: **2 ft below MHHW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2018-53** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-352.3 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **NA**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **NA**
- Bulkhead/bank armoring – maximum linear foot of structure: **26/124**
- Bulkhead/bank armoring – structure placement should not extend below: **5 ft below MHHW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**
RPM 2 - **NA**
RPM 3 - **NA**
RPM 4 - **NA**
RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**
T&C 2 - **NA**
T&C 3 - **NA**
T&C 4 - **NA**
T&C 5 - **Required**

Summary of current status of **NWS-2018-636** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-20.8 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **4/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **140**
- Creosote removal – minimum tons removed (can remove more): **15**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **2514**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2017-955** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-101.8 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **14/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **1**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **NA**
- Bulkhead/bank armoring – maximum linear foot of structure: **140**
- Bulkhead/bank armoring – structure placement should not extend below: **1.5 ft below MHHW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**
RPM 2 - **NA**
RPM 3 - **Required**
RPM 4 - **NA**
RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**
T&C 2 - **NA**
T&C 3 - **Required**
T&C 4 - **NA**
T&C 5 - **Required**

Summary of current status of **NWS-2018-760** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-54.4 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **3/1**
- Number of days that pile driving will occur/ number of work windows: **2/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **80**
- Creosote removal – minimum tons removed (can remove more): **0.96**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **1460**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2017-840** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-87.1 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **NA**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **NA**
- Bulkhead/bank armoring – maximum linear foot of structure: **136**
- Bulkhead/bank armoring – structure placement should not extend below: **1 ft below MHHW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2018-981** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-1.9 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **4/1**
- Impact pile driving activities - maximum number of pile strikes per day: **4000**
- Vibratory pile driving activities – minutes of vibratory driving per day: **160**
- Creosote removal – minimum tons removed (can remove more): **22**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **2722**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2018-1143** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **3 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **14/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **NA**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **NA**
- Bulkhead/bank armoring – maximum linear foot of structure: **60**
- Bulkhead/bank armoring – structure placement should not extend below: **1 ft below MHHW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2018-570** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-329.2 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 2 – March 2**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **8/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **160**
- Creosote removal – minimum tons removed (can remove more): **179.5**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **5469**
- Bulkhead/bank armoring – maximum linear foot of structure: **386**
- Bulkhead/bank armoring – structure placement should not extend below: **2 ft below MHHW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NSW-2018-1165** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **No**
- Current Nearshore Habitat Values Model Output: **16.4 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **10**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **782**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2017-573** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-1045.2 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - October 14**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **20/1**
- Impact pile driving activities - maximum number of pile strikes per day: **400**
- Vibratory pile driving activities – minutes of vibratory driving per day: **160**
- Creosote removal – minimum tons removed (can remove more): **NA**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **11670**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2018-382** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-39.6 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - January 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **17.86**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **NA**
- Bulkhead/bank armoring – maximum linear foot of structure: **125**
- Bulkhead/bank armoring – structure placement should not extend below: **MHHW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**
RPM 2 - **NA**
RPM 3 - **Required**
RPM 4 - **NA**
RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**
T&C 2 - **NA**
T&C 3 - **Required**
T&C 4 - **NA**
T&C 5 - **Required**

Summary of current status of **NWS-2019-207** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-80.7 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **1/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **20**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **4168**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**
RPM 2 - **NA**
RPM 3 - **NA**
RPM 4 - **NA**
RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**
T&C 2 - **NA**
T&C 3 - **NA**
T&C 4 - **NA**
T&C 5 - **Required**

Summary of current status of **NWS-2019-552** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-374.8 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **August 1- January 31**
- Number of days of in-water work/number of work windows: **15/1**
- Number of days that pile driving will occur/ number of work windows: **6/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **100**
- Creosote removal – minimum tons removed (can remove more): **NA**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **NA**
- Bulkhead/bank armoring – maximum linear foot of structure: **307**
- Bulkhead/bank armoring – structure placement should not extend below: **2 ft below MHHW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2019-676** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **No**
- Current Nearshore Habitat Values Model Output: **0 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **7/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **1.36**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **64**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2019-526** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **No**
- Current Nearshore Habitat Values Model Output: **15.5 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **2/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **160**
- Creosote removal – minimum tons removed (can remove more): **22**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **3615**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2018-750** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-146.2 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **60/4**
- Number of days that pile driving will occur/ number of work windows: **60/4**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **160**
- Creosote removal – minimum tons removed (can remove more): **120**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **31744**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2018-39** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-28.3 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **2/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **NA**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **NA**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**
RPM 2 - **NA**
RPM 3 - **NA**
RPM 4 - **NA**
RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**
T&C 2 - **NA**
T&C 3 - **NA**
T&C 4 - **NA**
T&C 5 - **Required**

Summary of current status of **NWS-2019-491** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-260.7 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **8/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **NA**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **2292**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2019-664** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-550.1 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **NA**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **NA**
- Bulkhead/bank armoring – maximum linear foot of structure: **360**
- Bulkhead/bank armoring – structure placement should not extend below: **8 inches below MHHW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**
RPM 2 - **NA**
RPM 3 - **NA**
RPM 4 - **NA**
RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**
T&C 2 - **NA**
T&C 3 - **NA**
T&C 4 - **NA**
T&C 5 - **Required**

Summary of current status of **NWS-2019-336** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-530.5 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **31/10**
- Number of days that pile driving will occur/ number of work windows: **31/10**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **160**
- Creosote removal – minimum tons removed (can remove more): **196**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **240**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2018-525** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-202.3 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **2/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **160**
- Creosote removal – minimum tons removed (can remove more): **13**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **12778**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2018-492** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-2043.14 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **60/3**
- Number of days that pile driving will occur/ number of work windows: **60/3**
- Impact pile driving activities - maximum number of pile strikes per day: **22500**
- Vibratory pile driving activities – minutes of vibratory driving per day: **100**
- Creosote removal – minimum tons removed (can remove more): **198**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **NA**
- Bulkhead/bank armoring – maximum linear foot of structure: **834**
- Bulkhead/bank armoring – structure placement should not extend below: **14 ft below MHHW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **73000**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **Required**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **Required**

T&C 5 - **Required**

Summary of current status of **NWS-2019-478** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-9.3 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **20/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **NA**
- Dredging projects - maximum cubic yards dredge: **7500**
- In and overwater structure – maximum square foot of overwater structure: **NA**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**

RPM 2 - **Required**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**

T&C 2 - **Required**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2019-956** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-212.05 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **14.61**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **NA**
- Bulkhead/bank armoring – maximum linear foot of structure: **117/13**
- Bulkhead/bank armoring – structure placement should not extend below: **MHHW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2019-0883** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **No**
- Current Nearshore Habitat Values Model Output: **14.3** (- debits/+ credits)

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **25/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **40**
- Creosote removal – minimum tons removed (can remove more): **11**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **1000**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2019-728** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **No**
- Current Nearshore Habitat Values Model Output: **7.8 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **August 1 - February 15**
- Number of days of in-water work/number of work windows: **2/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **NA**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **NA**
- Bulkhead/bank armoring – maximum linear foot of structure: **4**
- Bulkhead/bank armoring – structure placement should not extend below: **MHHW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2019-690** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-37.7 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - January 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **4**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **220**
- Bulkhead/bank armoring – maximum linear foot of structure: **35**
- Bulkhead/bank armoring – structure placement should not extend below: **1 ft below MHHW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2019-0703** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **No**
- Current Nearshore Habitat Values Model Output: **957.4 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **September 1- February 15**
- Number of days of in-water work/number of work windows: **119/5**
- Number of days that pile driving will occur/ number of work windows: **119/5**
- Impact pile driving activities - maximum number of pile strikes per day: **10800**
- Vibratory pile driving activities – minutes of vibratory driving per day: **405**
- Creosote removal – minimum tons removed (can remove more): **2232**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **74636**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2020-0204** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-1185.6 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **100/2**
- Number of days that pile driving will occur/ number of work windows: **NA/2**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **NA**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **4124**
- Bulkhead/bank armoring – maximum linear foot of structure: **330**
- Bulkhead/bank armoring – structure placement should not extend below: **3 ft below MHHW**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2017-550** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **No**
- Current Nearshore Habitat Values Model Output: **440.2 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - October 14**
- Number of days of in-water work/number of work windows: **90/10**
- Number of days that pile driving will occur/ number of work windows: **90/10**
- Impact pile driving activities - maximum number of pile strikes per day: **245**
- Vibratory pile driving activities – minutes of vibratory driving per day: **140**
- Creosote removal – minimum tons removed (can remove more): **272.21**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **1883**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2019-101** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **No**
- Current Nearshore Habitat Values Model Output: **208.8 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **August 1- January 31**
- Number of days of in-water work/number of work windows: **30/5**
- Number of days that pile driving will occur/ number of work windows: **20/5**
- Impact pile driving activities - maximum number of pile strikes per day: **4000**
- Vibratory pile driving activities – minutes of vibratory driving per day: **80**
- Creosote removal – minimum tons removed (can remove more): **167**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **1139**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2019-832** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **No**
- Current Nearshore Habitat Values Model Output: **30 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **7/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **160**
- Creosote removal – minimum tons removed (can remove more): **11.5**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **948**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2017-427** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **Yes**
- Current Nearshore Habitat Values Model Output: **-2.1 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - October 14**
- Number of days of in-water work/number of work windows: **5/1**
- Number of days that pile driving will occur/ number of work windows: **1/1**
- Impact pile driving activities - maximum number of pile strikes per day: **600**
- Vibratory pile driving activities – minutes of vibratory driving per day: **20**
- Creosote removal – minimum tons removed (can remove more): **NA**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **37**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **NA**

The RPM(s) that are applicable to this project are:

RPM 1 - **Required**

RPM 2 - **NA**

RPM 3 - **NA**

RPM 4 - **NA**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **Required**

T&C 2 - **NA**

T&C 3 - **NA**

T&C 4 - **NA**

T&C 5 - **Required**

Summary of current status of **NWS-2019-983** (at date of final signing of WCRO 2020-01361)

- Subject to the Reasonable and Prudent Alternative (RPA): **No**
- Current Nearshore Habitat Values Model Output: **19.8 (- debits/+ credits)**

NOTE – This output include conservation offsets that the applicant has not yet committed to implement; in this case without these assumed conservation offsets the currently reflected in NMHV results the amount of resulting debits could be larger (or smaller) and result in the need of additional (or fewer) credits needed for RPA fulfillment.

- Work window for this project: **July 16 - February 15**
- Number of days of in-water work/number of work windows: **30/1**
- Number of days that pile driving will occur/ number of work windows: **NA/1**
- Impact pile driving activities - maximum number of pile strikes per day: **NA**
- Vibratory pile driving activities – minutes of vibratory driving per day: **NA**
- Creosote removal – minimum tons removed (can remove more): **27**
- Dredging projects - maximum cubic yards dredge: **NA**
- In and overwater structure – maximum square foot of overwater structure: **704**
- Bulkhead/bank armoring – maximum linear foot of structure: **NA**
- Bulkhead/bank armoring – structure placement should not extend below: **NA**
- Stormwater discharge – square foot of impervious surface generating stormwater: **8269**

The RPM(s) that are applicable to this project are:

RPM 1 - **NA**

RPM 2 - **NA**

RPM 3 - **Required**

RPM 4 - **Required**

RPM 5 - **Required**

The T&C(s) that are applicable to this project are:

T&C 1 - **NA**

T&C 2 - **NA**

T&C 3 - **Required**

T&C 4 - **Required**

T&C 5 - **Required**



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, SEATTLE DISTRICT
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

Regulatory Branch

August 12, 2020

Mr. Barry Thom
National Marine Fisheries Service
West Coast Region
1201 NE Lloyd Boulevard, Suite 110
Portland, Oregon 97232

Reference: DRAFT Jeopardy Biological
Opinion (WCRO-2020-01361)

Dear Mr. Thom:

Thank you for the Draft Jeopardy Biological Opinion (BO) dated July 2, 2020, in response to 39 different projects seeking authorization from the U.S. Army Corps of Engineers (Corps) to conduct activities regulated under either Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act. The Corps had requested individual consultations on these projects between May 1, 2018 - March 20, 2020. We recognize NOAA's National Marine Fisheries Services (NMFS) aspired for these individual consultations to be eligible for coverage through a forthcoming programmatic consultation and our staff worked with NMFS on the programmatic. However, because of ongoing differences between our agencies regarding aspects of this ongoing programmatic consultation, NMFS determined that in order to bring these open consultations to a conclusion, it could instead produce a BO that "batches" these 39 individual Endangered Species Act (ESA) Section 7 consultations together in a single BO as an alternative pathway to completing the programmatic. On page 3 (page 7 of PDF) of the draft BO, you state in the second paragraph that "in 2019, the COE and NMFS had agreed to postpone individual consultations on this suite of projects pending completion of a programmatic consultation", to clarify, we did not agree to postpone individual consultations while the programmatic consultation was being developed; our preference was individual consultations and the programmatic consultation be completed concurrently. We recognize that further work needs to occur between our agencies in order to conclude the programmatic consultation and look forward to working with you further on this effort. In the meantime, we have been working diligently with your staff, applicants, and Corps staff to provide you feedback on the Draft BO and Reasonable and Prudent Alternatives (RPAs).

As discussed with you and your staff, we continue to have strong reservations about certain aspects of NMFS' approach to how effects of a proposed action are taken into consideration when this involves the repair or replacement of an existing structure (i.e., determination and basis of the "useful life" of an existing structure; what is included in the "environmental baseline"), concerns about jeopardy in Puget Sound, and continue to recognize a need to further discuss how those policies could impact future individual and programmatic consultations and

Civil Works projects. We will continue to have Corps legal staff coordinate with your general counsel in an attempt to resolve these concerns separate from the batched BO to eliminate further delays to finalizing this BO.

While we and the applicants appreciate the flexibility NMFS proposed to offer regarding a range of options available to each applicant to implement RPAs to avoid jeopardizing an ESA listed species and adversely modifying designated critical habitat, the Corps needs to have more certainty as to the full scope of the applicant's proposed activity before a Department of the Army (DA) permit decision can be made. As currently framed in the Draft BO, an applicant may elect to fulfill the RPAs by pursuing compensatory conservation actions through a number of potential pathways, all of which depend upon the actions of a third party (not the Corps), and some of which would involve additional work (beyond what the applicant originally proposed) in waters of the U.S. requiring DA authorization. In particular, the Corps needs to know the extent of all impacts to waters of the U.S. and its effects before a permit decision can be made. This is particularly the case when faced with a determination from NMFS that the proposed activity by an applicant will result in jeopardizing the continued existence of ESA-listed species or adversely modify designated critical habitat.

Therefore, we cannot wait for up to 2 years and 6 months after finalization of the BO for the applicant to submit a plan to meet the RPAs. For the Corps, this would mean we could not make a permit decision until the RPA plan is submitted and approved by NOAA and the Corps. Waiting 2 years and 6 months to make a permit decision is not an acceptable option for the Corps.

Under 50 CFR 402.15, the Corps needs to determine whether and in what manner it will proceed with the action in light of its ESA Section 7 obligations and the NMFS' BO. To provide the Corps with sufficient certainty, and to meet the 60-day requirement at 50 CFR 402.15 for the Corps to respond to NMFS after finalization of a Jeopardy BO, we intend to require applicants subject to this batched BO to provide a written plan to the Corps and NMFS within 30 days from the finalization date of the BO (if not already provided) describing how they will meet the RPAs of the BO, and express an affirmation that the applicant commits to meeting all applicable requirements of the BO for their project. We respectfully request that upon your receipt of those written affirmations, you reply to the Corps no later than 55 days from the date of finalization of the BO with your concurrence that the applicant meets the RPA requirements. On this basis, we will then provide NMFS affirmation of which applicants the Corps would or would not be able to accept implementation of the RPAs.

For those applicants who do not affirmatively indicate that they will meet the RPA requirements as framed in the final BO, we will request that they are withdrawn from the batched BO and request NMFS continue with completing individual (not batched) consultation for those projects. If NMFS believes the outcome of individual Section 7 consultation will be the same as the batched BO, we feel it is appropriate that NMFS provide that messaging directly to the

applicants so they fully understand the consequences of them not accepting the batched BO and how it will negatively affect their ability to obtain a DA permit since they will not have a completed ESA consultation. We also believe it is NMFS' responsibility to explain to these applicants the time frame for completing these individual consultations. The Corps will explain to these applicants that they will also have the option of requesting the Corps make a permit decision based on the findings of the final BO. Because it is a jeopardy opinion and the applicant is unwilling to meet the RPA requirements, the likely outcome would be a permit denial.

Please find detailed below our feedback regarding the draft BO. Please note that portions of these comments are purposely kept in Track Changes to clearly show our proposed changes to the text in the draft BO and certain comments highlighted in gray provide our reason for the proposed revision.

Revised and or Clarifications to Project Descriptions

Your staff and Corps staff have coordinated with the 39 applicants to provide accurate and up-to-date project descriptions such that NMFS can accurately account for impacts and the required amount of conservation credits. We have endeavored to provide your staff with this feedback on all projects by the date of this letter but given the volume of applicants and the limited amount of time, we are still collecting this information for some projects and will provide it to your staff as quickly as we receive it.

Marine Mammal Monitoring Plan (MMMP)

In the draft BO there are references to a requirement for a MMMP for all projects including impact or vibratory pile driving. There have been questions regarding this requirement because for several projects, certain measures will be implemented to reduce noise and vibrations below harmful levels. It appears you are requiring a MMMP for all projects with impact or vibratory pile driving, regardless of noise levels or noise mitigation measures. For example, there have been questions from applicants whether or not a MMMP is required if a bubble curtain is used. We have also had a question from the applicant for NWS-2019-552 whether a MMMP is required because as described in the Biological Evaluation for the project, it was determined that harmful levels will not be reached. We request that the MMMP requirement be reassessed based on the specific construction and noise mitigation measures proposed, not just the fact that there will be impact or vibratory pile driving. Please clarify this in the final BO.

Also, the logistics of obtaining an acceptable MMMP from all relevant applicants before finalization of the BO would be very time consuming and would delay finalization of the BO. To prevent further delays, in lieu of the Corps having MMMPs in place with each application before finalization of the BO, the Corps suggests the revised text (see below) be included in the final BO to reference the need for applicants to submit and receive approval on a MMMP from

NOAA before any work in waters of the U.S. can commence. To emphasize this requirement, in the permit/verification letter to the applicant, the Corps will include the following language:

“Please be reminded that Special Condition “[XX]” of your permit requires that you implement and abide by the Endangered Species Act (ESA) requirements and/or agreements set forth in the Biological Evaluation/Assessment (BE/BA) and the Biological Opinion (BO) for this project. In particular, note that the BO requires that you submit a *Marine Mammal Monitoring Plan* which will need to be reviewed and approved by a NMFS biologist before work in waters of the U.S. can commence. Failure to comply with the commitments made in the BE/BA constitutes non-compliance with the ESA and with this authorization.”

DRAFT BO, page 18 (page 22 of PDF), proposed text changes regarding MMMP:

For the proposed projects, the Corps has proposed the following best management practices:

4. All project that include impact or vibratory pile driving which will exceed harmful noise levels will have a NOAA-approved will include a Marine Mammal Monitoring Plan in place before any work can commence in waters of the U.S. The MMMP must meet the requirements of NOAA's guidance for MMMPs found on NOAA's website:
http://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/monitoring_plan_guidance.html

~~that is sufficient to ensure pile driving ceases before marine mammals enter the area where sound will exceed 120 dBRMS. [CORPS PLEASE ENSURE THIS IS ACCURATE]~~

Take Tables 24 and 25

Specific project information for Tables 24 and 25 were requested by NMFS for a number of projects. We are still in the process of collecting that data and will submit completed tables as soon as possible.

Impacts due to Vessel Noise – Construction vessels and vessels using completed structure

In the draft BO, effects of and take due to vessel noise are discussed. While we understand under ESA these effects are considered, please be reminded that the Corps does not regulate vessel use or movement.

Use - Reasonable and Prudent Alternatives (RPAs)

Please see our comments and suggested edits below to provide more enforceable language and clarity for applicants while allowing flexibility.

2.8 Reasonable and Prudent Alternative

On page 161 (page 165 of PDF), paragraph 3, there is the following statement: “The RPA is reasonable and prudent because it allows the Corps to authorize the projects primarily as proposed.” As currently framed, the Corps respectfully disagrees that the draft RPA allows the Corps to authorize the projects primarily as proposed by the applicants, and it is therefore not a reasonable and prudent alternative within the Corps’ authority as it depends on the actions of third parties for implementation and verification by NMFS as to sufficiency, and provides too much flexibility as to timing and uncertainty for how a particular applicant may elect to achieve the RPA. The RPA would allow the Corps to authorize all projects primarily as proposed only if project applicants elect to obtain conservation credits as the sole method of implementing the RPA. For those applicants who elect to pursue either on-site or off-site “restoration” to achieve credits, this may involve a substantial revision to the applicant’s project’s proposed design, location, scope, duration, and/or timing.

On page 161 (page 165 of PDF), paragraph 3, there is the following statement: “The RPA is consistent with the Corps legal authority and jurisdiction.” The Corps disagrees that the requirement to offset adverse effects of the proposed action for ESA effects as presented in this draft BO is consistent with the authorities provided at 33 CFR 325 and 332 and requests striking this entire paragraph. Note that the RPA offers avenues for the applicant to provide compensatory mitigation for ESA impacts in a way that differs in key aspects from what is required under 33 CFR 325 and 332 for Corps compensatory mitigation. For instance, a Corps-approved mitigation bank must have an approved mitigation plan and other legal and financial assurances in place before any of its credits can be used to offset permitted impacts. Also note that when a permittee’s Corps compensatory mitigation requirements are satisfied by a mitigation bank or in-lieu fee program, responsibility for ensuring that required compensation is completed and successful, shifts from the permittee to the bank or in-lieu fee sponsor.

2.8.1 RPA Compensatory Conservation Actions, page 162 (page 166 of PDF)

Comment on RPA 3: Consistent with national guidance, when a BO is issued for a project, Corps Districts rely upon the inclusion of the following special condition to a permit to require compliance with the BO, and do not add additional special conditions regarding components of the BO. The Corps believes this to be an enforceable condition to ensure the requirements of the BO are met. However, please note the last sentence which states “the USFWS/NMFS is the appropriate authority to determine compliance with the terms and conditions of its BO and with the ESA.”

“This U.S. Army Corps of Engineers (Corps) permit does not authorize you to take a threatened or endangered species, in particular the [LIST SPECIES OF CONCERN]. In order to legally take a listed species, you must have a separate authorization under the Endangered Species Act (ESA; e.g., an ESA Section 10 permit, or ESA Section 7 consultation Biological

Opinion (BO) with non-discretionary “incidental take” provisions with which you must comply). The enclosed BO(s) prepared by the National Marine Fisheries Service (NMFS) dated [DATE], and the U.S. Fish and Wildlife Service (USFWS) dated [DATE], contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with the specified “incidental take” in the BO(s) (NMFS Reference Number ###, USFWS Reference Number ###). Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take of the enclosed BO(s). These terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the BO(s), where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Corps permit. The USFWS/NMFS is the appropriate authority to determine compliance with the terms and conditions of its BO and with the ESA.”

Comment on RPA 4: The Corps needs to know the extent of impacts to waters of the U.S. before a permit decision can be made. Any given RPA implemented by an applicant may involve work in waters of the U.S. requiring authorization. Therefore, we cannot wait for up to 2 years and 6 months after finalization of the BO for submittal of a plan to meet the RPAs. For the Corps, this would mean we could not make a permit decision until the RPA plan is submitted and approved by NOAA and the Corps. Waiting 2 years and 6 months after the finalization of the BO to make a permit decision is not an acceptable option for the Corps. Also, more importantly, there is an ESA regulatory requirement for the action agency to respond to the Services within 60 days of finalization of the BO regarding their ability to implement the proposed RPAs (Section 2.8.2 of draft BO). As the implementation of the applicable RPA lies with the applicant who will be performing the work, to meet this 60 day requirement, we propose the following revisions to the text of this RPA to allow, within the 60 days, time for the applicant to select and fully describe their selected RPA to the Corps and NOAA, time for NOAA to respond with their validation the selected RPA(s) meets their requirements of the BO, and time for the Corps to respond whether or not the RPAs can be met for each applicant.

“4. Responses of a commitment to comply with the requirements of ~~to~~ this RPA from the applicants must should be submitted in writing to the Corps for verification and NMFS for validation within 2 years and 6 months 30 days after the signing of this opinion.”

2.9.4 Terms and Conditions (T&Cs), page 172 (page 176 of PDF)

Please see our comments and suggested edits below for the following T&Cs:

T&C 1) The following terms and conditions implement RPM 1 (impact pile driving and construction vessel noise). To minimize incidental take from impact pile driving and construction vessel noise water during construction, the Corps shall require the applicant to:

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- a) Adhere to the work window of July 15 to February 15 or the applicable work window for the specific geographic region. [This addition will allow for any variance between the 39 projects.]
- b) Utilize vibratory pile driving whenever sediment conditions allow.
- c) ~~NMFS will work with Corps to determine maximum number of hours a day pile driving may occur.~~ [This should be deleted as this limit should be determined by NOAA as part of the BO.]
- d) ~~NMFS will work with Corps to determine maximum number of steel impact strikes, including proofing, allowed per day.~~ [This should be deleted as this limit should be determined by NOAA as part of the BO.]
- e) Utilize sound attenuation measure(s) (double walled piled, wooden block, bubble curtain, etc.) for all steel impact pile driving activities to keep source sound levels below the following thresholds at 10 meters distance.
- f) The applicant must develop and implement an Acoustic Monitoring Plan and submit to and receive approval from NOAA before pile driving can commence each year for a subset of the anticipated piles that will be placed. The Plan must be approved by NMFS each year. The Acoustic Monitoring Plan shall document the results of acoustic monitoring and be sent annually by the applicant to the NMFS Oregon Washington Coastal Office.

T&C 4) The following terms and conditions implement ~~RMPM~~ 4 (RPA 1):

This T&C overlaps with provisions in RPA 2 and 4. We suggest deleting the details in RPM 4 that overlap/duplicate with the provisions of these RPAs. Comments here are intended to provide recommendations for clarify the specificity in or consolidation of revised RPAs.

- a) To minimize incidental take resulting from the proposed action including all bank armoring, overwater structures, and dredging, the applicant shall receive validation from NMFS within 60 days after finalization of the BO for submit a proposal to the Corps for verification and to NMFS for validation within 2 years and 6 months after the signing of this opinion, a plan to implement one or more of the following:
 - i) Restoration Plans:
 - (1) ~~Prior to beginning construction, submit to Corp for verification and NMFS for validation.~~ On or off-site plans that demonstrate improvement of the same type of nearshore estuarine habitat within the marine basin or natal estuary that is affected by the proposed action.
 - (2) Plans should include the NHVM calculations or results from similar tool verifying credit equivalency. [It appears that NMFS would be the entity to identify and determine if there was a "similar" tool OTHER than the compensation calculator. This adds complexity for the applicant; and increased uncertainty. Because this is intended to address an alternative for these applicants only, we suggest instead identifying the other "similar

- tool(s)" that NMFS knows about in the final RPA. (e.g., Hood Canal ILF, etc). As well as whether, in the face of multiple tools being available, which one the applicant should rely upon as it is unclear on what basis "equivalency" would be determined by NMFS, or what information should be provided to NMFS to inform that determination].
- (3) ~~Once NMFS has verified, provide date to be completed with proof of commitment of implementation. Plans shall be submitted in writing to the Corps for coordination and to NMFS for validation within 30 days after the signing of this opinion.~~ If the applicant chooses this option, implementation must occur within three years after the signing of this opinion.
- ii) Documented agreement with state or local watershed group to contribute funds to a project that will improve nearshore and/or estuarine habitat within the marine basin or natal estuary that the proposed project will take place and that demonstrates improvement of the same type of nearshore estuarine habitat that is affected by the proposed action. If the applicant chooses this option, funds must be contributed, and implementation must occur, within three years after the signing of this opinion.
- (1) NHVM calculations or results from similar tool [see previous comment about "similar tool"] verifying credit equivalency.
- (2) Date and proof of completion or date to be completed with proof of commitment implementation must be submitted by the applicant to NMFS. ~~If the applicant chooses to satisfy this with a proof of commitment, implementation must occur within three years after the signing of this opinion.~~ [suggest deleting because redundant since stated above in item "ii"]
- iii) Documented agreement with other landowners to remove an in-water and over-water structure within the marine basin or natal estuary
- (1) NHVM calculations or results from a similar tool [see previous comment about "similar tool"] verifying credit equivalency.
- (2) Date and proof of completion or date to be completed with proof of commitment implementation and documented conservation easement or like instrument insuring conservation protections must be submitted in writing by the applicant to NMFS and Corps within 30 days after finalization of the BO. If the applicant chooses this option, implementation must occur within three years after the signing of this opinion.
- iv) Receipt from a NMFS-approved conservation bank for proof of payment for conservation or mitigation credits.
- (1) NHVM calculations or results from a similar tool [see previous comment about "similar tool"] verifying credit equivalency.
- (2) Date and proof of completion or date to be completed with proof of commitment implementation must be submitted in writing by the applicant to NMFS and Corps within 30 days after finalization of the BO. If the

applicant chooses this option, credits must be purchased within three years after the signing of this opinion.

T&C 5) The following terms and conditions implement reasonable and prudent measure 5 (Monitoring and Reporting):

- a) Before beginning work require all contractors working on site to be provided with a complete list of the ~~DA~~Corps permit special conditions, this biological opinion's RPMs, and terms and conditions intended to minimize the amount and extent of take resulting from in water work.
- b) Within 60 days of project completion the ~~Corps~~ applicant shall prepare and send to the Corps and NMFS a project completion report that contains the following:
 - i) Project identification
 - ii) Project name
 - iii) Type of activity
 - iv) Project location by 5th field U.S. Geological Survey (USGS) HUC and by latitude and longitude as determined from the appropriate 7- minute USGS quadrangle map.
 - v) Corps contact person(s)
 - vi) Starting and ending dates for work completed
 - vii) Starting and ending dates of in-water work completed
 - viii) A description of how the ~~Corps~~ applicant successfully met the terms and conditions contained in this Opinion.

To reiterate, as stated at the beginning of this letter, the RPAs and T&Cs provide flexibility but do not provide the needed clarity for the Corps. For example, regarding availability and timing of implementation of RPAs, on page 217 (page 221 of PDF), in the paragraph after the T &Cs it states whether an offset action in a particular basin is not "readily available to implement or purchase (and are not expected to become available within the next 3 years)" an option exists to pursue an action in another basin since the applicant would have 2 years and 6 months to identify a particular approach. The Corps needs to know from the applicant what specifically they will be proposing for us to make a legally sound permit decision based on assessing all impacts and effects to waters of the U.S.

If you make significant changes to the BO and RPAs, and would like further applicant and Corps feedback on the revised RPA, we would welcome the opportunity to provide feedback if it would help provide clarity to applicants and result in more applicants being able to accept the RPAs for their individual project. Thank you again for the opportunity to comment on the draft

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BO. If you have any questions, please contact me at michelle.walker@usace.army.mil or (206) 764-6915 or contact Ms. Kristina Tong at kristina.g.tong@usace.army.mil or (206) 764-6913 or Ms. Juliana Houghton at juliana.houghton@usace.army.mil or (206) 764-3768.

Sincerely,

A handwritten signature in black ink, appearing to read "Michelle Walker". The signature is fluid and cursive, with the first name "Michelle" and last name "Walker" clearly distinguishable.

Michelle Walker, Chief
Regulatory Branch

11/4/2020

National Oceanic and Atmospheric Administration Mail - Seattle District comments on revised DRAFT Jeopardy Biological Opinion



Jennifer Quan - NOAA Federal <jennifer.quan@noaa.gov>

Seattle District comments on revised DRAFT Jeopardy Biological Opinion

Jennifer Quan - NOAA Federal <jennifer.quan@noaa.gov>

Fri, Oct 16, 2020 at 5:35 PM

To: "Walker, Michelle CIV USARMY CENWS (US)" <Michelle.Walker@usace.army.mil>

Cc: Kim Kratz - NOAA Federal <kim.kratz@noaa.gov>, "Bullock, Alexander L (Xander) COL USARMY CENWS (USA)"

<Alexander.L.Bullock@usace.army.mil>, "Coffey, Frances E (Beth) SES USARMY CENWD (USA)"

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NOAA Federal <caitlin.imaki@noaa.gov>, Eric Murray - NOAA Federal <eric.murray@noaa.gov>

Good Evening Muffy (et al).

Thank you for your October 1, 2020, letter outlining additional Corps input on NMFS's revised RAP and ITS.

In an effort to "front load" our Tuesday meeting (which has a full agenda) - below is NMFS response to your Oct 1, 2020 letter. We hope this will help facilitate a more efficient meeting.

1. Request further meaningful applicant coordination regarding the revised RPA, RPM, T&Cs.

To accommodate additional applicant coordination, NMFS offers to send to each applicant project-specific letters that contain the revised and applicable RPA, RPM, T&Cs, updated Nearshore Habitat Valued Model (NHVM) calculator outputs, and an FAQ that address some of the applicant questions that you have been receiving. Our letter will provide a point of contact where applicants can schedule a meeting with Branch Chiefs for clarification on how to implement the RPA and offer 30-minute time slots that we are making available prior to when we intend to sign and finalize the Opinion. Under the terms of the RPA, on-going coordination can also continue post BiOp finalization to help applicants with any project changes that will help them meet the RPA.

Further, the RPA lays out NMFS commitments for timely engagement in response to applicant requests for technician assistance (15-days) and or Corps request for RPA proposal verification (30 days).

Finally, NMFS is developing a website where the public will be able to access the NHVM and calculator, more information about it and how to use it as well as where to go to find credits.

The FAQ will respond to questions about why the project was included in the batch, whether there is an option for individual consultation, and what it means if the RPA cannot be achieved.

2. The Corps' ability to implement the RPA as it is currently framed in the Draft RPA.

11/4/2020

National Oceanic and Atmospheric Administration Mail - Seattle District comments on revised DRAFT Jeopardy Biological Opinion

NMFS edited the language of the RPA to address the Corps' request. Specifically, we changed "authorize the projects in a manner consistent with their intended purpose" to "the authorized structure can serve its intended purpose" to address the Corps' stated concern. It is important to note that the RPA does provide a way for all structures to be constructed in a manner that allows the structure to function as intended. For instance, the proposed bulkheads can stabilize shorelines and prevent erosion, and overwater structures can provide mooring locations for various types of vessels. Specifically, this is how the edits will read:

The RPA is reasonable and prudent, is consistent with the scope of the Corps' legal authority and jurisdiction, and ~~under the Rivers and Harbor and Clean Water Act. Further, the RPA~~ allows the Corps to authorize the proposed projects such that the structures involved in these projects can serve their intended purpose. ~~the projects in a manner consistent with their intended purpose~~ The range of options offered in the RPA could allow the Corps to finalize a project permit as currently proposed (i.e., RPA 1.3 and 1.4), while others options would result in project amendments that may also require amendments to the current Corp permit proposals (i.e., RPA 1.1, 1.2 and 1.5). Regardless of which option a project applicant chooses, compliance with this RPA is expected to achieve a no-net-loss for ESA species and critical habitat, while allowing the project to achieve its intended purpose.

3. Availability of information regarding Puget Sound Partnership's (PSP) provision of conservation credits.

We are finalizing our work the Puget Sound Partnership. They plan to provide credits Puget Sound wide. We expect that the PSP will be able to accommodate the pre-sale agreement requirements in the RPA in conjunction with the finalization of the biological opinion.

4. Requesting clarification regarding "take" exceedances by a single applicant, and reinitiation of consultation for others in the Batch BO.

NMFS recognizes the distinct circumstances created by batching 39 projects into a single biological opinion. Because our opinion concludes the actions as proposed would result in jeopardy and adverse modification, the amount and extent of incidental take identified in our Incidental Take Statement is the take resulting from implementation of the action as modified by the RPA. If the amount or extent of incidental take were exceeded, the inquiry during re-initiation would be to determine if the RPA still avoided jeopardy and adverse modification.

It is not our intent to require reinitiation of consultation on all 39 projects if one or a few of the projects exceed the amount or extent of take identified in our Incidental Take Statement. The ITS provides project-specific amount or extent of take. Along with the structure of the RPA, this is expected to allow for reinitiation to be addressed at the project level. We revised the opinion to clarify our intent.

The Incidental Take Statement was revised to clarify that applicants in compliance with the Reasonable and Prudent Measures/Terms and Conditions would still have an incidental take exemption even if another applicant took actions that exceeded the identified amount or extent of take for their project.

To address the Corps' comment, we propose amending the ITS language as follows:

This consultation represents a combined review of 39 individual requests for consultation on proposed projects that may affect listed species and critical habitat in Puget Sound. If any of the re-initiation triggers identified above are reached, and the Corps retains discretionary involvement or control over the action, the Corps can request re-initiation on an project-by-project basis. In such a case, NMFS does not expect that reinitiation on a single project

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would trigger a need to reinstate consultation on all of the projects addressed by this Opinion. Other projects may still meet the no net loss requirements of the RPA and be consistent with the analysis in this opinion even if a single project does not.

5. Requesting clarification of “take” provisions and stormwater effects and treatment

Our analysis shows that the Corps' proposed actions include construction of stormwater outfalls or modifications of stormwater discharge points that convey stormwater runoff (stormwater run-off would not occur but for those actions). We have clarified the Incidental Take Statement to indicate the applicant is responsible for Reasonable and Prudent Measures/Terms and Conditions minimizing take resulting from stormwater effects.

6. Inclusion of Special Condition Language to include in DA Permit.

NMFS has removed this language as the inclusion of this language is unnecessary to ensure applicant compliance with the RPA. The Corps has developed other methods of documenting applicant compliance with the RPA.

7. Technical questions regarding what qualifies as on-site versus off-site restoration.

Generally, on-site would mean within the boundaries of an applicant's property. The location of an activity proposed to obtain conservation credits is not critically important as long as the activity is consistent with the RPA. We have clarified this further in the RPA.

8. Technical question, clarification in regards to RPA 1.2.

The NHVM accounts for the long-term aspects of the projects as currently proposed. This includes activities that cause negative and positive impacts on nearshore habitat. If a project, as proposed now, includes removal of an existing structure, the applicant will get credit for the removal of that structure in the NHVM calculation, and thus the same action would not also count towards RPA implementation.

RPA Number 2 we are missing the word “not” and it has been revised to read:

The removal of pilings or overwater structures, or any removal of shoreline armoring that is already included as part of the proposed action has already been accounted for when NMFS calculated project debits and credits and thus would NOT be considered again as an action that would meet the terms of this RPA.

9. Technical questions regarding what will be required (and by when) to substantiate off-site restoration if it does not occur on applicant-owned or controlled land.

The RPA specifies written agreement with the third party. We have added more clarifying language in the RPA on required documentation. At this time, we will not be offering third-party responsible agreements (work load will not allow) and thus the reference to this has been deleted.

10. Questions regarding ESA Section 9 coverage of restoration activities, for RPAs 1.1- 1.2

We intend the Incidental Take Statement of this opinion to exempt incidental take for RPA elements other than RPA 1.3 and 1.4. For actions under RPA 1.3 and 1.4, take would be addressed in other existing or future biological opinions or other existing take exemptions (e.g., 4(d) Limit 8) associated with those restoration actions.

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11. Ongoing coordination

NMFS is thankful for the extensive progress we have made to date during the Batch Consultation and appreciates the Corps' input that has helped improve the strength and clarity of the Opinion and fostered good working relationships with the applicants. We are committed to continue our work together on all ongoing issues.

Sincerely,

Jennifer

Jennifer Quan
Branch Chief - Central/South Puget Sound
Phone 206.618.9858
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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, SEATTLE DISTRICT
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

Regulatory Branch

October 1, 2020

Mr. Barry Thom
National Marine Fisheries Service
West Coast Region
1201 NE Lloyd Boulevard, Suite 110
Portland, Oregon 97232

Reference: DRAFT Jeopardy Biological
Opinion (WCRO-2020-01361)

Dear Mr. Thom:

Thank you for providing updated and revised portions of the Draft Jeopardy Biological Opinion (BO)'s Reasonable and Prudent Alternative (RPA), Reasonable and Prudent Measures (RPM) and terms and conditions (T&C's) on September 16, 2020, in response to 39 different projects seeking authorization from the U.S. Army Corps of Engineers (Corps) to conduct activities regulated under either Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act. The Corps appreciates this additional opportunity to provide agency input regarding the corrective actions addressed in the revised RPA, RPM, and T&Cs, and requests further coordination with the 39 applicants proposing activities subject to this consultation regarding these updated and revised provisions prior to NMFS' finalization of this BO. We offer the following comments for your consideration and look forward to further collaboration on this consultation.

1. Request further meaningful applicant coordination regarding the revised RPA, RPM, T&Cs.

While applicants were provided with an opportunity to review a prior version of the RPA earlier this summer, National Marine Fisheries Service (NMFS) has continued to develop substantive updates to the RPA and new information regarding RPMs and T&Cs that will affect applicants. The Corps considers this an important opportunity for NMFS to address ongoing development of the RPA, RPM, and T&Cs, and to share additional information that exists regarding implementation between and amongst the Corps, applicant, and NMFS prior to finalization of the BO. NMFS has previously recognized the importance of providing "every opportunity" to both the action agency and applicants when developing an RPA prior to finalization of a BO. ("The action agency and the applicant (if any) should be given every opportunity to assist in developing the reasonable and prudent alternatives. Often they are the only ones who can determine if an alternative is within their legal authority and jurisdiction, and

if it is economically and technologically feasible.” USFWS/NMFS: Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act,” (March 1998)) (“Consultation Handbook”)(Page 4-43).

Applicant coordination is necessary to determine the applicant’s ability to comply with the proposed construction limits, methodologies, and conditions in the T&Cs. This would be the applicant’s first opportunity to review the take surrogates for accuracy and T&Cs for practicability as the Draft BO previously only had a placeholder.

The Corps appreciates NMFS’ draft applicant outreach proposal discussed Friday 25 September and believes the proposal will help effectively coordinate with applicants. As you proposed, NMFS would provide a releasable version of the revised BO sections (RPA, RPM, T&Cs) and take a lead role in facilitating project-specific coordination with each applicant subject to the RPA. This should include providing each applicant with a project-specific letter with the revised RPA, RPM and T&Cs, a revised project-specific calculator, and setting up a virtual meeting with each applicant. We would also like to coordinate with your Agency further in regards to questions that we have received from applicants to date regarding the draft BO and RPA. Specifically, if NMFS believes the outcome of individual Section 7 consultation for those applicants subject to the RPA would be the same as the batched BO, we feel it is appropriate that NMFS provide that messaging directly to the applicants so they fully understand their options and the ramifications of this Jeopardy BO with an RPA. The Corps will explain to these applicants that a Department of the Army (DA) permit cannot be issued if there is not ESA compliance. Applicants have the option of withdrawing their DA permit application, or requesting the Corps make a permit decision based on the findings of the final BO. Because it is a jeopardy opinion, if an applicant is unwilling to meet the RPA requirements, the likely outcome would be a permit denial.

2. The Corps’ ability to implement the RPA as it is currently framed in the Draft RPA.

Respectfully, we continue to request revision to the following statement in the final BO:

“The RPA is reasonable and prudent, and is consistent with the scope of the Corps’ legal authority and jurisdiction under the Rivers and Harbor and Clean Water Act. Further, the RPA allows the Corps to authorize the projects in a manner consistent with their intended purpose.”

As currently framed, the Corps respectfully disagrees that the draft RPA allows the Corps to authorize the projects primarily as proposed by the applicants, as not all aspects of the RPA are currently within the Corps’ authority. The RPA depends upon the actions of the applicants, and third parties not involved in the proposed action to first create opportunities for off-site conservation credits to become available, or to create off-site restoration opportunities that are

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then subject to further verification by NMFS as to sufficiency. The revised and updated RPA allows the Corps to authorize projects primarily as proposed only if project applicants have a proposed project within an existing service area of an ESA-approved conservation credit stakeholder, and elect to obtain conservation credits as the sole method of implementing the RPA. For those applicants who elect to pursue either on-site or off-site "restoration" to achieve credits, this alternative would likely involve a substantial revision to the applicant's project's proposed design, location, scope, duration, and/or timing, and may involve actions over lands where the action agency has no jurisdiction or residual authority to enforce compliance. This appears to be recognized by NMFS elsewhere in the revised RPA, with the provision: "The range of options offered in the RPA could allow the Corps to finalize a project permit as currently purposed (i.e., RPA 1.3 and 1.4), while others options would result in project amendments that may also require amendments to the current DA permit proposals (i.e., RPA 1.1, 1.2 and 1.5)".

3. Availability of information regarding Puget Sound Partnership's (PSP) provision of conservation credits.

NMFS states "significant opportunities exist for project proponents to obtain conservation credits". (Page 1). To date, however, there is limited information available regarding the forthcoming provision of ESA-approved conservation credits with PSP. This is particularly important when considering the impact of this RPA to each of the individual applicants subject to this BO and RPA. Will PSP have a service area that extends throughout Puget Sound? Will the Corps and applicants be able to see a copy of the Memorandum of Understanding (MOU) between NMFS and PSP to better understand the opportunities for conservation credits? In addition, Partners/Sponsors will not always have restoration projects in the queue, so project details and a calculator may not be ready when an applicant wishes to buy credits. On a more technical note, the Corps would like to add that the Hood Canal Coordinating Council In-lieu Fee (HCCC ILF) use requires IRT approval; not solely NMFS approval for use as conservation credits. The Corps is also concerned that HCCC ILF and Blue Heron Slough Conservation Bank have limited service areas and at any given time, the amount of available credits for sale is limited.

4. Requesting clarification regarding "take" exceedances by a single applicant, and re-initiation of consultation for others in the Batch BO.

The last paragraph on page 23 provides: "This consultation represents a combined review of 39 individual requests for consultation on proposed projects that may affect listed species and critical habitat in Puget Sound. If any of the re-initiation triggers identified above are reached, and the Corps retains discretionary involvement or control over the action, the Corps can request re-initiation on an action-by-action basis. NMFS will evaluate appropriate next steps, but in

most cases, re-initiation of consultation on single project evaluated in this Opinion will not trigger a need to reinitiate consultation on all of the projects addressed by this Opinion”.

This seems to indicate that an exceedance of take by one project could trigger re-initiation of consultation for other applicants in the batch consultation. One of the Corps’ specific parameters for proceeding with this consultation process that “batches” these 39 individual requests for consultation into a single BO was the separation of take for each applicant. Please clarify that individual applicants in the batch consultation would not be subject to lapsed ESA coverage if another applicant exceeds “take” as provided in the final BO, Incidental Take Statement (ITS), RPM, & T&Cs.

5. Requesting clarification of “take” provisions and stormwater effects and treatment.

The revised and updated BO includes provisions regarding stormwater effects and treatment (see pages 17-18). Specifically, surrogacy for the extent of take expected due to stormwater runoff is the physical extent (square feet) of pollution generating impervious surface “associated with the permitted structure (i.e., access roads and parking lots)”. While the updated information does not specifically identify which applicants these provisions would apply to, these provisions raise concerns regarding the applicability of the surrogate identified. These provisions raise questions that may require fact-specific information with individual applicants regarding the specifics of their proposed action, and whether their proposed action that is seeking DA authorization is the “but for” causation of stormwater impacts. This is particularly the case where there is an already existing impervious surface present in the uplands. To the extent that these provisions are intended to specifically apply to an applicant, the terms and conditions on page 19 includes general language indicating that: “The Corps or any applicant” must comply with RPMs, and indicates that both have an ongoing duty to monitor impacts of ITS and report.” We request this T&C be removed, or specifically addressed to the applicant and not the Corps.

6. Inclusion of Special Condition Language to include in DA Permit.

The Revised RPA on page 5 also includes specific language that NMFS indicates the Corps shall provide as a special condition of a DA permit. It is unclear why this provision is necessary given a DA permit will not be issued to an individual applicant until after NMFS has already provided verification as to the adequacy of a particular applicant’s proposed approach to implement the RPA, and it varies from the standard language that is present in DA permit decisions regarding ESA compliance throughout the country.

7. Technical questions regarding what qualifies as on-site versus off-site restoration.

The revised RPA on page 7 indicates that the Corps must verify responses from applicants meet the requirements for the RPA provisions, but there remain some key technical distinctions

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to figure out. For instance, the Corps requests clarification of the revised RPA 1.1, on page 2, as to what may be considered an “on-site” (versus off-site) habitat improvement project, as falling within “the immediate vicinity” of the project site?

8. Technical question, clarification in regards to RPA 1.2.

The Corps requests clarification of what is meant in regards to the following provision (is this intended to allow “double-counting?”):

“The removal of pilings or overwater structures, or any removal of shoreline armoring that is already included as part of the proposed action has already been accounted for when NMFS calculated project debits and credits *and thus would be considered again as an action that would meet the terms of this RPA.*” (emphasis added).

9. Technical questions regarding what will be required (and by when) to substantiate off-site restoration if it does not occur on applicant-owned or controlled land.

Along the same lines as above, in regards to RPA 1.2 or 1.4, what will need to be required to be provided if the off-site restoration does not occur on applicant-owned or controlled land? Will the Habitat Improvement Plan suffice as evidence of intent? Is there a sample third-party responsible conservation agreement that could be made available to applicants?

10. Questions regarding ESA Section 9 coverage of restoration activities, for RPAs 1.1-1.2.

In regards to the general provisions (page 5), where implementation of RPAs 1.1-1.2 must meet the design, Best Management Practices, and restoration actions of the Fish Passage Restoration Programmatic (FPRP), the Corps is not sure all potential proposals will meet these parameters. What happens if the proposal does not meet FPRP? The Corps assumes that this would require individual ESA section 7 consultation. Because applicants in the batch are paying a fee to conservation bank sponsors, is it accurate that the Corps/applicant does not need to initiate this ESA consultation, but rather the Sponsor/Partner does when they have an actual restoration project? On page 8, does “anticipating” consistency mean all applicants will meet FPRP and individual ESA consultation is not required?

11. Ongoing coordination.

As discussed with you and your staff, we continue to have strong reservations about certain aspects of NMFS’ approach to how effects of a proposed action are taken into consideration when this involves the repair or replacement of an existing structure (i.e., determination and basis of the “useful life” of an existing structure; what is included in the “environmental

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baseline”), concerns about jeopardy in Puget Sound, and continue to recognize a need to further discuss how those policies could impact future individual and programmatic consultations and Civil Works projects.

We welcome the opportunity to incorporate continued applicant feedback to result in more applicants being able to accept the RPAs for their individual projects. Thank you again for the opportunity to comment on the revised sections of the BO. If you have any questions, please contact me at michelle.walker@usace.army.mil or (206) 764-6915 or contact Ms. Kristina Tong at kristina.g.tong@usace.army.mil or (206) 764-6913 or Ms. Juliana Houghton at juliana.houghton@usace.army.mil or (206) 764-3768.

Sincerely,

A handwritten signature in black ink, appearing to read "Michelle Walker".

Michelle Walker
Chief, Regulatory Branch

cc: Elizabeth Babcock (elizabeth.babcock@noaa.gov) and Jennifer Quan (jennifer.quan@noaa.gov)

Questions and Answers

October 2020

Introduction

The U.S. Army Corps of Engineers permits the construction of shoreline structures such as docks and marinas in the nearshore environment of Puget Sound. Under the Endangered Species Act, the Corps consults with NMFS when its action may jeopardize the continued existence of an ESA-listed species or adversely modify its critical habitat. Since 2018, the Corps has requested more than 100 consultations with NMFS on its permitting for rebuilding, expanding, and installing new marinas, docks, bulkheads, and other structures in Puget Sound.

Your project is part of a “batch” of 39 projects that required consultation to evaluate potential impacts on threatened and endangered species. In a draft biological opinion shared with the Corps in July 2020, NMFS determined that the proposed action would jeopardize the continued existence and adversely modify the critical habitat of threatened Puget Sound Chinook salmon and endangered Southern Resident killer whales. The draft outlined an approach in which the projects may proceed with protections necessary to mitigate the impacts to the species and their habitat. NMFS intends to finalize this Opinion in November 2020.

The human population of Puget Sound continues to grow, increasing demand for commercial and recreational opportunities that these projects afford. Climate change and sea level rise will also affect nearshore habitat, the people who use it, and the species that depend on it. NMFS is seeking a path forward that works for people, fish, and the environment.

What is a batch consultation and why am I in it?

Given staff shortages and the impact of the lengthy government shutdown in 2019, NMFS attempted to shift to a more efficient programmatic consultation that evaluates many proposed projects at once. The purpose of this kind of consultation is to make sure that threatened and endangered species are sufficiently protected as development continues. Unfortunately, we could not reach agreement with the U.S. Army Corps of Engineers on the programmatic approach this year. Instead, we combined similar projects into one review that we call a “batch consultation.” The outcome of this consultation is a biological opinion that encompasses 39 projects, including yours, and specifies measures necessary to protect the species listed under the Endangered Species Act. Using the batch approach did not substantively change the outcome of any individual project.

Can I consult individually instead of being part of the batch?

The Corps submitted the request for consultation on your project to NMFS, which is considering it as part of the batch of projects. Starting over with an individual request for consultation is possible but unlikely to make any difference in the outcome, since the impacts of the project and opportunities for conservation offsets would be the same.

This Batch Consultation is currently the quickest route to completing ESA consultation. Given the high volumes of consultation requests, individual consultation could take at least two years.

What did the consultation find?

It found that the proposed action would jeopardize the continued existence and adversely modify the critical habitat for threatened Puget Sound Chinook salmon and endangered Southern Resident killer whales. This means that, according to the Endangered Species Act, the “effects of the proposed action would reasonably 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.” Given that conclusion, NMFS developed a Reasonable and Prudent Alternative (RPA) that identifies mitigation for the projects so that they can move forward. The purpose of this consultation is to find ways for the proposed projects to advance while also protecting threatened and endangered species that are vital to the culture and economy of the Northwest.

What is a Reasonable and Prudent Alternative and how does it work?

If we find a proposed action will cause jeopardy or adverse modification, we suggest reasonable and prudent alternatives that can be taken by the federal agency or applicant in implementing the agency action. 16 U.S.C. 1536(b)(3). “Reasonable and prudent alternatives” are alternative actions, identified during formal consultation, that meet certain conditions:

- They can be implemented consistent with the intended purpose of the action;
- They can be implemented consistent with the scope of the federal agency’s legal authority and jurisdiction;
- They are economically and technologically feasible; and
- They avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat (50 CFR 402.02).

In the regulatory definition of RPA, we interpret “feasible” to mean “capable of being done or carried out.” This interpretation is consistent with the language of the Act and the Section 7 implementing regulations. In the preamble to the 1986 final rule on the Section 7 implementing regulations (51 FR 19957), NMFS and the US Fish and Wildlife Service stated “ Reasonable and prudent alternatives must cover the full gamut of design changes that are economically and technologically feasible for an action, independent of who is sponsoring the action.”

What is the Reasonable and Prudent Alternative in this case?

The Reasonable and Prudent Alternative provides for the projects to proceed while avoiding the net loss of nearshore habitat, given its essential value to Puget Sound Chinook salmon and the Southern Resident killer whales that feed on them. This means impacts that reduce the value of the habitat to the species would be offset by compensatory conservation measures or “conservation offsets” such as restoration that increases the value of habitat elsewhere by a comparable amount.

The conservation offsets can take several forms. Individual projects may include actions that increase habitat value, such as removing seawalls. This can offset the project’s other impacts. Proponents may also partner to sponsor or support habitat restoration in other areas. They may also purchase credits from approved conservation banks, which often include large habitat restoration projects. Conservation banks sell credits, which in effect represent a share of the restored habitat that can be applied to offset impacts elsewhere. Purchasing credits from authorized conservation banks can also be an effective way to offset impacts. Finally, the RPA allows project proponents the option to amend their proposed project in a way that would reduce impacts, thereby requiring less mitigation.

How will the proposed projects jeopardize Chinook salmon and killer whales?

The nearshore environment where the projects are located provides essential nursery habitat where juvenile Chinook salmon grow before they migrate to the ocean. Research shows that the larger they grow in this productive habitat, the more likely they are to survive their subsequent years in the ocean and return to rivers as adults to spawn. Most nearshore habitat in Puget Sound is gone. More than 95 percent of key tidal wetlands across South and Central Puget Sound have been eliminated, with many river deltas lost to development.

The odds of survival for juvenile Puget Sound Chinook salmon have dwindled as nearshore habitat has declined. Fewer than 1 percent of juvenile Chinook salmon that leave for the ocean typically return as adults. This is not enough to sustain the species, and some populations in South and Central Puget Sound have declined in roughly four of every five years. Southern Resident killer whales are also affected because Puget Sound Chinook salmon are one of the most important Chinook stocks that the fish-eating killer whales depend on as prey.

The availability of prey is considered one of the three main threats to the whales, which also include vessel traffic and noise and toxic pollution.

Is it fair to burden someone who wants to fix or build a dock with saving killer whales?

Recovery of killer whales and the salmon they depend on will take much more than conservation offsets for a specific nearshore project. The required conservation offsets are specific to the impacts of each project, based on what science says about the importance of that habitat to juvenile Chinook salmon, and in turn to Southern Resident killer whales. The conservation responsibility includes only that impact determined based on the design, location, and type of project involved. Some proposed actions might yield a net benefit to the species. That is the case for several projects assessed under this biological opinion: their combined result is a net benefit to juvenile Puget Sound Chinook salmon and therefore they have no conservation offset requirement. For some projects this may increase the cost of the overall project.

Conservation of endangered species and their habitats requires all sectors to do their part. Halting the species decline is a prerequisite for long-term survival and movement towards recovery. In Puget Sound there has been significant conservation progress made in hatchery production, harvest, and fish passage at large dams. The one remaining but most important piece is focused efforts to facilitate progress in habitat protection and restoration. It is imperative to recognize that the expected benefits of habitat restoration will take years or decades to produce significant improvement in natural population viability.

Doesn't a lot of money already go to habitat restoration?

While the Pacific Coastal Salmon Recovery Fund and other programs do dedicate millions of dollars toward habitat restoration, it is only a fraction of what is necessary to recover Puget Sound Chinook salmon and support the Southern Resident killer whales in both the near and longer term. The Governor's Salmon Recovery Office had reported that in the past 18 years, the Puget Sound region received only about 40 percent of the identified funding needed for habitat restoration. By some estimates the funding going to address the habitat losses we have seen over the decades may be billions of dollars short of what is needed to make progress toward recovery. The provisions of this biological opinion will not come close to making up for that but will help keep us from falling further behind when it comes to essential nearshore habitat especially.

How can a maintenance project that repairs or replaces a structure cause new impacts?

Although some of the 39 projects are described as "maintenance," our review of the projects indicates each of these kinds of projects involves either replacement of existing structures or structural repairs that meaningfully extend the life of all or part of an existing structure. In these circumstances, future impacts of these repaired or replaced structures would be analyzed as effects resulting from the project in an ESA consultation. The Reasonable and Prudent Alternative (RPA) requires that any impacts on nearshore habitat from the proposed projects should be offset, and provides for a range of options from project modifications (soft shore bank armoring, smaller footprints) to incorporation of additional on-site habitat improvements (planting, removal of debris) to obtaining conservation credits.

All of the repair or replacement projects analyzed in this Opinion extend the life of all or part of that structure for many decades. As a result, the additional life of that structure can cause a net loss of critical habitat quality. Those increments of habitat loss aggregate over time and contribute to the declining trend in habitat quality. Against the backdrop of a continued decline in the quality of nearshore habitat in Puget Sound, repair or replacement projects that cause a net loss of nearshore habitat threaten the survival and recovery of Puget Sound Chinook salmon and Southern Resident killer whales. The RPA provides a way for the proposed repair or replacement projects to move forward while achieving a no-net loss approach to nearshore habitat quality in Puget Sound.

What kind of conservation measures can offset impacts on nearshore habitat?

There are many options for restoring habitat in ways that offset impacts, whether on the same property or elsewhere. The options may range from elimination of harmful impacts such as toxic creosote pilings or shoreline armoring to restoring wetland habitat that can support juvenile salmon. Adverse impacts are estimated as conservation debits, while improvements are estimated in the form of credits. If project debits exceed credits, project proponents can secure additional credits that offset their net impact, by, for example:

- Adding on-site habitat improvements to their projects.
- Removing pilings and overwater structure to reduce impacts on nearshore habitat.
- Removing shoreline armoring to improve the value of nearshore habitat.
- Partnering with state agencies, local watershed councils or other local organizations to contribute funds to a project that improves nearshore habitat within the same marine basin or estuary.
- Partnering with other landowners to remove an in-water and over-water structure within the same marine basin or estuary.
- Acquiring conservation credits from approved conservation banks and in-lieu fee programs, or a NMFS-approved third-party responsible agreement.

How do you measure the impact to know how much conservation offset is necessary? What science and review supports this approach?

In 2016, NMFS began using the Habitat Equivalency Analysis (HEA) methodology in Endangered Species Act consultations in the Puget Sound nearshore environment in the Structures in Marine Waters Programmatic Consultation (WCR-2016-4361, aka "RGP6/SIMP"). Using HEA along with the Puget Sound Nearshore Habitat Values Model (NHVM) (Ehinger et al. 2015), NMFS is able to express impacts through a "calculator" currently in use here: <https://www.nws.usace.army.mil/Missions/Civil-Works/Regulatory/Permit-Guidebook/RGP/>.

To measure our impact on the nearshore, NMFS uses:

- 1) The Habitat Equivalency Analysis (HEA) methodology. Ecological equivalency that forms the basis of HEA is a concept that uses a common currency to express and assign a value to functional habitat loss and gain. Ecological equivalency is traditionally a service-to-service approach where the ecological functions and services for a species or group of species lost from an impacting activity are fully offset by the services gained from a conservation activity.

HEA, developed by the NOAA Restoration Center, in cooperation with stakeholders, has become a common method for Natural Resource Damage Assessments (NRDA). NMFS chose this methodology for its ESA consultation first, as it adopts and requires a high standard of scientific input and rigor and as well as the fact that this method has withstood multiple legal challenges that can occur during NRDA proceedings.

- 2) The Nearshore Habitat Values Model. The NHVM was developed by a team of NMFS biologists in 2015. The model's values are specific to the designated critical habitat of listed Puget Sound Chinook. These values were derived from scientific literature, and best available information as required by the ESA. This model provides the input parameters for HEA that facilitates the evaluation of impacts and benefits to habitat for listed species. The 2015 version of the NHVM along with documentation is available on NMFS's web site at https://archive.fisheries.noaa.gov/wcr/publications/habitat/critical_habitat/doc_nhv_heamodel_working_draft_2015.pdf. This model was vetted with input from tribes, state and Federal agencies, and consultants as outlined in the acknowledgements.

Since developing the 2015 NHVM, along with continued input from external users, stakeholder, tribes and federal and state scientific peers, NMFS has expanded and updated the model to support a broader suite of nearshore habitat actions. The Batch uses the is expanded and update model.

- 3) A "conservation calculator." The calculator is a user-friendly interface to simplify HEA and NHVM use and provides a model that numerically characterizes impacts as "debits" and benefits as "credits."

The calculator allows input of project specific information (e.g., number of piles, bank armoring being replaced, placement relative to forage fish spawning or submerged aquatic vegetation). Using the HEA method that allows for assessment of impacts in time and space, and the habitat values from the NHVM, the calculator produces numerical outputs in the form of conservation credits and debits. Credits (+) indicate positive environmental results to nearshore habitat quality, quantity, or function. Debits (-) on the other hand indicate a loss of nearshore habitat quality, quantity, or function.

Model outputs for new or expanded projects account for impacts to a "pristine" environment and are calculated at a higher debit rate (~2 times greater) than those

calculated for replace/repair projects, which assume that some function has already been lost. The calculator outputs account for:

- Beneficial aspects of proposed projects, including any positive effects that would result from removing a structure, or piece of a structure, prior to the end of the remaining “useful life period.”
- Minimization incorporated through project design improvements (e.g., credit is given for removal replacing creosote piles with steel piles as steel piles typically have less impact on water quality)
- Adverse effects that would occur for the duration of a new “useful life period” that would result from the proposed expanded, new, or repaired or replaced structure (or components).

Why would similar projects cause different degrees of impacts?

The number of conservation credits needed for each project is determined by the NHVM conservation calculator. The number of credits needed corresponds to the impact of the project. The Calculator also considers the importance to species of the specific habitat affected by a proposed project. Projects occurring in an important nearshore habitat type will typically incur more debits, and thus need more credits. For instance, development of a pocket estuary will incur more debits due to the importance of these areas to juvenile Puget Sound Chinook salmon. Conversely, the calculator assigns “credits” to many repair or replacement projects for the positive impacts of removing that structure, along with credits for conservation improvements, for a certain period of time. And finally, the model assigns a reduced debit/credit factor to habitat impacted by repaired or replaced projects compared with habitat impacted by new construction to account for the fact that impacts to habitat already impaired by existing structures is less detrimental to species than future impacts to unimpaired habitat.

Does this mean future projects in nearshore habitat will face similar conditions?

Nearshore habitat in Puget Sound continues to decline. This negatively affects the survival and recovery of Puget Sound Chinook salmon and Southern Resident killer whales. We cannot predict the outcome of future consultations in Puget Sound. For instance, an action that had only minor short-term adverse effects combined with long-term beneficial effects on the quality of nearshore habitat may not result in a jeopardy or adverse modification of critical habitat finding.

As explained in the preamble to the 2019 revision of the ESA Section 7 regulations, the concept of ‘baseline’ jeopardy does not apply to a section 7 consultation. A jeopardy finding can only be reached if the effects of the proposed action would reasonably 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. A poor baseline condition in and of itself cannot cause jeopardy.

If nearshore habitat in Puget Sound quality continues to decline, it seems more likely that projects resulting in a net loss of habitat quality would result in a jeopardy or adverse modification of critical habitat. However, we must evaluate each future proposed action using the appropriate consultation framework and based on the best scientific and commercial data available at that time. We therefore cannot predict the outcome of those future consultations.

Will conservation credits be available to the extent necessary?

We expect that at or near completion of this Biological Opinion, conservation credits can be obtained Puget Sound-wide through the Puget Sound Partnership. Some or all (subject to NMFS approval) mitigation credits obtained through the Hood Canal Coordinating Council's In-Lieu-Fee program for projects in Hood Canal may also be able to be used as conservation credits to fulfill the requirements of this RPA. The Blue Heron Slough Conservation Bank also has conservation credits available for proposed projects in their approved service area that includes the estuary of the Snohomish River expanding into the marine waters around Vashon Island and south to approximately the city of Des Moines (applicants will need to contact that bank for exact locations).

How much would the credits cost?

The cost would be determined by the market as credits are purchased for a comparable amount of habitat improvement or restoration. That value could change over time if more restoration options became available such that the prices change in response to costs and supply and demand. You will need to work directly with a conservation credit provider for cost estimates.

How do I know if I have met the RPA?

The RPA enclosed in this letter details the requirements needed to fulfill the RPA. NMFS has committed to continuing to work closely with the Corps and project applicants through this process. For any part of this RPA that requires updated NHVM calculator outputs, NMFS will provide technical assistance and provide a response to a request for technical assistance within 15 day of any such request.

For projects that are subject to the RPA, when applicants have a proposed plan to comply with the requirements of the RPA, they will be submitted to the Corps for verification. After verification, the Corps shall then submit the proposed plans to NMFS for review. Within 30 calendar days of receipt of a proposed plan, NMFS will reply to the Corps and applicant as to whether the proposed plan meets the requirements of the RPA.

Why does beach nourishment not fully offset the impacts from a bulkhead?

A bulkhead has several adverse impacts on critical habitat for listed Puget Sound Chinook. First, it renders the area behind the bulkhead inaccessible to juveniles at high tides. Juvenile salmonids need the shallow water to avoid predators. Second, it prevents sediment supply to the beach. Sediment is important for forage fish at the site and within the entire drift cell. Third, it changes the wave regime and that reduces the ability for wrack and beach logs to accumulate waterward of the armoring. The altered wave regime also contributes to beach lowering and coarsening.

The likely most beneficial action to reduce the impact of shoreline armoring is reducing the amount of hard armoring. When replacing hard armoring with soft and hybrid approaches, no conservation debits are incurred. For example, installing a pocket beach with soft or hybrid armoring will result in NO impacts for that section of shoreline. In fact, a section of shoreline that replaces hard armoring with soft or hybrid can generate conservation credits. You can use the calculator to find out how large your pocket beach would have to be to offset some hard replacement armoring.

Moving the hard armoring landward will also result in reduced impacts.

APPENDIX 4. ADDITIONAL RESPONSES TO APPLICANT QUESTIONS

Appendix 3 addresses comments that were commonly received throughout the applicant review process. The following, more project specific comments were also received. Below, we provide a response to those comments.

1. **Comment:** One applicant noted that the areas immediately surrounding their proposed project did not have the limiting baseline conditions impacting PS Chinook salmon described in the opinion.

Response: We agree that habitat conditions vary at the 39 project sites addressed in this opinion. Some projects are located in relatively undisturbed areas, where habitat quality for salmon remains high. However, many of the projects are located in highly developed areas with low habitat quality.

Given current risk levels for PS Chinook salmon and SRKWs, protecting habitat quality and offsetting adverse effects on habitat quality at both types of sites is necessary to avoid jeopardy. In areas where habitat quality is high, our analysis shows that the proposed projects still result in a loss of nearshore habitat function. Given the importance of the small amount of remaining high quality nearshore habitat in Puget Sound, the RPA's no-net loss approach to habitat quality is appropriate and consistent with conservation principles stressing the need to protect high quality habitat when there is only a small amount of such habitat remaining.

2. **Comment:** One applicant asserted their project is "not likely to adversely affect" salmon and SRKWs. Their assertion is based on the idea that project sites are currently developed and the proposed action reduces the impact of the development by replacing existing near- and in-water structures with structures having less effect on the quality of nearshore habitat.

Response: We disagree that environmentally friendly design improvements always result in a project that is not likely to adversely affect listed species. Effects of an action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. 50 CFR § 402.02.

Existing structures form part of the environmental baseline for our analysis in this opinion. However, as explained within this Opinion (see. e.g., Sections 1.3 Proposed Federal Action and 2.3.2 Distinguishing Baseline from Effects of the Action), when an applicant repairs or replaces part or all of a structure, that action extends the life of that structure (or the part repaired or replaced). Here, we have described that extension as equivalent to an additional 40 or 50 years of useful life. The extension of life, and the associated impacts caused by those structures during that extended life, would not occur but for the proposed action. Thus, impacts caused by those repaired or replaced structures during its extended useful life period are addressed by this opinion as consequences of

the proposed actions(further detailed in Section 2.3.2 Distinguishing Baseline from Effects of the Action and Section 2.4 Effects of the Action).

As established by the ESA Section 7 implementing regulations (50 CFR 402), consequences of an action, both positive and negative, on listed species and critical habitat, are analyzed as effects of the proposed action. If the proposed action reduces the overall impact of structures at a project site by replacing existing structures with structures that have less impact on listed species, those positive effects are accounted for in our analysis. Any negative impacts of the structure during its extended, or new, useful life, including impacts from construction, are also considered effects of the proposed action. As described in our opinion, those effects can include underwater sound from pile driving, migration delays and predation caused by overwater structures, and interruption of habitat forming processes resulting from shoreline bulkheads. If these effects are not insignificant, discountable, or wholly beneficial (the standard for not likely to adversely affect), the appropriate determination would be that the proposed action is “likely to adversely affect” listed species or critical habitat. In other words, the net effects of the repaired or replaced structure can be “less than” what might have been caused by a structure in its current form over the same time period; however, the effects are typically not “wholly beneficial.”

3. **Comment:** One applicant stated that without the proposed repairs and maintenance included in the proposed action, structures at the project site will create continued and increasing long-term impacts to juvenile PS Chinook salmon and SRKW's greater than would occur without the proposed action.

Response: Section 7 of the ESA requires us to evaluate the consequences of actions funded, authorized, or carried out by federal agencies (50 CFR 402.02). In a Section 7 consultation, we add the consequences of the proposed action and cumulative effects to the environmental baseline, and, in light of the status of the species and critical habitat, determine whether the proposed action is likely to jeopardize the continued existence of listed species or adversely modify critical habitat. This is an additive analysis focusing on the consequences, also referred to as the “effects,” of proposed federal actions. Section 7 does not require us to analyze a range of outcomes that would occur if the proposed federal action did not occur.

In the context of the 39 projects addressed by this opinion, we analyze the consequences of the actions as proposed by the Corps. Here the Corps has proposed to authorize the construction of, repair of, or replacement of structures. As explained in our previous response, the Corps’ authorization will extend the life of structures (or their parts) by 40 to 50 years. The associated impacts caused by those structures during that extended life, would not occur but for the proposed action. Thus, impacts caused by those repaired or replaced structures during its extended useful life period are addressed by this opinion as consequences of the proposed actions. Thus, as required by 50 CFR 402.02, we analyze what would not occur but for the proposed action. The focus of this inquiry is the proposed action and what is caused by the proposed action. Stated differently, the Corps’ proposal to authorize specific actions as described in the consultation initiation packages

does not give rise to the need to analyze a range of actions the Corps is *not* proposing to take.

Further, and as articulated in Section 2.3.2 of this Opinion, even if we were to consider what might happen to a structure absent the proposed repair or replacement, and such effects should be attributed to the baseline, those effects are in fact still part of the calculus, they have just been moved out in time to occur after the new useful life (rather than the existing useful life). The basic consequence of the currently proposed actions is to extend the life of the part of the structure being worked on. Any effects of a possible degradation (or other possible scenario), instead of occurring now, will occur, if at all, after the new useful life expires.

4. **Comment:** One applicant stated that the opinion utilizes a flawed impact calculus through “batching” the 39 projects in Puget Sound. They also state that the environmental baseline and action area should be more tailored to fit specific projects and that our analysis should give greater consideration to these more specific baselines and action areas. The applicant goes on to state that cumulative impacts, referred to as cumulative effects in the Opinion, should not include the other 38 projects, which all involve federal actions, namely the potential issuance of a Corps permit.

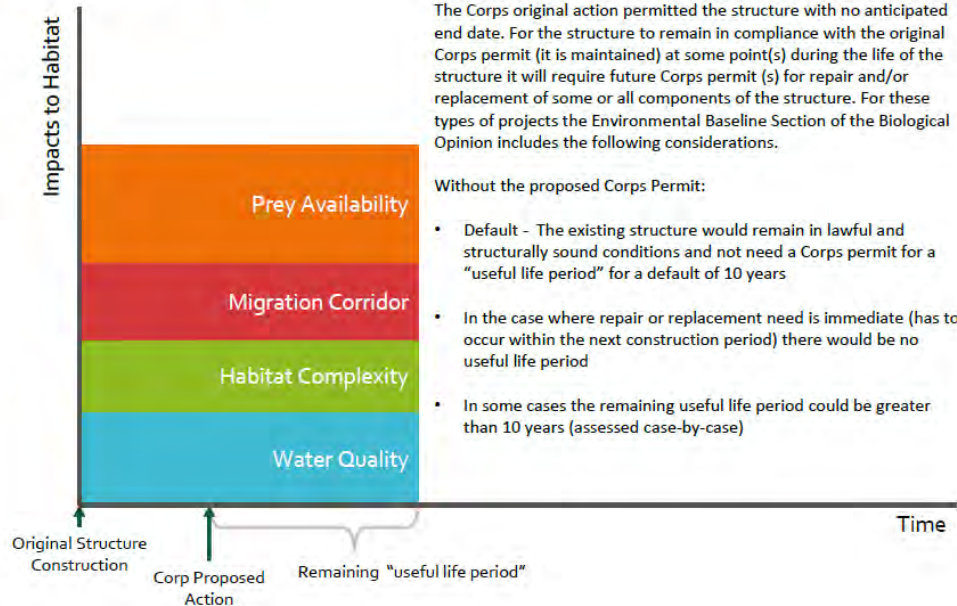
Response: We disagree that batching these projects into a single Opinion was improper. Batching is specifically allowed under the regulations. 50 CFR 402.14(c)(4). More specifically, we disagree that a project’s action area would necessarily be limited to the immediate area impacted by the structure or the construction that would be authorized even if we evaluated the project in an individual consultation. As explained in Section 1.4 discussing the 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 402.02. In this instance, the construction of new overwater structures and the repair or replacement of existing overwater structures is included in many of the 39 projects. The purpose of many of these structures is to provide mooring locations for vessels. Because the primary purpose of these structures is to provide moorage for vessels, it is reasonably certain that the structures will generate some future vessel operation. As identified in the Opinion, vessel impacts include noise, propeller wash, and the introduction of a small amount of contaminants (i.e., fuel). Although vessel use caused by the proposed structures would be most concentrated around the structures themselves, we expect many vessels to travel throughout Puget Sound. In addition, as explained in this Opinion, enduring effects caused by the proposed structures would result in a reduction in nearshore habitat quality. This reduction in habitat quality would reduce survival of juvenile PS Chinook salmon. This in turn would reduce the abundance of adult PS Chinook salmon, resulting in less forage for SRKWs. The reduction in forage for SRKWs that would be caused by the proposed action manifests predominantly within Puget Sound. For these reasons, Puget Sound proper is the appropriate action area for this consultation.

Moreover, as we describe in Section 2.6.1, the Integration and Synthesis for Critical Habitat, even if we had given greater consideration to the quality of habitat at each

project site, we disagree that such consideration would have lead us to a different conclusion in light of the status of the species and the value of high quality habitat.

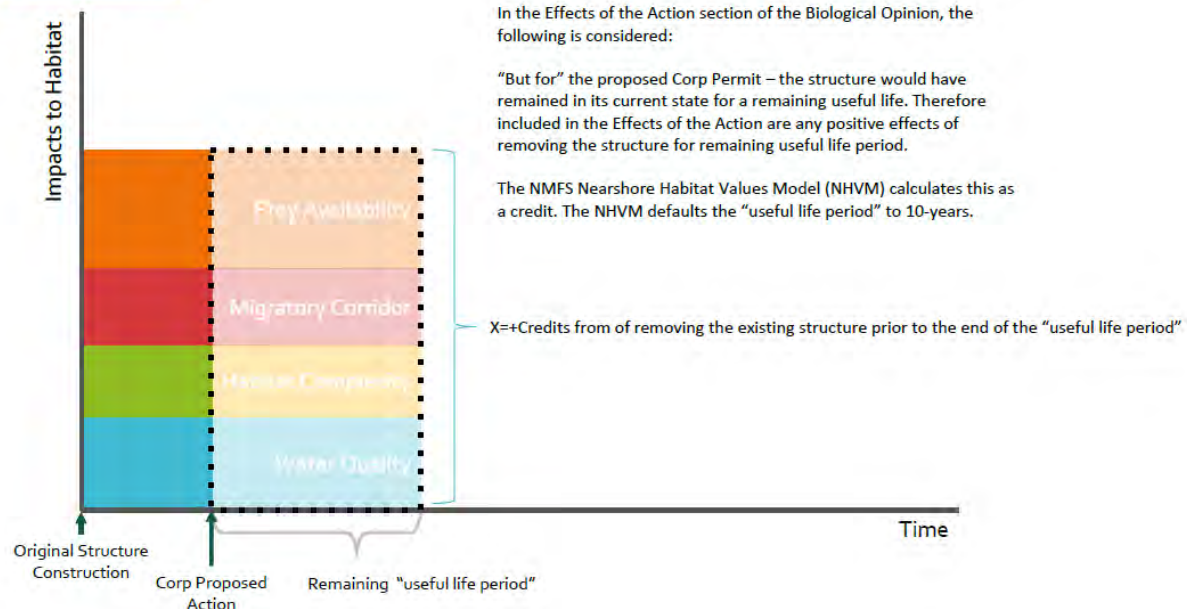
DISTINGUISHING BASELINE FROM EFFECTS OF THE ACTION

Environmental Baseline



Note: This scenario is applied when a structure has not undergone previous ESA Section 7 consultation (consultation). In the event that the structure has a previous consultation, the Corps will need to assess whether the proposed repair or replacement would constitute the need for re-initiation of the previous consultation.

Effects of the Action



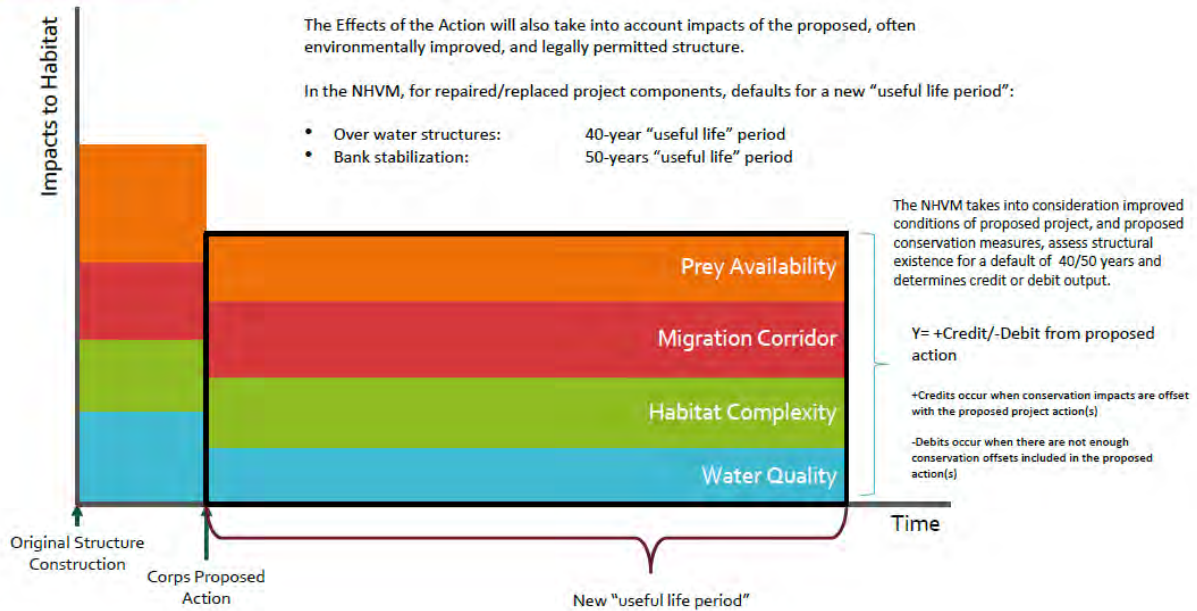
Effects of the Action

FOR REPLACE AND REPAIR PROJECTS:

The Effects of the Action will also take into account impacts of the proposed, often environmentally improved, and legally permitted structure.

In the NHVM, for repaired/replaced project components, defaults for a new "useful life period":

- Over water structures: 40-year "useful life" period
- Bank stabilization: 50-years "useful life" period



Effects of the Action

FOR NEW/EXPANSION PROJECTS:

For new projects, the NHVM takes into consideration impacts to an undisturbed environment and assess a multiplier (~2). As with repair and replace projects, the proposed conservation offsets, and defaults of 40/50 years and determines credit or debit output are applied.

$Y = +\text{Credit}/-\text{Debit}$ from proposed new action

+Credits occur when conservation impacts are offset with the proposed project action(s)

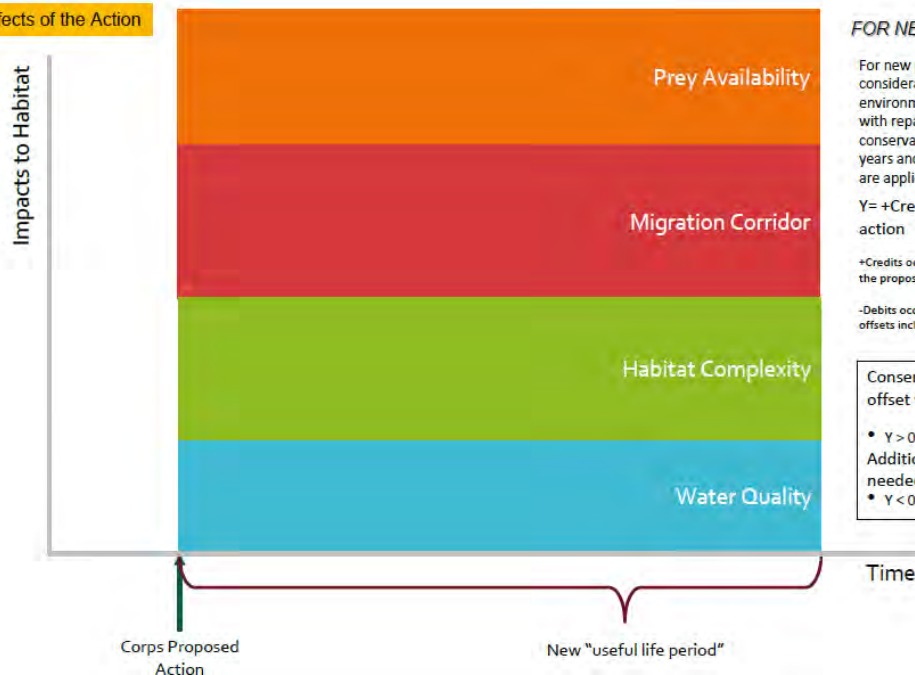
-Debits occur when there are not enough conservation offsets included in the proposed action(s)

Conservation impacts are considered offset when:

- $Y > 0$

Additional conservation offsets are needed when:

- $Y < 0$



From: [Lisa Abernathy - NOAA Federal](#)
To: [Nicole Foster](#)
Cc: [Kimberly Mahoney](#); [Steve Robert](#); [Jeff Langhelm](#); [Endicott, Halie N CIV USARMY CENWS \(US](#)
Subject: Re: NWS-2018-981 Gig Harbor Community Paddlers Dock (WCRO-2019-00196)
Date: Wednesday, January 6, 2021 12:53:56 PM
Attachments: [image001.png](#)

Hi again - I just went over the emails back and forth between the COE and us and realized you weren't copied on any of them. I'm not sure if you are supposed to be or not, but now it makes sense as to why you were asking. I will get to the bottom of this. In the meantime, YES! The proposed changes/mitigation looks great, you have met the RPA.

Thanks,

Lisa Abernathy

Fisheries Biologist, Central Puget Sound
NOAA Fisheries | U.S. Department of Commerce
Office: (206) 526-4742
Cell: (206) 707-5386
www.fisheries.noaa.gov



On Wed, Jan 6, 2021 at 9:30 AM Nicole Foster <nicole@dcgengr.com> wrote:

Awesome! Thank you for all your work, Lisa!

And just so we have it in writing – you approve of the proposed mitigation, correct?

Nicole Foster, MMA

Senior Environmental Scientist | Marine and Environmental Department

David Consulting Group, Inc.

T 206.523.0024 x144

Seattle | Mount Vernon | Whidbey Island | Federal Way



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COVID-19 situation, DCG is restricting travel and moving all meetings online.

From: Lisa Abernathy - NOAA Federal <lisa.abernathy@noaa.gov>

Sent: Wednesday, January 6, 2021 9:26 AM

To: Nicole Foster <nicole@dcgengr.com>

Cc: Kimberly Mahoney <MahoneyK@cityofgigharbor.net>; Steve Robert <steve@dcgengr.com>; Jeff Langhelm <LanghelmJ@cityofgigharbor.net>; Endicott, Halie N CIV USARMY CENWS (US <Halie.N.Endicott@usace.army.mil>

Subject: Re: NWS-2018-981 Gig Harbor Community Paddlers Dock (WCRO-2019-00196)

Hi Nicole -

Happy New Year to you! NMFS agrees you have met the RPA and the COE has accepted the meeting of the RPA. You are done on the NMFS side of things. As far as "closing consultations" or issuing permits, that is a question for Halie and the COE.

Thanks,

Lisa Abernathy

Fisheries Biologist, Central Puget Sound
NOAA Fisheries | U.S. Department of Commerce
Office: (206) 526-4742
Cell: (206) 707-5386
www.fisheries.noaa.gov



On Mon, Jan 4, 2021 at 1:48 PM Nicole Foster <nicole@dcgengr.com> wrote:

Hello Lisa,

Has consultation come to a close for this project?

Happy New Year,

Nicole Foster, MMA

Senior Environmental Scientist | Marine and Environmental Department

Davido Consulting Group, Inc.

T 206.523.0024 x144

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From: Nicole Foster

Sent: Thursday, December 17, 2020 9:12 AM

To: Lisa Abernathy - NOAA Federal <lisa.abernathy@noaa.gov>; Kimberly Mahoney <MahoneyK@cityofgigharbor.net>

Cc: Steve Robert <steve@dcgengr.com>; Jeff Langhelm <LanghelmJ@cityofgigharbor.net>; Endicott, Halie N CIV USARMY CENWS (US <Halie.N.Endicott@usace.army.mil>

Subject: RE: NWS-2018-981 Gig Harbor Community Paddlers Dock (WCRO-2019-00196)

Fantastic! Thank you, Lisa!

Kim, Do you need any further information?

Nicole Foster, MMA

Senior Environmental Scientist | Marine and Environmental Department

Davido Consulting Group, Inc.

T 206.523.0024 x144

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From: Lisa Abernathy - NOAA Federal <lisa.abernathy@noaa.gov>
Sent: Thursday, December 17, 2020 9:07 AM
To: Nicole Foster <nicole@dcgengr.com>
Cc: Kimberly Mahoney <MahoneyK@cityofgigharbor.net>; Steve Robert <steve@dcgengr.com>; Jeff Langhelm <LanghelmJ@cityofgigharbor.net>; Endicott, Halie N CIV USARMY CENWS (US <Halie.N.Endicott@usace.army.mil>
Subject: Re: NWS-2018-981 Gig Harbor Community Paddlers Dock (WCRO-2019-00196)

Yes, there will be a net enhancement of shoreline ecological function due to this project.

Thanks,

Lisa Abernathy

Fisheries Biologist, Central Puget Sound
NOAA Fisheries | U.S. Department of Commerce
Office: (206) 526-4742
Cell: (206) 707-5386
www.fisheries.noaa.gov



On Thu, Dec 17, 2020 at 9:00 AM Nicole Foster <nicole@dcgengr.com> wrote:

Hello Lisa,

In order words, the project plus the proosed mitigation will provide a “net enhancement of

shoreline ecological function” per the language provided below?

7.11.4 Regulations – General

- 1) Boating facilities shall not be permitted within the following marine shoreline habitats because of their scarcity, biological productivity and sensitivity unless no alternative location is feasible, the project would result in a net enhancement of shoreline ecological functions, and the proposal is otherwise consistent with this Program:
 - a) Critical saltwater habitats; and
 - b) Marshes, estuaries and other wetlands.

Best,

Nicole Foster, MMA

Senior Environmental Scientist | Marine and Environmental Department

Davido Consulting Group, Inc.

T 206.523.0024 x144

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DCG is committed to the health of our employees and clients; given the current state of the COVID-19 situation, DCG is restricting travel and moving all meetings online.

From: Lisa Abernathy - NOAA Federal <lisa.abernathy@noaa.gov>

Sent: Thursday, December 17, 2020 8:53 AM

To: Nicole Foster <nicole@dcgengr.com>

Cc: Kimberly Mahoney <MahoneyK@cityofgigharbor.net>; Steve Robert <steve@dcgengr.com>; Jeff Langhelm <LanghelmJ@cityofgigharbor.net>; Endicott, Halie N CIV USARMY CENWS (US <Halie.N.Endicott@usace.army.mil>

Subject: Re: NWS-2018-981 Gig Harbor Community Paddlers Dock (WCRO-2019-00196)

Hi Nicole -

The BiOp (Batch Consultation Reference No. WCRO-2020-01361), dated 11/9/2020, demonstrates compliance with a consultation under Section 7 of the ESA. The project in reference, NWS-2018-981 Gig Harbor Community Paddlers Dock, has offset impacts associated with the project.

Thanks,

Lisa Abernathy

Fisheries Biologist, Central Puget Sound

NOAA Fisheries | U.S. Department of Commerce

Office: (206) 526-4742

Cell: (206) 707-5386

www.fisheries.noaa.gov



On Wed, Dec 16, 2020 at 4:16 PM Nicole Foster <nicole@dcgengr.com> wrote:

Hello Lisa,

In order to satisfy local code requirements for the City of Gig Harbor, could you please respond to this email stating that the BiOp (Batch Consultation Reference No. WCRO-2020-01361), dated 11/9/2020, demonstrates compliance with the highlighted section of code below? Kim, please feel free to interject here if there is more information that you need.

GHMC 18.10.100.B. The planning director or designee shall review the habitat assessment report to determine whether the development meets the standard of NE, NLAA or LAA. If the planning director or designee determines that the development is LAA, then the city may not issue the development permit unless the development is redesigned to a point where the assessment is NLAA or NE. **If a development cannot be redesigned to meet the standard of NLAA or NE, the development may only be permitted if the applicant submits a letter from the National Marine Fisheries Service or the Federal Emergency Management Agency demonstrating concurrence through a consultation under Section 7** or 4(d) of the ESA or issuance of an incidental take permit under Section 10 of the ESA. The habitat assessment report and/or concurrence letter from the National Marine Fisheries Service or the Federal

Emergency Management Agency shall be retained in the permit file. (Ord. 1259 § 4, 2013).

Best,

Nicole Foster, MMA

Senior Environmental Scientist | Marine and Environmental Department

Davido Consulting Group, Inc.

T 206.523.0024 x144

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DCG is committed to the health of our employees and clients; given the current state of the COVID-19 situation, DCG is restricting travel and moving all meetings online.

Peter Katich

From: Peter Katich
Sent: Monday, December 24, 2018 1:53 PM
To: 'Nicole Foster'
Cc: Katrina Knutson; Kirsten Gregory <kgregory@ghckrt.com>; Jeff Langhelm
Subject: FW: Ancich Launch Float Biological Evaluation

Hi Nicole: I inadvertently forgot to include in my e-mail to you below that due to this issue, per GHMC Subsection 19.02.006.A, I'm providing you with 90 days or until March 25, 2019 to respond to and resolve this matter. In the meantime, I'm stopping the permit "time clock" pending resolution of the issue. Please let me know if you have any questions. Thank you. Pete

From: Peter Katich
Sent: Monday, December 24, 2018 11:48 AM
To: 'Nicole Foster' <NFoster@pndengineers.com>
Cc: Katrina Knutson <KnutsonK@cityofgigharbor.net>; Kirsten Gregory <kgregory@ghckrt.com>
<kgregory@ghckrt.com>; Jeff Langhelm <LanghelmJ@cityofgigharbor.net>
Subject: Ancich Launch Float Biological Evaluation

Hi Nicole: I'm reviewing the B.E. referenced above for consistency with the city's Flood Hazard Construction Standard Ordinance and its requirement for a habitat assessment that determines the project complies with the ESA. Gig Harbor Municipal Code (GHMC) Section 18.10.100 states the following:

A. No development permits may be issued on any parcel partially or fully within the area of special flood hazard or riparian buffer zone unless the planning director or designee, after review of a habitat assessment report provided by the applicant, **has determined the development meets the standards of NE or NLAA, or the applicant submits a letter from the National Marine Fisheries Service or the Federal Emergency Management Agency stating that the development complies with the requirements under the biological opinion and the ESA.**

B. The planning director or designee shall review the habitat assessment report to determine whether the development meets the standard of NE, NLAA or LAA. **If the planning director or designee determines that the development is LAA, then the city may not issue the development permit unless the development is redesigned to a point where the assessment is NLAA or NE. If a development cannot be redesigned to meet the standard of NLAA or NE, the development may only be permitted if the applicant submits a letter from the National Marine Fisheries Service or the Federal Emergency Management Agency demonstrating concurrence through a consultation under Section 7 or 4(d) of the ESA or issuance of an incidental take permit under Section 10 of the ESA.** The habitat assessment report and/or concurrence letter from the National Marine Fisheries Service or the Federal Emergency Management Agency shall be retained in the permit file.
(emphasis supplied)

The B.E's Conclusions and Effect Determinations in Chapter 9 (see page 20, Section 9.5, Puget Sound Chinook, & page 21, Section 9.6, Puget Sound Steelhead Trout) concludes that the project is likely to adversely affect (LAA) Puget Sound Chinook salmon and their critical habitat due to an increase in nearshore overwater coverage, disorienting, schooling and altering migration patterns of juveniles and a slight reduction in benthic and epibenthic macroinvertebrates prey. The determination further states that, "the long-term effect of overwater structures will be minimized with the addition of grating. Additionally, overall long-term improvements to water quality is expected with the removal of

creosote-treated timber piles.” In regard to Steelhead Trout the determination concludes, “the project is likely to adversely affect Puget Sound steelhead trout due to a slight reduction in benthic and epibenthic macroinvertebrates prey. However, overall long-term improvement to water quality is expected with the removal of creosote-treated timber piles.”

Per the GHMC, such determinations require that the project be redesigned to meet the NLAA or NE determination or a letter from NMFS or FEMA demonstrating concurrence through consultation under Section 7 or 4(d) of the ESA or in the alternative, the issuance of an incidental take permit under Section 10 of the ESA. Please let me know how you propose to address this issue. Thank you. Pete

MEMORANDUM

DATE: March 26, 2021
TO: Kim Mahoney, Associate Planner
FROM: Aaron Hulst, P.E., Senior Engineer 
SUBJECT: **Ancich Park Public Launch Floats** (PL-SEPA-18-0013)
Recommended SEPA Mitigation and Conditions

Reference: - Water Capacity Reservation Certificate, dated received on March 17, 2021
- Sewer Capacity Reservation Certificate, dated received on March 24, 2021
- Transportation Capacity Reservation Certificate, dated approved on March 19, 2021
- Trip Generation Memo, dated March 12, 2021.

Based on the submitted project documents and the identified impacts from the proposed development, the Public Works Department has the following “Recommended Mitigation and Conditions” described below. Unless otherwise noted, all mitigation items shall meet the City of Gig Harbor Public Works Standards and be completed prior to any certificates of occupancy being issued for structures on the proposed development.

BACKGROUND

The project proposes the demolition of a creosote-treated timber pier and associated creosote piles and construction of an overwater float system to replace them.

REVIEW and ANALYSIS

Water Infrastructure: The project does not propose any new connections to, nor does it have any impact on the City’s water system. All water ERUs were reserved under the Ancich Waterfront Park Project.

Wastewater Infrastructure: The project does not propose any new connections to, nor does it have any impact on the City’s wastewater system. All sewer ERUs were reserved under the Ancich Waterfront Park Project.

Stormwater Infrastructure: The City has reviewed the storm water impacts for the proposed development based on the documents provided by the applicant. The project is not creating any new impervious surfaces, as the float system will be an overwater structure. The project does not trigger water quality or quantity control.

Transportation Infrastructure: The impacts to the City’s transportation infrastructure from the proposed development have been reviewed in accordance with the following:

March 26, 2021

Kim Mahoney, Associate Planner

(PL-SEPA-18-0013) Ancich Park Public Launch Floats

Page **2** of **2**

- Gig Harbor Municipal Code (GHMC), Chapter 19.10, Concurrency Management
- City of Gig Harbor Comprehensive Plan (Plan).

The applicant provided a trip generation memo that describes how the project proposes to generate 1 new PM peak hour trip. The trip generation memo was prepared consistent with the ITE Manual. The project is expected to have minimal impact to the City's roadway network. **The City has reserved 1 PM Peak hour trip** for the proposed development. The project is required to pay transportation impact fees prior to building permit issuance.

Recommended Mitigations and Conditions

None.



City of Gig Harbor Water Concurrency Management Program Capacity Reservation Certificate Application

Submit completed application to:
City of Gig Harbor Public Works Department
3510 Grandview Street, Gig Harbor, Washington 98335
(253) 851-6170

\$90.00 Paid (Commercial Only) _____

Today's Date _____

Gig Harbor Project # **PL-SDP-18-0003**

1. Applicant (Developer or Owner) please circle one

Name Jeff Langhelm Company City of Gig Harbor Telephone (253) 853-8253
Address 3510 Grandview Street City/State/Zip Gig Harbor, WA 98335

2. Property Owner (If other than applicant)

Name Same as applicant Company _____ Telephone _____
Address _____ City/State/Zip _____

Project Name Community Paddlers Dock

Project Address 3589 Harborview Drive Total Acreage 0.42

3. Parcel # 5970000244 (Attach a Legal Description with this application)

4. Property Description (check one)

Note: Applicants are responsible for accurate land use designations. The issuance of a Water Capacity Reservation Certificate does not constitute land use or development approval.

Existing

☐ Short Plat ☒ Commercial/Industrial ☐ Single-Family
☐ Sub-division ☐ Multi-family (3+ units)

Proposed

☐ Short Plat ☒ Commercial/Industrial ☐ Single-Family
☐ Sub-division ☐ Multi-family (3+ units)

Project Information

A. Number of new dwelling units 0 B. Commercial building area in gross square feet 0

Proposed Water Use (In ERU's, Including Irrigation): A preliminary water hydraulic report shall be submitted with this application in accordance with **GHMC 19.10.011**.

Single-Family: n/a (1 ERU = 200 GPD)

Commercial/ Industrial/ Other: n/a

Number of meters requested: 0

Size of each meter: n/a

Signature: _____
(Property Owner signature)

Date: _____

☒ I, the property owner, authorize my agent to receive all original correspondence (initial) _____

Agent's Name Nicole Foster, Davido Consulting Group Address 9706 4th Ave NE #300, Seattle, WA 98115

Questions?

Please call (253) 851-6170 if you have any questions about the Concurrency Management Program.

FOR CITY USE ONLY:

Approved Reservation Capacity: _____ Water ERU's

Public Works Superintendent Approval: _____

Date: 3-17-21



City of Gig Harbor Sewer Concurrency Management Program Capacity Reservation Certificate Application

Submit completed application to:
City of Gig Harbor Public Works Department
3510 Grandview Street, Gig Harbor, Washington 98335
(253) 851-6170

\$90.00 Paid (Commercial Only) _____

Today's Date _____

Gig Harbor Project # **PL - SDP - 18 - 0003**

1. Applicant (Developer or Owner) please circle one

Name Jeff Langhelm Company City of Gig Harbor Telephone (253) 853-8253
Address 3510 Grandview Street City/State/Zip Gig Harbor, WA 98335

2. Property Owner (If other than applicant)

Name Same as applicant Company _____ Telephone _____
Address _____ City/State/Zip _____

Project Name Community Paddlers Dock

Project Address 3589 Harborview Drive Total Acreage 0.42

3. Parcel # 5970000244 (Attach a Legal Description with this application)

4. Property Description (check one)

Note: Applicants are responsible for accurate land use designations. The issuance of a Sewer Capacity Reservation Certificate does not constitute land use or development approval.

Existing

☐ Short Plat ☒ Commercial/Industrial ☐ Single-Family
☐ Sub-division ☐ Multi-family (3+ units)

Proposed

☐ Short Plat ☒ Commercial/Industrial ☐ Single-Family
☐ Sub-division ☐ Multi-family (3+ units)

Project Information

A. Number of new dwelling units 0 B. Commercial building area in gross square feet 0

Proposed Sewer Use (In ERU's): A preliminary sewer hydraulic report shall be submitted with this application in Accordance with GHMC 19.10.011.

Single-Family: n/a (1 ERU = 150 GPD) **Commercial/ Industrial/ Other:** n/a (see GHMC 13.32.060)

Signature: _____ **Date:** _____
(Property Owner signature)

☒ I, the property owner, authorize my agent to receive all original correspondence (initial) _____

Agent's Name Nicole Foster, Davido Consulting Group Address 9706 4th Ave NE #300, Seattle, WA 98115

Questions?

Please call (253) 851-6170 if you have any questions about the Concurrency Management Program.

FOR CITY USE ONLY:

Approved Reservation Capacity: N/A Sewer ERU's

Wastewater Treatment Plant Supervisor Approval: [Signature] Date: 03/24/2021



City of Gig Harbor Transportation Concurrency Management Program Capacity Reservation Certificate Application

Submit completed application to:
City of Gig Harbor Public Works Department
3510 Grandview Street, Gig Harbor, Washington 98335
(253) 851-6170

\$90.00 Paid (Commercial Only) _____

Today's Date 3/17/21

Gig Harbor Project # **PL-SDP-18-0003**

1. Applicant (Developer ☐ or Owner ☐) please select one

Name Jeff Langhelfm Company City of Gig Harbor Telephone (253) 853-8253
Address 3510 Grandview Street City/State/Zip Gig Harbor, WA 98335

2. Property Owner (If other than applicant)

Name Same as applicant Company _____ Telephone _____
Address _____ City/State/Zip _____

Project Name Community Paddlers Dock

Project Address 3589 Harborview Drive Total Acreage 0.42

3. Parcel # 5970000244 (Attach a Legal Description and site plan)

4. Property Description (check one)

Note: Applicants are responsible for accurate land use designations. The issuance of a Capacity Reservation Certificate does not constitute land use or development approval.

Existing

☐ Short Plat ☐ Commercial/Industrial ☐ Mixed use
☐ Sub-division ☐ Multi-family (3+ units) ☐ Single-Family

Proposed

☐ Short Plat ☐ Commercial/Industrial ☐ Mixed use
☐ Sub-division ☐ Multi-family (3+ units) ☐ Single-Family

Phasing Information

A. Number of new dwelling units 0 B. Commercial building area in gross square feet 0

5. Number of New PM Peak hour trips 1



Proposed Site Design Information (attach Legal Description and a site plan depicting proposed road/driveway access point(s) for the development)

6. Land Use Codes: GHMC 19.10.011

(Most recent edition of Trip Generation from the Institute of Transportation Engineers)

Upon submission and acceptance of this completed Transportation CRC application, the Director shall conduct a Traffic Model Run and issue a Traffic Report for those applications meeting the requirements of the City of Gig Harbor Municipal Code, Section 19.10.003(B)(1). In performing the concurrency evaluation for transportation facilities, the Director shall determine, based on the conclusion of the Traffic Report, whether a proposed development can be accommodated within the existing or planned capacity of City transportation facilities.

If the Director determines that the proposed development will cause the Level of Service (LOS) of a city-owned transportation facility to decline below the Standards adopted in the transportation element of the city's comprehensive plan, and improvements or strategies to accommodate the impacts of development are not planned to be made concurrent with development, a Transportation CRC and the underlying development permit, if such an application has been made, shall be denied. Upon denial, the applicant may perform one of the following:

1. Appeal the findings of the Traffic Report in accordance with GHMC 19.10.021;
2. Offer alternative data and/or perform an independent traffic impact analysis at the applicant's sole expense in

support of alternative conclusions. Any study shall be in accordance with GHMC 19.10.027;

3. Modify the development proposal to lessen the traffic impacts and/or identify voluntary transportation improvements as mitigation to be provided by the applicant at the applicant's cost and re-apply for capacity review. Re-application shall require re-payment of the Traffic Report preparation fee in accordance with GHMC 19.10.011(B); or
4. Withdraw the CRC application.

Intent of Request for Credit: GHMC 19.12.083

- A. Credit Allowed. The Director shall reduce the calculated proportionate share for a particular development by giving credit for the benefit factors described in this section.
- B. Procedure for Obtaining Credit, Time to Request Credit. **Request for credits** against impact fees will not be considered unless the developer makes the request in writing, concurrent with submission of the application for the underlying development permit triggering the impact fee. For example, credit for impact fees relating to a preliminary plat must be submitted concurrent with submission of the application for the preliminary plat application, not the final plat or building permits for development in the plat.
- C. Benefit Factors. The Director will consider the following benefit factors when determining whether an impact fee credit is appropriate:
 1. Developer's Dedication of Land and/or Construction of System Improvements. The value of any dedication of land for, improvement to, or new construction of any system improvements provided by the developer, to facilities required by the city that are identified in the capital facilities plan and that are required by the city as a condition of approving the development activity, as long as the following conditions are satisfied.
 - a. The system improvements are located on land owned by the city; and
 - b. A designated public owner is responsible for permanent, continuing maintenance and operation of the system improvements; and
 - c. The Director determines that the system improvements correspond to the type(s) of transportation system improvements that are reasonably related to the development as determined pursuant to this chapter; and
 - d. The Director determines an analysis of supply and demand data of the Six-Year Transportation Improvement Plan (TIP) that the proposed transportation system improvements better meet the city's need for transportation system improvements than would payment of funds to mitigate the transportation impacts of the development;
 - e. In the determination of credit toward the impact fee, the Director shall also consider the extent to which the proposed dedication or conveyance meets the following criteria:
 - i. The land should result in an integral element of the Gig Harbor road system;
 - ii. The land is suitable for future transportation facilities;
 - iii. The land is of appropriate size and of an acceptable configuration;
 - iv. The land has public access via a public street or an easement of an equivalent width and accessibility;
 - v. The land is located in or near areas designated by the city on land use plans for park, trail or recreational purposes;
 - vi. The land provides linkage between Gig Harbor and/or other publicly owned recreation and transportation properties;
 - vii. The land has been surveyed or adequately marked with survey monuments, or is otherwise readily distinguishable from adjacent privately-owned property;
 - viii. The land has no known physical problems associated with it, such as the presence of hazardous waste, drainage, erosion or flooding problems which the director or superintendent determines would cause inordinate demands on public resources for maintenance and operation;
 - ix. The land has no known safety hazards;
 - x. The developer is able to provide documentation, as nearly as practicable, of the land's compliance with the criteria of this subsection, and of clear title;
 - xi. The developer is able to provide and fund a long-term method, acceptable to the Director, for the management and maintenance of the land, if applicable.
- D. Requirement for System Improvement Plan. When the Director has agreed to a developer's proposal to satisfy some or all of the impact fee through the purchase, installation and/or improvement of transportation facilities, the developer shall prepare and submit a system improvement plan to the Director, for approval prior to recordation of a plat or short plat for subdivisions, and prior to issuance of a building permit for all other developments.
- E. Amount of Credit. The credit against the impact fee shall be equal to the fair market value of the purchased/dedicated property or equal to the cost of the completed system improvements. In those situations in which a developer has not yet installed or constructed system improvements and **requests a credit** for the system improvement(s), the City Engineer shall estimate the cost of the system improvements, which shall be the credit allowed to the developer in the decision on the amount of the impact fee. If a credit is granted for a system improvement that has not been constructed, the developer shall pay the full impact fee without the credit, at the time established in GHMC [19.12.110](#). After construction and/or installation of the system improvement, the developer may **request the credit** granted by the engineer under this subsection, and the city shall refund the difference of the impact fee to reflect the credit; provided, that if the city and the property owner have entered into a development agreement on or before the effective date of the ordinance codified in this section, and the agreement requires the construction of such improvements, the city may allow a credit to be subtracted from the impact fee paid at the time established in GHMC [19.12.100](#).

- F. PRDs, PUDs and Mobile Home Parks. A developer of a planned residential development, a planned unit development or a mobile home park may receive credit only for park, school and transportation facilities provided in addition to those normally required under SEPA for such developments pursuant to Chapter 18.04 GHMC.
- G. Credit to Apply Proportionately to Units. The amount of credit determined pursuant to this subsection shall be credited proportionately among all of the units in the development, and the impact fee for each unit for which a permit or approval is applied shall be reduced accordingly.
- H. Limits on Credit Requests. Applicants may not request that an impact fee credit be provided for a proposed development based on taxes, user fees, assessments, improvements, payments or other benefit factors applicable to property that is not included within the proposed development.
- I. Local Improvement Districts. Applicants shall receive credit against the impact fee equal to the amount of an LID assessment paid for transportation-related system improvements identified by the Director as increasing transportation system capacity.
- J. Appeals of Credits. The Director shall issue a written decision on the developer's request for a credit of the impact fee calculation, which shall explain why the credit was granted or denied. The developer may request reconsideration and appeal the impact fee amount and credit pursuant to GHMC 19.12.170. If the procedures in GHMC 19.12.170 are not timely followed to request an appeal of the credit, the Director's decision on the impact fee credit shall be final. (Ord. 1079 § 2, 2007).

Signature: 
(Property Owner signature)

Date: 3/17/21

☒ I, the property owner, authorize my agent to receive all original correspondence (initial) 
Agent's Name Nicole Foster Address 9706 4th Ave NE #300, Seattle, WA 98115

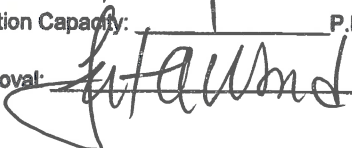
Questions?

Please call (253) 851-6170 if you have any questions about the Concurrency Management Program.

FOR CITY USE ONLY:

City Road Segment: HARBORVIEW DR.

Approved Reservation Capacity: 1 P.M. Peak Hour trips

City Engineer Approval: 

Date: 3/19/21



MEMORANDUM

TO: Aaron Hulst, P.E.
City of Gig Harbor
3510 Grandview Street
Gig Harbor, WA 98335

FROM: Steve Robert, P.E.
Davido Consulting Group, Inc.
9706 4th Ave NE #300
Seattle, WA 98115

DATE: March 12, 2021

RE: Community Paddlers Dock Project Transportation Concurrency Management Program

Dear Aaron Hulst,

The purpose of this memo is to justify the updated and attached Transportation Concurrency Management Program for the Community Paddlers Dock (CPD) Project that is consistent with the Gig Harbor Municipal Code.

The Community Paddlers Dock Project is anticipated to add 1 peak hour trip. Because of the reasons outlined below, the City is proposing to pay the transportation impact fee only and not perform any mitigation.

1. The project is located at the already developed Ancich Waterfront Park. The boat storage building, beach launch point, and the staging stall for cars are already present. The additional use point (the new dock) primarily draws in existing users from the existing boat storage building.
2. Users do not typically arrive to the site during peak hours, but rather outside the pm peak hours to use human powered watercrafts recreationally.
3. Please see the attached TIA and approved TCRC for Phase 1 of Ancich Waterfront Park. Note that all trips associated with the boat storage building and associated human powered watercraft launching at both the Community Paddler's Dock and the shoreline have been captured as part of the previous Phase 1 project.
4. The TCRC application for the CPD is intended to only identify the additional trips that may be generated due to new users not previously identified or associated with the Phase 1 project.
5. Trip generation for non-boat storage building was developed as follows:

Seattle
9706 4th Ave NE Suite 300
Seattle, WA 98115
Tel 206.523.0024

Whidbey Island
PO Box 1132
Freeland, WA 98249
Tel 360.331.4131

Mount Vernon
2210 Riverside Drive, Suite 110
Mount Vernon, WA 98273
Tel 360.899.1110

Federal Way
31620 23rd Ave S, Suite 307
Federal Way, WA 98003
Tel 206.523.0024

- a. The ITE trip generation manual 10th edition does not have a land use category for human-powered craft launching floats.
- b. The closest possible land use code comparison is it to a Marina/LUC420 (attached); however the CPD floats will not have any other use such as retail space and restaurant space as identified in LUC420 and a typical Marina would not have a separate boat storage building identified as a previously established use.
- c. The CPD has approximately 6 berths and a peak hour average trip generation rate of 0.20 trips per berth per LUC420 PM. Therefore, the additional PM peak hour trips based on LUC420 and the above information is: $6 \times 0.2 = 1.2$.
- d. The City proposes using the minimum 1.0 new peak hour trips since there is no retail or restaurant use and the Phase 1 work already accounted for PM peak hour trips for users of the boat storage building.

Sincerely,



Digitally signed by Steve Robert
Date: 2021.03.15 15:45:31 -
07'00'

Steve Robert, P.E.
Senior Civil Engineer | Marine Engineering Lead



City of Gig Harbor

Transportation Concurrency Management Program

Capacity Reservation Certificate Application

Submit completed application to:
City of Gig Harbor Public Works Department
3510 Grandview Street, Gig Harbor, Washington 98335
(253) 851-6170

\$90.00 Paid (Commercial Only) _____

Today's Date _____

Gig Harbor Project # _____

1. Applicant (Developer ☐ or Owner ☐) please select one

Name Jeff Langhelm Company City of Gig Harbor Telephone (253) 853-8253
Address 3510 Grandview Street City/State/Zip Gig Harbor, WA 98335

2. Property Owner (If other than applicant)

Name Same as applicant Company _____ Telephone _____
Address _____ City/State/Zip _____

Project Name Community Paddlers Dock

Project Address 3589 Harborview Drive Total Acreage 0.42

3. Parcel # 5970000244 (Attach a Legal Description and site plan)

4. Property Description (check one)

Note: Applicants are responsible for accurate land use designations. The issuance of a Capacity Reservation Certificate does not constitute land use or development approval.

Existing

☐ Short Plat ☒ Commercial/Industrial ☐ Mixed use
☐ Sub-division ☐ Multi-family (3+ units) ☐ Single-Family

Proposed

☐ Short Plat ☒ Commercial/Industrial ☐ Mixed use
☐ Sub-division ☐ Multi-family (3+ units) ☐ Single-Family

Phasing Information

A. Number of new dwelling units 0 B. Commercial building area in gross square feet 0

5. Number of New PM Peak hour trips 1

☒ **Proposed Site Design Information** (attach Legal Description and a site plan depicting proposed road/driveway access point(s) for the development)

6. Land Use Codes: GHMC 19.10.011

(Most recent edition of Trip Generation from the Institute of Transportation Engineers)

Upon submission and acceptance of this completed Transportation CRC application, the Director shall conduct a Traffic Model Run and issue a Traffic Report for those applications meeting the requirements of the City of Gig Harbor Municipal Code, Section 19.10.003(B)(1). In performing the concurrency evaluation for transportation facilities, the Director shall determine, based on the conclusion of the Traffic Report, whether a proposed development can be accommodated within the existing or planned capacity of City transportation facilities.

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2. Offer alternative data and/or perform an independent traffic impact analysis at the applicant's sole expense in

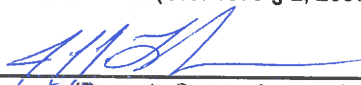
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3. Modify the development proposal to lessen the traffic impacts and/or identify voluntary transportation improvements as mitigation to be provided by the applicant at the applicant's cost and re-apply for capacity review. Re-application shall require re-payment of the Traffic Report preparation fee in accordance with GHMC 19.10.011(B); or
4. Withdraw the CRC application.

Intent of Request for Credit: GHMC 19.12.083

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 - b. A designated public owner is responsible for permanent, continuing maintenance and operation of the system improvements; and
 - c. The Director determines that the system improvements correspond to the type(s) of transportation system improvements that are reasonably related to the development as determined pursuant to this chapter; and
 - d. The Director determines an analysis of supply and demand data of the Six-Year Transportation Improvement Plan (TIP) that the proposed transportation system improvements better meet the city's need for transportation system improvements than would payment of funds to mitigate the transportation impacts of the development;
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 - ii. The land is suitable for future transportation facilities;
 - iii. The land is of appropriate size and of an acceptable configuration;
 - iv. The land has public access via a public street or an easement of an equivalent width and accessibility;
 - v. The land is located in or near areas designated by the city on land use plans for park, trail or recreational purposes;
 - vi. The land provides linkage between Gig Harbor and/or other publicly owned recreation and transportation properties;
 - vii. The land has been surveyed or adequately marked with survey monuments, or is otherwise readily distinguishable from adjacent privately-owned property;
 - viii. The land has no known physical problems associated with it, such as the presence of hazardous waste, drainage, erosion or flooding problems which the director or superintendent determines would cause inordinate demands on public resources for maintenance and operation;
 - ix. The land has no known safety hazards;
 - x. The developer is able to provide documentation, as nearly as practicable, of the land's compliance with the criteria of this subsection, and of clear title;
 - xi. The developer is able to provide and fund a long-term method, acceptable to the Director, for the management and maintenance of the land, if applicable.
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- G. Credit to Apply Proportionately to Units. The amount of credit determined pursuant to this subsection shall be credited proportionately among all of the units in the development, and the impact fee for each unit for which a permit or approval is applied shall be reduced accordingly.
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Signature: 
 (Property Owner signature)

Date: 3/17/21

☒ I, the property owner, authorize my agent to receive all original correspondence (initial) 

Agent's Name Nicole Foster

Address 9706 4th Ave NE #300, Seattle, WA 98115

Questions?

Please call (253) 851-6170 if you have any questions about the Concurrency Management Program.

FOR CITY USE ONLY:

City Road Segment: _____

Approved Reservation Capacity: _____ P.M. Peak Hour trips

City Engineer Approval: _____

Date: _____

Legal Description

Section 05 Township 21 Range 02 Quarter 33 MILLVILLE PARCEL A OF ROS FOR BLA 2016-09-12-5001 DESC AS L 5 THRU 7 B 3 TOG/W 2ND CL TDLDS ABUTT THEREON SD L 6 & 7 TO EXTREME LOW TIDE WLY BDRY OF SD TDLDS DESC AS FOLL COM AT INTER OF C/L OF HARBOR VIEW AVE & W LI OF PLAT OF TOWN OF MILLVILLE TH N 02 DEG 23 MIN 15 SEC E 155.46 FT TO NW COR OF SD PLAT & BEG OF SD AGREED LI TH N 18 DEG 22 MIN 56 SEC E 111.51 FT M/L TO EXTREME LOW WATER ALSO TOG/W POR OF LAND LOC WITHIN FRONT ST AS SHOWN ON PLAT ADJ TO & ABUTT SAID L 6 & 7 ON S LY N OF N LI HARBORVIEW DR FORMERLY FRONT ST TOG/W 2ND CL TDLDS ABUTT TO EXTREME LOW TIDE EXC ANY POR CYD BY AGREEMENT BLR 2009-12-09-0165 EASE OF REC COMB OF 024-3, 025-1 & 025- 2 SEG 2017-0174 JP 09/19/16 JP

Property Description

Ancich Park is located at Lot 5, Block 3, Town of Millville, Pierce County, W.T., According to the Plat Recorded in Book 2 of Plats at Page 23, in Pierce County, Washington. The property is currently undergoing construction per NWS-2016-733. The site is listed by in the shoreline master program as historic, working waterfront. After construction, the primary uses of Ancich Park will include a working netshed for the fishing fleet, public storage and launching of human powered watercraft, access to the private floating dock, and a public park for the community.

Address: 3658 Harborview Drive, Gig Harbor, WA, 98335

Tax Parcel: 5970000244

Latitude and Longitude: 47.333 N / -122.586 W



City of Gig Harbor Transportation Concurrency Management Program Capacity Reservation Certificate Application

Submit completed application to:
City of Gig Harbor Public Works Department
3510 Grandview Street, Gig Harbor, Washington 98335
(253) 851-6170

\$90.00 Paid (Commercial Only) _____

Today's Date 12/17/18

Gig Harbor Project # CPP-1414

1. Applicant (Developer or Owner) please circle one

Name City of Gig Harbor Company _____ Telephone _____

Address _____ City/State/Zip _____

2. Property Owner (If other than applicant)

Name City of Gig Harbor Company _____ Telephone _____

Address _____ City/State/Zip _____

Project Name Ancich Waterfront Park

Project Address 3589, 3557, & 3525 Harborview Dr. Total Acreage 0.78

3. Parcel # 5970000244 (Attach a Legal Description and site plan)

4. Property Description (check one)

Proposed PM Peak trips 1

Note: Applicants are responsible for accurate land use designations. The issuance of a Capacity Reservation Certificate does not constitute land use or development approval.

Existing

- ☐ Short Plat ☐ Commercial/Industrial ☐ Mixed use
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Proposed

- ☐ Short Plat ☐ Commercial/Industrial ☐ Mixed use
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Phasing Information

A. Number of new dwelling units _____ B. Commercial building area in gross square feet _____



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(Most recent edition of Trip Generation from the Institute of Transportation Engineers)

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1. Appeal the findings of the Traffic Report in accordance with GHMC 19.10.021;
2. Offer alternative data and/or perform an independent traffic impact analysis at the applicant's sole expense in support of alternative conclusions. Any study shall be in accordance with GHMC 19.10.027;

3. Modify the development proposal to lessen the traffic impacts and/or identify voluntary transportation improvements as mitigation to be provided by the applicant at the applicant's cost and re-apply for capacity review. Re-application shall require re-payment of the Traffic Report preparation fee in accordance with GHMC 19.10.011(B); or
4. Withdraw the CRC application.

☐ **Intent of Request for Credit: GHMC 19.12.083**

- A. Credit Allowed. The Director shall reduce the calculated proportionate share for a particular development by giving credit for the benefit factors described in this section.
- B. Procedure for Obtaining Credit, Time to Request Credit. **Request for credits** against impact fees will not be considered unless the developer makes the request in writing, concurrent with submission of the application for the underlying development permit triggering the impact fee. For example, credit for impact fees relating to a preliminary plat must be submitted concurrent with submission of the application for the preliminary plat application, not the final plat or building permits for development in the plat.
- C. Benefit Factors. The Director will consider the following benefit factors when determining whether an impact fee credit is appropriate:
 1. Developer's Dedication of Land and/or Construction of System Improvements. The value of any dedication of land for, improvement to, or new construction of any system improvements provided by the developer, to facilities required by the city that are identified in the capital facilities plan and that are required by the city as a condition of approving the development activity, as long as the following conditions are satisfied.
 - a. The system improvements are located on land owned by the city; and
 - b. A designated public owner is responsible for permanent, continuing maintenance and operation of the system improvements; and
 - c. The Director determines that the system improvements correspond to the type(s) of transportation system improvements that are reasonably related to the development as determined pursuant to this chapter; and
 - d. The Director determines an analysis of supply and demand data of the Six-Year Transportation Improvement Plan (TIP) that the proposed transportation system improvements better meet the city's need for transportation system improvements than would payment of funds to mitigate the transportation impacts of the development;
 - e. In the determination of credit toward the impact fee, the Director shall also consider the extent to which the proposed dedication or conveyance meets the following criteria:
 - i. The land should result in an integral element of the Gig Harbor road system;
 - ii. The land is suitable for future transportation facilities;
 - iii. The land is of appropriate size and of an acceptable configuration;
 - iv. The land has public access via a public street or an easement of an equivalent width and accessibility;
 - v. The land is located in or near areas designated by the city on land use plans for park, trail or recreational purposes;
 - vi. The land provides linkage between Gig Harbor and/or other publicly owned recreation and transportation properties;
 - vii. The land has been surveyed or adequately marked with survey monuments, or is otherwise readily distinguishable from adjacent privately-owned property;
 - viii. The land has no known physical problems associated with it, such as the presence of hazardous waste, drainage, erosion or flooding problems which the director or superintendent determines would cause inordinate demands on public resources for maintenance and operation;
 - ix. The land has no known safety hazards;
 - x. The developer is able to provide documentation, as nearly as practicable, of the land's compliance with the criteria of this subsection, and of clear title;
 - xi. The developer is able to provide and fund a long-term method, acceptable to the Director, for the management and maintenance of the land, if applicable.
 - D. Requirement for System Improvement Plan. When the Director has agreed to a developer's proposal to satisfy some or all of the impact fee through the purchase, installation and/or improvement of transportation facilities, the developer shall prepare and submit a system improvement plan to the Director, for approval prior to recordation of a plat or short plat for subdivisions, and prior to issuance of a building permit for all other developments.
 - E. Amount of Credit. The credit against the impact fee shall be equal to the fair market value of the purchased/dedicated property or equal to the cost of the completed system improvements. In those situations in which a developer has not yet installed or constructed system improvements and **requests a credit** for the system improvement(s), the City Engineer shall estimate the cost of the system improvements, which shall be the credit allowed to the developer in the decision on the amount of the impact fee. If a credit is granted for a system improvement that has not been constructed, the developer shall pay the full impact fee without the credit, at the time established in GHMC [19.12.110](#). After construction and/or installation of the system improvement, the developer may **request the credit** granted by the engineer under this subsection, and the city shall refund the difference of the impact fee to reflect the credit; provided, that if the city and the property owner have entered into a development agreement on or before the effective date of the ordinance codified in this section, and the agreement requires the construction of such improvements, the city may allow a credit to be subtracted from the impact fee paid at the time established in GHMC [19.12.100](#).

- F. PRDs, PUDs and Mobile Home Parks. A developer of a planned residential development, a planned unit development or a mobile home park may receive credit only for park, school and transportation facilities provided in addition to those normally required under SEPA for such developments pursuant to Chapter 18.04 GHMC.
- G. Credit to Apply Proportionately to Units. The amount of credit determined pursuant to this subsection shall be credited proportionately among all of the units in the development, and the impact fee for each unit for which a permit or approval is applied shall be reduced accordingly.
- H. Limits on Credit Requests. Applicants may not request that an impact fee credit be provided for a proposed development based on taxes, user fees, assessments, improvements, payments or other benefit factors applicable to property that is not included within the proposed development.
- I. Local Improvement Districts. Applicants shall receive credit against the impact fee equal to the amount of an LID assessment paid for transportation-related system improvements identified by the Director as increasing transportation system capacity.
- J. Appeals of Credits. The Director shall issue a written decision on the developer's request for a credit of the impact fee calculation, which shall explain why the credit was granted or denied. The developer may request reconsideration and appeal the impact fee amount and credit pursuant to GHMC 19.12.170. If the procedures in GHMC 19.12.170 are not timely followed to request an appeal of the credit, the Director's decision on the impact fee credit shall be final. (Ord. 1079 § 2, 2007).

Signature: 
(Property Owner signature)

Date: 12/17/18

☐ I, the property owner, authorize my agent to receive all original correspondence (initial) _____

Agent's Name _____

Address _____

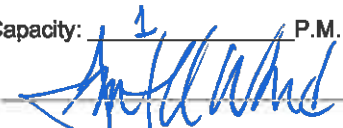
Questions?

Please call (253) 851-6170 if you have any questions about the Concurrency Management Program.

~~For City Use Only~~

City Road Segment: HARBORVIEW DRIVE

Approved Reservation Capacity: 1 P.M. Peak Hour trips

City Engineer Approval: 

Date: 12/17/18

Ancich Waterfront Park Transportation impact fee and concurrency consideration

The currently adopted edition (7th) of the ITE manual was used to estimate the number of trips that would be generated by the site. The pertinent information from the 7th edition of the ITE manual is located on page 631 (attached).

The land use code for a city park is 411 and was used to estimate the trip generation rate. The average rate is 1.59 average daily weekday trips. This is converted to PM peak hour trips by dividing by a factor of ten. Therefore, the average PM peak hour rate is .159. As the site is 0.78 acres, 0.159 is multiplied by 0.78 to obtain the estimate for PM peak hour trips. The above calculation estimates the site will be generating 0.124 pm peak hour trips. However, the text in the ITE Manual cautions that park trips can vary considerably.

It is for this reason, that a conservative increase factor of 20 was applied to the number recommended by the ITE manual for the park use. Applying the factor of 20, brings the proposed park use to an estimated PM peak hour trip generation rate of 2.48. This is a much more realistic number than the ITE recommended trip rate of 0.124.

For the purposes of concurrency, the project will be reserving 1 pm peak hour trip with a transportation CRC application. See below calculation:

Concurrency trips = new site trips – previous use trips

New site trips rounded to nearest whole number = 2

Concurrency trips = new site trips – existing trips

Concurrency trips = 2 – 0.99

Concurrency trips = 1.01

Round to nearest whole trip => 1

Total site trips = 1 pm peak hour trips

Because the proposed site generates less than 2 pm peak hour trips, the project is not required to be ran in the City's concurrency model.

The transportation impact fee of \$2,102.65 is calculated by multiplying the 1 pm peak hour trip by the current impact fee rate.

City Park (411)

Average Vehicle Trip Ends vs: Acres
On a: Weekday

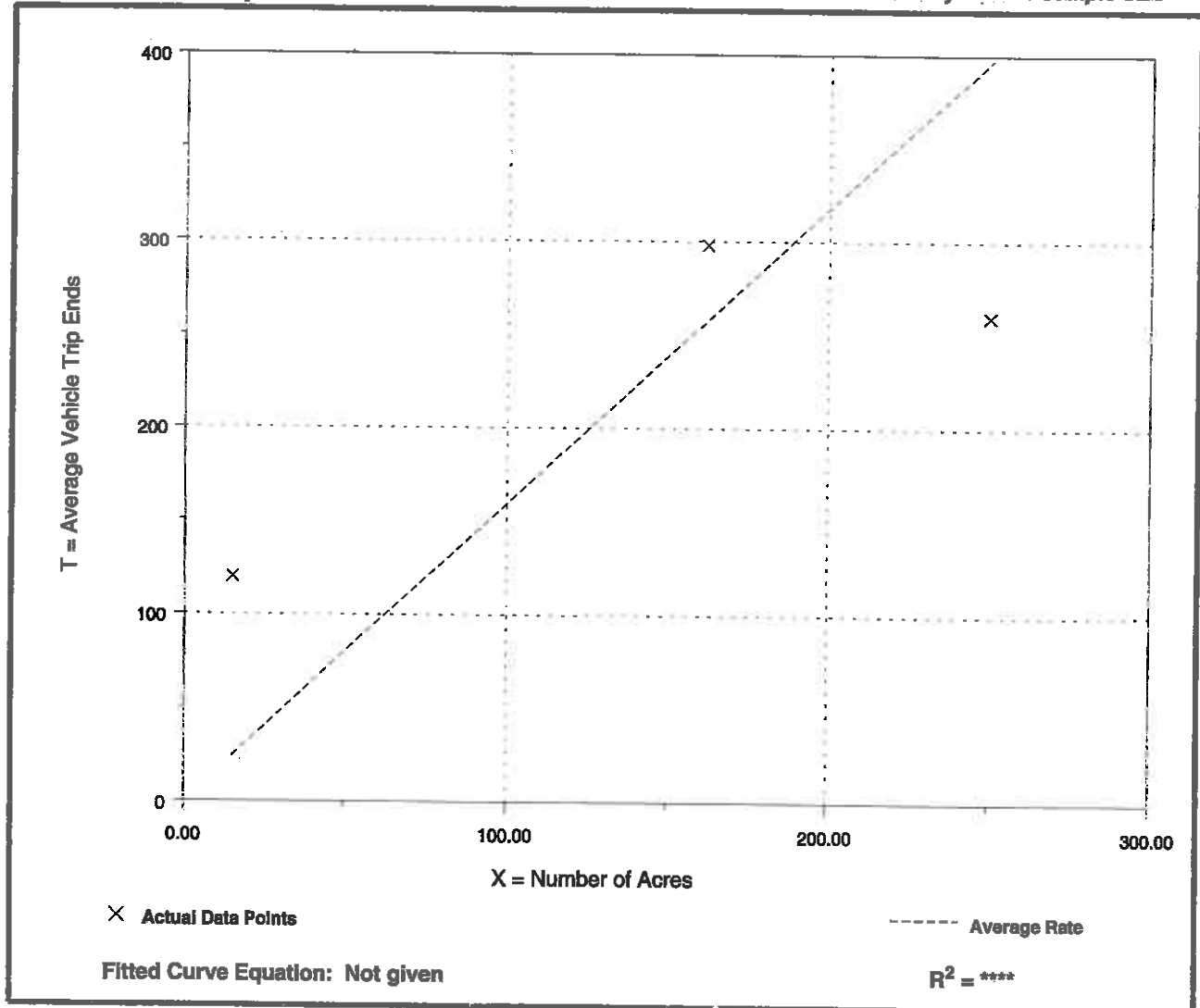
Number of Studies: 3
Average Number of Acres: 142
Directional Distribution: 50% entering, 50% exiting

Trip Generation per Acre

Average Rate	Range of Rates	Standard Deviation
1.59	1.04 - 8.00	1.79

Data Plot and Equation

Caution - Use Carefully - Small Sample Size



Land Use: 420

Marina

Description

A marina is a public or private facility that provides docks and berths for boats and may include limited retail and restaurant space.

Additional Data

The sites were surveyed in the 1980s in Connecticut and Washington.

Source Numbers

123, 265

Marina (420)

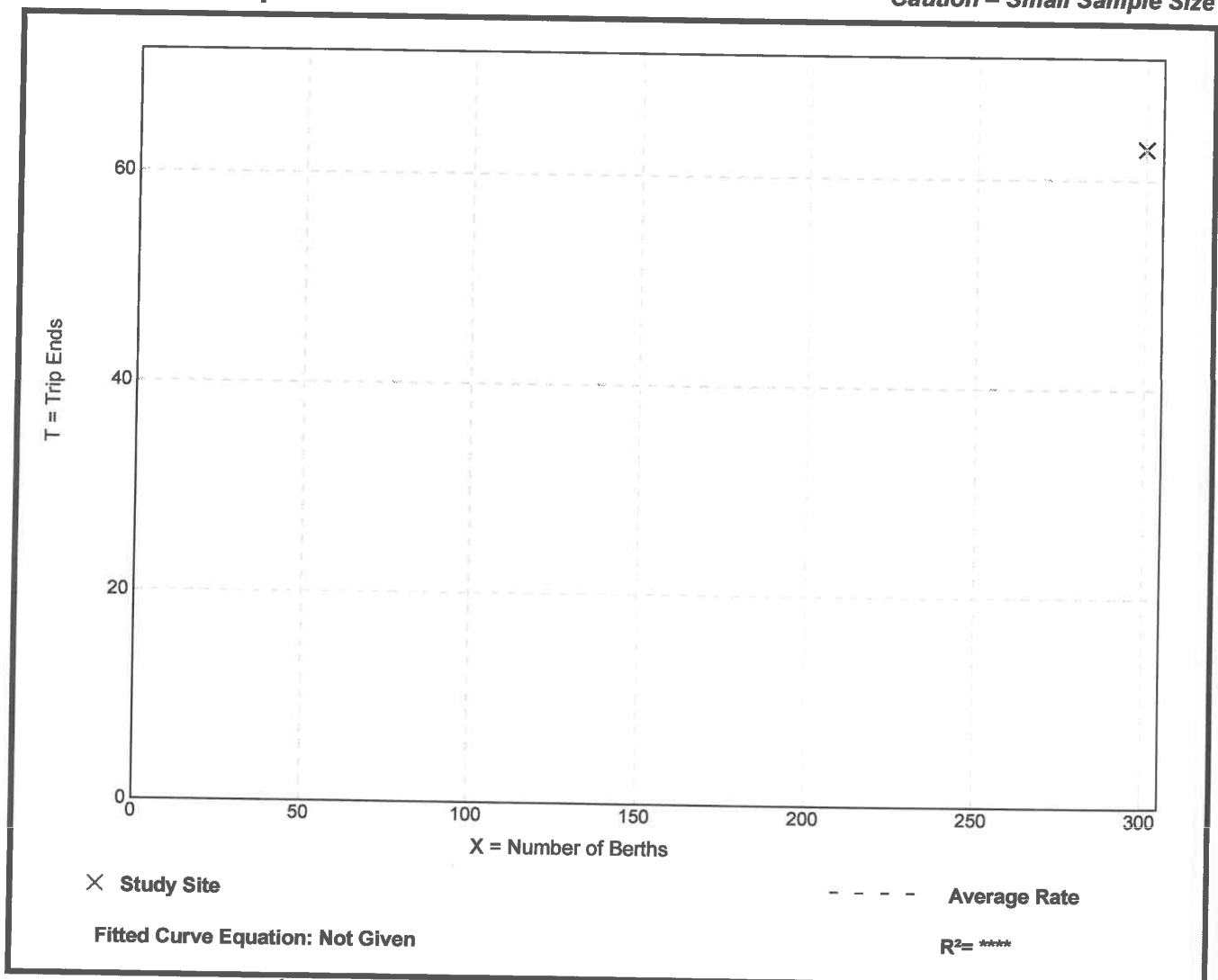
Vehicle Trip Ends vs: Berths
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 1
 Avg. Num. of Berths: 300
 Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per Berth

Average Rate	Range of Rates	Standard Deviation
0.21	0.21 - 0.21	*

Data Plot and Equation

Caution – Small Sample Size



Marina (420)

Vehicle Trip Ends vs: Berths
On a: Weekday,
PM Peak Hour of Generator

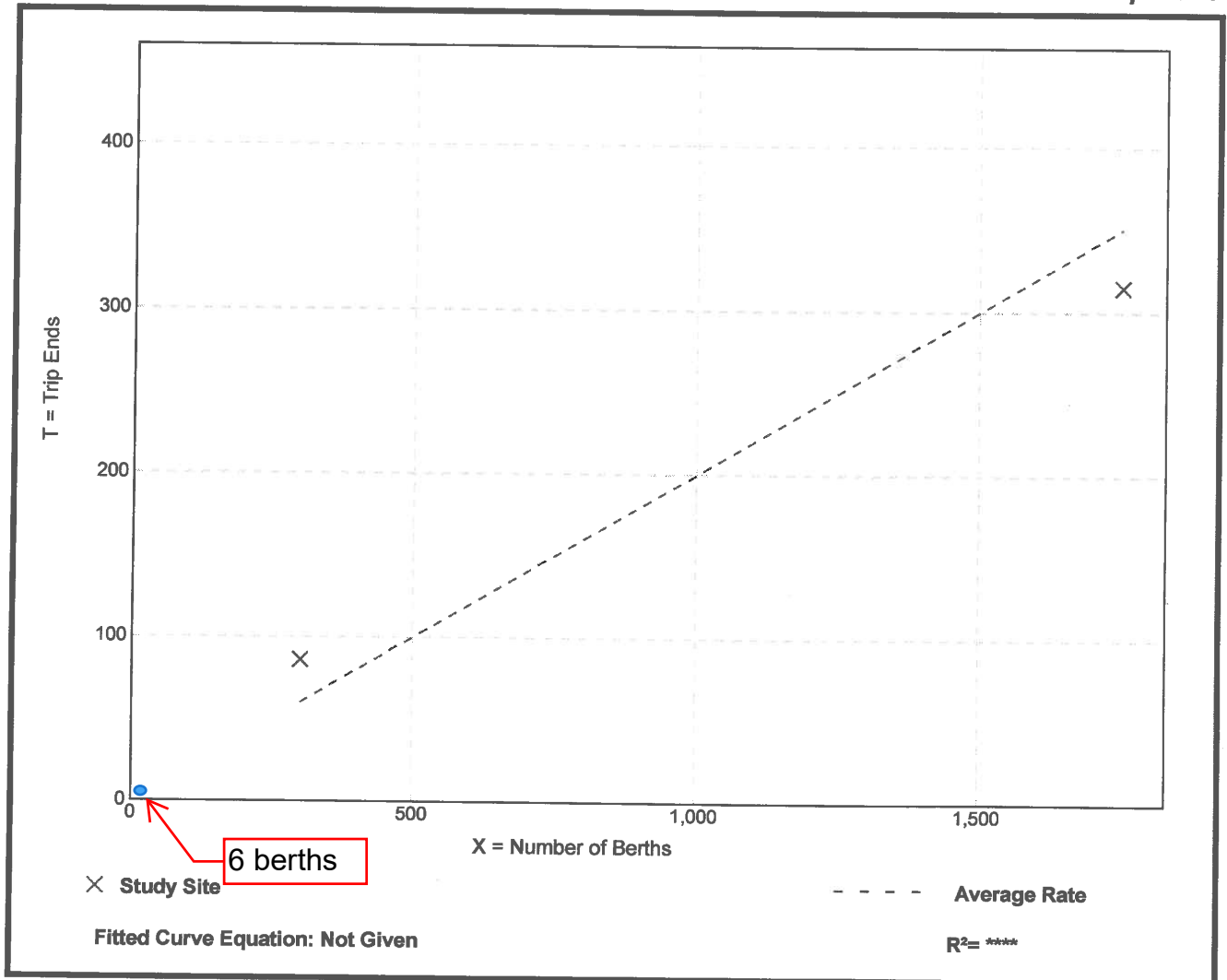
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. Num. of Berths: 1027
Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per Berth

Average Rate	Range of Rates	Standard Deviation
0.20	0.18 - 0.29	*

Data Plot and Equation

Caution – Small Sample Size





WASHINGTON STATE

Joint Aquatic Resources Permit Application (JARPA) Form^{1,2} [\[help\]](#)

USE BLACK OR BLUE INK TO ENTER ANSWERS IN THE WHITE SPACES BELOW.

PL-SEPA-18-0013
MDNS
REFERENCE 7



US Army Corps
of Engineers®
Seattle District

AGENCY USE ONLY

Date received:

Agency reference #: _____

Tax Parcel #(s): _____

Part 1—Project Identification

1. Project Name (A name for your project that you create. Examples: Smith's Dock or Seabrook Lane Development) [\[help\]](#)

Community Paddler's Dock

Part 2—Applicant

The person and/or organization responsible for the project. [\[help\]](#)

2a. Name (Last, First, Middle)

Langhelm, Jeff

2b. Organization (If applicable)

City of Gig Harbor

2c. Mailing Address (Street or PO Box)

3510 Grandview Street

2d. City, State, Zip

Gig Harbor, WA 98335

2e. Phone (1)

2f. Phone (2)

2g. Fax

2h. E-(mail

(253) 853-8253

langhelmJ@cityofgigharbor.net

¹Additional forms may be required for the following permits:

- If your project may qualify for Department of the Army authorization through a Regional General Permit (RGP), contact the U.S. Army Corps of Engineers for application information (206) 764-3495.
- If your project might affect species listed under the Endangered Species Act, you will need to fill out a Specific Project Information Form (SPIF) or prepare a Biological Evaluation. Forms can be found at <http://www.nws.usace.army.mil/Missions/CivilWorks/Regulatory/PermitGuidebook/EndangeredSpecies.aspx>.
- Not all cities and counties accept the JARPA for their local Shoreline permits. If you need a Shoreline permit, contact the appropriate city or county government to make sure they accept the JARPA.

²To access an online JARPA form with [help] screens, go to

http://www.epermitting.wa.gov/site/alias_resourcecenter/jarpa_jarpa_form/9984/jarpa_form.aspx.

For other help, contact the Governor's Office for Regulatory Innovation and Assistance at (800) 917-0043 or help@oria.wa.gov.

Part 3—Authorized Agent or Contact

Person authorized to represent the applicant about the project. (Note: Authorized agent(s) must sign 11b of this application.) [\[help\]](#)

3a. Name (Last, First, Middle)			
Foster, Nicole			
3b. Organization (If applicable)			
Davido Consulting Group			
3c. Mailing Address (Street or PO Box)			
9706 4th Ave NE #300			
3d. City, State, Zip			
Seattle, WA 98115			
3e. Phone (1)	3f. Phone (2)	3g. Fax	3h. E-mail
(206) 523-0024 x144			nicole@dcgengr.com

Part 4—Property Owner(s)

Contact information for people or organizations owning the property(ies) where the project will occur. Consider both **upland and aquatic** ownership because the upland owners may not own the adjacent aquatic land. [\[help\]](#)

- ☒ Same as applicant. (Skip to Part 5.)
- ☐ Repair or maintenance activities on existing rights-of-way or easements. (Skip to Part 5.)
- ☐ There are multiple upland property owners. Complete the section below and fill out [JARPA Attachment A](#) for each additional property owner.
- ☒ Your project is on Department of Natural Resources (DNR)-managed aquatic lands. If you don't know, contact the DNR at (360) 902-1100 to determine aquatic land ownership. If yes, complete [JARPA Attachment E](#) to apply for the Aquatic Use Authorization.

4a. Name (Last, First, Middle)			
4b. Organization (If applicable)			
4c. Mailing Address (Street or PO Box)			
4d. City, State, Zip			
4e. Phone (1)	4f. Phone (2)	4g. Fax	4h. E-mail

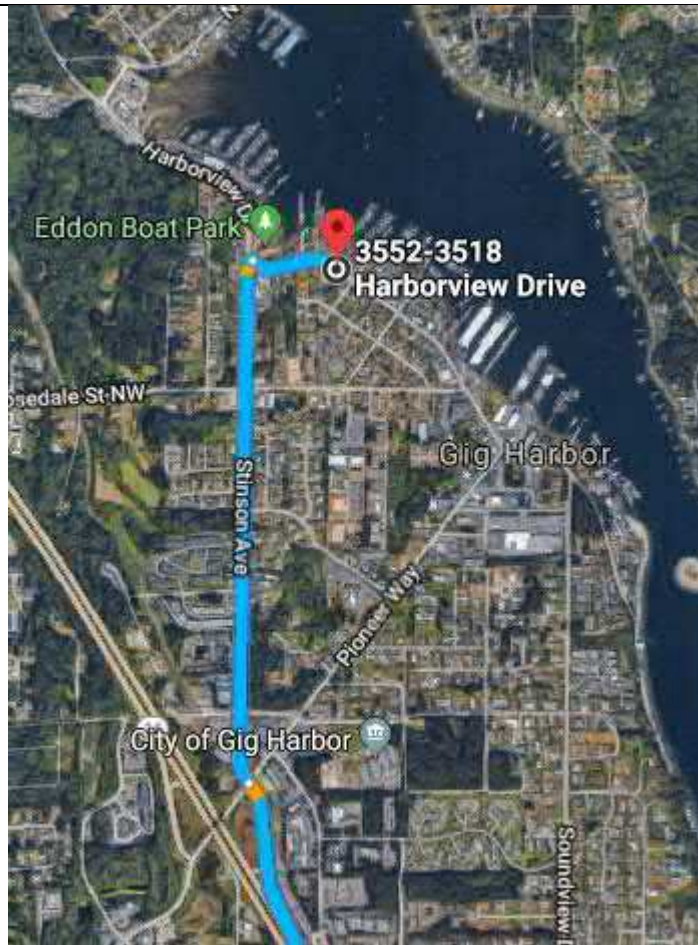
Part 5–Project Location(s)

Identifying information about the property or properties where the project will occur. [\[help\]](#)

- ☐ There are multiple project locations (e.g. linear projects). Complete the section below and use [JARPA Attachment B](#) for each additional project location.

5a. Indicate the type of ownership of the property. (Check all that apply.) [help]			
☐ Private			
☐ Federal			
☒ Publicly owned (state, county, city, special districts like schools, ports, etc.)			
☐ Tribal			
☒ Department of Natural Resources (DNR) – managed aquatic lands (Complete JARPA Attachment E)			
5b. Street Address (Cannot be a PO Box. If there is no address, provide other location information in 5p.) [help]			
3525 Harborview Drive			
5c. City, State, Zip (If the project is not in a city or town, provide the name of the nearest city or town.) [help]			
Gig Harbor, WA 98332			
5d. County [help]			
Pierce			
5e. Provide the section, township, and range for the project location. [help]			
¼ Section	Section	Township	Range
	5	21	02
5f. Provide the latitude and longitude of the project location. [help]			
• Example: 47.03922 N lat. / -122.89142 W long. (Use decimal degrees - NAD 83)			
47.333 N / -122.586 W			
5g. List the tax parcel number(s) for the project location. [help]			
• The local county assessor's office can provide this information.			
5970000244			
5h. Contact information for all adjoining property owners. (If you need more space, use JARPA Attachment C.) [help]			
Name	Mailing Address		Tax Parcel # (if known)
RIGHT-OF-WAY	HARBORVIEW DRIVE		
DNR TIDELANDS			
TARABOCHIA DOMINICK J JR & ANCICH LLC	3309 56TH ST NW STE 107 GIG HARBOR WA 98335-8580		0221053114 & 0221053113
MULLAN LLC	PO BOX 7605 TACOMA WA 98417		5970000215
BERG CAROLYN S	3526 HARBORVIEW DR GIG HARBOR WA 98332-2128		5970000230

5i. List all wetlands on or adjacent to the project location. [help]
None. Two wetlands were filled in per NWS-2016-733.
5j. List all waterbodies (other than wetlands) on or adjacent to the project location. [help]
Gig Harbor
5k. Is any part of the project area within a 100-year floodplain? [help]
☒ Yes ☐ No ☐ Don't know
5l. Briefly describe the vegetation and habitat conditions on the property. [help]
Upland: Upland vegetation will consists of a City maintained vegetated buffer along a concrete vertical bulkhead following completion of NWS-2016-733. At present, upland vegetation present is per the agreement of NWS-2016-733. Tidal: Macroalgal habitat is sparse and dominated by <i>Enteromorpha</i> spp. and <i>Ulva</i> spp. <i>Fucus</i> sp. is also present. There was no eelgrass or kelp observed in the surveyed area.
5m. Describe how the property is currently used. [help]
The primary uses of the site is a waterfront park which includes a working netshed for the fishing fleet and public watercraft storage. The site is listed by in the Gig Harbor Shoreline Master Program as Historic, Working Waterfront.
5n. Describe how the adjacent properties are currently used. [help]
The property to the west is a single family home. The property to the east is a single family home with a private floating dock.
5o. Describe the structures (above and below ground) on the property, including their purpose(s) and current condition. [help]
The Ancich Brother's Pier and historic netshed is in the northwest corner of the property atop a new pier. On the eastern edge of the property is the South Ancich Pier, on which the Jerkovich family has a 10' easement across the property to access the Jerkovich's private floating docks.
5p. Provide driving directions from the closest highway to the project location, and attach a map. [help]
1. From WA-16 W take the Wollochet Dr. NW exit toward City Center 2. Continue straight onto Stinson Ave. 3. Turn right onto Harborview Dr. 4. Destination will be on the left



Part 6–Project Description

6a. Briefly summarize the overall project. You can provide more detail in 6b. [\[help\]](#)

The City of Gig harbor has recently constructed Ancich Park's boat storage building (Corps No. NWS-2016-733) and is now proposing to replace a portion of the neighbor's pier with a public, ADA accessible gangway and floats for launching human powered watercrafts.

6b. Describe the purpose of the project and why you want or need to perform it. [\[help\]](#)

Ancich park is classified as working waterfront with water dependent uses in the City shoreline code. Resolution 949 by the City Council directed that launching small personal craft be accommodated at a facility not shared by commercial or motorized recreational vehicles at this site. Human powered water craft require launching from low freeboard floats in adequate water depths as proposed.

6c. Indicate the project category. (Check all that apply) [\[help\]](#)

- | | | | | |
|--------------------------------------|--|--|---|--|
| ☐ Commercial | ☐ Residential | ☐ Institutional | ☐ Transportation | ☒ Recreational |
| ☐ Maintenance | ☐ Environmental Enhancement | | | |

6d. Indicate the major elements of your project. (Check all that apply) [\[help\]](#)

- | | | | |
|---|---|--|--|
| ☐ Aquaculture | ☐ Culvert | ☒ Float | ☐ Retaining Wall (upland) |
| ☐ Bank Stabilization | ☐ Dam / Weir | ☐ Floating Home | ☐ Road |
| ☐ Boat House | ☐ Dike / Levee / Jetty | ☐ Geotechnical Survey | ☐ Scientific Measurement Device |
| ☒ Boat Launch | ☐ Ditch | ☐ Land Clearing | |

☐ Boat Lift	☒ Dock / Pier	☐ Marina / Moorage	☐ Stairs
☐ Bridge	☐ Dredging	☐ Mining	☐ Stormwater facility
☐ Bulkhead	☐ Fence	☐ Outfall Structure	☐ Swimming Pool
☐ Buoy	☐ Ferry Terminal	☒ Piling/Dolphin	☐ Utility Line
☐ Channel Modification	☐ Fishway	☐ Raft	

☐ Other:

6e. Describe how you plan to construct each project element checked in 6d. Include specific construction methods and equipment to be used. [\[help\]](#)

- Identify where each element will occur in relation to the nearest waterbody.
- Indicate which activities are within the 100-year floodplain.

The proposed project consists of the following elements:

- Demolition**
Removal of the existing gangway, floats, a finger float, and (14) 16-inch diameter creosote treated timber piles. Pile removal will be completed from a barge in the harbor using a vibratory hammer. All other structures will be removed from the site without the need for heavy equipment.
- Launch and Finger Float Installation**
(5) steel guide piles will be driven to keep the floating dock in place. Piles will be driven with a vibratory hammer as far as possible. They will then be driven to final depth with an impact hammer. (24) grounding posts will be installed beneath the corners of the specified float modules ensuring that they do not ground onto the seabed at low tides. Grounding posts will be installed by driving short segments of 12-inch (nominal) diameter steel pipe with a vibratory hammer. Grounding posts will be proofed with an impact hammer to verify bearing capacity. The crew will then lift and place precast panels, beams and top plates from the barge and weld or bolt onto the pile foundations. Float modules will be fabricated offsite, brought in via barge and splashed with the crane. They will be attached to the guide piles, over the grounding posts at a high tide. External pile hoops will bolt to the float modules.
- Gangway Installation**
An 80-foot gangway will be fabricated offsite, brought in via barge and lifted into position, connecting the fixed pier to the floating dock. Gangway connections will be installed without the need for heavy equipment.

6f. What are the anticipated start and end dates for project construction? (Month/Year) [\[help\]](#)

- If the project will be constructed in phases or stages, use [JARPA Attachment D](#) to list the start and end dates of each phase or stage.

Start Date: July 15, 2021 End Date: February 15, 2022 ☐ See JARPA Attachment D

6g. Fair market value of the project, including materials, labor, machine rentals, etc. [\[help\]](#)

\$500,000

6h. Will any portion of the project receive federal funding? [\[help\]](#)

- If yes, list each agency providing funds.

☐ Yes ☒ No ☐ Don't know

Part 7–Wetlands: Impacts and Mitigation

- ☐ Check here if there are wetlands or wetland buffers on or adjacent to the project area.
(If there are none, skip to Part 8.) [\[help\]](#)

7a. Describe how the project has been designed to avoid and minimize adverse impacts to wetlands. [\[help\]](#)

☒ Not applicable

7b. Will the project impact wetlands? [\[help\]](#)

☐ Yes ☐ No ☐ Don't know

7c. Will the project impact wetland buffers? [\[help\]](#)

☐ Yes ☐ No ☐ Don't know

7d. Has a wetland delineation report been prepared? [\[help\]](#)

- If Yes**, submit the report, including data sheets, with the JARPA package.

☐ Yes ☐ No

7e. Have the wetlands been rated using the Western Washington or Eastern Washington Wetland Rating System? [\[help\]](#)

- If Yes**, submit the wetland rating forms and figures with the JARPA package.

☐ Yes ☐ No ☐ Don't know

7f. Have you prepared a mitigation plan to compensate for any adverse impacts to wetlands? [\[help\]](#)

- If Yes**, submit the plan with the JARPA package and answer 7g.
- If No, or Not applicable**, explain below why a mitigation plan should not be required.

☐ Yes ☐ No ☐ Don't know

7g. Summarize what the mitigation plan is meant to accomplish, and describe how a watershed approach was used to design the plan. [\[help\]](#)

7h. Use the table below to list the type and rating of each wetland impacted, the extent and duration of the impact, and the type and amount of mitigation proposed. Or if you are submitting a mitigation plan with a similar table, you can state (below) where we can find this information in the plan. [\[help\]](#)

Activity (fill, drain, excavate, flood, etc.)	Wetland Name ¹	Wetland type and rating category ²	Impact area (sq. ft. or Acres)	Duration of impact ³	Proposed mitigation type ⁴	Wetland mitigation area (sq. ft. or acres)

¹ If no official name for the wetland exists, create a unique name (such as "Wetland 1"). The name should be consistent with other project documents, such as a wetland delineation report.
² Ecology wetland category based on current Western Washington or Eastern Washington Wetland Rating System. Provide the wetland rating forms with the JARPA package.
³ Indicate the days, months or years the wetland will be measurably impacted by the activity. Enter "permanent" if applicable.
⁴ Creation (C), Re-establishment/Rehabilitation (R), Enhancement (E), Preservation (P), Mitigation Bank/In-lieu fee (B)

Page number(s) for similar information in the mitigation plan, if available: _____

7i. For all filling activities identified in 7h, describe the source and nature of the fill material, the amount in cubic yards that will be used, and how and where it will be placed into the wetland. [\[help\]](#)

7j. For all excavating activities identified in 7h, describe the excavation method, type and amount of material in cubic yards you will remove, and where the material will be disposed. [\[help\]](#)

Part 8—Waterbodies (other than wetlands): Impacts and Mitigation

In Part 8, “waterbodies” refers to non-wetland waterbodies. (See Part 7 for information related to wetlands.) [\[help\]](#)

☒ Check here if there are waterbodies on or adjacent to the project area. (If there are none, skip to Part 9.)

8a. Describe how the project is designed to avoid and minimize adverse impacts to the aquatic environment. [\[help\]](#)

☐ Not applicable

The negative impacts resulting from this project are minor, temporary and associated with excavation and construction activity such as noise and turbidity, and are avoided by performing the work during the approved work window.

In order to avoid and minimize adverse impacts to the aquatic environment, the following Best Management Practices and construction measures will be employed to reduce the potential for construction-related impacts on species and their habitats.

1. Project will adhere to agency approved work windows so work occurs when few juvenile salmonids are present in the action area (July 15 - February 15).
2. If required by governing agencies, water quality monitoring will be conducted during excavation activities,
3. All manmade construction debris will be collected and not allowed to enter waters of the state.
4. If debris or spill material accidentally enters the waterway, immediate actions will be taken to remove the material.
5. All debris or spill material will be properly disposed of at an approved off-site disposal facility.
6. As piles are pulled from the sediments, they will be quickly placed upland to minimize potential releases of creosote, petroleum sheens, and turbidity to the waterway. Piles will be properly disposed of at an approved upland disposal facility.
7. Contractor will maintain a spill containment kit with floating sausage booms on site at all times.
8. A turbidity curtain surrounding the site (as shown in the drawings) will be deployed prior to start of construction to minimize potential water quality impacts.

The overall goal of the conceptual mitigation plan is to strive for a gain in environmental quality over present conditions. Mitigation will be provided through on-site habitat improvements including the following described in 8c.

8b. Will your project impact a waterbody or the area around a waterbody? [\[help\]](#)

☒ Yes ☐ No

8c. Have you prepared a mitigation plan to compensate for the project’s adverse impacts to non-wetland waterbodies? [\[help\]](#)

- If Yes, submit the plan with the JARPA package and answer 8d.
- If No, or Not applicable, explain below why a mitigation plan should not be required.

☒ Yes ☐ No ☐ Don’t know

1. Creosote-Treated Piles

The project will remove (14) 16-inch diameter creosote timber piles.

2. Beach Cleanup

The city also proposes to remove concrete debris from the beach north west of Eddon Boat Park. The approximately 2,000 square feet of debris was identified during the initial mitigation proposal for NWS-2016-733.

3. Intertidal Shading

All solid decking will be removed and replaced with grated decking.

4. Float Grounding Prevention

The existing floats are very shallow and ground at low tides. With the complete removal of the shallowest floats and installation of the grounding posts, all grounding and therefore impacts to the seabed will be greatly reduced.

8d. Summarize what the mitigation plan is meant to accomplish. Describe how a watershed approach was used to design the plan.

- If you already completed 7g you do not need to restate your answer here. [\[help\]](#)

The overall goal of the conceptual mitigation plan is to improve habitat function and to strive for a net resource gain over present conditions.

8e. Summarize impact(s) to each waterbody in the table below. [\[help\]](#)

Activity (clear, dredge, fill, pile drive, etc.)	Waterbody name ¹	Impact location ²	Duration of impact ³	Amount of material (cubic yards) to be placed in or removed from waterbody	Area (sq. ft. or linear ft.) of waterbody directly affected
--	-----------------------------	------------------------------	---------------------------------	--	---

OVERWATER COVERAGE

Walkway Floats and 1 Finger Float Demo	Gig Harbor	In-water	Permanent	N/A	997 SF (solid decking)
Gangway Demo	Gig Harbor	In-water	Permanent	N/A	99 SF (grated decking) (Area not including overlap with float)
Total Square Footage of Demolition					1,096 SF
Gangway Installation	Gig Harbor	In-water	Permanent	N/A	490 SF (grating 45% net open area) (Area not including overlap with float)
Installation of Walkway Floats, 2 Finger Floats, and Transition	Gig Harbor	In-water	Permanent	N/A	1,124 SF (grating 45% net open area)
Total Square Footage of Installation					1,614 SF
NET CHANGE IN OVERWATER COVERAGE					+518 SF

PILES

12-inch Creosote Treated Timber Pile Removal	Gig Harbor	In-water	Permanent	N/A	14 full length piles
12-inch Steel Pile Installation	Gig Harbor	In-water	Permanent	N/A	5 full length guide piles and 24 grounding posts
NET CHANGE IN NUMBER OF PILES					+15 piles

¹ If no official name for the waterbody exists, create a unique name (such as "Stream 1") The name should be consistent with other documents provided.

² Indicate whether the impact will occur in or adjacent to the waterbody. If adjacent, provide the distance between the impact and the waterbody and indicate whether the impact will occur within the 100-year flood plain.

³ Indicate the days, months or years the waterbody will be measurably impacted by the work. Enter "permanent" if applicable.

8f. For all activities identified in 8e, describe the source and nature of the fill material, amount (in cubic yards) you will use, and how and where it will be placed into the waterbody. [\[help\]](#)

No fill is proposed.

8g. For all excavating or dredging activities identified in 8e, describe the method for excavating or dredging, type and amount of material you will remove, and where the material will be disposed. [\[help\]](#)

No excavation or dredging is proposed.

Part 9—Additional Information

Any additional information you can provide helps the reviewer(s) understand your project. Complete as much of this section as you can. It is ok if you cannot answer a question.

9a. If you have already worked with any government agencies on this project, list them below. [\[help\]](#)

Agency Name	Contact Name	Phone	Most Recent Date of Contact
City of Gig Harbor	Kimberly Mahoney	(253) 853-8253	November 2020
WDFW	Matt Curtis	(360) 902-2578	February 2018
USACE	Halie Endicott	(206) 764-6848	July 2020
DNR	Hannah Blackstock	(206) 909-1304	August 2018

9b. Are any of the wetlands or waterbodies identified in Part 7 or Part 8 of this JARPA on the Washington Department of Ecology's 303(d) List? [\[help\]](#)

- If **Yes**, list the parameter(s) below.
- If you don't know, use Washington Department of Ecology's Water Quality Assessment tools at: <https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-improvement/Assessment-of-state-waters-303d>.

☐ Yes ☒ No

9c. What U.S. Geological Survey Hydrological Unit Code (HUC) is the project in? [\[help\]](#)

- Go to <http://cfpub.epa.gov/surf/locate/index.cfm> to help identify the HUC.

Puget Sound Watershed - 17110019

9d. What Water Resource Inventory Area Number (WRIA #) is the project in? [\[help\]](#)

- Go to <https://ecology.wa.gov/Water-Shorelines/Water-supply/Water-availability/Watershed-look-up> to find the WRIA #.

15 – Kitsap

9e. Will the in-water construction work comply with the State of Washington water quality standards for turbidity? [\[help\]](#)

- Go to <https://ecology.wa.gov/Water-Shorelines/Water-quality/Freshwater/Surface-water-quality-standards/Criteria> for the standards.

☒ Yes ☐ No ☐ Not applicable

9f. If the project is within the jurisdiction of the Shoreline Management Act, what is the local shoreline environment designation? [\[help\]](#)

- If you don't know, contact the local planning department.
- For more information, go to: <https://ecology.wa.gov/Water-Shorelines/Shoreline-coastal-management/Shoreline-coastal-planning/Shoreline-laws-rules-and-cases>.

☒ Urban ☐ Natural ☐ Aquatic ☐ Conservancy ☐ Other:

9g. What is the Washington Department of Natural Resources Water Type? [help] Go to http://www.dnr.wa.gov/forest-practices-water-typing for the Forest Practices Water Typing System.
☒ Shoreline ☐ Fish ☐ Non-Fish Perennial ☐ Non-Fish Seasonal
9h. Will this project be designed to meet the Washington Department of Ecology's most current stormwater manual? [help] If No, provide the name of the manual your project is designed to meet.
☒ Yes ☐ No
Name of manual: _____
9i. Does the project site have known contaminated sediment? [help] If Yes, please describe below.
☐ Yes ☒ No
9j. If you know what the property was used for in the past, describe below. [help]
The site was privately owned by the Ancich family and was a mooring point for fishing vessels.
9k. Has a cultural resource (archaeological) survey been performed on the project area? [help] If Yes, attach it to your JARPA package.
☒ Yes ☐ No
Completed for NWS-2016-733.
9l. Name each species listed under the federal Endangered Species Act that occurs in the vicinity of the project area or might be affected by the proposed work. [help]
1. Puget Sound Chinook (<i>Oncorhynchus tshawytscha</i>) 2. Puget Sound steelhead trout (<i>Oncorhynchus mykiss</i>) 3. Coastal-Puget Sound bull trout (<i>Salvelinus confluentus</i>) 4. Georgia Basin bocaccio (<i>Sebastes paucispinis</i>) 5. Georgia Basin yelloweye rockfish (<i>Sebastes ruberrimus</i>) 6. Georgia Basin canary rockfish (<i>Sebastes pinniger</i>) 7. Marbled murrelet (<i>Brachyramphus marmoratus</i>) 8. Southern resident killer whale (<i>Orca orcinus</i>) 9. Humpback whale (<i>Megaptera novaeangliae</i>)
9m. Name each species or habitat on the Washington Department of Fish and Wildlife's Priority Habitats and Species List that might be affected by the proposed work. [help]
Priority Habitats Include: 1. Estuarine and Marine Wetland 2. Estuarine Zone Priority Species include: 1. Resident Coastal Cutthroat (<i>Oncorhynchus clarki</i>) 2. Steelhead and Winter Steelhead (<i>Oncorhynchus mykiss</i>) 3. Fall Chum (<i>Oncorhynchus keta</i>) 4. Coho (<i>Oncorhynchus kisutch</i>)

Use the resources and checklist below to identify the permits you are applying for.

- Online Project Questionnaire at <http://apps.oria.wa.gov/opas/>.
- Governor's Office for Regulatory Innovation and Assistance at (800) 917-0043 or help@oria.wa.gov.
- For a list of addresses to send your JARPA to, click on [agency addresses for completed JARPA](#).

10a. Compliance with the State Environmental Policy Act (SEPA). (Check all that apply.) [\[help\]](#)

- For more information about SEPA, go to <https://ecology.wa.gov/regulations-permits/SEPA-environmental-review>.

☐ A copy of the SEPA determination or letter of exemption is included with this application.

☒ A SEPA determination is pending with the City of Gig Harbor (lead agency). The expected decision date is TBD.

☐ I am applying for a Fish Habitat Enhancement Exemption. (Check the box below in 10b.) [\[help\]](#)

☐ This project is exempt (choose type of exemption below).

☐ Categorical Exemption. Under what section of the SEPA administrative code (WAC) is it exempt?

☐ Other: _____

☐ SEPA is pre-empted by federal law.

10b. Indicate the permits you are applying for. (Check all that apply.) [\[help\]](#)

LOCAL GOVERNMENT

Local Government Shoreline permits:

☒ Substantial Development ☐ Conditional Use ☐ Variance

☐ Shoreline Exemption Type (explain): _____

Other City/County permits:

☒ Floodplain Development Permit ☒ Critical Areas Ordinance

STATE GOVERNMENT

Washington Department of Fish and Wildlife:

☒ Hydraulic Project Approval (HPA) ☐ Fish Habitat Enhancement Exemption – [Attach Exemption Form](#)

Washington Department of Natural Resources:

☒ Aquatic Use Authorization

Complete [JARPA Attachment E](#) and submit a check for \$25 payable to the Washington Department of Natural Resources.

Do not send cash.

Washington Department of Ecology:

☐ Section 401 Water Quality Certification

FEDERAL GOVERNMENT

United States Department of the Army permits (U.S. Army Corps of Engineers):

☐ Section 404 (discharges into waters of the U.S.) ☒ Section 10 (work in navigable waters)

United States Coast Guard permits:

☐ General Bridge Act Permit

☐ Private Aids to Navigation (for non-bridge projects)

Part 11—Authorizing Signatures

Signatures are required before submitting the JARPA package. The JARPA package includes the JARPA form, project plans, photos, etc. [\[help\]](#)

11a. Applicant Signature (required) [\[help\]](#)

I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities, and I agree to start work only after I have received all necessary permits.

I hereby authorize the agent named in Part 3 of this application to act on my behalf in matters related to this application. JS (initial)

By initialing here, I state that I have the authority to grant access to the property. I also give my consent to the permitting agencies entering the property where the project is located to inspect the project site or any work related to the project. JS (initial)

Jeff Langhelm

Applicant Printed Name

[Signature]
Applicant Signature

11/16/2020
Date

11b. Authorized Agent Signature [\[help\]](#)

I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities and I agree to start work only after all necessary permits have been issued.

Nicole Foster

Authorized Agent Printed Name

Nicole
Foster

Authorized Agent Signature

Digitally signed by Nicole Foster
DN: cn=Nicole Foster, c=US, o=David
Consulting Group,
email=nicole@dcgengr.com
Reason: I have reviewed this document
Location: DCG
Date: 2020.11.18 07:56:05 -06'00'

Date

11c. Property Owner Signature (if not applicant) [\[help\]](#)

Not required if project is on existing rights-of-way or easements (provide copy of easement with JARPA).

I consent to the permitting agencies entering the property where the project is located to inspect the project site or any work. These inspections shall occur at reasonable times and, if practical, with prior notice to the landowner.

Property Owner Printed Name

Property Owner Signature

Date

18 U.S.C §1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious, or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious, or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than 5 years or both.

If you require this document in another format, contact the Governor's Office for Regulatory Innovation and Assistance (ORIA) at (800) 917-0043. People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call (877) 833-6341. ORIA publication number: ORIA-16-011 rev. 07/2017



WASHINGTON STATE
Joint Aquatic Resources Permit
Application (JARPA) [\[help\]](#)



US Army Corps
of Engineers
Seattle District

AGENCY USE ONLY

Date received: _____; ☐ Town
☐ Application Fee Received; ☐ Fee N/A
☐ New Application; ☐ Renewal Application
Type/Prefix #: _____; NaturE Use Code: _____
LM Initials & BP#: _____
RE Assets Finance BP#: _____
New Application Number: _____
Trust(s): _____; County: _____
AQR Plate #(s): _____
Gov Lot #(s): _____
Tax Parcel #(s): _____

Attachment E:
Aquatic Use Authorization on
Department of Natural Resources
(DNR)-managed aquatic lands [\[help\]](#)

Complete this attachment and submit it with the completed JARPA form only if you are applying for an Aquatic Use Authorization with DNR. Call (360) 902-1100 or visit <http://www.dnr.wa.gov/programs-and-services/aquatics/leasing-and-land-transactions> for more information.

- DNR recommends you discuss your proposal with a DNR land manager before applying for regulatory permits. Contact your regional land manager for more information on potential permit and survey requirements. You can find your regional land manager by calling (360) 902-1100 or going to <http://www.dnr.wa.gov/programs-and-services/aquatics/aquatic-districts-and-land-managers-map>. [\[help\]](#)
- The applicant may not begin work on DNR-managed aquatic lands until DNR grants an Aquatic Use Authorization.
- Include a \$25 non-refundable application processing fee, payable to the "Washington Department of Natural Resources." (Contact your Land Manager to determine if and when you are required to pay this fee.) [\[help\]](#)

DNR may reject the application at any time prior to issuing the applicant an Aquatic Use Authorization. [\[help\]](#)

Use black or blue ink to enter answers in white spaces below.

1. Applicant Name (Last, First, Middle)	
Langhelm, Jeff	
2. Project Name (A name for your project that you create. Examples: Smith's Dock or Seabrook Lane Development) [help]	
Community Paddler's Dock	
3. Phone Number and Email	
(253) 853-8253, LanghelmJ@cityofgigharbor.net	
4. Which of the following applies to Applicant? Check one and, if applicable, attach the written authority – bylaws, power of attorney, etc. [help]	
☐ Corporation ☐ Limited Partnership ☐ General Partnership ☐ Limited Liability Company Home State of Registration: _____	☐ Individual ☐ Marital Community (Identify spouse): _____ ☒ Government Agency ☐ Other (Please Explain): _____

5. Washington UBI (Unified Business Identifier) number, if applicable: [help]
6. Are you aware of any existing or previously expired Aquatic Use Authorizations at the project location?
☒ Yes ☐ No ☐ Don't know If Yes, Authorization number(s): <u>22-A02571</u>
7. Do you intend to sublease the property to someone else?
☐ Yes ☒ No If Yes, contact your Land Manager to discuss subleasing.
8. If fill material was used previously on DNR-managed aquatic lands, describe below the type of fill material and the purpose for using it. [help]
N/A

To be completed by DNR and a copy returned to the applicant.

Signature for projects on DNR-managed aquatic lands:

Applicant must obtain the signature of DNR Aquatics District Manager OR Assistant Division Manager if the project is located on DNR-managed aquatic lands.

I, a designated representative of the Dept. of Natural Resources, am aware that the project is being proposed on Dept. of Natural Resources-managed aquatic lands and agree that the applicant or his/her representative may pursue the necessary regulatory permits. My signature does not authorize the use of DNR-managed aquatic lands for this project.

Printed Name

Dept. of Natural Resources
District Manager or Assistant Division Manager

Signature

Dept. of Natural Resources
District Manager or Assistant Division Manager

Date

If you require this document in another format, contact the Governor's Office for Regulatory Innovation and Assistance (ORIA) at (800) 917-0043. People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call (877) 833-6341. ORIA Publication ORIA-16-016 rev. 10/2016

CULTURAL RESOURCES REPORT COVER SHEET

Author: Schultze, C. and C. Beckner

Title of Report: Draft – Cultural Resources Inventory for the Ancich Park
Redevelopment Project, Gig Harbor, Pierce County, Washington

Date of Report: June 2016

County(ies): Pierce Section: 5 Township: 21N Range: 02E

Quad: Gig Harbor Acres: 1.25

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Inventory Forms to be Approved Online? ☒ Yes ☐ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☐ Yes ☒ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes # ☒ No

Were Human Remains Found? ☐ Yes DAHP Case # ☒ No

DAHP Archaeological Site #:
None

- Submission of PDFs is required.
- Please be sure that any PDF submitted to DAHP has its cover sheet, figures, graphics, appendices, attachments, correspondence, etc., compiled into one single PDF file.
- Please check that the PDF displays correctly when opened.

DRAFT—Cultural Resources Inventory for the
Ancich Park Redevelopment Project,
Gig Harbor, Pierce County, Washington

Submitted to:
PND Engineers, Inc.

Submitted by:
Historical Research Associates, Inc.
Carol Schultze, PhD, RPA
Chrisanne Beckner, MS

Seattle, Washington
June 2016



HISTORICAL
RESEARCH
ASSOCIATES, INC.

This report was prepared by HRA Archaeologist Carol Schultze, PhD, RPA, who meet the Secretary of the Interior's professional qualifications standards for archaeology, and Chrisanne Beckner, MS, who meets the Secretary of the Interior's professional qualifications standards for architectural history. This report is intended for the exclusive use of the Client and its representatives. It contains professional conclusions and recommendations concerning the potential for project-related impacts to archaeological resources based on the results of HRA's investigation. It should not be considered to constitute project clearance with regard to the treatment of cultural resources or permission to proceed with the project described in lieu of review by the appropriate reviewing or permitting agency. This report should be submitted to the appropriate state and local review agencies for their comments prior to the commencement of the project.

Executive Summary

The City of Gig Harbor (City) and PND Engineers, Inc. (PND), are proposing the Ancich Park Redevelopment Project (Project). This project will develop the existing park consistent with community vision at the Ancich pier along Harborview Drive in Gig Harbor, Pierce County, Washington. The Project is located in Section 5 of Township 21 North, Range 02 East, Willamette Meridian.

Elements of the Project fall under different regulatory contexts, federal cultural resource compliance and state cultural resource compliance. Work to be undertaken in-water, defined as below the mean high-tide line, requires Section 404 permitting under the Clean Water Act (CWA) issued by the United States Army Corps of Engineers (USACE); the Project is defined as a federal undertaking and must comply with Section 106 of the National Historic Preservation Act (NHPA). Work in the upland, defined as above the mean high-tide line, does not require federal permitting and will instead comply with the State Environmental Policy Act (SEPA), as well as Governor's Executive Order 05-05 (EO 05-05).

PND contracted Historical Research Associates, Inc. (HRA), to conduct archival research and archaeological fieldwork. Archival research identified an ethnographically reported Native American village within 0.5 mile of the proposed Project. Additionally, HRA conducted an architectural evaluation of the Ancich Brothers net shed and pier, which will be rehabilitated as part of the proposed Project. HRA recommends that the net shed and pier are eligible for listing in the National Register of Historic Places (NRHP) and Washington Heritage Register (WHR) under Criteria A for their association with a Croatian purse seining fishing community in Gig Harbor. The net shed is also eligible under Criterion C as a good example of a rare resource type. The Project will replace the deteriorated pier on which the net shed sits with in-kind materials that match the present dimensions and retrofit the net shed to avoid further deterioration. The Project, as proposed, appears to meet the Secretary of the Interior's Standards for Rehabilitation, and HRA recommends a finding of no adverse effect (NPS 2016).

The archaeological inventory included surface and subsurface survey and identified an upper layer of disturbed fill containing construction materials likely associated with the demolition of a house, identified as the Castelan property, that was located along the eastern edge of the lot until the 1990s. These materials included a square nail but were otherwise out of context and not recorded as an archaeological site or isolate. Other materials identified were either modern or temporally nondiagnostic. The sediment directly beneath the disturbed fill was a grey and orange mottled clay

interpreted to be sterile glacio-lacustrine material. Due to the depth of the proposed disturbance and the sensitivity of the surrounding cultural environment, HRA recommends archaeological monitoring (or spot checking) during the deepest proposed excavations and/or archaeological review of geoprobe samples.

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1. Introduction and Project Description

The City of Gig Harbor (City) and PND Engineers, Inc. (PND), are proposing the Ancich Park Redevelopment Project (Project). This project will develop the existing park consistent with community vision at the Ancich pier along Harborview Drive in Gig Harbor, Pierce County, Washington. The Project is located in Section 5 of Township 21 North, Range 02 East, Willamette Meridian, and is depicted on the United States Geological Survey (USGS) 7.5 minute Gig Harbor topographic quadrangle map (Figure 1-1). PND contracted Historical Research Associates, Inc. (HRA), to carry out a cultural resources inventory for the Project, the results of which form the body of this report.

The Project will involve landscaping and facilities improvement at the Ancich dock location. Project elements include:

1. **Earthwork necessary to regrade the park** - ground disturbance associated with this activity is anticipated to reach up to 10 feet below current ground surface.
2. **New pavement placement** - ground disturbance associated with this activity is anticipated to reach between 15 and 20 feet below current ground surface.
3. **Landscaping** - ground disturbance associated with this activity is anticipated to reach up to 1 foot below current ground surface.
4. **Potable water and electrical utility installation** - ground disturbance associated with this activity is anticipated to reach up to 4 feet below current ground surface.
5. **Restroom and viewpoint upland structure** - ground disturbance associated with this activity is anticipated to reach between 15 and 20 feet below current ground surface.
6. **Retrofit of Pier and Ancich Brothers Net Shed** - will have ground disturbance associated with structural piling replacement. Disturbance will be limited to removal of pilings and issues relating to rehabilitation of the net shed structure.
7. **Jerkovich Pier** - Work will include removal of the existing deck. Structural repairs and installation of a new timber deck. Steel grating will be used if required by WDFW, but the City does not prefer it. Structural work may include installation of a handful of steel piles adjacent to existing failing piles, but we hope to largely utilize the existing structure.

The Ancich Brothers net shed, which will be rehabilitated as part of the proposed Project, is listed in the Gig Harbor Register of Historic Properties and recorded in the Washington State Department of

Archaeology and Historic Preservation (DAHP)'s historic property inventory (HPI) database. However, DAHP has not made a determination of its eligibility for listing in the National Register of Historic Places (NRHP). In light of this, HRA carried out both an archaeological survey of the area subject to direct ground-disturbing activities, as well as an architectural evaluation of the net shed and pier for NRHP eligibility at an intensive level, according to DAHP standards.

The Jerkovich pier at 3525 Harborview Drive (parcel no. 5970000243) was constructed in 1969 and is not yet 50 years old—generally considered the minimum requirement for listing in the NRHP, the Washington Heritage Register, and the Gig Harbor Register of Historic Places, unless the resource is of exceptional significance. The pier does not appear to qualify for special consideration and is therefore not being reviewed at this time.

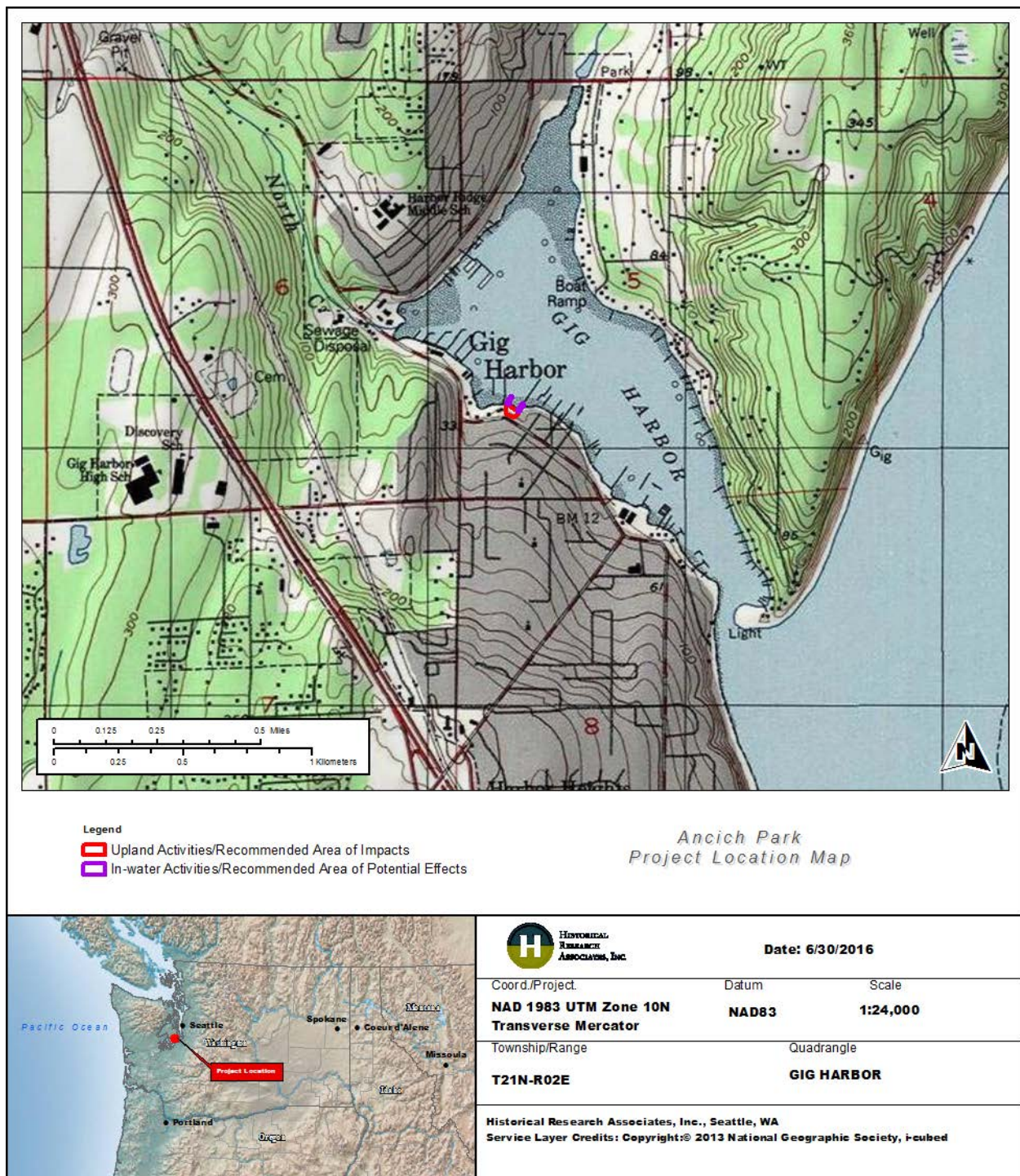


Figure 1-1. Project location and vicinity.

1.1 Regulatory Context

Different elements of the Project fall under different regulatory contexts. In-water (below the mean high-tide line) work requires Section 404 permitting under the Clean Water Act (CWA). It is defined as a federal undertaking and must comply with Section 106 of the National Historic Preservation Act (NHPA). The United States Corps of Engineers (USACE) is the lead agency for Section 106 compliance.

Upland (above the mean high tide line) work does not require federal permitting but must instead comply with the State Environmental Policy Act (SEPA) and Governor's Executive Order 05-05 (EO 05-05). The City of Gig Harbor will serve as the lead agency for SEPA compliance and EO 05-05 consultation. The upland work is also subject to Washington State regulations regarding the protection of Native American burials and archaeological sites under the Revised Code of Washington (RCW) 27.44 and 27.53, respectively.

1.2 Area of Potential Effects and Area of Impacts

The project area includes both in-water and upland components. In-water activities fall under USACE jurisdiction and are subject to Section 106; HRA recommends that the area of potential effects (APE) encompass all in-water activities. Upland activities fall under the City's jurisdiction and must comply with SEPA; HRA recommends that the SEPA area of impacts (AI) encompass all upland activities (Figure 1-2). The recommended APE and recommended AI together are referred to as the recommended AI/APE.

Project elements that will entail ground disturbance are described above (Section 1.0). The retrofit of the pier and net shed fall within the recommended APE. All other project elements are within the recommended AI.



Figure 1-2. Aerial photograph showing recommended APE and recommended AI.

2. Archival Research

2.1 Research Methods and Materials Reviewed

HRA archaeologist Carol Schultze, PhD, RPA, conducted an archival record search for records pertaining to locations within 0.5-mile (mi) of the recommended AI/APE. Schultze searched DAHP's online database (WISAARD) for archaeological site records, cultural resource survey reports, and cemetery records. Geological and soils data were obtained from web-based resources maintained by Washington State and the United States Department of Agriculture (USDA). A statewide archeological predictive model on DAHP's WISAARD was reviewed for probability estimates for archaeological resources, and to aid in developing the field strategy.

HRA architectural historian Chrisanne Beckner, MS, consulted historic maps, including the United States Surveyor General's General Land Office (USSG GLO) plats, topographical maps, and atlases to establish land use patterns over time. She reviewed county assessor's records for parcels within the recommended AI/APE and reviewed genealogical records, local histories, and archival resources within HRA's own libraries.

2.2 Archival Research Results

2.2.1 *Previous Cultural Resources Studies*

A total of twenty-two previous cultural resource studies have been carried out within 0.5 mi of the recommended AI/APE (Table 2-1). Four were public infrastructure projects (Berger and Hartmann 2008a; Diedrich and Hartmann 2012; Meter 2008; Schumacher 2007). Three were transportation corridor improvement projects (Berger and Hartman 2011; HRA 1998; Western Heritage 1989) and the remaining 15 were commercial development of privately held coastline and inland parcels (Berger and Hartmann 2007, 2008b, 2008c, 2008d; Daugherty and Kirk 2005, 2007; Forsman 2002; Gill et al. 2008; Neil and Baldwin 2008; Roedel and Larson 2002; Rooke and Scott 2010; Schumacher and Hartmann 2009; White et al. 2007). Many of the coastal projects involved refinement of the site boundaries for the village site 45PI102.

Importantly, Gill et al. 2008 performed an archaeological inventory project including the upland portions of the AI. Their survey revealed glacially deposited sediment near the surface and noted disturbance across the AI. These results will be verified in part by the present study but are used here to buttress HRA's field effort. Specifically, shovel probes 1-5 excavated by Gill et al. (2008) modern and temporally non-diagnostic materials and sediment indicative of relatively recent land clearing events.

Table 2-1. Cultural Resources Studies within 0.5 mi of the Project area

Reference	NADB#	Title	Distance from the recommended AI/APE (mi)	Cultural Materials Identified Within or Adjacent to the recommended AI/APE
Meteer 2008	1351844	<i>Archaeological Monitoring of the On-Shore Outfall and Foremain Project, Gig Harbor</i>	0.4 mi NE	None
Diedrich 2012	1682284	<i>Archaeological Monitoring for the Austin Creek Estuary, Gig Harbor</i>	0.3 mi NW	None
Berger and Hartmann 2008a	1350714	<i>Cultural Resources Assessment for the Outfall Extension Project, Gig Harbor</i>	0.25 mi NW	None
Schumacher 2007	1350462	<i>Cultural Resources Survey for Eddon Boatyard Sediment Cleanup, Gig Harbor</i>	0.2 mi SW	None
HRA 1998	1340366	<i>SR16/Tacoma Narrows Corridor Project Updated Cultural/ Archaeological</i>	0.5 mi W	None
Western Heritage 1989	1333682	<i>A Survey and Inventory of the Transmission Lines and a Cultural Overview of the Lake Cushman Hydroelectric Facilities in Mason County, Washington, Volume II</i>	0.5 mi NW	None
Berger and Hartmann 2011	1681562	<i>Phase II Archaeological Investigations for the Madison Shores Marina Project, Gig Harbor</i>	0.5 mi SE	None
Berger and Hartmann 2008b	1351216	<i>Phase II Archaeological Investigations for the Madison Shores Marina Project, Gig Harbor</i>	0.5 mi SE	None
Berger and Hartmann 2008c	1351303	<i>Cultural Resources Assessment for the Heritage Point Preliminary Plat (Parcels 0221031059 and 0221061060), at 4219 Harborview Drive</i>	0.4 mi NW	None
Berger and Hartmann 2008d	1350291	<i>Final Report: Initial Monitoring Results: Archaeological Investigations for the Harbor History Museum Project, Gig Harbor</i>	0.6 mi NW	None

Table 2-1. Cultural Resources Studies within 0.5 mi of the Project area

Reference	NADB#	Title	Distance from the recommended AI/APE (mi)	Cultural Materials Identified Within or Adjacent to the recommended AI/APE
Berger and Hartmann 2007	1350291	<i>INTERIM REPORT: Initial Monitoring Results: Archaeological Investigations for the Harbor History Museum Project, Gig Harbor</i>	0.6 mi NW	None
Forsman 2002	1340896	<i>Donkey Creek Park Cultural Resources Overview and Traditional Cultural Places Assessment, Gig Harbor</i>	0.3 mi NE	None
Daugherty and Kirk 2005	1349983	<i>Archaeological and Historical Survey of Henington Place Condominiums Property, Gig Harbor, Parcel 0221052009</i>	0.2 mi NW	None
Daugherty and Kirk 2007	1351385	<i>Archaeological and Historical Survey of Henington Place Condominiums Property, Gig Harbor, Parcel 0221052009</i>	0.2 mi NW	None
Daugherty 2007a	1349983	<i>Archaeological and Historical Investigations of the Madison Shores Marina Property in Gig Harbor</i>	0.5 mi SE	None
Gill et al. 2008	1351426	<i>Archaeological Investigation for the Harbor Town Marina Development Project, Parcels 5970000241, 5970000251, and 5970000252</i>	Encompasses the AI	None
Hartmann and Kelly 2013	1683948	<i>Cultural Resources Assessment for the Quigg Family Home Project, Gig Harbor</i>	0.3 mi Semi	None
Neil and Baldwin 2008	1684563	<i>Archaeological Assessment of the Proposed Eagle Quest Development, Gig Harbor</i>	0.4 mi E	None
Roedel and Larson 2002	1341311	<i>Letter Report: Donkey Creek Park Archaeological Resources Monitoring</i>	0.3 mi NW	None
Rooke and Scott 2010	1354920	<i>Letter to Jeffrey Becker RE: Results of Cultural Resource Survey for Murphy's Landing Marina Owners Association, City of Gig Harbor</i>	0.1 mi NE	None

Table 2-1. Cultural Resources Studies within 0.5 mi of the Project area

Reference	NADB#	Title	Distance from the recommended AI/APE (mi)	Cultural Materials Identified Within or Adjacent to the recommended AI/APE
Schumacher and Hartmann 2009	1681307	<i>Memo to Barry Margolese RE: Cultural Resources Survey for Jasmine Court, Gig Harbor, Parcels 0221082212, 0221086012, 022182183</i>	0.2 mi SW	None
White III 2007	1351625	<i>Cultural Resources Assessment for the Highlands at the Harbor Project, Parcel 0221064154</i>	0.2 mi W	None

2.2.2 Previously Recorded Cultural Resources

Five previously recorded archaeological sites are found within 0.5 mi of the recommended AI/APE (Table 2-2). These include two precontact sites and three historic sites. Approximately 0.3 mi northwest of the recommended AI/APE is a precontact shell midden site (45PI102) that is likely to have been the location of the original Puyallup village described by Smith (1940) (see Section 4.2 below). The site record notes that a “potlach house” was active at this location as late as 1887 (McClure 1980). Subsequent site updates report lenses of shell midden at different locations across the site from 20 centimeters (cm) below the surface to 1.7 meters (m) below ground surface (Berger 2010).

Another shell midden site (45PI782) is recorded approximately 0.4 mi southeast, along the southern shoreline of Gig Harbor (Daugherty 2007b). Shell midden, fire-affected rock, faunal bone, and charcoal were recorded at a depth of 80 cm to 1.5 m below the ground surface (Berger et al. 2007). More recent historic and modern items were found in the upper 60 cm, in some cases mixed with shell from the lower deposit.

The historic sites include an NRHP nominated net shed (45PI1237) at the Skansie property, located approximately 0.3 mi southwest along the Gig Harbor shoreline (Chase 2011). Construction episodes occurred in 1910, 1912, and 1950. The Hoover Chicken Farm Site (45PI531) is located inland, approximately 0.5 mi southwest along State Route (SR) 16. The site consists of two concrete foundations and associated depressions, water spigot, and artifact scatter with no definite time period assigned (Goetz and Montgomery 1998). Also inland, approximately 0.3 mi southwest along Rosedale Street Northwest (NW), the Wilkinson Farm and Historic Barn (45PI807) is recorded as a circa 1900 farmstead. The barn was built in 1914–1915 (BOLA 2007).

Table 2-2 Previously Recorded Cultural Resources within 0.5 mi of the Recommended AI/APE.

Site Number and Name	Reference	Resource Type	Distance from recommended AI/APE	NRHP status
45PI102	McClure 1980; Berger 2010	Shell midden /precontact village	0.3 mi NW	unevaluated
45PI782	Daugherty 2007b	Shell midden	0.4 mi SE	determined not eligible
45PI1237 <i>Skansie Netshed</i>	Chase 2011	Historic era Netshed	0.3 mi SE	listed
45PI531 <i>Hoover Chicken Farm</i>	Goetz and Montgomery 1998	Historic Farmstead	0.5 mi SW	determined not eligible
5PI807 <i>Wilkinson Farm and Historic Barn</i>	BOLA 2007	Historic Farmstead and Barn	0.3 mi SW	listed

2.2.3 Cemeteries

There are no cemeteries located within 0.5 mi of the recommended AI/APE. The nearest cemetery is the Haven of Rest Cemetery located 0.6 mi west. It was established in 1953 (DAHP 2007).

2.2.4 Historic-Period Plat and Map Research

USSG GLO Plats

Gig Harbor appears in the 1858 plat of Township 21 North, Range 2 East (USSG 1858). Hash marks suggest native grasses along the shoreline of the harbor, but no evidence of habitation is indicated around the harbor, including at the site of the AI/APE.

Plummer Maps

An 1898 map of Pierce County shows two platted settlements on Gig Harbor (Plummer 1889). One town, labeled Millville, is located at the present site of the recommended AI/APE and consists of roughly six blocks along Front Street (Harborview Drive) at the present streets of Novak and Dorotich. The other town site is unlabeled, but is located at the western end of the harbor and

consists of roughly three blocks at the present intersection of Burnham Drive and N. Harborview Drive. No structures or buildings are detailed, including within the recommended AI/APE.

Sanborn Fire Insurance Maps

A 1929 Sanborn map of Gig Harbor shows the two town sites and includes a dwelling, a “boat shed,” and “fish net stage” at the present site of the Ancich Brothers net shed (Sanborn 1929). At that time, seven other boat docks and/or net sheds were located at the Millville site.

USGS Quadrangle Maps

The USGS mapped the Gig Harbor quadrangle in 1942, 1943, 1953, 1959, and 1970. The 1940s maps indicate a small number of boat docks along the shoreline east and west of the APE, although the current Ancich Brothers net shed and its associated pier do not appear to be among them (USGS 1942, 1943). The 1953 and 1959 maps show a single dock on or near the current location of the Ancich Brothers net shed, although structures are not labeled. Other docks appear to the east and west (USGS 1953, 1959). The 1970 map shows multiple docks at or near the APE, including what appears to be the Ancich Brothers pier, although buildings and structures are not labeled (USGS 1970). Structures atop the piers are not detailed.

Pierce County Atlases

Between 1951 and 1965, Gig Harbor appeared in three atlases of Pierce County (Metsker 1951, 1960, 1965). In all three, roadways appear unchanged from their present configurations, although these maps are not detailed enough to include resources like net sheds, docks, or individual buildings.

2.2.5 *Historically Significant Properties*

The Wilkinson Farm and Barn (45PI807), discussed in Section 2.2.2 above and located approximately 0.3 mi southwest of the recommended AI/APE, is NRHP-listed as a representative and relatively well preserved example of early twentieth-century farmsteads.

2.2.6 *DAHP Predictive Model*

DAHP has a predictive model for cultural resource sensitivity that is based on statewide information, using large-scale environmental factors. Information on geology, soils, site types, landforms, and GLO maps are used to estimate the probability of encountering cultural resources at any given location throughout the state. DAHP's model uses five categories for the predictions: Low Risk, Moderately Low Risk, Moderate Risk, High Risk, and Very High Risk. The DAHP predictive model map for the recommended AI/APE indicates a Very High Risk for identifying archaeological resources.

3. Environmental Context

3.1 Topography and Geology

The recommended AI/APE is along the southeastern shoreline of the Kitsap Peninsula, bordering the Puget Sound to the east. The Kitsap Peninsula and Sound were formed by the repeated advance and retreat of the Puget Lobe of the Cordilleran Ice Sheet between 18,000 and 15,500 years ago (Pielou 1991; Porter and Swanson 1998). The entire Puget Sound region was scoured and carved by this glacial ice, which formed north–south trending ridges and drainages. A glacial outwash zone further shaped the topography (Porter and Swanson 1998). Human occupation of the region is generally considered to have been feasible approximately 14,000 years ago, after the last (Fraser) Glaciation, the Vashon Stade (Dixon 2013).

Sediments in the recommended AI/APE are Quaternary alluvium comprised primarily of advanced glacial outwash sand, gravel and lacustrine clay, silt, and sand (DNR 2016). The United States Natural Resource Conservation Service’s Web Soil Survey identifies the sediments of the recommended AI/APE as Harstine gravelly ashy sandy loam. This is a moderately well drained sandy glacial drift with volcanic ash over dense glaciomarine deposits that form on ridges and footslopes (Web Soil Survey 2016).

3.2 Climate and Vegetation

Late Pleistocene conditions, circa 20,000 to 16,000 years ago, were colder as compared to modern conditions, with a lower treeline and open tundra (Whitlock 1992). There was generally less environmental variation across state. During the early Holocene, circa 11500–7800 years ago, there began a substantial warming trend. Circa 10,000 years ago was the height of this postglacial warming. At lower elevation foothills, Douglas-fir, true fir, and grand fir replaced the pine, spruce, mountain hemlock and other cold-tolerant trees of the previous period (Chatters et al. 2011).

In the Middle Holocene (circa 8,000–4,500 years ago), larger portions of Washington became open forest or savannah lands. This warmer and drier period shows in pollen records of western Washington beginning between 8,000 years ago and culminating in most places at 6,000 years ago (Barnosky et al. 1987:314).

Beginning approximately 4,500 years ago, conditions shifted toward the modern climate, becoming cooler and moister (Whitlock 1992). The tree line moved downslope. Prairies shrank in size (Hibbert 1979), and peat and fen margins expanded at many locations. More mesic conditions favored the expansion of *Tsuga*, *Thuja* and *Pseudotsuga* forests such as characterize the modern period (Barnosky 1984). Modern forest configurations were established by 2,500 years ago (Whitlock 1992).

Today the recommended AI/APE is within the *Tsuga heterophylla* (western hemlock) vegetation zone. This vegetation zone has a wet, mild maritime climate. Latitude, elevation, and relative location to the mountain ranges can affect climatic variations within this zone (Franklin and Dyrness 1973:70–71). This zone is characterized by a higher proportion of western hemlock and western red cedar (*Thuja plicata*) relative to the once dominant Douglas-fir, red alder, and various grasslands. Understory vegetation in the region typically consists of a variety of ferns, including sword fern, deer fern, and bracken fern (respectively *Polystichum munitum*, *Blechnum spicant*, and *Pteridium aquilinum*); blueberry (*Vaccinium* sp.); red huckleberry (*Vaccinium parvifolium*); and salmonberry (*Rubus spectabilis*) (Brubaker 1991; Whitlock 1992). Dominant tree species in this vegetation zone include Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), and western red cedar (*Thuja plicata*) (Pojar and Mackinnon 2004:30–42). Grand fir (*Abies grandis*), Sitka spruce (*Picea sitchensis*), and western white pine (*Pinus monticola*) are less common, but still present (Barnosky et al. 1987; Brubaker 1991; Franklin and Dyrness 1973:72; Whitlock 1992). Secondary species include red alder (*Alnus rubra*) and big-leaf maple (*Acer macrophyllum*) (Franklin and Dyrness 1973). Plants observed during fieldwork included cedar (*Thuja plicata*), deciduous trees, lawn grass, and horsetail (*Equisetum* sp.).

3.3 Fauna

In the Late Pleistocene, as the glaciers were retreating from the area, terrestrial mega fauna, black-tailed deer (*Odocoileus hemionus*), and elk (or wapiti, *Cervus elephus*) would have browsed on grasses, shrubs, and herbs in the newly emerging forest parkland (Suttles 1990). With fluctuating temperatures and levels of precipitation affecting the number and types of trees providing canopy cover, and therefore the amount and kinds of understory vegetation, the location and abundance of terrestrial animals varied over the millennia. Before extensive Euroamerican influence in the area, larger terrestrial mammals would have included elk, deer, black bear (*Ursus americanus*), coyote (*Canis latrans*), and cougar (*Felis concolor*).

Anadromous salmon runs would have become more abundant and reliable approximately 6,000 years ago and these became a critical resource for sustaining human population in the region (Chatters et al. 2011). In the vicinity of the recommended AI/APE, the principle members of the *Salmonidae* family are coho (*Oncorhynchus kisutch*) and chum (*O. keta*) species, running principally in North Creek at the western edge of Gig Harbor (Williams et al. 1975:402–403). Maritime resources would also have included marine mammals, such as harbor seals (*Phoca vitulina*) and river otters (*Lontra canadensis*), as well as a variety of waterfowl.

4. Cultural Context

The cultural evolutionary changes described in the chronology of Ames and Maschner (1999:57–112) are based on technological advancement in the context of increasing sedentism and demographic growth. Their cultural chronology is divided into five periods: Paleo-Indian, Archaic, Early Pacific, Middle Pacific, and Late Pacific. Over this time, small nomadic groups reliant on general hunting and gathering subsistence strategies gradually shifted to more sedentary living, with permanent or semi-permanent winter villages and a seasonal round of specialized resources, focusing on certain abundant riverine and marine resources (Ames and Maschner 1999). A summary of the chronological sequence is provided in Table 4-1.

Table 4-1. Model of Precontact Change in the Puget Basin (after Ames and Maschner 1999:66).

Dates	Period	Land Use	Settlement	Subsistence	Technology
~13,500 B.C. to 10,500 B.C.	Paleo-Indian	Generalized marine, littoral, and/or terrestrial	Short-term use pit houses and shelters	Generalized marine, littoral, and/or terrestrial	Stone; bone, antler, and perishable materials likely
10,500 B.C. to 4,400 B.C.	Archaic	Generalized littoral, neritic, and terrestrial	Short-term use pit houses and shelters	Generalized littoral, neritic, and terrestrial	Stone; some bone and antler; other perishable materials likely
4,400 B.C. to 1,800 B.C.	Early Pacific	Littoral, neritic, and terrestrial	Increased sedentism in seasonal villages	Increased focus on littoral resources and expanded use of neritic resources	Increase in ground stone, bone, antler, and perishable materials
1,800 B.C. to A.D. 200/500	Middle Pacific	Neritic, littoral, and terrestrial	Winter villages of plank houses and seasonal camps	Increased focus on marine and riverine resources. Food storage technologies developed	A decrease in stone and diversification of tools and tackle of bone, antler, and perishable materials
A.D. 200/500 to A.D. 1775	Late Pacific	Neritic, littoral, and terrestrial	Large permanent villages and special use sites	Specialized marine, riverine, littoral, and terrestrial resource use and management. Extensive food storage	Tools and tackle of bone, antler, and perishable materials; very little stone

The earliest periods of human occupation in the Americas are not readily observed in coastal environments, due to the rise in sea levels at the end of the Pleistocene. The earliest evidence of human occupation along the coast is likely to be underwater. Inland, however, there is evidence for human occupation in the North America beginning as early as 15,500 to 14,500 years ago, based on

finds at Buttermilk Creek, Texas (Pringle 2011), and Meadowcroft Rockshelter, Pennsylvania (Adovasio et al. 1990), among others. In the Pacific Northwest, at the Manis site near Sequim, there is a mastodon skeleton that has been radiocarbon dated to 13,800 years ago (Waters et al. 2011). The mastodon was impaled with a bone spear point proving the presence of human populations using technologies that were culturally related to Upper Paleolithic people of the Bering Strait area (Lawler 2011), although some remain critical of this find (Grayson and Meltzer 2015:184). A pre-Clovis dated occupation at Bear Creek recovered large concave base points in contexts dating to 12,770–12,596 calibrated radiocarbon years before present (B.P.) (Kopperl et al. 2015). Corroboration for these early dates is found at the rock shelter site at Paisley Cave, Oregon, where human coprolites have been radiocarbon dated to between 12,750 and 14,290 years ago (Wolman 2008).

The Archaic period (circa 10,500 BC to 4400 BC) was a time of transhumant hunting and gathering with increasing emphasis on locally available resources. Artifact assemblages are characterized by temporally diagnostic lanceolate shaped forms, regionally called Olcott or Cascade points, and cobble implements (Kidd 1964). Bone and antler tools have also been found at sites dating to the Archaic period. It is toward the end of this phase that the coastlines of the Puget Sound islands would have begun to stabilize and a more modern climate regime would have been established.

The Pacific period (circa 4400 B.C. to A.D. 1775) is characterized by increasing local resource intensification (particularly directed toward salmon) and residential sedentism. Ames and Maschner (1999) suggest these traits evolved in three different sub-periods, characterized by demographic increase and increasing resource intensification (Ames and Maschner 1999:90, 94, 96). Semi-subterranean pit houses and semi-permanent winter village adaptations develop during this period (Nelson 1990:483). Along Gig Harbor, as with the Puget Sound generally, the majority of extant archaeological sites are coastal shell middens that date to the Pacific period.

4.1 Ethnographic Background

The recommended AI/APE is within the traditional territory of Southern Coastal Salish groups. The Salish populations in the region of the recommended AI/APE would have spoken a dialect of Southern Lushootseed (Suttles and Lane 1990:486). Coastal Salish groups generally are characterized by a semi-sedentary settlement pattern that makes use of shoreline winter villages, paired with spring and summers special use camps near specific resources. Winter villages were comprised of two to five longhouses made from cedar planks (Waterman and Greiner 1921). These houses could be massive, providing room for very large extended families and storage for much of the food they would need to survive the coldest months. One historic example of such a longhouse is the Old/Strong Man House in Suquamish, approximately 14 mi northeast of the recommended AI/APE. It is reported to have measured between 500 and 1,000 feet long (Snyder 1968).

During the warmer months, Southern Coast Salish groups focused activities on obtaining and processing salmon which ran in the numerous rivers and streams around the Puget Sound. During

spring, fall, and summer, people from the winter villages dispersed to hunt, fish, and gather plant foods for immediate consumption and winter storage (Haeberlin and Gunther 1930). Summer camps usually consisted of small, temporary reed or grass-mat structures occupied by a single family, although several families might join together to build a larger mat house (Haeberlin and Gunther 1930; Suttles 1990). Inland forested environments not only attracted and supported deer and elk populations for hunting, but likely also provided a variety of plant resources such as berries, nuts, and root foods.

T. T. Waterman’s 1920-era ethnography of place names around the Puget Sound notes that Gig Harbor was called *Tua’wILkEL*, which is translated as a Lushootseed term meaning “trout” (Coastal Salish Map 2015; Hilbert et al. 2000:221). M. Smith (1940) describes this as a main village, “said to have been founded many generations before by Puyallup from Commencement Bay” (Smith 1940:11). In addition to the Puyallup, the Squaxin, Nisqually, Muckleshoot, and Suquamish peoples are likely to have made use of the Gig Harbor area.

4.2 Historic Background

In the eighteenth and nineteenth centuries, European and American naval vessels, including those under the command of George Vancouver (1792) and Charles Wilkes (1841), explored and named many of the features of south Puget Sound. Wilkes’s team discovered the inlet to Gig Harbor and took a small captain’s gig into the bay, where they purchased salmon from the villagers residing there. They later named the little bay after their gig (Eckrom 2004:21; Kershner 2012).

By the mid-1840s, Euroamericans were investigating the lands around the Puget Sound’s many bays and inlets, preparing to establish the first settlements in what would become Washington Territory. In 1846, Great Britain and the United States signed a treaty securing U.S. ownership of Puget Sound and all lands south of the present-day American–Canadian border. In December 1854, the Nisqually, Puyallup, Steilacoom, Squaxin and other bands signed the Medicine Creek Treaty, ceding their lands and agreeing to move to one of three reservations: the Puyallup, the Nisqually and the Squaxin (Marino 1990:169). As Euroamericans came west to settle in the Pacific Northwest, some tribal members living around Gig Harbor moved to the Puyallup Reservation, but others stayed (Andrews History Group 2009).

In 1866, the U.S. military claimed roughly 1,200 acres around much of Gig Harbor, Point Defiance, and Vashon Island as a military reservation (Eckrom 2004:33). In 1867, unaware of the military’s claim, a trio of fisherman traveled down the Puget Sound and steered into Gig Harbor. Samuel Jerisich and Peter Goldsmith were from Croatia. John Farrague was born in Spain (Kershner 2012). All three chose to settle on Gig Harbor, forming the first Euroamerican settlement near the tribal village of *Tua’wILkEL* (appearing in local histories as “Twa-Wal-Kut”) (Eckrom 2004:15). They began to fish the abundant fall salmon runs. Although tribal fisherman used fish traps, the new residents of Gig Harbor practiced purse seining, a method of dragging a weighted, open net through

the water and then cinching the top closed like the top of a purse. Their nets captured not only salmon but also cod, snapper, and flounder. The settlers also fished the wolf eels that hid in the rocks (Eckrom 2004:24–30). By the 1870s, the community’s fisherman actively fished for dogfish, a comparatively small shark that yielded a fish oil particularly well suited for maintaining sawmill machinery, tanning leather, and fueling oil lamps (Eckrom 2004:31)

When Jerisich learned that the lands he’d chosen at the southeastern tip of the harbor were already claimed by the U.S. military, he and his fellow settlers moved to unclaimed lands nearer the west end of the harbor. New immigrants soon joined the three settling families, including other fisherman from Croatia and immigrants from Scandinavia who established local farms and opened small businesses (Andrews History Group 2009).

Gig Harbor was one of many small communities and islands within Puget Sound that traded with other coastal communities, primarily by boat. To sell their fish, Gig Harbor fisherman had to row them to places like Olympia or Steilacoom, contributing to an active transportation network on the sound. Water travel improved in the 1880s, as steamboats began to visit Gig Harbor, carrying goods, passengers, mail, and news. At one point, the sound’s boats were christened the “Mosquito Fleet,” as they were said to be as common as mosquitos. In 1883, when the Northern Pacific Railway opened the northwest to the rest of the nation through the country’s second transcontinental railway, Gig Harbor began to experience modest growth as new settlers logged, built boats, and founded new fishing and farming businesses on the shoreline (Andrews History Group 2009). In the late 1880s, the Gig Harbor Mill Company built a sawmill and shingle mill that contributed to the local economy on Gig Harbor’s south shore.

In 1888, the Burnham family filed a plat for the city of Gig Harbor on acres it purchased from the three founding settlers. Only months later, a number of Croatian families, including the Dorotichs, the Novaks, and original settler Sam Jerisich, platted Millville east of the new town of Gig Harbor, naming the new settlement in honor of the neighboring sawmill and shingle mills. These two early towns would retain distinct characters for decades, as European farmers from Scandinavia settled Gig Harbor, and Slavonian immigrants, who were generally fishermen by trade, settled Millville (Andrews History Group 2009).

As the populations slowly but steadily grew, purse-seining operations dominated the waterfront at Millville. Fishermen began to travel farther north and south, fishing for weeks at a time. Purse seining required large, well-tended nets. These were generally cotton nets dipped into pots of tar for waterproofing and then spread over the ground to dry. They were then stored in net sheds, which were built, often along with a family’s residence, on or near the water (Andrews History Group 2009). As an exhibit at the Harborview History Museum notes, the fishermen pulled nets in by hand and also tended and repaired them by hand. “At the end of each season, and to prevent rot, the ‘web’ was rinsed in ‘bluestone,’ a copper sulphate [*sic*] preservative, and hung to dry in modest overwater structures called ‘netsheds.’” These buildings provided fisherman with storage space for

their gear, easy year-round access, and “a gathering place for skippers, crews, and their families” (Harbor History Museum 2016).

In 1899, Peter Ancich, Sr., came to the United States from Dalmatia, a western region of Croatia, and purchased land from John Novak along the waterfront at Millville (City of Gig Harbor 2016). Ancich was one of a small number of Croatian families that formed Gig Harbor’s commercial fishing fleet. According to one historian, 19 Croatian people lived in Millville in 1900. By 1910, when Ancich brought his wife Kate to Gig Harbor, there were 50 (Stanton 2008). Together, Peter and Kate raised two daughters and three sons in Millville, including Joe and John Ancich, both of whom followed their father into the commercial fishing business (Andrews and Koler 2008). The Ancich fishermen tied their boats to a piling near their waterfront home before completing their first net shed in the 1920s (Harbor History Museum 2016).¹

Gig Harbor residents continued to grow their businesses, schools, and churches in the first decade of the twentieth century. By 1905, the Skansie family of fishermen was experimenting with such new technologies as gas-powered boat engines. In 1908, civic-minded women from the local Fortnightly Club established the harbor’s first library. The community progressed, but historians note that even as late as 1911, the Polk Directory listed only 46 people at the town site of Gig Harbor.

By the second decade of the twentieth century, transportation advances were changing the community’s character. In 1912, the Skansies opened the Skansie Ship Building Company in Millville southeast of the recommended AI/APE, establishing a well-regarded local business that produced primarily purse seiners, described as 60 feet long with a cabin and crew’s quarters. By 1918, as the national preference for personal automobiles grew, Gig Harbor established its first car ferry, offering quicker access to nearby cities like Tacoma. Local companies responded by shoring up and paving roads throughout the region. The added trade allowed both Millville and Gig Harbor to grow their commercial centers. At Millville, visitors of the day described attractive Craftsmen bungalows along the water and small modest farms climbing up the hill to the south (Andrews History Group 2009).

Gig Harbor residents weathered the Great Depression of the 1930s, as those with fishing or farming operations could live off the land and the sea. People in the area also received federal funds through programs like the Works Progress Administration (WPA), which employed local men to improve Gig Harbor’s parks with new comfort stations, picnic shelters, and playgrounds (Andrews History Group 2009). Perhaps the public project that was expected to contribute the most to the growth of Gig Harbor was the Tacoma Narrows Bridge, constructed to link Gig Harbor’s peninsula with Tacoma south of the APE. Constructed in 1940, the bridge was expected to put a nearby ferry out of business. The local passenger terminal was dismantled in anticipation. However, the Tacoma Narrows Bridge, affectionately known as “Gallopertie,” famously twisted and then collapsed in

¹ Although it is cause for confusion, Peter Ancich is not known to be related to Martin Ancich, another Croatian fisherman who arrived in the early twentieth century, settled in Millville, and built a net shed just west of Peter Ancich’s net shed. Martin Ancich’s net shed is generally known as the Martin and Anna or the Tarabochia net shed (Andrews and Stanton 2008).

a strong wind mere months after it was completed. Ferry service was soon resumed from points south of Gig Harbor (Eckrom 2004: 158–175).

Despite the depression and into the World War II years, the city maintained a healthy fishing community. WPA writers described Gig Harbor in their 1941 guide to Washington: “scattered between woods and water are the prosperous modern homes of fisherman, whose tarred nets are spread to dry on well-kept lawns” (WPA 1941:575). WPA writers also mentioned the Gig Harbor shipyard (heir to the Skansie Shipyard), which at that time managed five ferries and had a long history of producing purse seiners, “more than 100 of which have slipped down the Gig Harbor ways to a roving life on the waters of Western America” (WPA 1941:575). According to the WPA, Gig Harbor was then home to “some 35 large purse seiners which followed the various fishing runs from Mexican waters to the Arctic seas. They are manned mostly by Croatians, Slovaks, and Austrians, who maintain a Catholic Church and its several societies, and a Croatian Fraternal Union, and form a strong unit of the Fisherman’s Union” (WPA 1941:575).

By the 1940s, advancements in the technology of purse seining began to alter traditional fishing practices. Nylon nets replaced cotton nets, removing the need for tarring and drying (Leavens 2009). The original settlements were also changing. In 1946, voters accepted a plan to incorporate the City of Gig Harbor, and Millville and Gig Harbor were joined. In 1950, the new Tacoma Narrows Bridge opened, again establishing easy access between the newly incorporated city of Gig Harbor and population centers such as Seattle and Tacoma to the east (Long 2003). Technological advancements continued into the 1950s, as a Croatian inventor in California devised the “Puretic Power Block,” a winch specifically designed to haul in purse seine nets, reducing the number of fisherman needed to haul nets by hand. In 1954, the Ancich family was also making improvements, rebuilding their original net shed, which had burned down in the 1920s. In 1974, the commercial fishing industry was further affected by Judge George Boldt’s now famous decision in the *U.S. vs State of Washington* court case that upheld native rights to one-half the harvestable fish in and around Puget Sound. Late twentieth-century researchers interviewed local fishermen who said the so-called Boldt Decision led them to diversify their fishing operations so as to recapture lost profit (Leavens 2009).

In recent years, Gig Harbor has seen many of its commercial fishing operations and ship builders close, while the young city developed into a tourism destination, attracting a new generation of retirees and vacationers.

The Ancich family continued to fish from Gig Harbor into the twenty-first century. However, in 2001, John Ancich Jr., of the third generation of Ancich fishermen, died when his boat, *Heritage*, ran aground (City of Gig Harbor 2016). In 2005, after the death of the last male heir to the Ancich fishing family, the Ancich Brothers net shed was sold by an executor to the Rainier Yacht Club, which sold it to the City of Gig Harbor in 2012 (Harbor History Museum 2016). That same year, the City of Gig Harbor established Ancich Park, which encompasses the grassy lawn east of the net shed and includes the former site of the Nicholas and Ella Castelan residence, a turn-of-the-twentieth-century home that once belonged to the Castelan family, another early fishing family with Croatian

roots. The house was located at the eastern edge of the present park and torn down in the 1990s (City of Gig Harbor 2016). According to the City of Gig Harbor, “it became known as the ‘honeymoon cottage’ because so many newlyweds rented it over the years” (City of Gig Harbor 2016). After the property was passed to their heirs, it became the Jerkovich parcel and was then combined with the Ancich property in 2005. Today, an easement gives the family access to their floats and commercial fishing vessels (City of Gig Harbor 2016).

The city has made efforts to preserve other elements of its fishing heritage. In 2008, the Ancich Brothers net shed was placed on the City of Gig Harbor’s Register of Historic Places, via city resolution (City of Gig Harbor 2008). The city has since surveyed all of Gig Harbor’s 17 existing net sheds and detailed them as part of a submission to the Historic American Engineering Record (HAER) (Leavens 2009).

5. Expectations for Hunter-Fisher-Gatherer, Ethnographic Period, Historic Indian, and Historic Euroamerican Cultural Resources

The DAHP predictive model anticipates a Very High Risk of encountering archaeological resources within the recommended AI/APE. The archival research conducted by HRA concurs with this assessment, given the proximity of the ethno-historically documented village location within 0.5 mi of the recommended AI/APE which has been confirmed archaeologically by previous cultural resource studies. The village location is one of two shell middens that have been found along the Gig Harbor shoreline within 0.5 mi of the recommended AI/APE. Additionally, early twentieth-century settlement of the shoreline and inland environs has been documented in archaeological and archival sources.

Based on results presented by Gill et al. (2008) HRA anticipates the AI will be disturbed and that the sediments in the area will be glacially deposited.

The types of precontact artifacts encountered might be expected to include shell deposits, greasy midden soils, charcoal, and hearth remains (i.e., fire-affected rock). Included among the midden deposit might be expected to be stone tools and stone tool debris, as well as non-shell food remains such as fish or mammal bone. Based on nearby sites, these deposits are expected from 20 cm to 170 cm below the ground surface.

Historic-period archaeological materials would likely relate to early settlement for small scale commercial fishing, residences, or commercial development within as a small regional town center. HRA anticipates that historic-period cultural materials within the recommended AI/APE could include ceramic or glass container and/or vessel fragments; assorted architectural materials (e.g., pane glass, brick fragments, milled wood, nails); and possibly machinery fragments (e.g., nets, engine parts). These would likely be found closer to the ground surface, unless the deposits have been disturbed.

6. Field Strategy and Methods

6.1 Archaeological Inventory

The archaeological inventory took place in the recommended AI/upland portions of the recommended AI/APE. Prior to fieldwork, utility locate requests were submitted in compliance with Washington's Underground Utilities regulations RCW 19.122.

The archaeological inventory consisted of pedestrian transects across the recommended AI and subsurface survey through the excavation of shovel probes (SPs). Shovel probe placement was at the discretion of the Field Supervisor. All SPs were approximately 40 cm in diameter and excavated to the greatest depth possible using a hand shovel and bucket auger. The sediments observed in each probe were described on a standardized form and in the Supervisor's field notes, including evidence of subsurface disturbances and integrity of the deposits. Sediment excavated from the probes was screened through ¼-inch hardware mesh. All probes were backfilled immediately following their termination and recording, and the turf replaced. The location of the survey, shovel probes, and cultural features were recorded using GPS. Survey mapping information was also recorded on field maps and in the Supervisor's notebook.

6.2 Architectural Inventory

HRA architectural historian Chrisanne Beckner surveyed the Ancich Brothers net shed on Friday, January 15, 2016, during rainy conditions. Beckner photographed all elevations and the associated pier and documented construction, materials, and condition.

7. Archaeological and Architectural Inventory Results

7.1 Archaeological Inventory

On January 21, 2016, HRA archaeologists Carol Schultze, PhD, RPA, and Serah Timm, BA, carried out archaeological fieldwork in the recommended AI. Weather conditions were of moderate to heavy rain with light winds and temperatures in the upper 30 degrees Fahrenheit.

7.1.1 Pedestrian Survey

The recommended AI was identified as the west half of an open lot that is covered in a grass lawn with very little ground surface visibility (Figure 7-1 and 7-2). There was a raised gravel road built along the western edge of the recommended AI. HRA archaeologists walked the entire recommended AI in transects spaced at 2 m intervals. Five modern marine shells were observed across the lawn surface. There were white utility markers noted outside the boundaries of the recommended AI to the east, but none within the recommended AI.

7.1.2 Shovel Probes

A total of 10 SPs were placed across the recommended AI (Table 7-1; Figure 7-1). Groundwater filled the SPs at depths between 10 cm and 85 cm below ground surface (Figure 7-3). The sediments were observed consistently in each shovel probe as follows: the upper 20 to 70 cm consisted of a disturbed upper deposit of brown sandy loam, and typically a sharp boundary separated this from the underlying grey and orange mottled clay with sand interpreted as intact glacio-lacustrine/glacially deposited sediment (Figure 7-4). In SP 5, there is an intervening lens of coarse sand. In SPs 4, 5, and 6, the underlying clay contained a blue gley that is indicative of saturation and an anaerobic environment.

The clay subsoil was interpreted as a sterile marine deposit. No cultural materials were recovered in this subsoil. The upper deposit contained construction debris, described below. The sediments found in the upper levels were interpreted as redistributed demolition materials that do not constitute an *in situ* deposit.



Figure 7-2. Overview of recommended AI: view facing north.

Table 7-1. Results of Shovel Probes in the recommended AI/APE

Shovel Probe	Maximum Depth (cm)	Depth (cm): Description – <i>Comments</i>	Cultural Materials (cm)
1	140 Groundwater at 25 Auger at 64	0-64: Brown to yellow brown sandy loam with some (40%) subrounded to rounded gravels and many roots – <i>disturbed/fill</i> 64-140: Grey and orange mottled clay with few (10%) subrounded gravels – <i>glacio-lacustrine deposit</i> <i>Terminated at rock obstruction in auger</i>	None
2	80 Groundwater at 10 Auger at 50	0-20: Brown sandy loam with few (5%) subrounded gravels and many roots. Large cobble at 10 cm – <i>disturbed/fill</i> 20-80: Grey and orange mottled clay with few (10%) subrounded gravels – <i>glacio-lacustrine deposit</i> <i>Terminated at rock obstruction in auger</i>	0-10: 1 pc. green glass 1 pc. red brick – <i>Modern debris</i>

Table 7-1. Results of Shovel Probes in the recommended AI/APE

Shovel Probe	Maximum Depth (cm)	Depth (cm): Description – <i>Comments</i>	Cultural Materials (cm)
3	80 Groundwater at 20 Auger at 45	0-40: Brown sandy loam with some (40%) subrounded to rounded gravels and many roots – <i>disturbed/fill</i> 40-80: Grey and orange mottled clay with increasing quantities of gravels and cobbles, ranging up to 5 cm in length – <i>glacio-lacustrine clay</i> <i>Terminated at rock obstruction in auger</i>	0-10: 1 rusted wire nail 4.5" long 1 pc. red plastic 10-30: 2 pc. amber bottle glass – <i>Modern debris</i>
4	120 Groundwater at 30 Auger at 80	0-70: Brown sandy loam with some (40%) subrounded to rounded gravels and many roots – <i>disturbed/fill</i> 70-120: Grey to bluish grey very compact, clay with coarse sand and cobbles – <i>glacio-lacustrine clay</i> <i>Terminated at rock obstruction in auger</i>	0-20: 3 rusted wire nails 1 pc. white ceramic earthenware – <i>non-diagnostic cultural material</i> 30-45: 1 cut nail - <i>historic artifact</i>
5	110 Groundwater at 20 Auger at 75	0-50: Brown sandy loam with few (20%) subrounded to rounded gravels and many roots. – <i>disturbed/fill</i> 50-70: Dark grey compact coarse sand – <i>alluvial deposit</i> 70-110: Grey to bluish grey clay and sandy clay with some (40%) gravels and cobbles <i>Terminated at rock obstruction in auger</i>	0-10: 1 rusted wire nail – <i>non-diagnostic cultural material</i>
6	115 Groundwater at 85 Auger at 90	0-60: Brown sandy loam with some (40%) subrounded to rounded gravels and many roots – <i>disturbed/fill</i> 60-85: Grey and orange mottled clay with increasing quantities of gravels and cobbles, ranging up to 5 cm in length – <i>glacio-lacustrine clay</i> 85-115: Grey to bluish grey sandy clay with some gravels – <i>glacio-lacustrine clay</i> <i>Terminated due to vacuum pressure on auger in saturated glacio-lacustrine clay</i>	None

Table 7-1. Results of Shovel Probes in the recommended AI/APE

Shovel Probe	Maximum Depth (cm)	Depth (cm): Description – <i>Comments</i>	Cultural Materials (cm)
7	82 Groundwater at 25 Auger at 50	0-30: Brown sandy loam with some (40%) subrounded to rounded gravels and many roots – <i>disturbed/fill</i> 30-45: Sandy loam with lots (70%) of sand and rounded gravels and cobble lens with gravels ranging from 1 to 12 cm in length – <i>fill related to adjacent gravel road</i> 45-82: Sandy loam with increasing quantities of rocks and gravels. – <i>disturbed/fill</i> <i>Terminated at impenetrable rock lens</i>	0-30: 1 pc. ceramic building material 30-45: 1 pc. amber bottle glass 1 pc. green bottle glass – <i>Modern debris</i>
8	25 Groundwater at 10	0-25: Brown sandy loam with some (40%) subrounded to rounded gravels and many roots – <i>disturbed/fill</i> <i>Terminated at rock or root obstruction – not visible due to groundwater</i>	None
9	65 Groundwater at 20 Auger below 40	0-25: Brown sandy loam with some (40%) subrounded to rounded gravels and many roots – <i>disturbed/fill</i> 25-65: Grey and orange mottled clay with increasing quantities of gravels and cobbles, ranging up to 5 cm in length – <i>glacio-lacustrine clay</i> <i>Terminated at rock obstruction in auger</i>	0-20: 1 rusted wire nail, 2" length – <i>non-diagnostic cultural material</i>
10	110 Groundwater at 20 Auger below 60	0-40: Brown sandy loam with some (40%) subrounded to rounded gravels and many roots – <i>disturbed/fill</i> 40-70: Brown sandy loam with increasing quantities of gravel and sand – <i>disturbed/fill</i> 70-110: Grey and red mottled clay with some pockets of sandy clay – <i>glacio-lacustrine clay</i> <i>Terminated due to vacuum pressure on auger in saturated glacio-lacustrine clay</i>	None



Figure 7-3. SP 6 at 115 cm showing groundwater at 85 cm depth.



Figure 7-4. Mottled clay from SP 2, as seen in screen.

In the disturbed upper fill layer, a number of modern or temporally non-diagnostic cultural items were recovered (Table 7-1), including rusted wire nails and one piece of whiteware ceramic earthenware. In SP 4, HRA archaeologists recovered a historic-period artifact, a cut nail at 45 cm below ground surface (Figure 7-5). This nail was found in the disturbed upper fill sediment. It is a cut nail type B. Based on morphological characteristics, this nail was manufactured between 1830 and the early 1900s (Visser 1997). This nail was clearly recovered from disturbed context and was not recorded as an archaeological isolate after an email conversation with DAHP local programs archaeologist Gretchen Kaehler (personal communication, February 2, 2016)



Figure 7-5. Cut Nail type B found in SP 4 at 45 cm below surface.

7.2 Architectural Inventory

7.2.1 3555 Harborview Drive, parcel #5970000252

HRA Architectural Historian Chrisanne Beckner prepared a Historic Property Inventory form for this structure (Appendix A).

The Ancich Brothers net shed is sometimes referred to in documentation as the Ancich net shed or Ancich/Rainier Yacht Club net shed. It is located at 3555 Harborview Drive and consists of a single net shed atop a pier that extends into Gig Harbor (Figure 7-6–7-8). The Ancich Brothers net shed is believed to be the second net shed constructed at this location. Peter Ancich, Jr., built it, or rebuilt it,

in 1954 to replace his father's 1928 net shed, which burned down in 1929 (Leavens 2009). The net shed is one of a collection of 17 net sheds along Gig Harbor's shoreline and is smaller and more



Figure 7-6. Ancich net shed (view northwest).



Figure 7-7. Ancich ned shed and pier (view southeast).



Figure 7-8. Ancich net shed and pier (view northwest).

modest than neighboring net sheds and piers. Unlike its neighbors, the Ancich Brothers net shed is owned by the City of Gig Harbor and no longer used as part of an active fishing operation.

Access to the Ancich Brothers net shed may be gained by water or land. Harborview Drive runs east–west just south of the net shed. From Harborview Drive, the shed is approached by a deteriorated gravel drive overgrown with grass. West of the drive is a neighboring parcel with a raised concrete-block parking lot with wood picket fence. East of the drive is a wide grassy lawn known as Ancich Park. No evidence remains of the Castelan house, which was once located at the eastern edge of the park but was torn down in the late 1990s (City of Gig Harbor 2016). The net shed itself is enclosed by chain-link fence due to its deteriorated condition.

The net shed sits on an L-shaped pier supported by timber pilings, some in pairs and others supported by knee braces. The pier's deck is constructed of timber pile caps topped by timber stringers and wood planks. The southern end of the pier rests on a retaining wall of logs lashed together and topped by squared timbers. A portion of the pier, including stringers and decking, extends to the hillside; this section is deteriorated with missing planks and exposed, round-headed nails.

The net shed is a rectangular, single-story building with a front-gabled roof. HAER records describe it as roughly 1,068 square feet, 24 feet wide, and 44.5 feet long (Leavens 2009). The wood-framed shed is clad in horizontal wood planks. Some planks are missing, revealing studs beneath. A swinging wood door with metal hinges is located on the southeast corner. Some cross bracing and

vertical boards have been nailed to the south and east elevations. Three small window openings on the west elevation and two small windows on the east elevation have been filled with planks. On the north elevation, the shed includes two sliding plank doors with metal hardware. The building's front-gabled roof is clad in corrugated metal sheet.

The shed is no longer used, but rope, nets, and floats are still stored on the pier and in the shed itself.

8. Architectural Evaluation and Effects Assessment

8.1 National Register of Historic Places Criteria

The criteria for listing a property in the NRHP require that, in addition to a building being over 50 years of age, it must meet at least one of the following criteria and possess integrity, as outlined in 36 CFR 60.4 (National Park Service 2002):

- A. Property is associated with events that have made a significant contribution to the broad patterns of our history; or
- B. Property is associated with the lives of persons significant in our past; or
- C. Property embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction; or
- D. Property has yielded, or is likely to yield, information important in prehistory or history.

8.2 Integrity

“Integrity is the ability of a property to convey its significance” (National Park Service 2002:44) and is related to how a property's physical features are tied to and convey its significance. It is based on “why, where and when a property is important.” In order to retain integrity, a property must retain most of the following seven aspects of integrity:

- Location: the place where the property was constructed or the place where the historic event occurred.
- Design: the combination of elements that create the form, plan, space, structure, and style of a property.
- Setting: the physical environment of a historic property.
- Materials: the physical elements that were combined or deposited during a particular period of time, and in a particular pattern or configuration, to form a historic property.
- Workmanship: the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.

- Feeling: a property's expression of the aesthetic or historic sense of a particular period of time.
- Association: the direct link between an important historic event or person and a historic property.

8.3 Washington Heritage Register

The criteria for listing in the WHR are similar to those for the NRHP. According to the Washington Heritage Guidebook, a resource must meet all of the following criteria (DAHPP 2011).

- A building, site, structure or object must be at least 50 years old. If newer, the resource should have documented exceptional significance.
- The resource should have a high to medium level of integrity, i.e. it should retain important character defining features from its historic period of construction.
- The resource should have documented historical significance at the local, state or federal level.

8.4 NRHP and WHR Evaluation

The net shed at 3555 Harborview Drive is a well-documented remnant of Gig Harbor's former commercial fishing fleet. It is one of 17 net sheds that remain along Gig Harbor and is the only one that's been added to the Gig Harbor Register of Historic Places (City of Gig Harbor 2016). In 2008, surveyors Mildred Andrews and L. D. Stanton recommended the net shed eligible to the NRHP for its national significance, arguing that "its simple form, massing and scale is typical of the 17 historic net sheds [*sic*] that remain on Gig Harbor's waterfront. Together with the remaining historic fishing vessels, the sheds are the last major physical link with what was once one of the most successful fishing fleets on the West Coast" (Andrews and Stanton 2008). DAHP did not make a final eligibility determination based on the surveyor's recommendation.

8.4.1 NRHP Evaluation

Criterion A: The Ancich Brothers net shed is directly associated with events that have made a significant contribution to broad patterns of history. Purse seiners used it consistently over almost half of the twentieth century to store and maintain their primary tool: fishing nets. It is closely associated with a culturally distinct community of Croatian fishermen who settled in early Millville and defined the character of Gig Harbor from the late nineteenth century through to the present day. The Ancich fishing operation was one of many that contributed to Puget Sound's twentieth-century maritime history. Presently, the net shed is one of a decreasing number of net sheds along Puget Sound and is recognized as one of the few remaining artifacts associated with the harbor's

diminishing fishing industry. This class of resources has also been recognized by the State of Washington for its important associations with the state's history (Artifacts Consultants 2011). The pier is a more common resource, ubiquitous along Puget Sound shorelines and its design is not specifically associated with purse seining or other culturally specific activities. However, paired together, the net shed and pier are significant statewide under Criterion A.

Criterion B: Peter Ancich, Sr., built the family's first net shed, which burned soon thereafter, in 1928. The replacement net shed was constructed by Ancich Sr.'s son, Peter Ancich, Jr., who also fished in Gig Harbor throughout his life. Although the net shed is associated with the work of the Ancich fishermen and was constructed by a descendent of the longtime fishing family, the Anciches were not known to be unique among purse-seining families in the Gig Harbor area. HRA recommends that while the Ancich fishermen were active members of Gig Harbor's fishing community throughout the twentieth century, the Ancich family's association with the rebuilt net shed does not rise to the level of significance to make the net shed and pier eligible under this criterion.

Criterion C: The Ancich Brothers net shed, which sits atop the family's former pier, is a simple rectangular, wood-framed building clad in horizontal boards. The building includes little architectural distinction. However, the net shed, as a type, is somewhat rare, and Gig Harbor has been recognized for retaining one of the largest collections of these resources in Washington. HRA recommends that the Ancich Brothers net shed is significant as an example of a net shed that embodies the distinctive characteristics of its type, period, and method of construction. It sits atop a pier, is easily accessible from both land and water, and was efficiently constructed in a simple plan with local materials so that the interior can be used to store and repair fishing nets, while providing a casual, open gathering space for the fishing family. HRA recommends that the Ancich Brothers net shed is significant under Criterion C as a rare and excellent example of a net shed.

The pier, however, is a common resource type found throughout the Puget Sound, as noted above, and is not a distinct example of its type, period or method of construction. It is not the work of a master and does not possess high artistic value. Because of the ubiquity of the resource type and the pier's lack of distinction, HRA recommends that the pier is not significant under Criterion C.

Criterion D: The Ancich Brothers net shed is not expected to yield new information important to understanding prehistory or history. HRA recommends that the resource is not significant under Criterion D.

Integrity: Some sources claim that the Ancich Brothers net shed and pier retain some or all of the basic design, materials, and workmanship from the original net shed, in spite of the 1929 fire (City of Gig Harbor 2016). However, the Pierce County Assessor's record gives a construction date of 1954 for the present shed, and historic maps from the 1940s do not depict a pier or net shed at this location (USGS 1942, 1943), suggesting that the pier and shed were entirely, rather than partially, reconstructed in 1954.

According to the Pierce County Assessor, the net shed was altered in 1970. Historic photos from the City of Gig Harbor's website show that the net shed included a shed roofed projection on the south elevation in the 1970s. This projection was removed in 2007 (Leavens 2009). Missing boards appear at the location where the addition would have been attached to the original building.

The net shed is in a deteriorated condition. No original windows appear, and some boards have been removed. The shed's roof has been replaced. In spite of these alterations, which appear to be related to its disuse and deterioration, the resource retains sufficient fabric to retain integrity of location, design, setting, materials, workmanship, feeling, and association. The pier also appears to retain integrity of location, design, setting, materials, workmanship, feeling, and association.

Eligibility: HRA recommends that the Ancich Brothers net shed and pier are eligible for listing in the NRHP for their statewide significance under Criterion A and that the Ancich Brothers net shed is also individually eligible under NRHP Criterion C.

8.4.2 *WHR Evaluation*

Criteria: As noted above, the net shed and pier, constructed in 1954, are more than 50 years old. The resources have a medium to high level of integrity, as defined by DAHP, and retain all important character-defining features, including their associations with the land and water. The net shed retains its simple front-gabled plan, original materials, and design. As noted above, the net shed and pier have documented historical significance on both the local and state level.

Eligibility: HRA recommends that the Ancich Brothers net shed and pier qualify for listing in the WHR for their local and statewide significance.

8.5 Effects Assessment for Architectural Resources

HRA recommends that the Ancich Brothers net shed and pier are eligible for listing in the NRHP and the WHR for statewide significance under Criteria A and that the net shed is eligible under Criterion C.

The current project proposes to replace the existing pier and to structurally retrofit the existing net shed. Under Section 106 of the NHPA, the current project is defined as an undertaking. An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association (ACHP 2016).

According to drawings prepared by PND, the net shed rehabilitation and retrofit will take place in phases (PND 2016). First, a barge will be installed east of the shed. A crane, either located in the park or on the barge, will lift the net shed and place it on the barge for storage. The existing pier will be demolished and a new pier will be constructed at the same location of in-kind materials. Timber

pilings will be replaced with timber pilings. The timber deck will be replaced with a new timber deck. The only alterations proposed include the possible installation of an eight-foot by thirty-foot steel deck grating at the deck's southeast corner and a bullrail or hand rail around portions of the perimeter. These proposed safety features will only be constructed if mandated by the state of Washington.

The net shed will be placed in its original location atop the new pier and retrofitted either by the addition of let-in bracing or by the addition of new plywood shear walls on new sills. Deteriorated material, including exterior planks, will be replaced as needed.

8.5.1 *Replacement Pier*

The pier is a supporting structure for the net shed and is eligible for the NRHP and WHR, along with the net shed, under Criterion A. The Project, as proposed, will replace the pier in-kind, maintaining the pier's integrity of location, design, setting, feeling, and association. The project will destroy the pier's integrity of materials and workmanship. Although the integrity of the pier will be affected, in this case, the timber pilings on which the pier rests and the plank decking are believed to be sufficiently deteriorated that replacement is necessary to protect the net shed, which possesses greater significance. As long as the pier is constructed of like materials, HRA recommends a finding of no adverse effect.

8.5.2 *Net Shed Rehabilitation*

Retrofitting the net shed will primarily consist of adding material, either shear walls or bracing that will be covered by original fabric when possible and replacement boards when original boards are too deteriorated to reuse. Although the replacement of the pier will affect the net shed's integrity of setting, the project appears to follow the Secretary of the Interior's guidelines for rehabilitation, as it will retain and restore the historic character of the property; will preserve distinctive features and finishes; and will replace deteriorated materials in kind (NPS 2016). As long as the Project will not affect the integrity of the building's location, design, materials, workmanship, feeling, or association, HRA recommends a finding of no adverse effect.

9. Summary and Recommendations

9.1 Archaeological Resources

HRA archaeologists carried out surface pedestrian survey and subsurface excavation shovel probes across the recommended AI. A single cut nail (dating to the turn of the last century) was found in a disturbed/fill deposit found to depths of between 20 and 70 cm below ground surface. Also mixed into this upper stratum were several non-diagnostic and modern items. Beneath the sandy loam was a clay sediment that is interpreted as the native glacio-lacustrine subsoil (see Section 3.1). No artifacts were found associated with this subsoil.

The upper deposit is interpreted as construction materials associated with the demolition of an early twentieth-century domicile, perhaps the Castelan building that was located on the eastern edge of this lot until the 1990s (see Section 4.3). As this material is in a disturbed context it does not represent an *in situ* archaeological deposit and was not recorded as a site or an isolate.

Subsurface probes were able to reach depths of 115 cm below ground surface. The persistent rain elevated the water table and impeded direct observation of the sediment and stratigraphy. It appeared that the clay subsoil was an intact native sediment and that no cultural material was associated with it. However, nearby shell midden site records report cultural material at depths between 80 and 170 cm.

These observations are consistent with those provided in Gill et al. (2008).

Given that Project impacts are projected to reach depths of 6 m and that the shoreline location has a very high risk for encountering archaeological deposits associated with the ethnographically recorded village at Gig Harbor (see Sections 2.2.2, 4.4, and 5), HRA recommends archaeological monitoring (or spot checking) during excavation of the deepest portions of the project and/or archaeological review of geoprobe samples for the purpose of confirming that the clay level is an intact culturally sterile subsoil.

Additionally, removal of sediment from the APE associated with activities on the Ancich Pier and Jerkovich pier should be observed by any archaeological monitor and should proceed under an inadvertent discovery plan.

9.2 Architectural Resources

HRA recommends that the project, as planned, follows the Secretary of Interior's guidelines for rehabilitation and therefore will have minimal effect on the integrity of the Ancich Brothers net shed and pier. HRA recommends a finding of no adverse effect. No further study is warranted.

9.3 Accidental Discovery of Archaeological Resources

In the event that archaeological deposits are inadvertently discovered during construction in any portion of the recommended AI/APE, ground-disturbing activities should be halted immediately, and the USACE and City should be notified. The USACE and City would then contact DAHP and the interested Tribes, as appropriate.

9.4 Discovery of Human Remains

Any human remains that are discovered during construction of the Project will be treated with dignity and respect. If ground-disturbing activities encounter human skeletal remains during the course of construction, then all activity that may cause further disturbance to those remains **must** cease, and the area of the find must be secured and protected from further disturbance. In addition, the finding of human skeletal remains **must** be reported to the county coroner **and** local law enforcement in the most expeditious manner possible. The remains should not be touched, moved, or further disturbed.

The county coroner will assume jurisdiction over the human skeletal remains, and make a determination of whether those remains are forensic or non-forensic. If the county coroner determines the remains are non-forensic, they will report that finding to DAHP. DAHP will then take jurisdiction over those remains and report them to the appropriate cemeteries and affected tribes. The State Physical Anthropologist will make a determination of whether the remains are Indian or non-Indian, and report that finding to any appropriate cemeteries and the affected tribes. DAHP will then handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains.

10. References Cited

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Appendix A. Historic Property Inventory Form

Project Number, Organization, Project Name: Cultural Resources Inventory for the Ancich Park Redevelopment Project, Gig Harbor, Pierce County, Washington

Resource Type: Property

Resource Name: Ancich, Peter Sr, Netshed

Address: 3555 Harborview Dr, Gig Harbor, WA

Township/Range/Section: T21R02E05

Property Type: Building

Historic Use: Agriculture/Subsistence: Fishing Facility or Site

Builder: Peter Ancich Jr.

Date Recorded: February 9, 2016

Field Recorder: HRA: C. Beckner

Inventory Level: Intensive

Field Site Number: 01

Common Name: Ancich Net Shed

Build Date: 1928/1954

Surveyor Opinion

Property appears to meet criteria for the National Register of Historic Places: Yes

Property is located in a potential historic district (National and/or local): Yes

Property potentially contributes to a historic district (National and/or local): No

Significance Narrative:

Historic Context:

In the eighteenth and nineteenth centuries, European and American naval vessels, including those under the command of George Vancouver (1792) and Charles Wilkes (1841), explored and named many of the features of south Puget Sound. Wilkes's team discovered the inlet to Gig Harbor and took a small captain's gig into the bay, where they purchased salmon from the villagers residing there. They later named the little bay after their gig (Eckrom 2004:21; Kershner 2012).

By the mid-1840s, Euroamericans were investigating the lands around the Puget Sound's many bays and inlets, preparing to establish the first settlements in what would become Washington Territory. In 1846, Great Britain and the United States signed a treaty securing U.S. ownership of Puget Sound and all lands south of the present-day American-Canadian border. In December 1854, the Nisqually, Puyallup, Steilacoom, Squaxin and other bands signed the Medicine Creek Treaty, ceding their lands and agreeing to move to one of three reservations: the Puyallup, the Nisqually and the Squaxin (Marino 1990:169). As Euroamericans came west to settle in the Pacific Northwest, some tribal members living around Gig Harbor moved to the Puyallup Reservation, but others stayed (Andrews History Group 2009).

In 1866, the U.S. military claimed roughly 1,200 acres around much of Gig Harbor, Point Defiance, and Vashon Island as a military reservation (Eckrom 2004:33). In 1867, unaware of the military's claim, a trio of fisherman traveled down the Puget Sound and steered into Gig Harbor. Samuel Jerisich and Peter Goldsmith were from Croatia. John Farrague was born in Spain (Kershner 2012). All three chose to settle on Gig Harbor, forming the first Euroamerican settlement near the tribal village of Tua'w1LkEL (appearing in local histories as "Twa-Wal-Kut") (Eckrom 2004:15). They began to fish the abundant fall salmon runs. Although tribal fisherman used fish traps, the new residents of Gig Harbor practiced purse seining, a method of dragging a weighted, open net through the water and then cinching the top closed like the top of a purse. Their nets captured not only salmon but also cod, snapper, and flounder. The settlers also fished the wolf eels that hid in the rocks (Eckrom 2004:24–30). By the 1870s, the community's fisherman actively fished for dogfish, a comparatively small shark that yielded a fish oil particularly well suited for maintaining sawmill machinery, tanning leather, and fueling oil lamps (Eckrom 2004:31).

When Jerisich learned that the lands he'd chosen at the southeastern tip of the harbor were already claimed by the U.S. military, he and his fellow settlers moved to unclaimed lands nearer the west end of the harbor. New immigrants soon joined the three settling families, including other fisherman from Croatia and immigrants from Scandinavia who established local farms and opened small businesses (Andrews History Group 2009).

Gig Harbor was one of many small communities and islands within Puget Sound that traded with other coastal communities, primarily by boat. To sell their fish, Gig Harbor fisherman had to row them to places like Olympia or Steilacoom, contributing to an active transportation network on the sound. Water travel improved in the 1880s, as steamboats began to visit Gig Harbor, carrying goods, passengers, mail, and news. At one point, the sound's boats were christened the "Mosquito Fleet," as they were said to be as common as mosquitos. In 1883, when the Northern Pacific Railway opened the northwest to the rest of the nation through the country's second transcontinental railway, Gig Harbor began to experience modest growth as new settlers logged, built boats, and founded new fishing and farming businesses on the shoreline (Andrews History Group 2009). In the late 1880s, the Gig Harbor Mill Company built a sawmill and shingle mill that contributed to the local economy on Gig Harbor's south shore.

In 1888, the Burnham family filed a plat for the city of Gig Harbor on acres it purchased from the three founding settlers. Only months later, a number of Croatian families, including the Dorotichs, the Novaks, and original settler Sam Jerisich, platted Millville east of the new town of Gig Harbor, naming the new settlement in honor of the neighboring sawmill and shingle mills. These two early towns would retain distinct characters for decades, as European farmers from Scandinavia settled Gig Harbor, and Slavonian immigrants, who were generally fishermen by trade, settled Millville (Andrews History Group 2009).

As the populations slowly but steadily grew, purse-seining operations dominated the waterfront at Millville. Fishermen began to travel farther north and south, fishing for weeks at a time. Purse seining required large, well-tended nets. These were generally cotton nets dipped into pots of tar for

waterproofing and then spread over the ground to dry. They were then stored in net sheds, which were built, often along with a family's residence, on or near the water (Andrews History Group 2009). As an exhibit at the Harborview History Museum notes, the fishermen pulled nets in by hand and also tended and repaired them by hand. "At the end of each season, and to prevent rot, the 'web' was rinsed in 'bluestone,' a copper sulphate [sic] preservative, and hung to dry in modest overwater structures called 'netsheds.'" These buildings provided fisherman with storage space for their gear, easy year-round access, and "a gathering place for skippers, crews, and their families" (Harbor History Museum 2016).

In 1899, Peter Ancich, Sr., came to the United States from Dalmatia, a western region of Croatia, and purchased land from John Novak along the waterfront at Millville (City of Gig Harbor 2016). Ancich was one of a small number of Croatian families that formed Gig Harbor's commercial fishing fleet. According to one historian, 19 Croatian people lived in Millville in 1900. By 1910, when Ancich brought his wife Kate to Gig Harbor, there were 50 (Stanton 2008). Together, Peter and Kate raised two daughters and three sons in Millville, including Joe and John Ancich, both of whom followed their father into the commercial fishing business (Andrews and Koler 2008). The Ancich fishermen tied their boats to a piling near their waterfront home before completing their first net shed in the 1920s (Harbor History Museum 2016).

Gig Harbor residents continued to grow their businesses, schools, and churches in the first decade of the twentieth century. By 1905, the Skansie family of fishermen was experimenting with such new technologies as gas-powered boat engines. In 1908, civic-minded women from the local Fortnightly Club established the harbor's first library. The community progressed, but historians note that even as late as 1911, the Polk Directory listed only 46 people at the town site of Gig Harbor.

By the second decade of the twentieth century, transportation advances were changing the community's character. In 1912, the Skansies opened the Skansie Ship Building Company in Millville southeast of the recommended AI/APE, establishing a well-regarded local business that produced primarily purse seiners, described as 60 feet long with a cabin and crew's quarters. By 1918, as the national preference for personal automobiles grew, Gig Harbor established its first car ferry, offering quicker access to nearby cities like Tacoma. Local companies responded by shoring up and paving roads throughout the region. The added trade allowed both Millville and Gig Harbor to grow their commercial centers. At Millville, visitors of the day described attractive Craftsmen bungalows along the water and small modest farms climbing up the hill to the south (Andrews History Group 2009).

Gig Harbor residents weathered the Great Depression of the 1930s, as those with fishing or farming operations could live off the land and the sea. People in the area also received federal funds through programs like the Works Progress Administration (WPA), which employed local men to improve Gig Harbor's parks with new comfort stations, picnic shelters, and playgrounds (Andrews History Group 2009). Perhaps the public project that was expected to contribute the most to the growth of Gig Harbor was the Tacoma Narrows Bridge, constructed to link Gig Harbor's peninsula with Tacoma south of the APE. Constructed in 1940, the bridge was expected to put a nearby ferry out of business. The local passenger terminal was dismantled in anticipation. However, the Tacoma Narrows Bridge, affectionately

known as “Gallopig Gertie,” famously twisted and then collapsed in a strong wind mere months after it was completed. Ferry service was soon resumed from points south of Gig Harbor (Eckrom 2004: 158–175).

Despite the depression and into the World War II years, the city maintained a healthy fishing community. WPA writers described Gig Harbor in their 1941 guide to Washington: “scattered between woods and water are the prosperous modern homes of fisherman, whose tarred nets are spread to dry on well-kept lawns” (WPA 1941:575). WPA writers also mentioned the Gig Harbor shipyard (heir to the Skansie Shipyard), which at that time managed five ferries and had a long history of producing purse seiners, “more than 100 of which have slipped down the Gig Harbor ways to a roving life on the waters of Western America” (WPA 1941:575). According to the WPA, Gig Harbor was then home to “some 35 large purse seiners which followed the various fishing runs from Mexican waters to the Arctic seas. They are manned mostly by Croatians, Slovaks, and Austrians, who maintain a Catholic Church and its several societies, and a Croatian Fraternal Union, and form a strong unit of the Fisherman’s Union” (WPA 1941:575).

By the 1940s, advancements in the technology of purse seining began to alter traditional fishing practices. Nylon nets replaced cotton nets, removing the need for tarring and drying (Leavens 2009). The original settlements were also changing. In 1946, voters accepted a plan to incorporate the City of Gig Harbor, and Millville and Gig Harbor were joined. In 1950, the new Tacoma Narrows Bridge opened, again establishing easy access between the newly incorporated city of Gig Harbor and population centers such as Seattle and Tacoma to the east (Long 2003). Technological advancements continued into the 1950s, as a Croatian inventor in California devised the “Puretic Power Block,” a winch specifically designed to haul in purse seine nets, reducing the number of fisherman needed to haul nets by hand. In 1954, the Ancich family was also making improvements, rebuilding their original net shed, which had burned down in the 1920s. In 1974, the commercial fishing industry was further affected by Judge George Boldt’s now famous decision in the U.S. vs State of Washington court case that upheld native rights to one-half the harvestable fish in and around Puget Sound. Late twentieth-century researchers interviewed local fishermen who said the so-called Boldt Decision led them to diversify their fishing operations so as to recapture lost profit (Leavens 2009).

In recent years, Gig Harbor has seen many of its commercial fishing operations and ship builders close, while the young city developed into a tourism destination, attracting a new generation of retirees and vacationers.

The Ancich family continued to fish from Gig Harbor into the twenty-first century. However, in 2001, John Ancich Jr., of the third generation of Ancich fishermen, died when his boat, *Heritage*, ran aground (City of Gig Harbor 2016). In 2005, after the death of the last male heir to the Ancich fishing family, the Ancich Brothers net shed was sold by an executor to the Rainier Yacht Club, which sold it to the City of Gig Harbor in 2012 (Harbor History Museum 2016). That same year, the City of Gig Harbor established Ancich Park, which encompasses the grassy lawn east of the net shed and includes the former site of the Nicholas and Ella Castelan residence, a turn-of-the-twentieth-century home that once belonged to the

Castelan family, another early fishing family with Croatian roots. The house was located at the eastern edge of the present park and torn down in the 1990s (City of Gig Harbor 2016). According to the City of Gig Harbor, “it became known as the ‘honeymoon cottage’ because so many newlyweds rented it over the years” (City of Gig Harbor 2016). After the property was passed to their heirs, it became the Jerkovich parcel and was then combined with the Ancich property in 2005. Today, an easement gives the family access to their floats and commercial fishing vessels (City of Gig Harbor 2016).

The city has made efforts to preserve other elements of its fishing heritage. In 2008, the Ancich Brothers net shed was placed on the City of Gig Harbor’s Register of Historic Places, via city resolution (City of Gig Harbor 2008). The city has since surveyed all of Gig Harbor’s 17 existing net sheds and detailed them as part of a submission to the Historic American Engineering Record (HAER) (Leavens 2009).

The net shed at 3555 Harborview Drive is a well-documented remnant of Gig Harbor’s former commercial fishing fleet. It is one of 17 net sheds that remain along Gig Harbor and is the only one that’s been added to the Gig Harbor Register of Historic Places (City of Gig Harbor 2016). In 2008, surveyors Mildred Andrews and L. D. Stanton recommended the net shed eligible to the NRHP for its national significance, arguing that “its simple form, massing and scale is typical of the 17 historic net sheds [sic] that remain on Gig Harbor’s waterfront. Together with the remaining historic fishing vessels, the sheds are the last major physical link with what was once one of the most successful fishing fleets on the West Coast” (Andrews and Stanton 2008). DAHP did not make a final eligibility determination based on the surveyor’s recommendation.

NRHP Evaluation:

Criterion A: The Ancich Brothers net shed is directly associated with events that have made a significant contribution to broad patterns of history. Purse seiners used it consistently over almost half of the twentieth century to store and maintain their primary tool: fishing nets. It is closely associated with a culturally distinct community of Croatian fishermen who settled in early Millville and defined the character of Gig Harbor from the late nineteenth century through to the present day. The Ancich fishing operation was one of many that contributed to Puget Sound’s twentieth-century maritime history. Presently, the net shed is one of a decreasing number of net sheds along Puget Sound and is recognized as one of the few remaining artifacts associated with the harbor’s diminishing fishing industry. This class of resources has also been recognized by the State of Washington for its important associations with the state’s history (Artifacts Consultants 2011). The pier is a more common resource, ubiquitous along Puget Sound shorelines and its design is not specifically associated with purse seining or other culturally specific activities. However, paired together, the net shed and pier are significant statewide under Criterion A.

Criterion B: Peter Ancich, Sr., built the family’s first net shed, which burned soon thereafter, in 1928. The replacement net shed was constructed by Ancich Sr.’s son, Peter Ancich, Jr., who also fished in Gig Harbor throughout his life. Although the net shed is associated with the work of the Ancich fishermen and was constructed by a descendant of the longtime fishing family, the Anciches were not known to be unique among purse-seining families in the Gig Harbor area. HRA recommends that while the Ancich

fishermen were active members of Gig Harbor's fishing community throughout the twentieth century, the Ancich family's association with the rebuilt net shed does not rise to the level of significance to make the net shed and pier eligible under this criterion.

Criterion C: The Ancich Brothers net shed, which sits atop the family's former pier, is a simple rectangular, wood-framed building clad in horizontal boards. The building includes little architectural distinction. However, the net shed, as a type, is somewhat rare, and Gig Harbor has been recognized for retaining one of the largest collections of these resources in Washington. HRA recommends that the Ancich Brothers net shed is significant as an example of a net shed that embodies the distinctive characteristics of its type, period, and method of construction. It sits atop a pier, is easily accessible from both land and water, and was efficiently constructed in a simple plan with local materials so that the interior can be used to store and repair fishing nets, while providing a casual, open gathering space for the fishing family. HRA recommends that the Ancich Brothers net shed is significant under Criterion C as a rare and excellent example of a net shed.

The pier, however, is a common resource type found throughout the Puget Sound, as noted above, and is not a distinct example of its type, period or method of construction. It is not the work of a master and does not possess high artistic value. Because of the ubiquity of the resource type and the pier's lack of distinction, HRA recommends that the pier is not significant under Criterion C.

Criterion D: The Ancich Brothers net shed is not expected to yield new information important to understanding prehistory or history. HRA recommends that the resource is not significant under Criterion D.

Integrity:

Some sources claim that the Ancich Brothers net shed and pier retain some or all of the basic design, materials, and workmanship from the original net shed, in spite of the 1929 fire (City of Gig Harbor 2016). However, the Pierce County Assessor's record gives a construction date of 1954 for the present shed, and historic maps from the 1940s do not depict a pier or net shed at this location (USGS 1942, 1943), suggesting that the pier and shed were entirely, rather than partially, reconstructed in 1954.

According to the Pierce County Assessor, the net shed was altered in 1970. Historic photos from the City of Gig Harbor's website show that the net shed included a shed roofed projection on the south elevation in the 1970s. This projection was removed in 2007 (Leavens 2009). Missing boards appear at the location where the addition would have been attached to the original building.

The net shed is in a deteriorated condition. No original windows appear, and some boards have been removed. The shed's roof has been replaced. In spite of these alterations, which appear to be related to its disuse and deterioration, the resource retains sufficient fabric to retain integrity of location, design, setting, materials, workmanship, feeling, and association. The pier also appears to retain integrity of location, design, setting, materials, workmanship, feeling, and association.

Eligibility:

NRHP Evaluation:

HRA recommends that the Ancich Brothers net shed and pier are eligible for listing in the NRHP for their statewide significance under Criterion A and that the Ancich Brothers net shed is also individually eligible under NRHP Criterion C.

WHR Evaluation:

As noted above, the net shed and pier, constructed in 1954, are more than 50 years old. The resources have a medium to high level of integrity, as defined by DAHP, and retain all important character-defining features, including their associations with the land and water. The net shed retains its simple front-gabled plan, original materials, and design. As noted above, the net shed and pier have documented historical significance on both the local and state level. HRA recommends that the Ancich Brothers net shed and pier qualify for listing in the WHR for their local and statewide significance.

Physical Description:

The Ancich Brothers net shed is sometimes referred to in documentation as the Ancich net shed or Ancich/Rainier Yacht Club net shed. It is located at 3555 Harborview Drive and consists of a single net shed atop a pier that extends into Gig Harbor. The Ancich Brothers net shed is believed to be the second net shed constructed at this location. Peter Ancich, Jr., built it, or rebuilt it, in 1954 to replace his father's 1928 net shed, which burned down in 1929 (Leavens 2009). The net shed is one of a collection of 17 net sheds along Gig Harbor's shoreline and is smaller and more modest than neighboring net sheds and piers. Unlike its neighbors, the Ancich Brothers net shed is owned by the City of Gig Harbor and no longer used as part of an active fishing operation.

Access to the Ancich Brothers net shed may be gained by water or land. Harborview Drive runs east–west just south of the net shed. From Harborview Drive, the shed is approached by a deteriorated gravel drive overgrown with grass. West of the drive is a neighboring parcel with a raised concrete-block parking lot with wood picket fence. East of the drive is a wide grassy lawn known as Ancich Park. No evidence remains of the Castelan house, which was once located at the eastern edge of the park but was torn down in the late 1990s (City of Gig Harbor 2016). The net shed itself is enclosed by chain-link fence due to its deteriorated condition.

The net shed sits on an L-shaped pier supported by timber pilings, some in pairs and others supported by knee braces. The pier's deck is constructed of timber pile caps topped by timber stringers and wood planks. The southern end of the pier rests on a retaining wall of logs lashed together and topped by squared timbers. A portion of the pier, including stringers and decking, extends to the hillside; this section is deteriorated with missing planks and exposed, round-headed nails.

The net shed is a rectangular, single-story building with a front-gabled roof. HAER records describe it as roughly 1,068 square feet, 24 feet wide, and 44.5 feet long (Leavens 2009). The wood-framed shed is clad in horizontal wood planks. Some planks are missing, revealing studs beneath. A swinging wood door with metal hinges is located on the southeast corner. Some cross bracing and vertical boards have been nailed to the south and east elevations. Three small window openings on the west elevation and two

small windows on the east elevation have been filled with planks. On the north elevation, the shed includes two sliding plank doors with metal hardware. The building's front-gabled roof is clad in corrugated metal sheet.

The shed is no longer used, but rope, nets, and floats are still stored on the pier and in the shed itself.

Photos:



Notes: Ancich Net Shed and pier

Date: 2016

View: Northwest



Notes: Ancich Net Shed and Pier

Date: 2016

View: Northwest



Notes: Ancich Net Shed and Pier

Date: 2016

View: East

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Pierce County Assessor-Treasurer Property Summary



3525 TO 3589 HARBORVIEW DR

CITY OF GIG HARBOR
5970000244

**Ancich Waterfront Park
Community Paddler's Dock**

**PL-SDP-18-0003 et al
Hearing Examiner**

Exhibit J

Tax Description

Section 05 Township 21 Range 02 Quarter 33 MILLVILLE PARCEL A OF ROS FOR BLA 2016-09-12-5001 DESC AS L 5 THRU 7 B 3 TOG/W 2ND CL TDLDS ABUTT THEREON SD L 6 & 7 TO EXTREME LOW TIDE WLY BDRY OF SD TDLDS DESC AS FOLL COM AT INTER OF C/L OF HARBOR VIEW AVE & W LI OF PLAT OF TOWN OF MILLVILLE TH N 02 DEG 23 MIN 15 SEC E 155.46 FT TO NW COR OF SD PLAT & BEG OF SD AGREED LI TH N 18 DEG 22 MIN 56 SEC E 111.51 FT M/L TO EXTREME LOW WATER ALSO TOG/W POR OF LAND LOC WITHIN FRONT ST AS SHOWN ON PLAT ADJ TO & ABUTT SAID L 6 & 7 ON S LY N OF N LI HARBORVIEW DR FORMERLY FRONT ST TOG/W 2ND CL TDLDS ABUTT TO EXTREME LOW TIDE EXC ANY POR CYD BY AGREEMENT BLR 2009-12-09-0165 EASE OF REC COMB OF 024-3, 025-1 & 025- 2 SEG 2017-0174 JP 09/19/16 JP

Property Details

Parcel Number 5970000244
Site Address 3525 TO 3589 HARBORVIEW DR
Account Type Real Property
Category Land and Improvements
Use Code 8400-FISHING ACTIVITIES AND SERVICES

Taxpayer Details

Taxpayer Name CITY OF GIG HARBOR
Mailing Address 3510 GRANDVIEW ST
GIG HARBOR, WA
98335-1214

Appraisal Details

Neighborhood 301 / 956
Value Area P11
Appr Acct Type Commercial
Business Name
Last Inspection 02/25/2020-Physical Inspection
Appraisal Area 3

Related Parcels

Group Account Number n/a
Located On n/a
Associated Parcels 8888879130

Assessed Value

Value Year	2020	Assessed Total	1,585,700
Tax Year	2021	Assessed Land	1,079,300
Taxable Value	0	Assessed Improvements	506,400
Tax Code Area	075	Current Use Land	0
Tax Code Area Rate	9.721847184529	Personal Property	0
Notice of Value Mailing Date	06/25/2020		

Assessment Details

2020 Values for 2021 Tax

Taxable Value \$0
Assessed Value \$1,585,700

Tax Amounts Due

Tax Year	Minimum Due	Total Due
TOTAL	0.00	0.00

Property Tax Exemptions

Tax Year 2021
Type Municipal Corp and Misc Taxing Districts
Expiration Date n/a

Land Details

Land Economic Area 2131
RTSQQ 02-21-05-33
Value Area PI1
Neighborhood 301 / 956
Square Footage 34,101
Acres 0.783
Front Foot 305
Electric Power Available
Sewer Sewer Available
Water Water Available

Building 1 Details

General Characteristics

Property Type	Commercial
Condition	Average
Quality	Average
Neighborhood	301
Occupancy	Marina
Square Feet	1
Net Square Feet	0
Attached Garage Square Feet	0
Detached Garage Square Feet	0
Carport Square Feet	0
Finished Attic Square Feet	0
Total Basement Square Feet	0
Finished Basement Square Feet	0
Basement Garage Door	0
Fireplaces	0

Built-As

DESCRIPTION	Addon Only Comm
YEAR BUILT	1969
ADJUSTED YEAR BUILT	1995
SQUARE FEET	1
STORIES	0
BEDROOMS	0
BATHROOMS	0
EXTERIOR	n/a
CLASS	Masonry
ROOF	n/a
HVAC	None
UNITS	0
SPRINKLER SQUARE FEET	0

Improvement Details

Type	Description	Units
Add On	Concrete (Reinforced) (1000 - 3000 Sq Ft)	900
Add On	Docks Med Constr (WD bolted) Med	3,200

Building 2 Details

General Characteristics

Property Type	Commercial
Condition	Poor
Quality	Low
Neighborhood	301
Occupancy	Marine Hangar
Square Feet	1,560
Net Square Feet	1,560
Attached Garage Square Feet	0
Detached Garage Square Feet	0
Carport Square Feet	0
Finished Attic Square Feet	0
Total Basement Square Feet	0
Finished Basement Square Feet	0
Basement Garage Door	0
Fireplaces	0

Built-As

DESCRIPTION	Shed - Equipment
YEAR BUILT	1954
ADJUSTED YEAR BUILT	2012
SQUARE FEET	1,560
STORIES	1
BEDROOMS	0
BATHROOMS	0
EXTERIOR	n/a
CLASS	Wood Frame
ROOF	n/a
HVAC	None
UNITS	0
SPRINKLER SQUARE FEET	0

Improvement Details

Type	Description	Units
Add On	Docks Med Constr (WD bolted) Med	2,292

Building 3 Details

General Characteristics

Property Type	Commercial
Condition	Average
Quality	Excellent
Neighborhood	301
Occupancy	Government
Square Feet	2,929
Net Square Feet	2,929
Attached Garage Square Feet	0
Detached Garage Square Feet	0
Carport Square Feet	0
Finished Attic Square Feet	0
Total Basement Square Feet	0
Finished Basement Square Feet	0
Basement Garage Door	0
Fireplaces	0

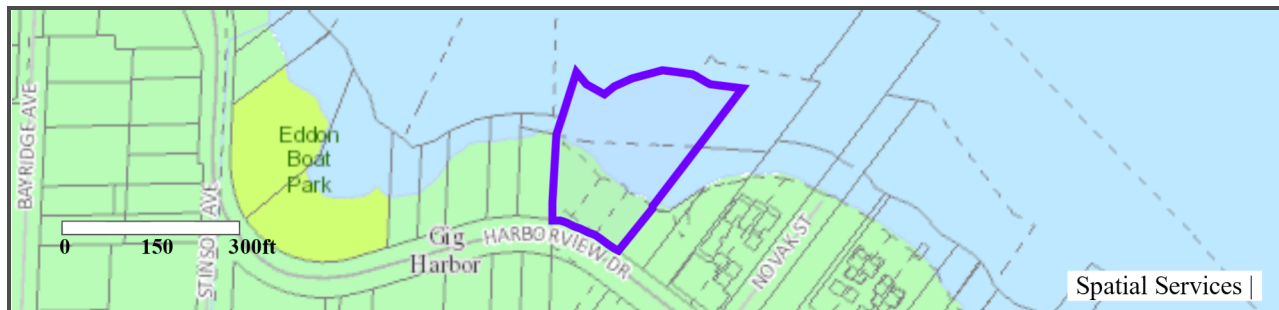
Built-As

DESCRIPTION	Boat Storage Buildings
YEAR BUILT	2019
ADJUSTED YEAR BUILT	2019
SQUARE FEET	2,929
STORIES	1
BEDROOMS	0
BATHROOMS	0
EXTERIOR	n/a
CLASS	Wood Frame
ROOF	n/a
HVAC	Space Heater
UNITS	0
SPRINKLER SQUARE FEET	0

Sales History

Sorry, no sales available for display

Map



Photos



2019_PRI_8-2-2019_20190801WJ-1.jpg

Sketches

Sorry, no sketches available for display