

**Biological Assessment and  
Essential Fish Habitat Evaluation**

North Shore Levee  
Aberdeen and Hoquiam, Washington

*for*  
**KPFF Consulting Engineers**

May 1, 2017



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**File No. 0201-008-02**

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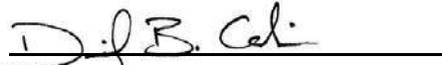
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## 1.0 INTRODUCTION

The Cities of Aberdeen and Hoquiam (Cities) are proposing to accredit the North Shore Levee project (the Project) through the Federal Emergency Management Agency (FEMA) to mitigate flood risk and reduce flood insurance costs. A large portion of the Cities north of the Chehalis River and Grays Harbor, west of the Wishkah River, and east of the Hoquiam River, lies on a low floodplain terrace. The FEMA Flood Insurance Rate Maps designate these areas as Zone AE with given Base Flood Elevations (BFEs). To minimize the burden on property owners of increased flood insurance premiums and to mitigate flood risk, the Cities propose to construct a new levee and seek FEMA approval that the design meets standards for accreditation through a Conditional Letter of Map Revision (CLOMR). Once constructed and accredited through a Letter of Map Revision (LOMR), map designations within the protected area would be changed from Zone AE to Zone X. The purpose of this Biological Assessment (BA) is to satisfy consultation requirements under Section 7 of the Endangered Species Act (ESA) in support of the CLOMR application to FEMA. An Essential Fish Habitat (EFH) evaluation is also included for Magnuson Stevens Fishery Conservation and Management Act compliance.

GeoEngineers, Inc. (GeoEngineers) is sub-contracted to KPFF Consulting Engineers under contract to the Cities to prepare this BA report. This BA has been prepared with preliminary designs and may need to be revised if there are significant changes to the finalized design plans.

## 2.0 PROJECT DESCRIPTION

The project will provide additional flood protection for the Cities of Aberdeen and Hoquiam, which is needed as a result of high tides, high winds, and/or high river discharge volumes. The project is linear, approximately 5.6 miles long, and is located within the Cities of Aberdeen and Hoquiam, Washington. The proposed levee will be located along the right bank of the Wishkah River, through both Cities on the north side of the Chehalis River and Grays Harbor, and along the left bank of the Hoquiam River (Figure 1 –Vicinity Map). The project is situated in Sections 01, 02, 11 and 12 of Township 17 N, Range 10 W, as well as Sections 04, 07, 08 and 09 of Township 17 N, Range 09 W of the Willamette Meridian. Within the project vicinity, the Wishkah River flows into the Chehalis River from the north near the mouth of the Chehalis River where it discharges into Grays Harbor. The Hoquiam River is the next tributary of Grays Harbor to the west, flowing into Grays Harbor from the north. The project is located within Water Resource Inventory Area (WRIA) 22 (Lower Chehalis) and is within the Grays Harbor watershed (Hydrologic Unit Code 17100105).

The levee system design includes earthen dikes, concrete and sheet pile floodwalls, and stoplog closures, utilizing existing high ground in some places, and with raised roadways and sidewalks as needed to maintain existing transportation networks. The levee system will be located north of the Chehalis River and Grays Harbor, and will extend north along the left bank of the Hoquiam River at the western extent and along the right bank of the Wishkah River at the eastern extent (Figure 1). The proposed levee system is about 5.6 miles long. The crest elevation of the levee is +15.2 feet (relative to the North American Vertical Datum of 1988 [NAVD88]). This elevation was chosen to provide additional freeboard above and beyond the required freeboard based on the controlling coastal BFE; which was identified based on: (1) the FEMA Stillwater BFE of +12.1 feet plus 2 feet of freeboard; (2) the FEMA Total Water Level BFE of +13.0 feet plus 1 foot of freeboard. The additional freeboard will take into account the potential for ground settlement and sea-level rise.

Openings in the levee for pedestrian and vehicle access will be closed in anticipation of flood events using stoplogs located in adjacent storage structures. Stormwater conveyance will be modified to separate the conveyance systems that are inside and outside of the proposed levee. Separation will ensure that flood waters will not enter and flow through the conveyance system to the protected side of the levee and cause flooding.

The levee system will be located immediately adjacent to the shoreline along some sections of the Wishkah and Hoquiam River, but is located inland where it parallels the Chehalis River and Grays Harbor. The levee system will be constructed entirely above the Ordinary High Water Mark (OHWM) and outside of wetlands or other waterbodies subject to Clean Water Act and Rivers and Harbors Act jurisdiction. However, some outfall work may require work below the OHWM, as described below.

The project description and analyses presented in this BA are based on 60% design drawings developed by KPFF, dated February 10, 2017, which are available separately. The project can be divided into the following components that are listed in a general construction sequence:

- **Existing Structures (fencing, utilities, etc.).** Prior to construction work, existing utilities and structures (such as outbuildings, fences, asphalt curbs, et cetera) will need to be removed or relocated.
- **Traffic Control Devices.** Traffic Control Devices, such as signage for detours and other associated elements, will need to be placed prior to beginning construction activities. Traffic control devices will be placed within the road right-of-way and outside of critical areas.
- **Temporary Erosion and Sedimentation Control (TESC) Best Management Practices (BMPs).** General TESC BMPs will be installed after traffic control devices have been placed. BMPs are described in more detail in Section 4.0 of this report. TESC BMPs will remain in place for the duration of the construction and will only be removed once construction activities are completed and it has been determined that slopes are stable.
- **Clearing and Earthwork.** The project will require the removal of some existing vegetation along the work area. Clearing activities will be confined to the minimum area required to construct the new levee. The project will require earthwork to increase the ground elevation along the levee alignment. Most earthwork will consist of importing fill to raise existing elevations to the appropriate elevations.
- **Levee Construction.** A trench will be excavated along earthen portions of the levee and the trench will be backfilled with low-permeability structural fill to make a foundation. Fill materials will need to be imported and placed over the foundation. The fill will be compacted as the levee is constructed to ensure stability. Flood walls will either have a shear key at the bottom of footing or a trench similar to earthen levees. Sheet piles will be driven into the ground to suitable depth to withstand anticipated forces based on geotechnical and structural recommendations. Once completed, the crest elevation of the levee will be approximately 15.2 feet elevation (NAVD88).
- **Stormwater Conveyance.** Stormwater conveyance will be modified to separate conveyance systems that are inside and outside of the proposed levee, as follows:
  - New stormwater conveyance system components on the protected side of the levee will be installed to convey stormwater runoff. An assortment of new and existing pump stations are designed to pump stormwater runoff from the protected side of the levee to the respective outfalls. A mixture of existing and proposed outfalls are used for stormwater runoff disposal. All new outfalls are located above the OHWM mark of the river and/or Grays Harbor. Riprap or

other bank protection will be required to protect the bank from localized erosion and scour where new outfalls are located, and will be placed entirely above the OHWM.

- Some existing outfalls that currently convey stormwater from the protected side of the levee will be decommissioned and abandoned. These pipes will be capped at the point of diversion and downstream components may either be: (1) abandoned but left in place, requiring no work below the OHWM at the existing discharge points; (2) abandoned and capped at the end, requiring limited work below the OHWM; and/or (3) removed, requiring limited bank excavation and pipe removal from below OHWM, followed by bank restoration. Work areas, if any, below the OHWM are accessible during low tides without dewatering. After these upgrades, stormwater will no longer discharge from these outfalls.
  - Some existing outfalls will continue to be used and will be retrofitted with tide gates to keep the storm system from surcharging during a high tide event.
  - The conveyance system on the unprotected side of the levee will be largely untouched, and will continue to convey stormwater to match existing flow patterns using the existing basin outfalls via gravity flow. These outfalls will be upgraded with tide gates at the existing discharge points, which are typically located below the OHWM but are accessible during low tides without dewatering. There are a couple of locations where existing drainage basins may be combined and the existing conveyance system on the unprotected side of the levee may need to be enlarged. In such a case, we would combine two outfalls into one by removing the outfall from the basin that no longer needs it and improve/enlarge the outfall at the existing location.
- **Roadways.** Roadways will need to be adjusted to the height of the levee. The adjacent roadways will be graded and structural road fill such as crushed rock will be added. The roadway surface will then be repaved.
  - **Mitigation and Restoration.** Native vegetation and/or grass seed will be used to stabilize exposed bare soils and slopes and to restore previously vegetated areas that will be cleared during construction. Within the riparian buffers of the Wishkah River and Hoquiam River, native species will be used to restore affected riparian habitat to the extent allowed by current levee standards. Where it is not feasible to install tree and shrub riparian vegetation due to levee standards, adjacent areas will be restored as compensation. Quantity of plants will be determined once design plans have been finalized and areas requiring restoration are identified.

### 3.0 SITE DESCRIPTION

The North Shore Levee project is approximately 5.6 miles in length and provides protection from coastal and riverine flooding associated with the Wishkah River, Chehalis River, Grays Harbor, and Hoquiam River. Baseline conditions along the length of the levee are illustrated on the aerial images and photographs included on Figure 2. Most of the land area affected by the project is highly developed with commercial, industrial and some residential use. Existing seawalls/bulkheads, overwater structures and relict timber piles are common along many sections of the shoreline affected by the project. Remaining undeveloped and vegetated riparian and floodplain habitats are few and are largely degraded as a result of historic land clearing, topographic alteration, and encroachment by invasive species. These areas are described in further detail below.

Three bridges span the Hoquiam River in Hoquiam, including a railroad bridge near the mouth, and eastbound (Simpson Avenue) and westbound (Riverside Avenue) lanes of US-101 (Figure 2). The shoreline of the Hoquiam River is also highly developed, with commercial and residential development immediately

abutting the river bank and a lengthy section of seawall/bulkhead along Riverside Avenue (Figure 2 – Photo 1). Vegetated areas along the Hoquiam River shoreline and within the floodplain are limited to a large wetland complex between the railroad bridge and Simpson Avenue bridge (Figure 2 – Photo 3) and some small patches of riparian vegetation interspersed among the developed waterfront. Existing riparian vegetation includes approximately 100 feet of shoreline containing mature riparian trees adjacent to “A” Street; a couple of mature trees near the Simpson Avenue bridge; and a relatively large marine/estuarine and depressional wetland complex south of the Simpson Avenue bridge, which spans over 1,000 feet of shoreline.

Riparian conditions along the Chehalis River/Grays Harbor shoreline (Figure 2) are degraded as a result of land use associated with: (1) multiple industrial sites; (2) a railroad yard featuring 10 track spurs; and (3) road infrastructure including the U.S. Highway 101 bridge structure over the Chehalis River, its right bank abutment, approach ramps, and supporting piers. The levee system will be set back from the shoreline approximately 300-3,000 feet throughout this area and will therefore not directly abut the shoreline environment. The levee system alignment generally follows the railroad through this area. Several manmade drainage ditches are present adjacent to the alignment (Figure 2 – Photos 6 and 9). The drainage patterns in this area are complex, with many culverts, crossings, and other drainage alterations. The drainage system is connected to the Hoquiam River near the railroad bridge at its western end (Figure 2), Fry Creek near the center (Figure 2 – Photo 7), a depressional wetland area (less than one acre in size) and a stormwater pond between North Maple Street and West First Street (Figure 2 – Photo 8), and potentially as far east as South Division Street (Figure 2 – Photo 9). Fry Creek is documented as fish-bearing by Washington Department of Fish & Wildlife (WDFW 2017a,b) and Washington Department of Natural Resources (WDNR 2017), potentially containing cutthroat trout and coho salmon. East of South Division Street, drainage appears disconnected from the Fry Creek system and is presumably conveyed into Grays Harbor directly.

A total of four bridges span the Wishkah River in Aberdeen (Figure 2). These include three public vehicle bridges, one each for westbound (East Wishkah Street) and eastbound (East Heron Street) lanes of US-12, and one for Young Street further upstream (north), as well as a railroad bridge near the mouth of the river. There are several structures over or immediately adjacent to the shoreline in this section, including the bridges as well as industrial/commercial buildings, docks and piers in the lower part of the river (Figure 2 – Photos 10 and 11), and residential development and docks further upstream (Figure 2 – Photo 12). Vegetated areas along the shoreline are limited to small isolated areas and narrow riparian strips occurring between developments (Figure 2 – Photos 10 and 11). The most significant vegetated areas include: an area overgrown with Japanese knotweed near the mouth downstream of the railroad bridge (outside of the project area); a small wetland (less than 1,500 square feet) located on a floodplain bench between the railroad bridge and East Heron Street bridge, which will remain waterward of the proposed levee (Figure 2 – Photo 10); a grass City park (Zelasko Park; less than one acre) between the two vehicle bridges (Figure 2 – Photo 11); and some isolated and/or narrow strips of riparian vegetation between existing developments and the river bank further upstream, including a single tree at the North “D” Street end, approximately 100 feet of degraded riparian forest west of the Young Street bridge, and approximately 1,000 feet of intermittent degraded riparian vegetation north of Young Street with about 50 percent tree cover (Figure 2 – Photo 12).

## 4.0 BEST MANAGEMENT PRACTICES (BMPS)

Conservation measures and BMPs will be employed during construction activities to avoid impacts to listed species and their habitat. Conservation measures will focus on minimizing construction noise and the possibility of spills, preventing soil erosion, and minimizing impacts to vegetation. Special measures will be taken to ensure that waste materials will be disposed of off-site and in accordance with applicable regulations, adequate materials and procedures are readily available on the site to respond to unanticipated weather conditions or accidental releases of materials, and that a protocol for contacting Washington State Department of Fish and Wildlife (WDFW) is readily available in the event that activities are observed to result in fish kills, fish in distress or other water quality problems.

### 4.1. General Conservation Measures

- The TESC plan will be fully implemented as part of a Stormwater Pollution Prevention Plan (SWPPP). Construction techniques will utilize BMPs such as those described in the 2012 version of Washington State Department of Transportation's (WSDOT) Standards and Specifications for Road, Bridge, and Municipal Construction (WSDOT 2012) and Washington State Department of Ecology's (Ecology) Stormwater Management Manual for Western Washington (Ecology 2012). Appropriate erosion control measures will be erected at appropriate locations according to the SWPPP.
- The contractor will prepare a Spill Prevention, Control and Countermeasures (SPCC) Plan for this project. Spills will be handled and disposed of in a manner that does not contaminate the surrounding area. Adequate materials and procedures to respond to unanticipated weather conditions or accidental releases of materials (sediment, petroleum hydrocarbons, etc.) will be available on site. The SPCC Plan will also ensure the proper management of oil, gasoline and solvents used in the operation and maintenance of construction equipment and that equipment remains free of external petroleum-based products prior to entering the work area and during the work, and for making necessary repairs prior to returning the equipment to operation in the work area.
- An emergency spill containment kit must be located on site along with a pollution prevention plan detailing planned fueling, materials storage and equipment storage. Waste storage areas must be prepared to address prevention and cleanup of accidental spills.
- Construction-related debris within riparian/shoreline areas (200 feet from waterbodies) will be cleaned up daily. Proper conservation measures will be taken to ensure that debris will not contaminate the stream waters.
- Waste materials, including concrete, riprap, miscellaneous garbage and/or other debris removed from the project site, will be transported off-site for disposal in accordance with applicable regulations.
- Work will follow other local, state and federal regulations and restrictions.
- Within riparian/shoreline areas, excavation will be limited to those areas necessary for access to the work areas and construction activities. The construction limits will be marked in the field and equipment will not be allowed outside the work area.
- Adequate materials will be maintained on site to respond to weather conditions and modify the construction plan as needed to accommodate unanticipated events.

- Routine inspections of the erosion control measures will be conducted daily during construction to ensure the effectiveness of the measures and to identify the need for maintenance or additional control measures.
- Grading and construction will be phased to reduce the time that soil is exposed to the extent possible.
- Silt fences will be constructed around excavation areas that are within the riparian/shoreline zone.
- Spoil stockpiles within the riparian/shoreline zone will be contained using BMPs to reduce the potential for introduction of fine sediments into adjacent waters.
- Disturbed slopes will be hydroseeded following project completion.
- Disturbance will be limited to the smallest area feasible for each phase of the project and element under construction and will stay within the limits of construction as identified on the site plans.
- Fueling areas will be distinctly identified and established outside of riparian/shoreline zones, but within the construction area. These areas will be equipped with spill prevention and control devices.

#### **4.2. Measures to Reduce Impacts to Species and Habitats**

Specific conservation measures and BMPs to minimize impacts to species and habitats could include but are not limited to:

- Work below the OHWM, if any, of waterbodies under state or federal jurisdiction will be limited. There will be no fill placed in wetlands or other waterbodies. Upgrades to existing outfalls and outfall abandonment and removal may be required below OHWM, but would be accessible during low tides without dewatering.
- The project will obtain and comply with conditions that will be outlined in state and federal permits.
- Debris resulting from construction within the riparian/shoreline zone shall be removed from the project area and prevented from entering the rivers.
- Construction procedures within riparian/shoreline areas have been designed to minimize the opportunity for erosion to occur or sediment-laden water to enter downstream areas.
- Depending on slope and weather conditions, filter fences or equivalent will be installed along the perimeter of work areas within the riparian/shoreline zone to help confine sediment and runoff. Straw bales or equivalent will be added if concentrated surface water flow is observed.

#### **5.0 ACTION AREA**

The Action Area is defined as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action” (50 CFR §402-02). The Action Area, therefore, includes the spatial extent of direct and indirect effects, as well as effects of interrelated and interdependent activities of the project. Many project effects are temporary in nature, occurring during or immediately after construction; other project effects may persist after project completion as a result of long-term changes to the environment. For this project, the Action Area was identified as the levee alignment footprint as well as the surrounding area within 218 feet of the alignment, as shown on Figure 3, and includes upland areas as well as portions of the Hoquiam and Wishkah Rivers, and Fry Creek. It does not include any aquatic habitat associated with the Chehalis River or Grays Harbor.

Project-specific effects that were considered to identify the Action Area for the project include:

- Construction-related noise (direct effect, short-term temporary impact);
- Degradation of water quality (direct and indirect effects, potential for both short-term and long-term impacts); and
- Habitat alteration (direct and indirect effects, potential for both short-term and long-term impacts).

The spatial extents of these effects are used in total to identify the Action Area, as discussed in the following sections.

### 5.1. Noise

Construction-related noise will occur as a result of operation of general construction equipment. This effect is limited to the construction period and will not persist once construction is complete. Construction-related noise will permeate terrestrial (in-air) environments and may carry into the surrounding environment beyond the project site. Construction-related noise will not affect aquatic (underwater) environments because construction will generally be above OHWM; in-water work associated with outfalls, will be completed during low tides when they are exposed and will not generate underwater noise.

The extent that in-air noise will permeate the surrounding environment was estimated using guidance provided by WSDOT (2015). Construction equipment will include typical machinery such as backhoes, graders, excavators, as well as and a vibratory hammer to drive sheet piles. The vibratory hammer will generate the greatest in-air noise (101 dBA at 50 feet from the source) and is used to estimate the maximum extent of construction noise (WSDOT 2015). Background noise levels surrounding the site are dependent on the industrial setting of the area and the community activity around the project site. Actively used railroad tracks, commercial and industrial buildings and residential areas are adjacent to the project site. Based on this information, background noise at the project site is estimated to be 75 dBA. The project site is surrounded by roads, buildings and trees creating a “soft-site” that would attenuate noise at an approximate rate of 7.5 dBA per doubling distance (WSDOT 2015). Therefore, potential noise impacts were calculated for a “soft-site.” Within these parameters, the distance from the project at which construction equipment noise is expected to become indistinguishable from background ambient noise conditions is between 400 and 800 feet (Table 1 below).

**TABLE 1. IN-AIR CONSTRUCTION NOISE ATTENUATION TABLE**

Distance from the Source (Feet)	Point Source Noise Soft Site (-7.5 dBA)	Background Sound
50	101 dBA	75 dBA
100	93.5 dBA	75 dBA
200	86 dBA	75 dBA
400	78.5 dBA	75 dBA
800	71 dBA	75 dBA

Note:

Source: WSDOT 2015

To identify a more precise estimate of noise extending into the surrounding environment, we used the regression equation provided by WSDOT (2015). Based on this analysis, we identified that noise impacts in excess of background may extend up to 548 feet from the project site (Figure 3).

## **5.2. Water Quality**

The project has the potential to impact the water quality of the Wishkah River and Hoquiam River. The Chehalis River and Grays Harbor are unlikely to be affected as construction will occur at least 300 feet away from these waterbodies (Figure 3). Water quality impacts could result from sediment erosion, spilling hazardous materials, or release of petroleum-based products associated with construction machinery. This potential is limited to the construction period and will not have lasting impacts once construction is complete. The potential for sediment erosion and spills will be controlled through proper implementation of BMPs.

There will be no new pollution-generating impervious surfaces (PGIS) resulting from this project and there will be no long-term change to the discharge volume and treatment of stormwater. Changes to stormwater conveyance systems may result in re-routing some stormwater runoff, but the receiving waterbodies for stormwater discharge will remain the same. Gravity fed systems will remain, however, new pumps will be installed to maintain discharge during high tide elevations. Overall the volume will remain unchanged. There will be limited new non-pollution-generating impervious surfaces associated with sidewalks, trails, walls and planters, but these surfaces are not expected to contribute to long-term changes in water quality beyond the construction period.

The zone in which water quality could be temporarily impacted because of spills or other construction-related degradation includes the Wishkah River and Hoquiam River immediately adjacent to and within 100 feet of the levee alignment.

## **5.3. Habitat Alteration**

Habitat alteration may include direct impacts to riparian vegetation, such as that resulting from levee construction, as well as indirect changes in flood storage capacity or conveyance, availability of refuge habitat, and habitat forming processes. Direct effects (impacts to riparian vegetation) and indirect effects (impacts to other floodplain habitats and processes) are discussed separately in the following sections. Alteration of stream habitats is not anticipated; however, an interrelated project that will impact Fry Creek is discussed in this section as well.

### **5.3.1. Riparian Vegetation**

Impacts to vegetated riparian area will be limited. Where the levee alignment is immediately adjacent to the riparian zone, it will generally be constructed of sheet pile or concrete and will be located at the immediate edge of existing development, thereby reducing impacts to vegetation. Temporary loss of riparian vegetation may occur within and adjacent to the levee alignment where sheet piles, concrete, or earthen berms are constructed. Earthen berms, which would require the largest total width of clearing are only proposed in a few vegetated areas. Most (estimated at greater than 95 percent) of the riparian area where the levee system will be constructed currently lacks native or other significant riparian vegetation. Degraded riparian areas that will be affected are generally dominated by grasses or invasive species with sparse trees. The levee alignment and type was specifically designed to avoid wetland fill.

The zone of influence for potential alteration of riparian habitats is limited to riparian areas directly impacted by construction activity. These areas occur within the same zone of influence identified for noise above (548 feet), or less.

### **5.3.2. Floodplain Habitats and Processes**

Remaining undeveloped floodplain areas are few, are generally isolated from other habitat areas, and habitat conditions are degraded. Affected floodplain areas are primarily associated with coastal flood hazard and would receive lower depths of flooding at the 100-year riverine flood level in the absence of coastal flooding. Flood storage capacity for coastal flood hazards are not applicable, and floodplain storage capacity for riverine flooding will not be reduced at 100-year or lesser flood events. A small section of the levee is located within the Wishkah River floodway as currently mapped by FEMA (Figure 3). However, hydraulic modeling shows that the portion of the levee within the floodway will cause less than an approximate 0.01-foot rise, and that there would be no change in rise if the levee was moved to be located just outside the floodway. Furthermore, based on a meeting held on April 21, 2017, between representatives of FEMA, STARR, City of Aberdeen, and the project design team, it was identified that the floodway mapping should be revised using additional modeling data and that revision during the LOMR process will result in the levee being outside of the floodway. The chosen alignment is the preferred alignment in order to provide flood protection for a series of apartment buildings.

Refuge from high velocity riverine flows could also be impacted as a result of isolation of the floodplain from the primary channels of the rivers by the new levee system; however, most floodplain areas protected by the levee are not within the 100-year flood elevation range for riverine flooding, but are instead within the 100-year flood elevation for coastal flooding. Consequently, such an impact would typically be associated with a much more extreme and rare flood event.

Where the existing floodplain remains undeveloped, such as occurs at several wetland areas identified along the project corridor and shoreline or other upland habitats occurring adjacent to the shoreline, accessible habitat may become inaccessible as a result of the levee. Overall, potential areas that could be isolated by the levee system are small and are already isolated at most flow levels due to prior topographic alterations. These areas would only provide habitat at the most extreme flood levels, such as may occur with a 100-year tidal flood event.

Habitat-forming process may be affected only to the extent there is alteration to the riparian vegetation community, resulting in changes to terrestrial inputs to the aquatic system (e.g., allochthonous nutrients, large woody debris [LWD] recruitment, etc.). Spawning or migratory habitats will not be altered by the project because work below the OHWM, will be limited to the upper tidal fringe where stormwater outlets are repaired or removed.

The zone of influence for potential alteration of floodplain habitats and processes is limited to undeveloped habitat areas landward of where the levee will be constructed, which include two wetland areas and a City park, as identified on Figure 3. These areas all occur within the same zone of influence identified for noise above (548 feet), or less.

### **5.3.3. Stream Habitat**

There will be no direct alteration of stream habitats resulting from the levee project. However, a separate project interrelated to the levee project is proposed to alter the existing discharge pattern at Fry Creek.

Currently, a tidegate exists on Fry Creek at Port Industrial Road. At high marine tides, the tidegate shuts, creating a fish passage barrier. When the tidegate is shut, discharge from Fry Creek is pumped to a separate outfall. The Fry Creek project will move the tidegate and pump station further upstream, approximately where the levee system is proposed, such that the stream will be free-flowing during a higher proportion of flow events, and the tidegates will shut and flow become pumped only during very high tides and discharge events. This will result in a net improvement to the Fry Creek hydrograph and fish passage conditions.

## 6.0 SPECIES AND HABITAT INFORMATION

Species and designated critical habitat listed under the ESA fall under the jurisdiction of one of two federal agencies: The U.S. Fish and Wildlife Service (USFWS) for terrestrial and freshwater species, and the National Oceanographic and Atmospheric Administration (NOAA) Fisheries for marine species. We obtained a list of listed or proposed species and designated or proposed critical habitat for the project area from the USFWS (2017). We also obtained lists of listed or proposed species and designated or proposed critical habitat for salmonid species on the Washington Coast from NOAA Fisheries (2015). These official species lists are included in Appendix A.

### 6.1. Species and Habitat Occurrence

There is only one federally listed species that may occur within the action area: **bull trout, *Salvelinus confluentus***, which is listed as threatened. According to WDFW (2017a) Priority Habitats and Species (PHS) data, the project contains numerous salmon and other fish species associated with Wishkah River, Hoquiam River, Chehalis River, Fry Creek, and Grays Harbor. However, none of the federally threatened or endangered ESA Units managed by NOAA Fisheries are located within these waterbodies. Bull trout, which are managed by USFWS as a threatened species, use the Wishkah River, Hoquiam River, Chehalis River and Grays Harbor, but not Fry Creek. There are no ESA-listed terrestrial species mapped within the Action Area (WDFW 2017a). The WDNR (2016) database indicates no sensitive plant records within Sections that that overlap the project action area.

Critical habitat has been designated for bull trout and occurs within the main stems of the Wishkah River and Chehalis River, as well as within Grays Harbor (75 FR 63897). Critical habitat within the main stem Wishkah River, which has been designated from its confluence with Grays Harbor upstream 54.4 kilometers (33.8 miles) to a natural barrier, occurs within the action area for the project (Figure 3). The Wishkah River is identified as part of the Lower Chehalis/Grays Harbor foraging, migration, and overwintering habitat for bull trout. Bull trout are not known to spawn in the Wishkah River basin, so their presence in the river likely originated from the core areas north of Grays Harbor. Critical Habitat associated with Grays Harbor and the Chehalis River is outside the action area for the Project. Critical Habitat does not occur within the Hoquiam River nor Fry Creek.

The following ESA-listed species may occur in Grays Harbor County, but are not expected to occur in the Action Area and are, therefore, not addressed in this BA:

- **Marbled Murrelet (*Brachyramphus marmoratus*) and Associated Critical Habitat.** The occurrence of marbled murrelet in the action area is possible, though not particularly likely. Marbled murrelets specifically tend not to occur adjacent to urban areas. There is no critical habitat designated for the marbled murrelet in the project action area. The nesting/critical habitat consists of mature forests,

which are not found within the action area. Marbled murrelets are, therefore, not expected to occur within the action area.

- **Yellow-Billed Cuckoo (*Coccyzus americanus*).** Yellow-billed cuckoos are associated with open deciduous woodlands and deciduous forests that are at least 25 acres in size (NatureServe 2015). Yellow-billed cuckoos are not expected to occur in the developed shoreline environment where there are no forested areas. The likelihood of a yellow-billed cuckoo entering the action area is minimal to none.
- **Streaked Horned Lark (*Eremophila alpestris strigata*).** This species typically utilizes open spaces dominated by grasses and other herbaceous vegetation, such as native prairies, coastal dunes, agricultural fields and other grass fields such as those found around airports (USFWS 2014). The Project area does include agricultural fields and remaining populations are concentrated in the Willamette Valley in Oregon (USFWS 2014). Furthermore, there have been no recent sightings of streaked horned larks within the project or Action Areas (WDFW 2015) and critical habitat does not occur near the project (USFWS 2015). Therefore, streaked horned larks are not expected to occur within the Action Area.
- **Short-Tailed Albatross (*Phoebastria albatrus*).** Short-tailed albatross forage across much of the subarctic North Pacific Ocean. There are only estimated to be 1,200 birds in the wild population and only two known breeding colonies on two Japanese islands (USFWS 2001). Short-tailed albatrosses nest on sloping grassy terraces on two rugged, isolated windswept islands in Japan. Furthermore, there have been no recent sightings of short-tailed albatross within the project or action areas (WDFW 2015). Therefore, short-tailed albatross are not expected to occur within the action area.
- **Fisher (*Martes pennant*).** According to the WDFW PHS Maps (2015), there have been no sightings in the vicinity of the project site. In addition, the project is located within developed areas that have a high level of human use. Fishers are not expected to occur in the urban river shoreline environment of the Cities of Aberdeen and Hoquiam. Therefore, fishers are not expected to occur within the action area.

## 6.2. Habitat Conditions in the Action Area

Grays Harbor and the Hoquiam, Wishkah, and Chehalis Rivers are migratory corridors for salmonids and are used to varying extents by different salmon species for rearing and spawning. Fry Creek is also used by cutthroat trout and coho salmon, but not bull trout. There is an existing tidegate on Fry Creek at Port Industrial Road (Figure 3). Designated critical habitat for bull trout has been identified within the action area, in the Wishkah River, as identified in the preceding section.

During site reconnaissance completed by the project team, shoreline conditions were documented throughout the project area. Vegetated sedge and grass areas are present below the OHWM where bulkhead or other overwater development is absent. Otherwise, much of the shoreline has been altered through human activity and is currently characterized by armoring, either large rock or concrete, as well as numerous relic timber piles and other structures.

Terrestrial habitats surrounding the proposed levee system (Figure 2) are influenced by urban development. Dominant vegetation within the project area consists primarily of mowed and maintained vegetation. Undeveloped upland areas that remain have typically been affected by historical land cover and topographic alteration and are currently dominated by invasive species such as Himalayan blackberry (*Rubus armeniacus*), scotch broom (*Cytisus scoparius*), and Japanese knotweed (*Fallopia japonica*). The

shoreline typically features vertical and very steep banks; in some areas along the bank native species such as slough sedge (*Carex obnupta*), silverweed (*Argentina anserina*), and tufted hairgrass (*Deschampsia cespitosa*) were identified. Tree and large shrub species such as alder (*Alnus rubra*) and willow (*Salix* ssp.) were infrequently encountered along the shoreline. Other sections of the shoreline have been modified with vertical seawall or bulkhead structures. There are also numerous over-water structures and derelict piles from former structures along the shorelines. Where vegetation remains in riparian and floodplain areas (such as occurs along the Hoquiam River near the western terminus, the wetland complex south of Simpson Avenue, along portions of Fry Creek and associated ditches and wetlands, at Zelasko Park, and along the Wishkah River near the eastern terminus; see Figures 2 and 3), it may provide flood flow attenuation but unlikely provides measurable inputs of woody debris to the adjacent aquatic system. Developed areas already lacking vegetation, which occurs throughout most of the area that will be protected, provide no habitat value to fish.

Within the action area, priority habitats mapped by the PHS online mapper (WDFW 2017a) are the Wishkah River, Hoquiam River, Fry Creek, various wetlands (including an estuarine/marine wetland, a freshwater forested/shrub wetland, and other general wetlands). Wetlands occurring within the action area are within the 1 percent chance annual flood zone (100-year floodplain) and therefore may provide accessible habitat during rare extreme flood events; on the other hand, some of these wetlands are surrounded by human development and are isolated from the river/harbor during typical flood events as a result of topographic alteration in the past. If these areas are accessed by fish during large flood events, fish stranding may result.

One of the mapped wetlands, which is identified as a mix of estuarine/marine and other general type, corresponds to the large wetland complex field-verified on the left bank of the Hoquiam River between the railroad and Simpson Avenue bridges (Figure 2, Photograph 3). An historic fill prism, either road or levee, currently bisects this wetland complex (Figure 2, Photographs 2, 4 and 5); wetlands on the west side of the fill are connected to the Hoquiam River and may be considered estuarine whereas wetland on the east side of the fill have become isolated and are now depressional degraded systems. The freshwater forested/shrub wetland identified by WDFW occurs near the intersection of Bay Avenue and Ontario Street and was field-verified as a non-wetland (upland) grass field. A third wetland identified by WDFW is associated with a slough extending north from the outlet of Fry Creek at Grays Harbor, is outside the project area (but partially within the action area), and will not be isolated by levee construction.

### **6.3. Primary Constituent Elements (PCEs) of Bull Trout Habitat**

According to WDFW (2015), bull trout are known to occur in the Wishkah and Hoquiam Rivers, and are therefore expected to be present within the action area of the project. The mainstem of the Wishkah River is designated as critical habitat for bull trout (70 FR 56212). The Primary Constituent Elements (PCEs) identified for bull trout critical habitat include: (1) water temperatures that support bull trout use; (2) complex stream channels with features such as woody debris, side channels, pools, and undercut banks to provide a variety of depths, velocities and in-stream structures; (3) substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival; (4) a natural hydrograph, including peak, high, low, and base flows within historic ranges or, if regulated, currently operate under a biological opinion that addresses bull trout, or a hydrograph that demonstrates the ability to support bull trout populations by minimizing daily and day-to-day fluctuations and minimizing departures from the natural cycle of flow levels corresponding with seasonal variation; (5) springs, seeps, groundwater sources and subsurface water to contribute to water

quality and quantity as a cold water source; (6) migratory corridors with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures or low flows; (7) an abundant food base including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish; and (8) permanent water of sufficient quantity and quality such that normal reproduction, growth and survival are not inhibited.

Freshwater-specific PCEs for bull trout are present in the action area. There is no spawning habitat (PCE 3) within the action area, but the habitat within the action area is identified primarily as a migratory corridor (PCE 6). The remaining PCEs (1, 2, 4, 5, 7 and 8) all apply to the project.

## 7.0 EFFECTS ANALYSIS

Effects of the action are defined as “the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with the action, that will be added to the environmental baseline” (50 CFR §402.02). Project-related effects are confined to the project action area, as defined herein. The project will have both direct and indirect effects on the natural environment; however, bull trout are not anticipated to be affected directly by the project but may be affected indirectly.

This section provides an analysis of the anticipated effects of the project, with a focus on potential effects (primarily indirect) to fish habitat. Traffic impacts and other land-use changes are not anticipated to affect bull trout and are therefore not addressed further. There will be no direct alteration of habitat used by bull trout resulting from the project. As described in Section 5.3, spawning and migratory habitats are not anticipated to be directly affected by the project because there is no spawning habitat within the action area and work below the OHWM within migratory corridors, will be limited to outfall repairs and/or removal. However, some of the project actions could have indirect effects, as described in the following sections.

### 7.1. Noise

The effect of construction activity and noise exceeding background conditions will be temporary, will not persist beyond project completion, and will only affect terrestrial rather than underwater environments. There are no listed terrestrial species within the Action Area. There will be no in-water work that could potentially increase noise levels affecting bull trout; outfall repairs and/or removal below the OHWM, will be completed during low tides without dewatering. Therefore, there will be *no effect* of noise on bull trout resulting from the project.

### 7.2. Water Quality and Quantity

Water quality and quantity are associated with PCEs 1, 4, 5, 6 and 8. PCE 1, which relates to water temperature, is discussed in Section 7.2 (Riparian Vegetation); there are no other mechanisms resulting from the project anticipated to affect water temperature. There will be impacts of the project on springs, seeps, or groundwater sources/subsurface water (PCE 5).

There will be no permanent changes to the amount of PGIS or stormwater treatment; therefore, there will be no long-term impacts related to stormwater runoff, which can affect peak flows, or water quality degradation, both of which are associated with PCEs 4, 6 and 8. Alterations to the stormwater conveyance

systems is not anticipated to result in changes in water quantity, which is primarily dictated by tidal cycles within the action area. Potential construction-related impacts to water quality, such as sediment erosion, spilling hazardous materials or release of petroleum-based products associated with construction machinery, will be controlled through proper implementation of the SPCC Plan and BMPs; therefore, the chance of negative impacts to the aquatic environment resulting from stormwater runoff are *discountable*.

New non-pollution-generating impervious surfaces (NPGIS), such as sidewalks, trails, walls and planters will not contribute to water quality degradation but could impede groundwater recharge and, consequently, reduce base flows in the Hoquiam and/or Wishkah River. This potential effect on water quantity could impact PCEs 4, 6 and 8. The project area is low in the watershed and the action area includes the reaches near the mouth of several large rivers. Furthermore, water quantity within the action area is influenced more by tidal cycles and less so by groundwater recharge. Reaches of the Hoquiam and Wishkah Rivers within the action area include large, deep water and fish habitat in these reaches is not limited by base flows. Therefore, impacts of the project on water quantity are *insignificant*.

### 7.3. Flood Storage Capacity, Velocity and Refuge

The project has the potential to reduce flood storage and/or conveyance capacity, as well as refuge habitat for fish, by disconnecting portions of the floodplain and floodway from adjacent waterways. These potential effects are indirectly related to PCEs 2 and 4, and may occur in the depression wetlands, undeveloped land (e.g. Zelasko Park), and Wishkah River floodway identified on Figure 3 by isolating them from the river during large, extremely rare flood events. The project is anticipated to have *no effect* on flow velocity due to the position of the action area near the mouths of the rivers, where flow velocity is typically low because the channels are oversized as a result of tidal flushing and the rivers discharge to a non-flowing body of water (Grays Harbor). Impacts to flood conveyance capacity within the Wishkah River floodway are not anticipated based on hydraulic model results, a conclusion that will be further reinforced during the LOMR map update process which is anticipated to show the levee is outside the revised floodway. The effect of the project on flood storage capacity is likewise considered *insignificant* due to the predominantly highly developed conditions in the floodplain, which are characterized by impervious surfaces and the low position of the project area in the watershed, where conditions are influenced more by tidal influence than by upstream flooding. The effect of the project on refuge habitat for fish is also considered *insignificant*, as explained further below.

Baseline conditions on the upland side of the levee system, which is the area that will be removed from the floodplain, are generally developed, with few exceptions. Developed areas do not provide quality refuge habitat for fish and may be harmful if fish access them during flood events and then are either exposed to other adverse conditions resulting from human activity (industrial sites, traffic/roads, non-fish-passable stormwater ponds and ditches, fences, et cetera) and/or are unable to return to the river system as flows recede, resulting in stranding.

There are only three natural areas identified adjacent to and on the upland side of the levee system that could otherwise be used by fish during large extreme flood events, but will be removed from the 1 percent annual chance (100-year) floodplain associated with tidal (coastal) flooding and become isolated by the levee (Figure 3). The first area is a small (less than 15,000 square feet), linear depression wetland occurring adjacent to the Hoquiam River, west of 21<sup>st</sup> Street and between Aberdeen and Pacific Avenues (Figure 3). This degraded depression area, though currently characterized by a shrub-dominated invasive and native vegetation community, likely receives untreated stormwater runoff and may be a risk for fish

stranding due to the abandoned road prism located on its west side, which results in existing habitat isolation during most flood events, and is the alignment of the proposed levee system. A second area occurs at Fry Creek, which currently contains a tidegate at Port Industrial Road, will be further isolated from the marine environment by the levee during tidal flood flows, as will the associated system of ditches and wetlands (less than one acre total; Figure 3) occurring east of the creek (Figure 2 – Photos 7 and 8). The third area is a small pocket of grassy floodplain at Zelasko Park (less than one acre) which will be isolated from the Wishkah River during extreme tidal flood events by the levee system, which will be constructed on the shoreline side of the park (Figure 2 – Photo 11). All of these areas are currently isolated and inaccessible to fish during normal high flows and moderate flood events, but may be accessible to fish during large tidal flood events, such as a 1-percent annual chance recurrence (100-year) flood. After the Project is constructed, these areas will become further isolated and inaccessible to fish.

Isolation of these habitats from the aquatic environment may have an impact on fish that may otherwise be able to use the habitat as refuge during flood events. However: (1) although not currently developed, these areas represent marginal habitat that could also be harmful to fish if accessed due to habitat degradation and human alterations that could result in fish entrapment; (2) these areas would only be accessible to fish during extreme tidal flood events, such as a 1-percent annual chance (100-year) flood, and are not typically accessible during less extreme floods; (3) these areas are located near the mouth of the Hoquiam and Wishkah Rivers or are connected directly to Grays Harbor, where riverine flooding is not anticipated and conditions are more influenced by tidal cycles and coastal flooding; and (4) the cumulative size of these habitats is very small (less than 3 acres) compared to the remaining floodplain that will not be affected. In particular, the following remaining floodplain habitats provide equal or better habitat conditions for fish refuge in the immediate vicinity of the project: Hoquiam River upstream near the confluence of the East Fork and Hoquiam Rivers, near the community of Woodlawn (Figure 1); along the Grays Harbor shoreline in the vicinity of the US-101 bridge; on the opposite (south) bank of Grays Harbor; around Rennie Island; and extensive undeveloped floodplains along the Wishkah River north of the project area (Figure 3).

#### **7.4. Riparian Vegetation**

Riparian habitat is associated with PCE numbers 1, 2, 6 and 7 for bull trout critical habitat (see Section 6.3). Riparian habitat can contribute to regulation of water temperature, cover, LWD inputs, and other organic (allochthonous) inputs to the aquatic system. Baseline riparian conditions within the project area are generally highly degraded and the project is not expected to result in significant further degradation of riparian functions. Consequently, the impact of riparian habitat alteration on bull trout and designated critical habitat for bull trout is considered *insignificant*.

Much of the project area has already been altered by human activity and currently lacks high-quality riparian vegetation that would otherwise be provided by native trees and shrubs. Within the action area, remaining riparian tree cover is extremely limited. On the Hoquiam River, some mature riparian trees exist: along approximately 100 feet of shoreline adjacent to A Street; near the Simpson Avenue bridge; and within a relatively large marine/estuarine and depressional wetland complex south of the Simpson Avenue bridge, which spans over 1,000 feet of shoreline. On the Wishkah River, there is: a single tree at the N D Street end; approximately 100 feet of degraded riparian forest west of the Young Street bridge, and approximately 1,000 feet of intermittent degraded riparian vegetation north of Young Street with about 50 percent tree cover (Figure 2 – Photo 12).

Temporary and permanent alteration of existing riparian vegetation will result from clearing and grading activities, as well as levee vegetation standards. Vegetation that will be removed during project construction consists primarily of weedy herbaceous and shrub layers; as described above, trees are rare within the project area and their removal will be kept to a minimum. Affected areas will be mitigated by stabilizing and re-vegetating cleared areas with native species as allowable according to levee standards and/or by restoring adjacent areas not restricted by levee standards. Disturbed areas within which levee standards apply will either be hydroseeded or planted with species selected from an approved list. In some areas, grass may be the only allowable vegetation cover.

Wildlife species that occupy riparian habitats may be temporarily displaced during construction and tree removal may temporarily remove or reduce bird perches and/or nesting habitat. However, there will be no direct impact on bull trout resulting from this activity. Re-planting affected areas with native plant species that includes trees, where allowable, will result in long-term restoration of riparian habitat that contributes to improvements in bull trout PCEs 1, 2, 6 and 7, including recruitment of LWD and allochthonous inputs, cover, and shade to the aquatic environment.

### 7.5. Habitat Forming Processes

Habitat-forming process may be affected only to the extent there is alteration to the riparian vegetation community, resulting in changes to terrestrial inputs to the aquatic system (e.g., allochthonous nutrients, large woody debris recruitment, et cetera.). There is no spawning habitat within the action area; impacts to habitat-forming processes resulting from riparian alterations that could affect migratory habitat were discussed in the preceding section.

## 8.0 EFFECTS DETERMINATION

We have made the following effect determinations for bull trout and bull trout critical habitat based on the information presented in the preceding sections.

### 8.1. Bull Trout

The project **may affect** bull trout because:

- The Hoquiam and Wishkah Rivers contain documented migratory corridor habitat for bull trout and are therefore considered occupied habitat.
- The project includes construction activity within the 1 percent annual chance (100-year) floodplain associated with and adjacent to the Hoquiam and Wishkah Rivers.
- The project will result in isolation of small undeveloped floodplain areas associated with the Hoquiam and Wishkah Rivers during large flood events.
- The project will result in minor alterations to riparian vegetation conditions adjacent to the Hoquiam and Wishkah Rivers.

The project is **not likely to adversely affect** bull trout because:

- In-water work associated with the project, will be limited to outfall repairs and/or removal, which will be completed during low tides without dewatering, and therefore will not directly impact habitat occupied by bull trout.
- Potential indirect impacts to water quality, such as contaminants or sediments entering aquatic habitats, will be adequately controlled through proper implementation of BMPs, such that the chance of water quality effects occurring is *discountable*.
- Potential impacts to water quantity are considered *insignificant* due to minor amounts of impervious surfaces that could reduce groundwater recharge as well as the position of the project low in the watershed and near the freshwater-tidal interface where groundwater recharge is not a fish habitat limiting factor.
- The project will have no effect on flood velocity because most of the project area is subject to coastal flooding, which is characterized by low velocity flows, rather than riverine flooding.
- The effect of the project on flood flow conveyance is considered *insignificant* based on model results showing no net rise (less than 0.01 foot) within the Wishkah River floodway and that the levee is outside of the revised floodway as demonstrated during the pending LOMR process.
- Potential impacts to flood storage capacity are considered *insignificant* because areas protected by the levee are subject to coastal/tidal flooding rather than riverine flooding, and floodplain storage capacity associated with a large non-flowing waterbody (Grays Harbor) will not affect flood elevations or velocities.
- Potential impacts to refuge habitat for fish are considered *insignificant* because most of the 1 percent annual chance (100-year) floodplain is already developed and does not constitute suitable refuge habitat. The few remaining undeveloped habitat areas that will be isolated from the river systems are small and degraded, and may result in fish stranding if accessed during flood events. These areas are already isolated during most flood events including moderate floods. There are other better areas for fish refuge available in the immediate vicinity, as well as further upstream within the river systems where refuge habitat may be of more value to bull trout.
- The impact of clearing and replanting of degraded riparian vegetation on bull trout is *insignificant*. Areas cleared of riparian vegetation will be re-vegetated with native species, where possible in accordance with levee vegetation standards, and/or adjacent areas will be restored where levee standards preclude installation of riparian vegetation.

## 8.2. Designated Critical Habitat for Bull Trout

The project **may affect** designated critical habitat for bull trout because:

- Water quality could be temporarily impacted during construction activities, affecting PCEs 6 and 8.
- The project may have impacts to riparian vegetation, which can affect PCEs 1, 2, 6 and 7.

The project is **not likely to adversely affect** designated critical habitat for bull trout because:

- There will be no direct alteration of aquatic habitats designated as critical habitat (all PCEs).
- There is no spawning habitat within the action area (PCE 3).
- The project will have no effect on hydrograph or groundwater resources (PCEs 4 and 5).

- Potential impacts to water quality, such as contaminants or sediments entering aquatic habitats, will be adequately controlled through proper implementation of BMPs, such that the chance of water quality effects occurring is *discountable*. Therefore, PCEs 6 and 8 are not expected to become degraded.
- Areas cleared of riparian vegetation will be re-vegetated with native species in accordance with levee standards. The impact of clearing and replanting of degraded riparian vegetation on bull trout habitat is *insignificant*. Therefore, the contribution of riparian vegetation toward sustaining PCEs 1, 2, 6 and 7 is not expected to be reduced.
- The project will not have any other unaccounted-for effects on water temperatures, stream habitat conditions, the natural hydrograph, water quantity, migratory corridors, or food base.

## 9.0 ESSENTIAL FISH HABITAT (EFH) EVALUATION

The Magnuson-Stevens Fishery Conservation Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996, established procedures designed to identify, conserve and enhance EFH for those species regulated under a Federal fisheries management plan (FMP). EFH is defined by the MSA as “*those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.*” For the Pacific West Coast, there are three FMPs covering: (1) groundfish; (2) coastal pelagic species; and (3) Pacific salmon.

The objective of this EFH evaluation is to describe potential adverse impacts to designated EFH for federally managed fish species within the Action Area. It also describes conservation measures to avoid, minimize or otherwise offset potential adverse impacts to designated EFH resulting from the action.

### 9.1. Occurrence in the Action Area

The area where the project will occur includes fish-bearing perennial waterbodies: the Hoquiam River, Wishkah River, and Fry Creek. The Chehalis River and Grays Harbor are outside the action area. No groundfish or coastal pelagic species occur in the project action area. The three Pacific salmon species regulated under the FMP include Chinook, pink and coho salmon. All three of these species occur in the action area.

### 9.2. Effects of the Project

The BA includes a complete description of the project actions and effects on fish habitat that may occur as a result. Baseline habitat conditions are described in detail in Section 3.0 of the BA. Habitat alteration that may result from the project is described in Section 5.3 and the anticipated effects of these alterations are presented in Section 7.0. Project effects on water quality are discussed in Sections 5.2 and 7.2.

As described above, the project site is adjacent to riverine environments which support adult and juvenile salmon. Habitat alterations, including vegetation clearing and grading, and potential water quality impacts could occur as a result of project construction. Construction activities will occur within riparian areas adjacent to salmon habitat. However, construction impacts will be temporary and baseline riparian conditions generally lack forested vegetation cover (see Section 7.4). After project construction is complete, cleared areas will be stabilized and re-vegetated in accordance with approved levee standards. Riparian conditions after construction are anticipated to be restored to baseline conditions.

Fry Creek contains coho salmon, which are regulated under the MSA. An existing tide gate is located at the Port Industrial Road stream crossing. This tide gate prevents floodwaters from backing up into the creek under the baseline condition, and a pump station is necessary to convey discharge from the creek to the marine environment during times of high flow or high tide. The levee project will not directly affect the current fish passage conditions. An interrelated project to restore lower Fry Creek will result in moving the tidegate and pump station further upstream (see Section 5.3.3). Once complete, fish passage conditions should be improved in lower Fry Creek.

### 9.3. Essential Fish Habitat Determination

In conclusion, the action **will not adversely affect** Pacific salmon habitat.

## 10.0 SUMMARY

The Cities of Aberdeen and Hoquiam are proposing to accredit the North Shore Levee project through FEMA in order to mitigate flood risk and reduce flood insurance costs. This will be accomplished by constructing a levee and floodwall system approximately 5.6 miles in length along the Hoquiam River, Grays Harbor, and Wishkah River. Bull trout is the only ESA-listed species that may be present within the action area. The action area also contains designated critical habitat for bull trout. There are no other listed terrestrial species and no known listed plant species identified in the action area.

The project may result in elevated noise levels and degradation of water quality during construction. The project may alter floodplain and riparian habitats as a result of isolation of small remaining undeveloped floodplain areas from the Hoquiam and Wishkah Rivers and minor amounts of riparian vegetation removal. Riparian habitats affected by the project are generally degraded, mostly lacking tree cover, and will be re-vegetated following completion of the project. Floodplain areas that will be isolated are mostly developed; where remaining undeveloped floodplain areas exist, conditions are degraded and of limited value within the watershed. The effects on listed species (bull trout) and designated critical habitat were evaluated and identified to be *discountable* and/or *insignificant*. Therefore, the ESA effect determination for this project is **may affect, but not likely to adversely affect** bull trout and associated critical habitat, and the EFH effect determination is **will not adversely affect** Pacific salmon habitat.

## 11.0 REFERENCES

- 61 FR 26255-26320. 50 CFR Part 17. Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for the Marbled Murrelet; Final Rule. Federal Register, Vol. 62, No. 102. 1996.
- 64 FR 58909-58933. 1999. 50 CFR Part 17. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for Bull Trout in the Coterminous United States. Federal Register, Vol. 64, No. 210.
- 70 FR 56212-56311. 50 CFR Part 17. United States Fish and Wildlife Service. Endangered and Threatened and Wildlife and Plants; Designation of Critical Habitat for Bull Trout. Federal Register, Vol. 70, No. 185. 2005.

75 FR 63897-64070, 2010. 50 CFR Part 17. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for Bull Trout in the Coterminous United States; Final Rule. Federal Register, Vol. 75, No. 200.

NatureServe. 2015. Available at: <http://www.natureserve.org/>

National Oceanic and Atmospheric Administration Fisheries. 2015. Endangered Species Act Critical Habitat. Available at: [http://www.westcoast.fisheries.noaa.gov/maps\\_data/endangered\\_species\\_act\\_critical\\_habitat.html](http://www.westcoast.fisheries.noaa.gov/maps_data/endangered_species_act_critical_habitat.html)

United States Fish and Wildlife Service. 2017. Official Species List. Consultation Tracking Number 01EWF00-2017-SLI-0354.

United States Fish and Wildlife Service. 2014. Species Fact Sheet: Streaked Horned Lark (*Eremophila alpestris strigata*). Washington Fish and Wildlife Office. Available at: <http://www.fws.gov/wafwo/species/Fact%20sheets/streakedhornedlarkfinal.pdf>

United States Fish and Wildlife Service. 2001. Short-tailed Albatross (*Phoebastria albatrus*), Threatened and Endangered Species. Available at: <http://www.fws.gov/alaska/fisheries/endangered/pdf/STALfactsheet.pdf>

Washington State Department of Ecology. 2012. Stormwater Management Manual for Western Washington. Publication Numbers 12-10-030. Available at: <https://fortress.wa.gov/ecy/publications/publications/1210030.pdf>

Washington State Department of Fish and Wildlife. 2017a. Priority Habitat and Species Interactive Map Viewer. Available at: <http://wdfw.wa.gov/mapping/phs/>

Washington State Department of Fish and Wildlife. 2017b. SalmonScape Application. Available at: <http://wdfw.wa.gov/mapping/salmonscape/>

Washington Department of Natural Resources. 2016. Sections that Contain Natural Heritage Features. Available at: [http://www.dnr.wa.gov/Publications/amp\\_nh\\_trs.pdf](http://www.dnr.wa.gov/Publications/amp_nh_trs.pdf). Data current as of August 1, 2016.

Washington Department of Natural Resources. 2017. Forest Practices Application Review System (FPARS) Mapping Tool. Available at: <http://www.dnr.wa.gov/programs-and-services/forest-practices/forest-practices-application-review-system-fpars>.

Washington State Department of Transportation. 2012. Standard Specifications for Road, Bridge, and Municipal Construction 2012. M 41-10. Available at: <http://www.wsdot.wa.gov/publications/manuals/fulltext/m41-10/ss2012.pdf>

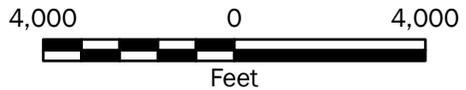
Washington State Department of Transportation. 2015. Biological Assessment Preparation for Transportation Projects: Advanced Training Manual. Version 2015. Available at: <http://www.wsdot.wa.gov/Environment/Biology/BA/BAGuidance.htm#manual>.







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**Vicinity Map**

**North Shore Levee  
Aberdeen & Hoquiam, Washington**



**Figure 1**

**Notes:**

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2015

Projection: NAD 1983 2011 StatePlane Washington South FIPS 4602 Ft US





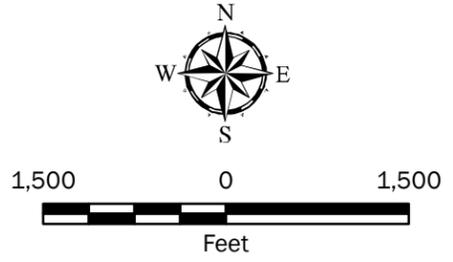
**Notes:**  
 1. The locations of all features shown are approximate.  
 2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Sources: KPFF Design Files; Aerial from ESRI, 2015; FEMA Flood Zones effective 2/3/2017; Streams downloaded from Grays Harbor GIS.  
 Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

📍 Photo Location and Direction  
 🌊 Stream

**FEMA Flood Zones**  
 🟢 Zones A, AE, and AH (100-year flood)  
 🟡 Zone AE Floodway

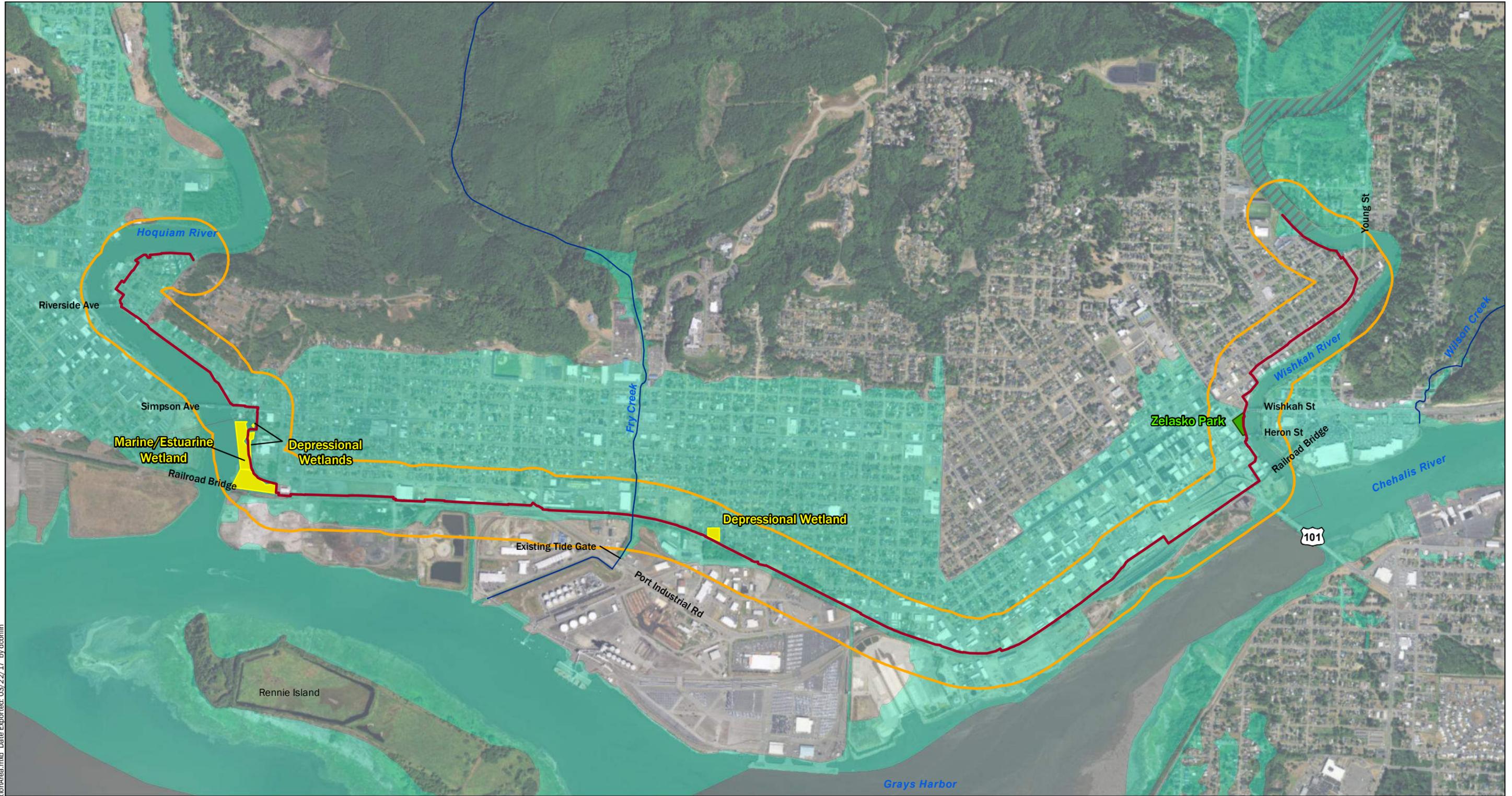
**Proposed Levee Type**  
 🟠 Sheet Pile Wall  
 🟢 Earthen Dike  
 🟡 Concrete Wall  
 🟣 Stoplog Closure  
 🟡 High Ground



<b>Baseline Conditions</b>	
North Shore Levee Aberdeen & Hoquiam, Washington	
	<b>Figure 2</b>

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**Notes:**

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Sources: Aerial from ESRI, 2015; FEMA Flood Zones effective 2/3/2017; Streams downloaded from Grays Harbor GIS.

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Action Area

Levee System Alignment

Stream

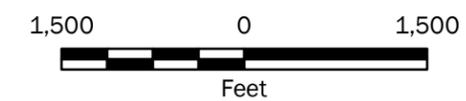
Wetland

Park

**FEMA Flood Zones**

Zones A, AE, and AH (100-year flood)

Zone AE Floodway



<b>Action Area Map</b>	
North Shore Levee Aberdeen & Hoquiam, Washington	
	<b>Figure 3</b>







**APPENDIX A**  
**Species List**



# Status of ESA Listings & Critical Habitat Designations for West Coast Salmon & Steelhead

- PUGET SOUND DOMAIN**
- Puget Sound Chinook (T) [FCH 9/2/05]
  - Hood Canal Summer Chum (T) [FCH 9/2/05]
  - Ozette Lake Sockeye (T) [FCH 9/2/05]
  - Puget Sound Steelhead (T) [CH under dev.; ANPR 1/10/11]

- WILLAMETTE/LOWER COLUMBIA DOMAIN**
- Columbia River Chum (T) [FCH 9/2/05]
  - Lower Columbia River Coho (T) [CH Under dev.; ANPR 1/10/11]
  - Lower Columbia River Chinook (T) [FCH 9/2/05]
  - Lower Columbia River Steelhead (T) [FCH 9/2/05]
  - Upper Willamette River Chinook (T) [FCH 9/2/05]
  - Upper Willamette River Steelhead (T) [FCH 9/2/05]

- OREGON COAST DOMAIN**
- Oregon Coast Coho (T) [FCH 2/11/08]

- SOUTHERN OREGON/NORTHERN CALIFORNIA COAST DOMAIN**
- Southern Oregon/Northern California Coast Coho (T) [FCH 5/5/99]

- CENTRAL VALLEY DOMAIN**
- Sacramento River Winter Chinook (E) [FCH 6/16/93]
  - Central Valley Spring Chinook (T) [FCH 9/2/05]
  - Central Valley Steelhead (T) [FCH 9/2/05]

- NORTH-CENTRAL CALIFORNIA COAST DOMAIN**
- Central California Coast Coho (E) [FCH 5/5/99]
  - California Coastal Chinook (T) [FCH 9/2/05]
  - Northern California Steelhead (T) [FCH 9/2/05]
  - Central California Coast Steelhead (T) [FCH 9/2/05]

- SOUTH-CENTRAL/SOUTHERN CALIFORNIA COAST DOMAIN**
- South-Central California Coast Steelhead (T) [FCH 9/2/05]
  - Southern California Coast Steelhead (E) [FCH 9/2/05]

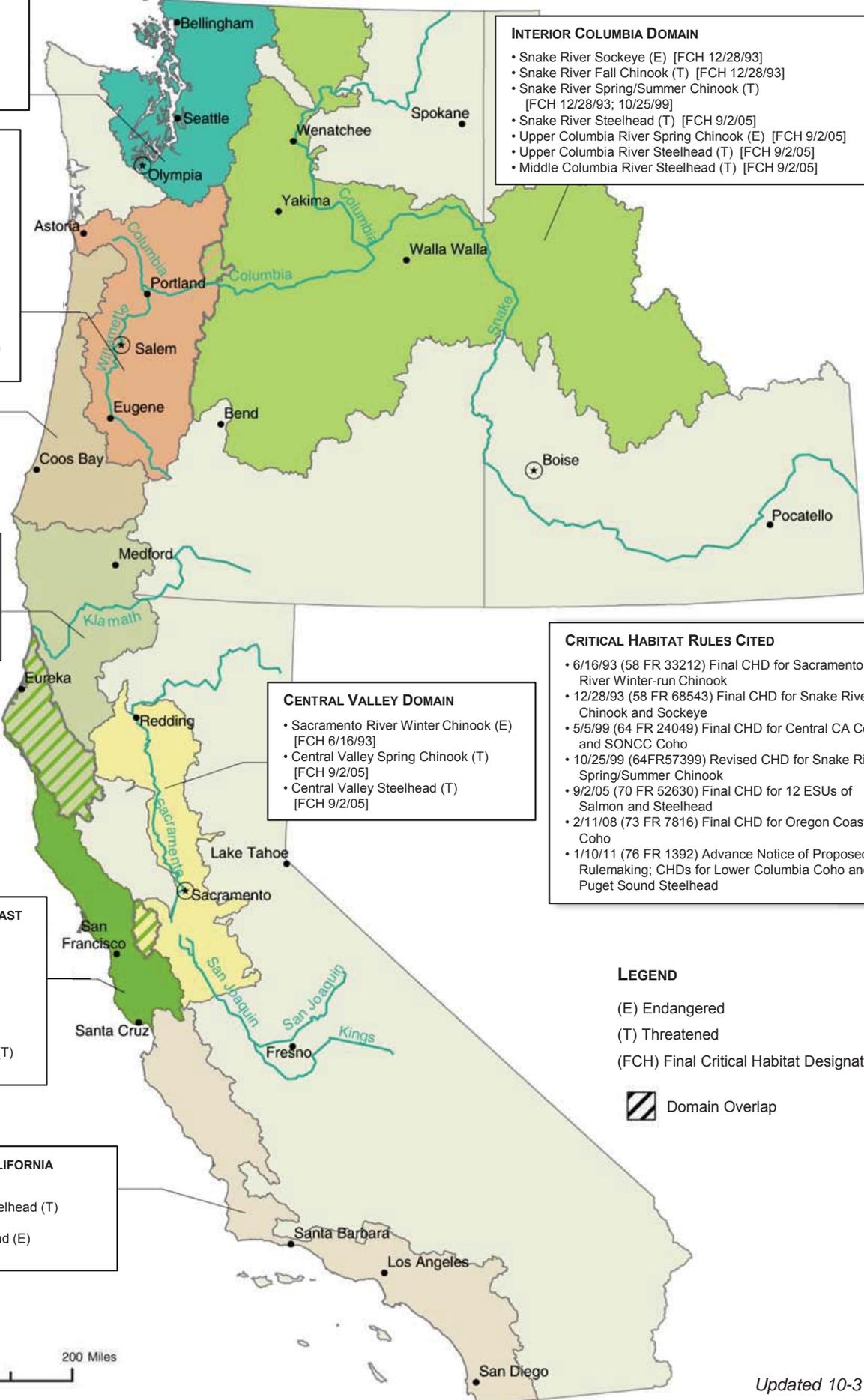
- INTERIOR COLUMBIA DOMAIN**
- Snake River Sockeye (E) [FCH 12/28/93]
  - Snake River Fall Chinook (T) [FCH 12/28/93]
  - Snake River Spring/Summer Chinook (T) [FCH 12/28/93; 10/25/99]
  - Snake River Steelhead (T) [FCH 9/2/05]
  - Upper Columbia River Spring Chinook (E) [FCH 9/2/05]
  - Upper Columbia River Steelhead (T) [FCH 9/2/05]
  - Middle Columbia River Steelhead (T) [FCH 9/2/05]

- CRITICAL HABITAT RULES CITED**
- 6/16/93 (58 FR 33212) Final CHD for Sacramento River Winter-run Chinook
  - 12/28/93 (58 FR 68543) Final CHD for Snake River Chinook and Sockeye
  - 5/5/99 (64 FR 24049) Final CHD for Central CA Coast and SONCC Coho
  - 10/25/99 (64FR57399) Revised CHD for Snake River Spring/Summer Chinook
  - 9/2/05 (70 FR 52630) Final CHD for 12 ESUs of Salmon and Steelhead
  - 2/11/08 (73 FR 7816) Final CHD for Oregon Coast Coho
  - 1/10/11 (76 FR 1392) Advance Notice of Proposed Rulemaking; CHDs for Lower Columbia Coho and Puget Sound Steelhead

**LEGEND**

(E) Endangered  
 (T) Threatened  
 (FCH) Final Critical Habitat Designated

 Domain Overlap







## United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Washington Fish and Wildlife Office  
510 DESMOND DRIVE SE, SUITE 102  
LACEY, WA 98503  
PHONE: (360)753-9440 FAX: (360)753-9405  
URL: [www.fws.gov/wafwo/](http://www.fws.gov/wafwo/)

Consultation Code: 01EWF00-2017-SLI-0354

February 03, 2017

Event Code: 01EWF00-2017-E-00546

Project Name: Aberdeen North Shore Levee

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

### To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated and proposed critical habitat, and candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. The species list is currently compiled at the county level. Additional information is available from the Washington Department of Fish and Wildlife, Priority Habitats and Species website:

<http://wdfw.wa.gov/mapping/phs/> or at our office website:

[http://www.fws.gov/wafwo/species\\_new.html](http://www.fws.gov/wafwo/species_new.html). Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether or not the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species, and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). You may visit our website at <http://www.fws.gov/pacific/eagle/for> information on disturbance or take of the species and information on how to get a permit and what current guidelines and regulations are. Some projects affecting these species may require development of an eagle conservation plan: ([http://www.fws.gov/windenergy/eagle\\_guidance.html](http://www.fws.gov/windenergy/eagle_guidance.html)). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Also be aware that all marine mammals are protected under the Marine Mammal Protection Act (MMPA). The MMPA prohibits, with certain exceptions, the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas. The importation of marine mammals and marine mammal products into the U.S. is also prohibited. More information can be found on the MMPA website: <http://www.nmfs.noaa.gov/pr/laws/mmpa/>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Related website:

National Marine Fisheries Service:

[http://www.nwr.noaa.gov/protected\\_species/species\\_list/species\\_lists.html](http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html)

Attachment



United States Department of Interior  
Fish and Wildlife Service

Project name: Aberdeen North Shore Levee

## Official Species List

### Provided by:

Washington Fish and Wildlife Office  
510 DESMOND DRIVE SE, SUITE 102  
LACEY, WA 98503  
(360) 753-9440  
<http://www.fws.gov/wafwo/>

**Consultation Code:** 01EWF00-2017-SLI-0354

**Event Code:** 01EWF00-2017-E-00546

**Project Type:** STREAM / WATERBODY / CANALS / LEVEES / DIKES

**Project Name:** Aberdeen North Shore Levee

**Project Description:** Flood control levee

**Please Note:** The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.



United States Department of Interior  
Fish and Wildlife Service

Project name: Aberdeen North Shore Levee

### Project Location Map:



**Project Coordinates:** The coordinates are too numerous to display here.

**Project Counties:** Grays Harbor, WA



United States Department of Interior  
Fish and Wildlife Service

Project name: Aberdeen North Shore Levee

## Endangered Species Act Species List

There are a total of 5 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	Status	Has Critical Habitat	Condition(s)
Marbled murrelet ( <i>Brachyramphus marmoratus</i> ) Population: U.S.A. (CA, OR, WA)	Threatened	Final designated	
Short-Tailed albatross ( <i>Phoebastria (=diomedea) albatrus</i> ) Population: Wherever found	Endangered		
Streaked Horned lark ( <i>Eremophila alpestris strigata</i> ) Population: Wherever found	Threatened	Final designated	
Yellow-Billed Cuckoo ( <i>Coccyzus americanus</i> ) Population: Western U.S. DPS	Threatened	Proposed	
<b>Fishes</b>			
Bull Trout ( <i>Salvelinus confluentus</i> ) Population: U.S.A., conterminous, lower 48 states	Threatened	Final designated	



United States Department of Interior  
Fish and Wildlife Service

Project name: Aberdeen North Shore Levee

## **Critical habitats that lie within your project area**

There are no critical habitats within your project area.

Have we delivered World Class Client Service?

Please let us know by visiting [www.geoengineers.com/feedback](http://www.geoengineers.com/feedback).



