Biological Evaluation
Essential Fish Habitat Evaluation

Irondale Iron and Steel Plant Site Cleanup

Irondale, Washington

for

Washington State Department of Ecology
Toxics Cleanup Program

June 28, 2011

GeoEngineers
Earth Science + Technology

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File No. 0504-042-01

June 28, 2011

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EXECUTIVE SUMMARY

The Washington State Department of Ecology (Ecology) proposes to conduct remedial cleanup and restoration actions at the Irondale Iron and Steel Plant Site (the Site) located at 526 Moore Street in Irondale, Washington (Figure 1 – Vicinity Map). The environmental remediation is being conducted pursuant to the requirements of the Model Toxics Control Act (MTCA) administered by the Washington Department of Ecology (Ecology) under Chapter 173-340 of the Washington Administrative Code (WAC) and the requirements of the Sediment Management Standards (SMS) administered by Ecology under Chapter 173-204 WAC.

Industrial activities took place at the Site from 1881 through 1919. Since 1919, no other waste-generating industry has used the Site. From the mid-1970s until 1999, the beach area east of the Site was used for log storage by the Port Townsend Paper Company. Jefferson County bought the property to use as a recreational area in 2002 and has operated the site as Irondale Beach Park since that time. Ecology placed the property on the suspected contaminated site list in March 2006 after both Ecology and Jefferson County conducted sampling. Irondale Beach Park has been identified as a high-priority cleanup area as part of the Puget Sound Initiative.

Ecology is proceeding with remedial cleanup actions at the site. Remedial construction work is expected to start in summer 2011 in the upland areas and the marine work will take place between mid-July and mid-October 2011, due to the potential presence of sandlance within the action area. If construction requires a longer timeframe than provided by the inwater work window, inwater work will be completed between October 15, 2011 and February 15, 2012. If inwater work is completed outside of the sandlance work window, a forage fish spawning survey will be completed prior to starting construction. The major remediation/construction activities include: (1) Removal and disposal of contaminated sediments; (2) Restoring and excavating shoreline areas and stabilizing exposed shoreline banks; (3) Removal and disposal of contaminated upland soil and restore the area; (4) Installation of a geotextile and soil cap across several upland areas to prevent exposure to contaminated soil remaining on site; (5) Removal of slag material on the beach and restoring the area; (6) restoring/regarding the beach north of the slag area; and (7) (optional) fence physical hazards in the upland area.

The action area for the project has been defined as the approximate sum of extent of project effects on the environment. The action area is estimated to extend in air, 0.65 miles over land and 1.89 miles over water, measured from the project site. No noise generating work will be conducted in-water while the site is inundated and therefore there are no underwater noise effects. The action area includes adjacent rural and residential land on the shoreline adjacent to the project site and marine environments in Port Townsend Bay.

The following ESA species and critical habitats may occur in the action area for the project: Coastal-Puget Sound bull trout (*Salvelinus confluentus*), Puget Sound chinook salmon (*Oncorhynchus tshawytscha*) (including designated critical habitat), Puget Sound steelhead (*Oncorhynchus mykiss*), southern resident killer whale (*Orcinus orca*) (including designated critical habitat), southern DPS green sturgeon (*Acipenser medirostris*), marbled murrelet (*Brachyramphus marmoratus*) and three species of rockfish in the Puget Sound/Georgia Basin

Bocaccio rockfish [*Sebastes paucispinis*], yelloweye rockfish [*Sebastes ruberrimus*] and canary rockfish [*Sebastes pinniger*]).

Based on the information and analysis presented in this report, the project was determined to **not likely adversely affect**:

- Puget Sound chinook salmon (*Oncorhynchus tshawytscha*) Evolutionary Significant Unit (ESU) and designated critical habitat;
- Coastal/Puget Sound bull trout (*Salvelinus confluentus*) Distinct Population Segment (DPS);
- Puget Sound steelhead (*Oncorhynchus mykiss*) DPS;
- Southern resident killer whale (*Orcinus orca*) and designated critical habitat;
- Southern DPS green sturgeon (*Acipenser medirostris)*;
- Marbled murrelet (*Brachyramphus marmoratus*); and
- Groundfish species (*Sebastes species).*

The EFH assessment includes discussions on coastal pelagic, groundfish and Pacific salmon. Pacific salmon that may occur at the project site include Puget Sound chinook, Puget Sound coho and pink salmon. The EFH assessment focuses on potential project impacts to these species, which are covered by the Pacific salmon and groundfish Fisheries Management Plans. It was concluded that the proposed action **will not adversely affect** EFH for Pacific salmon, groundfish, or coastal pelagic species, including both managed species and prey species, occurring at or near the project site.

1.0 INTRODUCTION

The Washington State Department of Ecology (Ecology) proposes to conduct remedial cleanup and restoration actions at the Irondale Iron and Steel Plant Site (the Site) located at 526 Moore Street in Irondale, Washington (Figure 1 – Vicinity Map). The proposed Irondale Iron and Steel Plant Site Cleanup (project) will improve the ecological condition of the site by removing contaminated sediment and fill material and installing geotextiles and soil caps to prevent further exposure to contaminants. Site restoration will include the placement of clean, native fill material and installation of native plants in upland and shoreline habitats. The proposed restoration will focus on creating a net improvement to habitat functions and the ecosystem as a whole.

Construction activities will involve excavation of contaminated soils within "Navigable Waters of the United States" (defined as areas waterward of the Mean High Water [MHW] elevation[1]). The project will therefore require a permit from the U.S. Army Corps of Engineers (USACE) under their authority to administer Section 10 of the Rivers and Harbors Act (RHA). Because of this federal nexus, the project will also need to comply with Section 7 of the Endangered Species Act (ESA) and the Magnuson-Stevens Fishery Management Act (MSA). The purpose of this Biological Evaluation (BE) is to present a description of project effects and project-specific species and habitat information pertinent to the informal consultation process for ESA compliance. An Essential Fish Habitat (EFH) evaluation is also included as Appendix A.

1.1. Project Purpose

The purpose of the proposed project is to improve the ecological condition of the site by removing contaminated sediment and fill material and installing geotextiles and soil caps to prevent further exposure to contaminants. Site restoration will include the placement of clean, native beach material and installation of native plants in upland and shoreline habitats. The project will create a net improvement to habitat functions and the ecosystem as a whole.

1.2. Project Location

The Irondale Iron and Steel Plant Site is located on the northeastern portion of the Quimper Peninsula, approximately five miles south of Port Townsend in Township 29 North, Range 1 West, Section 2 and Township 30 North, Range 1 West, Section 35 in Irondale, Washington (Figure 1). The site includes approximately 1,800 feet of marine shoreline along Port Townsend Bay and approximately 13 acres of adjacent upland areas.

1.3. Site History and Project Setting

Industrial activities took place at the Site from 1881 through 1919. The iron and steel plant produced the first batch of iron in 1881, and the steel production plant was operational beginning in 1909. The Irondale Iron and Steel Plant consisted of a blast furnace and cast house, steel production building (including three open-hearth furnaces and a steel rolling mill), boiler plant,

[1] The Mean High Water (MHW) level is the jurisdictional boundary for tidal waters regulated under Section 10 of the Rivers and Harbors Act.

six charcoal kilns (also referred to as beehive kilns), miscellaneous support buildings (raw material warehouses, power house, machine shop, engine shop, and other supporting buildings), a 600-foot wharf and a 6,000-barrel (252,000-gallon) aboveground storage tank (AST) for fuel oil. The plant was closed in 1911 and was reopened between 1917 and 1919 because of the demand for steel during World War I.

Since 1919, no other waste-generating industry has used the Site. From the mid-1970s until 1999, the beach area east of the Site was used for log storage by the Port Townsend Paper Company. A review of the Site history and potentially liable parties by Ecology (Ecology, 2007) states that Cotton Engineering and Shipbuilding Corporation, later known as the Cotton Family Limited Partnership, owned the property from 1943 until December 30, 2002, when the property was sold to Jefferson County. Jefferson County bought the property to use as a recreational area and has operated the site as Irondale Beach Park since that time.

In November 2005, a park visitor notified Ecology about an oily residue on the beach at the Site. After an initial investigation, Ecology determined that there was evidence of petroleum contamination along the beach. Ecology and Jefferson County conducted additional sampling to investigate the source of this contamination. Ecology placed the property on the suspected contaminated site list in March 2006. Irondale Beach Park has been identified as a high-priority cleanup area as part of the Puget Sound Initiative.

In December 2006, Irondale Beach Park was closed pending concerns about potential human health risk. In April 2007, Irondale Beach Park was reopened to the public. However, Jefferson County posted signs warning of possible risk to human health from consumption of intertidal shellfish harvested in the area. As of May 29, 2009, the Washington State Department of Health (DOH) Office of Shellfish and Water Protection has a marine biotoxin advisory for the Irondale Beach Park area; DOH also indicated that the Chimacum Creek Tidelands were not affected by the marine biotoxin advisory (DOH website accessed July 15, 2009). The Chimacum Creek Tidelands are immediately north of the Irondale Beach Park as shown in Figure 1.

The Site is part of the Irondale National Historic District designated by the National Park Service and listed on the National Register of Historic Places. It is our understanding from conversations with Ecology that the only environmental cleanup known to have been conducted at the site is the removal of oily debris from the bottom of the former AST by Jefferson County. The Jefferson County web page describes this action being completed in January 2006 (Jefferson County, 2009).

2.0 PROJECT DESCRIPTION

Ecology is proceeding with remedial cleanup actions at the site. Project drawings are included in Appendix B and should be referenced for more project detail. Remedial activities on the marine shoreline will include the removal of contaminated sediment, fill and slag material in two primary locations (Appendix B). Excavation will be accomplished using mechanized excavation equipment to an estimated depth of 7 to 10 feet, backfilled with clean fill and top dressed with appropriate sized fine to medium sand beach mix. Upland remediation will be similar to that prescribed for marine shoreline areas but will also include the installation of geotextile fabrics and soil caps in

several areas. Upland excavations will range in depth from 6 to approximately 11 feet, depending on location. The major remediation/construction activities include the following:

- Remove and dispose of contaminated beach sediments;
- Restore excavated shoreline areas and stabilize exposed shoreline banks;
- Remove and dispose of contaminated upland soil and restore area;
- Install a geotextile and soil cap across several upland areas to prevent exposure to contaminated soil remaining on site;
- Remove slag material on the beach and restore area; and
- Optional (TBD): restore/regrade beach north of slag area, and fence physical hazards in upland area.

Work within the intertidal zone will take place, when possible, around the tidal cycling and be performed while the site is exposed. If work within a specific area will require longer than one low tide cycle, installation of a sheet-pile wall or use of anchored silt curtains with oil containment booms may be required to contain sediments. If sheet piling is used, the sheet will be installed using a vibratory hammer. Sediment containment devices will be installed during low tide when the beach is exposed. Once all work has been completed, all sediment containment devices will be removed.

2.1. Timing

Although the work will be completed while the beach substrate is exposed, removal of contaminated sediments and installation of the sediment containment devices will involve work below the MHHW level. Therefore in order to limit and minimize impacts, work will be completed during the in-water work windows for bull trout (*Salvelinus confluentus*) and salmon (including Puget Sound chinook salmon [*Oncorhynchus tshawytscha*]). An overall construction window for in-water work is from July 16 to February 15 (USACE, 2010) accounts for restrictions to protect these species. Compliance with these work windows will reduce impacts to listed salmonids. There is not an approved construction work window for steelhead (*Oncorhynchus mykiss*) at this time. A complete summary of construction work windows for applicable species is listed below in Table 1.

TABLE 1. DESIGNATED IN-WATER WORK WINDOWS FOR CONSTRUCTION

Species	Construction Work Windows[1]
Bull trout	July 16 – February 15
Salmon	July 16 – March 1
OVERALL	July 16 – February 15

Note:

[1] Work windows provided according to USACE (2010).

Remedial construction work in marine areas will take place between mid-July and mid-October 2011, due to the potential presence of sandlance within the action area. If construction requires a longer timeframe than provided by the inwater work window, inwater work will be completed between October 15, 2011 and February 15, 2012. If inwater work is

completed outside of the sandlance work window, a forage fish spawning survey will be completed prior to starting construction.

2.2. Work Corridor

The work corridor includes an approximately 1,800-foot-long stretch of shoreline and ranges from approximately 80 feet wide to 250 feet. The project extends approximately 100 feet into Port Townsend Bay (Appendix B).

2.3. Equipment Used

- Excavator;
- Backhoe;
- Dump trucks and/or other heavy trucks (e.g., tractor-trailer with flatbed);
- Forklift;
- Other general construction tools, including hand tools to perform various construction tasks; and
- Vibratory hammer if sheet piles are used.

2.4. Interrelated or Interdependent Actions

There are no interdependent actions associated with the project. The project components are interrelated and are the remedial cleanup and restoration effort.

2.5. Conservation Measures

Conservation measures and BMPs will be utilized during implementation of the project to avoid impacts to listed species and critical habitat. Conservation measures will focus on minimizing the construction noise and the possibility of spills. Special measures will be taken to ensure that all waste materials will be disposed of off-site and in accordance with applicable regulations, that 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 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.

2.5.1. General Conservation Measures

- A Temporary Erosion and Sedimentation Control (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 2010 version of WSDOT's *Standards and Specifications for Road, Bridge, and Municipal Construction* (WSDOT, 2010) and Washington State Department of Ecology's (Ecology's) *Stormwater Management Manual for Western Washington* (Ecology, 2005). Appropriate erosion control measures will be erected at appropriate locations.
- The contractor will prepare a construction Spill Prevention, Control and Countermeasures (SPCC) Plan for this project according to WSDOT (2009) guidance. Any potential 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 remain free of external petroleum-based products prior to entering the work area and during the work, and for making any necessary repairs prior to returning the equipment to operation in the work area. The SPCC Plan will be consistent with 40 CFR 112.3 as well as the State of Washington Oil Spill Contingency Plan (WAC 173-182).

- The contractor will install, as needed, perimeter protection/silt fence as needed to protect surface waters and other critical areas. The actual location will be specified in the field, based upon site conditions.
- The contractor will limit site work to daylight hours and comply with local, state and federal permit restrictions.
- All construction-related debris will be cleaned up on a daily basis. Proper conservation measures will be taken to ensure that debris will not contaminate the marine shoreline or marine waters.
- All equipment used for construction activities will be cleaned and inspected prior to arriving at the project site to ensure no potentially hazardous materials are exposed, no leaks are present and the equipment is functioning properly.
- Waste materials, including any riprap, derelict piles, miscellaneous garbage and/or other debris removed from the shoreline environment, will be transported off site for disposal in accordance with applicable regulations.
- Work will be in compliance with all other local, state and federal regulations and restrictions (e.g., WDFW Hydraulic Project Approval [HPA], local Critical Areas ordinance and land use regulations, Shoreline Master Plan, State Environmental Policy Act [SEPA], 401 Water Quality Certification, USACE Nationwide Permit [Rivers and Harbors Act]).

2.5.2. Additional Measures to Reduce Impacts to Species and Habitats

- The contractor will limit construction impacts to the minimum area necessary to complete the project.
- All work below MHHW will be conducted during the approved work windows for listed fish species that may occur in the project area (July 16 through February 15). Due to the potential presence of sandlance within the action area, inwater work conducted between October 15 and February 15 will not occur until a forage fish survey is completed and confirms the absence of forage fish eggs within the project area.
- Work will be completed while beach substrate is exposed.
- All debris resulting from restoration activities that temporarily staged on the beach below MHHW shall be removed from the beach prior to contact with the incoming tide to prevent debris from entering the water.

- Where needed areas to be backfilled will use clean fill and top dressed with appropriate sized fine to medium sand beach mix.
- Silt curtains will be used as needed during in-water activities to limit redistribution of disturbed sediment.

3.0 ACTION AREA

The action area for the project is defined by the geographical effects of the action on the environment. The potential impacts to ESA species include:

- Temporary construction-related noise (direct effect);
- Temporary and permanent alteration of near-shore habitat by removal of contaminated sediment and installation of native plants along the backshore (direct effect); and
- Exposure to contaminated sediments (indirect effect).

Construction-related noise will occur as a result of restoration activities (impact) and the operation of general construction equipment. Construction-related noise will permeate terrestrial (in-air) environments only and may carry into the surrounding environment beyond the project site. Water quality impacts, such as increased turbidity and the spill of hazardous materials or petroleum-based products associated with construction machinery, will be controlled through proper implementation of BMPs and are not expected to have negative impacts on the environment. Temporary adverse effects resulting from the suspension of toxic sediments associated with sediment removal is unlikely due to performing the work during low tides and capping with clean fine to medium sand

3.1. Assessing the Action Area

The overall action area includes the spatial extent of all project effects on the environment and is presented in Figure 2. The action area includes the zones of influence for areas affected by construction-related noise, and habitat alteration. If sheet piles are needed, they will be installed while the beach substrate is exposed and therefore, there will be no underwater noise. The action area is three dimensional and the spatial extent of project effects differs between areas above and below water level (defined by the MHHW). It is estimated to extend 0.65 miles over land and 1.89 miles over water measured from the project site above land and water surfaces. The action area includes residential land uses in Irondale and marine environments in Port Townsend Bay.

3.1.1. In Air/Terrestrial Noise

The WSDOT Biological Assessment Preparation Manual cites the 1978 Environmental Protection Agency (EPA) document for residential areas having a dBA level that ranges from 45 to 50 and rural areas having a dBA level that ranges from 35 to 40 (2011). Since the project is located in Irondale (a small rural community) and in an area adjacent to residential homes and roads, the ambient baseline levels are estimated to be 40 dBA.

The project site is surrounded by trees, buildings and water, creating both a hard (water) and soft site (buildings and trees) that would attenuate noise at an approximate rate of 6.0 for the hard portion of the site and 7.5 dBA for the soft site. The WSDOT manual provides an equation to determine the distance point source construction noise will travel before it attenuates to the ambient baseline sound level of 40 dBA (2011).

The combined dBA levels for typical construction equipment to be used for the project are expected to generate in-air point source noise of up to 86 dBA at a distance of 50 feet (WSDOT, 2011). Based on the above mentioned parameters and the equation, the distance from the project site at which the construction noise would become indistinguishable from background ambient noise conditions at 40 dBA, is 0.65 mile for the soft site conditions (i.e. over the land) and 1.89 miles for the hard site conditions (i.e. over the water). Table 2 below shows the distances it will take for the in-air project noise to attenuate to background noise conditions and Figure 2 depicts these distances.

TABLE 2. IN-AIR DISTANCES TO ATTENUATION

Location	Distance to Attenuation
Over Land (soft site conditions)	0.65 mile
Over Water (hard site conditions)	1.89 miles

Note:

[1] Determined using the practical spreading loss method within the WSDOT BA preparation manual (WSDOT 2011).

3.2. Habitat Alteration

The habitat of the entire site, both shoreline and upland areas, will be altered. The remedial cleanup and restoration activities involve excavation of contaminated soils, historic shoreline fill and slag material and backfilled and top dressed with appropriate sized fine to medium sand beach mix. The backshore areas will then be restored with native tree, shrub and emergent plantings. The zone of influence for habitat alteration will extend over the entire project corridor work area. There is an expected net benefit to habitat functions from the proposed project.

3.3. Exposure to Contaminated Sediments

Excavation activities will cause sediment disturbance resulting in possible suspension of below surface contaminants into the water column where organisms could be exposed to them. However, these types of effects are unlikely to occur due to the proposed methods of the cleanup actions. The work will be performed during low tides while sediments are exposed and silt curtains and or sheet piles will be used to contain suspended sediment. The zone of influence for this effect is limited to the footprint of the work, where excavation of contaminated sediments will occur.

4.0 SPECIES AND HABITAT INFORMATION

Species 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 Marine Fisheries Service (NMFS) for marine species. We obtained a list of listed or proposed species and designated or proposed critical habitat for Jefferson County, Washington, from the USFWS (2010). We also obtained lists of listed or proposed species and designated or proposed critical habitat for marine species in the Puget Sound from the NMFS (2009 and 2010). These official species lists are included in Appendix D. Species listing status and life history are included in Appendix E.

4.1. Species and Critical Habitat That May be Present in the Action Area

The lists identify species and critical habitat potentially present anywhere in Jefferson County, as is the case for the USFWS list, or Puget Sound, as is the case for the NMFS lists; consequently, not all species in these lists are expected to occur at the project site, or within the action area. Additional information regarding the presence of listed species within the action area was obtained from the WDFW Priority Habitats and Species (PHS) dataset, which was acquired specific to the project site (WDFW 2011). No federally-listed or proposed plant species are identified on the USFWS species list for Jefferson County. A summary of the listed or proposed species and designated or proposed critical habitat that may occur in the action area is provided in Table 3. The BE will address project potential impacts to these species.

TABLE 3. SPECIES AND CRITICAL HABITAT THAT MAY OCCUR IN THE ACTION AREA

Common Name	Specific Name	Jurisdiction	Status	Critical Habitat
Bull trout	*Salvelinus confluentus*	USFWS	Threatened	Designated[3]
Puget Sound chinook salmon	*Oncorhynchus tshawyscha*	NMFS	Threatened	Designated[1]
Hood Canal summer chum salmon	*Oncorhynchus keta*	NMFS	Threatened	Designated[1]
Puget Sound steelhead	*Oncorhynchus mykiss*	NMFS	Threatened	N/A[2]
Southern resident killer whale	*Orcinus orca*	NMFS	Endangered	Designated
Green sturgeon	*Acipenser medirostris*	NMFS	Threatened	Designated[3]
Bocaccio rockfish	*Sebastes paucispinis*	NMFS	Endangered	N/A[2]
Yelloweye rockfish	*Sebastes ruberrimus*	NMFS	Threatened	N/A[2]
Canary rockfish	*Sebastes pinniger*	NMFS	Threatened	N/A[2]
Marbled murrelet	*Brachyramphus marmoratus*	USFWS	Threatened	N/A[2]

Notes:

N/A – Not Applicable

1. Includes near-shore marine areas in Puget Sound.
2. Critical habitat has not been designated at this time for these species.
3. Although critical habitat has been designated for this species, it does not occur in the action area.

4.2. Species and Critical Habitat Not Addressed in the BE

The following ESA-listed species may occur in Jefferson County and/or Puget Sound but are not expected to occur in the action area, impacts are not expected and are, therefore, not addressed in this BE.

- **Northern Spotted Owl (*Strix occidentalis caurina*),** including designated critical habitat: Spotted owls are found in low- and mid-elevation mature forests with dense canopy. There is no foraging or nesting habitat designated for the spotted owl within the project vicinity. The habitat in the project vicinity is not suitable for spotted owls and, therefore, the likelihood of a spotted owl entering the action area is minimal to none. There are no adverse effects expected to occur from the project activities.
- **Humpback Whale (*Megaptera novaeangliae*)**: There is no habitat designated for the humpback whale in at the project site. There are no adverse effects expected to occur from project activities. The likelihood of a humpback whale entering the action area is minimal to none.
- **Sperm Whale (*Physeter macrocephalus*)**: There is no habitat designated for the sperm whale at the project site. There are no adverse effects expected to occur from project activities. The likelihood of a sperm whale entering the action area is minimal to none.
- **Sei Whale (*Balaenoptera borealis*)**: There is no habitat designated for the Sei whale at the project site. There are no adverse effects expected to occur from project activities. The likelihood of a Sei whale entering the action area is minimal to none.
- **Blue Whale (*Balaenoptera musculus*)**: There is no habitat designated for the blue whale at the project site. There are no adverse effects expected to occur from project activities. The likelihood of a blue whale entering the action area is minimal to none.
- **Fin Whale (*Balaenoptera physalus*)**: There is no habitat designated for the fin whale at the project site. There are no adverse effects expected to occur from project activities. The likelihood of a fin whale entering the action area is minimal to none.
- **Short Tailed Albatross (*Phoebastria albatrus*)**: The short tailed albatross is potentially found on the outer coast of Jefferson County. It is a pelagic bird that often occurs in regions of high marine productivity (Natureserve 2010). It tends to nest on the ground on small oceanic islands; on volcanic ash slopes with sparse vegetation, formerly on level open areas adjacent to tall clumps of grass (Natureserve 2010). The habitat in the project vicinity is not suitable for short-tailed albatross and, therefore, the likelihood of one entering the action area is minimal to none. There are no adverse effects expected to occur from the project activities.
- **Steller Sea Lion (*Eumetopias jubatus*)**: In Washington, numbers of Steller sea lions vary seasonally with peak numbers of animals present during the fall and winter months. Haulout sites are found on jetties, offshore rocks and coastal islands. There are no breeding rookeries in Washington. Although harbor seal haulout sites are mapped east of the project site on the north tip of Indian Island and the east side of Marrowstone Island, according to the *Seal and Sea Lion Atlas*, there are no known sea lion haulout sites in this region (2000). The habitat in the project vicinity is not suitable for steller sea lions and, therefore, the likelihood of a steller sea lion entering the action area is minimal to none. There are no adverse effects expected to occur from the project activities.

- Leatherback Sea Turtle (*Dermochelys coriacea*) including designated and proposed critical habitat: Current critical habitat is designated south of Puerto Rico. However critical habitat is proposed off the outer coast of Washington, outside the project site and action area. This turtle is the largest marine turtle and is a circumglobal species that generally forages in temperate waters and nests in tropical and subtropical latitudes (Natureserve 2010). There are no adverse effects expected to occur from project activities. The likelihood of a leatherback sea turtle entering the action area is minimal to none.

- Eulachon (*Thaleichthys pacificus*) including proposed critical habitat: Eulachon is a small anadromous fish that typically spend three to five years in saltwater before returning to freshwater to spawn. Eulachon occur in nearshore ocean waters and to a depth of 1,000 feet. There are no adverse effects expected to occur from project activities. The likelihood of a eulachon entering the action area is minimal to none.

4.3. Utilization of Habitats by Listed Species

Terrestrial habitats surrounding the project site are rural and residential. The shoreline and intertidal habitats at the site are un-developed and the beach surface is primarily composed of slag, cobbles, sand and gravels with the subsurface dominated by fine to medium sand. The upland areas of the property slope up to the west and are dominated by a second growth forest with shrub and herbaceous layers. Residential homes and roads border the property to the west, northwest and southwest. The shoreline to the south is similar to the onsite shoreline conditions. The shoreline to the north consists of a sand beach. A public parking lot and trails to the gravel and sand beach are also to the north.

The only ESA-listed species that may occur in the action area are fish associated with shoreline habitat in Port Townsend Bay. Port Townsend Bay is likely used as rearing habitat and as a migratory area for salmonids. Chimacum Creek is located more than 0.5 mile to the north and is used as spawning and rearing habitat and as a migratory corridor for salmonids.

4.3.1. Bull Trout (Salvelinus confluentis)

The coastal Puget Sound bull trout are listed as threatened by the USFWS under the ESA. USFWS has also determined that near-shore marine habitat for coastal Puget Sound bull trout has been designated within Port Townsend Bay in the vicinity of the Project (70 FR 56212). Bull trout have more specific habitat requirements compared to other salmonids (Rieman and McIntyre, 1993). Habitat components that appear to influence bull trout distribution and abundance include water temperature, cover, channel form and stability, valley form, spawning and rearing substrates, and migratory corridors. PHS data from the WDFW (2011) does not indicate the presence of a stream with bull trout within a mile of the project area. Port Townsend Bay is considered priority habitat for bull trout, however the potential for bull trout to occur in the Action Area is low, due to the timing of construction. Although the likelihood of bull trout occurring in the action area during the in-water work window is substantially reduced, it is still possible.

Near-shore marine areas in Puget Sound are 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 not present in the action area (i.e., PCEs 2, 3, 4 and 5). Four of the eight PCEs are contained in the general project area. The project site contains water temperatures that support bull trout use and has adequate water quantity, and quality (elements 1 and 8), is a migratory corridor between habitats (element 6), and contains an adequate food base (element 7).

The proposed remediation and restoration actions will improve the functions of marine PCEs for bull trout within the action area. The removal of contaminates that are currently leaching into the waters of Port Townsend Bay will improve local water quality. The removal of the slag outcropping and other debris along the beach will remove barriers and improve migration along the shoreline and the removal of fill and restoration of the upper intertidal area will increase the opportunity for forage fish spawning, increasing the available food base within the action area.

4.3.2. Puget Sound Chinook Salmon (Oncorhynchus tshawytscha)

Puget Sound chinook salmon are listed as threatened by the NOAA Fisheries Service under the ESA. Their current designated critical habitat is near-shore marine areas of the Puget Sound (70 FR 52630). The project is located in designated marine near-shore areas of Port Townsend Bay, which is part of the waters of the Puget Sound. Juvenile chinook could forage and migrate in the general vicinity of the project, but would be more likely to spend time within eelgrass beds. PHS data from the WDFW (2011) does not indicate the presence of a stream with chinook salmon within a mile of the project area. Port Townsend Bay is considered priority habitat for chinook salmon, however the potential for chinook salmon to occur in the Action Area is low, due to the timing of construction. Although the likelihood of chinook salmon occurring in the action area during the in-water work window is substantially reduced, it is still possible.

The PCEs for chinook salmon critical habitat include: (1) freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development; (2) freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and 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; (3) freshwater migration corridors free of obstruction 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; (4) estuarine areas free of obstruction with water quality, water quantity and salinity conditions supporting juvenile and adult physiological transitions between fresh and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation; (5) near-shore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and (6) offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

Freshwater-specific PCEs for chinook salmon are not present in the action area (i.e., PCEs 1, 2 and 3). Three of the six PCEs are contained in the general project area. Although the action area is generally free of obstructions, contains adequate water quality and quantity, and food base (elements 4 through 6), the proposed project will have a net benefit on habitat conditions.

The proposed remediation and restoration actions will improve the functions of estuary, nearshore and marine PCEs for chinook salmon within the action area. The removal of contaminates that are currently leaching into the waters of Port Townsend Bay will improve local water quality. The removal of the slag outcropping and other debris along the beach will remove barriers and improve migration along the shoreline and the removal of fill and restoration of the upper intertidal area will increase the opportunity for forage fish spawning, increasing the available food base within the action area.

4.3.3. Hood Canal Summer Chum Salmon (Oncorhynchus keta)

Hood Canal summer chum salmon are listed as threatened by the NOAA Fisheries Service under the ESA. Their current designated critical habitat is within Hood Canal (70 FR 52630). The project is located in designated marine areas of Port Townsend Bay, which is situated in the northern end of Hood Canal. PHS data from the WDFW (2011) indicate the presence of a stream with Hood Canal summer chum salmon less than a mile north of the project area. Port Townsend Bay is considered priority habitat for chum salmon, however the potential for chum salmon to occur in the Action Area is low, due to the timing of construction. Although the likelihood of chum salmon occurring in the action area during the in-water work window is substantially reduced, it is still possible.

The PCEs for chum salmon critical habitat include: (1) freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development; (2) freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and 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; (3) freshwater migration corridors free of obstruction 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; (4) estuarine areas free of obstruction with water quality, water quantity and salinity conditions supporting juvenile and adult physiological transitions between fresh and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation; (5) near-shore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and (6) offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

Freshwater-specific PCEs for chum salmon are not present in the action area (i.e., PCEs 1, 2 and 3). Three of the six PCEs are contained in the general project area. Although the action area is generally free of obstructions, contains adequate water quality and quantity, and food base (elements 4 through 6), the proposed project will have a net benefit on habitat conditions.

The proposed remediation and restoration actions will improve the functions of estuary, nearshore and marine PCEs for chum salmon within the action area. The removal of contaminates that are currently leaching into the waters of Port Townsend Bay will improve local water quality. The removal of the slag outcropping and other debris along the beach will remove barriers and improve migration along the shoreline and the removal of fill and restoration of the upper intertidal area will increase the opportunity for forage fish spawning, increasing the available food base within the action area.

4.3.4. Puget Sound Steelhead (Oncorhynchus mykiss)

Puget Sound steelhead have been listed as threatened by the NOAA Fisheries Service under the ESA (72 FR 26722). Potential designation of critical habitat for the steelhead in Puget Sound marine waters is currently under review by NOAA. There is a potential for Puget Sound steelhead to occur in the vicinity of the project because steelhead are identified within Chimacum Creek approximately 0.6 mile north of the site (WDFW 2011). Juvenile steelhead leave their natal streams during various times of the year and could be found in the Project area year round, during which time they would tend to stay relatively close to shore, using piers and other near-shore habitat features for refuge. Thus, although the extent and duration of steelhead use of the Project site and Action Area is not clear and may be limited by poor habitat quality, both adults and juveniles of this species may be present in the project vicinity all times of year.

The PCEs for steelhead habitat include: (1) freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development; (2) freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and 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; (3) freshwater migration corridors free of obstruction 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; (4) estuarine areas free of obstruction with water quality, water quantity

and salinity conditions supporting juvenile and adult physiological transitions between fresh and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation; (5) near-shore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and (6) offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

Three of the six PCEs are contained in the general project area. Although the action area is generally free of obstructions, contains adequate water quality and quantity, and food base (elements 4 through 6), the proposed project will have a net benefit on habitat conditions.

The proposed remediation and restoration actions will improve the functions of estuary, nearshore and marine PCEs for chum salmon within the action area. The removal of contaminates that are currently leaching into the waters of Port Townsend Bay will improve local water quality. The removal of the slag outcropping and other debris along the beach will remove barriers and improve migration along the shoreline and the removal of fill and restoration of the upper intertidal area will increase the opportunity for forage fish spawning, increasing the available food base within the action area.

4.3.5. Southern Resident Killer Whale (Orcinus orca)

The southern resident killer whale was listed as an endangered species under the ESA (70 FR 69903). Killer whales have been sighted in Port Townsend Bay (Orca Network 2011). Killer whales are known to follow salmonids in Puget Sound for prey. The presence of killer whales in Port Townsend Bay during the fall months can likely be attributed to the whales following fall chinook and fall chum runs to stream systems located in south Puget Sound.

Killer whales prefer deeper water and follow salmonids in the Puget Sound as their primary source of prey (Jensen 2006). Critical habitat has been designated for the killer whale and includes near-shore and offshore marine areas of the Puget Sound, including Port Townsend Bay (71 FR 69054). Although, it is highly unlikely that the southern resident killer whale will be in Port Townsend Bay in the Action Area during construction, they may be in the vicinity and their prey (in various life stages) are likely to occur in Port Townsend Bay.

Specific PCEs that have been identified for killer whale critical habitat include: (1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and generally, (5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

Habitat at the project site or within the action area generally does not provide these PCEs and, therefore, is not considered suitable for killer whales.

4.3.6. Green Sturgeon (Acipenser medirostris)

Green sturgeon has been listed as threatened by the NOAA Fisheries Service under the ESA (75 FR 30714). Their current designated critical habitat is located within the Strait of Juan De Fuca and along the outer Washington Coast (70 FR 52630). The project is located in designated marine areas of Port Townsend Bay, outside and south of the designated critical habitat. PHS data from the WDFW (2011) does not indicate the presence of green sturgeon on or in the vicinity of the project area. It is possible, but unlikely that green sturgeon could occur in the action area during construction activities.

4.3.7. Marbled Murrelet (Brachyramphus marmoratus)

Marbled murrelet has been listed as threatened by USFWS under the ESA (57 FR 45328). Marbled murrelets are closely linked to salt-water coastal areas. They are primarily piscivorous and dive underwater for forage. They nest in mature or old growth forest, generally near the coast (NatureServe, 2010). The marine waters of Port Townsend Bay have not been designated as critical habitat for marbled murrelets.

4.3.8. Rockfishes

Habitat information in this section is summarized from the information presented in the proposed listing (74 FR 18516) and final rule (75 FR 22275) published in the Federal Register. In general, adult rockfish are benthic but may also venture into mid-water pelagic habitats in deeper water. Most species are associated with rocky bottoms and outcrops and feed on bottom and mid-water dwelling invertebrates and small fishes. Rockfish are generally slow-growing, long-lived and late-maturing. Rockfish larvae are more common than adults in shallow water and are generally associated with rocky reefs, kelp canopies and artificial structures such as piers. Juveniles feed primarily on zooplankton. The project area does not contain habitat suitable for rockfish.

4.3.8.1. BOCACCIO ROCKFISH (*SEBASTES PAUCISPINIS*)

Adults of this species are most commonly found at depths ranging from 160 to 820 feet, but are known to sometimes inhabit waters as shallow as 40 feet in depth. This species is most common around the Point Defiance and Tacoma narrows area. Larvae are pelagic at first, settle on the bottom within 3.5 to 5.5 months after birth and move to deeper waters within several weeks after settling. There are no rocky reefs or kelp canopies on or adjacent to the project area, and therefore it is unlikely that the Bocaccio rockfish is present within the action area.

4.3.8.2. YELLOWEYE ROCKFISH *(SEBASTES RUBERRIMUS)*

Yelloweye rockfish adults are most commonly found in much deeper waters from 300 to 590 feet depth and are not known to occupy habitats less than 80 feet in depth. This species is highly associated with rocky, high-relief areas and is more common in the North Puget Sound. After the pelagic period, juveniles settle into high relief zones, crevices and sponge gardens in shallow areas before moving into deeper waters. Due to the lack of rock and high-relief areas, it is unlikely that the yelloweye rockfish is within the action area.

4.3.8.3. CANARY ROCKFISH (*SEBASTES PINNIGER*)

Adult canary rockfish are generally found at depths from 160 to 820 feet. This species is highly associated with rocky coarse habitats. This species is broadly distributed within the Georgia Basin,

including North Puget Sound. Due to the lack of appropriate habitat at the project site it is unlikely that the canary rockfish is within the action area.

4.3.9. Other Species

The following are other species identified by WDFW that have a potential to occur within the action area of the project:

- Bald eagle (*Haliaeetus leucocephalus*) Nest
- Purple martin (*Progne subis*)
- Great blue heron (*Ardea Herodias*) Colony

There should be no impacts to these species that result from project activities.

5.0 ENVIRONMENTAL BASELINE WITHIN THE PROJECT ACTION AREA

The project is located within Port Townsend Bay in residential and rural areas of Irondale. The action area includes terrestrial, marine aquatic and shoreline habitats. The discussion of environmental baseline conditions focuses on the pathways and indicators by which impacts to listed salmonids and other species and their suitable or critical habitat may be measured.

5.1. Water Quality

Ecology placed the property on the suspected contaminated site list in March 2006 and the site has been identified as a high-priority cleanup area as part of the Puget Sound Initiative. Water quality in the action area and at the project site is generally low but will improve as a result of project actions.

5.2. Habitat Access

Most of the shoreline in the action area consists of slag, gravels, cobbles and sand. Forest borders the shoreline to the west. Complex shorelines with woody debris are not common in the action area, but a small area to the north has some accumulated large woody debris.

5.3. Habitat Diversity

Estuarine habitat diversity and accessibility are not properly functioning in the action area due to contamination and other human disturbances. Shoreline modification is the main cause of losses of estuarine habitat; however what remains has poor water quality. The project will result in more habitat diversity with the installation of native tree, shrub and herbaceous plant species within the backshore.

5.4. Priority Habitat

A mapped fish-bearing stream, Chimacum Creek, containing coho salmon (*Oncorhynchus kisutch*), chum salmon (*Oncorhynchus keta*), pink salmon (*Oncorhynchus gorbuscha*), resident cutthroat (*Oncorhynchus clarkii*), and steelhead (*Oncorhynchus mykiss*) is mapped approximately 0.6 miles to the north. Two other streams are mapped, approximately 1 mile to the south; these streams are not mapped as fish-bearing according to the PHS dataset (WDFW 2011).

Associated with Chinacum Creek, approximately 0.6 mile to the north, are several mapped wetlands, a waterfowl concentration and an estuarine zone according to PHS dataset. To the south, approximately 1-mile, where the non fish bearing streams are located, wetlands and waterfowl concentrations are also mapped. No other priority habitats are mapped within 2 miles of the site.

5.5. Suitable Habitat

The project effects to listed species use of suitable habitat are discussed in the following paragraphs. Temporary potential effects to suitable aquatic habitat could occur within the footprint of the work area or within Port Townsend Bay to the extent that water quality and noise impacts may occur. Our discussion focuses on the use of suitable terrestrial or aquatic habitat.

5.5.1. Terrestrial

Terrestrial habitat alteration will include the excavation of contaminated soils, backfill with clean gravels and rocks and native plant installation in the backshore area. Although temporary impacts will occur from excavation activities, the water quality at the project site will be improved and with the installation of native plantings terrestrial habitat will benefit. Noise will not impact wildlife since suitable habitat for terrestrial T&E species does not exist in the action area.

5.5.2. Aquatic

Port Townsend Bay, within the action area, provides suitable aquatic habitat for the migration of listed fish (including chinook, chum, steelhead and bull trout). During construction activities there will be minor, temporary impacts to listed species due to isolation of the work area from approximately 5-foot Mean Lower Low Water (MLLW) to the OHW of the shoreline for approximately 2-weeks.

Potential impacts to aquatic species that may use the site will be temporary and result largely from exclusion from the site. This action will be completed during the in-water work windows to minimize impacts. The project is a restoration project and long term effects are expected to be beneficial to the shoreline and marine environment within and adjacent to the project site.

5.5.3. Summary

Based on the assessment of effects to suitable terrestrial and aquatic habitat within the action area, including species use of the habitat, the project will not affect the use of suitable terrestrial habitat. Potential impacts from the temporary avoidance of suitable aquatic habitat for listed fish and their prey (benthic invertebrates and forage fish) will be at levels that are insignificant and discountable. Construction timing and other minimization measures will limit the potential for listed species to be affected by project activities.

The project may temporarily degrade suitable habitat for fish, marine mammals and their prey at the project scale due to the potential for short-term impacts during construction. However, the project will result in a net benefit to species use of suitable aquatic habitat in the vicinity of the project through improved water quality, removal of shoreline fill and installation of native plants in the backshore.

6.0 EFFECTS ON LISTED SPECIES

6.1. Construction-Related Noise

There will be no underwater noise associated with this project because there will be no noise generating activities conducted in-water while the site is inundated. Although the project site likely serves as a migratory corridor for listed fish, habitats at the project site are unlikely to be occupied by listed fish during construction. Therefore impacts to these species will be at levels that are insignificant and discountable. In-air noise is not expected to extend into marine areas beyond the Port Townsend Bay (Figure 2). Therefore, impacts to these species will be at levels that are insignificant and discountable.

6.2. Habitat Alteration

The habitat of the entire site, both shoreline and upland areas, will be altered. The remedial cleanup activities involve excavation of contaminated soils, fill and slag material that consists of clean fill and top dressed with appropriate sized fine to medium sand beach mix. The backshore areas will then be restored with native tree, shrub and emergent plantings. The zone of influence for habitat alteration will extend over the entire project corridor work area. These alterations will result in clean sediments and more natural habitats in the intertidal zone. Therefore, habitat alteration is not expected to have negative effects on listed species for this project. The removal of contaminated sediments and installation of native backshore area plantings will likely have a beneficial impact on listed species that may use the project area after construction.

6.3. Exposure to Contaminated Sediment

Contaminates are currently leaching into marine waters and sediments from contaminated upland areas. Excavation activities will cause sediment disturbance resulting in possible suspension of below surface contaminants into the water column where organisms could be exposed to them. However, these types of effects are unlikely to occur due to the proposed methods of the cleanup actions. The work will be completed during low tides while the site is exposed and sediment containment devices will be used to contain sediments and exclude aquatic species from the work area. Furthermore because construction activities will be isolated by silt curtains, ESA-listed species will be absent from the immediate construction area. Clean fine to medium sand will be used as backfill, thereby limiting the long term opportunity for contaminated sediments to come into contact with marine water and aquatic organisms.

7.0 EFFECT DETERMINATIONS

Based on species and critical habitat occurrence information presented in Section 4.0 and the project effects discussed in Sections 3.0 and 6.0, we have made effect determinations for each species and its critical habitat, as applicable. Effect determinations for each species and critical habitat take into account the possible project effects; these determinations are summarized in Table 4 and discussed in the following sections.

TABLE 4. EFFECT DETERMINATIONS FOR LISTED SPECIES AND CRITICAL HABITAT

Common Name	Jurisdiction	Federal Status	Effect Determination	
			Species	Critical Habitat
Bull trout	USFWS	T	NLAA	NLAA
Puget Sound chinook salmon	NMFS	T	NLAA	NLAA
Hood Canal summer chum salmon	NMFS	T	NLAA	NLAA
Puget Sound steelhead	NMFS	T	NLAA	--
Southern resident killer whale	NMFS	E	NLAA	NLAA
Green sturgeon	NMFS	T	NLAA	--
Marbled murrelet	USFWS	T	NLAA	--
Bocaccio rockfish	NMFS	E	NLAA	--
Yelloweye rockfish	NMFS	T	NLAA	--
Canary rockfish	NMFS	T	NLAA	--

Notes:
T = Threatened; E = Endangered; NE = No Effect; NLAA = Not Likely to Adversely Affect.

7.1. Bull Trout

Although bull trout may be present within the action area, proposed project actions are **not likely to adversely affect (NLAA)** bull trout because:

- Construction activities will be completed during low tides while the beach substrate is exposed.
- Sediment containment devices will be used to minimize the release of contaminates and sediments and exclude fish from the immediate construction area.
- The absence of any data indicating the presence of bull trout within the project area combined with the timing of the in-water work result in a remote likelihood of exposing bull trout to the effects of the project.
- The likelihood of exposing bull trout to the effects of the proposed project is remote, since there are no streams within the action area that contain potential bull trout habitat and is considered discountable.
- The project will have a net benefit on bull trout by improving local water quality, removing physical barriers along the shoreline and increasing forage fish spawning habitat.

7.2. Designated Critical Habitat for Bull Trout

Four of the eight PCEs of bull trout critical habitat are present within the project area. Although the project includes near-shore marine environment of the Puget Sound, which is designated as critical habitat for bull trout, the project is **not likely to adversely affect (NLAA)** PCEs 1, 6, 7 and 8 of designated bull trout critical habitat because:

- The project will not negatively impact water temperatures in Port Townsend Bay (PCE 1).
- The project will not impede migratory corridors for bull trout (PCE 6).

- Construction activities will not alter prey base populations or distributions (PCE 7).
- Long term benefits will be experienced for water quality and (PCE 8).
- No impacts will occur to water quantity (PCE 8).
- The removal of contaminated sediments and installation of native plantings on the backshore habitat may benefit fish habitat. (PCEs 1, 7 and 8).

7.3. Puget Sound Chinook Salmon

Although chinook salmon may be present within the action area, proposed project actions are **not likely to adversely affect (NLAA)** chinook salmon because:

- Construction activities will be competed while the beach substrate is exposed.
- Sediment containment devices will be used to minimize the release of sediments and exclude fish from the immediate construction area.
- The absence of any data indicating the presence of chinook salmon within the project area combined with the timing of the water work result in a remote likelihood of exposing chinook salmon to the effects of the project.
- The likelihood of exposing chinook salmon to the effects of the proposed project is remote and is considered discountable.
- The project will have a net benefit on chinook salmon by improving local water quality, removing physical barriers along the shoreline and increasing forage fish spawning habitat.

7.4. Designated Critical Habitat for Chinook Salmon

Three of the six PCEs of chinook salmon critical habitat are present within the project area. Although the project includes near-shore marine environment of the Puget Sound, which is designated as critical habitat for chinook salmon, the project is **not likely to adversely affect (NLAA)** PCEs 4, 5 and 6 of designated chinook salmon critical habitat because:

- The project will not negatively affect the quality of the habitat at or around the project site. (PCEs 4, 5 and 6)
- The removal of contaminated sediments and installation of native plantings on the backshore habitat may benefit fish habitat. (PCEs 4, 5 and 6)

7.5. Hood Canal Summer Chum Salmon

Although chum salmon may be present within the action area, proposed project actions are **not likely to adversely affect (NLAA)** chum salmon because:

- Construction activities will be competed while the beach substrate is exposed.
- Sediment containment devices will be used to minimize the release of sediments and exclude fish from the immediate construction area.
- The likelihood of exposing chum salmon to the effects of the proposed project is remote and is considered discountable.

- The project will have a net benefit on Hood Canal summer chum by improving local water quality, removing physical barriers along the shoreline and increasing forage fish spawning habitat.

7.6. Designated Critical Habitat for Hood Canal Summer Chum Salmon

Three of the six PCEs of Hood Canal summer chum salmon critical habitat are present within the project area. Although the project includes near-shore marine environment of the Puget Sound, which is designated as critical habitat for chum salmon, the project is **not likely to adversely affect (NLAA)** PCEs 4, 5 and 6 of designated chum salmon critical habitat because:

- The project will not negatively affect the quality of the habitat at or around the project site. (PCEs 4, 5 and 6)
- The removal of contaminated sediments and installation of native plantings on the backshore habitat may benefit fish habitat. (PCEs 4, 5 and 6)

7.7. Puget Sound Steelhead

Although steelhead may be present within the action area, proposed project actions are **not likely to adversely affect (NLAA)** steelhead because:

- Construction activities will be competed while the beach substrate is exposed.
- Sediment containment devices will be used to minimize the release of sediments and exclude fish from the immediate construction area.
- The absence of any data indicating the presence of steelhead within the project area combined with the timing of the water work result in a remote likelihood of exposing steelhead to the effects of the project.
- The likelihood of exposing steelhead to the effects of the proposed project is remote and is considered discountable.
- The project will have a net benefit on steelhead by improving local water quality, removing physical barriers along the shoreline and increasing forage fish spawning habitat.

7.8. Potential Critical habitat for Puget Sound Steelhead

Critical habitat for Puget Sound steelhead has not yet been designated. However, in the event that it is designated prior to or during project construction, the following provisional effects determination has been presented. Three of the six proposed PCEs of steelhead critical habitat are present within the project area. Although the project includes near-shore marine environment of the Puget Sound, which is proposed as critical habitat for steelhead, the project is **not likely to adversely affect (NLAA)** PCEs 4, 5 and 6 of proposed steelhead critical habitat because:

- The project will not negatively affect the quality of the habitat at or around the project site. (PCEs 4, 5 and 6)
- The removal of contaminated sediments and installation of native plantings on the backshore habitat may benefit fish habitat. (PCEs 4, 5 and 6)

7.9. Southern Resident Killer Whale

The project is **not likely to adversely affect (NLAA)** the Southern Resident killer whales because:

- The southern resident killer whales are infrequently observed within Port Townsend Bay and are unlikely to be within the project area.
- There is no proposed inwater work, therefore impacts to southern resident killer whales from project activities will be at levels that are insignificant and discountable.

7.10. Designated Critical Habitat for Southern Resident Killer Whales

One of the five PCEs for killer whales are present within the project area. Although the project is located in near-shore marine environment of the Puget Sound, which is designated as critical habitat for southern resident killer whale, the project is **not likely to adversely affect (NLAA)** PCE 2 of the designated critical habitat for southern resident killer whale because:

- The project will not negatively affect the quality of the habitat at or around the project site. (PCE 2)
- The removal of contaminated sediments and installation of native plantings on the backshore habitat may benefit prey habitat, therefore being a benefit to the killer whale. (PCE 2)

7.11. Green Sturgeon

Although green sturgeon may utilize nearshore habitats adjacent to the project site, the project is **not likely to adversely affect (NLAA)** this species for the following reasons:

- Construction activities will be competed while the beach substrate is exposed.
- Sediment containment devices will be used to minimize the release of sediments and exclude fish from the immediate construction area.
- The absence of any data indicating the presence of green sturgeon within the project area combined with the timing of the water work result in a remote likelihood of exposing green sturgeon to the effects of the project.
- The likelihood of exposing green sturgeon to the effects of the proposed project is remote and is considered insignificant and discountable.

7.12. Marbled Murrelet

The project is **not likely to adversely affect (NLAA)** marbled murrelet for the following reasons:

- Sediment containment devices will be used to minimize the release of sediments into the adjacent marine environment.
- The absence of any data indicating the presence of marbled murrelet within the project area.
- The likelihood of exposing marbled murrelet to the effects of the proposed project is remote and is considered insignificant and discountable.

7.13. Designated Marbled Murrelet Critical Habitat

The project is **no effect (NE)** marbled murrelet critical habitat for the following reasons:

- There is no marbled murrelet critical habitat designated within the project action area.

7.14. Bocaccio Rockfish

The project is **not likely to adversely affect (NLAA)** Bocaccio Rockfish for the following reasons:

- Construction activities will be competed while the beach substrate is exposed.
- Sediment containment devices will be used to minimize the release of sediments and exclude fish from the immediate construction area.
- The absence of any data indicating the presence of rockfish within the project area combined with the timing of the water work result in a remote likelihood of exposing rockfish to the effects of the project.
- The likelihood of exposing rockfish to the effects of the proposed project is remote and is considered discountable.

7.15. Yelloweye Rockfish

The project is **not likely to adversely affect (NLAA)** Yelloweye Rockfish for the following reasons:

- Construction activities will be competed while the beach substrate is exposed.
- Sediment containment devices will be used to minimize the release of sediments and exclude fish from the immediate construction area.
- The absence of any data indicating the presence of rockfish within the project area combined with the timing of the water work result in a remote likelihood of exposing rockfish to the effects of the project.
- The likelihood of exposing rockfish to the effects of the proposed project is remote and is considered discountable.

7.16. Canary Rockfish

The project is **not likely to adversely affect (NLAA)** Canary Rockfish for the following reasons:

- Construction activities will be competed while the beach substrate is exposed.
- Sediment containment devices will be used to minimize the release of sediments and exclude fish from the immediate construction area.
- The absence of any data indicating the presence of rockfish within the project area combined with the timing of the water work result in a remote likelihood of exposing rockfish to the effects of the project.
- The likelihood of exposing rockfish to the effects of the proposed project is remote and is considered discountable.

8.0 CONCLUSIONS

Ecology is proceeding with remedial cleanup actions at the site. Remedial construction work is expected to start in summer 2011 in the upland areas and the marine work will take place between mid-July and mid-October 2011, due to the potential presence of sandlance within the action area. If construction requires a longer timeframe than provided by the inwater work window, inwater work will be completed between October15, 2011 and February 15, 2012. If inwater work is completed outside of the sandlance work window, a forage fish spawning survey will be completed prior to starting construction. The major remediation/construction activities include: (1) Removal and disposal of contaminated sediments; (2) Restoring and excavating shoreline areas and stabilizing exposed shoreline banks; (3) Removal and disposal of contaminated upland soil and restore the area; (4) Installation of a geotextile and soil cap across several upland areas to prevent exposure to contaminated soil remaining on site; (5) Removal of slag material on the beach and restoring the area; and (6) Potentially restoring/regarding the beach north of the slag area, and fence physical hazards in the upland area.

These activities will create in-air noise only. There will be habitat alteration as contaminated sediments will be removed and replaced with clean fine to medium sand and with the installation of native plantings. BMPs and minimization measures that will mitigate the effects of project actions on species and habitat will include removing contaminated sediments and compliance with all other permit requirements. Consequently, the effects of the project on the marine shoreline are limited.

Project activities will produce in-air construction-related noise for a limited time during construction. There will be no impacts to species resulting from water quality or habitat alteration, aside from habitat improvements. Potential impacts to listed species from construction activities have been determined to be at levels that are insignificant and discountable. As a result, the project is **not likely to adversely affect** on all listed species and critical habitat. The proposed action **will not adversely affect** EFH for Pacific salmon, groundfish, or coastal pelagic species, including both managed species and prey species, occurring at or near the project site (Appendix A).

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FIGURES

GeoEngineers

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. can not 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.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps, Street Maps 2005

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

Vicinity Map

Irondale Iron and Steel Plant
Irondale, Washington

GeoEngineers

Figure 1

Map Revised: May 24, 2007

Path: P:\0504042\00\GIS\0504042 00 FIG-1.mxd

Office: SEA

Project Area

Action Area

0.5 0 0.5

Miles

N

W E

S

Reference: NAD 1983 Washington State Plane North, Feet
Data Source: ESRI World Imagery, 2010.

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.

Action Area Map

Irondale Iron and Steel Plant
Irondale, Washington

GeoEngineers

Figure 2

Office: SEA Path: W:\Seattle\Archives\0\0504042\00\GIS\0504042_Fig2_ActionArea.mxd Map Revised: April 21, 2011 AMM

APPENDICES

GeoEngineers

APPENDIX A
Essential Fish Habitat (EFH) Evaluation

APPENDIX A
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 Essential Fish Habitat (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 proposed action area. It also describes conservation measures proposed to avoid, minimize or otherwise offset potential adverse impacts to designated EFH resulting from the proposed action.

The project is located over shoreline habitats within Port Townsend Bay. Groundfish and Pacific salmon, but not coastal pelagic species, may occur in waters of the Puget Sound, including Port Townsend Bay. Pacific salmon that may occur at the project site include Puget Sound chinook (*Oncorhynchus tshawyscha*), Puget Sound coho (*Oncorhynchus kisutch*) and pink salmon (*Oncorhynchus gorbuscha*). The project is situated within the shoreline of Port Townsend Bay and does not provide suitable habitat for groundfish or coastal pelagic species. Both are primarily associated with deeper, more offshore waters and are unlikely to be found in the work area. This assessment focuses on potential project impacts to the Pacific salmon FMP.

Proposed Action

For more details concerning the proposed actions for the project, please refer to Section 2.0 of the BE.

Potential Effects of Proposed Action on EFH

Effects on Pacific Salmon EFH

As described above, the project is located within designated Puget Sound chinook salmon critical habitat. Both adults and juveniles of the three salmon are included within the Pacific salmon FMP, as well as certain forage species, could occur in the project vicinity during the restoration activities and could be subject to some minor, temporary impacts. Potential effects to salmon FMP include:

- Area avoidance due to lack of water within the project site and short-term increases in noise levels;
- Short-term water quality degradation caused by construction activities and use of equipment, resulting in erosion/sedimentation, temperature or pH changes, or equipment fluid leakage that may damage subtidal vegetation or forage base spawning areas.
- Water quality impacts caused by unpredicted adverse weather conditions, resulting in erosion that may damage subtidal vegetation or forage base spawning areas.

Conservation measures that will be implemented to offset project impacts, as described above, will result in a smaller potential for impacts. The project will **not adversely affect** Pacific salmon EFH. For more information on the effects of the project on salmon EFH, please see the "Effects Determination" section of this report. The analysis of effects on chinook applies to effects on coho and pink salmon as well.

Effects on Groundfish EFH

No effects on the groundfish EFH are anticipated for the project. Groundfish are expected to use the area only incidentally and, if present during the construction, would likely move to another (probably deeper offshore) area without harm to the individual. Furthermore, the construction would not permanently alter habitat for groundfish.

Effects on Coastal Pelagics EFH

No effects on the coastal pelagic EFH are anticipated for the project. Coastal pelagic species are not likely to use the area, but, if present during the construction, they would likely move away from the work to more open waters without experiencing any harm.

EFH Conservation Measures

A number of measures will be implemented to minimize the potential adverse effects on the Pacific salmon EFH. These same measures, listed below, will also serve to minimize potential effects on the groundfish or coastal pelagic EFHs:

- The engineer will develop and implement a Temporary Erosion and Sediment Control (TESC) Plan and a Source Control Plan. The contractor will use the BMPs to control sediments from all vegetation removal or ground disturbing activities.
- The contractor shall prepare a Spill Prevention, Control and Countermeasures (SPCC) Plan prior to beginning construction. The SPCC Plan shall identify the appropriate spill containment materials, which will be available at the project site at all times.
- All equipment used for construction activities will be cleaned and inspected prior to arriving at the project site to ensure no potentially hazardous materials are exposed, no leaks are present, and the equipment is functioning properly.
- Operate construction equipment used for project activities from existing approach roads above the MHHW.
- Material that may be temporarily stored for use in project activities shall be covered with plastic or other impervious material to prevent sediments from being washed from the storage area to surface waters.
- If there are exposed soils that result from project activities, the exposed soils will be seeded and covered with straw mulch after construction is complete. Any temporary construction impact areas will be revegetated with native plants.
- If necessary, a biologist shall re-evaluate the project for changes in design and potential impacts associated with those changes, as well as the status and location of listed species, every 6 months until project construction is completed. Consultation with the services will be reinitiated if there are changes in project design or changes in listed species.

- Perform work according to the requirements and conditions of the Section 10 permit and Hydraulic Project Approval (HPA) issued by the USACE and the WDFW and the shoreline permit issued by Jefferson County.

See Section 2.6 Conservation Measures, of this report for additional information. For more information regarding prey species, please see the Species and Critical Habitat section in this report. For more information regarding status and life histories of the listed species, see Appendix E.

CONCLUSION

The proposed action will have **no effect** on groundfish or coastal pelagic EFHs, including their managed species and associated species, occurring in the vicinity of the project. The proposed action may affect but will **not likely adversely affect** Pacific salmon EFH, including their managed species and associates species, occurring in the action area. As described previously, the project may affect, but will **not likely adversely affect** designated Puget Sound chinook critical habitat.

If more detailed information is desired concerning the determination of effect of all listed species occurring within the action area, please refer to the "Effect Determination" section in this report.

APPENDIX B
Project JARPA Drawings

2010
WASHINGTON STATE
Joint Aquatic Resources Permit Application (JARPA) Form[1]

USE BLACK OR BLUE INK TO ENTER ANSWERS IN WHITE SPACES BELOW.

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][2]
Irondale Environmental Remediation and Habitat Restoration Project

Part 2–Applicant

The person or organization responsible for the project. [help]

2a. Name (Last, First, Middle) and Organization (if applicable)			
Teel, Steve; Washington Department of Ecology			
2b. Mailing Address (Street or PO Box)			
P.O. Box 47775			
2c. City, State, Zip			
Lacey, Washington 98504-7775			
2d. Phone (1)	**2e.** Phone (2)	**2f.** Fax	**2g.** E-mail
(360) 407-6247	( )	(360) 407-6305	STEE461@ECY.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) and Organization (if applicable)
Callaghan, Joe; GeoEngineers, Inc.
3b. Mailing Address (Street or PO Box)
1101 Fawcett Ave. , Suite 200

[1] Additional 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/PublicMenu/Menu.cfm?sitename=REG&pagename=mainpage_ESA
- If you are applying for an Aquatic Resources Use Authorization you will need to fill out and submit an Application for Authorization to Use State-Owned Aquatic Lands form to DNR, which can be found at http://www.dnr.wa.gov/Publications/aqr_use_auth_app.doc
- Not all cities and counties accept the JARPA for their local Shoreline permits. If you think you will need a Shoreline permit, contact the appropriate city or county government to make sure they will accept the JARPA.

[2] To 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 of Regulatory Assistance at 1-800-917-0043 or help@ora.wa.gov.

3c. City, State, Zip			
Tacoma, Washington 98403			
3d. Phone (1)	**3e.** Phone (2)	**3f.** Fax	**3g.** E-mail
(253) 383-4940	( )	(253) 383-4923	jcallaghan@geoengineers.com

Part 4–Property Owner(s)

Contact information for people or organizations owning the property(ies) where the project will occur. [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 property owners. Complete the section below and fill out JARPA Attachment A for each additional property owner.

4a. Name (Last, First, Middle) and Organization (if applicable)			
Jefferson County, Frank Gifford			
4b. Mailing Address (Street or PO Box)			
623 Sheridan Street			
4c. City, State, Zip			
Port Townsend, Washington 98368			
4d. Phone (1)	**4e.** Phone (2)	**4f.** Fax	**4g.** E-mail
(360) 385-9160	( )	(360) 385-9234	fgifford@co.jefferson.wa.gov

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]
☐ State Owned Aquatic Land (If yes or maybe, contact the Department of Natural Resources (DNR) at (360) 902-1100) ☐ Federal ☒ Other publicly owned (state, ***county***, city, special districts like schools, ports, etc.) ☐ Tribal ☐ Private
5b. Street Address (Cannot be a PO Box. If there is no address, provide other location information in 5p.) [help]
562 Moore St
5c. City, State, Zip (If the project is not in a city or town, provide the name of the nearest city or town.) [help]
Port Hadlock, WA 98339
5d. County [help]
Jefferson

5e. Provide the section, township, and range for the project location. [help]

¼ Section	Section	Township	Range
SW1/4	35	30 North	1 West
NE1/4	2	29 North	1 West

5f. Provide the latitude and longitude of the project location. [help]

- Example: 47.03922 N lat. / -122.89142 W long. (NAD 83)

48.04453 N Lat / -122.76828 W Long (NAD 83)

5g. List the tax parcel number(s) for the project location. [help]

- The local county assessor's office can provide this information.

001353004, 001353001, 901021002

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)
See Attachment C		

5i. List all wetlands on or adjacent to the project location. [help]

None

5j. List all waterbodies (other than wetlands) on or adjacent to the project location. [help]

Port Townsend Bay

5k. Is any part of the project area within a 100-year flood plain? [help]

☒ Yes ☐ No ☐ Don't know

5l. Briefly describe the vegetation and habitat conditions on the property. [help]

The northern half of the property contains mowed grass with patches of Himalayan blackberry (*Rubus armeniacus*) along the shoreline. Small amounts of American dunegrass (*Leymus mollis*) are located above the ordinary high water mark. The remainder of the site is forested with red alder (*Alnus rubra*), big-leaf maple (*Acer macrophyllum*), and western red cedar (*Thuja plicata*). Understory species include red elderberry (*Sambucus racemosa*), roses (*Rosa ssp*), holly (*Ilex ssp*), english ivy (*Hedera helix*), Himalayan blackberry and various other species.

Shoreline habitat throughout the majority of the site is minimal due to the historic fill pad and presence of invasive species. The upper intertidal zone is limited by the abrupt, vertical edge of the eroding fill pad. According to test pits, the fill pad consists of 1 to 2 feet of wood chips on top of fine to medium size sand, which extends more than 10 feet below grade. Substrate within the upper and middle intertidal zones, along the remediation and restoration area, is dominated by fine to medium sand at depths up to 14 feet below grade. The middle and lower intertidal areas in the southern half of the site contain large amounts of cobble sized "slag" material that comprise the majority of the surface substrate. To the north of the remediation areas sand substrate is present along with large pieces of concrete and brick that remain in place from historic site use.

5m. Describe how the property is currently used. [help]

The site is currently maintained as a County day use park. A small parking area is present that acts as a trailhead for multiple walking trails which traverse the site Uses include exercise, dog walking and picnicking.

5n. Describe how the adjacent properties are currently used. [help]

Adjacent land use is residential to the west. With undeveloped and open space lands to the north and south.

5o. Describe the structures (above and below ground) on the property, including their purpose(s). [help]

Remnants of three structures are currently located at the site. The southern portion of the site adjacent to the shoreline contains a large concrete above ground storage tank, which was historically used to store petroleum products. Two concrete foundations that were historically part of the iron and steel mill facilities remain in place in the western portion of the site. Remnants of historic brick kilns are located along the shoreline in the southern end of the project area. The remnants are buried below ground surface in the shoreline area and exposed in the intertidal zone. Additional chunks of concrete and bricks are located in the central portion of the beach associated with the historic pier.

5p. Provide driving directions from the closest highway to the project location, and attach a map. [help]

From I-5: take WA-16 West toward Bremerton (28 miles); Keep right at fork and continue on WA-3 North (0.3 miles); Keep left at fork and continue on WA-3 North (25.3 miles); turn left at WA-104 West / Hood Canal Bridge (6.6 miles); Turn Right at WA-19 North / Beaver Valley Road (11.6 miles); Turn right at Irondale Rd (0.8 miles); Turn left at 4th St (0.2 miles); take second right at Moore St (0.2 miles); Site at end or road (gravel parking lot).

See also Figure 1

Part 6–Project Description

6a. Summarize the overall project. You can provide more detail in 6d. [help]

The proposed project at the Irondale Beach Park site (location of the former Irondale Iron and Steel Plant) is located in Jefferson County, Washington and includes two primary elements; environmental remediation and habitat restoration. The environmental remediation is being conducted pursuant to the requirements of the Model Toxics Control Act (MTCA) administered by the Washington Department of Ecology (Ecology) under Chapter 173-340 of the Washington Administrative Code (WAC) and the requirements of the Sediment Management Standards (SMS) administered by Ecology under Chapter 173-204 WAC. Environmental remediation includes the excavation and disposal of contaminated beach sediments and shoreline soils as well as capping of two contaminated upland soil areas. Habitat restoration will occur along the entire shoreline of the project area and tie-in to the previously conducted Washington Department of Fish and Wildlife Chimacum Creek beach restoration project to the north. An important component of the environmental remediation and habitat restoration activities is maintaining, to the extent practicable, the historic archaeological features that contribute to the eligibility of the Irondale Historic District on the National Register of Historic Places.

Intertidal and shoreline remediation areas will be excavated and contaminated sediments will be removed and disposed of in an approved facility. Clean fine to medium sand fill will be utilized from the excavated portion of the restoration area. If additional fill is required, it will be imported and placed within the excavation area to re-establish the subgrade. A layer of clean fine to medium sand (excavated from the restoration area) will be placed on top of the subgrade within the remediation areas to establish the finished beach grade. The shoreline bank, which consists of mostly fill, will be re-graded in the remediation area to establish a more stable slope angle. The upland slopes will be re-vegetated with a native shrub and tree mixture to help stabilize the upland shoreline areas adjacent to the remediation areas. Beach nourishment is proposed for the southern end of the project area to transition the shoreline slope restoration within the remediation area and preserve the remnants of the historic brick kilns currently located below Ordinary High Water Mark (OHWM). The beach nourishment material will consist of fine to medium sand from either excess materials excavated within the restoration area or imported from local sources.

Upland soil remediation areas (the former Steel Production Building and the former Power House Complex area) will be addressed with a combination of capping methods and institutional controls to limit exposure to

contaminated soil. The proposed areas to be capped will be covered with a permeable geotextile and an approximately 2-foot thick layer of clean soil will be placed upon the geotextile to create a physical barrier between the contaminated soil and Site users and terrestrial ecological receptors. The ground surface in the proposed capping areas will require preparation prior to placement of the geotextile and soil cap components. However, historic building and structure foundations and slabs, if found to be present, will not be removed. Additionally, while site preparation will generally require removal of plants across the cap area that would prevent placement of the geotextile, larger trees may be allowed to remain in place if determined to be healthy and not impacted by site contaminants. Following completion of the soil cap, the areas will be replanted with plants suitable for the thin layer of soil placed over the geotextile to stabilize the soil and restore native vegetation for wildlife habitat.

The proposed shoreline restoration will occur north of the remediation area along the existing upland fill pad. Restoration will include removal of fill from the existing shoreline, placement of Large Woody Debris (LWD) and creation of a backshore habitat area. Removing the historic fill pad along the shoreline north of the remediation area will create a more natural beach slope angle, reducing erosion of the fill pad into the upper intertidal area. According to test pits along the restoration area, the fill pad consists of 1 to 2 feet of wood chips, that will be excavated and hauled offsite, on top of fine to medium sand fill. Excess clean fine to medium sand will be removed and utilized onsite for backfill in the remediation area and beach nourishment materials. An LWD berm will be created at the OHWM by placing logs and rootwads at the transition between upper intertidal and the backshore habitat areas. The backshore habitat area will be created at OHWM by excavating historic fill, exposing clean fine to medium sand, placing scattered LWD and re-vegetating the area with American dunegrass (*Leymus mollis*).

Within the restoration area, the backshore habitat will transition to an existing grass lawn to maintain a portion of the upland recreation area of the park. The small drainage near the northern end of the county property will be restored by removing invasive species and re-vegetating with native shrub and tree species. Invasive species will also be removed from the shoreline throughout the project area and native shrub and tree species will be installed south of the above ground storage tank location.

6b. Indicate the project category. (Check all that apply) [help]

☐ Commercial ☐ Residential ☐ Institutional ☐ Transportation ☐ Recreational
☐ Maintenance ☒ Environmental Enhancement

6c. Indicate the major elements of your project. (Check all that apply) [help]

☐ Aquaculture	☐ Culvert	☐ Float	☐ Road
☒ Bank Stabilization	☐ Dam / Weir	☐ Geotechnical Survey	☐ Scientific Measurement Device
☐ Boat House	☐ Dike / Levee / Jetty	☐ Land Clearing	☐ Stairs
☐ Boat Launch	☐ Ditch	☐ Marina / Moorage	☐ Stormwater facility
☐ Boat Lift	☐ Dock / Pier	☐ Mining	☐ Swimming Pool
☐ Bridge	☒ Dredging	☐ Outfall Structure	☐ Utility Line
☐ Bulkhead	☐ Fence	☐ Piling	
☐ Buoy	☐ Ferry Terminal	☐ Retaining Wall (upland)	
☐ Channel Modification	☐ Fishway		

☒ Other: Environmental Remediation, Shoreline Habitat Restoration

6d. Describe how you plan to construct each project element checked in 6c. 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 flood plain.

All activities described in this section will occur within the 100-year floodplain of Port Townsend Bay. Excavation of marine sediments will occur within Port Townsend Bay while the remaining activities will occur immediately adjacent to the Bay. Staging areas will be determined by the Contractor, with Owner approval, and will be limited to upland areas such as the existing parking lot. Remediation and restoration activities will be performed using common methods. Upland soil and invasive species removal will be performed using standard excavation methods and equipment to be determined by the Contractor. Excavation of contaminated soil within the marine environment is proposed to be performed using land-based excavation methods and equipment.

Best management practices (BMPs) will be used to contain contaminants within the work areas during excavation. Specific methods will be determined by the Contractor, with Owner approval, but may consist of installation of a sheet-pile wall, use of anchored silt curtains with oil containment booms, and excavation of shoreline sediment during low-tide periods.

Excavation of existing upland fill for habitat restoration will be initiated at the northern end of the project area and will be completed in segments during low tide cycles. As the tide recedes each cycle, additional fill material will be removed. Erosion control fabric or silt fencing will be utilized as needed to reduce erosion of exposed fill material and minimize the amount of sedimentation occurring during high tides.

Once the fill material has been excavated, clean fine to medium sand will be reused onsite as the final beach grade when possible and clean, double-washed, imported fine to medium sand will be used if necessary. Upon completion of fill removal and placement of beach substrate, large woody debris (LWD) will be installed above the Ordinary High Water (OHW) line throughout the project area. American dunegrass will be installed in the created backshore dune habitat throughout the project area and native tree and shrub species will also be installed in the backshore areas in the southern portion of the site. Native plant installation will be completed by hand methods using shovels and other hand tools.

6e. What are the 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 16, 2011 End date: October 14, 2011 ☒ See JARPA Attachment D

6f. Describe the purpose of the project and why you want or need to perform it. [help]

The purpose of this project is to remove environmental contaminants and restore degraded intertidal and shoreline habitats. The need for remedial actions arose in November 2005 when a park visitor notified Ecology about an oily residue on the beach near the above ground storage tank. After an initial investigation, Ecology determined that there was evidence of contamination along the beach. Ecology and Jefferson County conducted additional sampling to investigate the source of this contamination. Ecology placed the Site on the suspected contaminated site list in March 2006. Irondale Beach Park has been identified as a high-priority cleanup area as part of the Puget Sound Initiative.

The remedial activities will disturb portions of the intertidal and shoreline zones, and will require restoration of these areas. The remaining portions of the site between the remediation areas and the WDFW Chimacum Creek restoration site also present opportunities for significant habitat restoration. These portions of the site contain large amounts of wood chip fill, which is rapidly eroding into Port Townsend Bay. By removing this fill the upper intertidal habitat will be restored and a more stable backshore dune habitat will be created. To maximize the overall benefits of the project, the entire stretch of shoreline was included in the restoration design from the southern edge of the Jefferson County property to the southern end of the WDFW Chimacum Creek restoration site.

The proposed remediation and restoration activities will provide long-term benefits for fish, and avian species that utilize the site including salmonids, forage fish, great blue heron and other species. The restoration will improve spawning habitat for forage fish in the upper intertidal zone throughout the project area. Direct benefits to listed salmonids will include availability of additional prey base as well as creation of additional foraging habitat.

6g. Fair market value of the project, including materials, labor, machine rentals, etc. [help]
$3,000,000
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 ☒ Not applicable

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 goal of the project is to provide long-term benefits to the marine and shoreline habitats at the Irondale site. Short-term, minimal temporary adverse impacts will be associated with completion of the remediation and restoration project and may include turbidity and noise. To minimize these impacts, the intertidal and shoreline components of the project will be completed during the approved in water work period for salmon, bull trout, and sand lance in the Port Townsend Bay vicinity (July 16 to October 14). Work within the intertidal zone will take place, when possible, around the tidal cycling and be performed while the site is exposed. If work within a specific area will require longer than one low tide cycle, installation of a sheet-pile wall or use of anchored silt curtains with oil containment booms may be required.

Temporary erosion and sediment control measures and standard best management practices will be employed during construction. Best management practices (BMPs) that may be implemented during upland construction include and are not limited to silt fencing, waddle dams, and erosion control mats, while in-water construction may utilize sheet piling, silt curtains, debris booms, and oil-absorbent booms to contain and collect sediment and pollutants. Specific BMPs utilized during construction will be based on site conditions and may be changed as needed in the field.

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 ☒ Not applicable

The habitat restoration and environmental clean-up project will provide long term benefits for species within Port Townsend Bay. This project will remove contaminants from existing intertidal and shoreline areas as well as create and enhance available shoreline and intertidal habitats. The restoration plan includes the removal of historic fill and invasive species and the restoration of impacted areas with the placement of clean beach substrate (fine to medium sand) and installation of LWD and native vegetation. Restoration will result in the creation of approximately 56,100 sq. ft. (1.29 ac.) of intertidal habitat. No aquatic habitat will be lost as a result of the proposed project. Short-term, temporary impacts from construction will be minimized using BMP's as stated above in section 8a.

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 restoration actions will remove some of the historic impacts to the site (wood chip fill) and restore intertidal and shoreline habitats. Approximately 56,100 sq. ft. (1.29 ac) of new intertidal habitat and 71,700 sq. ft. (1.65 ac) of new backshore habitat will be created by excavating the existing fill pad and exposing the existing fine to medium sandy substrate. This plan has been developed using a watershed approach through collaboration with Washington Department of Ecology Shoreline Specialist Hugh Shipman, WDFW Watershed Steward Doris Small, Hood Canal Coordinating Council members, North Olympic Salmon Coalition members, Jefferson County and other local stakeholders. Through this collaboration the project has evolved into a continuation of restoration work completed in 2006 by WDFW on the north of the county property. The proposed restoration has been designed to complement the previous restoration work and remove adverse man-made impacts to the shoreline and nearshore habitats.

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 to be placed in or removed from waterbody	Area (sq. ft. or linear ft.) of waterbody directly affected
Remedial Excavation	Port Townsend Bay	In waterbody	1 month	2,306 CY	13,823 SF
Remedial Excavation	Port Townsend Bay	Immediately adjacent to waterbody w/in 100YR floodplain	1 month	5,602 CY	27,085 SF
Remedial beach replacement	Port Townsend Bay	In waterbody	1 month	1,960 CY	13,823 SF
Remedial beach replacement	Port Townsend Bay	Immediately adjacent to waterbody w/in 100YR floodplain	1 month	3,700 CY	20,000 SF
Restoration Beach Nourishment	Port Townsend Bay	In waterbody	1 month	90 CY	4,270 SF
Restoration beach excavation	Port Townsend Bay	In waterbody	1 month	2,425 CY	73,100 SF
Upland Conversion to beach	Port Townsend Bay	Immediately adjacent to waterbody w/in 100YR floodplain	1 month	15,240 CY	56,100 SF

[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]

Remediation Fill (subgrade): The base of each remedial excavation will be backfilled with clean fine to medium sand with silt excavated from the shoreline restoration area. The shoreline restoration grading will result in removal of a significant volume of clean sand that is expected to be similar to the material at the base of the remedial excavations and should be suitable for use as backfill. If needed certified clean fine to medium sand with silt will be obtained from a local off-site source. The fill will be tested to ensure that it meets Site cleanup levels for metals and petroleum hydrocarbons.

Beach Surface Substrate: the proposed restoration excavation will exposed the existing fine to medium sand material, which is similar to the existing shoreline substrate. Clean fine to medium sand, excavated from the shoreline restoration areas, will be utilized for placement as final beach grade substrate where needed, similar to the WDFW restoration project. If additional material is required for beach nourishment or to replace excavated material, clean double washed fine to medium sand will be imported from an approved local source.

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]

Remediation Excavations: Soil and sediment excavated for the cleanup action is native beach sediments contaminated with petroleum hydrocarbons and metals at concentrations exceeding site-specific cleanup levels protective of surface water. Shoreline soil and marine sediments near the former concrete fuel tank are contaminated with diesel and heavy oil range hydrocarbons at depths ranging from approximately 4 to 13 feet below ground surface. The slag material and soil mixed with slag have created an outcrop on the shoreline and are proposed to be removed from the upland and marine environments as a component of shoreline restoration activities. Excavated soil and sediment contaminated with petroleum hydrocarbons and metals, as well as removed slag material, will be stockpiled on site and sampled for disposal characterization. The contaminated material is expected to be transported off-site to a RCRA Subtitle D disposal facility to be selected by the Contractor. Material determined to be free of contaminants above Site cleanup levels will be reused on site as clean backfill for the upland excavations.

Restoration Excavations: Soil and sediment removed for the purpose of re-grading the shoreline outside of the contaminated areas will be stockpiled on site, sampled to confirm the absence of contaminants, and evaluated for backfill suitability. Stockpiled clean material is proposed to be reused on site for suitable purposes, including: placement as backfill within upland and marine remedial excavation areas; placement as backfill in beach creation areas as needed; placement as beach nourishment material; placement as upland cap material; and amendment, and use as upland topsoil in backshore planting areas. The wood chip fill excavated within the restoration areas will be stockpiled and tested and evaluated for appropriate reuse on site or hauled to an appropriate offsite location.

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
USACE	Jess Jordan	(206) 439-4536	April 7, 2011
WDFW	Doris Small	(360) 895-4756	April 18, 2011
WA Ecology	Hugh Shipman	(425) 649-7095	April 14, 2011

9b. Are any of the wetlands or waterbodies identified in Part 7 or Part 8 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: http://www.ecy.wa.gov/programs/wq/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.

17110019

9d. What Water Resource Inventory Area Number (WRIA #) is the project in? [help]

- Go to http://www.ecy.wa.gov/services/gis/maps/wria/wria.htm to find the WRIA #.

WRIA# 17

9e. Will the in-water construction work comply with the State of Washington water quality standards for turbidity? [help]

- Go to http://www.ecy.wa.gov/programs/wq/swqs/criteria.html 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: http://www.ecy.wa.gov/programs/sea/sma/laws_rules/173-26/211_designations.html.

☐ Rural ☐ Urban ☐ Natural ☒ Aquatic ☐ Conservancy ☐ Other _____

9g. What is the Washington Department of Natural Resources Water Type? [help]

- Go to http://www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_watertyping.aspx 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. If you know what the property was used for in the past, describe below. [help]

The Site history described in this section was obtained from previous reports, primarily Jefferson County's 2001 Site Hazard Assessment.

Industrial activities took place at the Site from 1881 through 1919. The iron and steel plant produced the first batch of iron in 1881, and the steel production plant was operational beginning in 1909. The Irondale Iron and Steel Plant consisted of a blast furnace and cast house, steel production building (including three open-hearth furnaces and a steel rolling mill), boiler plant, six charcoal kilns (also referred to as beehive kilns), miscellaneous support buildings (raw material warehouses, power house, machine shop, engine shop, and other supporting buildings), a 600-foot wharf and a 6,000-barrel (252,000-gallon) aboveground storage tank (AST) for fuel oil. At its peak in 1910, the steel plant produced more than 700 tons of steel per day and employed 600 workers. The plant was closed in 1911 and was reopened between 1917 and 1919 because of the demand for steel during World War I. The estimated locations of former structures associated with the iron and steel plant are shown in Figure 2.

From the mid-1970s until 1999, the beach area east of the Site was used as log storage for the Port Townsend Paper Company. A review of the Site history and potentially liable parties by Ecology states that Cotton

Engineering and Shipbuilding Corporation, later known as the Cotton Family Limited Partnership, owned the property from 1943 until December 30, 2002, when the property was sold to Jefferson County. Jefferson County bought the property to use as a recreational area and has operated the Site as Irondale Beach Park since that time.

The Site is part of the Irondale National Historic District designated by the National Park Service and listed on the National Register of Historic Places.

9j. Has a cultural resource (archaeological) survey been performed on the project area? [help]

- **If yes**, attach it to your JARPA package.

☒ Yes ☐ No

9k. 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]

Federally listed fish and wildlife species that are listed to potentially occur in the marine environments of Washington include;

- Bull trout (*Salvelinus confluentus*) – Coastal-Puget Sound DPS
- Chinook Salmon (*Oncorhynchus tshawytscha*) – Puget Sound ESU
- Chum Salmon (*O. keta*) – Hood Canal Summer Run ESU
- Steelhead (*O. Mykiss*) Puget Sound DPS
- Green sturgeon (*Acipenser medirostris*)
- Eulachon (*Thaleichthys pacificus*)
- Bocaccio Rockfish (*Sebastes paucispinis*)
- Yelloweye Rockfish (*S. ruberrimus*)
- Canary Rockfish (*S. pinniger*)
- Leatherback sea turtle (*Dermochelys coriacea*)
- Eastern Stellar Sea Lion (*Eumetopias jubatus*)
- Sperm whale (*Physeter macrocephalus*)
- Southern Resident killer whale (*Orcinus orca*)
- Humpback whale (*Megaptera novaeangliae*)
- Sei whale (*Balaenoptera borealis*)
- Blue whale (*B. musculus*)
- Fin whale (*B. physalus*)
- Marbled murrelet (*Brachyramphus marmoratus*)
- Northern spotted owl (*Strix occidentalis caurina*)
- Short-tailed albatross (*Phoebastria albatrus*) [outer coast]

Of these species only bull trout, Chinook salmon, chum salmon, steelhead, green sturgeon, and Southern Resident killer whale may potentially be affected by the project. See attached Biological Assessment for additional information on ESA species and potential impacts.

9l. 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]

According to WDFW PHS data obtained January 12, 2011 multiple Priority Habitats and Species are present within the project vicinity. A great blue heron colony is located immediately upland of the project area in the forested draw to the west. A purple martin observation is document immediately north of the project area in the WDFW restoration area. One bald eagle is mapped approximately 2,000 feet south of the project area along the shoreline. Dungeness crab is mapped throughout Port Townsend Bay, including the project area. Forage fish occurrences include documented sand lance spawning and potential surf smelt spawning within the project reach of the Port Townsend Bay shoreline and documented herring spawning area approximately 1,000 feet northwest.

Part 10–SEPA Compliance and Permits

Use the resources and checklist below to identify the permits you are applying for.

- Online Project Questionnaire at http://apps.ecy.wa.gov/opas/.
- Governor's Office of Regulatory Assistance at (800) 917-0043 or help@ora.wa.gov.
- For a list of agency addresses to send your application, click on the "where to send your completed JARPA" at http://www.epermitting.wa.gov.

10a. Compliance with the State Environmental Policy Act (SEPA). (Check all that apply.) [help]

- For more information about SEPA, go to www.ecy.wa.gov/programs/sea/sepa/e-review.html.

☒ A copy of the SEPA determination or letter of exemption is included with this application.

☐ A SEPA determination is pending with _____ (lead agency). The expected decision date is _____.

☐ 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

Washington Department of Ecology:

☒ Section 401 Water Quality Certification

Washington Department of Natural Resources:

☐ Aquatic Resources Use Authorization

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. _____ (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. _____ (initial)

Applicant Printed Name	Applicant Signature	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.

Authorized Agent Printed Name	Authorized Agent Signature	Date

11c. Property Owner Signature (if not applicant). [help]
Not required if project is on existing rights-of-way or easements.

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 of Regulatory Assistance (ORA). People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call (877) 833-6341.
ORA publication number: ENV-019-09

Data Sources: ESRI Data & Maps, Street Maps 2005.
Chimacum Creek Tidelands location obtained from "Health Consultation. Evaluation of Selected Metals in Irondale Beach Park and Chimacum Creek Tidelands Shell Fish." Irondale, Jefferson County, Washington. Agency for Toxic Substances and Disease Registry. July 28, 2008.

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PURPOSE:

DEPARTMENT OF ECOLOGY
IRONDALE ENVIRONMENTAL
CLEANUP AND HABITAT
RESTORATION ACTIONS

ADJACENT PROPERTY OWNERS:

SEE ATTACHMENT C FOR ALL
ADJOINING PROPERTY OWNERS

VICINITY MAP

LATITUDE: 48.04453 N
LONGITUDE: -122.76828W

SECTION, TOWNSHIP, RANGE:
T 30N, R1W, SEC 35 AND T29N,
R1W, SEC 2

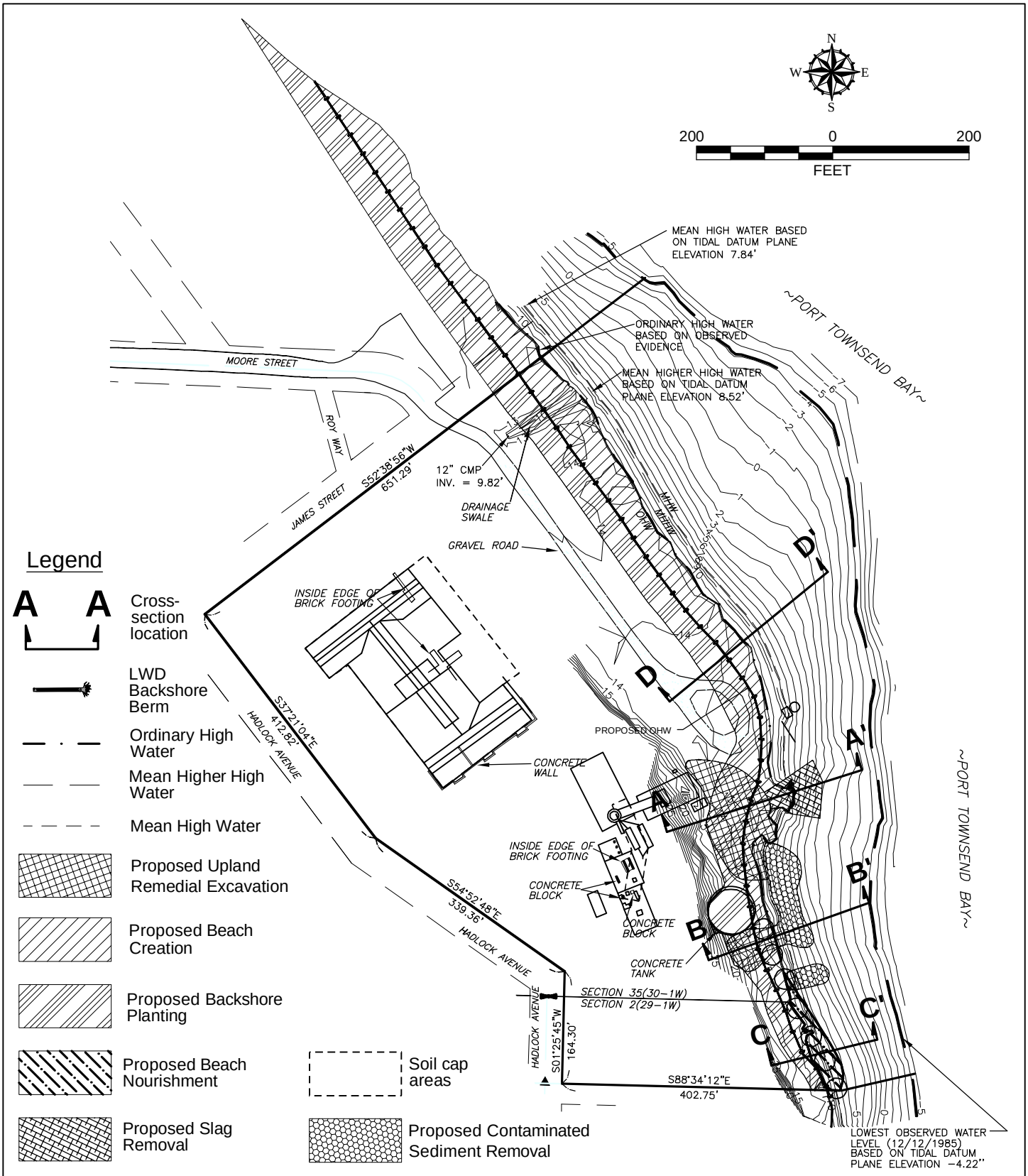
IRONDALE IRON AND STEEL PLANT
IRONDALE, WASHINGTON 98339

PURPOSE: IRONDALE REMEDIATION AND RESTORATION PROJECT

CITY OF: IRONDALE
COUNTY OF: JEFFERSON
STATE OF: WASHINGTON

APPLICATION BY:
WASHINGTON DEPARTMENT
OF ECOLOGY

SHEET: 1 OF 6 DATE APRIL 25, 2011



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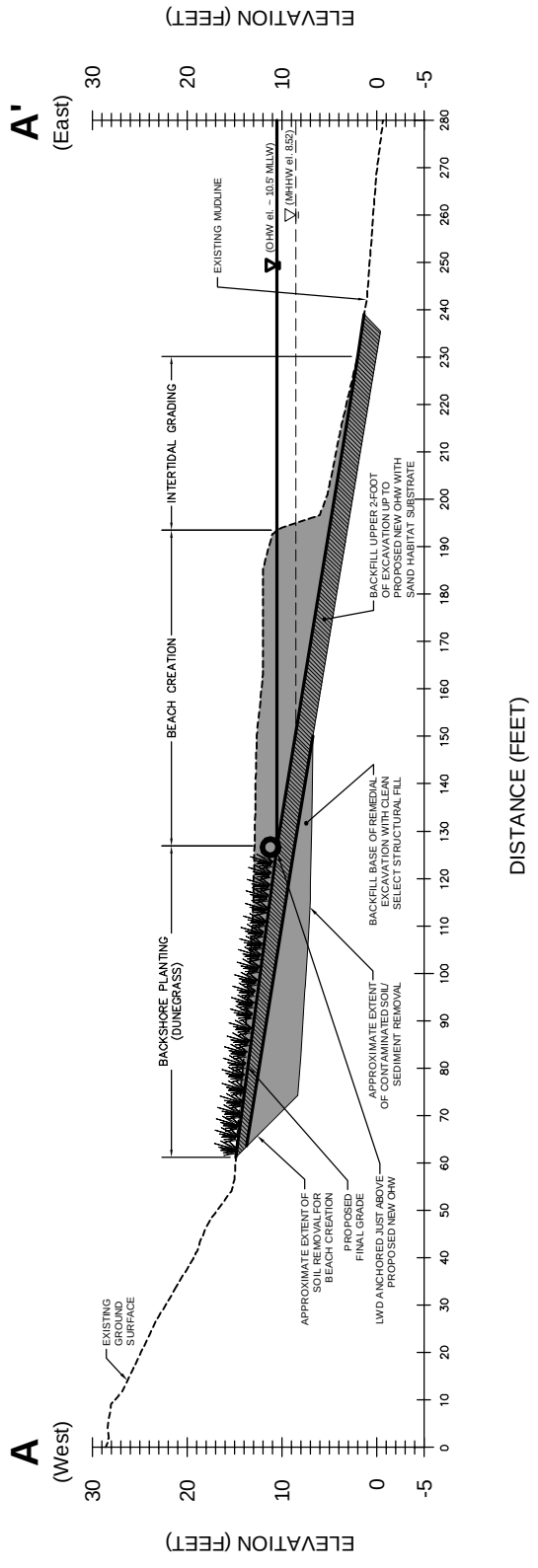

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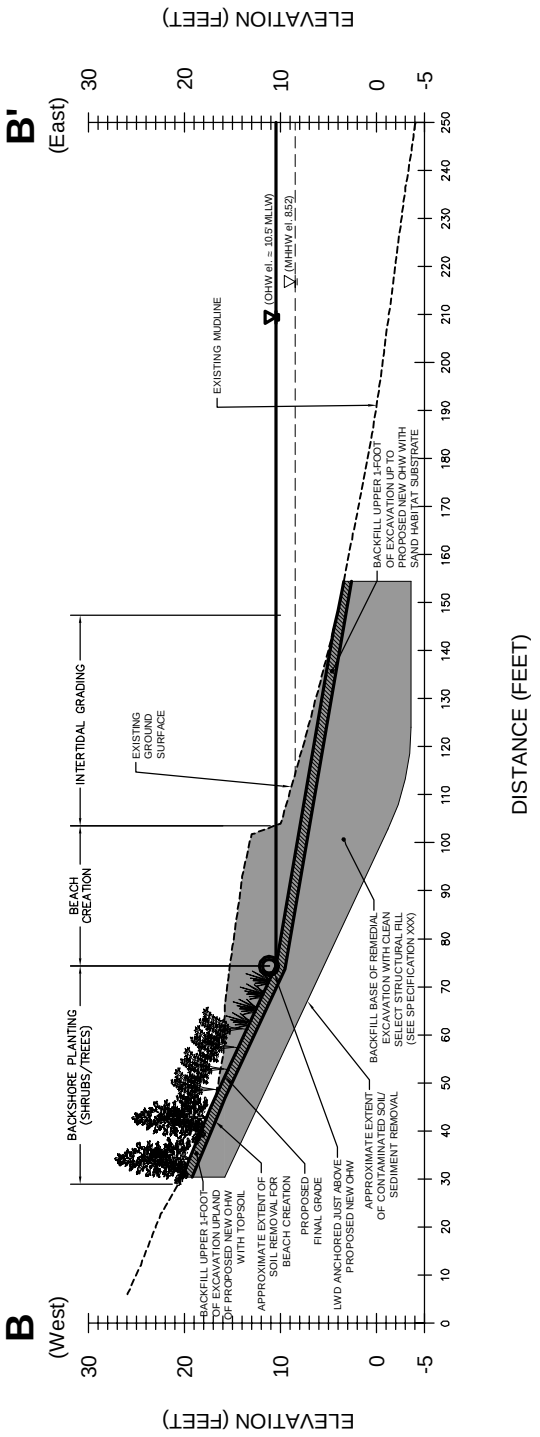

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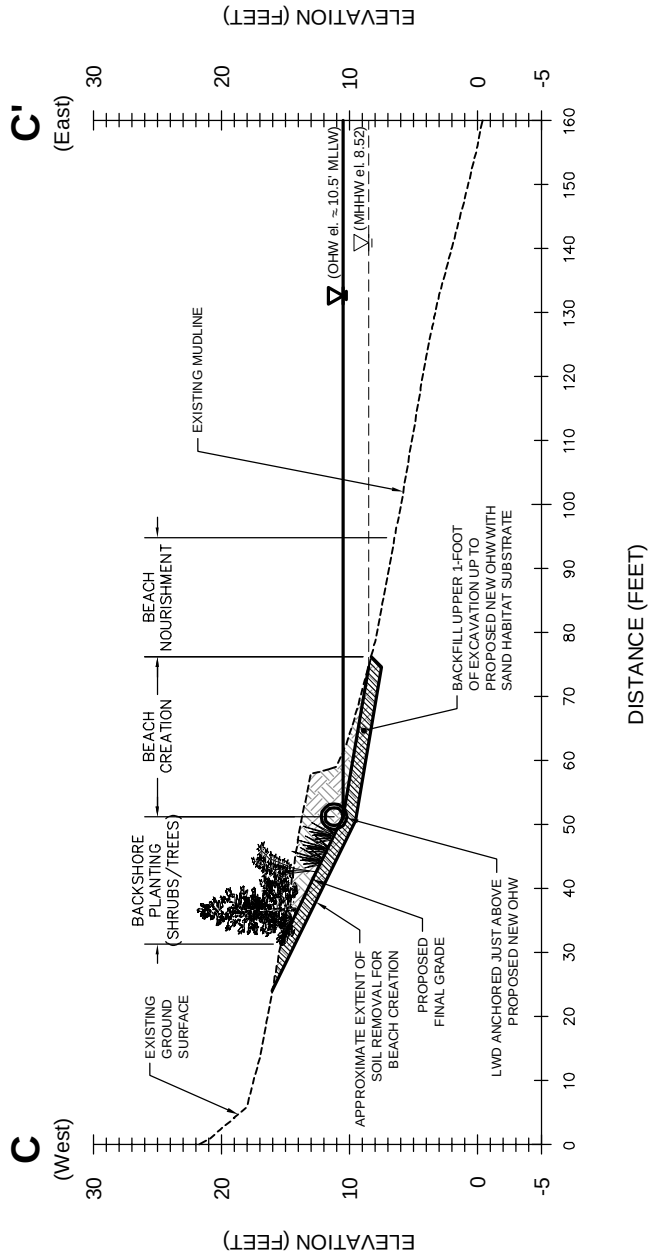

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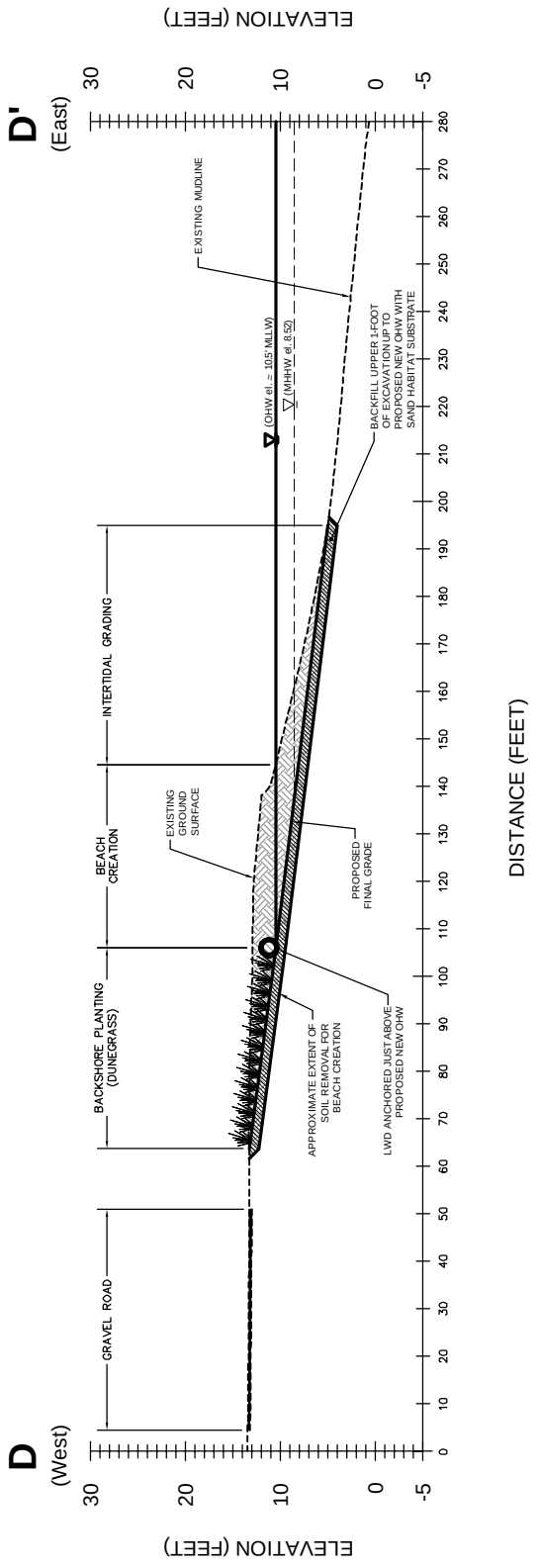

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APPENDIX C
Site Photographs

Photograph 1. Northern Sediment Remediation Area

Photograph 2. Vicinity of Southern Sediment Remediation Area

Photograph 3. Sediment to be Removed

Photograph 4. Additional Sediment to be Removed

Photograph 5. Slag to Potentially be removed

Photograph 6. Restoration Site Immediately North of Project Area

APPENDIX D
Species Lists

Endangered Species Act Status of West Coast Salmon & Steelhead

(Updated July 1, 2009)

Species[1]			*Current Endangered Species Act Listing Status*[2]	*ESA Listing Actions Under Review*
Sockeye Salmon (*Oncorhynchus nerka*)	1	Snake River	***Endangered***	
	2	Ozette Lake	***Threatened***	
	3	Baker River	*Not Warranted*	
	4	Okanogan River	*Not Warranted*	
	5	Lake Wenatchee	*Not Warranted*	
	6	Quinalt Lake	*Not Warranted*	
	7	Lake Pleasant	*Not Warranted*	
Chinook Salmon (*O. tshawytscha*)	8	Sacramento River Winter-run	***Endangered***	
	9	Upper Columbia River Spring-run	***Endangered***	
	10	Snake River Spring/Summer-run	***Threatened***	
	11	Snake River Fall-run	***Threatened***	
	12	Puget Sound	***Threatened***	
	13	Lower Columbia River	***Threatened***	
	14	Upper Willamette River	***Threatened***	
	15	Central Valley Spring-run	***Threatened***	
	16	California Coastal	***Threatened***	
	17	Central Valley Fall and Late Fall-run	***Species of Concern***	
	18	Upper Klamath-Trinity Rivers	*Not Warranted*	
	19	Oregon Coast	*Not Warranted*	
	20	Washington Coast	*Not Warranted*	
	21	Middle Columbia River spring-run	*Not Warranted*	
	22	Upper Columbia River summer/fall-run	*Not Warranted*	
	23	Southern Oregon and Northern California Coast	*Not Warranted*	
	24	Deschutes River summer/fall-run	*Not Warranted*	
Coho Salmon (*O. kisutch*)	25	Central California Coast	***Endangered***	
	26	Southern Oregon/Northern California	***Threatened***	
	27	Lower Columbia River	***Threatened***	• Critical habitat
	28	Oregon Coast	***Threatened***	
	29	Southwest Washington	*Undetermined*	
	30	Puget Sound/Strait of Georgia	***Species of Concern***	
	31	Olympic Peninsula	*Not Warranted*	
Chum Salmon (*O. keta*)	32	Hood Canal Summer-run	***Threatened***	
	33	Columbia River	***Threatened***	
	34	Puget Sound/Strait of Georgia	*Not Warranted*	
	35	Pacific Coast	*Not Warranted*	
Steelhead (*O. mykiss)*	36	Southern California	***Endangered***	
	37	Upper Columbia River	***Threatened***	
	38	Central California Coast	***Threatened***	
	39	South Central California Coast	***Threatened***	
	40	Snake River Basin	***Threatened***	
	41	Lower Columbia River	***Threatened***	
	42	California Central Valley	***Threatened***	
	43	Upper Willamette River	***Threatened***	
	44	Middle Columbia River	***Threatened***	
	45	Northern California	***Threatened***	
	46	Oregon Coast	***Species of Concern***	
	47	Southwest Washington	*Not Warranted*	
	48	Olympic Peninsula	*Not Warranted*	
	49	Puget Sound	***Threatened***	• Critical habitat
	50	Klamath Mountains Province	*Not Warranted*	
Pink Salmon *(O. gorbuscha)*	51	Even-year	*Not Warranted*	
	52	Odd-year	*Not Warranted*	

1 The ESA defines a “species” to include any distinct population segment of any species of vertebrate fish or wildlife. For Pacific salmon, NOAA Fisheries Service considers an evolutionarily significant unit, or “ESU,” a “species” under the ESA. For Pacific steelhead, NOAA Fisheries Service has delineated distinct population segments (DPSs) for consideration as “species” under the ESA.

Page Title: ESA MM List
URL: http://www.nwr.noaa.gov/Marine-Mammals/ESA-MM-List.cfm

ESA-Listed Marine Mammals

Under the jurisdiction of NOAA Fisheries that may occur:

off Washington & Oregon

- Southern Resident killer whale (*Orcinus orca*) (E); critical habitat
- humpback whale *(Megaptera novaeangliae)* (E)
- blue whale *(Balaenoptera musculus)* (E)
- fin whale (*Balaenoptera physalus)* (E)
- sei whale (*Balaenoptera borealis)* (E)
- sperm whale (*Physeter macrocephalus)* (E)
- Steller sea lion *(Eumetopias jubatus)* (T); critical habitat

in Puget Sound

- Southern Resident killer whale *(Orcinus orca*) (E); critical habitat
- humpback whale *(Megaptera novaeangliae)* (E)
- Steller sea lion *(Eumetopias jubatus)* (T); critical habitat

(E) = Endangered
(T) = Threatened

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LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CRITICAL HABITAT; CANDIDATE SPECIES; AND SPECIES OF CONCERN IN JEFFERSON COUNTY AS PREPARED BY THE U.S. FISH AND WILDLIFE SERVICE WASHINGTON FISH AND WILDLIFE OFFICE

(Revised August 26, 2010)

LISTED

Bull trout *(Salvelinus confluentus)* – Coastal-Puget Sound DPS
Marbled murrelet *(Brachyramphus marmoratus)*
Northern spotted owl *(Strix occidentalis caurina)*
Short-tailed albatross *(Phoebastria albatrus)* [outer coast]

Major concerns that should be addressed in your Biological Assessment of project impacts to listed animal species include:

1. Level of use of the project area by listed species.

2. Effect of the project on listed species' primary food stocks, prey species, and foraging areas in all areas influenced by the project.

3. Impacts from project activities and implementation (e.g., increased noise levels, increased human activity and/or access, loss or degradation of habitat) that may result in disturbance to listed species and/or their avoidance of the project area.

DESIGNATED

Critical habitat for bull trout
Critical habitat for the marbled murrelet
Critical habitat for the northern spotted owl

PROPOSED

Dolly Varden *(Salvelinus malma)* due to similarity of appearance
Revised critical habitat for bull trout

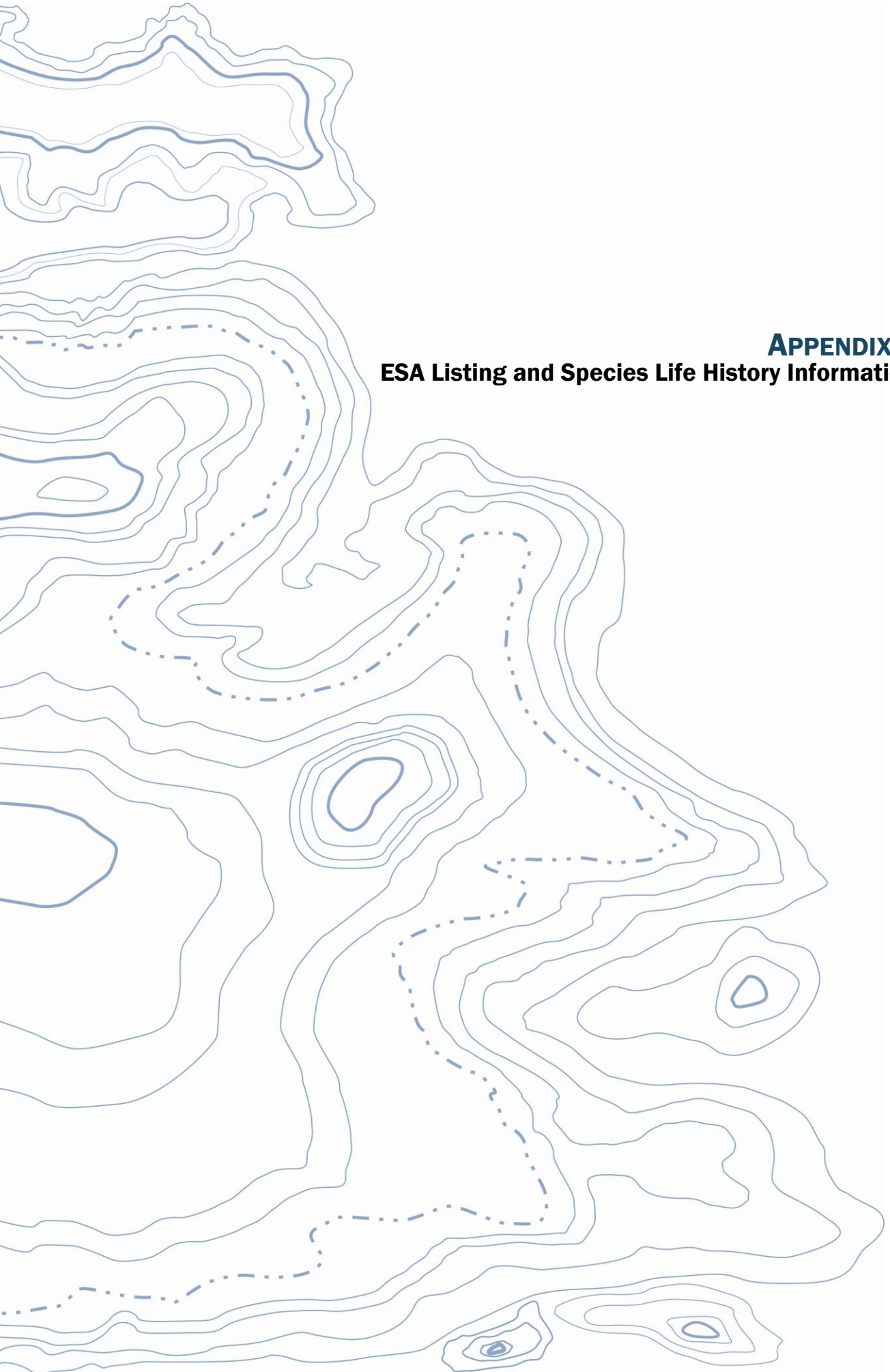
CANDIDATE

Fisher *(Martes pennanti)* – West Coast DPS

SPECIES OF CONCERN

Aleutian Canada goose *(Branta canadensis leucopareia)*
Bald eagle *(Haliaeetus leucocephalus)*
Brown pelican *(Pelecanus occidentalis)* [outer coast]

Cascades frog *(Rana cascadae)*
Cassin's auklet *(Ptychoramphus aleuticus)*
Coastal cutthroat trout *(Oncorhynchus clarki clarki)* [southwest Washington DPS]
Destruction Island shrew *(Sorex trowbridgii destructioni)*
Long-eared myotis *(Myotis evotis)*
Long-legged myotis *(Myotis volans)*
Northern goshawk *(Accipiter gentilis)*
Northern sea otter *(Enhydra lutris kenyoni)*
Olive-sided flycatcher *(Contopus cooperi)*
Olympic torrent salamander *(Rhyacotriton olympicus)*
Pacific lamprey *(Lampetra tridentata)*
Pacific Townsend's big-eared bat *(Corynorhinus townsendii townsendii)*
Peregrine falcon *(Falco peregrinus)*
River lamprey *(Lampetra ayresi)*
Tailed frog *(Ascaphus truei)*
Tufted puffin *(Fratercula cirrhata)*
Valley silverspot *(Speyeria zerene bremeri)*
Van Dyke's salamander *(Plethodon vandykei)*
Western toad *(Bufo boreas)*



APPENDIX E
ESA Listing and Species Life History Information

APPENDIX E
ESA LISTING STATUS AND SPECIES LIFE HISTORIES

Species of Fish

Chinook Salmon (Oncorhynchus Tshawytscha)

STATUS

As a result of the National Marine Fisheries Service's (NMFS) status review of chinook salmon populations in Washington, Oregon, Idaho and California, five Evolutionary Significant Units (ESUs) were defined. The Puget Sound ESU, composed of all naturally spawning spring, summer and fall runs of chinook salmon populations from the Elwha River to the Nooksack River, was listed as threatened under the ESA in March 1999. Critical habitat was designated for Puget Sound chinook in 2000, but was vacated by court order in 2002. National Oceanic and Atmospheric Administration (NOAA) Fisheries reevaluated the critical habitat designations for chinook in the Puget Sound and published the rules on this issue in 2005 (70 FR 52630-52853).

Overall abundance of chinook in the Puget Sound ESU has declined substantially from historic levels, and there has been concern over the effects of a high degree of hatchery supplementation on the genetic fitness of wild stocks. Additional factors leading to declines in the ESU include habitat degradation and high harvest rates, which in recent years have exceeded 90 percent (Myers et al., 1998).

LIFE HISTORY

Chinook salmon are anadromous. Adults migrate from marine environments and spawn in freshwater, while juveniles rear in freshwater for varying periods of time before migrating out to saltwater where they mature. Chinook use a wide variety of freshwater habitats from headwaters to the estuary but are typically found in low-gradient streams dominated by gravel and cobble (Scott and Crossman 1973). They require clean gravel for spawning. Juvenile chinook are typically associated with low gradient, meandering, unconstrained stream reaches (Lee et al. 1996) and require abundant habitat complexity such as that associated with accumulations of large woody debris and overhanging vegetation (United States Department of the Interior [USDI] 1996). Juvenile chinook often move into side channels, beaver ponds and sloughs for over-wintering habitat.

Most juvenile summer/fall chinook salmon in Puget Sound river systems migrate to the marine environment as smolts during their first year although their early life history patterns vary. Some migrate downstream almost immediately after emerging from the gravel. Others migrate downstream and enter side-channels where they may rear for several weeks before migrating to marine waters. A third life history strategy involves a more extended rearing time (up to 2 years) in the river before migrating to salt water.

Juvenile chinook salmon reside for a period of time in shallow intertidal areas before migrating to the sea. The availability of rearing habitat that includes an abundance of food items and security from predation during this early marine phase is critical to their growth and survival.

As smolts mature into juveniles, they move into Puget Sound and the North Pacific to feed and mature into adults. As juveniles, their diet consists usually of either small crustaceans or insects in fresh water and small crustaceans in the sea; as they mature their diet includes a greater proportion of small fish (Royce 1972). As juvenile salmon shift their prey preference to fish species such as juvenile herring and sandlance, they become dependent on these prey species as a forage base and are more likely to be found in shoreline zones containing eelgrass and other habitat features that support their prey.

Bull Trout (Salvelinus Confluentus)

STATUS

United States Fish and Wildlife Service (USFWS) identified five Distinct Population Segments (DPS) of bull trout in the western states and, in 1999, listed bull trout in the Coastal-Puget Sound DPS as threatened. The coastal bull trout DPS is composed of 34 sub-populations, including the only anadromous bull trout runs within the contiguous United States (USFWS 1999). The more common life history forms presently recognized for bull trout are resident and fluvial, neither of which use marine waters.

Bull trout have a wide, but very patchy, distribution across their range (Reiman and McIntyre 1993). Bull trout have been extirpated from many of the large rivers within their historic range and exist primarily in isolated headwater populations. The decline of bull trout has been attributed to habitat degradation, blocking of migratory corridors, poor water quality, introduction of non-native species and the effects of past fisheries management practices.

LIFE HISTORY

Bull trout are char native to the Pacific Northwest and western Canada. Bull trout exhibit resident and migratory life history strategies through much of the current range (Rieman and McIntyre 1993). Migratory bull trout spawn in tributary streams where juvenile fish rear from one to four years before migrating to either a lake (adfluvial), river (fluvial), or in certain coastal areas, to saltwater (anadromous), where maturity is reached in one of the three habitats. Resident and migratory forms may be found together and it is suspected that bull trout give rise to offspring exhibiting either resident or migratory behavior (Rieman and McIntyre 1993).

Bull trout have more specific habitat requirements compared to other salmonids (Rieman and McIntyre 1993). Habitat components that appear to influence bull trout distribution and abundance include water temperature, cover, channel form and stability, valley form, spawning and rearing substrates, and migratory corridors. Bull trout typically spawn from August to November during periods of decreasing water temperatures. However migratory bull trout frequently begin spawning migrations as early as April. Bull trout require spawning substrate consisting of loose, clean gravel relatively free of fine sediments. Depending on water temperature, incubation is normally 100 to 145 days, and after hatching, juveniles remain in the substrate. Time from egg deposition to emergence may surpass 200 days. Fry normally emerge from early April through May depending upon water temperatures and increasing stream flows. Bull trout are opportunistic feeders with food habits primarily a function of size and life history strategy. Resident and juvenile migratory bull trout prey on terrestrial and aquatic insects, macro zooplankton and small fish. Adult migratory bull trout are primarily piscivorous, know to feed on various fish species (Rieman and McIntyre 1993).

Hood Canal Summer Run Chum Salmon (Oncorhynchus keta)

STATUS

Hood Canal Summer run chum salmon are listed as threatened under the ESA (70 FR 37160). This run was first listed as threatened on March 25, 1999 and the threatened status reaffirmed on June 28, 2005. The ESU includes all naturally spawned populations of Summer run chum salmon in Hood Canal and its associated tributaries as well as populations in the Olympic Peninsula rivers between Hood Canal and Dungeness Bay, Washington, as well as eight artificial propagation programs in area hatcheries. Critical habitat was designated on September 2, 2005 (70 FR 52630).

LIFE HISTORY

The life history of Summer run chum salmon as discussed in this section comes from the Summer Chum Salmon Conservation Initiative: An Implementation Plan to Recover Summer Chum Salmon in the Hood Canal and Strait of Juan de Fuca Region, produced by the WDFW and the Point No Point Treaty Tribes in 2000.

Summer chum of the Hood Canal region are defined as those fish that have an average peak of spawning before November 1. One distinguishing characteristic of this group of summer chum populations is an early nearshore marine area, adult run timing (early August into October). This early timing creates a temporal separation from the more abundant indigenous fall chum stocks which spawn in the same area, allowing for reproductive isolation between summer and fall chum stocks in the region (WDF et al. 1993). The distance between summer chum spawning tributaries of Hood Canal and the eastern Strait of Juan de Fuca, and the rest of the Puget Sound streams, creates a geographical separation among the stocks.

Summer chum have evolved to exploit freshwater and estuarine habitats during periods, and for durations, when interaction with other Pacific salmon species and races is minimized. Summer chum spawning occurs from late August through late October, generally within the lowest one to two miles of the tributaries. Depending upon temperature regimes in spawning streams, eggs reach the eyed stage after approximately 4 to 6 weeks of incubation in the redds, and hatching occurs approximately 8 weeks after spawning (L. Telles, Quilcene National Fish Hatchery, Quilcene, WA, pers. Comm., 1996). Alevins develop in the redds for additional 10 to 12 weeks before emerging as fry between February and the last week of May. Estimated peak emergence timings for Hood Canal summer chum populations are March 22.

Summer chum fry emergence timing in Hood Canal can range from the first week in February through the second week in April. Upon arrival in the estuary within Hood Canal, the chum salmon fry inhabit nearshore areas with a preferred water depth between 1.5 to 5 meters. Chum fry arriving in the Hood Canal estuary are initially widely dispersed but form loose aggregations oriented to the shoreline within a few days (Schreiner 1977, Bax 1983, Whitmus 1985). These aggregations occur in daylight hours only and tend to break up after dark, regrouping nearshore at dawn the following morning (Schreiner 1977, Bax 1983). The Schreiner 1997 document states that Hood Canal chum maintain a nearshore distribution until they reach a size of 45 to 50 mm, at which time they move to deeper offshore areas. After two to four years of rearing in the northeast Pacific Ocean, maturing Puget Sound origin chum salmon follow a southerly migration path parallel to the coastlines of southeast Alaska and British Columbia

(Neave et al. 1976, Salo 1991, Myers 1993). The precise timing of this migration from the Gulf of Alaska waters for Hood Canal summer chum is unknown.

Summer chum mature primarily at 3 and 4 years of age. They enter the Hood Canal terminal area from early August through the end of September (WDFW and WWTIT 1994).

Puget Sound Steelhead (Oncorhynchus Mykiss)

STATUS

In 1996, NOAA Fisheries conducted a comprehensive status review of coastal and inland steelhead stocks in California, Oregon, Washington and Idaho. This review identified a Puget Sound ESU of coastal steelhead. The conclusion of that review stated that the Puget Sound steelhead ESU was not in danger of becoming extinct and did not warrant listing under the ESA. Not listing the Puget Sound steelhead was largely based on large positive overall trends for the two largest area steelhead populations and the lack of strong upward or downward trends for the other winter-run steelhead populations in the Puget Sound. This review did express concern about the sustainability of summer steelhead populations and potential adverse impacts from hatchery practices in the Puget Sound (71 FR 15666-15680).

On September 13, 2004, NOAA Fisheries received a petition to list Puget Sound steelhead as a threatened or endangered species. A status review was conducted and NOAA determined that naturally spawned summer- and winter-run steelhead populations and two hatchery steelhead stocks, below natural and manmade impassable barriers, in the river basins of the Strait of Juan de Fuca, Puget Sound and Hood Canal constitute a DPS and are a "species" for listing under the ESA. The results of the status review were released on March 29, 2006 stating that NOAA has proposed to list Puget Sound steelhead as threatened based on wide spread declines in abundance and productivity over the past nine years, particularly for the two populations identified as strongholds in the 1996 review. This listing action includes only the anadromous form of *Oncorhynchus mykiss* (71 FR 15666-15680).

LIFE HISTORY

Steelhead is the name commonly applied to the anadromous (sea-going) form of the biological species *Oncorhynchus mykiss*. Steelhead exhibit perhaps the most complex suite of life-history traits of any species of Pacific salmonid. *Oncorhynchus mykiss* can be anadromous (''steelhead''), or freshwater residents (''rainbow or redband trout''), and under some circumstances yield offspring of the opposite life-history form. Those that are anadromous can spend up to 7 years in freshwater prior to smoltification (the physiological and behavioral changes required for the transition to salt water), and then spend up to 3 years in salt water prior to first spawning. Steelhead are also iteroparous (meaning individuals may spawn more than once), whereas the Pacific salmon species are principally semelparous (meaning individuals generally spawn once and die). Within the range of West Coast steelhead, spawning migrations occur throughout the year, with seasonal peaks of activity. In a given river basin there may be one or more peaks in migration activity; since these ''runs'' are usually named for the season in which the peak occurs, some rivers may have runs known as winter, spring, summer, or fall steelhead (71 FR 15666-15680).

Steelhead can be divided into two basic reproductive ecotypes, based on the state of sexual maturity at the time of river entry and duration of spawning migration. The summer or ''stream

maturing'' type enters fresh water in a sexually immature condition between May and October, and requires several months to mature and spawn. The winter or ''ocean-maturing'' type enters fresh water between November and April with well-developed gonads and spawns shortly thereafter. In basins with both summer and winter steelhead runs, the summer run generally occurs where habitat is not fully utilized by the winter run, or where an ephemeral hydrologic barrier separates them, such as a seasonal velocity barrier at a waterfall. Summer steelhead usually spawn farther upstream than winter steelhead (71 FR 15666-15680).

Puget Sound/Georgia Basin Rockfish

STATUS

Three Puget Sound/Georgia Basin Distinct Population Segments (DPS) of rockfish were officially listed on April 28, 2010 (75 FR 22276). These species include Bocaccio Rockfish (*Sebastes paucispinis*), which has been listed as endangered, and Yelloweye Rockfish (*Sebastes ruberrimus*) and Canary Rockfish (*Sebastes pinniger*), which have been listed as threatened. Listing became effective on July 27, 2010. The primary threats to rockfish are degradation of habitat, overutilization from commercial and recreational fishing, and disease/predation. These factors are compounded by their slow recovery rate once populations are low.

LIFE HISTORY

Habitat and life history information in this section is summarized from the proposed listing in the Federal Register (74 FR 18516). Rockfishes as a group are among the most common of bottom and mid-water dwelling fish on the Pacific coast of North America. Adult rockfish can be the most abundant fish in various coastal benthic habitats at depths greater than 300 meters. Larval rockfish feed on diatoms, dinoflagellates, tintinnids, and cladocerans. Juveniles consume copepods and euphausiids of all life stages. Adults eat bottom and mid-water dwelling invertebrates and small fishes, including other species of rockfish associated with kelp beds, rocky reefs, pinnacles, and sharp drop-offs. Juveniles and subadults may be more common than adults in shallow water and are associated with rocky reefs, kelp canopies, and artificial structures such as piers and oil platforms. Adults generally move into deeper water as they increase in size and age and many species exhibit strong site fidelity to rocky bottoms and outcrops. Many species of rockfishes are slow-growing, long-lived, and late maturing.

Bocaccio Rockfish adults are most commonly found at depths ranging from 160 to 820 feet, but are known to sometimes inhabit waters as shallow as 40 feet in depth. This species is most common around the Point Defiance and Tacoma narrows area and is rare in the North Puget Sound. Larvae are pelagic at first, settle on the bottom within 3.5 to 5.5 months after birth and move to deeper waters within several weeks after settling.

Yellow Rockfish adults are most commonly found in much deeper waters from 300 to 590 feet depth and are not known to occupy habitats less than 80 feet in depth. This species is highly associated with rocky, high-relief areas and is more common in the North Puget Sound. After the pelagic period, juveniles settle into high relief zones, crevices and sponge gardens in shallow areas before moving into deeper waters.

Canary Rockfish adults are generally found at depths from 160 to 820 feet. This species is highly associated with rocky coarse habitats. This species is broadly distributed within the Georgia Basin, including North Puget Sound.

Green Sturgeon (Acipenser medirostris)

STATUS

It was determined in 2002 that the green sturgeon is comprised of two DPSs (northern and southern), but at that time neither DPSs warranted listing as threatened or endangered. In 2005 NMFS produced an updated status review that proposed the Southern DPS should be listed as threatened under the ESA. The southern DPS of Green sturgeon are listed as threatened under the ESA (71 FR 17757) on April 07, 2006. Critical habitat was designated on June 2, 2010 (75 FR 30714).

LIFE HISTORY

The information presented below on the life history of green sturgeon is summarized from the NOAA Fisheries Green Sturgeon website.

Green Sturgeon are long-lived, slow-growing fish and the most marine oriented of the sturgeon species. This species is found along the west coast of Mexico, the United States and Canada. Green Sturgeon are believed to spend the majority of their lives in nearshore oceanic waters, bays, and estuaries. Early life-history stages reside in fresh water, with adults returning to freshwater to spawn when they are more than 15 years of age and more than 4-feet in size. Spawning is believed to occur every 2 to 5 years (Moyle, 2002). Adults typically migrate into fresh water beginning in late February; spawning occurs from March to July with peak activity from April to June (Moyle et al., 1995). Females can produce 60,000 to 140,000 eggs (Moyle et al., 1992). Juvenile green sturgeon spend 1 to 4 years in fresh and estuarine waters before dispersal to saltwater (Beamsesderfer and Webb, 2002). They disperse widely in the ocean after their out-migration from freshwater (Moyle et al., 1992). It is believed that adult green sturgeon eat benthic invertebrates including shrimp, mollusks, amphipods, and small fish (Moyle et al., 1992).

It is believed that a principal factor in the decline of the Southern DPS is the reduction of the spawning area to a limited section of the Sacramento River. This remains a threat due to increased risk of extirpation due to catastrophic events. Insufficient freshwater flow rates in spawning areas, contaminants, by-catch of green sturgeon in fisheries, potential poaching, influence of exotic species, small population size, impassable barriers, and elevated water temperatures likely pose a threat to this species.

Species of Marine Mammals

Southern Resident Killer Whale (Orcinus Orca)

STATUS

Southern resident killer whales first became protected under the Marine Mammal Protection Act (MMPA) in 1972 and were considered to be depleted under the MMPA in May of 2003. The population was drastically reduced from 1965 through 1975 due to captures of the animals for marine parks (NOAA 2005). The southern resident killer whale was considered a “DPS” of the killer whale species in August 2004 and was proposed as “threatened” status under the ESA in December 2004. In November of 2005 (70 FR 69903) the southern resident killer whale was

listed as an endangered species under the ESA (NOAA 2005). On November 29, 2006 killer whale critical habitat was designated for Puget Sound (71 FR 69054).

The southern resident killer whale population has fluctuated considerably over the past 30 years. In the early 1970s, the population consisted of 71 whales. It peaked in 1996 at 97 whales and declined to 79 in 2001. There are several reasons why biologists think that the southern resident killer whale population is not thriving. There are limited numbers of reproductive-age southern resident males in the population. Several of the reproductive-age females are not having calves either. Their population has always been small and this increases their susceptibility to catastrophic risks such as disease or oil spills. Some other potential causes of decline are the reduced quality and quantity of prey, excessive noise and disturbance from passing vessels. The factors causing the decline of southern resident killer whales are not well known, and are likely to continue until the NOAA's NMFS learns more about what needs to be done to reverse this trend (NOAA 2005).

LIFE HISTORY

Southern resident killer whales occur in large, stable pods with memberships ranging from 10 to approximately 60 whales. The primary prey of these whales is fish and their distribution is closely tied with peak abundance of various species of salmon prey. The assemblage contains three distinct pods: J pod, K pod and L pod and is considered a stock under the MMPA. Their range during the spring, summer and fall includes the inland waterways of Puget Sound, Strait of Juan de Fuca and Southern Georgia Strait. Little is known about the winter movements and range of the southern resident stock. Southern resident killer whales have not been seen to associate with other resident whales. Mitochondrial and nuclear genetic data suggests that southern residents rarely interbreed with other killer whales if at all (NOAA 2005).

Both males and females reach sexual maturity at 15 years of age on average. Reported gestation periods, often established with captive animals, have ranged from 12-17 months. The interval between calving is usually about 5 years (ranging from 2 to 12 years). Length of calves at birth ranges from 7-9 feet. Calving occurs year round, but appears to peak between fall and spring. Mortality rates vary with age. Neonate mortality, from birth to six months of age, is high and has been known to reach 50 percent. From birth, the average life expectancy is about 29 years for females and 17 years for males (Species at Risk 2005).

The southern resident population is more subject to anthropogenic influences than any of the other populations. For example, levels of toxic chemicals in southern residents are three times higher than levels known to cause immunotoxicity in Harbour Seals (*Phoca vitulina*). Organochlorine concentrations are four times higher than reported for the northern resident population. It is also possible that the large and growing commercial and recreational whale watching industry on the west coast may be having an impact although specific impacts are unclear. The southern residents are also subject to significantly higher levels of vessel interactions due to the proximity of their summer range to large urban areas (Seattle, Victoria and Vancouver). Human interactions include live-capture fisheries, entanglement in fishing gear, collisions with vessels, and exposure to oil spills (Species at Risk 2005).

Species of Marine Birds

Marbled Murrelet (Brachyramphus marmoratus)

STATUS

The North American subspecies of marbled murrelet ranges from the Aleutian Islands and southern Alaska south to central California, the largest portion of the population occurs in Alaska and British Columbia. Due to loss of older forests used for nesting sites, the species is declining. For example, current estimates indicate that the population has declined by 50 percent to 80 percent; approximately 6,500 individual murrelets inhabit the area along the coast of California. Using known population numbers relative to remaining suitable nesting habitat, it has been estimated that historically, 60,000 marbled murrelet pairs may have been found in this same area. Along the Oregon coast, recent surveys have shown a decline in murrelet numbers during the 1990s. Loss of viable nesting habitat is thought to be a primary factor responsible for an estimated annual 4 percent to 7 percent decline in marbled murrelet populations in Washington, Oregon, and California. It is unlikely that population numbers will increase rapidly due to the naturally low reproductive rate and the continued loss of nesting habitat indicates that the recovery of the species is likely to take decades.

LIFE HISTORY

Marbled murrelets nest from mid-April to late September. The sexually mature adult murrelet (at age 2 or 3 of an average 15-year lifespan) generally lays a single egg on a mossy limb of an old-growth conifer tree. Both sexes incubate the egg in alternating 24-hour shifts for 30 days. Murrelet chicks are virtually helpless at hatching and rely on the adults for food. The adults feed the chick at least once per day, flying in (primarily at dawn and dusk) from feeding on the ocean, carrying one fish at a time. The young fledge from the nest in about 28 days and appear to fly directly to the sea upon leaving the nest. Marbled murrelets have a naturally low reproductive rate because they lay only one egg per nest and not all adults nest every year.

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