Biological Evaluation

Smith Island Terminal
Everett, Washington

for
Cedar Grove Composting, Inc.

February 11, 2014

GeoEngineers
Earth Science + Technology

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File No. 10625-001-28

February 11, 2014

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1.0 INTRODUCTION

Smith Island Terminal LLC (SIT) is proposing to re-develop properties on Smith Island in Everett, Washington (Figure 1 – Vicinity Map) owned by SIT LLC partners (Cedar Grove Composting, Inc., Miles Sand and Gravel [dba Concrete NorWest] and Sumner Capital LLC) which will be leased back to SIT for this Project.. The Project consists of the construction of two connecting rail lines of approximately 400 feet each to reach the nearby mainline of BNSF (north of Delta Jct.), along with the construction of approximately 8,400 feet of loop track (two full loops) and ancillary storage tracks and loading areas, office and maintenance building, a paved equipment storage area, stormwater collection and treatment facilities, construction of an undercrossing of the BNSF mainline to provide grade separated access for the Terminal and other properties on Smith Island, a new access road outside of the track to access Cedar Grove Composting and its Public Access trail, relocated utility poles, wetland mitigation including some reconfiguration and minor changes to the trail to accommodate bridging for dike breaches and tidal connection, buffer enhancement and a kayak launch adjacent to the re-located public access parking. To construct the Project, approximately 685,000 cubic yards of fill material will be placed throughout the site. The purpose of this fill is to elevate the existing grade to match the elevation of the BNSF main line and to meet flood protection requirements of the site. Placement of the proposed fill will permanently impact approximately 13.7 acres of existing wetlands and approximately 1.1 acres of regulated ditches at the site.

49 U.S.C. §§ 10501 (b) and 10901 grants exclusive jurisdiction to the construction of this type of facility to the Surface Transportation Board (which is a cooperating agency with the U.S. Army Corps of Engineers [USACE]) and the Washington State Department of Ecology (Ecology) for environmental review and generally pre-empts most state and local permit requirements. The Terminal development will comply with the substantive elements of the Everett Shoreline Master Plan and Regulations. Since the project work will involve fill in jurisdictional wetlands and alteration of navigable waters, the work must be approved under the Clean Water Act Section 404 and Section 10 River and Harbor Act authorities of the USACE. Because this is a federal permit, the USACE requires the proponent to submit a Biological Evaluation (BE) to address consultation requirements under Section 7(c) of the Endangered Species Act (ESA) as well as the Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation Management Act. As a consultant to the project, GeoEngineers, Inc. (GeoEngineers) has prepared this BE to support SIT's application for a USACE permit.

On behalf of Cedar Grove Composting, GeoEngineers, Inc. (GeoEngineers) submitted multiple documents in support of earlier development proposals. Those relevant documents include but are not limited to:

- Revised Wetland and Ordinary High Water Delineation, dated March 11, 2008;
- Revised Mitigation Plan, Dated March 13, 2008;
- Biological Evaluation, dated June 27, 2008.
- Wetland Delineation Addendum, dated April 16, 2010;
- Addendum to the Revised Wetland Mitigation Plan, Dated June 4, 2010;

- Revised Critical Areas Delineation and Mitigation Plan, dated April 20, 2011; and
- Ordinary High Water Mark Determination Memorandum, dated September 1, 2011;

This BE and accompanying Conceptual Mitigation Plan (GeoEngineers 2014) supersede previous BE and mitigation planning documents.

1.1. Project Location

As presented in Figure 1, the SIT property is located within five tax parcels on the north end of Smith Island within Section 5, Township 29N, and Range 5E. The site is within the urban growth boundary of the City of Everett and zoned for industrial use. The undeveloped portions of the site are generally level and dominated by herbaceous vegetation. Cedar Grove Composting owns and occupies the parcels to the west of the proposed SIT for the processing of organic wastes and debris. The east-west oriented Cedar Grove access road (36th Place NE) bisects the proposed development site. The BNSF mainline and right-of-way is located immediately east of the site. The Concrete Nor'West concrete batch plant is located in the southeast portion of the SIT site. An existing large-scale commercial topsoil production facility (owned by Pacific Topsoil) and a log yard (owned by Millser Shingle) are located south of the site.

The confluence of Union and Steamboat Sloughs is located immediately north of the site. A dike along the northern boundary of the site protects Smith Island from tidal and riverine flooding. The dike was constructed circa 1870 (Wolken, 2014). Since dike construction, the site has been used primarily for logging related industry and agricultural purposes.

2.0 BASELINE ENVIRONMENTAL CONDITIONS

Smith Island is located in the Snohomish River estuary and is part of an extensive deltaic zone that sits north of the main channel of the Snohomish River where Union Slough and Steamboat Slough converge before flowing into Puget Sound. Smith Island is featured in the Snohomish River Estuary Wetland Integration Plan (SEWIP) (City of Everett, 1997) and is located within Watershed Resource Inventory Area (WRIA) 7. Ground surface elevations at the site range from approximately 1-foot to 15 feet (NAVD 88 vertical datum).

Current land use on Smith Island, west of Interstate 5, consists primarily of undeveloped former agricultural areas and industrial facilities. These industrial facilities include lumber mills, forest resource facilities, aggregate material yards and marine storage yards.

2.1. Water Resources

The lower Snohomish River estuary is tidally influenced and experiences mixed semi-diurnal fluctuations of river stage averaging 7.5 feet mean lower low water (MLLW), with large tidal exchanges frequently exceeding 12 feet (USACE, 2014). Tidal range along Steamboat and Union Sloughs is based on tidal datums established for Everett. The NOAA station ID for Everett is 9447659, located at Latitude 47 58.8'N, Longitude 112 13.4'W. Station tidal elevation data, presented in tidal datum and land datum NAVD 88 is presented below.

TABLE 1. TIDAL ELEVATION DATA FOR NOAA EVERETT STATION 9447659 (EPOCH 1983-2001)

Datum Plane	MLLW	NAVD 88
Highest Estimated Tide	12.96	11.19
Mean Higher High Water	10.83	9.06
Mean High Water	9.95	8.18
Mean Low Water	2.54	0.77
Mean Lower Low Water	-0.26	-2.03

Reference:

** http://tidesandcurrents.noaa.gov/datums.html?id=9447729

The dike protects Smith Island, west of the BNSF mainline, from tidal flow and flooding. The elevation of the top of the dike is approximately 12 feet to 13 feet elevation (NAVD 88). Most of the site lies within the current Federal Emergency Management Agency (FEMA) 100-year floodplain designation of the Snohomish River established at 12.68 feet (NAVD 88).

2.2. Site Drainage and Stormwater Management

A freshwater blind slough defines the southern boundary of the site. This slough flows to Steamboat Slough through a regulated tidegate. The area south of 36th Place NE includes the concrete batch plant, which is operated by Miles Sand and Gravel (Concrete Northwest). Stormwater within the concrete batch plant site drains into existing linear wet ponds which discharge through a bioswale into the southern slough. Drainage from the existing Concrete Northwest facility flows into several holding ponds on the western edge of the site, also discharging to the slough via a grass lined bioswale. The southern slough is not tidally influenced because the existing tidegate precludes tidal flow. Water surface elevation within the slough are controlled by shallow groundwater expression and local surface water input. Historic dredging of the slough and elimination of sediment enrichment has substantially entrenched the channel.

The undeveloped northern portion of the site, north of 36th Place NE, has a series of agricultural drainage ditches designed to convey water to a primary, north-south drainage ditch. The on-site ditch system conveys water from areas north of the road to Union Slough via a 36-inch culvert with a functional tidegate located at the northeast corner of the site.

The site contains a total of 11 drainage ditches that are jurisdictional wetlands, totaling 1.1 acres. See the wetlands reports (GeoEngineers 2008, 2010) and Conceptual Mitigation Plan (GeoEngineers 2014) for more detailed description of site drainage.

2.3. Wetlands

GeoEngineers delineated eleven (11) wetlands on the site (GeoEngineers, 2008, 2010a and confirmed by the USACE in a Jurisdictional Determination concurrence letter and follow up email in April 2010. Total wetland area at the site is approximately 13.8 acres. The wetlands on site were historically utilized for agricultural production and were harvested as recently as the fall of 2005. Wetland habitat consists of an assortment of native and non-native emergent vegetation dominated by herbaceous species including vast areas of reed canarygrass (*Phalaris arundinacea*), thistle (*Cirsium* spp), bentgrass (*Agrostis* spp) and creeping buttercup (*Ranunculus repens*). Wetter

depressions support pockets of mannagrass and rush species (*Glyceria* and *Juncus* spp). As a result of the historical disturbance at the site, tree cover is sparse. Individual tree species include red alder (Alnus rubra), black cottonwood (*Populus balsamifera*) and pacific crabapple (*malus fusca*). Shrub species include Himalayan blackberry (*Rubus armeniacus*) and some willow (*Salix* spp).

Due to the close proximity of each wetland unit, their homogeneous vegetation structure and hydrologic regime, the wetlands are functionally similar. The onsite wetlands function primarily as habitat for passerine bird species. Great blue herons (*Ardea herodias*) have been observed foraging within the wetlands at the site. Habitat suitability functions are reduced because of the lack of vegetation diversity and a history of human disturbance within and surrounding the wetland areas. It is unlikely that the wetlands provide breeding habitat for amphibian species, such as salamanders, due to the total absence of necessary forested upland rearing habitat near the site and the brackish nature of the site due to infrequent inundation by tidal water. The on-site wetlands provide no potential habitat for fish and minimal habitat for birds other than ground nesting species. Because of their closed depressional configurations and lack of surface water connections to the other waterbodies, the wetlands do not provide fish habitat. In general, the wetlands do not receive stormwater runoff because of the presence of the onsite ditches and do not perform substantial water quality or flood attenuation functions.

See the wetlands reports (GeoEngineers 2008, 2010) and Conceptual Mitigation Plan (GeoEngineers 2014) for more detailed description of on-site wetlands.

2.4. Fish and Wildlife

The Washington State Department of Fish and Wildlife ([WDFW], 2014a) identifies a number of anadromous salmonids that utilize Union and Steamboat Sloughs, and the greater Snohomish River estuary. WDFW (2014a) does not indicate that fish are present in the slough along the southern border of the site, which is consistent with our observations. There are no reported spawning grounds for surf smelt, sand lance or Pacific herring in the vicinity of Smith Island (WDFW, 2014b). In addition to salmonids, a variety of estuarine species (groundfish) likely reside in Union and Steamboat Sloughs at varying times depending on life stage.

Coyote and other small mammals (raccoon, opossum, rats, feral cat) are known to forage on the site.

The other important fish and wildlife features identified by WDFW (2014b) located in the proximity of Smith Island include:

- Wetland habitats are mapped within and adjacent to the project site.
- Riverine tidal habitat is mapped within in Union Slough.
- Estuarine habitat is mapped along Union South, northeast of the project site.
- A number of osprey (*Pandeon haliaetus*) nests which are common on pilings at the mouth of Steamboat Slough.
- Waterfowl concentrations in Union Slough are depicted north of Smith Island,

- Dungeness Crab (*Metacarcinus magister*) about ½ mile to the west.
- Purple Martin (*Progne subis*) about 1 mile to the south.
- Bald eagle (*Haliaeetus leucocephalus*) nests approximately 1 mile to the south.
- Peregrine falcon (*Falco peregrinus*) nest approximately 1 mile to the south.

3.0 DESCRIPTION OF THE ACTION

The Project consists of the construction of two connecting rail lines of approximately 400 feet each to reach the nearby mainline of BNSF (north of Delta Jct.), along with the construction of approximately 8,400 feet of loop track (two full loops) and ancillary storage tracks and loading areas, office and maintenance building, a paved equipment storage area, stormwater collection and treatment facilities, construction of an undercrossing of the BNSF mainline to provide grade separated access for the Terminal and other properties on Smith Island, a new access road outside of the track to access Cedar Grove Composting and its Public Access trail, and relocated utility poles.

The purpose of the Smith Island Rail Terminal project is to (i) meet the business needs of Cedar Grove (a partner in SIT) and the Formark Log Yard (Miller Shingle) for outgoing and incoming freight rail service and (ii) to meet the business needs of other third parties for incoming and outgoing freight rail service and (iii) provide a grade separated access to properties located west of the BNSF mainline on Smith Island. For SIT partner Cedar Grove, the implementation of connecting line-haul rail service would allow it to create transportation cost savings and to ship finished compost to more distant markets where product demand is strong, but where that demand rarely can be met by Cedar Grove because trucking is not economically feasible. This could include, for example, shipping bulk compost shipments in gondola cars to wineries in eastern Washington for agricultural use, or to mines in Montana for mine reclamation purposes. Additionally, bagged compost could be shipped in box cars to California or elsewhere to meet more distant consumer and commercial business demands (e.g., for landscaping). The line could also be used for incoming return shipments of commodities by rail originating from points where Cedar Grove compost is delivered (e.g., hay from eastern Washington to be re-loaded into export containers via the Port of Everett or the Port of Seattle). For SIT neighbor Formark/Miller Shingle the yard would provide a means to import logs from locations such as Montana at an economically practical rate for processing and export to Pacific Rim markets and other uses.

The Smith Island Rail Terminal line will also be available for third party use to meet the incoming and outgoing rail service demands of local and regional businesses and shippers including the Port of Everett, with SIT holding itself out as a common carrier to serve shippers who may wish to transport freight over its lines.

Additional rail commodities may include forest products, such as lumber and logs, imported and export steel products, dry cement dust, agricultural products from eastern Washington intended for export (e.g. hay) and possibly construction equipment and/or automobiles from the Port of Everett.

SIT anticipates shipping the equivalent of at least 500,000 tons per year of commodities. Most of the bulk compost will be shipped in covered gondola cars with each car holding approximately

100 tons. Shipments would likely be in increments of 20 cars at one time (1,500 feet of cars). Cars would be loaded by a fixed overhead conveyor. As cars are loaded, they will be pushed forward by a loader or switch engine. Some box cars of bagged product on pallets would also be shipped. Logs would be handled in bulkhead flat cars and handled with industry equipment (log loaders). Fork-lifts and other equipment would be used for other commodities.

3.1. Site Development

In accordance with the National Pollution Discharge Elimination System (NPDES), a Construction Stormwater Permit will be required for the project. SIT will implement a temporary construction stormwater management system. During the design process, SIT will develop a Stormwater Pollution Prevention Plan (SWPPP) that details how they will manage stormwater at the site during construction of the SIT and prevent water quality issues.

SIT will begin installing fill material to pre-load the footprint of the new setback protective dike adjacent to Union and Steamboat Sloughs, per the project engineers' specifications. SIT will complete the mitigation plan site grading within the proposed saltmarsh mitigation areas to achieve design elevations. Once the mitigation area grading and the new protective dike are complete, SIT will remove the existing protective dike. Removing the existing dike will allow tidal ebb and flow to enter the reestablished saltmarsh mitigation areas.

Pre-loading of the site will occur concurrently with the new dike construction. Clean fill, consisting of dirt and rock, will be brought to the site by truck. Fill will be placed on the footprint for the terminal at an elevation recommended to promote settlement. Once desired settlement has been achieved, excess material will be removed and placed in other fill areas of the site for the future phases. Once the ground has been prepared the track bed will be laid. SIT will install the necessary utilities to the site including the permanent stormwater system during the final stages of site grading. Once the desired elevations of the site are achieved, loading and storage areas will be paved as needed.

3.2. Wetland Mitigation Plan

In order to construct the SIT, the project will include the placement of approximately 685,000 cubic yards of fill material. Since a portion of this fill will be placed in approximately 13.7 acres of degraded palustrine emergent wetlands and 1.1 acres of drainage ditches, a compensatory mitigation plan (GeoEngineers, 2014) is also part of the proposed project. The mitigation includes the creation of 1.4 acres of onsite, in-kind wetlands and approximately 15.5 acres of onsite, out-of-kind intertidal saltmarsh to reestablish habitat for salmonids. Most of this mitigation work will be conducted landward of the ordinary high water mark (OHWM), and this work will be limited to the removal of the existing dikes and the replacement of a tidegate to accomplish wetland mitigation goals. This mitigation plan proposes a total of 16.9 acres of created wetlands to compensate for the loss of 14.8 acres of palustrine wetlands and drainage ditches. The total effective mitigation ratio to offset the permanent impacts to wetlands and ditches is approximately 1.14:1.

The goal of the proposed Mitigation Plan emphasizes the conversion of existing degraded upland and palustrine wetland habitats to high quality, expanded estuarine conditions. SIT's planned creation of three intertidal saltmarsh areas via dike breeching, excavation, and installation of a

self-regulating tidegate is intended to restore an essential ecosystem habitat component for the rearing and refuge of salmonid species in the Snohomish River estuary. We expect that the overall functional benefit of these saltmarsh and freshwater wetlands will far outweigh those functions currently provided by the existing, degraded palustrine wetlands. To expedite permitting of the SIT, Cedar Grove proposes to complete the majority of the mitigation in advance of the project.

3.3. Timing of the Action

Site development and construction is anticipated to begin within two months of permit approvals and take approximately five years to complete. The in-water work portion of the project will occur during the approved construction work window for marine/estuarine areas in Tidal Reference Area 7 (Everett), or approximately from July 16 to February 15. This consolidated work window takes into account the designated work windows for both salmon and bull trout. There are no reported spawning grounds for surf smelt, sand lance or Pacific herring in the vicinity of Smith Island (WDFW 2014), so work windows restrictions for these species do not apply.

3.4. Interdependent/Interrelated Actions or Activities

Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action being considered. There are no interdependent or interrelated actions or activities that would occur as a result of construction and operation of the SIT.

4.0 ACTION AREA

The Action Area for the SIT proposal is illustrated in Figure 2. We identified a 2,000-foot wide action area based on the following potential impacts, which we discuss in further detail in subsequent sections:

- **Noise**: temporary construction-related noise (direct effect);
- **Alteration of Terrestrial and Aquatic Environments**: permanent alteration of aquatic and upland environments through minor vegetation removal above OHWM. Areas affected include existing shoreline areas armored with riprap (both above and below OHWM), nearshore marine areas and estuarine areas (direct effect);
- **Water Quality**: construction stormwater (direct effect), accidental release of contaminants during construction (direct effect), and stormwater runoff from new non-pollution-generating impervious surfaces (indirect effect).

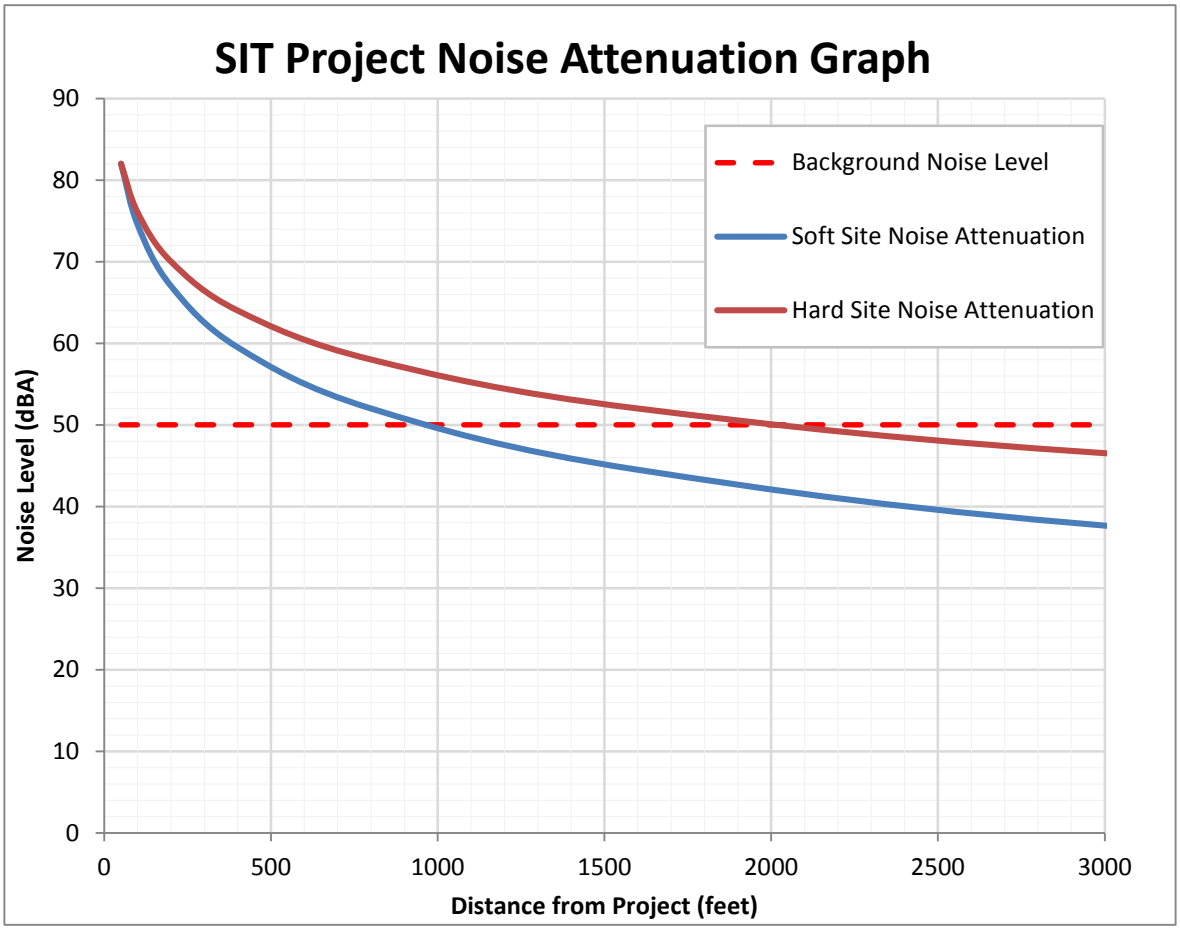
4.1. Construction-Related Noise

The action area for the project is dictated by the extent of temporary construction related noise (direct effect). Construction related noise will permeate terrestrial (in-air) environments and is expected to carry into the surrounding environment beyond the project site. Noise emanating from the site during construction will be from typical construction equipment, including but not limited to excavators, loaders, and dump trucks.

Most of the planned construction activities will occur above the OHWM. Construction activities below OHWM will be performed during low tide and we do not anticipate that machinery will operate in the water. No pile driving in the areas below OHWM is planned. As such, construction noise will not permeate into aquatic environments.

We used guidance provided by the Washington State Department of Transportation ([WSDOT], 2013) to estimate the extent that in-air noise will permeate the environment surrounding the project site. We expect construction equipment to produce average maximum sound levels of up to 82 decibels (dBA) measured at 50 feet from the project site. Conventional noise modeling demonstrates that noise from construction equipment attenuates across vegetated areas (soft sites) at the rate of 7.5 dBA per doubling of distance. However, noise attenuates across paved areas or open water at a rate of 6.0 dBA per doubling of distance. The areas adjacent to the project site are a mix of soft site (vegetated) and hard site (open water) conditions and therefore the attenuation rate is 7.5 dBA and 6.0 dBA, respectively. As such, for every doubling of 50 feet, noise will be reduced 7.5 dBA (soft site) or by 6.0 dBA (hard site) until it eventually reaches baseline levels.

It is expected that existing baseline in-air noise levels in the vicinity of the project are estimated to be 50 dBA given the amount of current railroad, highway, and industrial uses. As presented in Graph 1, construction noise is expected to attenuate to background levels across vegetated areas at approximately 900 feet (0.2 mile) and approximately 2,000 feet (0.4 miles) across open water adjacent to the work area. For the purpose of this BE, we have defined the action area to be the greater of the two distances, or 2,000 feet (0.4 miles).



Graph 1: Estimated Noise Attenuation of SIT into Action Area

4.2. Alteration of Terrestrial and Aquatic Habitats

Alteration of areas both above and below OHWM will occur as a result of dike removal. The zone of influence for environmental alteration is limited to the foot print of the existing dike and will not impact the Lyngby sedge community that exists immediately waterward of the dike. We anticipate that the impacts to the aquatic habitat will be largely limited to the armored face of the existing dike and the upland vegetation located on the dike above OHWM. Further details on the removal of the dike are included in the Conceptual Wetland Mitigation Plan (GeoEngineers, 2014).

4.3. Water Quality

Temporary impacts to water quality may occur as a result of stormwater and accidental release of contaminants during construction. Negative impacts to water quality may result from runoff from the new pollution-generating impervious surfaces of the proposed facility.

4.3.1. Construction Stormwater

In accordance with the National Pollution Discharge Elimination System (NPDES), a Construction Stormwater Permit will be required for the project. SIT will install a temporary construction stormwater management system in accordance with that permit. SIT will develop a SWPPP that details how they will manage stormwater at the site during construction of the SIT and prevent water quality issues. The SWPPP will identify Best Management Practices (BMPs) and Temporary Erosion and Sediment Control (TESC) measures will be utilized during the project to avoid impacts to ESA-listed species and critical habitat.

Other impact avoidance and minimization measures include but are not limited to:

- Daily inspections of the erosion control measures will be conducted throughout the construction period. This will ensure the effectiveness of the measures and determine the need for maintenance, repairs, or additional measures.
- Work below the OHWM will be conducted during the approved work windows for fish species that may occur in the project area.
- Disturbance will be limited to those areas necessary for construction, which will be identified on approved site plans and marked in the field before construction begins.
- Work will be in compliance with local, state and federal regulations and restrictions.
- The project will obtain and comply with the conditions and provisions of the permits issued by the regulatory agencies.

It is anticipated that stormwater will be contained within the project area during construction and will not be allowed to enter surface water bodies unless in compliance with state water quality standards (WAC 173-201A). As such, construction stormwater is not expected to effect the environment beyond the immediate project site.

SIT will manage water quality impacts through proper implementation of BMPs and significant increases in turbidity, detectable beyond the allowable mixing zone, are not expected. With the implementation of construction BMPs, the potential for discharge of sediments into Union Slough is very low and considered inconsequential.

4.3.2. Accidental Release of Contaminants

There is a potential for impacts to water quality resulting from spilling hazardous materials or petroleum-based products associated with construction machinery. Potential impacts to water quality, such as spilling hazardous materials or petroleum-based products associated with construction machinery, will be managed through proper implementation of the Spill Prevention Control and Countermeasures (SPCC) plan.

4.3.3. Permanent Stormwater and New Impervious Surfaces

The proposed Smith Island Terminal will convert a largely vegetated area to gravel or impervious surfaces for industrial use. Impervious surfaces are pollution-generating because they collect and convey oils, sediment and other pollutants from vehicles and trains. In accordance with current City of Everett drainage requirements for new and redeveloped sites, Project Engineers will develop a Stormwater Site Plan to meet applicable minimum requirements including enhanced water quality treatment standards. In addition to meeting the City of Everett enhanced water quality treatment requirements, discharge will comply with the Washington Department of Ecology 2012 Stormwater Management Manual for Western Washington (SWMMWW) and current Department of Ecology Industrial Stormwater General Permit benchmarks and sampling for the proposed industrial use.

The SIT will be developed in phases and the stormwater facilities will be constructed in order to accommodate each phase of construction. Stormwater will be collected and conveyed to the new on-site treatment facility by means of conventional piped systems. The proposed stormwater facility will be located in the northwest corner of the proposed railway loop. A chitosan enhanced sand filtration or electrocoagulation treatment system is recommended by the project civil engineer. The existing Concrete Northwest linear wetpond treatment system will be abandoned. Drainage from the yard and stockpile areas will be collected into the newly constructed conveyance system and routed to the terminal mechanical treatment facility. Drainage from a minor portion of the proposed access road will be pumped up to the pipe conveyance system. The stormwater from the concrete batch plant will continue to be hydraulically isolated from the SIT drainage plan and will be maintained independently. Stormwater from that portion of the newly aligned Cedar Grove access road will be treated by means of a filter media strip along the roadway. This treated runoff will be collected in a parallel swale and discharged into the previously mentioned existing channel along the southern property boundary

At this stage of design, no stormwater detention will be provided due to allowable direct discharge of treated stormwater into Steamboat Slough. An open stormwater storage facility (pond) will be constructed within the loop track area to provide sedimentation and large storm storage capacity prior to water quality treatment. Following sedimentation, a pump will be utilized to pump stormwater through an adequately sized chitosan enhanced sand filtration or electrocoagulation treatment system. Gravity and/or pump conveyance systems will be constructed in a phased manner as industrial development progresses to convey drainage into the northwest corner of the site. It is possible that future activities and associated development could necessitate use of an underground detention vault rather than open storage.

4.4. Railway Noise and Vibration

The operation of the proposed railway loop will result in increased levels of noise and vibration compared to baseline conditions. Source noise and vibrations currently exist in the vicinity of the proposed SIT. These sources include the existing BNSF mainline, SR 529, marine traffic in Steamboat and Union Sloughs, as well as vehicle and machinery associated with the existing Cedar Grove and Concrete NorWest concrete batch plant. Parsons Brinkerhoff (2013) conducted a noise and vibration study for a similar railway expansion project and their sound modeling estimated noise levels within the subject rail yard to range between 45 and 58 dBA. Measured noise levels at the subject rail facility vary between 55 and 62 dBA (Parsons Brinkerhoff, 2013). Parson Brinkerhoff (2013) predicted that the subject railway expansion would result in an increase in noise levels of approximately 1-2 dBA above baseline noise levels. It is reasonable to assume that the proposed SIT will result in similar increases in noise of 1-2 dBA. Additionally, Parsons Brinkerhoff (2013) concluded that trains operating at low speeds (10 mph), are expected to generate vibration levels below 70 VdB (vibrations measured in velocity decibels) at 50 feet from the tracks.

4.5. Action Area Summary

The impact with the greatest extent for this project is temporary construction noise disturbance. Potential noise impacts resulting from construction may exceed background levels and affect listed species and habitats up to approximately 900 feet (0.2 mile) over land and approximately 2,000 feet (0.4 miles) across open water located north of the site. For the purpose of this BE, we have defined the action area to be the greater of the two distances, or 2,000 feet (0.4 miles).

5.0 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 Oceanographic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) for marine and anadromous species. We obtained information regarding listed or proposed species and designated or proposed critical habitat for Snohomish County, Washington, from the USFWS (2014) and designated or proposed critical habitat for marine species in Puget Sound from NMFS (2014). Critical habitat is defined as: (1) the specific areas occupied by a species with the physical or biological features that are essential to the conservation of the species. USFWS's (2014) species list is included in Appendix C.

We obtained additional information regarding the presence of listed species within the action area from WDFW's Priority Habitats and Species (PHS) (WDFW, 2014b). A search of the Washington Department of Natural Resources (DNR) Natural Heritage Program online database revealed no records of any listed plants, high quality ecosystems or other significant natural features within a mile of the project site (DNR, 2014).

Table 2 summarizes the species listed by NMFS and USFWS that may occur in the terrestrial environments of Snohomish County or the aquatic habitats of the Snohomish River and Puget Sound.

TABLE 2. ESA-LISTED SPECIES AND CRITICAL HABITATS IDENTIFIED BY USFWS AND NMFS

Common Name	Species Name	Federal Status	Designated Critical Habitat
Marbled murrelet	*Brachyramphus marmoratus*	Threatened	Yes
Northern spotted owl	*Strix occidentalis caurina*	Threatened	Yes
Yellow-billed cuckoo	*Coccyzus americanus*	Proposed	No
Bocaccio	*Sebastes paucispinis*	Threatened	No
Canary rockfish	*Sebastes pinniger*	Threatened	No
Yellow-eye rockfish	*Sebastes ruberrimus*	Threatened	No
Pacific eulachon/smelt	*Thaleichthys pacificus*	Threatened	No
Puget Sound/coastal bull trout	*Salvelinus confluentis*	Threatened	Yes
Puget Sound Chinook salmon	*Oncorhynchus tshawytscha*	Threatened	Yes
Puget Sound steelhead trout	*Oncorhynchus mykiss*	Threatened	Proposed
Southern Resident killer whale	*Orcinus orca*	Endangered	Yes
Humpback whale	*Megaptera novaeangliae*	Endangered	No
Oregon spotted frog	*Rana pretiosa*	Proposed	No
Fisher	*Martes pennant*	Candidate	No
Canada lynx	*Lynx Canadensis*	Threatened	Yes
Gray wolf	*Canis lupus*	Endangered	No
Grizzly bear	*Ursus arctos*	Threatened	No

5.1. Species and Critical Habitat Not Expected to Occur in the Action Area

Of the ESA-listed species in Table 2, many of them are not expected to occur in the 2,000-foot Action area because of a lack of suitable habitat. The ESA-listed species not expected to occur in the action area are:

- **Rockfish species (*Sebastes spp.*)** - Three species of rockfish have been listed as threatened or endangered under the ESA. Puget Sound/Georgia Basin Distinct Population Segments of yelloweye rockfish (Sebastes ruberrimus) and canary rockfish (Sebastes pinniger) are listed as threatened and bocaccio rockfish (Sebastes paucispinis) is listed as endangered. Critical habitat for these species has not yet been designated. Most rockfish species are associated with rocky bottoms and outcrops and feed on bottom and mid-water dwelling invertebrates and small fishes. Rockfish larvae are more common than adults in shallow water and are generally associated with rocky reefs, kelp canopies and artificial structures. Due to the shallowness of marine waters within the action area and the lack of associated rocky reefs and kelp canopies, rockfish species are not expected to be within the action area.
- **Oregon spotted frog (*Rana pretiosa*)** - According to Pearl and Hayes (2004), Oregon spotted frogs are associated with large (>4 ha) freshwater wetland complexes with areas of permanent open water. This habitat type does not occur in the action area.

- **Fisher (*Martes pennant*)** – This member of the weasel family is found exclusively in expansive mixed hardwood and coniferous forest habitats that do not exist in the vicinity of Smith Island.
- **Canada lynx (*Lynx canadensis*) -** Sightings have not been reported from nor are they expected to occur in the Smith Island area. Their distributions are limited to higher elevation, less developed areas of the Cascades.
- **Gray wolf (*Canis lupus*) -** *Sightings* have not been reported from nor are they expected to occur in the Smith Island area. Their distributions are limited to higher elevation, less developed areas of eastern Snohomish County.
- **Grizzly bear (*Ursus arctos*)** – Sightings have not been reported from nor are they expected to occur in the Smith Island area. Their distributions are limited to higher elevation, less developed areas of the Cascades.
- **Marbled murrelet (*Brachyramphus marmoratus*), Including designated critical habitat –** High boat traffic and loud consistent noise from adjacent industrial uses will likely discourage marbled murrrelets from using the shoreline within the action area. In addition, there is no suitable foraging or nesting habitat for the marbled murrelet in the Smith Island area. Critical habitat has been designated for marbled murrelets in forested areas where they nest. Forested habitat is not present in the action area, which is located in an industrialized urban area. Marbled murrelets also use marine environments for foraging, but these environments have not been designated as critical habitat for this species.
- **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 action area is not suitable for spotted owls and, therefore, the likelihood of a spotted owl entering the action area is minimal to none.
- **Yellow-billed cuckoo (*Coccyzus americanus*)** – This species is typically found in wooded and shrub habitats east of the cascade mountains and is not expected to occur in the vicinity of Smith Island.
- **Humpback whale (*Megaptera novaeangliae*)** - This species is restricted to deeper, open water areas within Puget Sound and would not be expected to occur near Smith Island.
- **Pacific eulachon (*Thaleichthys pacificus*), Including designated critical habitat** - According to NMFS (2014), most eulachon originate in the Columbia River Basin and are only infrequently found in coastal rivers and tributaries to the Puget Sound. Pacific eulachon are not expected to be found within the project action area. Critical habitat has been designated for Pacific eulachon in the Columbia River Basin, the Quinault River and the Elwha River. There is no critical habitat for Pacific eulachon within the action area.

There are no reported spawning grounds for surf smelt, sand lance or Pacific herring in the vicinity of Smith Island (WDFW, 2014b).

5.2. Listed Species and Critical Habitat Expected to Occur in the Action Area

Of the federally protected species listed in Table 2, we anticipate that the following species and their critical habitat may occur in the 2,000-foot action area that surrounds the site:

- Bull trout (Salvelinus confluentus),
- Chinook salmon (Oncorhynchus tshawytscha),
- Steelhead trout (O. mykiss) and
- Southern Resident killer whales (Orcinus orca).

Three of the four species are pacific salmonids that utilize the saltmarsh habitat that exists in Steamboat and Union Sloughs. Adult and juvenile salmonids primarily use Steamboat and Union Sloughs as a migration corridor and foraging areas (City of Everett, 2001). Upstream migration of adults occurs during every month of the year, although the primary period for migration is August through March (USACE, 2002). Downstream smolt migration occurs mainly in the spring and early summer. The estuary provides important juvenile salmonid-rearing habitat where young salmon have their highest growth rates before migrating to the ocean.

The City of Everett (2001) identified the estuarine and tideland area waterward of the dike as medium habitat quality for salmonids. Currently, a small intertidal community of Lyngby sedge that slopes to a mudflat exists immediately waterward of the dike. The wetlands and ditches landward of the dike and tidegates do not provide fish habitat.

The slough at the southern edge of the site is not currently suitable habitat for fish resources. The existing tidegate excludes inflow of tidal water, allowing fresh water to drain out at low tide. There is no streamside woody vegetation to provide structure or shade to the highly entrenched channel. Fish have not been observed in this slough during numerous field investigations, and the tidegate has been observed to function properly, eliminating upstream migration of fish into the slough. Fish cannot access the drainage ditches at the site or the isolated wetlands on the project site.

The status, habitat requirements and life histories of the species listed in Table 1 are described in detail in Appendix B of this report. Species utilization and potential for occurrence in the action area are discussed below.

5.2.1. Bull Trout (Salvelinus confluentis)

The PHS database (WDFW, 2014b) indicates that bull trout are present throughout the Snohomish River watershed. Spawning and most juvenile rearing occurs in natal streams in the upper watershed. Relatively little data exists regarding bull trout residence periods and habitat utilization of estuarine areas (USACE, 2002). Juvenile bull trout in the Snohomish River system migrate downstream to Puget Sound by spring where they spend the summer feeding in the estuarine system near the mouth (Kraemer, 1994). Adults migrate upstream to spawning habitat in the upper Skykomish River tributaries and rearing habitat exists within the Tolt and Lower Snoqualmie River (WDFW, 2014a).

Designated critical habitat for this species includes the Snohomish and major tributaries including the Tolt, Pilchuck, Skykomish and lower Snoqualmie rivers, within the OHWM (FR Vol. 70, No. 185, September 26, 2005). The SIT action area includes near-shore marine areas which are designated as critical habitat for bull trout (70 FR 56212).

The Primary Constituent Elements (PCE) identified for bull trout critical habitat that exists within the action area include:

1. Water temperatures that support bull trout use;
2. Complex stream channels with a variety of depths, velocities and in-stream structures;
3. 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;
4. An abundant food base including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish; and
5. Permanent water of sufficient quantity and quality such that normal reproduction, growth and survival are not inhibited.

5.2.2. Chinook Salmon (Oncorhynchus tshawytscha)

Chinook use of the lower Snohomish River is limited mainly to migration, year-round rearing and no known spawning activity (WDFW, 1975). Peak adult chinook migration periods are from May through October (Haring, 2002). River and slough channels in the lower Snohomish system are deep compared to upstream freshwater areas and may provide staging areas where adults can aggregate before moving upstream. Residence times of adult salmonids in the Snohomish River estuary are unknown but are generally assumed to range from 1 to 6 weeks in Puget Sound estuaries (Simenstad et al., 1982).

The project action area encompasses Chinook critical habitat. Designated critical habitat for Chinook salmon includes near-shore marine areas of the Puget Sound (70 FR 52630).

The Primary Constituent Elements (PCEs) for Chinook salmon critical habitat within the action area include:

1. 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; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation; and
2. Near-shore marine areas free of obstruction with good 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 and aquatic vegetation.

5.2.3. Steelhead (Oncorhynchus mykiss)

Like Chinook, steelhead migrate through the lower Snohomish River system but do not use these areas for spawning. In the Snohomish River watershed, three summer steelhead stocks and three winter steelhead stocks have been identified (Haring, 2002). Adult return timing of summer steelhead stocks occurs generally May through October, which is distinct from the return timing of winter steelhead stocks from November through April. Spawn timing for summer steelhead stocks may be similar to other steelhead stocks in the Puget Sound area, typically February through April. Spawn timing for winter steelhead stocks is generally from early March to early-mid June.

Critical habitat for this species has been proposed and includes the Snohomish River, within the OHWM. Proposed critical habitat is included within the project action area. Proposed designated critical habitat for steelhead includes near-shore marine areas of the Puget Sound (78 FR 2726). The PCEs for steelhead critical habitat within the action area include:

1. 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, and side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation; and
2. Near-shore marine areas free of obstruction with good 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.

5.2.4. Southern Resident Killer Whale (Orcinus orca)

Killer whales prefer deeper water and spend several months of the summer and fall each year in Puget Sound. Although they may be found in the general vicinity of Everett as they prey on salmonids migrating to and from the Snohomish River, this would be an uncommon occurrence and they would not be expected to use shallow habitats in the vicinity of Smith Island. It is highly unlikely that the Southern Resident killer whale will be present in the action area during project construction.

Designated critical habitat for this species includes nearshore (waters deeper than 20 feet relative to extreme high tide) and offshore marine areas of the Puget Sound (FR Vol. 71, No. 229). The deeper, offshore portions of the action area encompass Southern Resident killer whale critical habitat. Specific PCEs that have been identified for killer whale critical habitat within the action area include:

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

6.0 ANALYSIS OF EFFECTS

6.1. Direct Effects

We anticipate that construction and operation of the SIT will not directly affect ESA-listed species. SIT will complete the majority of the site development work in upland areas with no significant habitat features or in degraded palustrine wetlands that are not directly connected to the Snohomish River estuary.

Work planned for below the OHWM will be limited to the removal of the existing dike as detailed in the Mitigation Plan (GeoEngineers, 2014). Because the armored dikes slope steeply into the

intertidal areas waterward of the dike, the available habitat immediately waterward of the dike provides relatively poor fish habitat. Also, the work below the OHWM would be limited in time (5 to 10 days) and in extent (approximately 200 linear feet) and would occur within allowable work windows when salmonids are expected to be either absent or present in low numbers.

Prior to this work below the OHWM, SIT will deploy silt curtains around the in-water work areas to contain turbidity. We expect that the silt curtain will preclude migrating adult or juvenile salmonids (if present) from the in-water work area. SIT will hire a qualified biologist to observe the in-water construction activities for fish in distress and/or within the work area.

The proposed project has the potential to affect adjacent marine habitats by runoff associated with construction. However, we anticipate that SIT's construction stormwater management system, as detailed in the SWPPP, will be effective at minimizing water quality impacts during construction. Therefore, we do not expect direct adverse effects on water quality during construction.

Increased noise from construction will carry beyond the site but will be limited to an increase of in-air sound. Because underwater sound levels will not be affected and because there are no listed terrestrial species in the action area, noise will have no effect on ESA-listed species.

Almost immediately after the intertidal mitigation cells have been constructed and the existing section of dike removed, approximately 15.5 acres restored intertidal habitat will be re-established to provide habitat for ESA-listed salmonids. The re-established saltmarsh habitat will passively be colonized by intertidal plants and animals and its productivity and value to salmonids will increase.

6.2. Indirect Effects

Stormwater or wastewater from the proposed SIT will be treated and disposed of according to the discharge standards required through the City of Everett Surface Water Ordinance and Stormwater Manual and state water quality standards (2012 Stormwater Management Manual for Western Washington).. Wastewater from the SIT will be collected in a separate recovery system and handled pursuant to regulatory standards. Beneficial reuses of treated stormwater include dust control, yard maintenance and irrigating buffer plantings within the mitigation areas. An overflow discharge for treated stormwater not beneficially used will be developed to Steamboat Slough.

The planned expansion of impervious surface area for the SIT has the potential to indirectly affect fish and wildlife using adjacent sloughs by increasing runoff rates and potentially increasing turbidity or transport of contaminants from pollution generating surfaces. However, these effects are expected to be minimal as the stormwater from the site will be detained and treated to meet state and City of Everett stormwater requirements and state water quality standards.

7.0 EFFECT ANALYSIS

Based on our understanding of the project, a synopsis of probable effects to ESA-listed species and their critical habitat is presented below.

7.1. Bull Trout

The project **may affect** bull trout and their critical habitat because:

- Bull trout are known to make use of designated nearshore critical habitat near the site and may be present at any time during the year.
- Water quality may be temporarily impacted during construction activities.
- Substrate disturbance during construction will result in minor amounts of temporary habitat alteration.

The project is **not likely to adversely affect** bull trout and their critical habitat because:

- No work will be performed in the water, so we do not expect direct impacts to bull trout.
- The project will be conducted within the appropriate fish windows to reduce the potential for bull trout to be in the vicinity of the project during construction.
- No other project effects are likely to have a negative impact on PCEs for bull trout critical habitat.
- SIT will mitigate the impacts to the existing low quality critical habitat at the site by re-establishing approximately 15.5 acres of saltmarsh habitat at the site.

7.2. Chinook Salmon

The project **may affect** Chinook salmon and their critical because:

- Chinook salmon and their critical habitat occur in the immediate project vicinity.
- Water quality may be temporarily impacted during construction activities.

The project is **not likely to adversely affect** Chinook salmon because:

- No work will be performed in the water, so we do not expect direct impacts to Chinook salmon.
- The project will be conducted within the appropriate fish windows to reduce the potential for Chinook to be in the vicinity of the project during construction.
- No other project effects are likely to have a negative impact on PCEs for Chinook salmon critical habitat.
- SIT will mitigate the impacts to the existing poor critical habitat at the site by re-establishing approximately 15.5 acres of saltmarsh habitat at the site.

7.3. Steelhead

The project **may affect** steelhead and their critical habitat because:

- Steelhead may be present in the Snohomish estuary at any time during the year because of varying life cycle patterns associated with the species.
- Water quality may be temporarily impacted during construction activities.
- The project is located in nearshore marine environments of the Puget Sound, which are designated as critical habitat for steelhead.

The project is **not likely to adversely affect** steelhead because:

- No work will be performed in the water, so we do not expect direct impacts to steelhead.
- The project will be conducted within the appropriate fish windows to reduce the potential for steelhead to be in the vicinity of the project during construction.
- No other project effects are likely to have a negative impact on PCEs for steelhead critical habitat.
- SIT will mitigate the impacts to the existing poor critical habitat at the site by re-establishing approximately 15.5 acres of saltmarsh habitat at the site.

7.4. Killer Whale

It is highly unlikely that Southern Resident killer whales would be present in the action area during the short period of in-water work. Although they could occur in deeper water portions of the action area, this portion of the action area was defined based on terrestrial noise which would not affect killer whales. The placement of silt curtains and the in-water construction activities would occur primarily in shallow water and water quality effects are not expected to occur beyond the mixing zone. The intertidal mitigation cells will benefit all salmonid populations which serve as prey for Southern Resident killer whales; however, no measurable effect on killer whales can be projected. Therefore, the project will have **no effect** on Southern Resident killer whales or their critical habitat.

7.5. Effects Summary

Within the July 16 through February 15 in-water work window, either adults or juveniles could use the action area during their upstream or downstream migrations. However, impacts from dike removal and tidegate replacement will be limited in duration and extent, and turbidity impacts will be managed using silt curtains or other comparable methods. We expect that adult or juvenile salmonids in the immediate vicinity of the in-water work sites will avoid that area and not be harmed. It is highly unlikely that killer whales will be in the action area during construction. Once the mitigation plan has been implemented and the intertidal habitats restored, the cumulative effects on ecosystem function will be beneficial.

Table 3 summarizes the determination of effect of the SIT on the species and their critical habitat (where designated) listed by USFWS and NMFS.

TABLE 3. DETERMINATIONS OF EFFECT

Common Name	Effect on Species	Effect on Critical Habitat
Marbled murrelet	No Effect	No Effect
Northern spotted owl	No Effect	No Effect
Yellow-billed cuckoo	No Effect	None designated
Bocaccio	No Effect	None designated
Canary rockfish	No Effect	None designated
Yellow-eye rockfish	No Effect	None designated
Pacific eulachon/smelt	No Effect	None designated
Puget Sound/coastal bull trout	Not Likely to Adversely Effect	Not Likely to Adversely Effect

Common Name	Effect on Species	Effect on Critical Habitat
Puget Sound Chinook salmon	Not Likely to Adversely Effect	Not Likely to Adversely Effect
Puget Sound steelhead trout	Not Likely to Adversely Effect	Not Likely to Adversely Effect
Southern Resident killer whale	No Effect	No Effect
Humpback whale	No Effect	None designated
Oregon spotted frog	No Effect	None designated
Fisher	No Effect	None designated
Canada lynx	No Effect	No Effect
Gray wolf	No Effect	None designated
Grizzly bear	No Effect	None designated

8.0 LIMITATIONS

GeoEngineers has prepared this report in general accordance with the scope and limitations of our proposal. Within the limitations of scope, schedule and budget, our services have been executed in accordance with the generally accepted practices for biological evaluations in this area at the time this report was prepared. No warranty or other conditions express or implied should be understood.

This report has been prepared for the exclusive use of Smith Island Terminal, Cedar Grove Composting, Inc., and their authorized agents and regulatory agencies, following the described methods and information available at the time of the work. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. The information contained herein should not be applied for any purpose or project except the one originally contemplated.

FIGURES

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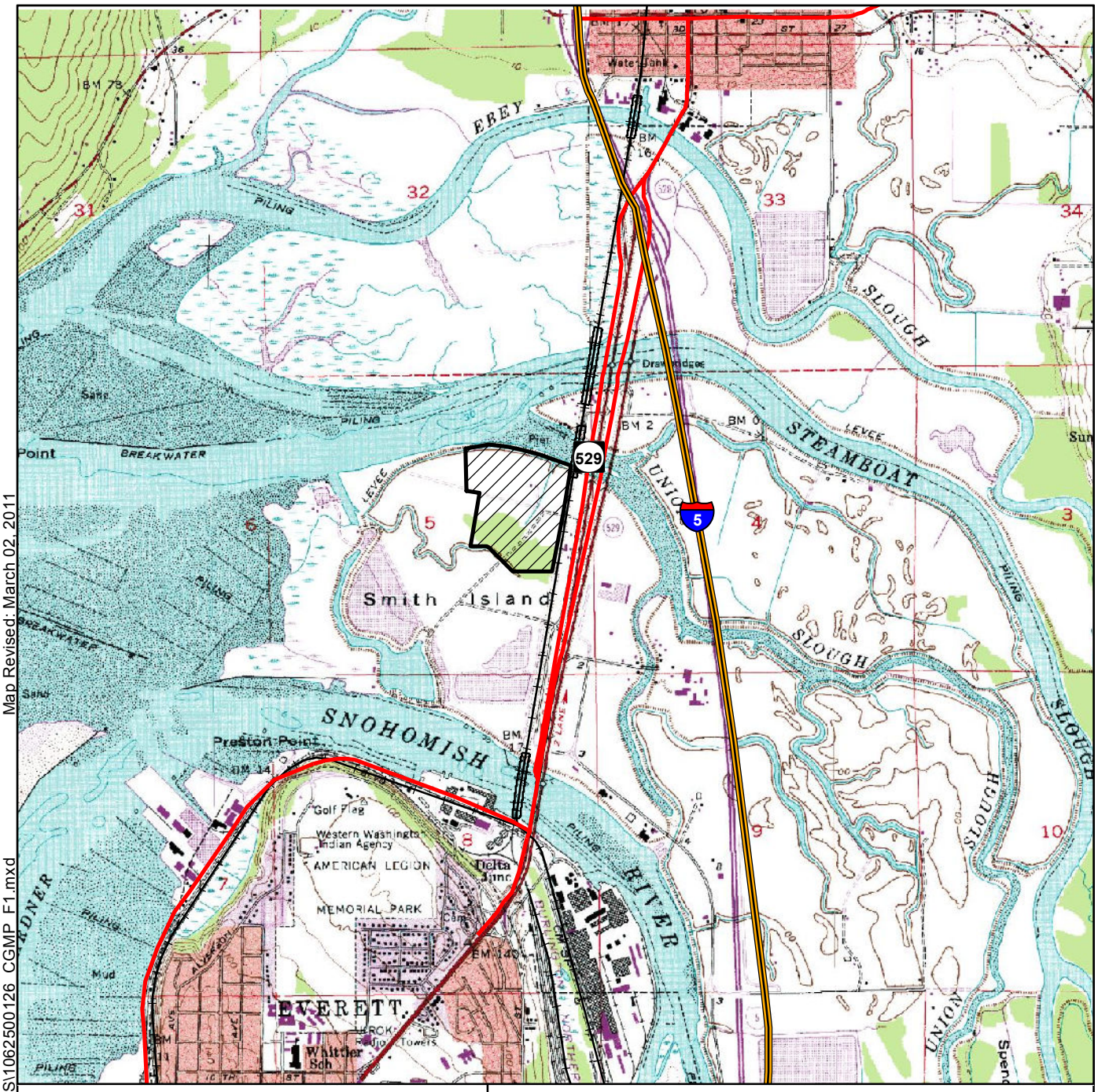

Explanation

- Study Area
- Interstates
- State Routes
- Rail Line

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Feet

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
Topo map base from USGS.
Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

Vicinity Map

Smith Island Terminal
Everett, Washington

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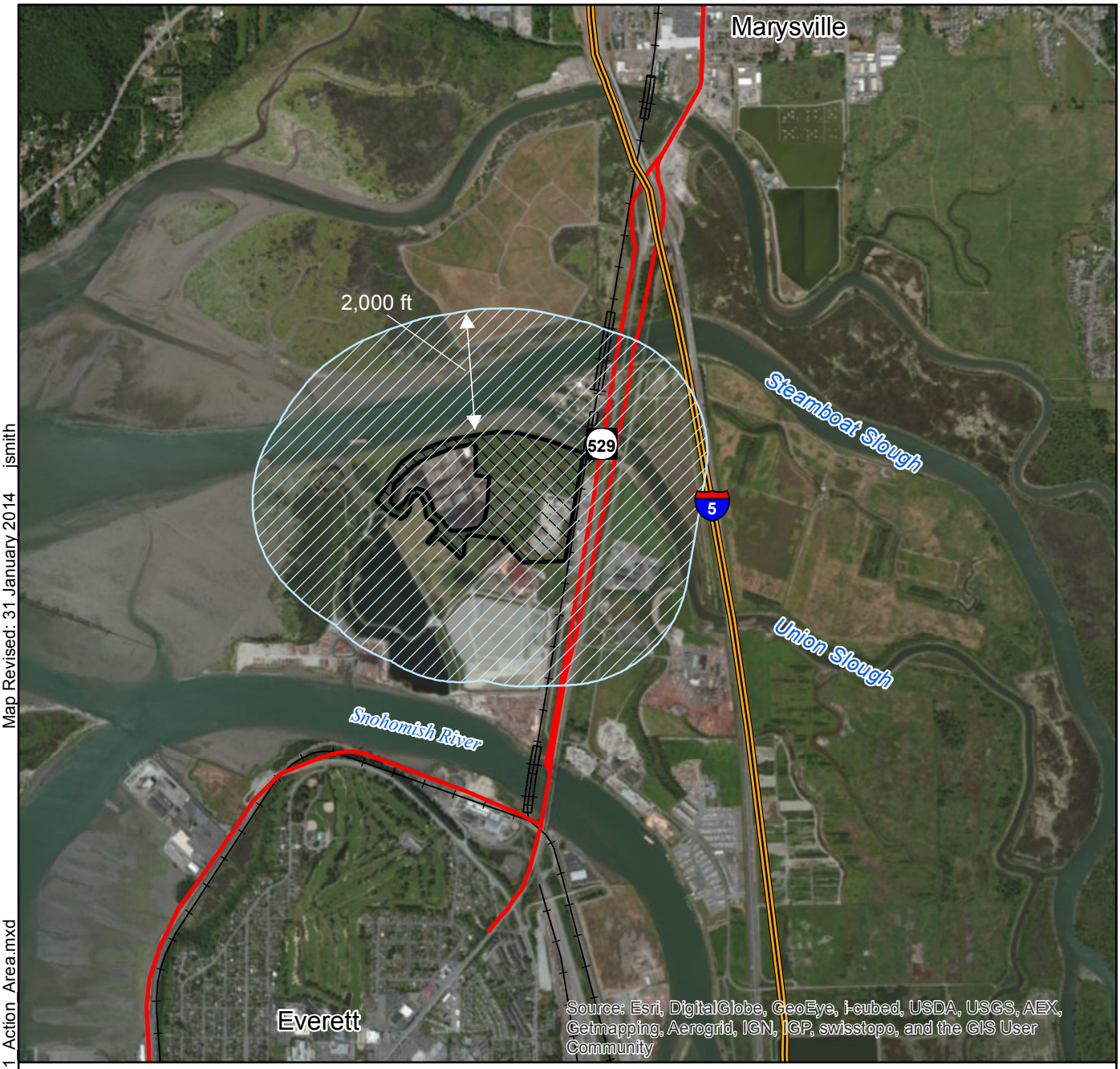
Figure 1

Office: SEAT Path:W:\Seattle\Projects\10\10625001\GIS\10625001 26 CGMP F1.mxd Map Revised: March 02, 2011



Explanation

- Action Area
- Project Site
- Interstates
- State Routes
- BNSF

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Feet

Notes:
1. The locations of all features shown are approximate.
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Data Sources: ESRI Data & Maps, Street Maps 2005
Topo map base from USGS.

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

Action Area

Smith Island Terminal
Everett, Washington

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Figure 2

Office: BAM Path:P:\10\10625001\GIS\MXD\1062500126_F1_Action_Area.mxd Map Revised: 31 January 2014 jsmith

APPENDICES

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APPENDIX A
Essential Fish Habitat 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 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.

For the Cedar Grove expansion project on Smith Island, Pacific salmon, but not coastal pelagic species or ground fish, may occur in waters of the Puget Sound, including Union Slough. Pacific salmon that may occur in the vicinity of the site include Chinook (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*) and pink salmon (*O. gorbusha*) could be present in the affected areas. This assessment focuses on potential project impacts to these species, which are covered by the Pacific salmon FMPs.

Proposed Action

For more details concerning the proposed action for this project, see Chapter 2 of the Biological Evaluation (BE).

Potential Effects of Proposed Action on EFH

As described in the BE, the project is expected to have a beneficial effect on Chinook salmon due to restoration of intertidal habitats. Like Chinook, adults of both pink and coho salmon could be present in the mainstem of the Snohomish River during the in-water work period as they migrate to upstream spawning grounds (pink spawn in late September to October and coho spawn from late October through mid-January). Migrating adults would not be adversely affected by the limited extent and duration of the work. Juveniles of all three species will have migrated out of the estuary and will not be present in the action area during the work below the OHWM. Once the intertidal mitigation cells have been constructed, all three species will benefit from the expanded habitat opportunities. Consequently, the project will have only beneficial effects on Chinook, pink or coho salmon populations and their habitats.

Conservation Measures

A number of measures will be implemented to minimize the potential adverse effects to fish habitat in general. These measures are listed below:

- Contractors will be required to prepare and implement a Spill Prevention Control and Countermeasures Plan (SPCC) consistent with Ecology regulations.
- Contractor personnel will be trained in hazardous material handling and will be equipped with appropriate spill response materials including oil-absorbent pads and booms.

- Extreme care shall be taken to ensure that no petroleum products, hydraulic fluid, sediment, sediment-laden water, chemicals, or any other toxic or deleterious materials are allowed to enter or leach into surface water.
- Material used for construction will only be stockpiled in the upland, in a designated stockpile area.
- Equipment will be inspected daily for drips or leaks in order to prevent spills or releases to surface water.
- In order to reduce the potential impacts on listed species, as much work as possible will be conducted during low tides.

EFH Conclusions

The proposed action will have no adverse effect on the Pacific Salmon EFH, managed species, or their prey or associated species occurring in the project area.

APPENDIX B
Life Histories of Listed Species

APPENDIX B
LIFE HISTORIES OF LISTED SPECIES

Chinook Salmon (Oncorhynchus tshawytscha)

ENDANGERED SPECIES ACT (ESA) LISTING AND STOCK 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 final 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).

Both summer and fall runs of Chinook are found in the Snohomish River system. Both runs are native with wild production, and the status of both is "depressed based on chronically low escapement levels and a long-term negative trend in Puget Sound run size" (SASSI 2002).

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).

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)

ESA LISTING AND STOCK 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 (Reiman 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).

Puget Sound Steelhead (Oncorhynchus mykiss)

ESA LISTING AND STOCK STATUS

On September 13, 2004, NMFS 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 NMFS 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). Subsequently, the Puget Sound steelhead was listed as a threatened species on May 11, 2007.

Snohomish/Skykomish winter steelhead were identified as a stock based on their distinct spawning distribution. The WDFW Salmonid Stock Inventory (WDFW 2014c) characterizes this stock of the Puget Sound steelhead as "depressed" based on severe short-term decline in total escapements since 1999. They are all native stock with wild production (WDFW, 2002). Most spawning takes place in the mainstem Snohomish, Skykomish, Sultan, and Wallace rivers and their tributaries. Spawning generally occurs from early March through mid-June.

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).

Southern Resident Killer Whale (Orcinus orca)

ESA LISTING AND STOCK 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. The population now stands in the high 80s. 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 Harbor 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).

APPENDIX C
USFWS Species Lists

U.S. Fish and Wildlife Service

Natural Resources of Concern

This resource list is to be used for planning purposes only — it is not an official species list.

Endangered Species Act species list information for your project is available online and listed below for the following FWS Field Offices:

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

Project Counties:

Snohomish, WA

Project Type:

Development

Endangered Species Act Species List (USFWS Endangered Species Program).

There are a total of **9** threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a project could cause downstream effects on the species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section below for critical habitat that lies within your project area. Please contact the designated FWS office if you have questions.

Species that should be considered in an effects analysis for your project:

Amphibians	Status		Has Critical Habitat	Contact
Oregon Spotted frog (*Rana pretiosa*)	Proposed Threatened	species info		Washington Fish And Wildlife Office

U.S. Fish and Wildlife Service

Natural Resources of Concern

Birds				
Marbled murrelet (*Brachyramphus marmoratus*) Population: CA, OR, WA	Threatened	species info	Final designated critical habitat	Washington Fish And Wildlife Office
Northern Spotted owl (*Strix occidentalis caurina*) Population: Entire	Threatened	species info	Final designated critical habitat	Washington Fish And Wildlife Office
Yellow-Billed Cuckoo (*Coccyzus americanus*) Population: Western U.S. DPS	Proposed Threatened	species info		Washington Fish And Wildlife Office
Fishes				
Bull Trout (*Salvelinus confluentus*) Population: U.S.A., conterminous, lower 48 states	Threatened	species info	Final designated critical habitat	Washington Fish And Wildlife Office
Mammals				
Canada Lynx (*Lynx canadensis*) Population: (Contiguous U.S. DPS)	Threatened	species info	Final designated critical habitat	Washington Fish And Wildlife Office
Fisher (*Martes pennanti*)	Candidate	species info		Washington Fish And Wildlife Office
Gray wolf (*Canis lupus*) Population: U.S.A.: All of AL, AR, CA, CO, CT, DE, FL, GA, KS, KY, LA, MA, MD, ME, MO, MS, NC, NE, NH, NJ, NV, NY, OK, PA, RI, SC, TN, VA, VT and WV; those portions of AZ, NM, and TX not included in an experimental population; and portions of IA, IN, IL, ND, OH, OR, SD, UT, and WA. Mexico.	Endangered	species info		Washington Fish And Wildlife Office

Grizzly bear (*Ursus arctos horribilis*) Population: lower 48 States, except where listed as an experimental population or delisted	Threatened	species info		Washington Fish And Wildlife Office

Critical habitats within your project area: (View all critical habitats within your project area on one map)

The following critical habitats lie fully or partially within your project area.

Birds	Critical Habitat Type
Marbled murrelet (*Brachyramphus marmoratus*) Population: CA, OR, WA	Final designated critical habitat
Northern Spotted owl (*Strix occidentalis caurina*) Population: Entire	Final designated critical habitat
Fishes	
Bull Trout (*Salvelinus confluentus*) Population: U.S.A., conterminous, lower 48 states	Final designated critical habitat
Chinook salmon (*Oncorhynchus (=salmo) tshawytscha*) Population: Puget Sound ESU	Final designated critical habitat
Mammals	
Killer Whale (*Orcinus orca*) Population: Southern Resident DPS	Final designated critical habitat

FWS National Wildlife Refuges (USFWS National Wildlife Refuges Program).

There are no refuges found within the vicinity of your project.

FWS Migratory Birds (USFWS Migratory Bird Program).

Most species of birds, including eagles and other raptors, are protected under the Migratory Bird Treaty Act (16 U.S.C. 703). Bald eagles and golden eagles receive additional protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668). The Service's Birds of Conservation Concern (2008) report

identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

Migratory bird information is not available for your project location.

NWI Wetlands (USFWS National Wetlands Inventory).

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

IPaC is unable to display wetland information at this time.

APPENDIX D
References and Literature Review

APPENDIX D - REFERENCES AND LITERATURE REVIEW

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