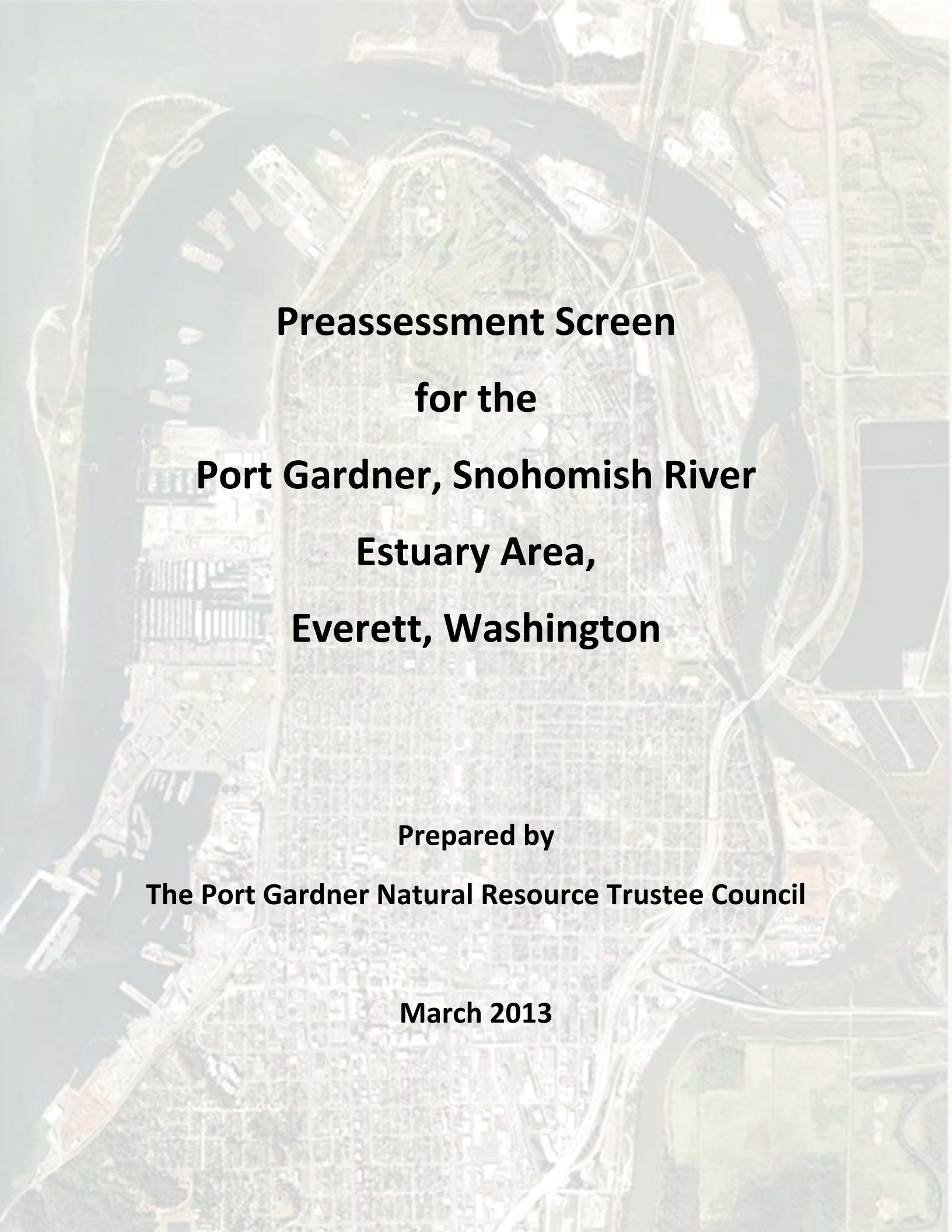

Preassessment Screen for the Port Gardner, Snohomish River Estuary Area, Everett, Washington

Prepared by

The Port Gardner Natural Resource Trustee Council

March 2013

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I. INTRODUCTIONS, AUTHORITIES, AND DELEGATIONS

This document is a preassessment screen (PAS), prepared pursuant to 43 CFR Part 11, for the Port Gardner, Snohomish River Estuary Area (Port Gardner Assessment Area) near Everett, Washington. The site is more fully described in Section II(A) below.

This PAS was undertaken to determine whether it is appropriate to conduct natural resource damage assessment pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. § 9601 et seq., as amended; the Oil Pollution Act of 1990 (OPA), 33 U.S.C. § 2701 et seq.; and the Clean Water Act (CWA), 33 U.S.C. § 1251 et seq, and the Model Toxics Control Act (MTCA), RCW Chapter 70.105D. Specifically, this PAS addresses whether the following regulatory criteria found in the CERCLA regulations at 43 C.F.R. § 11.23(e) for a natural resource damage assessment have been met:

1) *A discharge of oil or release of hazardous substance has occurred.*

2) *Natural resources for which a State or Federal agency or Indian Tribe may assert trusteeship under CERCLA have been or are likely to have been adversely affected by the discharge or release.*

3) *The quantity and concentration of the discharged oil or released hazardous substances is sufficient to potentially cause injury to those natural resources.*

4) *Data sufficient to pursue an assessment are readily available or likely to be obtained at reasonable cost.*

5) *Response actions from remedial activities carried out or planned do not or will not sufficiently remedy the injury to natural resources without further action.*

This preassessment screen has been prepared pursuant to 43 CFR § 11.23(e) by members of the Port Gardner Natural Resource Trustee Council (Trustees) and include the Secretary of the United States Department of Commerce, acting through the National Oceanic and Atmospheric Administration (NOAA), the Secretary of the United States Department of the Interior (DOI), acting through the U.S. Fish and Wildlife Service (USFWS), the State of Washington Department of Ecology (Ecology), the Tulalip Tribes, and the Suquamish Tribe.

Collectively, pursuant to CERCLA Section 107 (f) and Section 300.600 of the National Contingency Plan, these entities are trustees for all of the natural resources in the environment potentially injured by releases from and into the Port Gardner Area.

II. INFORMATION ON THE SITE

A. Background and History

The Port Gardner Assessment Area includes the lower Snohomish River, Everett Waterfront, East Waterway, and a portion of Possession Sound near Everett, Washington (**Figure 1**). This area serves a commercial shipping industry and contains many facilities and both private and municipal wastewater outfalls. Numerous industrial operations have been identified as sources of contamination to Port Gardner. Cleanup actions in Port Gardner are being addressed by Ecology.

Figure 1. Port Gardner Assessment Area, Everett, Washington.

1. Lower Snohomish River

The Lower Snohomish River is a heavily traveled and industrialized section of the Snohomish River adjacent to Everett, Washington. The primary depositional area of the Snohomish River system is Port Gardner Bay which contains an industrialized area around the city of Everett, Washington. The Snohomish River and its watershed originates in the Washington Cascade Range and drains approximately 1,856 square miles of the western Cascades and is the second largest river basin surrounding Puget Sound.

Tidal influence reaches 20 miles upstream. Sediment from the river is carried downstream and deposited into the lowlands of the estuary delta. Historically there were an estimated 19 square miles of marshes, forested wetlands, distributary sloughs, mudflats, and connecting channels. Only 17% of the historical estuary area remains due to extensive diking and tide gate construction in the assessment area (Qwuloolt Estuary Restoration Project, n.d.). Figure 2 shows the historical habitat types in the estuary prior to modification.

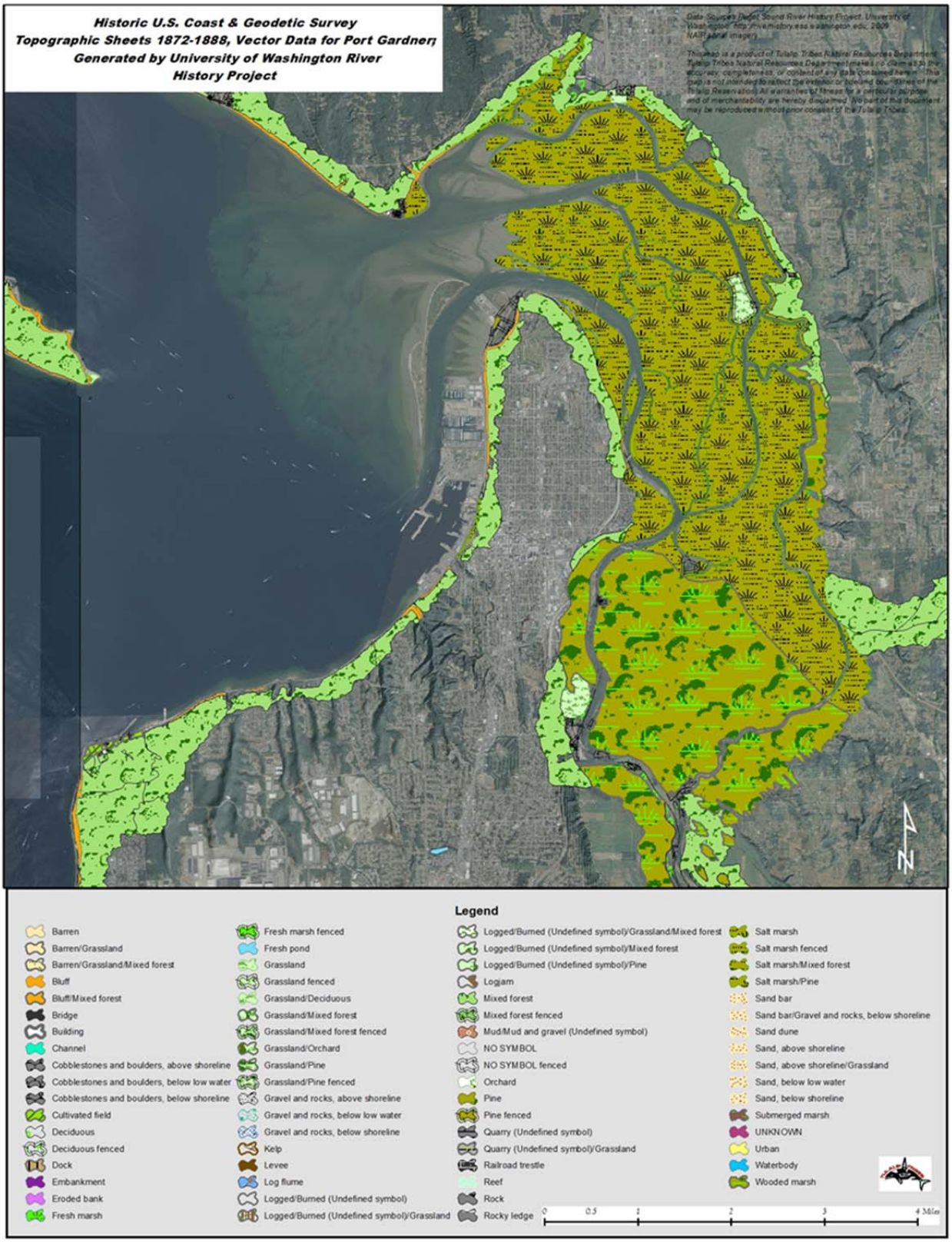

Figure 2. Historical habitat types in the lower Snohomish River, Everett, Washington.

The Lower Snohomish River branches into four segments, Main Stem, Ebey Slough, Steamboat Slough, and Union Slough, roughly 5 miles upriver from Everett. The Main Stem flows around Everett and nearly forms three

sides of the city. From the split, the Main Stem flows north along the eastern city boundary, meanders west to form the northern city boundary, and thereafter flows south along the western boundary between the city and Jetty Island. Jetty Island is a man-made island created from the dredged material from East Waterway.

2. Everett Waterfront

The Everett Waterfront is located along the Lower Snohomish River between Priest Point to the north, Jetty Island to the west, and East Waterway to the south. This area was historically the location of the Hibulb village, one of the largest Native American villages in the Puget Sound, as well as several other seasonal villages. Following the Treaty of Point Elliott of 1855 and the formation of the City of Everett, this area became heavily industrialized and contained numerous factories, ports, and smelters (Eldridge and Orlob, 1951).

Currently the Everett Waterfront is more commercialized; however some shipping activities and industry remain. Along the north end, several sites currently under cleanup orders have been used for lumber and mill operations since the last century. The middle portion of the waterfront is more commercialized with the Port of Everett Marinas and commercial development areas. Several large marinas, boat ramps, and a fuel dock are currently active along the Everett waterfront. Shipbuilding, ship repair, and associated boat maintenance businesses have been located in the Everett Waterfront. Some of these businesses are currently operating, while others have moved or closed and are in the process of remediating contamination at their sites. Currently the bulk of Everett's industrial presence is located along the East Waterway.

3. East Waterway

The East Waterway is historically and currently the most industrialized area within Port Gardner (**Figure 3**). The waterway was created to facilitate Everett waterfront shipping and the dredged material was used to create Jetty Island. The waterway has an average depth of 10 m below MLLW. During World War II, the East Waterway was used for repair and outfitting of ships (Eldridge and Orlob, 1951). Historically also, the area was used extensively for log rafting and the transportation of timber products, some of which continues today (Eldridge and Orlob, 1954 and Gara et al. 1997). Currently, the East Waterway is used primarily for deep water shipping. Two pulp and paper mills have operated for decades in or near East Waterway, including historical untreated discharges directly into the Waterway. There are also several stormwater outfalls that discharge into East Waterway.

4. Possession Sound

The section of Possession Sound considered for this document stretches from Everett to the west as far as Hat (Gedney) Island. Located within the greater Puget Sound, the larger Possession Sound is the body of water extending between Mukilteo to the south, Everett to the east, Tulalip Bay to the north, and Whidbey Island to the west. The majority of areas surrounding Possession Sound are residential except the rail line running along the shoreline between Everett and east of Mukilteo water front (about 5 miles).

Mukilteo, also known as Point Elliott, was historically a Native American year-round village providing subsistence resources and playing a prominent role in the settlement of Native American communities. The water front area between Everett and Mukilteo was dotted with small lumber mills located at the mouths of small streams draining into Possession Sound.

Figure 3. East Waterway aerial from 1968. *Photo from Everett Public Library*.

B. Biological Resources

The Port Gardner and Snohomish River estuary area provides important spawning, rearing, and feeding areas for many fish and wildlife species. Historically, the lower estuary consisted of mudflats, tidal marshes, and scrub-shrub wetlands with grasses, sedges, bulrush, cattails, willow, and rose growing in lower elevations with Sitka spruce, pine, fir, crab apple, and alder present in the tidally influenced swamp forests at higher elevations.

The estuary functions as an important corridor and refuge for fish and wildlife thereby linking urban and rural open space from the Puget Sound lowlands to the Cascade crest. During the field inventory process for the Snohomish Estuary Wetland Integration Plan (SEWIP), the City of Everett conducted a field inventory in 1997 in the estuary and reported a variety of rare and uncommon species present, in addition to a great diversity of common species (City of Everett et al. 1997). The USFWS identified 116 species of migratory and resident birds during a 1978 to 1980 study of the estuary (Tanner, C.D., USFWS, Pers. Comm. 2012) and the State's Priority Habitat and Species Program listed 40 out of 62 "wetland associated" priority species occur in the estuary (WDFW, 1993).

1. Vegetation

The surrounding uplands support a variety of plant communities, ranging from cultivated land to forest habitat. Cultivated land comprises the majority of the riverbank, with mostly bare ground and agricultural crops that include strawberries, raspberries, seed kale, and pumpkins. Scattered across the river bank are Douglas fir (*Pseudotsuga menziesii*) and other conifer species, plus a variety of non-native broad-leaved deciduous trees including maples (*Acer* sp.), weeping birch (*Betula* spp.), cherry (*Prunus* spp.) and London plane (*Plantanus* spp.).

Himalayan blackberry (*Rubus armeniacus*), grasses and other understory and ground cover species occur under the forest canopy.

Fallow areas are dominated by grassland that supports primarily ryegrass (*Lolium perenne*), reed canarygrass *(Phalaris arundinacea)* and Canada thistle (*Cirsium arvense*). Narrow bands of scrub-shrub and forest habitat occur along the outer dikes and on the dredge spoils that flank the central slough. These areas are dominated by Himalayan blackberry, salmonberry (*Rubus spectabilis*), Nootka rose (*Rosa nootkana*), red elderberry (*Sambucus racemosa*), and red alder (*Alnus rubra*). Other common, but not dominant, plant species observed throughout the site include evergreen blackberry (*Rubus laciniatus*), Douglas spirea (*Spiraea douglasii*), cutleaf geranium (*Geranium dissectum*), vetch (*Vicia* spp.) and black twinberry (*Lonicera involucrata*).

The assessment area includes numerous estuarine and palustrine wetland habitat types.

2. Aquatic Vegetation

Extensive beds of eelgrass (*Zostera* spp.) are found on the tidal flats in Possession Sound and extend up the slough channels as far up as the Highway 529 trestles. Both kelp (primarily *Nereocystis luetkeana)* and eelgrass serve a wide variety of ecological functions in nearshore ecosystems. Both are highly productive, annually producing large amounts of carbon that fuel nearshore food webs, principally through detritus pathways. Both also provide critical three-dimensional structure in otherwise two-dimensional environments, and many other marine organisms use this structure (Mumford, T.F. 2007) (**Figure 4**).

3. Fish

A large commercial fishery exists in Possession Sound and a recreational fishery exists throughout the estuary and Snohomish River system. The nearshore and estuary supports a diverse array of habitats providing spawning, rearing, and feeding areas for many aquatic species including seven species of anadromous salmon. They include: Chinook (*Oncorhynchus tshawytscha*), coho (*Oncorhynchus kisutch*), chum (*Oncorhynchus keta*) and pink salmon (*Oncorhynchus gorbuscha*); anadromous and resident cutthroat (*Oncorhynchus clarkii*), steelhead/rainbow trout (*Oncorhynchus mykiss*); bull trout (*Salvelinus confluentus*), and brook trout (*Salvelinus fontinalis*) (**Figure 5**). According to the Pentec Survey (Pentec 1992), juvenile starry flounder (*Platichthys stellatus*) were considered to be the most widely distributed and abundant non-salmonid fish species in the Snohomish River Estuary. Peamouth chub (*Mylocheilus caurinus*), was considered the second most abundant non-salmonid estuary species, and was found to be widely distributed throughout the estuary as was the Pacific staghorn sculpin (*Leptocottus armatus*). The freshwater prickly sculpin (*Cottus asper*), three-spined sticklebacks (*Gasterosteus aculeatus*), shiner perch (*Cymatogaster aggregata*), juvenile smelt, and lamprey were also found in the survey.

The Pentec Survey also identified starry flounder and English sole (*Parophrys vetulus*) as common flatfish, and surf smelt (*Hypomesus pretiosus*) and sand lance (*Ammodytes hexapterus*) as important forage fish present in the Port Gardner Bay and Possession Sound assessment area (Pentec 1992). Additionally, other species of significance encountered in surveys are longfin smelt (*Spirinchus thaleichth*ys), eulachon (*Thaleichthys pacificus*), and green sturgeon (*Acipenser medirostris*), (Weatherly, N., Tulalip Tribes, Pers. Comm. 2012).

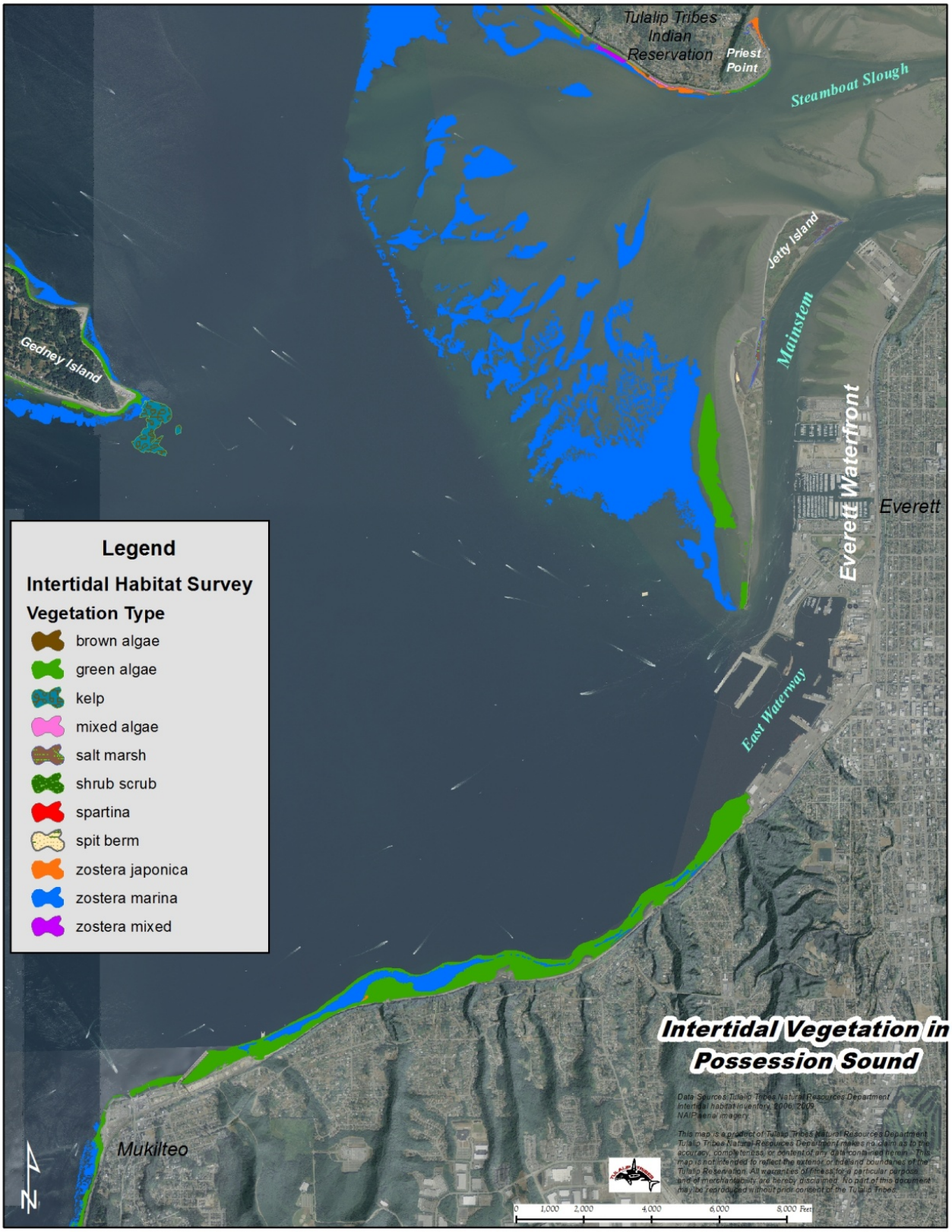

Figure 4. Intertidal Vegetation in Possession Sound, Everett, Washington.

4. Shellfish and Invertebrates

Port Gardner and Possession Sound support an important commercial fishery. The lower reaches of the estuary are known to have a large biomass of shrimp (*Pandalus* spp.) and provide rearing habitat for juvenile Dungeness crab (*Metacarcinus magister*). The open tidal flats of Possession Sound have a high density of ghost shrimp (*Callianassa californiensis*). The extensive eelgrass beds on the flats provide important rearing and foraging habitat for Dungeness crab. Spot prawns and tiger stripe shrimp (*Pandalus* spp.) are also found in Possession Sound and support small commercial and recreational fisheries.

5. Marine and Terrestrial Mammals

Wildlife species including river otter (*Lontra canadensis*), mink (*Neovison vison*), muskrat (*Ondatra zibethicus*), weasel (*Mustela frenata*), beaver (*Castor canadensis*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), and deer (*Odocoileus* spp.) are all common terrestrial mammal species in the estuary. Southern resident killer whale (*Orcinus orca*), California sea lion (*Zalophus californianus*) and Steller sea lion (*Eumetopias jubatus*), porpoise (*Phocoena* spp.), and harbor seal (*Phoca vitulina*) are present in the marine environment. In the spring migrating gray whale (*Eschrichtius robustus*) will come to feed on the ghost shrimp bed on the Possession Sound tidal flats. For federally-listed species, refer to section C for more information.

6. Birds

The lower estuary in the assessment area supports a variety of marine birds, waterbirds, waterfowl, and raptors. Species observed include: merganser (including *Mergus serrator*), loon (*Gavia* spp.), scoter (*Melanitta* spp.), grebe (*Podicipediformes* spp.), cormorant (*Phalacrocorax* spp.), pigeon guillemot (*Cepphus columba*), great-blue heron (*Ardea herodias*), marsh wren (*Cistothorus palustris*), cedar waxwing (*Bombycilla cedrorum*), song sparrow (*Melospiza melodia*), red-tailed hawk (*Buteo jamaicensis*), merlin (*Falco columbarius*), and several gull and tern species (Laridae spp.) (Carroll and Pentec 1992). The estuary is important foraging, nesting, and roosting habitat for Puget Sound and resident bird populations and an important staging and stop-over area for bird migration along the Pacific Flyway. Shorebirds such as dunlin (*Calidris alpina*) and western sandpiper (*Calidris mauri*) are most common in the spring migration, with waterfowl and raptors dominating in the fall. Nesting cormorants are present in the estuary near Union slough and marbled murrelet (*Brachyramphus marmoratus*) have been observed using the bay and Possession Sound for foraging (City of Everett and Pentec, 2001). Marsh-dependent species such as American bittern (*Botaurus lentiginosus*), American coot (*Fulica americana*), Virginia rail (*Rallus limicola*), and western grebe (*Aechmophorus occidentalis*) rely on the estuary for wintering and breeding habitat. The estuary is a significant overwintering habitat for thousands of dabbling ducks and several trumpeter swan (*Cygnus buccinator*) and supports over 25 species of waterfowl including: northern shoveler (*Anas clypeata*), ruddy duck (*Oxyura jamaicensis*), northern pintail (*Anas acuta*), and several species that breed in the estuary, including Canada geese (*Branta canadensis*), mallard duck (*Anas platyrhynchos*), and gadwall duck (*Anas strepera*). Snow geese (*Chen caerulescens*) have been observed along the lower Snohomish channel with American wigeon (*Anas americana*) and brant (*Branta bernicla*) on or just offshore of Jetty Island (City of Everett and Pentec, 2001).

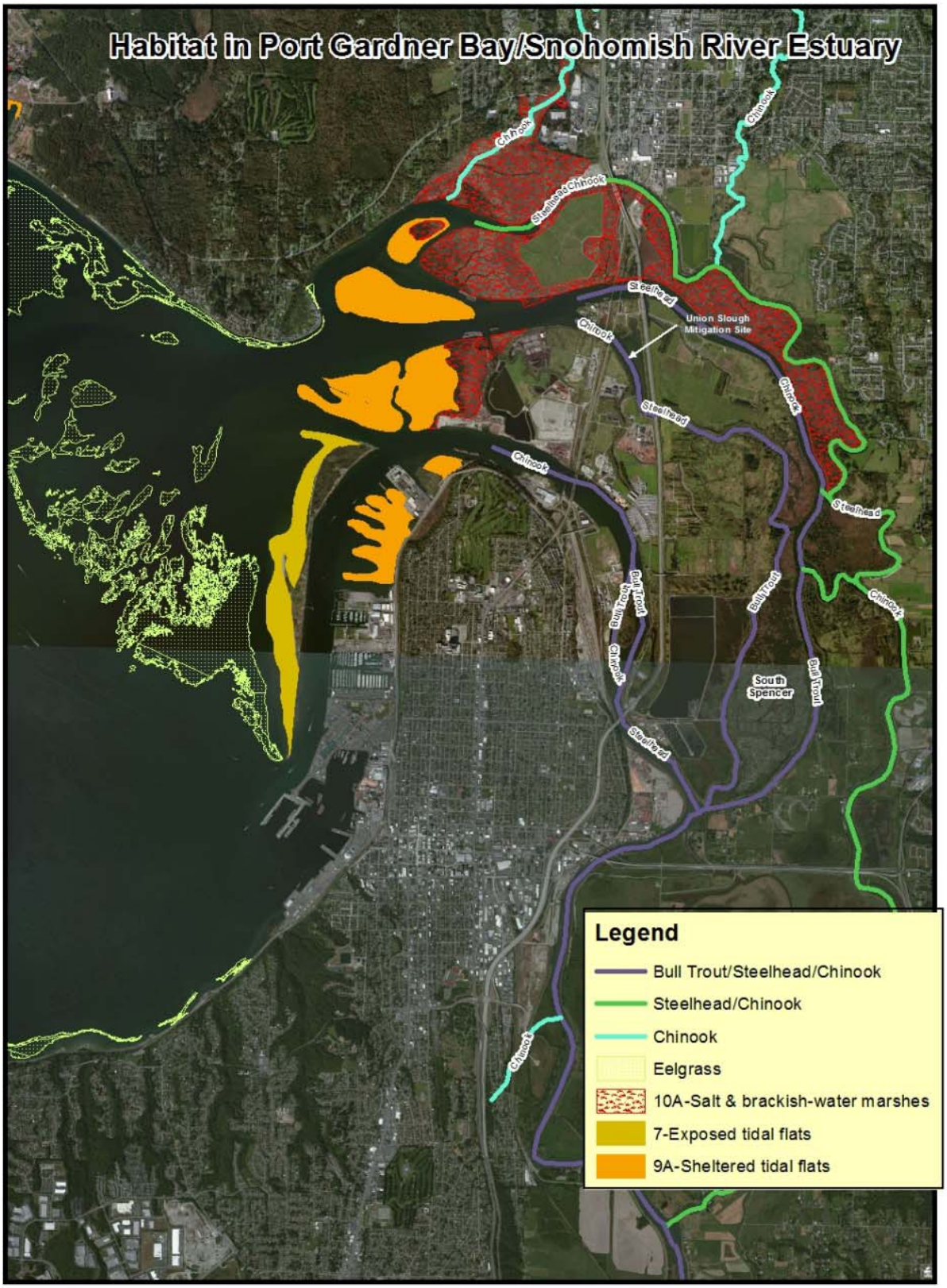

Figure 5. Tidal flats, marshes and salmon habitat, Everett, Washington.

Raptor species are found throughout the estuary, including in the mudflats, emergent marshes, agricultural fields, and forested swamps. Species that nest in the estuary include northern harrier (*Circus cyaneus*), Cooper's

hawk (*Accipiter cooperii*), great-horned owl (*Bubo virginianus*), barn owl (*Tyto alba*), bald eagle (*Haliaeetus leucocephalus*), and osprey (*Pandion haliaetus*). Twenty-six pairs of osprey were observed nesting on pilings in Port Gardner Bay in 2002 (Henny, C. J., USGS, pers. comm., 2011), and bald eagle use the mudflats year round with at least seven pairs known to nest in the estuary (City of Everett and Pentec, 2001; Carroll and Pentec, 1992).

C. Federally and State Listed Species

Federally-listed species under the Endangered Species Act are known to occur or may be found in the vicinity of the Port Gardner Assessment Area and include Coastal-Puget Sound Bull Trout, Puget Sound Chinook salmon, and Puget Sound steelhead. Other federally-listed species that may occur within the area include Steller sea lion, humpback whale (*Megaptera novaeangliae*), southern resident killer whale, leatherback sea turtle (*Dermochelys coriacea*), and marbled murrelet. Federal Species of Concern include bald eagle, black swift (*Cypseloides niger*), northern goshawk (*Accipiter gentilis*), and peregrine falcon (*Falco peregrinus*). In addition, the assessment area has been included in the area designated as critical habitat for Puget Sound Chinook salmon (September 2005). Critical habitat for Puget Sound steelhead, which occur in this area is under development (US DOC, NOAA, http://www.nwr.noaa.gov/ESA-Salmon-Listings/).

The State of Washington has listed killer whale and humpback whale and the leatherback sea turtle as endangered species. The state lists Steller sea lion as threatened species, and bald eagle, peregrine falcon, purple martin (*Carpodacus purpureus*), coho and chum salmon, as species of concern. A summary table of Federal and State listed species is shown in **Table 1**.

Several unique features of the Snohomish River basin make it a crucial component in the overall success of recovering salmon populations in the Puget Sound region. At 1,856 square miles, the Snohomish River basin is the second-largest basin draining to the Puget Sound. There are over 1,730 tributary rivers and streams that total approximately 2,718 miles in length. Nine salmonid species live in the basin including: Chinook, coho, chum, pink, and sockeye salmon (*O. nerka*); steelhead and rainbow, cutthroat, and bull trout; and mountain whitefish (*Prosopium williamsoni*). There are two populations of Chinook salmon in the basin: Skykomish and Snoqualmie. These populations have the highest and third-highest respectively, of the Chinook recovery abundance target set in Puget Sound and with several other Chinook salmon populations, rely on the Snohomish nearshore for spawning, rearing, and feeding. The other Chinook populations include those from the Skagit and Stillaguamish River basins to the north and the Hood Canal, Lake Washington, Green, Puyallup-White, and Nisqually populations to the south.

Within the Snohomish-Skykomish Rivers bull trout core area, four local populations (spawning groups) have been identified: North Fork Skykomish River, South Fork Skykomish River, Salmon Creek, and Troublesome Creek.

The basin also supports the largest number of Coho spawners between the Columbia River and Canadian border. It produces between 25 and 50 percent of the Coho in Puget Sound.

Table 1. Federal and State-listed species present in the Port Gardner Assessment Area.

Common Name	*Scientific Name*	*Animal Type*	*State*	*Federal*
Bald eagle	*Haliaeetus leucocephalus*	Bird	SS	FCo
Black Swift	*Cypseloides niger*	Bird	None	FCo
Marbled murrelet	*Brachyramphus marmoratus*	Bird	ST	FT
Northern goshawk	*Accipiter gentilis*	Bird	SC	FCo
Peregrine falcon	*Falco peregrinus*	Bird	SS	FCo
Pileated woodpecker	*Dryocopus pileatus*	Bird	SC	none
Purple martin	*Progne subis*	Bird	SC	none
Western grebe	*Aechmophorus occidentalis*	Bird	SC	none
Bocaccio rockfish	*Sebastes paucispinis*	Fish	SC	FE
Bull trout	*Salvelinus confluentus*	Fish	SC	FT
Canary rockfish	*Sebastes pinniger*	Fish	SC	FT
Chinook salmon (Puget Sound)	*Oncorhynchus tshawytscha*	Fish	SC	FT
Pacific cod (S&C Puget Sound)	*Gadus macrocephalus*	Fish	SC	FCo
Steelhead (Puget Sound)	*Oncorhynchus mykiss*	Fish	none	FT
Yelloweye rockfish	*Sebastes ruberrimus*	Fish	SC	FT
Blue whale	*Baleonoptera musculus*	Mammal	SE	FE
Humpback whale	*Megaptera novaeangliae*	Mammal	SE	FE
Killer whale	*Orcinus orca*	Mammal	SE	FE
Pacific harbor porpoise	*Phocoena phocoena*	Mammal	SC	none
Sea otter	*Enhydra lutris*	Mammal	SE	FCo
Steller sea lion	*Eumetopias jubatus*	Mammal	ST	FT
Leatherback Sea Turtle	*Dermochelys coriacea*	Reptile	SE	FE

SE = State Endangered, ST = State Threatened, SC = State Candidate, SS = State Sensitive, SM = State Monitored, FE = Federally Endangered, FT = Federally Threatened, FC = Federal Candidate, FCo = Federal Species of Concern.

Nearshore and estuarine habitats of the Snohomish River are critical to the health of Puget Sound and its marine life. They provide shelter, and are used as spawning, rearing and feeding grounds for species that live in and around the Sound (PSAT 1998). The loss of rearing habitat, in quantity and quality, along mainstems and within the estuary and nearshore environment, is thought to be a limiting factor in the recovery (Snohomish Basin Salmon Recovery Forum 2005).

1. Federally-Listed Species - Chinook Salmon

Puget Sound stocks of Chinook salmon are listed as a threatened species. In the Snohomish River there are four recognized stocks of naturally spawning Chinook salmon: Snohomish River summer, Snohomish River fall, Bridal Veil Creek fall, and Wallace River summer/fall (City of Everett and Pentec, 2001). Designated critical habitat for Puget Sound Chinook salmon within the assessment area include freshwater rearing sites, freshwater migration corridors, estuarine and nearshore rearing areas, and estuarine and nearshore migration corridors. These estuarine and nearshore area are of critical importance for Chinook and constitute a primary factors limiting survival. These areas are necessary in the transition from freshwater to the critically important first year at sea.

The Port Gardner assessment area is within the range of a Puget Sound Chinook Evolutionarily Significant Unit (ESU). An ESU is a distinct population segment that is substantially, reproductively isolated from other conspecific population units and represents an important component in the evolutionary legacy of the species (Waples 1991). The geographic area of the Puget Sound Chinook ESU encompasses the entire Puget Sound

drainage basin west to the Elwha River basin and north to the Canadian Border. The Puget Sound Chinook ESU was listed as threatened on March 24, 1999 (64 FR 14307).

The Puget Sound ESU is a complex of many individual populations of naturally spawning Puget Sound Chinook and 36 hatchery populations (64 FR 14308; March 24, 1999). The Puget Sound Technical Recovery Team (TRT), an independent scientific body convened by NOAA's National Marine Fisheries Service (NMFS) to develop technical delisting criteria and guidance for salmon recovery planning in Puget Sound, identified 21 geographically distinct populations representing the primary historical spawning areas of Chinook in Puget Sound (NMFS 2001).

Overall abundance of Puget Sound Chinook in this ESU has declined substantially from historical levels, and many populations are small enough that genetic and demographic risks are likely to be relatively high. Trends in abundance are predominantly downward, and several populations exhibit short-term declines. Factors contributing to the downward trends are widespread blockages of streams, degraded freshwater and marine habitat, upper river tributaries widely affected by poor forest practices, and lower tributaries and mainstem rivers affected by urbanization and agriculture. Hatchery production and release of Puget Sound Chinook is widespread and more than half of the recent total escapement returned to hatcheries. All spring- and summer-run populations throughout this ESU are depressed and are of special concern to NMFS (Myers et al. 1998).

2. Federally-Listed Species - Bull Trout

Coastal-Puget Sound bull trout are listed as a threatened species under the Endangered Species Act (USFWS 1999). The anadromous form of bull trout is unique to the Coastal Puget Sound region within their distribution in the coterminous United States (Ardren et al. 2011). Puget Sound populations include both resident and migratory forms. The Port Gardner Assessment Area is part of the Puget Sound Management Unit for bull trout designated as critical habitat (USFWS 2004; USFWS 2010). Although both bull trout and Dolly Varden (*S. malma*) occur in the Puget Sound region (Spruell and Maxwell 2002; Ardren et al. 2011), and WDFW treats both species the same (as "native char") for management and regulatory purposes (WDFW 1998), based on genetic analyses bull trout are the only anadromous char in Puget Sound (Goetz et al. 2004) and only bull trout are present in the Snohomish River drainage (Hawkins, in litt. 2008). Within the Port Gardner assessment area, freshwater and estuarine migration corridors and rearing habitats are important for the anadromous life-history type of bull trout. Functional estuarine and nearshore habitats are not only critical to anadromous bull trout for foraging and migration (WDFW et al. 1997; Goetz et al. 2004), but also to their prey species (e.g., herring, surf smelt, sand lance) for spawning, rearing, and migration (WDFW 2000; BMSL et al. 2001).

Unlike most Pacific salmon species, bull trout are iteroparous (survive over multiple seasons) and may make multiple migrations to and from nearshore waters of Puget Sound as part of their life history (Hayes et al. 2012). Bull trout also have more specific habitat requirements than most other salmonids, especially the need for cold water (Rieman and McIntyre 1993). Therefore, they may be at higher exposure risk than Chinook because of greater sensitivity to temperature increases and possibly contaminants from storm water runoff, and because of more frequent or increased exposure to contaminants over their lifetime.

3. Federally-Listed Species - Steelhead

Puget Sound Steelhead were listed as threatened on May 11, 2007 (72 FR 26722). Steelhead are the anadromous version of freshwater rainbow trout. The typical life history involves spending two to three years in freshwater before migrating downstream into marine waters. Once the juveniles emigrate they move rapidly through Puget Sound into the North Pacific Ocean where they reside for several years before returning to spawn

in their natal streams. Unlike many other members of the *Oncorhynchus* genus, steelhead do not die after spawning and can undergo multiple spawning cycles (Wydoski and Whitney 2003).

The Puget Sound steelhead Distinct Population Segment (DPS) is composed primarily of winter-run populations (37 of the 53 populations). No abundance estimates exist for most of the summer-run populations; all appear to be small, most averaging less than 200 spawners annually. Summer-run populations are concentrated in northern Puget Sound and Hood Canal; only the Elwha River and Canyon Creek support summer-run steelhead in the rest of the DPS. Steelhead are most abundant in northern Puget Sound, with winter-run steelhead in the Skagit and Snohomish rivers supporting the two largest populations (approximately 3,000 and 5,000 respectively). The geometric means of most populations have declined in the last five years; recent mean abundance for many populations is 50 to 80 percent of the corresponding long-term means.

Summer-run and winter-run steelhead stocks are present in the Snohomish basin; both runs are composed of wild and hatchery-raised steelhead. The winter run is the larger of the two stocks. Three wild winter steelhead stocks have been identified from the Snohomish/Skykomish, Snoqualmie, and Pilchuck rivers. The wild steelhead winter run occurs primarily between February and April, while the hatchery fish generally run from mid-November through mid-February. Spawning occurs through most of this entire winter/spring period. Three summer steelhead stocks are present in the Snohomish basin - the upper Tolt, North Fork Skykomish, and South Fork Skykomish. The summer steelhead in the Tolt and North Fork Skykomish are native and the South Fork Skykomish summer steelhead stock was developed by colonization of non-native fish. Native summer stocks are small runs of fish limited by their habitats, spawning in areas isolated from native winter stocks. This occurs upstream of falls that were probably once migration barriers except during the low flows of summer and fall. Since only a few miles of stream are used for spawning, native summer steelhead populations are small. Total populations are not known and data are not sufficient to set escapement goals.

4. Federally-Listed Species - Steller Sea Lion

Steller sea lions are listed as threatened, but only rarely occur in Puget Sound south of Admiralty Inlet (Yates, 1988). Both California and Steller sea lions have been observed in the estuary (Carroll, J.R., Snohomish County, pers.comm., 1996 *as cited in* City of Everett and Pentec, 2001). Steller sea lion is found around the North Pacific Rim from the Channel Islands of southern California to northern Hokkaido, Japan; the center of distribution is in Alaska (NMFS 1992). Within this distribution, land sites used by the animals include rookeries and haul outs. Rookeries are used for pupping and nursing; haul outs are used by the entire Steller sea lion community as onshore rest areas, but generally are not used for breeding. Although animals of all ages have been observed in the Washington population, no rookeries have been identified in Washington.

Steller sea lions are migratory and appear to be most abundant during spring and fall. They are known to migrate into Puget Sound. Steller's sea lions were also seen in the area between October 1987 and January 1988 during the steelhead fishing season (Gearin et al. 1988; Chumbley 1993; Gearin et al. 1999; Jeffries et al. 2000). There is growing evidence that the vast majority of feeding dives occur in the top 328 feet of the ocean, although feeding to depths over 820 feet has been reported. The animals appear to be largely opportunistic feeders. The primary Steller sea lion prey in Washington appears to be species of gadids (cod and pollock), rockfishes, herring, and smelt that are abundant at various areas along the Washington Coast. For the most part, Steller sea lions are not known to prey significantly on bottom-dwelling invertebrates

5. Federally-Listed Species – Marbled Murrelet

Marbled murrelets are listed as threatened and have been observed using Port Gardner Bay and Possession

Sound for foraging (City of Everett and Pentec, 2001). Murrelets feed on fish and invertebrates usually within two miles of shore and nest in stands of mature and old growth forest. Marbled murrelets typically forage for prey during the day and visit their nest site in the canopy of old-growth forests at dawn or dusk. No critical habitat for marbled murrelets is present within the Port Gardner Assessment Area.

6. Federally-Listed Species - Killer Whale

Southern resident killer whales, identified as J, K and L pods, reside for part of the year in the inland waterways of the Strait of Georgia, Strait of Juan de Fuca, and Puget Sound, especially during the spring, summer and fall. The J pod contains approximately 18 whales, the K pod 16 whales, and the L pod 46 whales. Pods regularly visit coastal sites off Washington and Vancouver Island and are known to travel as far south as central California and as far north as the Queen Charlotte Islands. Orcas enter Puget Sound between June and October as they hunt the salmon runs. The J pod is the pod most likely to be observed near Port Gardner. Groups of orcas belonging to both the J and K pods have been sighted off Vashon Island in summer (Balcomb and Goebal 1976; Balcomb et al.1982; Olesiuk et al. 1990; Forney et al. 1999, 2000; Dahlheim et al. 2000). Winter movements and distribution are poorly understood for the population.

7. Federally-Listed Species - Humpback Whale

Humpback whales are found in all oceans to the edges of polar ice. They follow definite migration paths from their summer feeding grounds to warmer waters in the winter. Three distinct and non-interactive groups of humpbacks are noted in the North Pacific: the eastern North Pacific stock, central North Pacific stock, and western North Pacific stock (NMFS 1991). In the North Pacific, where the total humpback population is around 15,000 individuals, humpbacks feed in the summer along the coast from California to Alaska. In the winter, they migrate to breeding grounds off Hawaii, Mexico, Costa Rica, and Japan.

Humpback whales historically frequented the Puget Sound area and sporadic observations of humpback whales have been reported in the Puget Sound since the 1970s (Osborne et al. 1988). In recent years, humpback whale sightings have increased in Puget Sound, including a 2004 report of a whale around Vashon Island, a May 2005 report of a humpback in central Puget Sound, and a July 2006 report of a juvenile humpback apparently injured by a small boat in southern Puget Sound (Calambokidis in *The Olympian,* July 11, 2006).

D. Discharges of Hazardous Substances

1. Potential sources of contamination

The Port Gardner assessment area receives contaminant inputs from multiple sources, including industrial activities. Discharges and releases of hazardous substances into Port Gardner have resulted from industrial and municipal processes since the early 1900s (**Figure 5**). Facilities released materials through permitted and non-permitted discharges, spills during cargo transfer and refueling, stormwater runoff through contaminated soils at upland facilities, and discharge of contaminated groundwater. Other releases into Port Gardner are a result of lumber operations, such as sawmills, and pulp and paper mills (Anderson and Crecelius 1985, Long et al. 1999, WDOH 2011).

Ecology is currently overseeing cleanup of more than 10 sites on the Everett Waterfront and East Waterway. Cleanup actions, such as removal of contaminated sediments and sediment capping, may be considered at these sites. Several sites have already completed cleanup actions to remove contaminated soil. There may be additional sources of contaminants to Port Gardner and cleanup sites that have not yet been identified.

Figure 5. Historical photo from 1928 of Everett Waterfront - *Photo from Everett Public library*.

2. Names of the hazardous substances

Hazardous substances released to the Port Gardner area include, but are not limited to, the following chemicals (reported by name):

- Polychlorinated biphenyls (PCBs), including various Aroclor and other mixtures.
- Dioxins and furans, including 2,3,7,8-tetrachlorodibenzo-p-dioxin and 2,3,7,8-tetrachlorodibenzofuran.
- Organochlorine pesticides and related transformation products, including DDT, DDD, DDE, heptachlor, and dieldrin.
- High and low molecular weight polyaromatic hydrocarbons (PAHs).
- Metals, including lead, mercury, copper, chromium, and arsenic.
- Semi-volatile organic compounds such as bis (2-ethylhexyl) phthalate, other phthalate esters, and pentachlorophenol, and other phenols.
- Volatile organic compounds such as benzene.
- Other compounds such as perchlorate, herbicides, and organic solvents.
- Antifouling agents such as tributyltin and other butyltins.
- Sulfide and ammonia.

3. History of the current and past uses in relation to sources of hazardous substances released or discharged

Port Gardner area sediment data are available from the 1980s until present, and indicate that there is considerable sediment contamination in some areas of Port Gardner (SAIC 2009 and other data sources further described in Section IIIc) . The Everett Harbor Action Program published a document in 1988 that listed sources

of potential contamination in the Port Gardner area, including industrial facilities, wastewater treatment plants, combined sewer overflows (CSO), landfills, surface runoff, groundwater, atmospheric deposition, and spills (TetraTech 1988). However, the investigation did not link contamination with specific sources based on the available data.

4. Potentially responsible parties

Ecology is currently overseeing remedial investigations at a number of sites that include contamination and has identified PRPs ("PLPs" or Potentially Liable Parties under the Washington State Model Toxics Control Act) for those sites. In addition, there are other cleanup sites that are awaiting cleanup, or have completed at least some remediation activities. PRPs have been identified or will be identified for those sites as well. Some facilities may have had discharges that contributed to sediment contamination, even if they have not been identified yet as a PRP for remediation purposes. Persons who discharged hazardous substances and owners or operators of facilities that contributed significantly to sediment contamination may be considered as PRPs for natural resource damages.

5. Damages Excluded from Liability under CERCLA

Title 43 CFR Part 11.24(b) notes certain damages are excluded from liability under CERCLA, such as damages resulting from a discharge or release that was specifically identified as an irreversible and irretrievable commitment of natural resources in an environmental assessment, damages from a release that occurred wholly before enactment of CERCLA, or damages resulting from other federally-permitted activities as those defined in Section 101(10) of CERCLA. In the Port Gardner area, releases have occurred which have the potential to cause or continue to cause injury and damages that are not excluded from liability under CERCLA. No environmental impact statement or similar environmental analysis has ever identified an irretrievable or irreversible commitment of natural resources at this site.

Aside from discharges permitted under the NPDES, there are no other known concerns relative to 43 CFR Part 11.24(b) warranting exclusion from liability under CERCLA, the Oil Pollution Act, or the Clean Water Act. Any injuries that may have resulted exclusively from specific NPDES releases, or other releases found to be under exclusion during the remedial investigations or injury assessments, will be considered further during the damage assessment process.

III. PRELIMINARY IDENTIFICATION OF RESOURCES AT RISK

A. Preliminary identification of pathways

Contaminants from sources are introduced into the lower Snohomish River and Port Gardner through point and non-point discharges, from spills during overwater activities, and to a lesser degree from aerial deposition and soil erosion. The primary media for transport of contaminants and exposure to organisms are surface water, groundwater, transition zone water, sediment, and tissue (i.e., from consumption of contaminated prey items or food chain transfer). Surface water flow over upland areas erodes soil or collects material from impermeable surfaces and transports contaminants from urban or industrial areas in the dissolved or particulate phase to the river. Precipitation infiltrates upland soils and can leach contaminants from soils as it percolates to the water table and flows along the top of impermeable layers or alongside discharge pipes before entering the river as seeps above the waterline or as transition zone water below the waterline. Groundwater discharge at seeps or in the transition zone can be attractive to aquatic organisms and provides a pathway for contaminants to reach these organisms through direct contact and ingestion of surface water, particulates, and prey items. Contaminated bed-load sediment, or suspended sediment and particulates, are transported from upriver or

local sources and deposited, resuspended, and redeposited within Port Gardner or transferred to downstream reaches and into the lower Snohomish River. The degree to which contaminants can move in or through these media depends on various factors including the partitioning coefficients of the specific chemicals.

Exposure of aquatic organisms, including trust resources at the Port Gardner site, occurs through direct contact or ingestion of dissolved or suspended contaminants in the water column, contact or ingestion of groundwater in seeps or transition zones, contact or ingestion of sediment or porewater, and ingestion of contaminated prey items (Johnson et al. 2008). Specific ecological receptor groups that are vulnerable to exposure to contaminants specific to the Port Gardner area include plants, benthic invertebrates, fish, amphibians and reptiles, birds, and mammals. Contaminants have been found in fish and invertebrate tissues in Port Gardner (SAIC 2009; WDOH 2011). Plant, amphibian, and reptile contaminant tissue analysis has not occurred. The primary exposure pathways of a contaminant from media to receptors are outlined in **Figure 6**, as exampled by a food web diagram of Puget Sound. Additional pathways may be identified during the remedial investigation and injury assessment phases.

B. Exposed areas

Contaminated sediments occur along the lower Snohomish River along the Everett Waterfront and in East Waterway. For the majority of contaminants assessed the contaminant footprints can be characterized as localized areas with relatively high chemical concentrations separated by larger areas with lower chemical concentrations. For contaminants such as PAHs, their distribution may be widespread, covering the majority of the assessment area.

C. Estimates of concentrations

Sediment chemistry data sets were selected to obtain the best representation of the spatial extent of contamination and maximum areal coverage of the Port Gardner area. A protocol was developed for reviewing qualified data, aggregating contaminants and addressing multiple samples from the same station. To determine the potential for injury to natural resources, contaminant concentrations were preliminarily evaluated based on threshold concentrations (**Table 2**) developed for the Hylebos Waterway in Commencement Bay (NOAA 2002). These threshold concentrations represent contaminant levels associated with reduction in ecological services. Scientific literature, technical data, and applicable regulatory standards were reviewed to determine the effects of varying sediment contaminant concentrations on key species or species groups. A series of concentration levels were established for each contaminant, expressed as a percent reduction in ecological services. These were based on the observation that as concentrations of hazardous substances increase, both the number of species adversely affected and the severity of effects also increases.

A number of sediment chemistry data sets used in the analysis are listed in **Table 3** and are publicly available in Ecology's EIM database. However this may not be a complete list of the data sets that will be used for the injury assessment. Preliminary comparison of sediment contaminant concentrations with threshold concentrations indicates that some areas have a 5– 20% service loss for contaminants such as chromium, copper, mercury, tributyltin, phthalates, PCBs and phenol; and up to an 80% loss for PAHs.

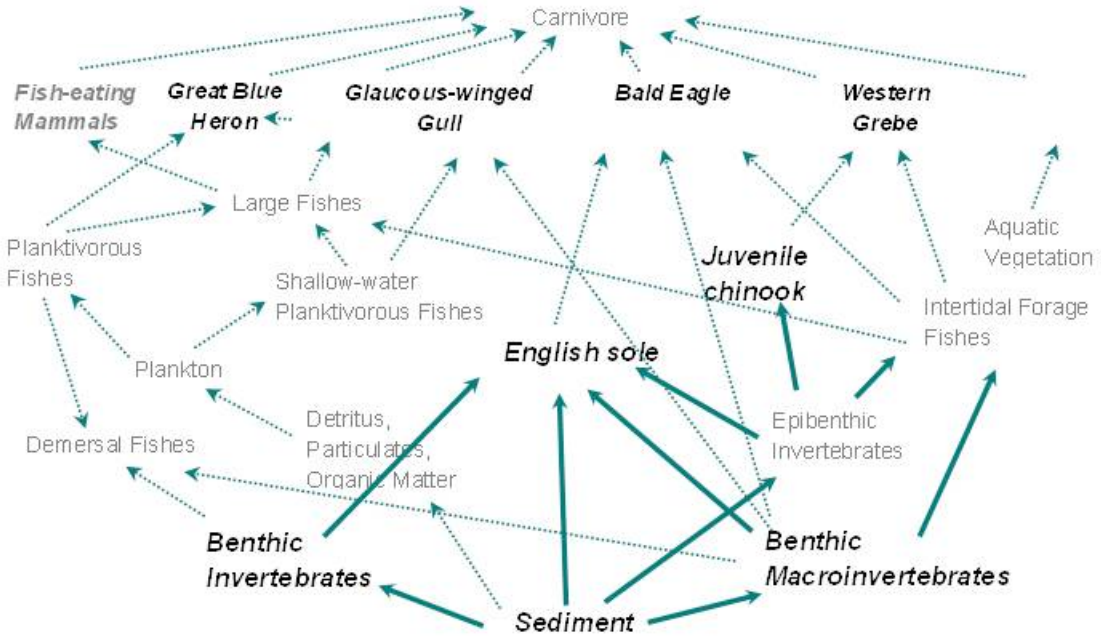

Figure 6. Food web example for the Port Gardner Assessment Area. Primary exposure routes are shown as solid lines.

Some early studies in the Port Gardner area have looked at biological effects from hazardous substances. They include laboratory bioassays of sediment organisms performed on Everett Harbor sediments demonstrating acute lethal, sublethal, and partial life cycle toxicities relative to reference area sediments. These sediment bioassays showed impaired fish cell reproduction, decreased oyster larvae survival and increased oyster larvae abnormalities, and were associated with areas with high chemical contamination in the sediment (Chapman 1984). Crecilius and Anderson (1986) showed decreased juvenile geoduck survival and oyster larvae survival in laboratory bioassays with contaminated East Waterway sediment compared to native sediments. SAIC (1989) demonstrated bioassay amphipod mortality in sediments from several sites in East Waterway. Liver lesions in English Sole and Rock Sole were prevalent in areas contaminated with PAH in East Waterway and shrimp and crabs had both gill and hepatopancreas lesions that appeared to be associated with areas of high chemical concentrations (Malins 1982).

Recent data from Port Gardner show that toxicity to benthic organisms may be present at many sites in the estuary. Thirteen of the 17 sediment locations showed biological toxicity from 1 or more of the laboratory bioassays done on the sediment. Locations with biological toxicity included East Waterway, Everett Waterfront, Ebey Slough, Steamboat Slough, and the mainstem Snohomish River. Tissue samples showed detectable levels of PCB and dioxins in Dungeness crab hepatopancreas, and detectable levels of dioxin in clams and Dungeness crab meat (SAIC 2009).

Contaminant levels in fish tissue have caused fish consumption advisories to be issued in the Port Gardner area. In the Washington State Department of Health's (WDOH) 2006 Puget Sound Fish Consumption Advice, WDOH recommended no more than 1 meal per week for Puget Sound Rockfish in the Port Gardner area (WDOH 2006). In WDOH's 2010 Fish Facts for Healthy Nutrition, a consumption advisory for the Port Gardner area recommends no more than two meals a month of rockfish, flatfish (sole, sanddab, and flounder), and Chinook Salmon (WDOH

2010). WDOH's Health Consultation assessment in 2011 showed that tissue concentrations of arsenic and PAH may have cancer risk above acceptable levels for humans that ingest fish and shellfish at or above Tribal ingestion rates and if tribes or nations are harvesting from Port Gardner and consuming at Tribal consumption rates, this would represent a "public health hazard" (WDOH 2011).

D. Potentially affected resources

The Tulalip Tribes, the Suquamish Tribe, U.S. Department of the Interior, National Oceanic and Atmospheric Administration, and the State of Washington collectively have trusteeship over all natural resources that have been exposed to hazardous substances within Port Gardner. The natural resources affected or potentially affected from releases or discharges of contaminants include, but are not limited to:

- Aquatic-dependent mammals such as gray whale, seal, sea lion, mink and river otter and species they depend on as prey items
- Migratory birds, including osprey, bald eagle, assorted waterfowl, great blue heron, spotted sandpiper and other shorebirds, cliff swallow, belted kingfisher, and other species
- Threatened and endangered species
- Anadromous and resident fish
- Reptiles and amphibians
- Aquatic invertebrates
- Aquatic plants
- Wetland and upland habitats
- Groundwater
- Surface water

The services that are provided by these natural resources include, but are not limited to, the following:

- Habitat for trust resources, including food, shelter, breeding, foraging, and rearing areas, and other factors essential for survival
- Resource use
- Hunting and fishing
- Non-consumptive uses such as wildlife viewing and photography and other outdoor recreation activities
- Primary and secondary contact activities such as swimming and boating
- Cultural, spiritual, and religious use
- Option and existence values
- Traditional foods
- Other lost human use

Table 2 - PRELIMINARY SEDIMENT CONCENTRATIONS USED FOR SCREENING FOOTPRINT MAPS
Developed for the Hylebos Waterway in Commencement Bay (US DOC, NOAA 2002)

Substance of Concern	Symbol	Units	Low	Med	High	Very High
PAHs (total)		ppm dw	1	5	50	250
PCBs		ppm dw	0.113	2.5	30	90
Metals						
Arsenic	AS	ppm dw	57	130	500	700
Cadmium	CD	ppm dw	5.1	14		
Chromium	CR	ppm dw	100	1200		
Copper	CU	ppm dw	390	1300		
Lead	PB	ppm dw	450	1200		
Mercury	HG	ppb dw	410	1300	2100	2300
Silver	AG	ppm dw	3.3	8.4		
Zinc	ZN	ppm dw	410	530	1600	3800
Tributyltin	TBT	ppb dw	220	1000		
Chlorobenzenes						
1,2-dichlorobenzene	ODCB	ppb dw	35	150		
1,4-dichlorobenzene	PDCB	ppb dw	110	120		
1,2,4-trichlorobenzene	TCB	ppb dw	31	64		
Hexachlorobenzene	HCB	ppb dw	22	230		
Phthalates						
bis (2-Ethylhexyl) phthalate	BEPH	ppb dw	1300	8500		
Butylbenzyl phthalate	BBPH	ppb dw	63	970		
Di-n-butyl phthalate	DnBPH	ppb dw	50	5100		
Di-n-octyl phthalate	DOPH	ppb dw	100	6200		
Diethylphthalate	DEPH	ppb dw	50	1200		
Dimethylphthalate	DMPH	ppb dw	71	1400		
Phenols						
4-methyl phenol	MP4	ppb dw	670	3600		
2,4-dimethyl phenol	DMP	ppb dw	29	77		
Pentachlorophenol	PCP	ppb dw	160	690		
Phenol	PNL	ppb dw	420	1200		
Hexachlorobutadiene	HCBD	ppb dw	11	270		
DDTs						
DDD		ppb dw	16	68	540	3000
DDE		ppb dw	9	62	3100	4600
DDT		ppb dw	19	34	270	3000

Units: ppm = Parts per million
ppb = Parts per billion
dw = Dry weight

Table 3. SEDIMENT CHEMISTRY SAMPLING EVENTS
Used in assessment of contamination

1985 Navy HP (EVRT) Sediment Character.
1986 Pt. of EVRT Hewitt Ave./S. Terminal Char
1986 1985 Everett Hbr. chem. & biota data.
1989-1995 Puget Sound Assessment and Monitoring Program's historical sediment monitoring program 1989-1995
1991 Mukilteo RI @ Defense Fuel Support Point
1994 U.S. Navy Everett Rec. Marina Sed. Mon.
1995 Scott Paper Co. Baseline Sediment Survey
1996 The Puget Sound Assessment and Monitoring Program's Long-Term Temporal Monitoring 1989-Present
1997 A Cooperative Agreement with the Puget Sound Assessment and Monitoring Program and the National Oceanic and Atmospheric Administration(NOAA) National Status and Trends (NS&T) Program to jointly examine measures of sediment quality throughout Puget Sound.
2002-Present The Puget Sound Assessment and Monitoring Program's (PSAMP) Spatial/Temporal Monitoring 2002-Present
2004 Kimberly-Clark Outfall 100 Baseline Sediment Sampling
2006 NOAA Mussel Watch Program
2007 Former Weyerhaeuser Mill A Site - MTCA Support Sample Collection, Everett Washington.
2008 Sediment Characterization Study in Port Gardner and Lower Snohomish Estuary, Port Gardner, WA.
2009 Jeld Wen Inc., Former Nord Door Site (Agreed Order DE5095) Everett, WA
2010 Remedial Investigation Everett Shipyard Property soil, groundwater and sediment
2011 Port of Everett- Former Bay Wood Products Site, Everett, WA. Formerly AQBAYWOOD & AQBaywood 2011

Because of the central role that sediments and the sediment-based biological community play in the assessment area, the Trustees anticipate evaluating the potential loss of natural resources in terms of affected habitat, rather than numbers of individual species impacted. Habitat Equivalency Analysis or similar type of injury analysis would be performed to estimate injury to trust resources and the amount of habitat restoration needed to compensate for the injury from the release of hazardous substances.

IV. OVERVIEW OF THE NATURAL RESOURCE DAMAGE PROCESS

Natural resource damage assessment is a complex process. The following three phases described in more detail below provide a framework to structure the process: *Preliminary Assessment*, *Injury Assessment and Restoration Planning*, and *Restoration Implementation*.

A. Preliminary assessment (Preassessment)

The purpose of the preassessment screen is to provide a rapid review of readily available information that allows the authorized official to make an early decision on whether a natural resource damage assessment can and should be performed. This work would include a review of existing information at the site along with applicable scientific literature. Based on the preassessment screen, the trustees determine whether it is

appropriate to move forward with the damage assessment process.

B. Injury Assessment/Restoration Planning

During the second phase, trustees quantify injuries to natural resources and the loss of resource services. This quantification can be done by conducting site-specific economic and/or scientific studies, especially if litigation is required. Alternatively, as discussed below, the results of injury studies conducted in similar areas and/or information in the scientific literature can be used to estimate injury using site-specific data (such as sediment contaminant levels). The results are used to develop a restoration plan that outlines alternative approaches to speed the recovery of injured resources and/or compensate for their loss or impairment from the time of injury to recovery.

Although the concept of assessing injuries may sound simple, understanding complex ecosystems, the services these ecosystems provide, and the injuries caused by oil and hazardous substances takes time. The season the resource was injured, the type of oil or hazardous substance, and the amount and duration of the release are among the factors that affect how quickly resources are assessed and how quickly restoration and recovery occurs. Trustees may not need to conduct detailed assessment studies if there is sufficient information available from the scientific literature, the results of other NRDAs, and studies conducted by the response agencies when determining what cleanup actions are needed to develop a reasonable estimate of injury to natural resources and services

Once injury assessment is complete or nearly complete, trustees develop a plan for restoring the injured natural resources and services. Trustees must identify a reasonable range of alternatives, evaluate and select the preferred alternatives(s) and develop a draft and final Restoration Plan. Acceptable restoration actions include restoration, rehabilitation, replacement or acquisition of the equivalent natural resources and services. Restoration actions are either primary or compensatory. Primary restoration is action taken to return injured resources and services to baseline, including natural recovery. Compensatory restoration is action taken to compensate for the interim losses of natural resources and/or services pending recovery. The type and scale of compensatory restoration depends on the nature of the primary restoration action, and the level and rate of recovery of the injured natural resources given the primary restoration action. When identifying compensatory restoration alternatives, trustees must first consider actions that provide services of the same type and quality, and of comparable value as those lost. If compensatory actions of the same type and quality and comparable value cannot provide a reasonable range of alternatives, trustees then consider other compensatory restoration actions that will provide services of at least comparable type and quality as those lost.

C. Restoration Implementation

The final phase is to implement restoration and monitor its effectiveness. Trustees seek public input to select and implement restoration projects. Examples of restoration include creating wetlands, and restoring salmon habitat. The PRP(s) are liable for the costs of assessment and restoration and are often a key participant in implementing the restoration.

V. PREASSESSMENT SCREEN CRITERIA

As indicated in Section I, title 43 CFR Part 11.23(e) explains the five criteria to be met in the preassessment phase to proceed to a full natural resource damage assessment. The criteria and corresponding conclusions based on this preassessment screen are as follows.

1) **A discharge of oil or release of hazardous substance has occurred**. Releases of appreciable quantities of petroleum compounds, organochlorine pesticides, PCBs, volatile and semi-volatile organic compounds, solvents, metals, and other hazardous substances listed in this preliminary assessment have been reported for the Port Gardner Assessment Area.

2) **Natural resources for which a State or Federal agency or Indian Tribe may assert trusteeship under CERCLA have been or are likely to have been adversely affected by the discharge or release.** Natural resources over which the State, Federal agencies and Indian Tribes may assert trusteeship have been adversely impacted. Existing field data indicate that hazardous substance concentrations in sediment and tissue spatially coincide or are elevated near areas with known releases from industrial facilities or other documented sources.

3) **The quantity and concentration of the discharged oil or released hazardous substances is sufficient to potentially cause injury to those natural resources.** Sediment samples from the Port Gardner Assessment Area contain hazardous substances at concentrations that exceed levels associated with injury in aquatic biota.

4) **Data sufficient to pursue an assessment are readily available or likely to be obtained at reasonable cost.** Data currently exist from the site that will be helpful and cost effective to use to further assess injury of natural resources at the site. Additional studies may be needed to better quantify injury and service losses for some resources, but these data can be obtained at reasonable costs. The costs of preparing the assessment are anticipated to be reasonable.

5) **Response actions from remedial activities carried out or planned do not or will not sufficiently remedy the injury to natural resources without further action.** The trustees expect the remedial actions at the Port Gardner Assessment Area will minimize or eliminate exposure to hazardous substances (primary restoration). The full extent of such impact cannot be assessed until the remedial action is selected by Ecology. However, site remediation likely will not address lost services of resources which have been ongoing since the enactment of CERCLA (compensatory restoration). Thus, additional restoration, replacement, and rehabilitation of natural resources will ultimately be necessary.

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