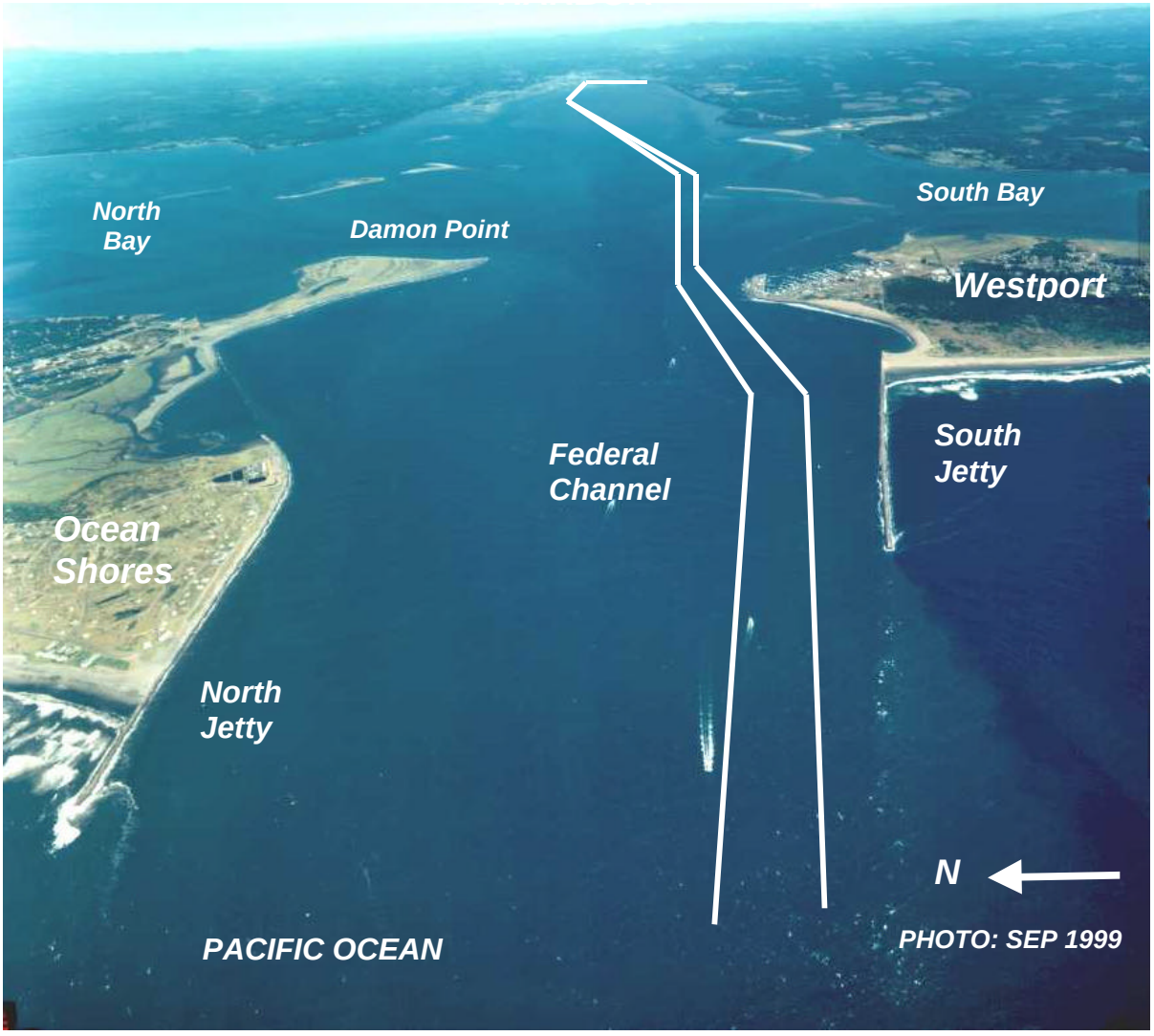
Final Environmental Assessment

Fiscal Years 2001-2006 Maintenance Dredging and Disposal
Grays Harbor and Chehalis River Navigation Project
Grays Harbor County, Washington

April 2001



US Army Corps of Engineers®
Seattle District

Fiscal Years 2001-2006 Maintenance Dredging and Disposal Grays Harbor and Chehalis River Navigation Project

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Responsible Agency: The responsible agency for this maintenance work is the U.S. Army Corps of Engineers, Seattle District.

Abstract: This document evaluates the impacts of five years of maintenance of the Grays Harbor and Chehalis River Navigation Channel. Between 2001 and 2006, an estimated annual 2,500,000 cubic yards of sediment from this deep draft Federal channel will be dredged. Disposal of this material will occur at three open water disposal sites, two nearshore nourishment sites, and one direct beach nourishment site.

Since the proposed action is one for which an Environmental Impact Statement (EIS) has been prepared, in accordance with 40 CFR 1502.20 this Environmental Assessment (EA) is tiered from the parent EIS. As a result, this EA does not repeat evaluations presented in the EIS but rather incorporates discussions from previous NEPA documents by reference and concentrates on new issues specific to these subsequent actions.

THE OFFICIAL COMMENT PERIOD ON THIS ENVIRONMENTAL ASSESSMENT COINCIDED WITH THE COMMENT PERIOD FOR PUBLIC NOTICE CENWS-OD-TS-NS-12, WHICH OCCURRED BETWEEN FEBRUARY 7, 2001 AND MARCH 12, 2001.

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1. INTRODUCTION

Pursuant to the National Environmental Policy Act (NEPA), this Environmental Assessment evaluates the impacts of five years of maintenance of the Grays Harbor and Chehalis River Navigation Channel. Between 2001 and 2006, an estimated annual 2,500,000 cubic yards of sediment from this deep draft Federal channel will be dredged. Disposal of this material will occur at three open water disposal sites and two direct beach/nearshore nourishment sites in Grays Harbor.

1.1 Location

The Grays Harbor navigation channel provides shipping access between the Pacific Ocean and Cosmopolis on the Chehalis River, Grays Harbor County, Washington (T17N, R10 W, Sections 9, 10, 11, 12, 13 and T17N R9W Sections 8, 9, and 10). Please see Figure 1.

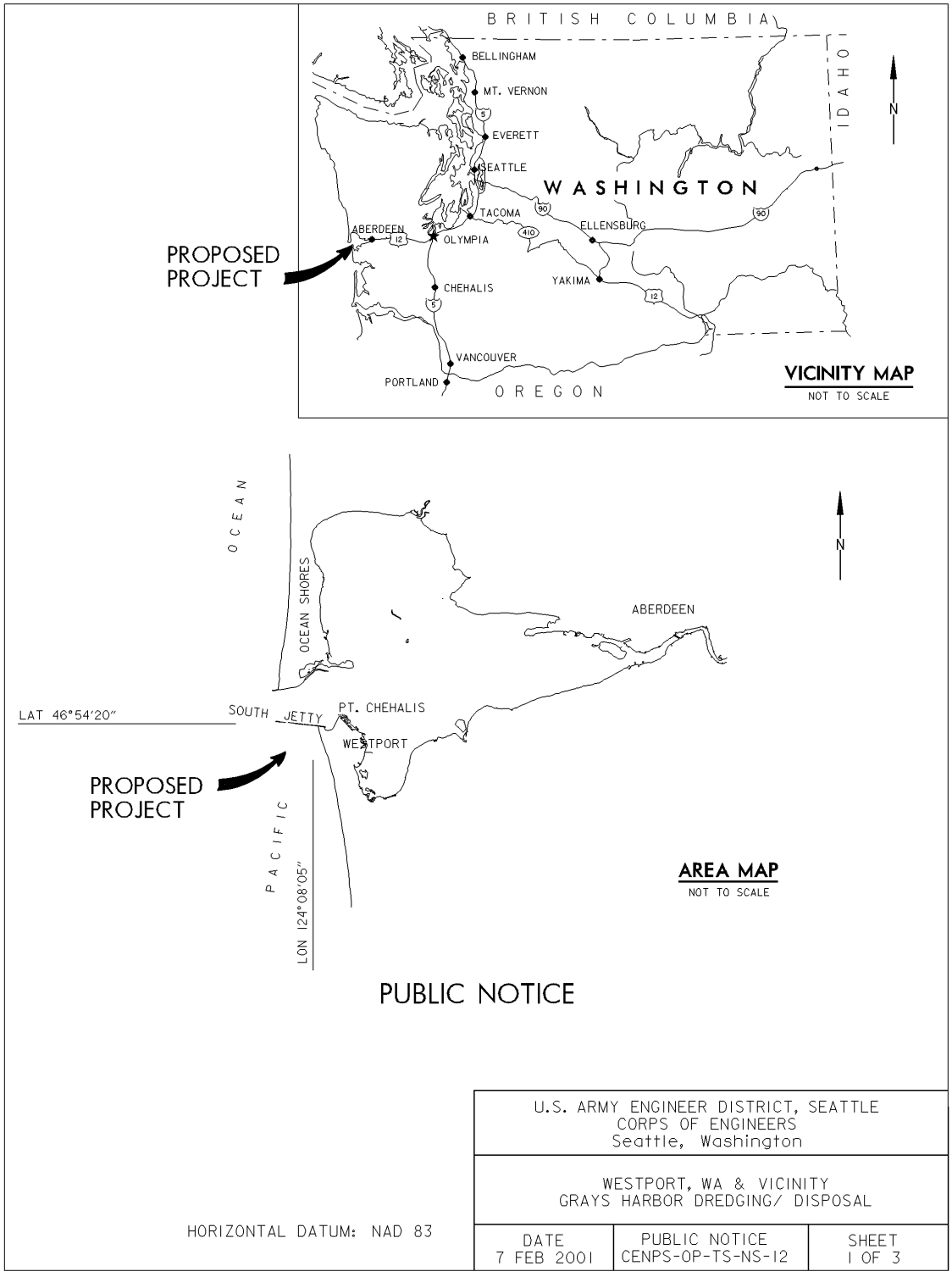
1.2 Background

The 23.5 mile long Grays Harbor navigation channel is dredged annually by the U.S. Army Corps of Engineers, Seattle District (Corps) in order to maintain authorized project depths. Without annual maintenance dredging, shoaling would reduce the ability of larger ships to enter and leave the inner harbor safely under full load or low tide conditions, thereby impacting the economy of Grays Harbor county.

The Grays Harbor and Chehalis River Navigation Project consists of the Federal navigation channel, the North Jetty, and the South Jetty. Historical information on these structures, as well as descriptions of recent modifications and maintenance work, has been described in several Corps documents. The following documents are incorporated here by reference and are available for inspection in the Seattle District Office: (1) Grays Harbor and Chehalis River Navigation Project, Operation and Maintenance Environmental Impact Statement (EIS), dated June 1975; (2) Long Range Maintenance Dredging Program for the Grays Harbor and Chehalis River Navigation Project, Operation and Maintenance Environmental Impact Statement Supplement No. 2 (EISS No. 2), dated October 1980; (3) Grays Harbor, Chehalis and Hoquiam Rivers, Washington Channel Improvements for Navigation Interim Feasibility Report and Final Environmental Impact Statement (EIS), dated September 1982; (4) Grays Harbor, Washington, Navigation Improvement Project Final EIS Supplement (EISS), dated February 1989; (5) Sediment Collection and Testing Program Navigation Improvement Project Final Environmental Assessment (EA), dated February 1990; (6) Dredged Material Evaluation Procedures and Disposal Site Manual, dated June 1995; (7) Long Term Maintenance of the South Jetty at Grays, Harbor Washington Evaluation Report, dated June 1997; (8) Revised Crab Mitigation Strategy Agreement Evaluation Report and Environmental Assessment, dated September 1998; (9) Point Chehalis revetment extension and Half Moon Bay inter-agency mitigation agreement; and (10) North Jetty Major Maintenance Environmental Assessment, dated March 1999.

Since the proposed action is one for which Environmental Impact Statements (EIS) have been prepared, in accordance with 40 CFR 1502.20 this Environmental Assessment (EA) is tiered from the parent EIS and supplements. As a result, this EA does not repeat evaluations presented in the EIS and supplements but rather incorporates discussions from previous NEPA documents

Figure 1. Location and Vicinity Map



by reference and concentrates on new issues specific to these subsequent actions. The term of this EA is extends until 2006, designed to coincide with the five-year term of the Programmatic Biological Evaluation (PBE) the Corps recently submitted to the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). This PBE satisfies the Corps' requirements under Section 7 of the Endangered Species Act (ESA).

1.3 Project Purpose and Need

The Port of Grays Harbor utilizes the federally authorized navigation channel to provide sea-going vessels with commercial access to the cities of Aberdeen, Hoquiam, and Cosmopolis. The local economy in the area is historically tied to forest products that are shipped to domestic and international markets. More recently, the Port of Grays Harbor has begun to host large cruise ships from the Alaska market. Without annual maintenance dredging, shoaling would lead to a shallower channel that would reduce the ability of large ships to enter and leave Grays Harbor safely. The purpose of channel dredging is to maintain the efficiency and safety of deep-draft water transportation in Grays Harbor.

1.4 Authority

The original Grays Harbor navigation channel was authorized by Congress in the Rivers and Harbors Act of 1896. The Grays Harbor and Chehalis River Navigation Project and regular Department of the Army maintenance dredging were authorized by the Rivers and Harbor Act of 1935, and modified in 1945 and 1954. In 1990, the navigation channel was widened and deepened as part of the Grays Harbor Navigation Improvement Project, which was authorized by Section 202 of the Water Resources Development Act of 1986 (Public Law 99-662) in November 1986. Copies of authorizing documents are on file at the Seattle District Office.

2. DESCRIPTION OF THE PROPOSED ACTIONS

2.1 Dredging

The 23.5 miles of the Grays Harbor Navigation Channel have been divided into 10 different reaches. The downstream reaches are Outer Crossover, South Reach, Entrance, and Bar Channel, while Elliott Slough Turning Basin, South Aberdeen, Cow Point, Hoquiam, North Channel, and Inner Crossover, constitute the upstream portion of the navigation project. Please see Figure 2 for the locations of these reaches and a typical channel cross section. Typically, only one reach is dredged at a time, and the different reaches have different dredging requirements (i.e., volume dredged, annual vs. biennial scheduling) as a result of different shoaling rates. The material dredged from the Bar, Entrance, and South Reach channels consists mainly of ocean sands deposited by tidal action and silty sand and sandy silt, redistributed within the estuary by wind and wave action. Materials dredged from the inner reaches is primarily suspended/ bedload material from tributary streams and rivers. All of the sediments have been tested and approved for open water disposal under the guidelines of the Dredged Material Management Program (DMMP) administered by the Corps, Environmental Protection Agency (EPA), Washington Department of Ecology (Ecology), and Washington Department of Natural Resources (DNR). Additional sediment sampling and analysis will occur on a regular basis as specified in the *Grays Harbor/Willapa Bay Dredged Material Evaluation Procedures*.

The side slopes of the navigation channel vary throughout the Harbor. Slopes progressively steepen towards the mouth of the Chehalis, since finer substrates are more cohesive and can therefore maintain a steeper slope. Representative slopes range from 1V:3H in the South Aberdeen, Cow Point, and Hoquium reaches, to 1V:5H in the North, Crossover, and inner portion of the South Reach channels, to 1V:10H in the outer potion of South Reach, Entrance and Bar reaches.

Below is a brief description of dredging requirements for the inner and outer reaches. Table 1 summarizes volume, channel dimension, disposal site, and timing information specific to individual reaches.

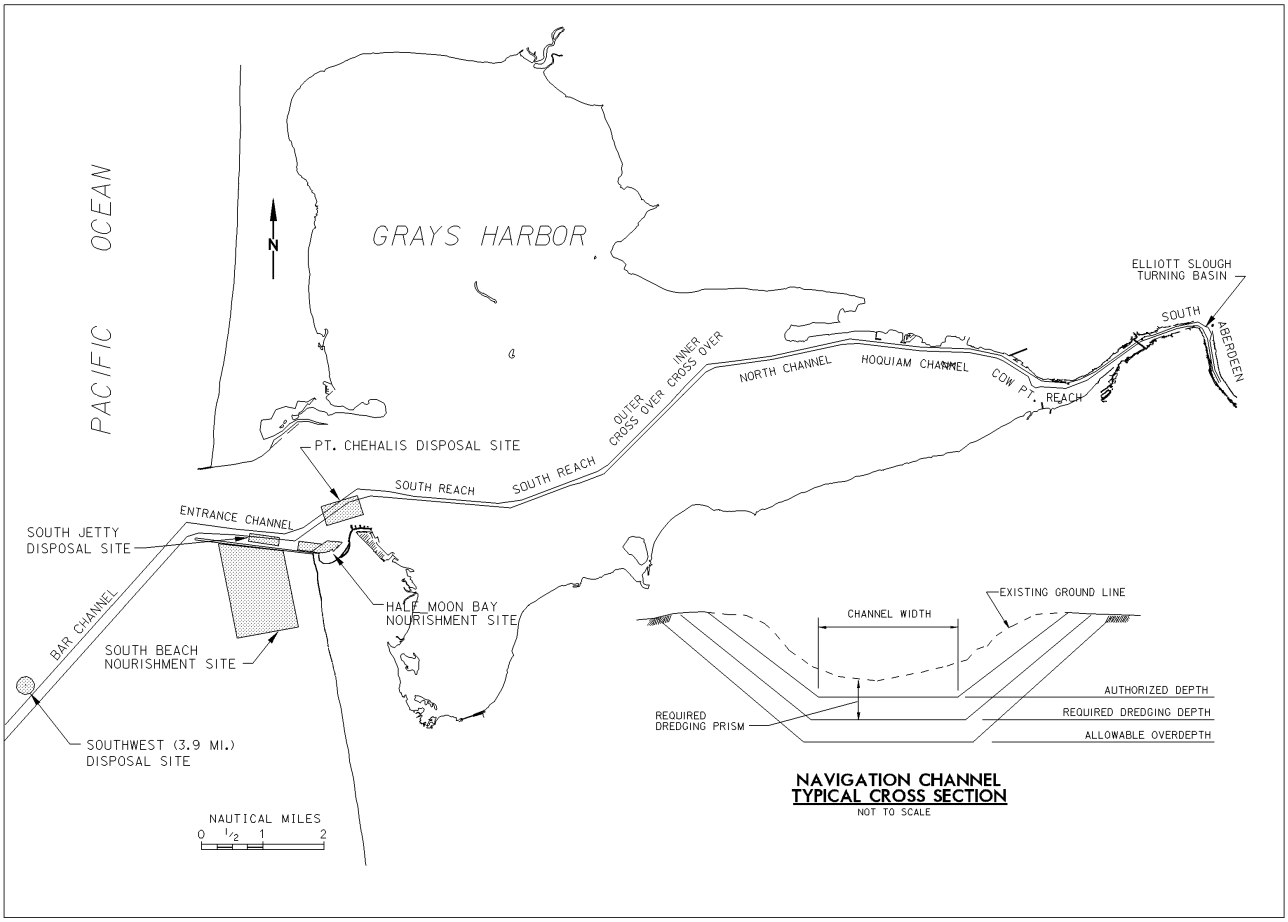
2.1.1 Inner Reaches

Approximately 1,565,000 cy are expected to be dredged annually from the inner reaches of the navigation channel. The inner portion of the Grays Harbor channel is four miles long, and extends from the Port of Grays Harbor Terminal 4 at Cow Point upstream through the Highway 101 bridge to 900 feet above the Weyerhaeuser terminal. The turning basin is located at the 90-degree river bend near the mouth of Elliot Slough. Based on recent surveys of these reaches, the channel is typically 31 to 32 feet deep, with some portions deeper and some shoals to -30 feet MLLW. The dredging will target shoals in the existing channel footprint in order to deepen to control depths between -32' and -36' MLLW. In order to avoid adverse salmonid impacts, the Corps will abide by timing restrictions designated by USFWS; no dredging will occur in these reaches from February 15 until July 15 of any year. Material dredged from these reaches will be disposed at the South Jetty site, or the Point Chehalis site during adverse weather/wave conditions or if the South Jetty site is full. These reaches are maintained using clamshell dredges.

2.1.2 Outer Reaches

Approximately 1,250,000 cy are expected to be dredged annually in the outer reaches of the navigation channel. These reaches will be maintained using a hopper dredge between April and May. No timing restrictions related to threatened or endangered species apply to the outer reaches because of the expansiveness of the estuary in this area, a characteristic which reduces the potential for adverse impacts on salmonids in two ways. First, the channel is not in a confined portion of the estuary, so a smaller proportion of the migratory pathway is affected by sediment plumes. Second, the relative distance between dredging activities and the shallow subtidal habitat where foraging occurs is greater. However, no hopper dredging is allowed after May 31 to avoid significant Dungeness crab impacts. If the dredging is not completed by May 31, a clamshell dredge will be used to complete the maintenance work. Materials dredged from the outer reaches may be disposed of at the South Jetty, Point Chehalis, 3.9 mile open water sites, or the Half Moon Bay and South Beach nourishment sites, depending on regulatory, tidal, weather, and sea conditions.

Figure2. Grays Harbor Navigation Channel Reaches and Disposal Sites



2.2 Disposal

Disposal will only occur at approved, designated disposal sites. Two Washington Department of Natural Resources (DNR) public, multi-user unconfined open water dredged material disposal sites are located directly adjacent to the navigation channel: Pt. Chehalis, South Jetty. These sites are located on state-owned aquatic lands, and are managed by DNR. One Environmental Protection Agency (EPA) designated ocean disposal site, Southwest (3.9 mile), is located adjacent to the bar channel. Please see Figure 2 for the location of these sites, which are discussed individually below. In addition, material dredged from the sandy outer reaches of the channel is periodically used for both direct and nearshore beach nourishment at Half Moon Bay, and nearshore nourishment at South Beach.

The determination of which site will be used during the course of maintenance dredging is based on a number of factors, including yearly surveys of the disposal areas, and on weather and wave conditions at the time of disposal. Likewise, placement of material at the direct and nearshore nourishment sites depends upon the surveyed depth of the nourishment areas as well as meeting

the requirements of the inter-agency mitigation agreement for the Point Chehalis revetment extension project.

Material disposed in the South Jetty and Pt. Chehalis sites is rapidly dispersed, while material disposed at the Southwest site tends to mound. Dredged material will be transported to disposal sites by either a bottom dump hopper dredge or by a tugboat and bottom-dump (split-hull) barge. These vessels generally have the ability to transport between 800 and 3,000 cubic yards of material each trip. The number of barge discharges per day is typically between three and five, but this number varies depending on the extent of the dredging activity ongoing at the time. A hydraulic pipeline is utilized at the Half Moon Bay direct beach nourishment site.

Table 1. Project Summary by Reach

REACH	ESTIMATED VOLUME (CUBIC YARDS)	DREDGE TYPE	DIMENSIONS	DISPOSAL AREA	WORK CLOSURES	WORK SCHEDULED
Elliott Slough Turning Basin	60,000 silt/sand biennially	Clamshell	-32' to -35' MLLW by 535' wide	South Jetty or Point Chehalis (W)	15 February to 15 July	16 July to 14 Feb
S. Aberdeen	55,000 silt/sand annually	Clamshell	-32' MLLW by 300-550' wide	South Jetty or Point Chehalis (W)	15 February to 15 July	16 July to 14 Feb
Cow Point	950,000 sandy silt annually	Clamshell	-36' MLLW by 350-725' wide	South Jetty or Point Chehalis (W)	15 February to 15 July	16 July to 14 Feb
Hoquiam	150,000 sandy silt annually	Clamshell	-36' MLLW by 350' wide	South Jetty or Point Chehalis (W)	15 February to 15 July	16 July to 14 Feb
North Channel	150,000 silty sand annually	Clamshell	-36' MLLW by 350' wide	Point Chehalis	None	August to Feb.
Inner Crossover	200,000 silty sand annually	Clamshell	-36' MLLW by 350-450' wide	Point Chehalis	None	August to Feb
Outer Crossover	200,000 silty sand annually	Hopper or Clamshell*	-36' MLLW by 350' wide	Point Chehalis	No hopper after 31 May	April and May
South Reach	400,000 sand annually	Hopper or Clamshell*	-36' MLLW by 350-450' wide	Point Chehalis or Half Moon Bay	No hopper after 31 May	April and May
Entrance	400,000 sand annually	Hopper	-40' to -46' MLLW by 600-900' wide	South Jetty or Half Moon Bay or Point Chehalis	No hopper after 31 May	April and May
Bar Channel	250,000 sand as needed	Hopper	-46' MLLW by 900' wide	South Beach or South Jetty or 3.9 mile ocean site	No hopper after 31 May	April and May

Notes: (W)=Adverse weather/waves relief site; * A clamshell dredge is used after May 31; Depths shown are authorized depths and do not include advanced maintenance (2') or overdepth tolerance (2'). The South Aberdeen reach has 0' advance maintenance and 1' overdepth. Widths shown are those of the channel bottom. Please see the "Navigation Channel Typical Cross Section" view in Figure 2.

2.2.1 Point Chehalis Open Water Disposal Site

The depth of this site varies between –50 to –70' MLLW. It is a high energy area with a predominately westward current. The irregular bottom consists of fine to medium sized sand grains of marine origin. Historically, this site has been extremely deep. Charts that predate jetty construction show depths of –100' MLLW in this area. Over 30 million cubic yards of dredged material have been placed in this area since 1977, at an average rate of 1.7 million cy/year. Annual survey records indicate that approximately 75% of material disposed at this site erodes during the dredging period, and that another 15% erodes during the following winter. Bathymetric surveys indicate that most of this eroded material moves seaward along the South Jetty. Disposal at this location reduces erosion of the Pt. Chehalis revetment and groins. The Point Chehalis site is the most heavily used disposal site in Grays Harbor.

2.2.2 South Jetty Open Water Disposal Site

The depth of this site varies between –50 to –70' MLLW. This area is subject to fast tidal currents, predominately westward, that sweep along the jetty toe. Rapid seaward erosion of disposed material occurs at this site. The irregular bottom consists of fine to medium sized sand grains of marine origin. Placement of dredged material at this site is necessary to prevent scour and undermining of the South Jetty's toe. This site is the preferred disposal area for inner harbor materials, although when the South Jetty site is full or weather/wave conditions are hazardous then inner harbor materials are disposed at the Point Chehalis site.

2.2.3 Southwest (3.9 mile) Open Water Disposal Site

The depth of this ocean disposal site varies between –100 and –120' MLLW. This site was designated to minimize impacts to Dungeness crabs during the construction phase of the widening and deepening project. This site is not used often because not much material is dredged from the Bar Channel, and material disposed at this site is unavailable for longshore transport (i.e., unable feed beaches to the north).

2.2.4 Half Moon Bay Nearshore Nourishment and Direct Beach Nourishment

The purpose of the direct beach and nearshore disposal at this site is to maintain a stable beach profile (approximately 1V:60H) and to ensure that the armor stone toe of the Point Chehalis revetment is not exposed. Sandy material from Bar, Entrance, South Reach and Outer Crossover Reach channels is placed both at the Point Chehalis revetment (direct nourishment), as well as in the bay as close to shore as possible (nearshore nourishment). The amount of direct beach nourishment material required will depend on loss of material during storm events and/or when the protective stockpile of sandy material fronting the revetment is depleted, in accordance with the October 1998 *Point Chehalis Revetment Extension Project Inter-Agency Mitigation Agreement*. Dredged material will replenish the stockpile at the revetment, which is located above the mean higher high water datum (+9 MLLW at this location). Nearshore nourishment will occur in accordance with the October 1998 *Point Chehalis Revetment Extension Project Inter-Agency Mitigation Agreement*, as bathymetric conditions permit. Nearshore nourishment will only occur when the bay is deep enough for the bottom dump barge to navigate; nourishment occurred during 1996, 1997, 1998, and 1999. Disposal in Half Moon Bay did not occur in 2000 because the area was too shallow for the bottom dump barge to gain access. It is expected that

during the five year term of this Biological Assessment, up to 700,000 cy of suitable sandy dredged material will be placed at the Half Moon Bay sites.

2.2.5 South Beach Near Shore Nourishment

The purpose of disposal at this site is to slow the erosion on the south side of the South Jetty. Sandy material from the Bar Channel is placed as close to shore as possible, generally between –30' and –40' MLLW. This location extends the residence time of dredged material in the littoral system while avoiding productive crabbing areas. It is expected that during the five year term of this Biological Assessment, up to 200,000 cy of Bar Channel material will be placed at the South Beach site.

3. ALTERNATIVES

3.1 Dredging

3.1.1 No Action

Under this alternative, the Corps would not dredge the Grays Harbor Navigation Channel. Shoaling would impede navigation from the Pacific Ocean to the head of the channel at Cosmopolis, Washington. The ability of ships to enter and leave the Port of Grays Harbor safely under full load or during low tide conditions would be restricted. A reduction in shipping of forest products to domestic and international markets would result in serious impacts to the economy of Grays Harbor County. Local companies would have to either ship limited quantities, ship only during higher tides, or ship material from a different port.

3.1.2 Reduced Dredging

Much care has been taken during the formulation of the proposed project to reduce dredging amounts to the very least possible. The quantity of material proposed to be dredged from the Grays Harbor channel during the next five years is the minimum amount necessary to accomplish project purposes. Delaying dredging for just one maintenance cycle would effectively preclude 50% of harbor shipping. There is no practicable alternative for reducing annual dredging requirements that would meet the project objectives presented in the Navigation Improvement Project EIS.

3.2 Disposal

3.2.1 Upland Disposal

Upland disposal sites were used in the past, but all existing upland sites in reasonable proximity to Grays Harbor have been filled to capacity and no new sites have been designated. Substantial cost and logistical constraints preclude use of upland sites not in close proximity to the harbor. Large expanses of undeveloped lands adjacent to Grays Harbor are typically a mixture of beach dune complex and wetlands which have important value as fish and wildlife habitat. Use of these areas is not considered a less environmentally damaging alternative to open water disposal. Disposal in upland sites would also permanently remove clean sands from the sediment-starved Washington coast (i.e., making these sands unavailable for longshore transport to feed beaches to the north).

3.2.2 Wetland Disposal

Extensive intertidal wetland acreage in the inner Harbor was filled using dredged material, creating much of downtown Aberdeen and Hoquiam. It is now recognized that these areas provide many important functions, which would be lost as a result of dredged material disposal. The use of open-water disposal sites is now considered to have less ecological impact than wetland disposal.

4. EXISTING ENVIRONMENT

Grays Harbor is at the mouth of the Chehalis river on the southwestern coastline of Washington, approximately 110 miles south of the entrance to the Strait of Juan de Fuca and 45 miles north of the Columbia River's outfall. The predominant physical feature of the Harbor is the expansive mudflats that cover 63% of the Harbor's surface area at low tide (MLLW); the water surface ranges from about 94 square miles at mean higher high water (MHHW) to 38 square miles at MLLW. Numerous shallow channels have been cut into the mudflat areas of the North, South, and East Bays by ebbtide flows and discharge from the Humptulips, Elk, and Chehalis Rivers, respectively. Harbor sediments are composed of ocean-borne sands in the outer estuary and river-borne silts near river outfalls in the North, South, and East Bays. A mixed transition zones lies between the two in a broad band.

A variety of habitats occur in the Harbor; these habitats and the organisms occupying them were described extensively by USFWS (1982). Deeper subtidal habitat is primarily man-made. Channel habitat largely consists of the dredged navigation channel running the length of the Harbor west from Cosmopolis. Characteristic channel fauna include several species, including starry flounder, staghorn sculpin, sharks, lingcod, and salmon. Other fish species that occur in Grays Harbor include forage fish such as herring (*Clupea harengus*), surf and longfin smelt (*Hypomesus pretiosus*, *Sprinichus thaleichthys*), and anchovy (*Engraulis mordax*). These fish are an important source of food for the larger fish found in the bay.

Sub- and intertidal mudflat habitat radiates from the mouths of major rivers emptying into the estuary. Epibenthic green and blue-green algae and diatoms are the predominant flora, while zooplankton is dominated by copepods and mysids. Softshell clams (*Mya arenaria*), bent-nose clams (*Macoma nasuta*), and polychaete worms dominate the benthos. Mudflats support a wide variety of avian species, such as the western sandpiper, sanderling, yellowleg, dunlin, dowitcher, curlew, western grebe, scoter, cormorant, and great blue heron. Starry flounders, staghorn sculpins, and sticklebacks are the most common resident fish species; mudflats are of special value to juvenile salmonids during their outmigtation.

Subtidal sandflat habitat is found in the western Harbor and is generally bounded toward the nearshore by eelgrass beds at the point where coarse ocean sands begin to mix with finer river-borne silts. Epibenthic algal production is low in sandflat areas, so detrital and deposit feeders are less abundant than in mudflat habitat. Ephemeral sand spits and islands are important nesting and foraging areas for the threatened snowy plover.

Eelgrass (*Zostera spp.*) habitat occurs in areas with moderate current velocities and substrates composed of a mix of sand and silt. In Grays Harbor, eelgrass is generally limited to –3' MLLW because of high turbidity. Areal extent and density may change from year to year as old beds are uprooted and new ones established. Eelgrass habitat provides food, shelter, and substrate for an abundance of marine organisms, thus increasing the biological productivity and diversity of the estuary. Benthic fauna include nereid worms, clams, nematodes, and burrowing anemones. Eelgrass blades support isopods, amphipods, hydroids, bryzoa, harpacticoids, snails, limpets, protozoa, ciliates, and nudibranchs. Juvenile salmonids, striped sea perch, pipefish, and blennies find food and cover in eelgrass beds. Flatfish, crabs, and moon snails can be found in the epibenthos. Eelgrass is also an important food item for waterfowl, particularly the black brant and widgeon.

Emergent vegetation fringes the estuary in areas of tidal influence and low-energy wave conditions. Characteristic marsh flora include three-square bullrush (*Scirpus americanus*), arrowgrass (*Triglochin moritimum*), spike rush (*Eleocharis macrostachya*), sand spurry (*Spergularia marina*), salt grass (*Distichlis spicata*), bullrush (*Scirpus validus*), and Lyngby's sedge (*Carex lyngbyei*). Grays Harbor marsh habitats have been extensively modified during the past century, although losses slowed substantially after 1972. Marsh habitats support the black brant, Canada goose, scaup, mallard, widgeon, canvasback, bald eagle, kestrel, muskrat, vagrant shrew, and Townsend's vole.

The continental shelf along the Grays Harbor coast varies from 30 to 36 miles in width. The continental slope then extends from about the 600-foot depth contour to abyssal ocean depths. The coast is subjected to the full impact of severe winter storm-produced waves. This winter wave environment produces turbulent mixing of surface and bottom waters over the continental shelf, which affects biological productivity, water column characteristics, and sediment transport processes. The shelf area is influenced heavily by the discharge of the Columbia River, which flows northward during the winter months. During the summer months, climatic conditions shift this flow southward and move coastal surface waters offshore, causing upwelling that supports high biological productivity.

The mouth of Grays Harbor is constricted by two sand spits, Point Brown to the north and Point Chehalis to the south, which were formed by coastal processes in recent geologic time. Before the jetties were constructed, sediment was carried into the Harbor by the flood tide, and out of the Harbor with the ebb tide. These sediments formed a large shoal west of the Harbor's inlet. This shoal was broad and shallow, and restricted safe navigation into the Harbor. The construction of jetties at the Harbor mouth confined tidal currents, and created scouring velocities that deepened the entrance channel.

Extensive information on the existing environment of Grays Harbor has been provided in previous environmental documentation. Only new and updated information is included in this brief assessment. A recent summary of research conducted in preparation of channel widening and deepening can be found in the "Environmental Baseline" section of the *Programmatic Biological Assessment for Grays Harbor Navigation Project Fiscal Years 2001-2006 Maintenance Dredging and Disposal*, which is available online at: <http://www.nws.usace.

army.mil/ers/envirdocs.html>.

4.1 Water and Sediment Quality

At present time, both the inner and outer harbors are on Washington's 303(d) list for fecal coliform. Recent sampling in various areas of the harbor indicate that water temperature, dissolved oxygen, and pH standards are sometimes violated, but that these problems may be the result of natural conditions (e.g., solar heating of shallow water) or nutrient enrichment attributed to wastewater treatment plant effluent.

Potential point and nonpoint sources of contaminants in Grays Harbor are associated with past and existing land uses adjacent to the estuary. One of two pulp mills that operated in the vicinity of Cow Point closed in the early 1990s. The Weyerhaeuser pulp mill, located in Aberdeen, is still in operation. Grays Harbor Paper, which produces uncoated free sheet paper used in copying and printing, now occupies the facilities that once housed ITT Rayonier in Hoquiam. Since 1990, the principal sources of dioxin as a result of pulp mill processing have been reduced or eliminated through Ecology actions.

Other potential sources of contaminants may originate from city outfalls located near the navigation channel in Aberdeen and Hoquiam. Paints, petroleum products, and antifoulants [i.e., tri-n-butyl tin (TBT)] may exist in sediments near marinas and boat docks located at Westport, the Hoquiam River in Hoquiam, the Wishkah River in Aberdeen, and smaller creeks surrounding the harbor. Boatyards (Westport Shipyard, The Boatyard and Pakonen & Son), located in Westport, Aberdeen and Hoquiam, respectively, may generate contaminants associated with marinas and sandblast grit (e.g., metals, paint chips, TBT). Seafood processors, oyster mariculture, and cranberry processors are located in South Bay near Westport. The pesticide, sevin (carbaryl) is used by the oyster culture industry to exterminate the burrowing shrimp that cause oysters to sink and perish.

All of the sediments have been tested and approved for open water disposal under the guidelines of the Dredged Material Management Program (DMMP) administered by the Corps, Environmental Protection Agency (EPA), Washington Department of Ecology (Ecology), and Washington Department of Natural Resources (DNR). The requirements for determining that Grays Harbor dredged materials are clean enough for unconfined, open-water disposal are documented in the 1995 *Dredged Material Evaluation Procedures and Disposal Site Management Manual, Grays Harbor and Willapa Bay, Washington* (the GHDMEP). The GHDMEP specifies a six-year "frequency" guideline during which sampling and testing of the entire channel must be completed. For purposes of planning, alternating portions of the navigation channel are characterized every other year. Sampling in the year 2000 initiated the second 6-year cycle of GHDMEP sampling and testing that was first implemented in 1994. The Grays Harbor Navigation channel is low-ranked, meaning few or no sources of chemicals appear to contribute to channel sediments. This conclusion is based on existing data that show no or low levels of chemicals of concern and no significant toxic responses in biological tests. Coarse-grained sands found at the Bar, Entrance, and South Reaches meet no-test guidelines for high-energy areas under the Marine Protection, Research, and Sanctuaries Act.

Although there have been a few chemicals of concern detected in Grays Harbor sediment sampling, virtually all sediments tested have been found suitable for open water disposal since implementation of the GHDMEP in 1994. The most recent sampling took place in July 2000, and characterized approximately 620,000 cy from the upstream portion of the navigation channel, including Cow Point, Aberdeen and South Aberdeen reaches. Eighty-two sediment grab samples were composited per an agency-approved sampling plan for eleven analyses. There were no exceedances of the inter-agency DMMP screening levels for any chemicals of concern. Bioassays of two representative composites showed no effects. Though a suitability determination has yet to be signed by the DMMP agencies, this data indicates that all material is suitable for open-water disposal at any of the proposed disposal sites or nearshore nourishment sites.

4.2 Aquatic and Estuarine Organisms

4.2.1 Oyster Culture

The Washington Department of Natural Resources currently leases 2,231 acres of state-owned aquatic lands in Grays Harbor for the purpose of oyster culture. An additional 500 acres of private and county-owned aquatic lands are also used to grow oysters for commercial harvest. In recent years, much of the prime oyster lands have been lost due to sand movement and high wave energy. Shifting sands bury oyster beds and/or changes the substrate from more productive mud to compacted sand. Large swells interrupt harrowing (harvest) operations, further affecting production. Oyster growers have been forced to shift production to marginal areas where growth rates are not as high and oyster quality is low. The viability of the oyster industry in Grays Harbor appears to be at risk. In South Bay, where most of the state leases are located, this can be attributed to the migration and erosion of Whitcomb Spit.

During the comment period for the Draft Environmental Assessment and Public Notice, the Corps received letters from the Washington Department of Natural Resources (DNR), the Grays Harbor Oyster Growers Association, and several oyster growers regarding this problem. In response the Corps met with the growers, DNR, and the Port of Grays Harbor to discuss the problem and potential solutions.

The oyster growers attribute these changes in the outer harbor to the navigation improvement project, since the rate of change appeared to increase dramatically after the outer reaches of the navigation channel was realigned, straightened, and deepened. The oyster grower's observations of the changes that have occurred over the past decade do support what the Corps knows about inlet morphology in Grays Harbor. However, the Corps believes that the cause of higher wave energies is not the navigation improvement project, but rather the original installation of the North and South Jetties. The jetties are causing a general deepening of the harbor inlet, as intended.

Since changes that have occurred are attributable to the jetties, which are a component of the federally authorized Grays Harbor and Chehalis River Navigation Project, Section 111 of the Water Resources Development Act gives the Corps the authority to study and implement projects for mitigation of damages. The Corps is currently working with the Department of Natural Resources to determine if they are willing and able to become the local sponsor for a Section 111 study.

4.2.2 Dungeness Crab Mitigation Update

Grays Harbor serves as a nursery ground for young Dungeness crabs (*Cancer magister*), which eventually emigrate to the Pacific Ocean and enter an important commercial fishery. Hopper dredges entrain and kill a substantial number of crabs, and may disrupt crab habitat through removal of food and benthic debris that provide shelter for young crabs. The Corps addresses the loss of crabs attributable to the widening and deepening of the Grays Harbor navigation channel through both impact avoidance and replacement measures: (1) dredging is scheduled to occur during periods outside peaks in crab abundance, and (2) a program has been implemented to replace adult Dungeness crabs lost to the commercial fishery by increasing the survival of juvenile crabs. Shortly after construction of the wider and deeper channel in 1990, the Corps began placing oyster shell on tidal flats to enhance the survival of young Dungeness crabs following their metamorphosis from planktonic stages. Larval crab settle in the oyster shell plots, which provide cover and food, then 2 to 3 months later leave the intertidal flat for subtidal waters at a size that can survive most predation pressures.

Dungeness crab losses attributable to dredging were estimated using a Dredge Impact Model (DIM) developed by researchers at the University of Washington (Armstrong et al. 1987, Wainwright et al. 1992). The DIM predicts the number of crabs of various age classes that would be entrained and killed by dredges, then uses that prediction to forecast losses to the fishery. The DIM sets target production goals, but since the DIM is an evolving model production goals have changed since the EISS was published. For instance, periodic trawl data is used to refine the crab abundance parameter (e.g., Visser and Armstrong 1998), and statistical analysis of such new data has changed the entrainment rate parameter.

Since 1990, the Corps has covered 228,319 m^2 of tidal flats in Grays Harbor with oyster shell. More shell than originally planned has been placed because production rates have lagged behind estimates made in the EISS. There are several reasons for this deficiency. The EISS assumed that deployed shell would continue to remain viable crab-producing habitat for at least nine years. Actual shell retention rates have been substantially below expected rates, as shell has sunk and/or become buried faster than anticipated and a method planned to recover sunken shell proved unsuccessful. In addition, by one year after shell placement, shell plots are often colonized by the green shore crab (*Hemigrapsus oregonensis*). This species competes with juvenile Dungeness crab for shell habitat, and may cause settling juvenile Dungeness to avoid areas already colonized by shore crab. Model refinements have also shown that more crabs were killed by dredges than what was predicted in the EISS.

Between 1995 and 1998, an interagency work group met annually to evaluate these problems and update the crab mitigation program. The Corps, USFWS, Washington Department of Fish and Wildlife (WDFW), Washington Department of Ecology (Ecology), Quinault Indian Nation (QIN), NMFS, and U.S. Environmental Protection Agency (EPA) formally modified the crab mitigation program in a September 1998 revision to the original mitigation agreement. Some elements of this revised agreement include: (1) a shift to using clamshell dredges, which entrain 95% fewer crabs than a hopper dredge, in the Crossover and South Reaches during times of the year when crab abundance is high; (2) a refinement of timing restrictions through additional data collection; (3) minimizing dredging by removing only the quantities necessary for navigation purposes; and

(4) a commitment to continue shell placement operations until all past and future impacts have been mitigated. The proposed dredging is consistent with the September 1998 *Revised Crab Mitigation Strategy Agreement*.

Since these changes were implemented, the production deficit has been reduced. Field sampling during June-August 2000 demonstrated that a total of 3.42 million crabs were produced during the summer of 2000, 2.5 million of which were produced by new shell placed in the spring of 2000 (Visser 2000). A preliminary estimate of cumulative crab production from 1990 through 2000 is approximately 15.2 million crabs (Visser 2000). According to the DIM, this number translates to 8.7 million J4 molt crabs (fourth molt after settlement). By the most recent estimates, 92% of the crabs lost through construction of the wider and deeper channel have been replaced and 81% of the crabs lost through incremental maintenance dredging of the improved channel have been replaced. The Corps is currently planning to place additional shell in 2003.

New crab population data has indicated that changes to work windows may be appropriate, so during the five-year term of this EA the timing information presented in Table 1. may be modified. Specifically, high sub-adult and adult crab densities in South Reach have lead the Corps to propose shifting the South Channel hopper dredging window from (April 1 - May 31) to (June 1 - June 30) for the purpose of reducing 1+ and adult crab impacts. This proposed change will not occur until a formal addendum to the *Crab Mitigation Strategy Agreement* is finalized.

4.2.3 Salmon Mitigation Update

When the Grays Harbor channel was widened as part of the navigation improvement project, approximately 1.8 acres of shallow subtidal habitat that is important to migrating juvenile salmon was lost. To mitigate for this loss, the Corps constructed an estuarine slough near the mouth of the Chehalis River in 1990. The slough is approximately 1200 feet long and provides approximately 4 acres of intertidal and shallow subtidal habitat.

The design of the created slough was based upon Ann's Slough, a natural slough adjacent to the mitigation site. Ann's slough provides a reference, or control site, to monitor the effectiveness of the created slough in providing the habitat functions lost when the channel was deepened, as well as salmon usage of the area. The Corps has been monitoring the created slough and Ann's slough for an array of indicators of fish and wildlife functionality; extensive field data collection occurred in 1992, 1995, and 2000.

The final report for the 1999 monitoring period is not yet available, but 1995 monitoring results indicate that the functionality of Ann's slough and created slough are roughly equivalent in several respects (Simenstad et al. 1997). For the following monitoring parameters, the two sloughs were found to be functionally equivalent: (1) densities of common fishes, especially juvenile salmon; (2) shoot density and aboveground biomass of transplanted slough sedge (*Carex lyngbyei*); (3) general avifauna composition and occurrence. Other monitoring parameters show lower equivalency, most notably *C. lyngbyei* below ground standing stock, juvenile salmon prey consumption, and benthic invertebrate composition.

4.3 Threatened and Endangered Species

In accordance with Section 7(a)(2) of the Endangered Species Act of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species. Several species listed as either threatened or endangered are potentially found in Grays Harbor. These species are listed in Table 2.

The Grays Harbor channel maintenance program has been impacted by the October 1999 listing of the Coastal/Puget Sound Distinct Population Segment of bull trout as a threatened species. The bull trout listing has altered the schedule for dredging in the inner reaches. The Corps no longer dredges the Elliot Slough, South Aberdeen, Cow Point, and Hoquiam reaches during February 15 through July 15, a work closure window designated by the USFWS. This timing restriction is protective of bull trout's most critical life history stages in the lower portion of a watershed, juvenile downstream migration and adults returning to the estuary in poor condition after spawning. The Corps, in cooperation with USFWS, is currently planning three years of bull trout sampling in the lower Chehalis to better substantiate bull trout presence in the area during the current work closure window.

Other salmonids protected under the Endangered Species Act are coastal cutthroat trout, proposed as a threatened species in April 1999, and coho salmon, a candidate species as of July 1995. Damon Point, approximately one mile north of South Reach, was designated as critical habitat for the Western snowy plover in December 1999.

5. ENVIRONMENTAL EFFECTS

Extensive information on the effects of dredging in Grays Harbor has been provided in previous environmental documentation. Only new and updated information is included in this assessment.

5.1 Water and Sediment Quality

Dredging and disposal operations will degrade water quality on a very localized and temporary basis, not over the long term nor harbor-wide. Dredge-induced water quality alterations are a short-term phenomena that do not cause problems in most estuarine systems. Given the relatively small quantities of sediment typically suspended, the short duration of suspension, and the dilution that occurs during dispersion, the suspension of sediments around dredges is not likely to lead to appreciable reductions in dissolved oxygen nor increases in turbidity.

During the summer of 1990, the Corps sampled suspended sediment concentrations near operating dredges in the inner harbor. Of 600 samples, only 23 had a total suspended solids (TSS) value higher than 500 mg/l and 7 of these were measuring ambient conditions (Phipps et al. 1992). Given flushing rates calculated for Grays Harbor, sediment plumes created by both clamshell and hopper dredges are thought to dissipate rapidly. The available evidence indicates that suspended sediment concentrations sufficient to cause adverse effects to aquatic/estuarine organisms would be limited in extent, both spatially and temporally. Seattle District is currently working with the Dredging Operations and Environmental Research (DOER) team at the U.S. Army Engineer Research and Development Center (ERDC) to develop a model specific to Grays Harbor that will enable us to better predict the fate of dredge plumes.

Dissolved oxygen (DO) levels will be temporarily reduced during dredging, generally on the order of 1 to 2 milligrams per liter (mg/l) from ambient levels (Phipps et al. 1992). This reduction is normally confined to the immediate area of dredging, is of very short duration (from several minutes to a half hour), and is not expected to degrade water quality to the extent that that aquatic/estuarine resources in the area would be significantly impacted. The Corps monitors DO levels as the dredges operate in the inner Harbor during low flow periods, and during nearshore disposal at Half Moon Bay. If DO levels drop below 5 mg/l, dredging operations are suspended until conditions improve.

Table 2. Endangered Species Potentially Occuring in the Project Vicinity

Species	Listing Status	Critical Habitat	Agency with Jurisdiction
Western Snowy Plover *Charadrius alexandrius nivosus*	Threatened	Designated	USFWS
Marbled Murrelet *Brachyramphus marmoratus*	Threatened	Designated	USFWS
Brown Pelican *Pelecanus occidentalis californicus*	Endangered	—	USFWS
Bald Eagle *Haliaeetus leucocephalus*	Threatened	—	USFWS
Aleutian Canada Goose *Branta canadensis leucopareia*	Threatened	—	USFWS
Bull Trout *Salvelinus confluentus*	Threatened	—	USFWS
Coastal Cutthroat Trout *Salmo clarki clarki*	Proposed	—	USFWS
Coho Salmon *Oncorhynchus kisutch*	Candidate	—	NMFS
Steller Sea Lion *Eumetopias jubatus*	Threatened	Designated	NMFS
Humpback Whale *Megaptera novaeangliae*	Endangered	—	NMFS
Blue Whale *Balaenoptera musculus*	Endangered	—	NMFS
Fin Whale *Balaenoptera physalus*	Endangered	—	NMFS
Sei Whale *Balaenoptera borealis*	Endangered	—	NMFS
Sperm Whale *Physeter macrocephalus*	Endangered	—	NMFS
Leatherback Sea Turtle *Dermochelys coriacea*	Endangered	Designated	NMFS/USFWS*
Loggerhead Sea Turtle *Caretta caretta*	Threatened	Proposed	NMFS/USFWS*
Green Sea Turtle *Chelonia mydas*	Threatened	Designated	NMFS/USFWS*
Olive Ridley Sea Turtle *Lepidochelys olivacea*	Threatened	Proposed	NMFS/USFWS*

Notes:
* NMFS has jurisdiction of sea turtles in the water, while USFWS has jurisdiction over sea turtles on land.

The fine grained sand and silt to be dredged are considered acceptable for open water disposal (see Section 4.1). Since the sediment standards on which this determination is based are designed to be protective of organisms that come into contact with sediments, concentrations and bioavailability of contaminants in sediments suspended during dredging are expected to be below levels that may cause harm to species that come into contact with dredged material.

5.2 Aquatic and Estuarine Organisms

Turbidity associated with dredging and disposal operations may interfere with feeding and respiratory mechanisms of benthic, epibenthic, and planktonic invertebrates. Some sessile invertebrates in the navigation channel will suffer mortality from dredging operations. However, the baseline condition for in-channel benthic infauna is highly modified from natural conditions. The benthic fauna of the Grays Harbor navigation channel are subjected to frequent disturbance and stress—both natural and anthropogenic—including frequent dredging, shipping activity, salinity fluctuations, large-scale sediment movements, and wave action. Several of the species characteristic of the channel are opportunistic species, often small, tube-dwelling, surface-deposit feeders that exihibit patchy distribution patterns in space and time.

Studies have found that benthic organisms recolonize dredged sites quickly, often reaching similar densities within eighteen months, but that they may never reach mature equilibrium benthic communities. In 1992 the Seattle District contracted a study on dredged material management in Grays Harbor and Willapa Bay which included a benthic infauna community analysis (SAIC 1993). In this study various samples were taken of areas that had been previously dredged and areas that had not been dredged. There were more deeply burrowing organisms obtained in the non-dredge sites than in the dredged sites, indicative of a more mature benthic community. The dredged sites consisted of more opportunistic benthic species, as opposed to a mature community.

Mobile benthic organisms and demersal fish are sometimes entrained, or suctioned along with the sediment slurry, by hopper dredges. Most fish species are equipped with sensory apparatus that can detect and avoid dredging equipment. However, some mobile benthic species, such as crabs, flatfish, and sand lance, are known to be susceptible to entrainment. For instance, an estimated 26% of Dungeness crabs in the path of a hopper dredge are entrained (Visser 2000). In a review of ten years (1979-1989) of entrainment data from Grays Harbor, McGraw and Armstrong (1990) found twenty-eight species of fish to be identified in entrainment samples. Pacific sand lance (*Ammodytes hexapterus*) were entrained at the highest rate (594 per 1000 cy), followed by Pacific staghorn sculpin (*Leptocottus armatus*, 92 per 1000 cy) and Pacific sanddab (*Citarichthys sordidus*, 76 per 1000 cy). The greatest entrainment rates and number of species occurred in the South Reach; for much of the study period, hopper and pipeline dredges were used in the inner harbor. A comparison of trawl data with this entrainment data indicates that larger crabs and some fish actively avoided the dredges. The only salmonid in this data set was one chum salmon fry (*O. keta*) entrained by a pipeline dredge in February of 1981.

Clamshell dredges are currently used to remove between 56 and 77% of the material dredged from the Grays Harbor Navigation Channel; annual percentages depend on the type of dredge is used for Outer Crossover and South Reach. Given the characteristics of this equipment, it is

generally accepted that clamshell dredges do not entrain fish. Clamshell buckets remains open until impacting the bottom, so the bucket cannot trap a mobile organism during its descent.

The open-water disposal sites are characterized by a high rate of natural disturbance, given the high velocity tidal currents, exposure to strong wind and wave action, and large volumes of sediments eroded and deposited in the area. Significant epibenthic or infaunal resources would not occur at these relatively deep water sites. Recent trawl surveys have provided information on salmonid, Dungeness crab, razor clam, and forage fish usage of the nearshore and direct beach disposal areas. To the extent possible, the Corps will avoid disposal at the direct beach and nearshore sites during times of the year when the disposal sites are extensively used by these species. Additional trawl surveys will occur before disposal to ensure that adverse impacts to these species will be avoided. Pre-disposal monitoring will be performed prior to disposal at Half Moon Bay, in coordination with WDFW, and if maximum allowable crab densities are reached disposal will not occur.

Potential impacts of dredging and disposal operations on salmonids, forage fish, and Dungeness crabs will be reduced and/or avoided through implementation of timing restrictions, dredge type restrictions, and pre-disposal trawl surveys. In addition, entrainment impacts to Dungeness crab are being mitigated in accordance with the interagency crab mitigation strategy agreements (Section 4.2.1). Due to these measures, impacts associated with this project to these economically important resources should not be significant.

5.3 Threatened and Endangered Species

Pursuant with Section 7 of the Endangered Species Act (ESA), the Corps prepared a Programmatic Biological Evaluation (PBE) to assess potential impacts of the proposed work on species protected under the Act. This document is available online at: <http://www.nws.usace.army.mil/ers/envirdocs.html>.

The PBE concluded that Grays Harbor maintenance dredging was **not likely to adversely affect** the bald eagle (*Haliaeetus leucocephalus*), brown pelican (*Pelecanus occidentalis*), Western snowy plover (*Charadrius alexandrius nivosus*), Aleutian Canada goose (*Branta canadensis leucopareia*), marbled murrelet (*Brachyramphus marmoratus*), bull trout (*Salvelinus confluentus*), humpback whale (*Megaptera novaeangliae*), and Steller sea lion (*Eumetopias jubatus*); would have **no effect** on the blue whale (*Balaenoptera musculus*), fin whale (*Balaenoptera physalus*), Sei whale (*Balaenoptera borealis*), sperm whale (*Physeter macrocephalus*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*); and would **not jeopardize the continued existence** of the Southwest Washington/Columbia River ESU cutthroat trout (*Salmo clarki clarki*). No effect determinations are made for candidate species, such as the Southwest Washington/Columbia River ESU coho (*Oncorhynchus kisutch*).

The PBE was submitted to USFWS and NMFS on December 19, 2000. The Corps received a letters concurring with the determinations made in the PBE on March 20, 2001 (NMFS) and April 19, 2001 (USFWS). If any additional species are listed as threatened and/or endangered during the life of the PBE (2001-2005), re-initiation of consultation will occur immediately.

6. ENVIRONMENTAL COMPLIANCE

6.1 National Environmental Policy Act

This Environmental Assessment (EA), along with the documents listed in Section 1.2, satisfy the documentation requirements of NEPA. The Corps has received six comments on the proposed work. These comments and the Corps response to the comments are included in Appendix E of this document. A Finding of No Significant Impact (FONSI) has been prepared.

6.2 Endangered Species Act

In accordance with Section 7(a)(2) of the Endangered Species Act of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed or proposed threatened or endangered species. A Programmatic Biological Evaluation (PBE) was submitted to USFWS and NMFS on December 19, 2000. The PBE is provided in Appendix C of this document, and is available online at: <http://www.nws.usace.army.mil/ers/envirdocs.html>. The Corps received a letter from NMFS concurring with the determinations made in the PBE on March 20, 2001. The Corps received a letter from USFWS concurring with the determinations made in the PBE on April 17, 2001. Copies of these letters can be found in Appendix F of this document.

6.3 Clean Water Act

The Corps must demonstrate compliance with the substantive requirements of the Clean Water Act prior to discharging dredged materials into waters of the United States. The Corps prepared a 404(b)(1) evaluation to document the Corps' findings regarding this project pursuant to Section 404 of the Act. This evaluation is provided in Appendix A of this document. The Corps received a Section 401 Water Quality Certification from the Washington Department of Ecology on April 9, 2001. A copy of that certification can be found in Appendix F. The Corps will abide by the conditions of the Water Quality Certification to ensure compliance with Washington water quality standards.

6.4 Coastal Zone Management Act

The Coastal Zone Management Act of 1972, as amended, requires Federal agencies to carry out their activities in a manner which is consistent to the maximum extent practicable with the enforceable policies of the approved Washington Coastal Zone Management Program. The Corps has prepared a Coastal Zone Management Act Consistency Determination for the navigation channel maintenance program. This evaluation established that the proposed work complies with the policies, general conditions, and general activities specified in the Grays Harbor County Shoreline Management Master Plan, the City of Westport Shoreline Management Master Plan, and the Grays Harbor Estuary Management Plan. The proposed action is thus considered consistent to the maximum extent practicable with the State of Washington Shoreline Management Program.

6.5 Marine Protection, Research, and Sanctuaries Act

Section 102 of the Marine Protection, Research, and Sanctuaries Act (MPRSA) authorizes the Environmental Protection Agency (EPA) to promulgate ocean dumping criteria and designate

recommended ocean disposal sites. The Southwest (3.9) site has been designated as an ocean disposal site under Section 102 of the MPRSA.

6.6 Rivers and Harbors Act

The Corps prepared an evaluation to document the Corps' findings regarding this project pursuant to pursuant to the Rivers and Harbors Act. This evaluation is provided in Appendix A of this document.

6.7 National Historic Preservation Act

The National Historic Preservation Act (16 USC 470) requires that the effects of proposed actions on sites, buildings, structures, or objects included or eligible for the National Register of Historic Places must be identified and evaluated. It is the policy of the Corps (33 CFR 336.1[c][6]) that historic resources surveys should not be conducted for maintenance dredging and disposal activities proposed within the boundaries of previously constructed navigation channels or previously used disposal areas. Since the proposed dredging is confined to the removal of recently deposited sediments within the previously dredged channel width and depth boundaries, no submerged cultural resources will be affected by the project.

6.8 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 USC 470) requires that wildlife conservation receive equal consideration and be coordinated with other features of water resource development projects. This goal is accomplished through Corps funding of U.S. Fish and Wildlife Service habitat surveys evaluating the likely impacts of proposed actions, which provide the basis for recommendations for avoiding or minimizing such impacts. A Fish and Wildlife Coordination Act Report was prepared for the Navigation Improvement Project. A report is not required for maintenance work.

6.9 Magnuson Fishery Conservation and Management Act

The Magnuson Fishery Conservation and Management Act requires Federal agencies to consult with the National Marine Fisheries Service (NMFS) regarding actions that may adversely affect Essential Fish Habitat (EFH) for Pacific coast groundfish, coastal pelagic species, and Pacific salmon. The Act defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. Descriptions of EFH are provided in Fishery Management Plans produced by the Pacific Fisheries Management Council.

NMFS has determined that the proposed action may adversely impact EFH of Pacific coast groundfish, coastal pelagic species, and Pacific salmon by: (1) reducing the suitability of the action area for settlement and recruitment of early life history stages; (2) entraining substantial numbers of fishes such as Pacific sanddab and sandlance; (3) reducing the quality of surrounding habitat through temporary increases in turbidity; (4) affecting fish and their prey resources through temporary decreases in dissolved oxygen; and (5) reducing the availability of prey resources through disturbance to the benthic invertebrate community.

NMFS offered the Corps the following conservation recommendations to reduce potential impacts to EHF: (1) minimize the disturbance to early life history stages of species with

designated EFH by scheduling work during a time when early life history stages of the fewest species are present in the work area; (2) when conditions permit, employ a clamshell dredge instead of a hopper dredge in the outer reaches to reduce the number of fish entrained; (3) implement the provisions of the Washington State HPA to minimize turbidity and dissolved oxygen impacts, as well as provide data on the utilization of the action area by species with designated EFH; and (4) maximize the time between periods of maintenance dredging to the extent practicable in order to allow more mature benthic prey communities to develop.

With respect to proposed Conservation Measure (1), the Corps has consulted with a number of agencies regarding dredging schedules. The current schedule is the result of years of negotiations between these agencies and the Seattle District's Navigation Section. It reflects consensus regarding the times of year when dredging would have the least impact on important commercial fisheries, species protected under the Endangered Species Act, as well as human safety. If NMFS provides the Corps with information on the early life history stages of species with designated EFH, we could determine if current work windows should be modified to accommodate these species.

Sea and weather conditions prevent the use of clamshell equipment in the outer reaches of the navigation channel. Clamshells dredges are used wherever safe to do so. Provisions of the Washington State HPA to minimize turbidity and dissolved oxygen impacts will be implemented. With respect to proposed Conservation Measure (4), much care has been taken during the formulation of the proposed project to reduce dredging amounts to the very least possible. The quantity of material proposed to be dredged from the Grays Harbor channel during the next five years is the minimum amount necessary to accomplish project purposes. Delaying dredging for just one maintenance cycle would effectively preclude 50% of harbor shipping. There is no practicable alternative for reducing annual dredging requirements that would meet the project objectives presented in the Navigation Improvement Project EIS.

6.10 Hydraulic Project Approval

An HPA from the WDFW is not required for federal work that involves construction within state waters, since there has been no waiver of sovereign immunity by the Federal government to require or allow such regulation of Federal agencies by local governments. An advisory HPA was issued on March 6, 2001 and is provided in Appendix F. To the extent possible, the Corps will abide by the provisions of this HPA.

7. UNAVOIDABLE ADVERSE EFFECTS

Unavoidable adverse effects of the proposed project include: (1) temporary, localized disruption of navigation by operating dredged and disposal barges; (2) temporary, localized disturbance of fish and wildlife in the vicinity of dredging and disposal operation; (3) temporary, localized water quality degradation associated with turbidity plumes; and (4) mortality of sessile and some mobile benthic invertebrates in the path of the dredges and in disposal sites. For reasons discussed in this and previous environmental documents, the Corps has determined that these effects are not significant.

8. CONCLUSION

Based on the above analysis, this project is not a major Federal action significantly affecting the quality of the human or natural environment, and therefore does not require preparation of an environmental impact statement.

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