Biological Evaluation Supplement

North Jetty Major Maintenance
Stations 95+00 to 145+00
Grays Harbor and Chehalis River Navigation Project

Prepared by:
Seattle District, U.S. Army Corps of Engineers
CENWS-PM-PL-ER

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On January 11, 2000 the Seattle District, U.S. Army Corps of Engineers (Corps) submitted a Biological Evaluation for work to be done on the North Jetty, Grays Harbor County, Washington to the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

Features of the work proposed in this document were designed to alleviate scour caused by wave overtopping of the jetty, and to reduce the magnitude and severity of flooding of East Ocean Shores Boulevard and nearby homes. However, subsequent field investigations indicated that there is insufficient erosion behind the jetty to warrant such an extensive structural solution. Raising the jetty top elevation by one foot is expected to address the overtopping problem in a more cost-effective and less disruptive manner.

The Corps would like to revise the project description and design drawings contained in the original Biological Evaluation. The new project description is provided below, and new design drawings are attached.

REVISED PROJECT DESCRIPTION:
All work described below would occur on the portion of the jetty that is directly adjacent to Point Brown; no work would occur on the free-standing portions of the jetty that extend westward from the shore into the Pacific Ocean, and eastward into North Bay. The proposed action consists of the following activities, which are detailed in the attached design drawings:

(a) Placement of approximately 87,000 tons of Class A stone (average weight 15 tons) along approximately 5000' of the North Jetty. The rehabilitated jetty section would have a top elevation of +23' MLLW, a top width of 30' and 2H:1V side slopes. This maintenance work would be offset from the existing alignment to avoid placing new materials below MHHW, and to avoid over-steepening the design slope on the ocean side. The North Jetty's elevation would be raised from +20' MLLW to +23' MLLW. The increase in height would allow for future settlement prior to the next maintenance cycle in approximately 30 years, and is expected to decrease the frequency and magnitude of flood events caused by jetty overtopping.

(b) Grading/excavation of the area landward of the jetty, and construction of a 30' wide access road between stations 99+00 and 137+00. Approximately 5000 cubic yards of sand would be removed from the area and temporarily stockpiled adjacent to the access road. Approximately 10,000 tons of pit run rock would be used for the access road, although exact specifications are under the discretion of the contractor. Upon completion of the project, the stockpiled native material (sand) would be spread onto the access road.

No in-water work would occur. All rock would be placed above +9 MLLW, which is the mean higher high water datum at this location. Large stone pieces would be individually placed on the jetty, most likely by a crane or hydraulic excavator. Contracting documents would specify that placement work will be accomplished at least one foot above still water elevation. The minimum size of armor rock placed on the outer face would be 8 tons, so it is highly unlikely that they could accidentally tumble into the water. Some smaller road material would be placed between the larger rocks on top of the jetty so that vehicles can work from the structure. This road material would be placed between 7 and 14 feet above MHHW. During severe storms some of this smaller material would likely be washed into the Harbor. Grading work and access road construction would also occur out of intertidal areas; boundaries for this project feature occur at +14' MLLW on the western side and +12' MLLW on the eastern side.

The project work would occur during daylight hours, and could utilize track-mounted excavators, bulldozers, and cranes. Approximately 40 round trips by dump trucks are expected each day. A staging area would be located within the project boundaries, likely west of the sewage treatment plant.

Construction is tentatively scheduled to begin during the spring of 2000, and activities would be completed approximately fourteen months later. In the spirit of the Congressional addition to the FY00 budget, the maintenance work will be optimized to maximize wave overtopping protection by the winter 2000/2001 (i.e., large gaps delineated in the 1996 bathymetric survey would be repaired first).

REVISED EFFECT DETERMINATIONS:
The Corps would not like to change the affect determinations made in the original Biological Evaluation.

Biological Evaluation

NORTH JETTY MAJOR MAINTENANCE
STATIONS 95+00 TO 145+00

Grays Harbor, Washington Navigation Project
January 2000

US Army Corps
of Engineers®
Seattle District

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1. INTRODUCTION

This Biological Evaluation describes the potential impacts of maintenance of the Grays Harbor North Jetty on federally listed and proposed threatened or endangered species. The proposed project would rehabilitate approximately 5000 feet of the existing jetty on the northern mouth of Gray's Harbor. This maintenance includes excavation to access the landward toe of the jetty, construction of a rock splash apron, and construction of a berm landward of the jetty through disposal of the excavated material. All proposed work is above mean higher high water; no in-water work would occur.

2. DESCRIPTION OF PROJECT AREA AND ACTION AREA

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. Fresh water inflow to the estuary comes predominately from the Chehalis, Hoquiam, and Humptulips Rivers. The proposed project is located at the Harbor's northern entrance, in T17N R12W Section 27. The action area for this project consists of Grays Harbor, the Pacific Ocean off the Harbor's mouth, and the southernmost 0.25 mile of Point Brown. See Figures 1 through 4.

The predominant physical features of the Harbor are 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 of copepods, starry flounder, staghorn sculpin, sharks, lingcod, and salmon.

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 endangered 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.

Between 1898 and 1902, the first rock jetty in Grays Harbor was constructed 13,734 feet seaward of Point Chehalis at an elevation of +8' MLLW. The South Jetty was constructed with the belief that it would maintain a bar channel of –24' MLLW. A jetty on Point Brown was constructed between 1907 and 1910. The North Jetty was originally 10,000 feet long and built to a height of +5' MLLW. However, shortly after construction was complete it became obvious that these jetties would not stabilize a deeper channel. Between 1910 and 1916, the North Jetty was extended 7000' and reconstructed to a height of +8' MLLW. By 1916, the rehabilitated jetties caused the entrance channel to scour to a depth of –18' MLLW. Between 1917 and 1927, the channel was periodically dredged to a depth of –24' MLLW and in 1928 the channel was dredged to a depth of –36' MLLW.

Between 1935 and 1942, the North Jetty was raised to a height of +20' MLLW. In 1966, 4000 feet of the South Jetty was reconstructed to an elevation of +20' MLLW. At this height, the jetties produced the self-maintaining desired channel depth of –34' MLLW. In 1976, the deteriorating North Jetty was rehabilitated to a height of 20' MLLW.

The scouring of the shoal west of the Harbor inlet freed a large sand supply, which fed the beaches north of the Harbor and resulted in rapid accretion. Between 1870 and 1950 Point Brown advanced seaward approximately 9000 feet, gaining approximately 1500 acres of new land (City of Ocean Shores 1999). Accumulation rates have slowed significantly in recent decades, and during the 1990's coastal erosion and ocean storm-surge flooding became significant problems for the City of Ocean Shores, a portion of which is located on Point Brown. Just as the tremendous accretion on Point Brown resulted from the deepening of the channel, current erosion problems can also be attributed to channel scour caused by the jetties. As the Harbor inlet continues to deepen, wave dissipation decreases. The jetty is now exposed to larger and more frequent ocean storm waves approaching from the southwest. Flooding in south Ocean Shores is occurring with increasing frequency, and is the result of either waves overtopping the North Jetty, and/or breaches in the primary dune north of the jetty along the Pacific Ocean. In addition, scour caused by the jetties and Columbia River dams have reduced the availability of sediment in this area.

The North Jetty was last rehabilitated in 1976, to a height of 20' MLLW with a top width of 30'. A detailed topographic and bathymetric survey of the North Jetty was conducted in August 1996. At this time, the portion of the jetty between stations 115+00 to 145+00 had an average crest elevation of between 17' and 18' MLLW, though several gaps with a top elevation of 14' MLLW were present (see Figure 6). East of Station 155+00, average elevations were about one foot lower. In its present condition, the jetty is overtopped by large amounts of water during even moderate storm events. Drainage through, and adjacent to, the jetty is inadequate to carry away the large volume of incoming water caused by combined extreme high tides and storm wave conditions. This results in erosion along the landward jetty toe, and extensive flooding in the upland portion of the action area. Return flow from overtopping waves has also formed swash channels at both ends of the structure (near Stations 100+00 and 140+00).

Oyhut Wildlife Area and Damon Point State Park, which provide high-quality habitat for a variety of shorebirds, waterfowl, and migratory birds, are located near the project site. The western boundary of the state-owned Oyhut Wildlife Area, which is under the jurisdiction of WDFW, is directly east of the City of Ocean Shores wastewater treatment plant (see Figures 1 and 3). Oyhut consists primarily of salt marsh and intertidal mud flat habitats. Damon Point, a sand spit east of Oyhut, is non-trust state land under the jurisdiction of the Washington Department of Natural Resources and is managed cooperatively by WDFW, Washington State Parks and Recreation Commission, and the City of Ocean Shores.

Point Brown can be characterized by its flat topography and lack of trees. The upland area adjacent to the jetty is platted for multi-family medium- and high-density residential development, and single-family residential development. There are a total of 86 lots, with a mean area of 0.42 acres; 40 of these lots have improvements. No homes are located on the jetty (south) side of East Ocean Shores Boulevard.

The area directly landward of the North Jetty is dominated by the non-native European beachgrass (*Ammophila arenaria*). A few pockets of big headed sedge (*Carex macrocephala*) are present, and scattered individuals of beach pea (*Lathyrus japonicus*), yarrow (*Achillea millefolium*), beach strawberry (*Fragaria chiloensis*), and American searocket (*Cakile edentula*) are dispersed throughout the area. It appears that a few small pockets of standing salt water may occur during certain times of the year, as indicated by the presence of sea milk-wort (*Glaux maritima*) and evidence of salt-stressed European beachgrass in depression areas.

3. PROJECT DESCRIPTION

All work described below would occur on the portion of the jetty that is directly adjacent to Point Brown. No work would occur on the free-standing portion of the jetty that extend westward from the shore into the Pacific Ocean, or on the submerged portion that extends eastward into North Bay. The proposed action consists of the following activities, which are detailed in Figures 5 and 6:

(c) Placement of approximately 65,000 tons of Class A stone (average weight 14 tons) along approximately 5000 feet of the North Jetty. The rehabilitated jetty section would have a top elevation of +22' MLLW, a top width of 30' and 2H:1V side slopes. This maintenance work would be offset from the existing alignment to avoid placing new materials below MHHW, and to avoid over-steepening the slope on the waterward side. The North Jetty's elevation would be raised from +20' MLLW to +22' MLLW. This change would allow for future settlement, caused by the loss of foundation sand, prior to the next maintenance cycle in approximately 25 years.

(d) Excavation of approximately 37,000 cy of sand from the landward side of the jetty. The purpose of this excavation is to provide access to the jetty toe and a level grade for construction of the overtopping apron described below.

(e) Placement of approximately 65,000 tons of 25 lb. to 200 lb. quarry spalls in a 3' to 4' thick layer landward of the jetty. This splash apron would promote drainage and would prevent scouring that could, over time, undermine the landward side of the jetty. It may also be used as a haul road during construction. During the 1976 rehabilitation, a 20-25' wide rock overtopping apron was placed along the landward side of the jetty to protect the toe. No sign of this material remains at this time.

The western 3000' this apron would be 50' wide. A 500' length near the sewage treatment facility would be 120' wide; this widening would prevent runoff from undermining the revetment protecting the sewage plant. A gradually tapering transition between the two widths, built to minimize eddy currents and promote runoff of overtopping water, would be 800' long (see Figure 5). The apron would be graded uniformly from a high point of 13' MLLW at station 125+00 downward to 10' MLLW at its east and west ends to drain overtopping water away from the backshore area. The apron would not extend the entire length of the maintenance project. Its ends would be constructed near stations 140+00 and 95+00; the exact locations would occur at an elevation of +10 MLLW (baselines to be determined in the field).

(f) Disposal of excavated material (from b) above) landward of the overtopping apron in a berm approximately 3450' long with a top elevation of 24' MLLW. This berm is an attempt to reduce the flooding of the backshore area during storm events. However, storms could rapidly displace and rearrange any constructed sand berm. The City of Ocean Shores would maintain this feature, and vegetate or armor it upon project completion. The berm would not become part of the Federal navigation project.

No in-water work would occur. All rock would be placed above +9 MLLW, which is mean higher high water at this location. Physical grading and placement work would occur at least one foot above still water elevation. On the north (landward) side of the jetty, there would be no grading work below +10 MLLW. Work approaching +9 MLLW on the waterward side of the jetty would occur in only a few spots, not the entire length of the project (see cross sections in Figure 6). The smallest rock placed on the outer face would weigh 8 tons, so it is highly unlikely that stone could accidentally tumble into the water. Some

smaller road material may be placed between the larger rocks on top of the jetty so that vehicles can work from the structure. This road material would be placed several (~13) feet above MHHW; however, during severe storms there is a possibility that some of this smaller material could be washed into the Harbor.

The overtopping apron would remain in place after construction, thus extending the rock footprint of the jetty project by 50' to 120' in the landward direction. The berm would become the responsibility of the City of Ocean Shores. The overtopping apron and berm are expected to decrease the frequency and magnitude of flood events in the southern portion of Ocean Shores.

The construction work could utilize track-mounted excavators, bulldozers, and cranes. Approximately 40 round trips by dump trucks are expected each day. A staging area would be located within the project boundaries, likely west of the sewage treatment plant.

Construction is tentatively scheduled to begin during the spring of 1999, and activities would be completed approximately fourteen months later. In the spirit of the Congressional Add to the FY00 budget, the maintenance work would be optimized to maximize wave overtopping protection by the winter 2000/2001. Large gaps delineated in the 1996 bathymetric survey will be repaired first.

4. AFFECTED SPECIES

4.1 Species under USFWS Jurisdiction

A list of species potentially affected by the proposed project was requested from the U.S. Fisheries and Wildlife Service in a letter dated 25 October 1999. A species list was received on 23 November 1999 (FWS Ref: 1-3-99-SP-0101). Species potentially occurring in the project vicinity are:

Bald Eagle (*Haliaeetus leucocephalus*)
Brown Pelican (*Pelecanus occidentalis californicus*)
Western Snowy Plover (*Charadrius alexandrius nivosus*)
Aleutian Canada Goose (*Branta canadensis leucopareia*)
Marbled Murrelet (*Brachyramphus marmoratus*)
Coastal/Puget Sound Population Segment Bull Trout (*Salvelinus confluentus*)
Southwest Washington/Columbia River ESU Coastal Cutthroat Trout (*Salmo clarki clarki*)

4.2 Species under NMFS jurisdiction

National Marine Fisheries Service Northwest Region web sites (*http://www.nwr.noaa.gov/1habcon/habweb/listnwr.htm* and *http://www.nwr.noaa.gov/1seals/marmamlist.html*) were consulted on 26 October 1999 to determine which species under NMFS's jurisdiction potentially occur in the project area. Species that may occur off Washington include:

Humpback Whale (*Megaptera novaeangliae*)
Blue Whale (*Balaenoptera musculus*)
Fin Whale (*Balaenoptera physalus*)
Sei Whale (*Balaenoptera borealis*)
Sperm Whale (*Physeter macrocephalus*)
Steller Sea Lion (*Eumetopias jubatus*)
Leatherback Sea Turtle (*Dermochelys coriacea*)
Loggerhead Sea Turtle (*Caretta caretta*)
Lower Columbia/Southwest Washington ESU Coho (*Oncorhynchus kisutch*)

Only the humpback whale, Steller sea lion, and coho will be thoroughly addressed in this biological evaluation. There is little evidence that the remainder of species under NMFS' jurisdiction are likely to occur in the project's action area.

Blue whales may feed on the continental shelf off of Washington and Oregon during the summer months, however the species is most abundant off the coast of California (Reeves et al. 1998a). North Pacific Fin whale concentrations generally form along frontal boundaries or mixing zones between coastal and oceanic waters; no regular occurrences off the coast of Washington were noted in a 1998 draft recovery plan for this species (Reeves et al. 1998b). Sei whales inhabit areas along the continental slope, and rarely enter semi-enclosed marginal seas or gulfs (Reeves et al. 1998b). Sperm whales, while more frequently present off the coast of Washington, typically inhabit deep waters and seldom venture close to coastal areas (Barlow et al. 1997). The preferred habitat for all of these whale species is the open ocean, not coastal waters.

Leatherback sea turtle nesting grounds occur between 40°N and 35°S (Plotkin 1995), so no nesting areas are located in Washington. While this species may use oceanic areas off the coast of Washington as foraging grounds during the summer and fall months, aerial surveys indicate that when off the U.S. Pacific coast leatherbacks usually occur in continental slope waters (NMFS and USFWS 1998a). The nesting areas of Loggerhead sea turtles are also located in the subtropics, though primarily in the western Pacific (NMFS and USFWS 1998b). It is thought that eastern Pacific waters may be used as foraging grounds and migratory corridors. However, sightings in the eastern Pacific are generally confined to the summer months off of southern California (NMFS and USFWS 1998b).

Given the distributions of these marine mammal and sea turtle species and the lack of in-water work during jetty rehabilitation, the Corps believes the proposed project will have **no effect** on these species.

5. METHODS

As the subject of several Environmental Assessments and Environmental Impact Statements, Grays Harbor has been extensively studied by the Corps of Engineers. In-house expertise provided a starting point for this evaluation. In addition, scientific literature was reviewed and local experts were interviewed to provide a basis for the affect determinations. References are named in the text and are listed in Section 11.

6. DETERMINATION SUMMARY

Below is a table summarizing the status and effect determinations made for each of the species listed above. Also included are the page numbers where detailed descriptions of the forecasted effects of the proposed action on these species can be found.

Table 1. Determination Summary

Species	Listing Status	Effect Determination	Page
Bald Eagle	Listed Threatened	Not likely to adversely affect	14
Brown Pelican	Listed Endangered	Not likely to adversely affect	16
Western Snowy Plover	Listed Threatened	Not likely to adversely affect	17
Aleutian Canada Goose	Listed Threatened	Not likely to adversely affect	19
Marbled Murrelet	Listed Threatened	Not likely to adversely affect	20
Bull Trout	Listed Threatened	Not likely to adversely affect	22
Coastal Cutthroat Trout	Proposed	Not likely to jeopardize the continued existence	23
Humpback Whale	Listed Endangered	Not likely to adversely affect	24
Blue Whale	Listed Endangered	No effect	13
Fin Whale	Listed Endangered	No effect	13
Sei Whale	Listed Endangered	No effect	13
Sperm Whale	Listed Endangered	No effect	13
Steller Sea Lion	Listed Threatened	Not likely to adversely affect	26
Leatherback Sea Turtle	Listed Endangered	No effect	13
Loggerhead Sea Turtle	Listed Threatened	No effect	13
Coho	Candidate	No determination made	28

7. IMPACTS OF THE PROPOSED PROJECT

7.1 Bald Eagle

The Washington State bald eagle population was listed as threatened under the Endangered Species Act of 1973, as amended (64 FR 16397), on 14 February 1978. Since DDT was banned in 1972, bald eagle populations have rebounded. The bald eagle was proposed for de-listing on 6 July 1999.

The bald eagle is found only in North America and ranges over much of the continent, from the northern reaches of Alaska and Canada to northern Mexico. Bald eagles in Washington State are most commonly found along lakes, rivers, marshes, or other wetland areas west of the Cascades, with an occasional occurrence along major rivers in eastern Washington.

The bald eagle wintering season extends from 31 October through 31 March. Food is recognized as the essential habitat requirement affecting winter numbers and distribution of bald eagles. Other wintering habitat considerations are communal night roosts and perches. Generally the largest, tallest, and more decadent stands of trees on slopes with northerly exposures are used for roosting; eagles tend to roost in older trees with broken crowns and open branching (WDFW 1998). Bald eagles select perches on the basis of exposure, and proximity to food sources. Trees are preferred over other types of perches, which may include pilings, fence posts, powerline poles, the ground, rock outcrops, and logs (Steenhof 1978).

Bald eagles nest between early January and mid-August. The characteristic features of bald eagle breeding habitat are nest sites, perch trees, and available prey. Bald eagles primarily nest in uneven-aged, multi-storied stands with old-growth components. Factors such as tree height, diameter, tree species, position on the surrounding topography, distance from water, and distance from disturbance also influence nest selection. Bald eagles normally lay two to three eggs once a year, which hatch after about 35 days. Snags, trees with exposed lateral branches, or trees with dead tops are often present in nesting territories and are critical to eagle perching, movement to and from the nest, and as points of defense of their territory.

Known Occurrences in the Project Vicinity

Bald eagle sightings during the winter months are more frequent than during other times of the year, as Grays Harbor provides important bald eagle winter feeding habitat. Anadromous fish returning to spawn, waterfowl, and shorebirds are the primary prey items in the estuary. Eagles tend to congregate near the mouths of the Humptulips, Elk, Johns, and Hoquiam rivers, and near Newskah and Charley creeks. Bald eagles likely prey on the shorebirds and waterfowl that congregate in the Oyhut Wildlife Recreation Area and on Damon Point, which are located northeast of the North Jetty.

The coniferous forests surrounding the Harbor provide nesting and roosting habitat for bald eagles. However, no forested habitat is available on Point Brown. Due to a lack of trees in this area eagles would be expected to perch on other landscape features. Eagles may occasionally perch on the jetty, most likely near its western and eastern terminuses. The remainder of the jetty is subject to frequent and regular human and dog use. In addition, prey concentrations would likely be higher at either end of the structure.

Effects of the Action

Project construction would extend for 14 months, so activities would occur during the bald eagle wintering and nesting seasons. However, the project is far from known bald eagle nests, so construction activities would not directly disrupt eagle nesting and rearing of young. No communal night roosts or perch trees would be affected, as none are present near the site.

Foraging bald eagles may be temporarily displaced by the noise of heavy equipment, but the availability of prey will not be significantly disrupted by project construction. Eagles tend to tolerate more disturbance at feeding sites than in roosting areas (Steenhof 1978). Eagles may avoid perching on the jetty during construction activities. Since eagles are transient in nature, they will naturally move to another perch site if disturbed (Fielder 1997).

Determination of Effect

The Corps believes this project **is not likely to adversely affect** the bald eagle. This determination is based on the lack of nests and communal night roosts in the immediate vicinity. This project would have no effects on bald eagle foraging, nesting, or roosting habitat. While construction activities have the potential to disrupt feeding opportunities in a localized area, this project would not alter the long-term food base.

7.2 Brown Pelican

In 1970 the brown pelican was listed as a endangered species under Endangered Species Conservation Act of 1969. This species is currently listed as endangered under the Endangered Species Act of 1973, as amended (64 FR 16397).

The California brown pelican is the Pacific coast form of a more widespread species. The breeding distribution of the subspecies ranges from southern California southward to Mexico. Between breeding seasons, the subspecies may range as far north as Vancouver Island (Gress and Anderson 1983). Post-breeding dispersal patterns depend largely on oceanographic conditions which influence prey availability. During the summer, brown pelicans migrate northward from their breeding range in central California to feed. The primary northward movement occurs in July, however the migration is "irregular and prolonged" (Bent 1964). They return south in the spring for nesting season, though juveniles may remain in the northern feeding grounds for several weeks after the adults have left. Peak egg laying generally occurs in March and April.

Pelicans eat fish species generally considered unimportant commercially, such as menhaden, herring, sheepshead, pigfish, mullet, grass minnows, top minnows silversides, and occasionally prawns. Feeding occurs primarily in shallow estuarine waters with the birds seldom venturing more than 20 miles out to sea except to take advantage of especially good fishing conditions. Sand spits, offshore sand bars, and rock areas such as jetties are used extensively as daily loafing and/or nocturnal roost areas.

In the late 19th and early 20th centuries, pelicans were hunted for their feathers, which were used to adorn women's clothing and hats. Following World War I, fishermen believed pelicans were decimating catches and slaughtered the birds by the thousands. During the late 1960s and early 1970s, the west coast brown pelican population experienced widespread pollutant-related reproductive failures. Since DDT was banned in 1972, pelicans have made a steady comeback. Brown pelicans are sensitive to human disturbance during some stages of their life cycle. The greatest impact occurs during the early stages of breeding (Gress and Anderson 1983).

Known Occurrences in the Project Vicinity

The brown pelican may be present in Grays Harbor from June through October, when they are commonly seen flying along the shore. Pelicans tend to favor rocky shorelines for perching; they perch on the North Jetty, primarily near its western terminus, when in the vicinity. The nearest brown pelican nocturnal roost area is located in Willapa Bay.

Effects of the Action

Brown pelicans will be in California nesting for a portion of the construction activities. During the remaining months, they can be expected to be feeding in the area. The proposed project will have no temporary or permanent effects on the brown pelican food base, although some disruption to foraging could be expected to result from the noise of heavy equipment. It is thought that effects of disturbance on non-breeding pelicans are not as significant as effects of similar disturbances during the breeding season. Pelicans can generally be more flexible in their response to disturbance when not breeding, since they are not held to a relatively limited geographic area as they are during the breeding season (Gress and Anderson 1983).

The jetty does serve as a perching area, however it is normally subject to frequent and repeated disturbance by human activity from both its waterward and landward sides. Pelicans will likely avoid perching on the

jetty where active construction is occurring. However, the proposed rehabilitation covers approximately a mile of the jetty structure; day-to-day operations will occur on a relatively small portion of the entire jetty length.

Determination of Effect
The proposed project is **not likely to adversely affect** the brown pelican since potential effects would occur during the non-breeding season and would be highly localized. In addition, pelicans are accustomed to human activity in the area, and there is ample feeding and perching habitat available elsewhere in Grays Harbor.

7.3 Western Snowy Plover

The western snowy plover was listed as a threatened species under the Endangered Species Act of 1973, as amended (64 FR 16397), on 5 March 1993. The primary cause of the western snowy plover population decline is poor reproductive success resulting from loss of nesting habitat. Active nesting colonies have declined as a result of the spread of non-native European beachgrass, urban development, human disturbance, predation, and inclement weather.

The western snowy plover breeds on the Pacific coast from southern Washington to Mexico, with a center of distribution near the southern boundary of California. Preferred nesting habitat includes sand spits, dune-backed beaches, unvegetated beach strands, open areas around estuaries, and beaches at river mouths (USFWS 1993). Most snowy plovers return to the same breeding site in subsequent breeding seasons. Of 28 snowy plover breeding sites on the Pacific coast two occur in Washington, one at Leadbetter Point in Willapa Bay and another at Damon Point in Grays Harbor. On 7 December 1999, the USFWS designated both nesting sites as Western snowy plover critical habitat (USFWS 1999). Damon Point is located approximately 5000 feet northeast of the eastern boundary of the proposed project (see Figures 1 and 3).

The breeding season of the western snowy plover extends from mid-March through mid-September. In Washington clutches are initiated from late April to late June, chicks hatch one month after eggs are laid, and fledging occurs from late June through August (WDFW 1995). Chicks leave the nest hours after hatching, and rarely remain in the nesting territory until fledging. Nest success varies widely. Instances of low nest success have been attributed to a variety of factors, such as predation, human disturbance, and inclement weather conditions.

Some birds winter in the same areas used for breeding, while others migrate either north or south to wintering areas. Snowy plovers occasionally winter in southern coastal Washington, however most winter south of Bodega Bay, California. Wintering habitats are similar to those used in during the nesting season.

Snowy plovers forage on invertebrates in the wet sand and surf-cast macroalgae of the intertidal zone, in sandy areas above high tide, on salt pans, on spoil sites, and along the edges of salt marshes and salt ponds.

Known Occurrences in the Project Vicinity
The northernmost record of wintering snowy plovers on the Pacific coast was on Cape Shoalwater on the northern mouth of Willapa Bay (USFWS 1995). Plovers are not known to over-winter on Damon Point or within the Oyhut Wildlife Area (USFWS 1999).

When plovers are in the area during nesting season, they generally forage on natural dunes along the beaches west of the construction area and on ephemeral sand spits within the Oyhut Wildlife area

(Richardson 1999). Given the dynamic nature of sand spits within Oyhut, however, it is difficult to definitively identify "current" foraging areas (Richardson 1999). Plovers are not thought to forage west of the point where the jetty becomes submerged (Richardson 1999); this location is approximately 1300 feet from the eastern boundary of the proposed construction. The abundance of sand dune arthropods is markedly depressed in areas dominated by European beachgrasss; plovers are thought to shift foraging activities away from sites which support a reduced prey base (WDFW 1995). This, combined with the level of human and vehicle disturbance in the vicinity, makes it highly unlikely that plovers would forage in the area directly landward of the jetty.

Plovers nest on recently accreted, unvegetated areas of Damon Point. Up to six adults and four nests were found in a 1994 survey at Damon Point and Oyhut Wildlife Area (WDFW 1995). Vegetation density is likely a limiting factor for nest site placement on Damon Point; when accretion outpaces pioneering vegetation, there is a net gain of potential plover nesting habitat (WDFW 1995). Damon Point State Park and the Oyhut Wildlife Area, which borders the Ocean Shores sewage treatment facility, have been designated as critical habitat for the Western snowy plover.

Effects of the Action

The proposed work would have no effect on the snowy plover food base. Rock transport and placement operations will produce noise above ambient levels, and thus may disturb plovers foraging in Oyhut. The effects of such disturbance are expected to be insignificant. No physical impacts of the proposed work on recent plover nesting areas are anticipated would occur as all of the work would be at least 5000 feet from recent nesting areas. Construction noise will not likely travel to Damon Point, so potential effects to nesting behavior are improbable. The proposed project will have no effect on plover predator populations.

The Corps has determined that the proposed project will **not adversely modify** designated Western snowy plover critical habitat. Construction of the overtopping apron is not likely to alter the topography or hydrology of the area east of the sewage treatment facility. The most severe overtopping events occur during higher tides. Overwash is expected to join with the tidal waters on the overtopping apron and recede slowly as the tide goes out, as opposed to flowing quickly and scouring the outflow area. The high tides would buffer runoff in the non-spall protected areas.

In the Washington State Recover Plan for the Snowy Plover (WDFW 1995), Scott Richardson described the effects of previous jetty maintenance on deposition patterns in the Harbor. Richardson noted:

> "The 1975 rehabilitation of the Grays Harbor North Jetty caused a temporary cessation of accretion at Damon Point by blocking the localized eastward movement of North Beach sands along the north side of the Harbor mouth. Gradually, the beach north of the jetty accreted westward until sand "filled" the jetty, allowing movement of sand around the tip of the jetty and eastward, resulting in the significant growth of Damon Point over the past 15 years (D. Schuldt, USACE, pers. comm.)."

Stations 100+00 to 160+00 were raised during the 1976 rehabilitation. In the proposed maintenance project, new jetty stone will be placed only on the upper portions of the jetty above the mean higher high water line. No additions to the submerged seaward (south) jetty toe or to the western-most portions (stations 145+00 to 160+00) will be made. Since very little beach material is being transported southward through the existing structure in the section where the maintenance is proposed (stations 95+00 to

145+00), the proposed work is not anticipated to affect sediment transport and disposition patterns in any way.

Determination of Effect
The proposed project is **not likely to adversely affect** the western snowy plover since there would be effects to plover foraging or nesting habitat. Potential noise disturbance effects are expected to be insignificant.

7.4 Aleutian Canada Goose

The Aleutian Canadian goose was federally recognized as an endangered species in 1967, and was reclassified as a threatened species under the Endangered Species Act of 1973, as amended (64 FR 16397), on 12 December 1990. The Aleutian Canadian goose was proposed for de-listing on 3 August 1999.

The Aleutian Canadian goose is one of 11 currently-recognized subspecies of the large and diverse *Branta canadensis* group. It is the only subspecies in this group whose range once included both the North American and Asian continents. The Aleutian Canadian goose is currently nests on remote islands southward of the Alaska Peninsula and in the Aleutian Archipelago (USFWS 1990). Most Aleutian geese migrate from their Alaskan breeding grounds in September. They may stop along the Washington and Oregon coasts en route to wintering grounds in California, where they begin arriving in mid-October. The California winter habitat is primarily agricultural lands, where the geese feed on grass, waste beans, and grains such as corn and sprouting winter wheat (USFWS 1999). Aleutian geese depart wintering areas in April, and return to Alaska to nest and rear young between May and September.

The decline in numbers of Aleutian geese is attributed to predation by arctic foxes, which were introduced on nesting grounds from 1836-1930. Hunting during migratory periods and on wintering areas is thought to have kept their numbers depressed (USFWS 1999). In addition, development and modification of wintering and migration habitat is considered a threat to Aleutian geese populations (USFWS 1999).

Known Occurrences in the Project Vicinity
Although Washington was potentially part of the historical winter range of the Aleutian Canada goose, today the state is considered important only for its migratory habitat. The Willapa National Wildlife Refuge and surrounding fields/farms provide the principal stop-over habitat in Washington. Occasionally individuals and small flocks stop briefly in other parts of the state, such as the Ridgefield National Wildlife Refuge. No other regularly-used areas are known (Hays 1997).

Birds usually visit Willapa Bay during the fall migration, from September until the end of November, whereas sightings of spring migrants generally occur between February and March (Hays 1997).

Effects of the Action
The proposed project would have no effect on Aleutian goose nesting or wintering habitat. No known stop-over sites in the vicinity of the project. However, the noise of heavy equipment could disrupt Aleutian goose flight paths; such an effect would likely be insignificant.

Determination of Effect
The proposed project is **not likely to adversely affect** the Aleutian Canadian goose since the proposed work will have no effect on nesting, wintering, or stop-over habitat. Potential effects of any disruptions to flight paths would be discountable.

7.5 Marbled Murrelet

The marbled murrelet was listed as a threatened species under the Endangered Species Act of 1973, as amended (64 FR 16397), on 1 October 1992. Primary causes of population decline include the loss of nesting habitat, and direct mortality from gillnet fisheries and oil spills.

Marbled murrelets forage in the near-shore marine environment and nest in inland old-growth coniferous forests of at least seven acres in size. The subspecies occurring in North America ranges from Alaska's Aleutian Archipelago to central California. Marbled murrelets nest in low-elevation forests with multi-layered canopies. Murrelets select large trees with horizontal branches of at least seven inches in diameter and heavy moss growth. Of 95 murrelet nests in North America during 1995, nine were located in Washington. 1 April through 15 September is considered nesting season; however in Washington, marbled murrelets generally nest between 26 May and 27 August (USFWS 1999). Adults feeding young fly between terrestrial nest sites and ocean feeding areas primarily during the dawn and dusk hours.

Marbled murrelets spend most of their lives in the marine environment, where they forage in areas 0.3 to 2 km from shore. Murrelets often aggregate near localized food sources, resulting in a clumped distribution. Prey species include herring, sand lance, anchovy, osmerids, seaperch, sardines, rockfish, capelin, smelt, as well as euphasiids, mysids, and gammarid amphipods. Marbled murrelets also aggregate, loaf, preen, and exihibit wing-stretching behaviors on the water.

Although marine habitat is critical to marbled murrelet survival, USFWS' primary concern with respect to declining marbled murrelet populations is loss of terrestrial nesting habitat. In the marine environment, USFWS is primarily concerned with direct mortality from gillnets and spills of oil and other pollutants (USFWS 1996).

Known Occurrences in the Project Vicinity

Marine observations of murrelets during the nesting season generally correspond to the presence of large blocks of nesting habitat. Studies have found that during the nesting season murrelets are more numerous along Washington's northern coast and less abundant along the southern coast. This distribution appears to be correlated with proximity to old growth forest, the distribution of rocky shoreline versus sandy shoreline, and the abundance of kelp and prey items (USFWS 1996). Murrelets, therefore, would not be expected to forage regularly in the project vicinity during the nesting season. Observations documented by Speich and Wahl (1995) support this conclusion. They found that marbled murrelets are generally present in Grays Harbor during the fall, winter, and spring; they are rarely seen in August and September. The highest numbers occurred in habitats closer to shore, generally in the Grays Harbor channel out to the 50m depth contour.

Effects of the Action

Construction activities would have no effect on murrelet nests, nesting habitat, or nesting season foraging behaviors. However, construction activities would occur adjacent to foraging habitat, so some disturbance to feeding activities during the rest of the year could be expected. Noise levels are the primary concern. USFWS guidance suggests that noise above ambient levels is considered to potentially disturb marbled murrelets when it occurs within 0.25 mile of suitable foraging habitat (USFWS 1996). Rock transport and placement operations will produce noise above ambient levels. However, the project area is located approximately 0.5 mile from the navigation channel, where murrelets are most commonly seen when in the

Harbor (Speich and Wahl 1995). USFWS (1996) notes that over water, noise may carry further than 0.25 miles. The loud wind and surf in the area are expected to mask such a carrying effect to a large extent.

The effects of human disturbance on murrelets at sea is not well documented, but they apparently habituate to heavy levels of boat traffic (Strachan et al. 1995). In addition, marbled murrelets are relatively opportunistic foragers; they have a flexibility in prey choice which likely enables them to respond to changes in prey abundance and location (USFWS 1996). This indicates that if murrelets are present in the immediate vicinity of construction activities and they are if disturbed while foraging, they would likely move without significant injury.

The proposed construction activities will not affect murrelet prey or predator species. See Section 10 for a discussion of steps that will be taken to prevent oil spills or the entry of other contaminants into Grays Harbor.

Determination of Effect
The proposed project is **not likely to adversely affect** the marbled murrelet since the project will have no effect on nests, nesting habitat, or the murrelet food base. Any disruption to foraging activities are expected to be minor, and would be highly localized relative to this species' foraging range.

7.6 Bull Trout

The Coastal/Puget Sound bull trout population segment was listed as a threatened species under the Endangered Species Act of 1973, as amended (64 FR 16397), in October 1999.

Bull trout is a western North American char in the family Salmonidae. In 1978, bull trout were differentiated from Dolly Varden as a separate species (Cavender 1978). This original work was supported by the further investigations of Haas and McPhail (1991). Bull trout populations have declined through much of the species' range; some local populations are extinct, and many other stocks are isolated and may be at risk (Rieman and McIntyre 1993). A combination of factors including habitat degradation, expansion of exotic species, and exploitation have contributed to the decline and fragmentation of indigenous bull trout populations.

Bull trout are known to exhibit four types of life history strategies. The three freshwater forms include adfluvial forms, which migrate between lakes and streams; fluvial forms, which migrate within river systems; and resident forms, which are non-migratory. The fourth strategy, anadromy, occurs when the fish spawn in fresh water after rearing for some portion of their life in the ocean.

Bull trout spawning usually takes place in the fall during September and October. Initiation of breeding appears to be related to declining water temperatures. In Washington, Wydoski and Whitney (1979) reported spawning activity was most intense at 5 to 6^{o}C. Spawning occurs primarily at night. Groundwater influence and proximity to cover are reported as important factors in spawning site selection. Bull trout characteristically occupy high quality habitat, often in less disturbed portions of a drainage. Necessary key habitat features include channel stability, clean spawning substrate, abundant and complex cover, cold temperatures, and lack of barriers which inhibit movement and habitat connectivity (Reiman and McIntyre, 1993).

Juvenile bull trout, particularly young of year (YOY), have very specific habitat requirements. Small bull trout are primarily bottom-dwellers, occupying positions above, on or below the stream bottom. Bull trout

fry are found in shallow, slow backwater side channels or eddies. The adult bull trout, like its young, is a bottom dweller, showing preference for deep pools of cold water rivers, lakes and reservoirs (Moyle 1976).

Known Occurrences in the Project Vicinity
A bull trout subpopulation is known to occur in the Chehalis River, however it is not known if this population is fluvial or anadromous. Bull trout in the Coastal-Puget Sound population segment have declined in abundance and distribution within several individual river basins; since the Chehalis is located near the southern extent of the species, abundance may be naturally low (USFWS 1999). In recent years there have been fewer reports of incidental catches of bull trout and Dolly Varden in the Chehalis Basin (USFWS 1999). Little historical and current information is available on potential causes of population declines, though habitat degradation has adversely affected other salmonids in the system and is assumed to have similarly affected bull trout (USFWS 1999).

Effects of the Action
Potential impacts to fishery resources were considered during the design of the proposed work, and steps have been taken to minimize construction impacts: the alignment of the jetty would be offset in the landward direction to avoid placement of rock below MHHW, and rock would be hauled via the landward side of the jetty as opposed to more cost-effective barge transport.

The proposed work will not alter existing intertidal habitat, nor would it affect feeding, refuge or spawning habitat. No trees would be removed during construction. Some smaller road material may be placed between the larger rocks on top of the jetty so that vehicles can work from the structure. This road material would be placed several (~13) feet above MHHW; however, during severe storms there is a possibility that some of this smaller material could be washed into the Harbor. A small increase in turbidity and sedimentation could be expected to occur during such events. However, elevated turbidity levels would be negligible considering high background turbidity during such events and the materials would likely be flushed to sea.

Determination of Effect
The Corps has determined that the proposed project is **not likely to adversely affect** bull trout. This determination is based on the lack of effects to spawning, rearing, or foraging habitat. No in-water work would occur, thus the project would not impede the migrations of bull trout.

7.7 Coastal Cutthroat Trout
The Southwest Washington/Columbia River ESU coastal cutthroat trout was proposed as a threatened species under the Endangered Species Act of 1973, as amended (64 FR 16397), on April 5, 1999. The Grays Harbor Basin is included in this ESU.

Though there is some qualitative and descriptive data of coastal cutthroat trout, there is little quantitative data; comprehensive information on distribution, abundance, age, structure, run timing, and other biological characteristics are largely absent (NMFS and USFWS 1999). Their population status is unknown, but believed to be declining.

Coastal cutthroat spawn in small tributaries of large or small streams with a drainage area of less than 13 km^2; they are known to spawn in numerous river systems throughout Western Washington (Pauley et al. 1989). Adult returns are associated with stream size and marine access (Johnston 1982). Coastal

cutthroat enter natal streams to feed and spawn from July to February—generally September to October for larger rivers, and January to February for small streams. Spawning occurs from December through May, and alevins emerge from gravel during June and July (Johnston 1982). In Washington and Oregon, the return of spawned-out adults to salt water peaks in late March and early April (Trotter 1997). Juveniles rear in freshwater for 2 to 3 years, then migrate to estuaries and marine waters during April and May. Juveniles and adults usually remain close to their natal estuary, and sometimes overwinter in freshwater streams.

Known Occurrences in the Project Vicinity
Washington south coast coastal cutthroat stocks, including those in the Grays Harbor basin, have life histories similar to Puget Sound stocks; most spend their entire life cycle without leaving stream and estuary zones (Leider 1997). In Grays Harbor adult in-migration generally occurs during September and October, while outmigration peaks in late March and early April; juvenile outmigration usually takes place during April and May (Trotter 1997 and Leider 1997).

Effects of the Action
Potential impacts to fishery resources were considered during the design of the proposed work, and steps have been taken to minimize construction impacts: the alignment of the jetty would be offset in the landward direction to avoid placement of rock below MHHW, and rock would be hauled via the landward side of the jetty as opposed to more cost-effective barge transport.

The proposed work will not alter existing intertidal habitat, nor would it affect feeding, refuge or spawning habitat. No trees would be removed during construction. Some smaller road material may be placed between the larger rocks on top of the jetty so that vehicles can work from the structure. This road material would be placed several (~13) feet above MHHW; however, during severe storms there is a possibility that some of this smaller material could be washed into the Harbor. A small increase in turbidity and sedimentation could be expected to occur during such events. However, elevated turbidity levels would be negligible considering high background turbidity during such events and the materials would likely be flushed to sea.

Determination of Effect
The Corps believes this project **will not jeopardize the continued existence** of the Lower Columbia River/Southwest Washington ESU sea-run cutthroat trout. This determination is based on the lack of effects to spawning, rearing, or foraging habitat. No in-water work would occur, thus the project would not impede the migrations of coastal cutthroat trout. For these same reasons, we would also determine that the project is not likely to adversely affect the species, should it be listed.

7.8 Humpback Whale
In 1970 the humpback whale was listed as a endangered species under Endangered Species Conservation Act of 1969. The humpback is currently listed as endangered under the Endangered Species Act of 1973, as amended (64 FR 16397).

Based on whaling statistics, the pre-1905 humpback population in the North Pacific can be estimated at 15,000. By 1966, this population was reduced to approximately 1,200. The North Pacific population is now thought to exceed 3,000 (Barlow 1994).

Humpbacks are a highly migratory species. Two types of migrations are distinguished: within-season movements through a portion of the summer range, presumably to find or follow concentrations of prey, and long-distance migrations between summering and wintering areas (NMFS 1991). The summer range of humpbacks extends from subtropical waters to the arctic and the species winters in tropical waters, where mating and calving occur. During the summer, North Pacific humpbacks feed in coastal areas; greatest numbers generally occur off the Aleutian Islands and California coast. The primary prey item of humpback whales is euphausiids, but they also feed on schooling fish such as anchovies, herring, sand lance, capelin, sardines, cod, and juvenile salmonids (Nitta and Naughton 1989). When not migrating, they occur very close to shore. Humpbacks visit coastal and inside waters more often than other large whale species, with the exception of the gray whale. At one time humpbacks were one of the most frequently sighted whales in Washington's inside waters.

Barlow (1994) identified four relatively separate migratory populations in the North Pacific: the coastal California/Oregon/Washington-Mexico stock, the Mexico offshore island stock, the central North Pacific stock (Hawaii/Alaska), and the western North Pacific (Japan) stock. The coastal California/Oregon/Washington-Mexico stock ranges from Costa Rica to southern British Columbia, but is most common in coastal waters off California in the summer/fall and Mexico in the winter/spring (Barlow et al. 1997). In 1996, the minimum population estimate for this population was 563; the coastal California/Oregon/Washington-Mexico stock appears to be increasing in abundance (Barlow et al. 1997).

In 1965, the International Whaling Commission banned the commercial harvest of humpback whales in the North Pacific. Current threats to humpback populations include entanglement in offshore drift gillnets and ship strikes. It is thought that increasing levels of anthropogenic noise in the world's oceans may also impact whales, particularly baleen whales like the humpback that may communicate using low-frequency sound (Barlow et al. 1997).

Known Occurrences in the Project Vicinity

Based on aerial and shipboard surveys between 1975 and 1994, humpbacks are the second most abundant (after the gray whale) large whale off of Washington and Oregon (Barlow et al. 1997). The summer distribution of humpbacks is linked to local distribution of prey, which is driven by physical oceanographic conditions; factors such as upwelling and converging currents, which are characteristic of fjords, channels, continental shelves, offshore banks, and the edges of continental shelves, affect the abundance and availability of prey items (NMFS 1991).

Effects of the Action

Potential effects to humpbacks as a result of the proposed work largely relate to possible sound disturbance caused by construction activities. No boat operations will be a part of construction activities, however rock transport and placement operations on the landward side of the jetty will produce noise above ambient levels. When placed on the waterward side of the jetty, rocks will be placed individually only above the water line; dumping of rock loads from transport trucks will occur only on the landward side of the jetty. Whale responses to sound disturbance may include avoidance, startle, annoyance, and slowed rate of travel (Calambokidis et al. 1987). Short-term impacts of any sound disturbance related to construction activities would likely result in displacement of animals rather than injury. The potential for long-term or indirect impacts of the proposed project to humpbacks is minimal. Jetty maintenance will not increase vessel traffic in the mouth of the Harbor, and construction activities are not anticipated to degrade water quality or decrease prey availability in any way.

Determination of Effect
The proposed project is **not likely to adversely affect** the humpback whale since no in-water work would occur, thus the potential for significant sound disturbance or impacts to water quality and prey abundance are highly unlikely.

7.9 Steller Sea Lion
The Steller sea lion was listed as a threatened species under the Endangered Species Act of 1973, as amended (64 FR 16397), on 26 November 1990. In 1997, the North Pacific's population of Steller sea lions was separated into two distinct stocks, one of which was reclassified as endangered. The status of the eastern stock, which includes the population inhabiting the waters of the Washington coast, remains unchanged.

The present range of the Steller sea lion extends from northern Japan, through the Bering Sea and Aleutian Islands, along Alaska's southern coast, and south to California. The centers of abundance and distribution lie in the Gulf and Alaska and Aleutian Islands. Steller sea lions are not known to migrate, but they do disperse widely during portions of the year other than the breeding season. Most information on the distribution of Steller sea lions has been collected during summer months, so their distribution during late fall and winter is poorly known (Steller Sea Lion Recovery Team 1992).

Two types of terrestrial habitats are utilized by Stellar sea lions: rookeries are areas where adults congregate for breeding and pupping, and haul-outs are areas used for rest and socializing. Sites used as rookeries during the breeding season may be used as haul-outs during the remainder of the year. Steller sea lions haul-out on offshore islands, reefs, and rocks, while rookeries generally occur on beaches. Preferred rookeries and haul-out areas are located in relatively remote areas where access by humans and mammalian predators is difficult; locations are specific and change little from year to year (Steller Sea Lion Recovery Team 1992).

When not on land Steller sea lions are generally seen inshore, less than 5 miles from the coast. Steller sea lion foraging patterns vary depending upon age, season, and reproductive status, as well as the distribution and availability of prey. Foraging patterns of females during the winter months vary considerably; individuals travel an average of 133 km and dive an average of 5.3 hours per day. The vast majority of feeding dives occur to a depth of 100 m. The diet of Washington's Steller sea lions is not well known; primary prey items may include cod, pollock, rockfishes, herring, and smelt (Gearin and Jeffries 1996). They appear to be largely opportunistic feeders.

During the past 30 years, Steller sea lion populations have suffered a dramatic decline. Numbers in the rookeries of central/southern California, the central Berring Sea, and in the core Alaskan ranges have all decreased substantially. A number of natural and anthropogenic factors have been hypothesized as contributing to these declines, but a primary cause has not been definitively identified. It is generally thought that a nutritional deficiency resulting from a lack of abundance or availability of suitable prey is involved (Steller Sea Lion Recovery Team 1992). Major shifts in the abundance of fish in the Berring Sea over the past several decades are well documented (WDFW 1993). The Alaska pollock and Atka mackerel fisheries have specifically been implicated in decreasing the availability of prey. A similar decline has not been documented in the region from southeast Alaska through Oregon, where Steller sea lion numbers appeared to have remained stable (Steller Sea Lion Recovery Team 1992).

Known Occurrences in the Project Vicinity

Steller sea lions may be observed along the Washington coast year round, but they are most abundant during March-April and August-November, and least abundant during breeding season in May-July (Gearin and Jeffries 1996). No breeding rookeries have been identified in Washington waters; however, in 1992 a single pup was born on Carroll Island (WDFW 1993)

The majority of Washington's haul-out sites are located along the northern outer coast. Major haul-out sites are concentrated at large rock complexes including Tatoosh Island, Cape Alva, Carroll Island, Split/Willoughby rocks, and the Columbia River South Jetty (Gearin and Jeffries 1996). No haul-out sites located in Grays Harbor were documented in the literature reviewed.

Effects of the Action

Given the lack of rookery and haul-out areas near Grays Harbor, when in the vicinity Steller sea lions are likely on foraging expeditions. Construction activities will have no effect on breeding habitat or behavior, and are unlikely to affect the Steller sea lion prey base. Construction activities would occur in an area with substantial human activity on both the waterward and landward sides of the shoreline. Additional noise from the operation of heavy equipment may have an effect on foraging opportunities. No boat operations will be a part of construction activities, however rock transport and placement operations on the landward side of the jetty will produce noise above ambient levels. When placed on the waterward side of the jetty, rocks will be placed individually only above the water line; dumping of rock from transport trucks will occur only on the landward side of the jetty. Short-term impacts of any sound disturbance related to construction activities would likely result in displacement of animals rather than injury. The potential for long-term or indirect impacts of the proposed project to Stellar sea lions is minimal. Jetty maintenance will not increase vessel traffic in the mouth of the Harbor, and construction activities are not anticipated to degrade water quality.

Determination of Effect

The Corps believes this project is **not likely to adversely affect** the Steller sea lion since the species is no in-water work will occur, thus the potential for significant sound disturbance or impacts to water quality and prey abundance are highly unlikely.

7.10 Lower Columbia River/Southwest Washington ESU Coho

The Lower Columbia River/Southwest Washington ESU coho salmon was declared a candidate species under the Endangered Species Act of 1973, as amended (64 FR 16397), in July 1995. The Grays Harbor Basin is included in this ESU.

Coho salmon have one of the more predictable life histories of the Pacific salmon. After 1 or 2 years in ocean waters, adult coho return to Grays Harbor from mid- to late September through mid-December, enter their parent rivers in beginning in October, and begin to spawn in November (WDFW and Washington Treaty Tribes 1994). Coho larvae spend 2 to 3 weeks absorbing the yolk sac in the gravels of the redd before they emerge. Juvenile coho salmon then rear in freshwater for approximately 15 to 18 months prior to migrating downstream to the ocean. Newly emergent fry usually congregate in schools in pools of their natal stream. As juveniles grow they move into riffle habitat and aggressively defend their territory, resulting in the displacement of excess juveniles downstream to less favorable habitat (Wydoski and Whitney 1979). This aggressive behavior may be an important factor maintaining the numbers of juveniles within the carrying capacity of the stream, and distributing juveniles more widely downstream. As territories are established, individuals rear in selected areas of the stream and feed on drifting benthic organisms and terrestrial insects. Territories expand as juveniles grow. Feeding and growth slow

considerably in the fall and winter, as food production and fish metabolisms slow. Coho seek off-channel sloughs and ponds in which to spend the winter.

Known Occurrences in the Project Vicinity
Coho are found in nearly all significant streams throughout the Grays Harbor drainage (WDFW and Washington Treaty Tribes 1994). Habitat characteristics at the project site are not conducive to coho spawning.

Effects of the Action
Potential impacts to fishery resources were considered during the design of the proposed work, and steps have been taken to minimize construction impacts: the alignment of the jetty would be offset in the landward direction to avoid placement of rock below MHHW, and rock would be hauled via the landward side of the jetty as opposed to more cost-effective barge transport.

The proposed work will not alter existing intertidal habitat, nor would it affect feeding, refuge or spawning habitat. No trees would be removed during construction. Some smaller road material may be placed between the larger rocks on top of the jetty so that vehicles can work from the structure. This road material would be placed several (~13) feet above MHHW; however, during severe storms there is a possibility that some of this smaller material could be washed into the Harbor. A small increase in turbidity and sedimentation could be expected to occur during such events. However, elevated turbidity levels would be negligible considering high background turbidity during such events and the materials would likely be flushed to sea.

8. INTERRELATED AND INTERDEPENDENT ACTIONS

The functionality of the North Jetty maintenance is interrelated to the maintenance of the Grays Harbor Federal Navigation Channel. By keeping the jetty maintained, the need for dredging of the channel is reduced.

Storms could rapidly displace and rearrange the sand berm created through the disposal of materials excavated for the project. The City of Ocean Shores may choose to vegetate or armor this berm so that it provides protection from flooding. The Corps would not maintain this feature, and it would not be part of the Federal navigation project.

9. CUMULATIVE AND SECONDARY EFFECTS

The City of Ocean Shores recently completed a Draft Environmental Impact Statement which described alternatives for managing the coastal erosion and ocean storm surge-flooding problems currently impacting a portion of the City. The Draft EIS identified several categories of alternatives including: 1) no action, (2) retreat and retreat with dune construction, (3) on-shore beach nourishment and/or offshore beach nourishment, (4) and construction of structural features (City of Ocean Shores 1999). No preferred alternative was identified in the Draft EIS. The Ocean Shores City Council has the final decision-making authority; some of the alternatives identified in the Draft EIS would require federal involvement.

There is a possibility that the project would be perceived as flood control. Such a perception could result in a secondary effect of increased home construction in the subdivided area behind jetty. However, an increase in development would be unlikely for two reasons: this area's real estate is "red lined" meaning

that obtaining a mortgage would be difficult, and obtaining city construction permits would also be difficult.

10. CONSERVATION MEASURES

The following conservation measures will be implemented during construction activities. These conditions are included in project contracting specification documents. A Corps inspector would be on-site to ensure that contractors abide by these requirements.

1) All grading and placement work will be accomplished in the dry at least one foot above still water elevation.
2) Large stone pieces will be individually placed on the jetty, so that they rest securely upon underlying material and are in contact and interlock with adjacent stone to the maximum extent possible.
3) Petroleum products and other toxic materials will be stored in a staging area above MHHW, and will be prevented from entering surface waters.
4) If distressed or dead fish, or any obvious sign of contamination such as oil sheen or odor, are observed by the contractor all work will cease and the inspector shall be notified.
5) All garbage from work crews will be placed into containers which are emptied on a regular schedule.

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