

# Minor Bank Stabilization Repair Activities

## 1.0. Summary of Activity

### 1.1. For all Fresh Waters *excluding* the Columbia River mainstem

This programmatic biological evaluation does not apply to fresh waters.

### 1.2. For the Columbia River mainstem *including* Snake River and Baker Bay

This programmatic biological evaluation does not apply to the Columbia River and Baker Bay.

### 1.3. For all Marine/Estuarine Waters *excluding* Baker Bay

Minor repair of existing bulkhead or sloped revetment only in marine/estuarine waters, provided that:

1. Work is done within the approved work window.
2. No work is done over or adjacent to vegetated shallows, wetlands, or spawning habitat for forage species.
3. All natural beach complexity features are not disturbed.
4. Less than 10% of the total bank protection (but not to exceed a total length of 10 linear feet) will be repaired.
5. Repair is in-kind and in-place at the existing structure.
6. Timber is untreated or treated with biodegradable<sup>1</sup>, non-toxic material and will be sprayed with a biodegradable material to prevent concrete from sticking to the form.
7. No uncured concrete shall come into contact with the waterbody.
8. All work will be done in the dry.
9. All work on the beach is done by hand.
10. No heavy equipment shall operate on the beach.
11. Bioengineering shall be employed wherever possible.
12. Access to the beach is via existing upland access.
13. Work is not done within one mile of a known steller sea lion haul-out.

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<sup>1</sup> According to established ASTM (American Society of Testing Material) procedures the following is the definition of biodegradability: A minimum of 40% of the original sample has been decomposed to inert ingredients within twenty eight (28) days.

14. No uncured concrete will come in contact with the waterbody.

15. Repair activities in or adjacent to a SUPERFUND or MTCA site are not covered under this programmatic.

## **2.0. Programmatic Description**

Individual permits (IPs), Nationwide Permit 3 (NWP 3) or Nationwide Permit 13 (NWP 13) may authorize the minor repair of existing bank stabilization in waters of the U.S. in Washington State. This programmatic biological evaluation applies only to such activities where the repair is less than 10% of the total bank protection, not to exceed a total length of 10 linear feet. Work that cannot be designed or constructed to fit under this biological evaluation must go through individual informal or formal ESA consultation.

## **3.0. Project Location**

All marine and/or estuarine waters excluding for the mouth of the Columbia River (Baker Bay) only in the counties of Washington State where the National Marine Fisheries Service and U.S. Fish and Wildlife Service have concurred that the project is not likely to adversely affect listed fish species and designated critical habitat and will not jeopardize proposed fish species or destroy or adversely modify proposed critical habitat.

## **4.0. Project Description**

For small repair activities, usually the repair is of a rock wall or timber wall and occasionally partial repair of a concrete wall. It is more typical for a concrete wall to be completely replaced versus partially repaired. Complete replacement is not addressed under this document. For partial replacement of any of these materials, the damaged area is removed by hand and handtools. A trench is excavated only at the damaged location and then the new material is placed. The trench is either excavated by hand with hand tools or with an excavator that is situated on the uplands, the excavator bucket reaching over the bank to the structure. For rock walls where the rock has fallen onto the beach, the rock is either lifted off the beach and put in place by hand or with an excavator situated on the uplands and the bucket reaching on to the beach. For concrete bulkhead repairs, forms and rebar will be placed before the concrete is poured. The forms are timber and are sprayed with a biodegradable lubricant prior to concrete placement to ensure that the concrete does not stick to the forms. For timber bulkheads, the untreated timber piles may be driven by hand or by pile driver (depending on length). If timber piles are being replaced, piling replacement shall comply with requirements and conditions of the Corps Programmatic Biological Evaluation for "Replacement of 18 Piling." This programmatic biological evaluation does not cover any interrelated and/or interdependent work activities in any of the designated critical habitat areas, except those activities distinctly specified.

## **5.0. Project Construction:<sup>2</sup>**

### **Construction Equipment**

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<sup>2</sup> Description of construction practices was collected from personal communication with representatives from WDFW, King County Department of Natural Resources, Japhet Bulkhead, and Sound Bulkhead.

For small repairs, any work on the beach is done by hand with the use of a hand truck, wheelbarrow, and shovels. An excavator (or pile driver if applicable) may be situated on the uplands with the excavator bucket reaching over the bank to either remove or place material on the beach. A pumper truck may also be used in the uplands to pour concrete.

## **Access**

The beach in front of the site is accessed by an existing upland access point.

## **Work Corridor**

Work corridor is a maximum of 10 feet wide in front (waterward) of the existing structure for the length of the repair (10% of the length of the bank protection, but not to exceed 10 linear feet). This width is based on the area necessary to move the wheelbarrow and other equipment around on the beach as well as how far damaged material has fallen waterward of the structure (i.e. rocks).

## **Removal of Existing Structure**

Structure is removed by hand, usually with the use of a wheelbarrow or hand truck. The structure may be removed with an excavator if the excavator can access the structure from the uplands.

## **Trenching and Preparation**

Trench depth is typically 2 feet deep for the length of the partial repair. The width is dependent upon the type of material used. The excavated material will be stockpiled on the uplands, transporting it from the beach by wheelbarrow. If concrete bulkhead is being partially replaced, wood forms will be placed in the trench. After placement, forms are sprayed with a biodegradable lubricant to ensure that the concrete does not stick to them. The forms are removed after the concrete has cured (2 to 3 days depending on weather conditions).

## **Stockpiling**

All material, including excavated material, will be stockpiled on the uplands.

## **Placement**

For timber or rock, the material is placed by hand or by equipment (such as pile driver or excavator) that is situated on the uplands with the material being placed and then backfilled with quarry spalls, drain rock or the like. For concrete, the concrete may be brought in with hand equipment and then poured into the forms. Concrete may be poured from the uplands from a truck. Concrete must cure before the next incoming tide or be protected from reaching adjacent waters. Timber must be sprayed with a biodegradable lubricant prior to concrete placement to ensure that it doesn't stick.

## **Clean-up**

Since work is conducted by hand, minimal clean up is necessary and can be done by hand as well, especially since no material is stockpiled on the beach. Pea gravel may be placed in front of the repair in compliance with WDFW mitigation requirements (see Corps Programmatic Biological Evaluation for

Nearshore Fill for State HPA Mitigation Requirements). The gravel in front of the repair may be raked to remove depressions created by the construction activities.

### **Construction Timing**

Most of the repair work takes one day. If a concrete bulkhead is being partially replaced, then 2-3 days is necessary to place the forms, pour the concrete, and allow the concrete to cure. Work must be done in the dry at low tide during approved work windows.

## **6.0. Action Area Description**

The action area is for activities in marine waters of Washington State, excluding Baker Bay. The action area includes the length of the repair area (10 % of the existing bank protection not to exceed 10 linear feet), the access road (an existing upland access point), the upland work corridor for a width of 25 feet, a work corridor along the beach for a width of 10 feet in front of the length of the repair, and a radius of 25 feet<sup>3</sup> from waterward edge of the work corridor for potential “temporary water quality” impacts.

## **7.0. Species and Habitat Information**

### **7.1. Species Present**

The animals, insects, and fish present in the project area are provided in Table 1 through 3. No listed plant species are found in marine or estuarine areas. Details on species can be found in Appendix B.

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<sup>3</sup> The determination of impact area for potential water quality impacts is based on personal communication with John Malek, Sediment Management, Environmental Protection Agency, on May 10, 2000. Mr. Malek stated that typically turbidity impacts of a pile driving, anchor placement or the like would not exceed a 15-foot radius, a 25-foot radius is the maximum extent of impact, regardless of substrate type and currents at a project site.

Table 1. Sensitive Terrestrial Animals and Insects Potentially Occurring in Designated Project Areas

<b>Species Name</b> <i>Scientific Name</i>	<b>Status</b>	<b>Marine/Estuarine Water Area (excluding Baker Bay)</b>
Brown Pelican <i>Pelecanus occidentalis</i>	E	X
Marbled Murrelet <i>Brachyramphus marmoratus</i>	T	X
Northern Spotted Owl <i>Strix occidentalis</i>	T	X
Short-Tailed Albatross <i>Phoebastria albatrus</i>	E	X
Western Snowy Plover <i>Charadrius alexandrinus</i>	T	X
Canada Lynx <i>Lynx canadensis</i>	T	
Columbia White-Tailed Deer <i>Odocoileus virginianus leucurus</i>	E	
Gray Wolf <i>Canis lupis</i>	E	
Grizzly Bear <i>Ursus arctos horribilis</i>	T	
Pygmy Rabbit <i>Barchylagus idahoensis</i>	E	
Woodland Caribou <i>Rangifer tarandus caribou</i>	E	
Oregon Silverspot Butterfly <i>Speyeria zerene hippolyta</i>	T	X

Table 2. Sensitive Marine Animals Potentially Occurring in Designated Project Areas

<b>Species Name</b> <i>Scientific Name</i>	<b>Status</b>	<b>Marine/Estuarine Water Area (excluding Baker Bay)</b>
Blue Whale <i>Balaenoptera musculus</i>	E	X
Fin Whale <i>Balaenoptera physalus</i>	E	X
Humpback Whale <i>Megaptera novaeangliae</i>	E	X
Sei Whale <i>Balaenoptera borealis</i>	E	X
Sperm Whale <i>Physeter macrocephalus</i>	E	X
Killer Whale <i>Orcinus orca</i>	E	X
Steller Sea Lion <i>Eumetopias jubatus</i>	T	X
Green Sea Turtle <i>Chelonia mydas</i>	T	X
Leatherback Sea Turtle <i>Dermochelys coriacea</i>	E	X
Loggerhead Sea Turtle <i>Caretta caretta</i>	T	X

Table 3. Sensitive Fish Species Potentially Occurring in Designated Project Areas

Species Name <i>Scientific Name</i> Evolutionary Significant Unit (ESU)/Distinct Population Segment (DPS)	Status	Marine/Estuarine Water Area (excluding Baker Bay)
Bull Trout <i>Salvelinus confluentus</i> Coastal/Puget Sound DPS Columbia River DPS	T T	X X
Chinook Salmon <i>Oncorhynchus tshawytscha</i> Puget Sound ESU	T	X
Steelhead <i>Oncorhynchus mykiss</i> Puget Sound ESU	T	X
Sockeye Salmon <i>Oncorhynchus nerka</i> Ozette Lake ESU Snake River ESU	T E	X X
Chum Salmon <i>Oncorhynchus keta</i> Hood Canal Summer-run ESU	T	X

## 8.0. Activity History and Status

Table 4 is a breakdown of the number of repair and maintenance activities of existing bank stabilization structures authorized by the Corps of Engineers. The breakdown is organized by year. Only marine waters are covered under this programmatic.

### 8.1. Marine

All marine waters, excluding Baker Bay, within Washington State (i.e., Pacific Ocean, Willapa Bay, Grays Harbor, Strait of Juan de Fuca, Strait of Georgia, Puget Sound, Hood Canal, Samish Bay, Skagit Bay, Totten Inlet, Dabob Bay, Commencement Bay, etc.). Because of the design of the Corps database, it was not possible to separate out tidal areas from minor freshwater creeks, streams, and unnamed tributaries that flow into these waterbodies.

To determine the number of bank stabilization activity verifications, all finalized permit actions were queried against the key word “NWP 3” and cross-referenced with the work type “bank protection.” The cross-referencing ensures that the activity is properly categorized and each wetland enhancement authorization is only counted once. The data set below represents only those bank stabilization repair and maintenance activities where the Corps was notified and a verification was actually issued. The following data also includes before- and, when applicable, after-the-fact authorizations. In comparing the Corps database with one year of data from WDFW (1998) for bank protection repair and replacement activities, the Corps database represents less than 1% of the actual number of bank stabilization repair activities, and less than 33% of all new bank stabilization activities. From January through August of 1998, WDFW issued 127 HPAs for bank protection repair activities in Washington State. The WDFW data for this time frame does not distinguish between fresh water areas and marine/estuarine areas.

**Table 4: Historical Record of Corps Authorization of Bank Stabilization Repair Activities**

<b>WATERBODY</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
Marine	26	34	62	50	18

As of August 2005, this programmatic has been used six times since authorization.

## **9.0. Environmental Baseline**

The environmental baseline is provided in Appendix C.

## **10.0 Effects of the Action**

### **10.1 Direct Effects**

Effects of the project to listed and proposed species will be similar in nature among species with the variability of the lifestage when the species utilizes the action area. Primary effects will be to juvenile salmonids as they directly use the marine nearshore for migratory corridor, refuge and forage areas. Effects to adult salmon and bull trout and other listed species would be secondary. Adult bull trout migrate in the shallow subtidal areas versus the intertidal areas.<sup>4</sup> Typically, the bank protection occurs in the intertidal areas. However, forage fish that they are dependent upon, spawn in intertidal areas, having the potential to be directly affected by the project. Although in some cases, beach degradation exacerbated by the bank protection may lower the beach to such an extent that the bulkhead is in subtidal waters. By definition, projects that are now in subtidal waters do not meet this “not likely to adversely affect” category, because of the restriction that work must be done in the dry during low tide.

- 1) Water quality (Turbidity): Under terms of this informal programmatic consultation, work is done during the approved work windows when listed or proposed species, or forage/prey species are least likely to be present. All construction will occur during low tide when the work corridor is in the dry, the only opportunity for sediments to enter the water column would be associated with erosion induced by the construction activity or precipitation. To keep erosion associated with construction material at insignificant and discountable levels, only hand equipment (wheelbarrows and hand trucks) will be used on the beach for the construction, heavy equipment shall only be sited on the uplands, no heavy equipment will operate on the beach, and no barges, or boats will be used for construction or to bring in construction material. As outlined in Appendix F - Implementation Conditions, all construction material will be cleaned or washed out beyond 300 feet landward of the MHHW line with no wash water reentering the waterbody, and all stockpiling will occur on uplands. In addition, all work will be conducted in approved work windows when listed, proposed or forage fish species are least likely to be present. Any potential temporary sediment plumes that may inadvertently occur will be insignificant and/or discountable as they are minimized, localized, and will drop out of the water column to background levels in less than one hour. Use of sediment and erosion control measures as outlined in Appendix F - Implementation Conditions will keep erosion associated with construction activities, stockpiling, cleaning and washing of equipment, and precipitation to insignificant and/or discountable levels as well.

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<sup>4</sup> Jeff Chan, U.S. Fish and Wildlife Service, “Seattle District Regulatory Branch, ESA Training”, personal communication. July, 23, 1999.

- 2) **Water Quality (Chemical Contamination):** Under the terms of this informal programmatic consultation, no uncured concrete may come into contact with the waterbody. Either “quick-setting concrete” may be used or the timing of construction schedule during low high tides so that the concrete will cure before tidal inundation. Wet concrete causes a change in the pH of the water due to the lime in the concrete, resulting in the water that comes into contact with the concrete becoming “basic” in fresh water systems. Basic water can adversely impact fish. These effects may be lessened in marine/estuarine waters, as the lime has more options to bind to aside from the water in marine/estuarine systems. If semi-wet concrete has a partially cured “skin” then the lime will leach at a slower rate.<sup>5</sup> Cured concrete in fresh water systems releases carbonate ( $\text{CO}_3^{2-}$ ) through natural weathering processes. Carbonate reacts with hydrogen ( $\text{H}^+$ ) to form bicarbonate ( $\text{HCO}_3^-$ ) and/or carbonic acid ( $\text{H}_2\text{CO}_3$ ). A product of these reactions is an increase in pH, thereby causing the water that comes into contact with the weathering concrete to become basic.<sup>6</sup> In addition, to ensure that chemical contamination will not occur, only the use of untreated timber and bio-degradable or non-toxic form lubricant is covered under this programmatic biological evaluation. It is possible that removal of existing bank stabilization within Superfund Clean-up sites or sites designated for clean-up under the Washington State Model Toxic Clean-up Act could result in exposure of hazardous or toxic chemical contaminants within the substrate (sediments contaminated by industrial pollutants). Thus, to be covered by this informal programmatic consultation and outlined in Appendix F – Implementation Conditions, bank stabilization repair activities will not be located in or adjacent to (within 300 feet) of existing or previously designated Superfund sites or Washington State Model Toxic Clean-up sites. Using these methods of installation, adverse impacts to water quality in terms of chemical contamination will be insignificant and/or discountable.
- 3) **Habitat Health (Refugia):** Overhanging vegetation, beach complexity features such as large woody debris and rocks, and vegetated shallows all provide refugia for juvenile salmonids. (Macdonald, et al 1987) Studies have shown that juvenile salmonid predation by cutthroat is significantly reduced in vegetated shallows. (Gregory and Levings 1996). Boat activity near or adjacent to vegetated areas has been documented to damage and/or destroy the vegetated areas. (NOAA, 1998) To ensure no impacts to overhanging vegetation, work will be limited to projects that will not result in disturbing, degrading, or removing any woody riparian vegetation. Any herbaceous areas disturbed will be revegetated with native plant species per Revegetation Guidelines as outlined in Appendix F - Implementation Conditions. To ensure that refugia on the beach is not impacted, work will be limited to the use of hand equipment, which means no heavy equipment, barges, or boats will be used for construction or to bring in construction material. In addition, to be covered under this informal programmatic consultation, work will be limited to those areas that are not located within or adjacent to vegetated shallows and all natural beach complexity features will remain on the beach. Using these methods of installation, adverse impacts to refugia will be insignificant and/or discountable.
- 4) **Habitat Health (Forage fish habitat):** Primary forage fish for salmonids include Pacific herring, surf smelt, and sand lance. Pacific herring spawn in vegetated shallows, primarily on eelgrass from late January through early April. Surf smelt spawn in the upper intertidal areas (between tidal elevations of +7.0 feet and MHHW) and require specific ratios of coarse sand to pea gravel for spawning habitat. The spawning areas are typically associated with freshwater seepages. Surf smelt spawn in the high intertidal reaches on beaches dominated by pea gravel. Sand lance

<sup>5</sup> Impacts associated with concrete were obtained through personal communication with Hal Michael, Fisheries Biologist, Washington Department of Fish and Wildlife on February 3, 2000.

<sup>6</sup> Information on the impacts of the natural weathering of concrete was obtained through personal communication with Maryann Baird, Soil Scientist, U.S. Army Corps of Engineers, Regulatory Branch.



spawn in the upper intertidal zone on a variety of substrates, from fine sand to pea gravel dominated beaches. As adults, sand lance school in nearshore marine waters, foraging during the day and burrowing in the sand at night. (WDFW, 1997b) To be covered under this informal programmatic consultation, no work will be allowed in or adjacent to spawning areas or vegetated shallows and all work will be conducted in approved work windows when listed, proposed or forage fish species are least likely to be present. Using these methods of installation, adverse impacts to forage fish habitat will be insignificant and/or discountable.

- 5) Habitat Health (Forage insect habitat): Juvenile salmonids have been documented to feed on both aquatic and terrestrial insects. Insects are dependent upon the overhanging riparian vegetation and the debris introduced by the overhanging vegetation for food and refuge. To ensure that impacts to forage insects and their habitat are insignificant and discountable, all woody riparian vegetation will not be disturbed, degraded, or removed and any disturbed herbaceous areas will be revegetated with native species, and all natural beach complexity features will not be disturbed. In addition, all work will be conducted in approved work windows when listed, proposed or forage fish are least likely to be present. Using these methods of installation, adverse impacts to habitat health in terms of forage insect habitat will be insignificant and/or discountable.
- 6) Watershed Conditions: If an area is heavily disturbed by manmade structures, substrate degradation, or riparian vegetation degradation, additional impacts may exponentially increase and significantly alter watershed conditions. Because the structure is repaired in kind and in place, there will be no change in the amount of manmade structures along the shoreline. Because all beach work will be done by hand and no stockpiling will occur on the beach, there will be no change to the existing substrate. Washington Department of Fish and Wildlife (WDFW) may require pea gravel placement/beach nourishment. The pea gravel placement/beach nourishment will be consistent with Corps of Engineers criteria under the “not likely to adversely affect” Nearshore Fill for State HPA Mitigation Requirements. This will ensure that impacts to substrate degradation of watershed conditions are insignificant and discountable. As outlined in Appendix F – Implementation Conditions, woody riparian vegetation will not be removed or degraded and all disturbed herbaceous areas will be revegetated per the “Revegetation Guidelines”. Using these methods of installation, adverse impacts to watershed conditions are insignificant and/or discountable.

## 10.2. Indirect Effects

Effects resulting from the existing structure that are later in time could potentially include modifying the groundwater regime, sediment suspension due to erosion, impairment of migration and/or increased predation of juvenile listed or proposed fish. Any such impacts are now part of the existing environmental baseline. The minor repair activity is small in nature (10 linear feet or less) and in-kind and in-place at the damaged area. Therefore, any adverse changes to the existing environmental baseline would be extremely rare and extremely minor. While not causing degradation of the existing environmental baseline, the minor bank stabilization repair work covered under this programmatic biological evaluation also would not provide any beneficial effect on restoration of critical habitat or recovery of the listed or proposed fish species.

- 1) Water Quality: Since the structure being repaired is already in existence, and presumably in existence for some time since it has reached a point of partial failure, impacts to water quality have already occurred or are occurring. The impacts may include modification to the existing groundwater regime or sediment suspension due to erosion in front of the structure associated

with wave action. The environmental baseline for the project includes the existing structures. Some methods of bank protection may impair or modify the existing groundwater regime. The build up of hydraulic pressure behind or landward of a bank protection may increase the groundwater pore pressures, exacerbating erosion waterward of the bank protection. (Macdonald et al. 1993) The increased erosion in front of the bank protection may cause a constant introduction of sediments into the water column. This is especially of concern if the substrate erodes below the sand and gravel lens and fine silts begin to be introduced into the system. Because the minor repair activity is very small in nature (10 linear feet or less) and in-kind and in-place at the damaged area, any additional water quality impacts from repair of the damaged area alone would be insignificant and discountable.

- 2) **Habitat Access:** Juvenile salmonids have been documented to avoid hardened shorelines and swim into deeper waters, increasing their risk to predation. (Toal, 1993) The beach may lower waterward of the structure as a result of exacerbated erosion from the bank protection and the decrease to sediment supply due to the restriction of otherwise naturally eroding material. This lowering of the beach grade would increase the water depth in front of the bank protection and may increase access of predators to juvenile salmonids. (Ecology. 1994c) With the structure already in existence and presumably in existence for some time since it has reach a point of partial failure, most of these impacts have already occurred or are occurring. Because the minor repair activity is very small in nature and in-kind and in-place at the damaged area, any additional habitat access impacts from repair of the damaged area alone would be insignificant and discountable.
- 3) **Habitat Health:** As discussed under effects of construction techniques, many forage species are dependent upon the marine nearshore. Each of these species has specific habitat requirements in terms of type of substrate, beach elevation, and introduction of nutrients. The repair activities will not occur on projects that are in or adjacent to forage fish spawning habitat or over or adjacent to vegetated shallows (i.e. eelgrass beds, kelp beds, or other macroalgae), intertidal vascular plant species, tidal marshes, tidally influenced wetlands, or mudflats that provide important habitat for forage fish and other forage species. As discussed in the above paragraph – Habitat Access, the presence of bank protection has been documented to lower beach elevations. High intertidal areas necessary for many forage species, such as surf smelt spawning areas, may be lost. Bank protection activities may also impair the introduction of natural sediment supply sources (eroding feeder bluffs) to the beach or other beaches. Forage fish spawning areas and epibenthic invertebrate habitat are dependent upon the natural introduction of sands and/or gravels from these feeder bluffs. Forage species habitat may decrease, degrading from sandy gravelly substrates to hardpan cobble substrates, as the supply of sediment decreases. (Ecology. 1994c) As erosion continues around bank protection activities, the bank protection may begin to extend further waterward, creating a groin type effect. This groin effect interferes with the natural sediment transport system or littoral drift, trapping sediment on one side of the bank protection and exacerbating erosion on the other. (Terich, T.A. 1987) As with the impairment of sediment supply from feeder bluffs, the impairment of sediment transport may result in degradation of habitat essential for forage species. With the structure already in existence and presumably in existence for some time since it has reach a point of partial failure, most of these impacts have already occurred or are occurring. In other areas, because the minor repair activity is very small in nature and in-kind and in-place at the damaged area, any additional habitat health impacts from repair of the damaged area alone would be insignificant and/or discountable.
- 4) **Watershed Conditions:** As discussed under construction techniques, if an area is heavily disturbed by manmade structures, substrate degradation, or riparian vegetation degradation, additional

impacts may exponentially increase and significantly alter watershed conditions. Concerns have been raised about the cumulative effects on marine watershed conditions by bank protection activities. (Ecology. 1994c) With the structure already in existence and presumably in existence for some time since it has reach a point of partial failure, most of these impacts have already occurred or are occurring. Because the minor repair activity is very small in nature and in-kind and in-place at the damaged area, any impacts to watershed conditions from repair of the damaged area alone would be insignificant and/or discountable.

### **10.3. Others**

By the time the applicant comes to the Corps, the site has already been manipulated for the installation of the original bank stabilization activity. This interrelated activity could have potentially caused the following direct effects: temporary water quality impacts with the use of heavy equipment and/or stockpiling on the beach; habitat access and health impacts if constructed outside of the approved work windows; habitat health impacts with the disturbance of beach substrate during construction; and impacts to refuge and forage with the removal of overhanging woody riparian vegetation. Potential indirect effects of the bank stabilization activity could include: increased erosion of the beach in front of the bank stabilization activity; erosion or destruction of habitat in adjacent areas due to the bank stabilization activity; impairment of sediment supply from the bank into the aquatic ecosystem; increased predation due to “lowering of the beach” in front of the bank stabilization activity; and, impairment to species migration by the presence of the bank stabilization activity if it is a vertical structure or groin. Amelioration of these potential effects is outside the Corps’ authority.

For all other pathways and indicators not specifically mentioned above, the activity will not alter the present environmental baseline.

### **10.4 Determination of Effect**

Activities covered by this document may affect certain threatened and endangered species, species proposed for listing as threatened or endangered, and designated or proposed critical habitat for those species (summarized in Table 5 through Table 7). The determinations for each species assumes the following:

For all Marine/Estuarine Waters excluding Baker Bay:

- Work is done within the approved work window.
- No work is done over or adjacent to vegetated shallows, wetlands, or spawning habitat for forage species.
- All natural beach complexity features are not disturbed.
- Less than 10% of the total bank protection (but not to exceed a total length of 10 linear feet) has been damaged or has failed.
- Repair is in-kind and in-place at the existing structure.
- Timber is untreated or treated with biodegradable, non-toxic material.
- No uncured concrete shall come into contact with the waterbody.
- All work will be done in the dry.
- All work on the beach is done by hand.
- No heavy equipment shall operate on the beach.
- Bioengineering shall be employed wherever possible.

- Access to the beach is via existing upland access.
- Any beach nourishment measures required by WDFW will comply with Corps of Engineers criteria for NLAA “Nearshore Fill for State HPA Mitigation Requirements”.

### **Brown Pelican (*Pelecanus occidentalis*)**

The proposed activity “may affect, but is not likely to adversely affect” brown pelicans. In Washington, brown pelicans inhabit only coastal marine waters. Any work near coastal marine waters and associated with the proposed activity may result in temporary displacement of brown pelicans during construction due to the associated noise and visual disturbance. To minimize impacts, work would be limited in Pacific and Grays Harbor Counties by the work window specified in Appendix E.

### **Marbled Murrelet (*Brachyramphus marmoratus*)**

The proposed activity “may affect, but is not likely to adversely affect” marbled murrelets and their critical habitat. The proposed activity may result in temporary displacement of marbled murrelets during construction due to the associated noise and visual disturbance. Direct mortality or sub-lethal effects are unlikely. The proposed activity will not alter or impact critical habitat because activity would only occur at the shoreline, away from old growth habitat. To minimize impacts, noise attenuation BMPs would be implemented and work would be prohibited in or near critical habitat areas and during sensitive nesting or foraging periods as described in Appendix E.

### **Northern Spotted Owl (*Strix occidentalis*)**

The proposed activity “may affect, but is not likely to adversely affect” the northern spotted owl and its critical habitat. The proposed activity may result in temporary displacement of spotted owls during construction due to the associated noise and visual disturbance. Direct mortality or sub-lethal effects are unlikely. The proposed activity will not alter or impact current spotted owl prey or habitat because activity would be away from old growth habitat. In addition, work would be prohibited in or near critical habitat areas and during sensitive nesting periods as described in Appendix E.

### **Short-Tailed Albatross (*Phoebastria albatrus*)**

The proposed activity “may affect, but is not likely to adversely affect” short-tailed albatross. In Washington, short-tailed albatross inhabit only coastal and offshore marine waters. Any work near coastal marine waters may result in temporary displacement of short-tailed albatross during construction due to the associated noise and visual disturbance. Direct mortality or sub-lethal effects are unlikely.

### **Western Snowy Plover (*Charadrius alexandrinus*)**

The proposed activity “may affect, but is not likely to adversely affect” western snowy plover and its proposed critical habitat. Plovers inhabit only ocean beach areas in Pacific and Grays Harbor counties; southwest Washington is furthest known northern area for snowy plovers. Western snowy plover utilize open shoreline areas where little vegetation exists. The proposed activity would occur the shoreline and may result in temporary displacement of western snowy plover during construction due to the associated noise and visual disturbance. To minimize impacts, work would be limited by the work window and distance to nesting areas specified in Appendix E.

### **Canada Lynx (*Lynx canadensis*)**

The proposed activity would have “no effect” on Canada lynx. The proposed activity would not occur near remote areas of the Selkirk Mountains or the Cascade Range where lynx occur. Because there would be no overlap of the proposed activity action area and Canada lynx or their habitat, the proposed activity would have no potential to affect Canada lynx.

### **Columbia White-Tailed Deer (*Odocoileus virginianus leucurus*)**

The proposed activity would have “no effect” on Columbia white-tailed deer. In Washington, Columbia white-tailed deer are only found in Wahkiakum County on islands in, and along the banks of, the Columbia River from River Mile (RM) 50 to RM 52. This PBE does not cover placing nearshore fill in or near the Columbia River mainstem, thus, there would be no overlap of the proposed activity action area and Columbia white-tailed deer or their habitat. The proposed activity would have no potential to affect Columbia white-tailed deer.

### **Gray Wolf (*Canis lupis*)**

The proposed activity would have “no effect” on gray wolves. The proposed activity would not occur near remote areas of the Selkirk Mountains or the Cascade Range where gray wolves occur. Because there would be no overlap of the proposed activity action area and gray wolves or their habitat, the proposed activity would have no potential to affect gray wolves.

### **Grizzly Bear (*Ursus arctos horribilis*)**

The proposed activity would have “no effect” on grizzly bears. The proposed activity would not occur near remote areas of the Selkirk Mountains or the Cascade Range where grizzly bears occur. Because there would be no overlap of the proposed activity action area and grizzly bear or their habitat, the proposed activity would have no potential to affect grizzly bears.

### **Pygmy Rabbit (*Barchylagus idahoensis*)**

The proposed activity will have “no effect” on pygmy rabbits. Pygmy rabbits occur in the shrub steppe habitat of Douglas County, Washington. Such habitat could occur along freshwater streams and lakes in eastern Washington. Construction has the potential to adversely affect pygmy rabbits via activities occurring along the shoreline in suitable habitat. To minimize impacts, construction will avoid areas near suitable habitat and known populations of pygmy rabbit.

### **Woodland Caribou (*Rangifer tarandus caribou*)**

The proposed activity would have “no effect” on woodland caribou. The proposed activity would not occur in or near the Selkirk Mountains where woodland caribou occur. Because there would be no overlap of the proposed activity action area and woodland caribou or their habitat, the proposed activity would have no potential to affect woodland caribou.

### **Oregon Silverspot Butterfly (*Speyeria zerene hippolyta*)**

The proposed activity “may affect, but is not likely to adversely affect” Oregon silverspot butterflies and their critical habitat. Oregon silverspot butterflies inhabit coastal salt spray marshes and open meadows. In Washington, Oregon silverspot butterflies may be extirpated. However, areas suitable for recolonization or reintroduction occur in southwest Washington. Activities near sand dune, salt-spray meadows or open field habitat in the Pacific coastal and Willapa Bay areas of Pacific County could

impact the butterfly or their habitat. To minimize potential impacts work will be prohibited in or near sensitive habitat areas as specified in Appendix E.

### **Blue Whale (*Balaenoptera musculus*)**

The proposed activity “may affect, but is not likely to adversely affect” whales. The blue whale occurs in marine areas where activities could occur. Construction noise and activity could result in confusion, disruption of social cohesion, separation, alteration of travel, and/or stranding.

### **Fin Whale (*Balaenoptera physalus*)**

The proposed activity “may affect, but is not likely to adversely affect” fin whales. The fin whale occurs in marine areas where activities could occur. Construction noise and activity could result in confusion, disruption of social cohesion, separation, alteration of travel, and/or stranding.

### **Humpback Whale (*Megaptera novaeangliae*)**

The proposed activity “may affect, but is not likely to adversely affect” humpback whales. The humpback whale occurs in marine areas where activities could occur. Construction noise and activity could result in confusion, disruption of social cohesion, separation, alteration of travel, and/or stranding.

### **Sei Whale (*Balaenoptera borealis*)**

The proposed activity “may affect, but is not likely to adversely affect” sei whales. The sei whale occurs in marine areas where activities could occur. Construction noise and activity could result in confusion, disruption of social cohesion, separation, alteration of travel, and/or stranding.

### **Sperm Whale (*Physeter macrocephalus*)**

The proposed activity “may affect, but is not likely to adversely affect” sperm whales. The sperm whale occurs in marine areas where activities could occur. Construction noise and activity could result in confusion, disruption of social cohesion, separation, alteration of travel, and/or stranding.

### **Killer Whale (*Orcinus orca*) and Critical Habitat**

The proposed activity may affect, but is not likely to adversely affect killer whales and their critical habitat. The killer whale occurs in marine areas where activities could occur, however, construction activities will be in the nearshore area and are unlikely to have an impact. Construction noise and activity could result in confusion, disruption of social cohesion, separation, alteration of travel, and/or stranding.

### **Steller Sea Lion (*Eumetopias jubatus*)**

The proposed activity “may affect, but is not likely to adversely affect” steller sea lions and their critical habitat. In Washington, Steller sea lions inhabit pelagic areas of marine waters and occasionally move up the lower Columbia River to feed during the fall. Activities could result in confusion, disruption of social cohesion, separation, alteration of travel, and interference with feeding or breeding.

### **Green Sea Turtle (*Chelonia mydas*)**

The proposed activity “may affect, but is not likely to adversely affect” green sea turtles. The green sea turtle occurs in marine areas where activities could occur. Any work in marine waters may result in temporary disturbance of green sea turtles during construction due to the associated noise and visual disturbance. Construction noise and activity could interfere with travel and foraging.

### **Leatherback Sea Turtle (*Dermochelys coriacea*)**

The proposed activity “may affect, but is not likely to adversely affect” leatherback sea turtles. The leatherback sea turtle occurs in marine areas where activities could occur. Any work in marine waters may result in temporary disturbance of leatherback sea turtles during construction due to the associated noise and visual disturbance. Construction noise and activity could interfere with travel and foraging.

### **Loggerhead Sea Turtle (*Caretta caretta*)**

The proposed activity “may affect, but is not likely to adversely affect” loggerhead sea turtles. The loggerhead sea occurs in marine areas where activities could occur. Any work in marine waters may result in temporary disturbance of loggerhead sea turtles during construction due to the associated noise and visual disturbance. Construction noise and activity could interfere with travel and foraging.

### **Bradshaw’s Desert Parsley (*Lomatium bradshawii*)**

The proposed activity will have “no effect” on Bradshaw’s desert parsley. Bradshaw's desert parsley occurs in wet meadows. It is unlikely that species or habitat would be affected by the proposed activity because the proposed activity is associated with shorelines and beaches. In addition, work would be prohibited in or near sensitive areas as specified in Appendix E.

### **Golden Paintbrush (*Castilleja levisecta*)**

The proposed activity would have “no effect” on golden paintbrush. Golden paintbrush occurs in small populations in uplands in the Puget Trough, San Juan County, and Clark County. It is unlikely that species or habitat would be affected by the proposed activity because the proposed activity is associated with shorelines and beaches, away from upland areas. In addition, work would be prohibited in or near sensitive areas as specified in Appendix E.

### **Kincaid’s Sulphur Lupine (*Lupinus sulphureus ssp. Kincaidii*)**

The proposed activity would have “no effect” on Kincaid’s sulphur lupine. Kincaid's sulphur lupine occurs in upland prairie habitat in southwest Washington. It is unlikely that species or habitat would be affected by the proposed activity because the proposed activity is associated with shorelines and beaches, away from upland areas. In addition, work would be prohibited in or near sensitive areas as specified in Appendix E.

### **Marsh Sandwort (*Arenaria paludicola*)**

The proposed activity would have “no effect” on the marsh sandwort. Marsh sandwort may be extirpated in Washington, but marsh sandwort historically occurred in freshwater wetlands. Because it may be extirpated and the activity would be limited to shorelines and beaches, where plants are not expected to occur, it is unlikely the proposed activity would affect the species or habitat.

### **Nelson’s Checker-Mallow (*Sidalcea nelsoniana*)**

The proposed activity would have “no effect” on Nelson’s checker mallow. Nelson's checker-mallow occurs in meadows and along streams in southwest Washington and the Olympic peninsula. It is unlikely that species or habitat would be affected by the proposed activity because the proposed activity is associated with shorelines and beaches, away from upland areas. In addition, work would be prohibited in or near sensitive areas as specified in Appendix E.

### **Showy Stickseed (*Hackelia venusta*)**

The proposed activity would have “no effect” on showy stickseed. Showy stickseed occurs in open mountain sites composed of loose sand or talus slopes, areas where activities would not occur. Therefore, species or habitat would not be affected by the proposed activity because the activities would occur near shorelines and beaches, away from open mountain sites.

### **Spalding’s Silene (*Silene spaldingii*)**

The proposed activity would have “no effect” on Spalding’s silene. Spalding's silene occurs in upland grasslands in eastern Washington, away from areas where activities would typically occur (e.g. shorelines and beaches). Therefore, the species would not be affected by the proposed activity because it would not occur in or near upland grassland habitat. In addition, surveys to determine the presence of Spalding's silene can help avoid and minimize potential impacts.

### **Water Howellia (*Howellia aquatilis*)**

The proposed activity would have “no effect” on water howellia. Water howellia occurs in seasonal wetlands in the Puget lowlands and the Columbia basin, primarily in small, vernal ponds, although some ponds may retain water throughout the year. It is unlikely that species or habitat would be affected by the proposed activity because it is associated with shorelines and beaches, away from upland areas. In addition, work would be prohibited in or near sensitive areas as specified in Appendix E.

### **Wenatchee Mountain Checker-Mallow (*Sidalcea oregana var. calva*)**

The proposed activity would have “no effect” on the Wenatchee mountain checker-mallow and its critical habitat. Wenatchee mountain checker-mallow occurs in wet meadows within a small region southeast of Leavenworth, Washington. It is unlikely that species or habitat would be affected by the proposed activity because it is associated with shorelines and beaches, away from upland areas. In addition, work would be prohibited in or near sensitive areas as specified in Appendix E.

### **Ute Ladies’-Tresses (*Spiranthes diluvialis*)**

The proposed activity “may affect, but is not likely to adversely affect” Ute ladies’-tresses. Ute ladies’-tresses can occur in wet meadows associated with meandering wetland complexes. It is unlikely that species or habitat would be affected by the proposed activity because it is associated with shorelines and beaches, away from upland areas. In addition, work would be prohibited in or near sensitive areas as specified in Appendix E.

### **Pacific Salmon and Bull Trout**

Adult and juvenile salmonids utilize habitats within the action area as migratory corridors and rearing habitat and may be affected by construction activities. The proposed activity may result in temporary



increases in suspended sediment during construction; however, turbidity is expected to be short-term. Proposed activity will not occur in or near vegetated shallows where listed salmonids or forage fish may occur. The in-water work windows (see Appendix D) will minimize the chance that adult and juvenile salmonids are present during project construction, and forage fish spawning will be protected.

The proposed activity “may affect, but is not likely to adversely affect”:

- Ozette Lake sockeye
- Hood Canal summer chum
- Puget Sound chinook and their critical habitat
- Puget Sound steelhead
- Coastal/Puget Sound bull trout/dolly varden and their critical habitat

Table 5. Effect Determinations for Listed Terrestrial Animals and Insects

Species Name <i>Scientific Name</i>	Status	Determination	Rational for Determination
Brown Pelican <i>Pelecanus occidentalis</i>	E	May affect, but not likely to adversely affect	Any work near coastal marine waters and associated with the proposed activity may result in temporary displacement during construction due to noise and visual disturbance. To minimize impacts work would be limited in Pacific and Grays Harbor Counties by a work window (Appendix E).
Marbled Murrelet <i>Brachyramphus marmoratus</i>	T	May affect, but not likely to adversely affect	The proposed activity may result in temporary displacement during construction due to noise and visual disturbance. Work will be prohibited in or near critical habitat areas and during sensitive nesting or foraging periods (Appendix E).
Northern Spotted Owl <i>Strix occidentalis</i>	T	May affect, but not likely to adversely affect	The proposed activity may result in temporary displacement during construction due to noise and visual disturbance. Work will be prohibited in or near critical habitat areas and during sensitive nesting or foraging periods (Appendix E).
Short-Tailed Albatross <i>Phoebastria albatrus</i>	E	May affect, but not likely to adversely affect	In Washington, short-tailed albatross inhabit only coastal and offshore marine waters where temporary displacement during construction has the potential to adversely affect short-tailed albatross.
Western Snowy Plover <i>Charadrius alexandrinus</i>	T	May affect, but not likely to adversely affect	Plovers inhabit only ocean beach areas in Pacific and Grays Harbor counties where temporary displacement during construction due to noise and visual disturbance has the potential to affect western snowy plover. Work will be prohibited in or near critical habitat and sensitive nesting areas (Appendix E).
Canada Lynx <i>Lynx Canadensis</i>	T	No effect	The proposed activity would not occur near remote areas of the Selkirk Mountains or the Cascade Range where lynx occur.
Columbia White-Tailed Deer <i>Odocoileus virginianus leucurus</i>	E	No effect	This PBE does not cover bank stabilization in the Columbia River mainstem, therefore, would not occur near suitable habitat and known populations of Columbia white-tailed deer.
Gray Wolf <i>Canis lupis</i>	E	No effect	The proposed activity would not occur near remote areas of the Selkirk Mountains or the Cascade Range where grey wolves occur.

<b>Species Name</b> <i>Scientific Name</i>	<b>Status</b>	<b>Determination</b>	<b>Rational for Determination</b>
Grizzly Bear <i>Ursus arctos horribilis</i>	T	No effect	The proposed activity would not occur near remote areas of the Selkirk Mountains or the Cascade Range where grizzly bears occur.
Pygmy Rabbit <i>Barchylagus idahoensis</i>	E	No effect	The proposed activity will not occur near the shrub steppe habitat of Douglas County, Washington
Woodland Caribou <i>Rangifer tarandus caribou</i>	E	No effect	The proposed activity would not occur in or near the Selkirk Mountains where woodland caribou occur.
Oregon Silverspot Butterfly <i>Speyeria zerene hippolyta</i>	T	May affect, but not likely to adversely affect	Activities near sand dune, salt-spray meadows or open field habitat in the Pacific coastal and Willapa Bay areas of Pacific County could impact the butterfly or their habitat. Work will be prohibited in or near sensitive habitat areas as specified in Appendix E.

Table 6. Effect Determinations for Listed Marine Animals

<b>Species Name</b> <i>Scientific Name</i>	<b>Status</b>	<b>Determination</b>	<b>Rational for Determination</b>
Blue Whale <i>Balaenoptera musculus</i>	E	May affect, but not likely to adversely affect	Construction noise and activity could result in confusion, disruption of social cohesion, separation, alteration of travel, and/or stranding.
Fin Whale <i>Balaenoptera physalus</i>	E	May affect, but not likely to adversely affect	Construction noise and activity could result in confusion, disruption of social cohesion, separation, alteration of travel, and/or stranding.
Humpback Whale <i>Megaptera novaeangliae</i>	E	May affect, but not likely to adversely affect	Construction noise and activity could result in confusion, disruption of social cohesion, separation, alteration of travel, and/or stranding.
Sei Whale <i>Balaenoptera borealis</i>	E	May affect, but not likely to adversely affect	Construction noise and activity could result in confusion, disruption of social cohesion, separation, alteration of travel, and/or stranding.
Sperm Whale <i>Physeter macrocephalus</i>	E	May affect, but not likely to adversely affect	Construction noise and activity could result in confusion, disruption of social cohesion, separation, alteration of travel, and/or stranding.
Killer Whale <i>Orcinus orca</i>	E	May affect, but not likely to adversely affect	Construction noise and activity could result in confusion, disruption of social cohesion, separation, alteration of travel, and/or stranding.
Steller Sea Lion <i>Eumetopias jubatus</i>	T	May affect, but not likely to adversely affect	Construction noise and activity could result in confusion, disruption of social cohesion, separation, alteration of travel, and interference with feeding or breeding.
Green Sea Turtle <i>Chelonia mydas</i>	T	May affect, but not likely to adversely affect	Construction noise and activity could interfere with travel and foraging
Leatherback Sea Turtle <i>Dermochelys coriacea</i>	E	May affect, but not likely to adversely affect	Construction noise and activity could interfere with travel and foraging
Loggerhead Sea Turtle <i>Caretta caretta</i>	T	May affect, but not likely to adversely affect	Construction noise and activity could interfere with travel and foraging.

Table 7. Effect Determinations for Listed, Proposed, and Candidate Fish Species

<b>Species Name</b> <i>Scientific Name</i> Evolutionary Significant Unit (ESU)/Distinct Population Segment (DPS)	<b>Status</b>	<b>Determination</b>	<b>Rational for Determination</b>
Bull Trout <i>Salvelinus confluentus</i> Coastal/Puget Sound DPS	T	May affect, but not likely to adversely affect	Proposed activity occurs in areas where fish may occur and potential impacts from turbidity, contaminants, and noise associated with construction could affect fish.
Chinook Salmon <i>Oncorhynchus tshawytscha</i> Puget Sound ESU	T	May affect, but not likely to adversely affect	Proposed activity occurs in areas where fish may occur and potential impacts from turbidity, contaminants, and noise associated with construction could affect fish.
Steelhead <i>Oncorhynchus mykiss</i> Puget Sound ESU	T	May affect, but not likely to adversely affect	Proposed activity occurs in areas where fish may occur and potential impacts from turbidity, contaminants, and noise associated with construction could affect fish.
Sockeye Salmon <i>Oncorhynchus nerka</i> Ozette Lake ESU	T	May affect, but not likely to adversely affect	Proposed activity occurs in areas where fish may occur and potential impacts from turbidity, contaminants, and noise associated with construction could affect fish.
Chum Salmon <i>Oncorhynchus keta</i> Hood Canal Summer-run ESU	T	May affect, but not likely to adversely affect	Proposed activity occurs in areas where fish may occur and potential impacts from turbidity, contaminants, and noise associated with construction could affect fish.

## **11.0 Essential Fish Habitat**

### **Overview**

Public Law 104-297, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fishery Conservation and Management Act to establish new requirements for Essential Fish Habitat (EFH) descriptions in Federal fishery management plans and to require federal agencies to consult with NMFS on activities that may adversely affect EFH.

The Magnuson-Stevens Act requires all fishery management councils to amend their fishery management plans to describe and identify EFH for each managed fishery. The Pacific Fishery Management Council (1999) has issued such an amendment in the form of Amendment 14 to the Pacific Coast Salmon Plan, and this amendment covers EFH for all fisheries under NMFS jurisdiction that would potentially be affected by the proposed action. Specifically, these are the chinook, coho and pink salmon fisheries. EFH includes all streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the habitat historically accessible to salmon. Activities occurring above impassable barriers that are likely to adversely affect EFH below impassable barriers are subject to the consultation provisions of the Magnuson-Stevens Act.

The Magnuson-Stevens Act requires consultation for all federal agency actions that may adversely affect EFH. EFH consultation with NMFS is required by federal agencies undertaking, permitting, or funding activities that may adversely affect EFH, regardless of its location. Under Section 305(b)(4) of the Magnuson-Stevens Act, NMFS is required to provide EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. Wherever possible, NMFS utilizes existing interagency coordination processes to fulfill EFH consultations with federal agencies. For the proposed action, this goal is being met by incorporating EFH consultation to the Endangered Species Act Section 7 consultation, as represented by this biological evaluation.

### **Location**

The location of the activity covered by this assessment has been described in detail earlier in this document (see Section 3).

### **Description of Proposed Activity**

The activity covered by this assessment has been described earlier in this document (see Section 4).

### **Potential Adverse Effects of the Proposed Activity**

Projects would occur in or along the edges of marine, estuarine, and freshwater waters. EFH for ground fish (Table 8), coastal pelagics (Table 9) and salmonids (Table 10) could be affected by proposed activity.

### **Ground Fish EFH**

Effects to the environmental baseline that would impact groundfish species are discussed in detail in Section 10.

### **Coastal Pelagic EFH**

Effects to the environmental baseline that would impact coastal pelagic species are discussed in detail in Section 10.

### **Salmon EFH**

Effects to the environmental baseline that would impact Pacific salmon species are discussed in detail in Section 10.

### **EFH Conservation Measures**

Conservation measures designed to protect listed species and those proposed as threatened or endangered will also help avoid and minimize impacts of the proposed activities on salmonid and groundfish EFH (see Appendix D, E, F, and G).

### **Conclusion**

In accordance with EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act, the Corps has determined that the proposed activity would not adversely impact EFH utilized by Pacific salmon, coastal pelagic species, and groundfish. It has been determined that the proposed action will not adversely affect EFH for federally managed fisheries in Washington waters.

Table 8. Ground Fish Species with Designated EFH and the Life History Stages that May Occur in the Action Area (PFMC, 1998a).

GROUND FISH SPECIES	Adults	Spawning/ Mating	Large Juvenile	Small Juvenile	Larvae	Eggs/ Parturition
Leopard Shark	X	X	N/A	X	N/A	X
Soupfin Shark	X	X	N/A	X	N/A	X
Spiny Dogfish	X		X	X	N/A	X
California Skate	X	X	N/A	X	N/A	X
Ratfish	X	X	N/A	X	N/A	
Lingcod	X	X	X	X	X	X
Cabezon	X	X	X	X	X	X
Kelp Greenling	X	X	X	X	X	X
Pacific Cod	X	X	N/A	X	X	X
Pacific Whiting (Hake)	X	X	N/A	X	X	X
Sablefish				X		
Jack Mackerel	X		N/A		X	
Black Rockfish	X			X		
Bocaccio				X	X	
Brown Rockfish	X	X	N/A	X		X
Calico Rockfish	X		N/A	X		
California Scorpionfish						X
Copper Rockfish	X		X	X		X
Kelp Rockfish				X		
Quillback Rockfish	X		X	X	X	X
English Sole	X	X	N/A	X	X	X
Pacific Sanddab			N/A	X	X	X
Rex Sole	X		N/A			
Starry Flounder	X	X	N/A	X	X	X

N/A - Not Applicable. Either the species does not have a particular life stage in its life history, or when EFH of juveniles is not identified separately for small juvenile and large juvenile stages. For many species, habitats occupied by juveniles differ substantially, depending on the size (or age) of the fish. Frequently, small juveniles are pelagic and large juveniles live on or near the bottom; these life stages are identified separately in the table when sufficient information is available to do so. When juvenile habitats do not differ so substantially or when information is insufficient to identify differences, EFH is identified only for the juvenile stage (small and large juveniles combined), and N/A is listed in the column for the large juvenile stage in the table (PFMC, 1998a).

Table 9. Coastal Pelagic Species with Designated EFH and the Life History Stages that May Occur in the Action Area (PFMC, 1998a).

COASTAL PELAGIC SPECIES	Adults	Spawning/ Mating	Large Juvenile	Small Juvenile	Larvae	Eggs/ Parturition
Northern Anchovy	X		X		X	X
Pacific Sardine	X		X		X	X
Pacific Mackerel	X		X		X	X
Jack Mackerel	X					
Market Squid	X	N/A		N/A	N/A	N/A

N/A - Not Applicable. Either the species does not have a particular life stage in its life history, or when EFH of juveniles is not identified separately for small juvenile and large juvenile stages. For many species, habitats occupied by juveniles differ substantially, depending on the size (or age) of the fish. Frequently, small juveniles are pelagic and large juveniles live on or near the bottom; these life stages are identified separately in the table when sufficient information is available to do so. When juvenile habitats do not differ so substantially or when information is insufficient to identify differences, EFH is identified only for the juvenile stage (small and large juveniles combined), and N/A is listed in the column for the large juvenile stage in the table (PFMC, 1998a).

Table 10. Salmonid Species with Designated EFH and the Life History Stages that May Occur in the Action Area (PFMC, 1998a).

PACIFIC SALMON	Egg	Larvae	Young Juvenile	Juvenile	Adult	Spawning
Chinook salmon		X	X	X	X	
Coho salmon		X	X	X	X	
Pink salmon		X	X	X	X	