

# **Nearshore Fill for State HPA Mitigation Requirements**

**Programmatic Biological Evaluation  
Nearshore Fill for State HPA Mitigation Requirements  
Version: October 13, 2000**

**1. Summary of Activity:**

a. All Fresh Waters excluding the Columbia River mainstem: Placement of up to 25 cubic yards of fill material waterward of the ordinary high water line (OHW) line to meet mitigation requirements imposed by Washington State Department of Fish and Wildlife (WDFW) where all other work (the bank stabilization activity and associated stockpiling) is outside Corps jurisdiction (landward of the OHW line) and has already been constructed, provided that: work is done within the approved work window, material is not placed in or adjacent to vegetated shallows (except where such vegetation is limited to State-designated noxious weeds) or other special aquatic sites, gravel materials are washed and clean prior to being brought to the site, work occurs only in the dry, stockpiling shall not occur below OHW, work is done by hand except that if a barge is used to deliver material it shall not ground out on the bottom, the material is spread out evenly and the beach grade is not altered (to avoid stranding of fish), upon completion of material placement the beach shall not contain any pits, potholes, or large depressions, and all natural beach complexity features that were necessary to remove are repositioned or replaced in their original locations on the beach immediately following completion of the work. [from NWP 18]

b. The Columbia River mainstem including Snake River and Baker Bay: This programmatic biological evaluation does not cover activities in the Columbia River mainstem including Snake River and Baker Bay.

c. All Marine/Estuarine Waters excluding Baker Bay: Placement of up to 25 cubic yards of fill material waterward of the mean higher high water (MHHW) line to meet mitigation requirements imposed by Washington State Department of Fish and Wildlife (WDFW) where all other work (the bank stabilization activity and associated stockpiling) is outside Corps jurisdiction (landward of the MHHW line) and already has been constructed, provided that: work is done within the approved work window, material is not placed in or adjacent to vegetated shallows or other special aquatic sites, gravel materials are washed and clean prior to being brought to the site, work occurs only in the dry, stockpiling shall not occur below MHHW, work is done by hand except that if a barge is used to deliver material it shall not ground out on the bottom, the material is spread out evenly and the beach grade is not altered (to avoid stranding of fish), upon completion of material placement the beach shall not contain any pits, potholes, or large depressions, and all natural beach complexity features that were necessary to remove are repositioned or replaced in their original locations on the beach immediately following completion of the work. [from NWP 18]

**2. Programmatic Description:** Individual permits (IPs) and Nationwide Permits 3, 13, and 18 (NWP 3, NWP 13, NWP 18) may authorize the placement of fill into waters of the U.S. This programmatic biological evaluation applies only to those activities where WDFW is requiring nearshore fill (pea or spawning gravel placement) as mitigation

under the State Hydraulic Project Approval (HPA) for bank protection activities and the only work within Corps jurisdiction is the nearshore fill for mitigation. All work for the bank protection activity is outside of Corps jurisdiction (landward of MHHW in marine/estuarine areas and landward of OHW in freshwater areas). Work that cannot be designed or constructed to fit under this biological evaluation must go through individual informal or formal ESA consultation.

**3. Project Location:** In all fresh and marine/estuarine waters excluding the Columbia river mainstem and 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. Project Description:** Place up to 25 cubic yards of material waterward of the line of OHW or MHHW to create or improve fish spawning habitat in the nearshore environment. 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. Project Construction Description:<sup>1</sup>**

a. Site Preparation: By the time the applicant comes to the Corps, typically the project site has already been manipulated for the installation of the bank stabilization structure outside of Corps jurisdiction, which includes the disturbance and/or removal of 25- to 50-foot strip of vegetation landward of the MHHW or OHW for the length of the structure. Bank stabilization structures can include, but are not limited to, vertical bulkheads, riprap, sheet piling, berm construction or large woody debris placement. The only work in Corps jurisdiction is the placement of the pea gravel or, in freshwater, spawning gravel, the structure and any stockpiling is all outside of Corps jurisdiction (landward of MHHW in marine/estuarine areas and landward of OHW in freshwater areas). Beach complexity features such as large boulders, logs or other woody material, and/or debris are temporarily removed from the construction area. At the end of the bank protection construction, the beach grade has been restored to pre-construction contours. The area is now ready to receive the fill material.

b. Equipment Used: The contractor may use a number of the following pieces of equipment. A barge (standard 24' wide x 40' long), a tug boat with a maximum length of 60 feet and the engine power equivalent to an 100-foot long pleasure vessel, wide-track excavator with loader on one end (approximately 2000 lbs.), rubber-tired front-end loader, dump truck, 8" PVC pipe with hopper, 2" x 6" timber plank, I-beam, wheelbarrow, hand shovels or rakes. Erosion controls such as silt fencing, filter fabric, or sheet piling are used on some bank stabilization projects, however, these controls are removed prior to placement of nearshore fill material.

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<sup>1</sup>Description of construction practices was collected from personal communication with representatives of WDFW, King County Department of Natural Resources, and Japhet Bulkhead, Inc.

c. Work Corridor: Typical work corridor on the beach is a width of 15 feet waterward of the structure, for its entire length. The finished area for the nearshore fill for HPA mitigation is a standard 9 feet wide (from the toe of the structure) and 6 inches deep for the entire length of the bank stabilization structure. These perimeters are the conditions of the WDFW HPA permit when pea or spawning gravel placement is required.

d. Material Used: The material used in nearshore fill for HPA mitigation is either pea gravel (no larger than 3/8"), sand, a mixture of pea gravel and sand, or, in freshwater only, spawning gravel (75% smaller than 2", no material larger than 4 inches). The type of material used depends on existing site conditions, mainly beach substrate. The material placed either matches the natural substrate (vs. existing degraded substrate) or one substrate size larger, not to exceed the size of pea or spawning (in freshwater only) gravel. For example, if the natural substrate for the area is fine sand, then fine sand or sand would be the material of choice. Because of the availability and low cost of pea gravel, pea gravel is often opted for over sand. To do a standard 100-foot bulkhead it takes approximately 20 cubic yards of material. To be covered by this informal programmatic consultation, all sand or gravel will be clean, washed material.

e. Stockpiling: The material used in nearshore fill for HPA mitigation is stockpiled either on the uplands or on a barge. The material is not stockpiled in an intertidal area due to the burying of sedentary benthic organisms and the risk of it being washed away.

f. Placement: The material used in nearshore fill for HPA mitigation originates from either the uplands or a barge. The following is a description of each.

1. Hauled in from Uplands: The material is transported to the site via a dump truck. The material may either be stockpiled on the uplands or it may be used straight from the bed of the truck. The material is shot down to the toe of the bank protection structure via an 8" PVC pipe with a hopper attachment. Once the material is on the beach it is spread out with the edge of the loader bucket, a piece of wood or I-beam attached to the excavator, or the material is hand shoveled or raked until all the depressions are removed.

2. Barged to the Site: The material is placed on a barge and ferried to the site. In marine/estuarine waters, the material is placed during high tide. Waiting for an extremely high tide, positioning the barge extremely close to the nearshore without grounding out the barge, and pushing the material off the end of the barge onto the dry portion of the beach - at the toe of the bank stabilization structure. The barge is anchored by either tying the barge to a tree or a stake installed in the uplands, or by dropping a 24" concrete square (spud) on the substrate. Before spreading the material, the contractor waits for the water to recede at the low tide. In freshwater areas, if a barge is used to bring in material, an excavator or crane mounted on the barge would move the material from the barge to the beach, allowing a greater reach so that the barge will not ground out. In most freshwater areas, however, the material is placed either by hand with hand tools or by equipment situated on the uplands, such as an

excavator. The material is either "bladed" with the edge of the loader bucket or the material is hand shoveled or raked until all the depressions are removed.

g. Running of Equipment During Construction: No heavy equipment will operate on the beach for spreading the gravel, outside of the barge bringing the material in to shore. For hand work and hand tools to access the beach, a single point of entry is used to eliminate impacts to the rest of the beach.

h. Clean-Up: After the material is placed and spread out, any material that was stockpiled on the uplands is removed and put back into the truck. If material is stockpiled on a barge, there is typically never an excess of material placed. Any beach complexity features are repositioned in their approximate pre-construction locations. The hand equipment is removed from the site.

i. Project Timing: Typical placement takes one day.

j. Construction Timing: Construction cannot occur during the listed, proposed or forage fish species migration/spawning periods.

**6. Action Area Description:** The action area includes all fresh and marine/estuarine waters in Washington State, excluding the Columbia River mainstem, Snake River and Baker Bay.

a. For all Fresh Waters in Washington State *excluding* Columbia River mainstem: Project site, including work corridor, 50 feet<sup>2</sup> waterward the bank stabilization activity (this includes the pea or spawning gravel placement, work corridor and 25 feet waterward of the work corridor for temporary water quality impacts), and 300 feet from either end of the project for potential relocation of material from water currents.

b. For all Marine/Estuarine Waters in Washington State *excluding* Baker Bay: Project site, including work corridor, 50 feet<sup>3</sup> waterward of toe of the bank stabilization activity (this includes the pea gravel placement, work corridor and 25 feet waterward of the work corridor for temporary water quality impacts), and up to the length of the drift cell for potential relocation of material from water currents.

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<sup>2</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.

<sup>3</sup> Ibid.

## 7. Species and Habitat Information:

### a. Species Present: <sup>4</sup>

1. For All Fresh Waters in Washington State *excluding* the Columbia River mainstem and its tributaries: Puget Sound chinook salmon - status threatened (designated critical habitat); Hood Canal chum salmon - status threatened (designated critical habitat); Coastal/Puget Sound bull trout - status threatened; SW Washington/ Columbia River/Coastal cutthroat trout - proposed threatened; Ozette Lake sockeye salmon - status threatened (designated critical habitat); and Puget Sound coho salmon - candidate species.

2. For all Marine/Estuarine waters in Washington State, *excluding* Baker Bay: Puget Sound chinook salmon, status threatened (designated critical habitat), Hood Canal chum salmon, status threatened (designated critical habitat), Coastal/Puget Sound bull trout, status threatened, Ozette Lake sockeye salmon, status threatened (designated critical habitat), SW Washington/Columbia River/Coastal cutthroat trout, proposed threatened, and, Puget Sound coho salmon, candidate species.

3. For tributaries to the Columbia River mainstem and Snake River in Washington State: Snake River sockeye salmon - status endangered (designated critical habitat); Snake River spring/summer chinook salmon - status threatened (designated critical habitat); Snake River fall chinook salmon - status threatened (designated critical habitat); Snake River steelhead - status threatened (designated critical habitat); Columbia River chum salmon - status threatened (designated critical habitat); Columbia River bull trout – status threatened; Lower Columbia River steelhead – status threatened (designated critical habitat); Lower Columbia River chinook salmon – status threatened (designated critical habitat); Middle Columbia River steelhead – status threatened (designated critical habitat); Upper Columbia River steelhead – status endangered (designated critical habitat); Upper Columbia River spring chinook salmon – status endangered (designated critical habitat); Upper Willamette River chinook salmon – status threatened (designated critical habitat); Upper Willamette steelhead – status threatened (designated critical habitat); and, SW Washington/Columbia River/Coastal cutthroat trout – proposed threatened.

Although this programmatic biological assessment does not cover actions in the Columbia River mainstem (including Snake River and Baker Bay), there may be circumstances when the actions occur in tributaries to the Columbia River (included in the fresh waters list of actions).

### b. Species Utilization: Refer to Appendix B - Species Life Histories.

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<sup>4</sup> Other listed or proposed plants or animals may occur in the project area. However, this document addresses only listed or proposed fish species. Review of impacts to other listed or proposed species will be done on a case-by-case basis.

**8. Activity History and Status:** The following table is a breakdown of the number of bank stabilization projects, both new construction and repair/maintenance, authorized by the Corps of Engineers. The breakdown is organized by year and waterbody. The waterbody includes all creeks, streams, and unnamed tributaries that flow into it. Each of the waterbodies is categorized as below:

**a. 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, Sammish 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.

**b. Fresh:** All fresh waters within Washington State including all rivers, tributaries, lakes, and reservoirs (regardless of size) and excluding the Columbia River mainstem. (i.e., Snoqualmie River, Skagit River, Puyallup River, Nisqually River, Cowlitz River, Yakima River, Wenatchee River, Snake River, Pend Oreille River, Lake Washington, Lake Sammamish, Lake Chelan, Moses Lake, Baker Lake, Spanaway Lake, etc).

To determine the number of authorized nearshore fill activities for HPA mitigation conducted to mitigate the impacts of bank stabilization activities, all finalized permit actions were queried against the key word “NWP 13” and “NWP 3” and cross-referenced with the work type “bank protection.” The cross-referencing ensures that the activity is properly categorized and each authorization is only counted once. Nearshore fill activities for HPA mitigation are authorized either by the Nationwide Permit general conditions on mitigation (authorizing mitigation requirements by other agencies) when a NWP 13 or NWP 3 is issued or by NWP 18 – Minor discharges when the only work in Corps jurisdiction is the nearshore fill. Under NWP 18, if the discharge is less than 25 cubic yards, no notification is required. Nearshore fill activities for HPA mitigation is not specifically tracked by the Corps of Engineers, therefore there is no Corps data on this type of work. However, this programmatic addresses nearshore fill performed as mitigation for bank stabilization activities, thus an approximation of nearshore fill activities for HPA mitigation can be inferred from the number of authorized bank stabilization activities. The data set below represents only those 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 both new bank protection activities and repair of existing bank protection, the Corps database represents approximately 33 % of the actual number of nearshore fill activities for State HPA mitigation.

**Table 1: Historical Record of Corps Authorization of Bank Stabilization Activities**

<b>Waterbody</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
Marine	58	73	90	79	28
Fresh	80	206	153	138	106
<b>TOTAL</b>	<b>138</b>	<b>279</b>	<b>243</b>	<b>217</b>	<b>134</b>

Because no notification is required for NWP18 discharges less than 25 cubic yards, the Corps acknowledges that tracking of nearshore fill activities for HPA mitigation has been inconsistent and infrequent. In light of the recent listings under ESA, the Corps proposes to track these activities as outlined in the “Programmatic Biological Evaluation Notification and Tracking Description”.

**9. Environmental Baseline:** Refer to Appendix C – Environmental Baseline.

**10. Effects of the Action:**

**a. Direct Effects:** The direct effects of nearshore fill for HPA mitigation on the listed or proposed fish species will be similar in nature among each of the fish species, and potentially within the variable lifestages of the species. Both adult and juvenile salmonids use the action area for migration, forage, and refuge. The degree to which an adult or juvenile of the species uses and area varies from waterbody and varies as to whether the work is in marine/estuarine waters or fresh waters. Juvenile listed or proposed fish species will be the most effected as a result of the work in the marine nearshore. Juveniles use the nearshore environment for migration, refuge and forage. Adult fish species may not be as directly affected as juveniles from nearshore activities because adults do not typically use the nearshore environment. Adults tend to travel somewhat away from the shoreline and would be less likely to encounter the project. Adult bull trout, however, have been documented in shallow waters.<sup>5</sup> Forage fish also use the nearshore environment to spawn, rear, and live, and are prey for adult listed or proposed fish species. A detailed discussion of the direct effects follows:

1. **Water Quality (turbidity):** The placement of clean, washed material and all construction will be done in the dry in the approved work windows when listed, proposed or forage fish species are least likely to be present. In addition, the barge will not ground out, no stockpiling will occur on the beach, and all work will be done by hand. Wheelbarrows, shovels, rakes, etc. will be used on the beach during construction. Any mechanized equipment will be staged in the upland area. Thus, water quality affects would be extremely minor. As discussed in Appendix F - Implementation Conditions, all equipment will be cleaned and washed in the uplands so that no wash water shall reenter the waterbody, and access to the beach will be limited to an existing upland access point either on site or within 300 feet of other property line. There is the possibility, though unlikely, that the placement of the enhancement material will produce a temporary, localized sediment plume triggered by construction activities. In the unlikely event that a temporary sediment plume would occur, it would be small in

<sup>5</sup>Jeff Chan, U.S. Fish and Wildlife Service, “Seattle District Regulatory Branch, ESA Training”, personal communication. July, 23, 1999.

nature (not to exceed a radius of 25 feet around the area where the fill is placed<sup>6</sup>) and the impact to listed, proposed or forage fish species will be insignificant and/or discountable due to the timing of the work.

2. Water quality (propwash): The tug bringing in the barge and removing it may cause some sediment suspension associated with propwash. The tug brings the barge in and retrieves it during high water. The placement is done very quickly (within an hour) and the work is done in the approved work window when listed, proposed or forage fish species are least likely to be present. Any turbidity associated with propwash from the tug and barge would settle out of the water column to background levels in no more than an hour, depending on sediment type and currents. All temporary water quality impacts associated with propwash are insignificant and/or discountable.

3. Habitat Access: The work (including barge operation) will be done in the approved work window when listed, proposed or forage fish species are least likely to be present. By accessing the site during the approved work window, potential direct impacts by the barge - such as displacing listed, proposed or forage fish species by the engine noise or impacting listed, proposed or forage fish species with the potential introduction of oil and gas from the barge – are insignificant and/or discountable. Using this method of installation, impacts to habitat access for listed, proposed or forage fish species are insignificant and/or discountable.

4. Habitat Health (Spawning areas): The work is proposed as mitigation of impacts to spawning areas for either listed, proposed or forage species associated with bank stabilization activities outside of Corps jurisdiction (landward of OHW in fresh waters and MHHW in marine/estuarine waters). As such, it is highly likely that the work will occur in spawning areas for listed or proposed fish. However, if mitigation is being required in listed or proposed fish spawning habitat, the spawning habitat is degraded or impaired and unlikely to be actively utilized though adjacent areas may be active spawning grounds. The fill is clean/washed material of adequate size to enhance spawning habitat and work is done in the approved work windows when listed or proposed fish (especially redds) are least likely to be present, so there is little likelihood that redds would be buried or smothered by the activity. The work on the beach is done by hand, an existing upland access point is used, and if a barge is being used, it will not ground out, so there is little likelihood that the construction will result in additional disturbance to the substrate. Using this method of installation, impacts to spawning areas of listed or proposed fish are insignificant and/or discountable.

5. Habitat Health (Forage insects and invertebrates): Benthic invertebrates that reside in the intertidal beaches are a primary food source for juvenile listed or proposed fish species. Juvenile fish species 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 over-hanging vegetation for food and refuge. As outlined in Appendix F - Implementation Conditions, no woody riparian vegetation shall be disturbed and any disturbed herbaceous vegetation will be revegetated, and access to

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<sup>6</sup> See discussion to 25-foot radius in Action Area (footnote 2).

the beach will be from an existing upland location or by barge. This programmatic biological evaluation allows for only those activities where the work is done in the dry, clean/washed gravel is used, and all work on the beach being done by hand except for delivery of material by barge that will not ground. The woody riparian vegetation may have been disturbed by the bank stabilization activity outside of Corps jurisdiction (landward of OHW in freshwater and landward of MHHW in marine/estuarine areas). The material will be placed in an area that has been disturbed as a result of the construction of a bank stabilization activity outside of Corps jurisdiction (landward of OHW in freshwater areas and landward of MHHW in marine/estuarine areas). Some temporary impacts to benthic organisms will occur with the placement of the material: any sedentary benthic organisms will be covered for a short period of time and foot traffic and hand equipment bury or squish benthic organisms and their habitat. The destruction of benthic organisms and their habitat will affect the availability of a food source for juvenile fish species. Based on field observations of WDFW Habitat Biologists, benthic organisms recover within half the time (approximately 3 months) with the gravel/sand placement than without (approximately 6 months). Using this method of installation, the impacts to forage insects and invertebrates is insignificant and/or discountable.

6. Habitat Health (Forage Fish): Primary forage fish for salmonids include Pacific herring, surf smelt, and Pacific sandlance. Pacific herring spawn in vegetated shallows and algal surfaces from late January through early April. Surf smelt spawn in the upper intertidal areas between the 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. Pacific sandlance spawn in the upper intertidal zone on a variety of substrates, from fine sand to pea gravel dominated beaches. As adults, sandlance school in nearshore marine waters, foraging during the day and burrowing in the sand at night. (WDFW, 1997b) The proposed activity is to enhance beach substrate, especially in areas where there are listed, proposed or forage fish spawning areas. Vegetated shallows support spawning habitat for Pacific herring and provide refuge for juvenile listed or proposed fish. Boat activity or the like near or adjacent to vegetated areas has been documented to damage and/or destroy the vegetated areas. (NOAA, 1998) Work in or adjacent to special aquatic sites such as vegetated shallows is not covered under this informal programmatic consultation. Work will be done in the approved work windows when listed, proposed or forage fish are least likely to be present. Using this method of installation, impacts to forage fish spawning habitat are insignificant and/or discountable.

7. Habitat Health (Refugia): Overhanging vegetation, beach complexity features such as large woody debris and rocks, and vegetated shallows all provide refugia for juvenile fish species. As outlined in Appendix F - Implementation Conditions, no woody riparian vegetation shall be disturbed and any disturbed herbaceous vegetation will be revegetated, and access to the beach will be from an existing upland location or by barge. This programmatic biological evaluation allows for only those activities where the barge does not ground out, no work occurs in or adjacent to special aquatic sites such as vegetated shallows, and any natural beach complexity features removed during

construction are replaced in the same location. The woody riparian vegetation may have been disturbed by the bank stabilization activity outside of Corps jurisdiction (landward of OHW in fresh waters and landward of MHHW in marine/estuarine waters). Using this method of installation, any impacts to refugia will be insignificant and/or discountable.

8. **Watershed Conditions:** When an area becomes heavily disturbed by manmade structures, degradation to the substrate and/or riparian vegetation, in addition to other impacts, may exponentially increase and significantly alter watershed conditions. Because the work on the beach will be conducted 1) from either the uplands and with hand tools, or from a barge that does not ground out, 2) with no stockpiling on the beach, and 3) the material placed on beach is cleaned and washed prior to placement and will be spread out evenly so as not to alter the beach grade, changes to the existing substrate are minor. As outlined in Appendix F – Implementation Conditions, no woody riparian vegetation shall be disturbed, degraded, or altered by the placement of the material and any disturbed herbaceous areas will be revegetated with native plant species. Woody riparian vegetation may have been removed or disturbed by the construction of the bank stabilization activity that is outside of Corps jurisdiction. There will be no additional disturbance to the woody riparian vegetation by the placement of the fill material. Using these methods of installation, impacts to watershed conditions will be insignificant and/or discountable.

**b. Indirect Effects:** The effects resulting from the activity that are later in time could include enhanced access for juvenile listed or proposed fish to shallow water, addition of “feeder” material to the aquatic ecosystem, and enhanced spawning areas for listed, proposed or forage fish.

1. **Water Quality:** The fill material either matches or is one grain size larger than the existing substrate to increase stability of the material. All material is cleaned and washed prior to placement. The fill material may stay on site, but it is more likely to drift into the aquatic ecosystem and disperse with wind driven wave action, stream currents, tidal inundation, and/or littoral drift. The fill material will be relocated on another beach either downstream in fresh waters or within the same littoral cell in marine/estuarine waters. Since the material is cleaned and washed, designed to match material lacking in the aquatic ecosystem, and of a small amount (25 cubic yards or less), any impacts to water quality from its movement in the aquatic ecosystem later in time would be the same as movement of material naturally occurring in the aquatic ecosystem. Indirect effects to water quality are insignificant and/or discountable.

2. **Habitat Access:** Juvenile fish species have been documented to avoid hardened shorelines and swim into deeper waters, increasing their risk to predation. Bank protection structures may cause erosion of the beach waterward of the structure as a result of the decrease in sediment supply due to the restriction of otherwise naturally eroding material. This erosion of the beach grade would increase the water depth in front of the bank protection and may increase the access of predators to juvenile salmonids. With the addition of nearshore fill material following bank stabilization, the area in front of the bank stabilization structure may be temporarily restored to almost

natural conditions. Any additional habitat access of predators may be reduced, at least temporarily, as the beach grade is raised so that it becomes too shallow for predator species. This will increase the potential for juvenile survival. Because the fill activity is minor in nature and is designed to restore the disturbed areas, indirect effects to habitat access are insignificant and/or discountable.

3. Habitat Health (forage fish habitat): The main purpose of placement of the material as part of the State HPA mitigation requirements is to restore or create habitat for forage fish and other juvenile fish species, as a result of the impacts and effects of bank stabilization activities. The presence of bank stabilization structures has been documented to erode beach elevations, resulting in the loss of prime spawning habitat for forage fish. High intertidal areas from tidal elevations of +7.0 feet to MHHW area necessary for spawning habitat for many forage species, such as surf smelt and sand lance. (WDFW, 1997b) Bank protection activities may also impair the introduction of natural sediment supply sources (eroding feeder bluffs) to the nearshore environment. Forage fish spawning areas and epibenthic invertebrate habitat are dependent upon the natural introduction of sands and/or gravels from these feeder bluffs. Each of these fish species have specific habitat requirements in terms of type of substrate, beach elevation, and introduction of nutrients. As the supply of sediment decreases, sandy gravelly substrates degrade to hardpan cobble substrates thus decreasing forage fish species habitat. The nearshore fill for HPA mitigation is designed to restore these areas, slow the erosion that would otherwise occur in front of the bank stabilization activity, and provide habitat. Vegetated shallows support spawning habitat for Pacific Herring and provide refuge for juvenile list fish. Boat activity or the like near or adjacent to vegetated areas has been documented to damage and/or destroy the vegetated areas. (NOAA, 1998) Because the project will not occur over or adjacent to (within 300 feet) special aquatic sites such as vegetated shallows, and the work will enhance the nearshore environment, the indirect effect to forage fish spawning habitat are insignificant and/or discountable.

c. Interrelated Effects: By the time the applicant comes to the Corps, typically the site has already been manipulated for the installation of the 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 fish 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.

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

e. Determination of Effect: Placement of up to 25 cubic yards of fill material waterward of the OHW/MHHW line to meet mitigation requirements imposed by Washington State Department of Fish and Wildlife (WDFW) may affect but is not likely to adversely affect listed fish species and designated critical habitat identified above, and will not jeopardize proposed fish species or destroy or adversely modify proposed critical habitat identified above, provided that:

1. All Freshwater areas *excluding* the Columbia River:

- Work is done within the approved work window.
- Material is not placed in or adjacent to vegetated shallows (except where such vegetation is limited to State-designated noxious weeds) or other special aquatic sites.
- Gravel materials are washed and clean prior to being brought to the site.
- Work occurs only in the dry.
- Stockpiling shall not occur below OHW.
- Work is done by hand except that if a barge is used to deliver material it shall not ground out on the bottom.
- The material is spread out evenly and the beach grade is not altered (to avoid stranding of fish).
- Upon completion of material placement the beach shall not contain any pits, potholes, or large depressions.
- All natural beach complexity features that were necessary to remove are repositioned or replaced in their original locations on the beach immediately following completion of the work.

2. All marine/estuarine waters *excluding* for Baker Bay:

- Work is done within the approved work window.
- Material is not placed in or adjacent to vegetated shallows or other special aquatic sites.
- Gravel materials are washed and clean prior to being brought to the site.
- Work occurs only in the dry.
- Stockpiling shall not occur below MHHW.
- Work is done by hand except that if a barge is used to deliver material it shall not ground out on the bottom.
- The material is spread out evenly and the beach grade is not altered (to avoid stranding of fish).
- Upon completion of material placement the beach shall not contain any pits, potholes, or large depressions.
- All natural beach complexity features that were necessary to remove are repositioned or replaced in their original locations on the beach immediately following completion of the work.