

Minor Bank Stabilization Repair Activities

Programmatic Biological Evaluation
Maintenance: Minor Bank Stabilization Repair Activities
Version: 13 October 2000

1. Summary of Activity:

a. All Fresh Waters excluding the Columbia River mainstem: This programmatic biological evaluation does not apply to fresh waters.

b. The Columbia River mainstem including Snake River and Baker Bay: This programmatic biological evaluation does not apply to the Columbia River and Baker Bay.

c. All Marine/Estuarine Waters excluding Baker Bay: Minor repair of existing bulkhead or sloped revetment only in marine/estuarine waters, provided that: 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 biodegradable¹, 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, and access to the beach is via existing upland access. [from NWP 3]

2. 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. 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.

¹ 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.

4. 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. Project Construction:²

a. Equipment used: 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.

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

c. 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).

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

d. 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.

e. 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).

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

g. 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.

h. 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.

i. 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. Action Area: 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 feet³ from waterward edge of the work corridor for potential “temporary water quality” impacts.

³ The determination of impact area for potential water quality impacts is based on personal communication with John Malek, Sediment Management, Environmental Protection Agency, on

7. Species and Habitat Information:

a. Species Present.⁴

1. In Marine/Estuarine Waters of Washington State, *excluding* Baker Bay: Puget Sound chinook salmon, status threatened (designated critical habitat), Coastal/Puget Sound bull trout, status threatened, Hood Canal chum salmon, status threatened (designated critical habitat), Ozette Lake Sockeye salmon, status threatened (designated critical habitat), SW Washington/Columbia River/Coastal Cutthroat trout, status proposed threatened, and Puget Sound coho salmon, status candidate species.

b. Species Utilization: Refer to Appendix B – Species Life Histories.

8. Activity History and Status: The following table 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 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.

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

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.

⁴ 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.

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 1: Historical Record of Corps Authorization of Bank Stabilization Repair Activities

WATERBODY	1995	1996	1997	1998	1999
Marine	26	34	62	50	18

Because no notification is required for NWP3, the Corps acknowledges that tracking of bank protection repair and replacement activities 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: Effects of the project to listed and proposed fish 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 would be secondary. Adult bull trout migrate in the shallow subtidal areas versus the intertidal areas.⁵ 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): With no construction activity occurring during salmonid migration periods, there is little likelihood that listed or proposed fish species will be impacted by the temporary sediment plumes. 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

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

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.

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.⁶ Cured concrete in fresh water systems releases carbonate (CO_3^{2-}) through natural weathering processes. Carbonate reacts with hydrogen (H^+) to form bicarbonate (HCO_3^-) and/or carbonic acid (H_2CO_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.⁷ 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.

⁶ Impacts associated with concrete were obtained through personal communication with Hal Michael, Fisheries Biologist, Washington Department of Fish and Wildlife on February 3, 2000.

⁷ 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.

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 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.

b. 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.

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

d. Determination of Effect: Minor Bank Stabilization Repair Activities in marine/estuarine waters, excluding Baker Bay, may affect but are not likely to adversely affect the listed fish species identified above and any designated critical habitat, will not jeopardize proposed fish species or destroy or adversely modify proposed critical habitat identified above, provided that:

- 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".