

**WAC 220-660-130 Stream bank protection and lake shoreline stabilization.** Suitable methods to identify and select an appropriate stream bank protection technique are available in the department's *Integrated Streambank Protection Guidelines*, as well as other published manuals and guidelines.

(1) **Description:**

(a) Stream bank and lake shoreline erosion is a process where soil, gravel, and rock within the bank of a waterway become mobilized by the flow or wave action of water. Stream bank and lake shoreline erosion is a natural process that supplies the materials necessary to create features such as beaches, gravel bars, and flood plains. However, activities that alter the surrounding environment can greatly increase the rate of erosion. One of the primary causes of accelerated erosion is a reduction in the amount of vegetation within the riparian zone of a watercourse or lake.

(b) Stream bank protection and lake shoreline stabilization structures are permanent or temporary structures constructed to reduce or prevent stream bank and shoreline erosion. Structural techniques armor the bank with material such as riprap, concrete, or timber. Biotechnical techniques attempt to mimic natural processes by using live plantings, rootwads, and large woody material. Biotechnical techniques usually impact fish life less than structural techniques. Some projects integrate both structural and biotechnical techniques.

(2) **Fish life concerns:** Stream bank protection and lake shoreline stabilization alter the bed or beach and the physical processes that form and maintain habitat that supports fish life. Direct loss of habitat may include loss of aquatic vegetation, spawning gravel, large woody material, riparian zone vegetation, and flood plain connectivity as well as alteration of the channel/beach. These losses and alterations decrease the complexity and diversity of habitat.

(3) **Bank protection and lake shoreline stabilization design - General:**

(a) The department may require a person to submit a qualified professional's rationale with the HPA application for a new structure or a replacement structure extending waterward of the existing structure or bankline. This requirement does not apply to projects that address constriction, drop/weir scour or other scour caused by an existing structure. The rationale for the proposed technique must include:

(i) An analysis performed by a qualified professional assessing the level of risk to existing buildings, roads, or services being threatened by the erosion;

(ii) Technical rationale specific to the project design, such as a reach and site assessment to identify the mechanism of the bank failure and cause of erosion; and

(iii) Evidence of erosion and/or slope instability to warrant the work.

(b) Protect fish life and habitat that supports fish life by using the least-impacting technically feasible alternative. The common alternatives below are in order from most to the least preferred:

(i) No action - Natural channel processes to occur;

(ii) Biotechnical techniques;

(iii) Combination of biotechnical and structural techniques; and

(iv) Structural techniques.

(c) The department may require a person to incorporate large woody material or native vegetation into the design of the structures as partial or complete mitigation for unavoidable impacts to fish life.

(d) Restrict the area of stream bank protection and lake shoreline stabilization to the least amount needed to protect eroding banks.

(e) Where technically feasible, the toe of the structure must be located landward of the OHWL, unless an alternative is shown to have a net benefit to fish life and the habitat that supports fish life. Large wood or other materials consistent with natural stream processes can be placed waterward of the OHWL when approved by the department.

(f) The project must be designed to withstand the maximum selected design flow for the project.

**(4) Stream bank protection design:**

(a) When the bankline of a river or stream has changed as a result of meander migration or lateral erosion, the current location of the bank must be maintained. If this new alignment poses imminent threat to safety or structures or other improvement of value, the department may grant an exemption on a case-by-case basis to establish the bank alignment waterward of the current location to provide the minimum footprint necessary to construct the bank protection elements.

(b) The design of bank protection projects must follow the mitigation sequence to protect fish life and the habitat that supports fish life. The department will evaluate designs on the basis of performance. Properly designed bank protection projects:

(i) Incorporate the ecological and geomorphological processes acting at the site in the design;

(ii) Use a site and reach assessment to understand the causes of erosion;

(iii) Recognize that natural bank erosion processes and rates are essential for ecological health of the aquatic system and ensure that the design includes bank treatments that allow for natural rates of erosion to occur whenever feasible;

(iv) Move existing structures or other improvements of value away from the eroding bank whenever feasible;

(v) Use design flows appropriate for the type of protection and function of the individual bank protection elements;

(vi) Use natural materials whenever feasible, including large wood and vegetation;

(vii) Protect existing spawning and rearing habitat and the processes that create and maintain it; and

(viii) Recognize that stream bank erosion treatments can cause the need for more stream bank protection projects upstream and downstream of the project site and understand that the design must prevent or minimize these impacts to habitat that supports fish life and property.

**(5) Lake shoreline stabilization design:**

(a) If the OHWL reestablishes landward of a lake shoreline stabilization structure, the department will consider this reestablished OHWL to be the existing OHWL for permitting purposes. If the breach was a result of storm damage or other natural conditions, the bank protection structure may be repaired or replaced in the existing footprint if the work is conducted within three years from the date the damage occurred.

(b) The design of lake shoreline stabilization projects must follow the mitigation sequence to protect fish life and the habitat that supports fish life. The department will evaluate designs on the basis of performance. To properly design bank protection projects:

(i) Set back structures or other improvements of value away from the eroding shoreline;

- (ii) Remove existing rock and concrete bulkheads whenever feasible;
- (iii) Use soft shore protection methods such as beach nourishment, large wood, bank resloping, and revegetation;
- (iv) Prevent impacts to adjacent habitat that supports fish life; and
- (v) Bury the base of the structure deep enough to prevent undermining. Where scour depth is deep enough, choose a design that adjusts to changing scour depth without compromising the function of the bank protection.

**(6) Bank protection and lake shoreline stabilization construction:**

- (a) The department may require a person to establish the horizontal distance of the structure from a permanent benchmark(s) (fixed objects) before starting work on the project. The benchmarks must be located, marked, and protected to serve as a post-project reference for ten years.
- (b) Do not release overburden material into the waters of the state when resloping the bank.
- (c) Do not use bed gravel for exterior armor unless approved by the department.
- (d) Bank protection or shoreline stabilization material and filter blanket material must be placed from the bank or a barge. Dumping material onto the bank face may occur only if the toe is established and the material can be confined to the bank face.

[Statutory Authority: RCW 77.04.012, 77.04.020, and 77.12.047. WSR 15-02-029 (Order 14-353), § 220-660-130, filed 12/30/14, effective 7/1/15.]