



Shoreline Stabilization Fact Sheet

Why Shorelines are Important

Natural, stable shorelines are an essential part of a healthy functioning aquatic ecosystem and include the areas above and below the water's edge. Aquatic vegetation, rocks, and woody debris provide important habitat for fish and other aquatic species, while protecting our shorelines from ice and wave erosion. Trees, shrubs, and grasses provide habitat for wildlife, and protect shorelines and stream banks from ice, waves, and other erosional forces; vegetation even acts as a filter for surface runoff.

When shorelines are disturbed (by development or natural causes) valuable fish and wildlife habitat can be lost, and shorelines may cease to provide erosion protection. The impact of shoreline alterations is not confined to any one parcel of land. A water body benefits – or suffers - from the cumulative works and actions of all the users of that water body. Changes and disruptions to the shoreline area, both above and below the waterline, can add up, resulting in significant habitat loss and negative changes to water quality.

To protect our properties, roads, and other infrastructure from erosion and bank slumping, shoreline stabilization along our lakeshores, rivers, or reservoirs is sometimes required. Erosion can occur through natural processes such as higher than normal water levels, wave and ice scour, and overland runoff. Erosion can also be caused by our own activities such as shoreline alterations, removal of riparian vegetation, excessive vehicle traffic on the bank, or allowing livestock unrestricted access to a shoreline.

Be Aware of the Environmental Management and Protection Act and Other Legislation

Most shorelines, which include the bed, bank and boundary of the water body in Saskatchewan, whether Crown lands or private lands are protected under *The Environmental Management and Protection Act, 2010* (EMPA). (See the Water Security Agency Information Sheet titled "Shoreline Development" for more information.)

Under EMPA any person planning work in or near a water body or watercourse must contact the Saskatchewan Water Security Agency to:

- alter the bed, bank or boundary of a water body or watercourse,
- remove or add material to the bed, bank or boundary of a water body or watercourse, or
- remove vegetation from the bed, bank or boundary of a water body or watercourse.

For more information or permit applications, contact the Water Security Agency (WSA). In addition to permitting requirements under EMPA, work within municipal lands requires consent from the appropriate authority such as the Rural Municipality, Village, or District when work is occurring on land designated as Municipal Reserve, Public Reserve, Environmental Reserves, or municipal road allowance.

Fisheries and Oceans Canada (DFO) should be contacted if your work might cause serious harm to fish, fish habitat or a fishery. (Information can be obtained at <http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html> under the Shoreline/Bank Re-vegetation and Stabilization heading).

Environmentally Friendly Practices to consider BEFORE Applying for your Shoreline Stabilization Permit

The use of environmentally friendly materials and designs for shoreline stabilization will help protect our shorelines and maintain a healthy nearshore environment. Some environmentally friendly practices for shoreline stabilization are outlined below.

Preserve the Natural Shoreline

Shoreline stabilization can start with something as simple as not mowing grass or cutting down trees and shrubs on your shoreline, and allowing natural vegetation to grow or become re-established. A naturally vegetated shoreline has many benefits including preventing contaminants or excess nutrients from entering the water; preventing erosion caused by rain, wind, wave, and ice action; and, supplying food, shade and cover for fish and other aquatic organisms. If some vegetation must be removed, limit the removal and avoid areas where erosion is already occurring. Prune trees and shrubs back instead of completely removing them. The stabilization treatment must closely follow the contour of the existing shoreline; infilling to encroach on the bed of the water body to increase the useable size of your lot is typically not allowed.



Shoreline Planting and Bioengineering

Establishing deep-rooted, native plant species will help provide long-term shoreline stabilization. Some species of common shrubs have roots that extend deep into the soil, helping to keep the soil and shoreline together and some of these species are low growing and will not block your waterfront view. (Willow, Red-osier Dogwood, Saskatoon, Shrubby Cinquefoil, and/or Silverberry/Wolf Willow bushes may work, depending on your property: for additional information see references such as *On the Living Edge: Your Handbook for Waterfront Living*, by Sarah Kipp and Clive Callaway, Saskatchewan /Manitoba edition, 2003). When ice or wave damage occurs to a natural shoreline, plants naturally re-establish themselves.



For steep or tall eroding banks, just planting deep rooted, native species may not be sufficient to stop erosion or work quickly enough to protect at risk infrastructure. In these cases consider a bioengineering approach, using a combination of soft and hard shoreline stabilization methods. Bioengineering incorporates plants in combination with other natural materials (e.g. logs, live stakes, live brush bundles (usually willow) and even some rock) creating a stronger and more



natural appearance, while also providing fish and wildlife habitat. The planting of vegetation, especially deep-rooting species, above and immediately behind harder materials such as logs or rock, will greatly increase the stability of the slope. This type of bioengineered shoreline can provide a relatively stable area in a short period of time, and over the long-term, provide a very stable and natural looking shoreline.

Rip Rap (or Field Stone)

In general, rock embankments are constructed with a final slope ratio of at least 30 degrees or 2H:1V (horizontal: vertical) (i.e., for every one metre in height, rock extends out two metres). A 3H:1V ratio or 18 degree slope is often preferred because it is more stable. Using rock to stabilize shorelines can allow waves hitting the slope to “roll-up” the slope rather than crash into it. Using appropriately sized rock (minimum 12 inches or 30 cm in diameter) will help ensure wave and current action will not damage the shoreline or remove the rock. Placing Geotextile fabric under and behind the rock reduces soil erosion and the release of sediments, preventing impacts to water quality. In many



cases, only the toe or bottom of the slope may need to be rip-rapped and the remainder of the slope can be planted with vegetation (see bioengineering above). Rock used for stabilization must be clean and free of soils and organic debris and must not be taken from a water body.

Vertical Retaining Walls (Not preferred)

Where infrastructure has been built too close to the water and where there is significant shoreline erosion, retaining walls may be the only option to protect the shoreline and the Infrastructure behind it. The use of vertical sheet steel, concrete, gabion baskets or large armour stone in retaining walls produces a vertical, unproductive surface which is of little value to fish and other aquatic organisms. Vertical walls tend to deflect energy rather than dissipate it, and if not designed by a professional, often cause erosion problems elsewhere along the shoreline. The use of vertical retaining walls for shoreline stabilization is a least preferred option and must be justified as the only feasible option before it will be approved by WSA. If justified, and approved, it is usually required that rock rip rap be placed at the toe of the wall to assist in reducing erosive forces from cutting under the wall.

Protect Water Quality

If your work cannot be done under dry conditions (i.e., out of the water), work will need to be isolated from the water body and a sediment curtain installed around the work area may be required. The curtain should be carefully removed after the work is completed and only once all of the sediment has settled. Prevent the suspension of fine sediment particles in the water by working on calm days. This will also ensure the sediment curtain is not disturbed by wave action. Follow the natural contours of the shoreline and tie your project into the existing shoreline to reduce the likelihood of increasing erosion potential at the edges of your work. Choosing appropriate materials for the shoreline project can also protect water quality. The use of certain types of treated wood that are not approved for use in water; old railroad ties, certain types of metals including metal drums, tires, or old vehicles are not acceptable for shoreline stabilization materials and can leach toxic materials into the water body. Confirm any material you are planning to use in your project is acceptable for use in water. Also, if using any machinery to assist in your work, it needs to be clean and free from leaks to ensure no oil, fuel, grease, lubricants, fine sediments, and plant material enter the water that could negatively affect water quality.



Information You Will Need To Submit

Information you will need to submit to the Water Security Agency for your Shoreline Stabilization Project to obtain an Aquatic Habitat Protection Permit (AHPP):

- ☐ Contact information (applicant/ contractor/ funding organization – whichever is applicable)
- ☐ Name of Water body (water bodies) that may be affected
- ☐ Project Location (Lat/Long; UTM; Land Legal; Legal lot description for cottage developments)
- ☐ Registered Landowner contact
- ☐ Description of work, a reason for the work, time frame, and other details, including:
- ☐ A plan view (bird's eye view) sketch/drawing of the work site indicating the location of existing buildings, shoreline structures, and property lines, the dimensions of proposed work area (length and width) and distance of all the above to the water's edge (if available, reference the high/low/summer water levels);
- ☐ A profile view (cross-sectional) sketch/drawing of the original bank slope and proposed slope including the distance from the current water's edge (if available, reference the high/low/summer levels); and
- ☐ Typically a minimum of four pictures of the surrounding shoreline and proposed work area.

Contact Information:

Water Security Agency, Aquatic Habitat Protection

420-2365 Albert Street
Regina, SK S4P 4K1
306.787-0726
<https://www.wsask.ca/Water-Programs/Aquatic-Habitat-Protection/>

Also Contact: Municipal authority that may have development restrictions for the shoreline area on or adjacent to your lot.

Definitions:

Bed: That portion of the water body typically covered by water.

Bank: The rising ground bordering a water body that serves to confine the water to a channel or bed.

Boundary: The line or elevation contour surrounding a water body or watercourse where the aquatic vegetation and terrestrial plant species known to tolerate water saturated soils change entirely to terrestrial vegetation tolerating little or no soil saturation and includes a minimum surrounding area of five metres measured outward from the top of the bank.

Infilling: the deposition of materials onto the bed or bank (e.g., bottom or shoreline) of any water body.