

For Hornby Island Local Trust Area web page on “resources”

Shoreline erosion - Best practices

Some Hornby Island waterfront property owners may have concerns about shoreline erosion. Here is some information that might be helpful.

There are many ways to limit or avoid shoreline erosion. These methods range from "soft" to "hard" approaches. Soft methods are preferred and include stabilizing the shoreline by planting native deep-rooted vegetation along with bioengineering (the use of plants with natural materials such as logs, live stakes, live brush bundles). Harder, less preferable methods include installing armoured embankments, gabion baskets, and retaining walls.

Soft approaches

Preserve the natural shoreline:

Shoreline stabilization can be as simple as not mowing the grass or not cutting the trees and shrubs on the shoreline. This allows natural vegetation to grow or become re-established. A naturally vegetated shoreline has many benefits such as 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 in the shallow water. If some vegetation must be removed, limit the amount. Try to prune trees and shrubs back instead of removing them.

Shoreline planting:

Planting native deep-rooted species (check with your local federal and provincial regulatory authority(ies) for suggestions) will help accelerate shoreline stabilization. Many low growing species are available that will not block the waterfront view. Some species of common shrubs have roots that extend deep into the soil, helping to keep the soil and shoreline together. When damage occurs to a natural shoreline, plants can easily re-establish themselves.

Bioengineering (Soft structures):

Where planting native species may not be sufficient to stop erosion, a bioengineering approach may be more appropriate. Bioengineering incorporates plants in combination with natural materials (e.g. logs, live stakes, live brush bundles) creating a natural appearance and habitat for fish. A bioengineering design can lead to the long-term stabilization of a shoreline, reducing the need for future works.

Hard approaches

Rock rubble:

In general, rock rubble or rip-rap embankments are constructed so that the final slope is at least 1:2 ratio (vertical:horizontal); that is, for every one metre in height, the rock should extend out two metres. Where possible, a 1:3 ratio is preferred as it is more stable. By designing rock embankments with slopes, waves hitting the slope will "roll-up" the slope rather than crashing into it. To maximize the life of an embankment, the appropriate slope and rock size are needed so wave and current action will not damage it. A filter cloth placed under the rock prevents the slope from being eroded away and releasing sediments which may harm fish and their eggs. In many cases, only the toe or bottom of the slope may

need to be rip-rapped and the remainder may be planted. The planting of vegetation, especially deep-rooting species, above and immediately behind the rock will greatly increase the stability of the slope. A combined rock rip-rap and natural shrub shoreline will greatly increase the stability of the slope and provides additional habitat, food supply and hiding spaces for a greater variety of fish species. Rock rubble or rip-rap must be clean and free of silts and organic debris and must not be removed from the waterbody. Removing rock rubble from the waterway is considered destruction or harmful alteration of fish habitat and is not permitted.

Gabion baskets:

The use of gabion baskets involves the placement of baseball to football-sized rock into closed wire cages. The durability of these baskets is questionable when they are exposed to the elements. Gabion baskets provide marginal fish habitat and their use is not encouraged.

Retaining walls:

In a few instances, retaining walls are the only option to protect the shoreline, essentially where building foundations have been built too close to the water and are threatened by shoreline erosion. The use of sheet steel, concrete or large armour stone in retaining walls produces a sterile, vertical, flat-faced object, which is of little use for fish or other aquatic organisms. Vertical walls tend to deflect energy rather than dissipating it, usually resulting in erosion problems elsewhere. The use of vertical retaining walls for shoreline stabilization is not encouraged and generally not approved. Where vertical retaining walls are the only option, they are more stable if rock rubble/rip-rap is placed at the foot of the wall at a 45 degree angle to prevent erosive forces from cutting under the wall.

Permitting requirements for shoreline protection structures on your property

The Hornby Island Land Use Bylaw requires a setback for structures of at least 15 m (49.2 ft) from and 1.5 m (5 ft) above the natural boundary of the sea. A Development Variance Permit would be required for any proposed structure within this setback area. Here is a link to the Application Guide for a Development Variance Permit: <http://www.islandstrust.bc.ca/lup/pdf/dvpapplicationguide.pdf>. Here is a link to the Application Form: <http://www.islandstrust.bc.ca/media/214670/dvpapplication.pdf>.

Note that the foreshore below the natural boundary of the sea comes under provincial and federal jurisdictions and permission must be obtained from relevant agencies before any modifications are made to public land.

Contact planning staff for more information.

How Do I Care for My Shoreline?

Click [here](#) for a wealth of stewardship information on the Islands Trust website.

[<http://www.islandstrust.bc.ca/how-do-i/care-for-my-shoreline.aspx>]

Useful links

Coastal Jurisdiction in BC

http://salishsea.ca/resources/Riparianrights/Greenshores%20JurisdictionIssueSheet_finalVer4.pdf

Sharing our Shorelines

<http://www.islandstrust.bc.ca/media/216897/sharingourshorelinebrochure.pdf>

Erosion (Living by Water Project)

<http://www.livingbywater.ca/erosion.html>

Coastal Shore Stewardship

<http://www.llbc.leg.bc.ca/public/pubdocs/bcdocs/368207/part1.pdf>

Prepared by Trustee Tony Law – March 2014