

Fish Habitat & SHORELINE STABILIZATION

FACT
SHEET

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Shoreline areas provide habitat for a variety of aquatic organisms including fish. The nearshore area is where many fish species lay their eggs, feed and seek protection from predators. Changes or disruptions to these areas can threaten their survival. If you own or lease waterfront property, you can help protect the fish populations in your lake or river by protecting fish habitat along your shoreline. By using appropriate materials and designs for shoreline stabilization, fish habitat can be protected.

Be aware of the Fisheries Act and other legislation

The federal *Fisheries Act* provides for the protection of fish habitat. Under this Act, no one may carry out any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat (HADD), unless authorized by the Minister of Fisheries and Oceans Canada. The Act also states that no one is permitted to deposit a deleterious (harmful) substance into water containing fish.

Violations to the *Fisheries Act* can result in substantial fines, and/or the risk of imprisonment. If found guilty, then the violator may also be required to cover the costs of restoring the habitat at the site and/or be required to fulfill other court ordered remedies. Other legislation that may also be relevant is outlined in the introductory Fact Sheet: *Working Around Water? What you should know about Fish Habitat.*

Contacts and approvals

If your project involves building or modifying shoreline stabilization structures, the table on the next page will help you to determine which agency you should contact. In some instances, you may have to contact more than one agency. Keep in mind that approval from one government agency does not guarantee that you will be able to obtain approval from another agency. Remember you must obtain all approvals before starting work. Early consultation can save you from designing shoreline structures that will not be approved.

Information you will need to submit

When seeking approvals or permits you will need to submit the following information:



- ◆ Your name, address, telephone number, and if available, a fax number and e-mail address
- ◆ Rationale for the stabilization and the method you have chosen
- ◆ Waterbody name and location of the work site including the lot and concession numbers, county, township, municipality, and if known, latitude and longitude
- ◆ Proof of ownership for each of the properties where the work will be done and the most recent legal survey(s)
- ◆ Detailed description of the work site including a signed and dated map or sketch with dimensions indicating the location and distances to the average annual high-water mark of existing buildings, shoreline structures and property lines
- ◆ Plan view (top down) sketch or drawing of the shoreline to be stabilized showing length (m) of the work area, existing shoreline, proposed works and the distances to the average annual high-water mark
- ◆ Cross-sectional (side view) drawing (with dimensions) of proposed structures, indicating the current water level, original unstable slope, proposed slope and distances to the average annual high-water mark
- ◆ List of heavy equipment to be used
- ◆ Proposed start and completion dates
- ◆ Description of the substrate at the work site indicating approximate percentages of sand,

silt, clay, rock, gravel and aquatic vegetation, etc.

- ◆ Any sediment and erosion control plan for construction
- ◆ Information you have about fish use of the site
- ◆ Photographs of the work site and surrounding shoreline during ice-free conditions
- ◆ Other agencies contacted.

A site visit by agency staff may be necessary before your proposal can be approved.

Best practices

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.

Protect water quality

If your work cannot be done in the dry (out of the water), a sediment or silt screen around the entire work area may be required. The screen should be carefully removed after the work is completed and all of the sediment has settled on the bottom. Only work in the water on calm days. This will help prevent the suspension of fine sediment particles into the water and will ensure

the silt screen is not disturbed by wave action. Sediment or silt screens should be inspected daily and maintained to prevent the spread of suspended sediments to adjacent water and fish habitat.

In all cases, the chosen stabilization method should follow the natural contour of the shoreline.

Other tips for a healthy shoreline

- ❖ Avoid using fertilizers, herbicides and pesticides on your property. Rainwater will transport these chemicals into the water, impairing water quality. Nutrients entering the water from the use of fertilizers cause an increase in the growth of algae and aquatic plants. When these plants die and rot, the process uses up dissolved oxygen in the water, reducing the supply of oxygen needed by fish.
- ❖ Use soaps and detergents that are low in phosphates. Excessive phosphate levels cause increased growth of aquatic plants and algae.
- ❖ Protect your investment and your environment. Make sure your septic system is maintained and the tank is pumped out on a regular basis.
- ❖ Maintain shrubs or trees in the area between your septic system and the water. Plants help absorb some of the nutrients that pass through your septic system.

Working together to protect fish habitat

Help maintain the quality and quantity of fish habitat in our lakes and streams. For more advice on how to construct an environmentally friendly shoreline stabilization structure, contact your local agency staff directly.

Contact information

Contact information – Ontario

If the shoreline stabilization work . . .

- is in the Rideau Canal or Trent-Severn Waterway
- is in a federally owned small craft harbour
- includes construction of structures or placement or removal of materials below the average annual high-water mark in a public (Crown) land or on a private water lot
- may affect boat navigation
- involves the use of explosives in or near water
- includes construction of structures or placement of materials above the average annual high-water mark but within a regulatory flood plain
- includes construction of structures or placement of materials above the average annual high-water mark and is on private property

For more information, see the electronic version of *The Shore Primer* on our Web site listed below under “Contact Information”, under “Infocentre”, then “Guidelines and Factsheets”.

Your first contact should be . . .

- Parks Canada Agency
- Fisheries and Oceans Canada (DFO) - Small Craft Harbours
- Your local Conservation Authority (CA). Where there is no designated CA contact your local Ontario Ministry of Natural Resources office
- DFO - Canadian Coast Guard - Navigable Waters Protection Program
- DFO - Fish Habitat Management Program
- Your local CA
- Approvals may be required from your local CA if the structure is within the flood plain or fill regulated area

www.dfo-mpo.gc.ca/canwaters-eauxcan

Canada

Cette publication est également disponible en français.

Working together to protect and conserve Ontario's aquatic resources



Fisheries and Oceans Canada / Pêches et Océans Canada

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