

• Gabion baskets

The use of gabion baskets involves the placement of baseball to football-sized rock into closed wire cages. Unfortunately, the durability of these baskets is questionable when they are exposed to the elements. The fish habitat provided by gabion baskets is marginal. The use of gabion baskets for shoreline stabilization is not encouraged.

• Vertical retaining walls

In a few instances, retaining walls are used to protect the shoreline. This can occur where building foundations have been built too close to the water and are threatened by shoreline erosion. The use of sheet steel or cement 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 dissipate 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 rip-rap is placed at the foot of the wall to prevent erosive forces from cutting under the wall. The riprap should be placed to form a 45-degree angle to the wall.



Vertical retaining walls provide little fish habitat.

• Protect water quality

If your work can not 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 column by wave action 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.

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

Working together to protect fish habitat

Help maintain the quality of fish habitat in our lakes and streams. Please contact agency staff before beginning any work in or around water.

For further information or to obtain copies of other fact sheets in this series, contact:

Fisheries and Oceans Canada Calgary District 7646-8 Street NE Calgary, AB T2E 8X4 Tel: (403) 292-5160 Fax: (403) 292-5173	Fisheries and Oceans Canada Edmonton District 4253-97 Street Edmonton, AB T6E 5Y7 Tel: (780) 495-4220 Fax: (780) 495-8606	Fisheries and Oceans Canada Lethbridge District 204, 704-4th Avenue Lethbridge, AB T1J 0N8 Tel: (403) 394-2920 Fax: (403) 394-2917	Fisheries and Oceans Canada Peace River District 9001-94 Street Peace River, AB T8S 1G9 Tel: (780) 618-3220 Fax: (780) 618-3235
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www.dfo-mpo.gc.ca/canwaters-eauxcan

Federal and provincial offices are listed in your phone book under Government of Canada and Government of Alberta.

Cette publication est également disponible en français.

Printed on post-consumer paper

September 2003



Working Around Water?

WHAT YOU SHOULD KNOW ABOUT FISH HABITAT AND SHORELINE STABILIZATION

This fact sheet provides information about shoreline stabilization and contacts for government agency approvals.

Recently there have been a number of changes in the way proposals for in-water works are reviewed. These changes are outlined in the introductory fact sheet, *Working Around Water? What You Should Know About Fish Habitat*. This introductory fact sheet introduces the entire *Working Around Water?* series of fact sheets that are designed to help in the planning of different types of in-water works.

Why shorelines are important

Shoreline waters provide habitat for hundreds 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 waterfront. If you use 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 that harmfully alters, disrupts or destroys fish habitat, unless authorized by Fisheries and Oceans Canada. The Act also states that no one is permitted to deposit a deleterious (harmful) substance into water containing fish. Violations can result in substantial fines, the risk of imprisonment and a requirement to cover the costs of returning the site to its original state.

Most lands in Alberta below the average annual high water level are crown lands. Works or development on provincial crown lands or leased crown lands may require a permit or authorisation under the Alberta Water Act and the Alberta Public Lands Act. You should also contact the local municipal authority.

Other legislation that may also be relevant is outlined in the introductory fact sheet: *Working Around Water? What You Should Know About Fish Habitat*.



Retaining natural vegetation helps to protect shorelines from erosion.

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WHAT YOU SHOULD KNOW ABOUT FISH HABITAT AND SHORELINE STABILIZATION



Contacts for approvals and permits

If you are modifying the shoreline or building shoreline stabilization structures, the table below will help you determine who you should contact.

If the shoreline stabilization work...

Your first contact should be:

<ul style="list-style-type: none"> • includes construction of structures or placement of materials below the high-water level 	<ul style="list-style-type: none"> - Fisheries and Oceans Canada - Alberta Environment - Alberta Sustainable Resource Development
<ul style="list-style-type: none"> • includes construction of structures or placement of materials above the high-water level 	<ul style="list-style-type: none"> - Alberta Sustainable Resource Development - Approval from Fisheries and Oceans Canada is not necessary.
<ul style="list-style-type: none"> • is in a provincial park 	<ul style="list-style-type: none"> - Fisheries and Oceans Canada
<ul style="list-style-type: none"> • may affect boat navigation 	<ul style="list-style-type: none"> - Fisheries and Oceans Canada
<ul style="list-style-type: none"> • is in a federally owned small craft harbour 	<ul style="list-style-type: none"> - Fisheries and Oceans Canada

This fact sheet refers primarily to the requirements of Fisheries and Oceans Canada. **Approvals from other federal, provincial, or municipal agencies may be required. It is the responsibility of the proponent to ensure they have all the necessary approvals in place before proceeding with work. Early consultation will help you design shoreline structures that will not harm fish habitat.**

Information you will need to submit

When seeking approvals or permits you will likely be asked for the following information. It will save time if you have this information available when you contact the agencies listed above.

- Your name, address and telephone number. If available, also include a fax number and an e-mail address.
- Rationale for project.
- The waterbody name and location of the work site, including the lot and block numbers, and park, or section, township, range and municipality.
- A detailed description of the work site including a map, survey plan or sketch with dimensions indicating the location of existing buildings, shoreline structures, property lines and the average annual high-water level.
- Cross-sectional (side view) drawing of proposed structures and their dimensions. Indicate the high-water level and the average high-water level. Also identify the current slope and the proposed change to the slope.
- Any sediment and erosion control plan for construction.
- Plan view (top down) drawing of shoreline to be stabilized showing length of shoreline to be stabilized, existing shoreline and proposed works.
- A list of heavy equipment required to complete the project.
- Proposed start and completion dates.
- Description of the substrate at the work site indicating approximate percentages of sand, silt, clay, rock, gravel, aquatic plant cover, or marsh etc.
- Any information you have about fish use of the site.
- Several open-water photographs of the work site and surrounding shoreline.
- A list of other agencies contacted.

Provincial approvals will require much of the same information, although maximum high and low water levels will also be required. *A site visit by agency staff may be necessary before your proposal can be approved.*

Bank stabilization options

There are many ways to limit or avoid the loss of your shoreline. These methods range from "soft" to "hard" approaches. Soft methods include stabilizing the existing shoreline by planting native deep-rooted vegetation, and bioengineering which uses plants with natural materials (logs, live stakes, live brush bundles etc.). Harder methods include installing armoured embankments, gabion baskets, and vertical retaining walls.

• Preserve the natural shoreline

One of the most effective and easiest ways is to take a "do nothing" approach. It is as simple as not mowing the grass or 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. Prune trees and shrubs instead of removing them.

• Shoreline planting

The establishment of natural vegetation can be accelerated by selectively planting native deep-rooted species. Willow, alder and red osier dogwood are some common species that have roots that extend deep into the soil, helping to keep the soil and shoreline together. The best time to plant is after the last frost in spring. When damage occurs, natural shoreline plants can re-establish themselves often without your assistance. Repairing damaged retaining walls or harder structures is usually difficult and more expensive.

• Soft structures (bioengineering)

The planting of native species may not be sufficient to stop the erosion of your shoreline, in which case a bioengineering approach may be more appropriate. Bioengineering incorporates plants in combination with natural materials (logs, live stakes, live brush bundles etc.) into the shoreline stabilization design. A bioengineered shoreline has a natural appearance and can also provide habitat for fish. A bioengineering design can lead to the long-term stabilization of a shoreline and reduce the need for future works.

• Rock rubble

The use of rock (rip-rap) to stabilize shorelines continues to be a common proposed type of shoreline stabilization project. In general rock rubble embankments are constructed so that the final slope is at least 1 to 2 (vertical:horizontal); that is, for every one foot in height, the rock should extend two feet out. By designing rock embankments with slopes, waves hitting the slope will "roll-up" the slope rather than crashing into it. This will maximize the life of the slope. The rock needs to be sized appropriately so wave or current action will not move it. Often a filter cloth is placed under the rock rip-rap to prevent underlying sediments from being eroded away. The planting of vegetation, especially deep-rooted species, above and immediately behind the rock will greatly increase the life span of the structure. The placement of rock rubble below the high-water level directly affects fish habitat by covering over areas of natural lake or river bottom and may result in in-filling of habitat (i.e. where a wetted area becomes dry and results in a permanent loss of habitat). In some cases, the placement of rock rubble can increase habitat diversity and provide spaces in which fish can find food and hide from predators.



Bank stabilization using rock rubble.