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# THE SHORE PRIMER

QUEBEC EDITION



A WATERFRONT PROPERTY OWNER'S  
GUIDE TO HEALTHY SHORES

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# THE SHORE PRIMER

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## YOUR SHORE: A NATURAL WONDER THAT MUST BE PRESERVED

**F**or many waterfront property owners, the quiet spot by the lake or river is a little bit of paradise where we can relax, play, and enjoy being closer to nature. But it is a special place for another reason too: it is one of the richest and most complex environment that we frequent. This exceptional environment is where water and land meet to form the

shore. Besides providing shelter for diverse wildlife and plants, the shore is crucial to the health of lakes and rivers because it acts as their lungs and a protective barrier.

When a natural shore is altered, often through developments intended to improve waterfront living, the existing intricate, fragile balance is disrupted, setting off a real chain



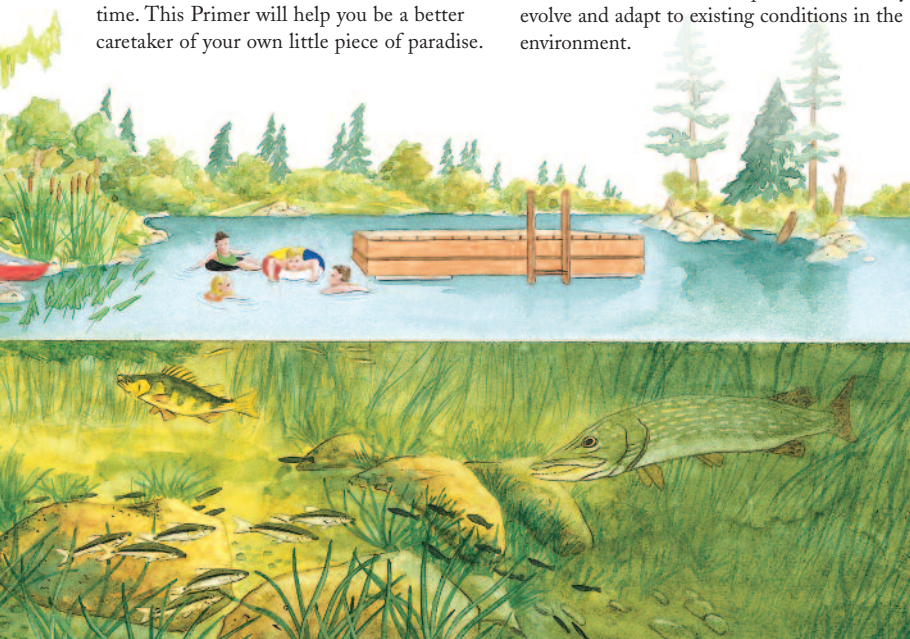
reaction. For example, if shore vegetation is removed to enhance the view of a lake, the shore is weakened. With the action of wind, rain and waves, it will gradually erode into the lake. Some shoreline residents then build a concrete or stone retaining wall to protect their property, but after a few years, the wall deteriorates, cracks and finally collapses. What began as an attempt to improve the view or access to the water has turned into a never-ending battle between the shoreline dweller and the elements of nature, leaving scars on both sides.

Usually, the best approach is to blend our needs into our environment. This way, we can preserve the health of our water bodies and save time and money. *The Shore Primer* explains how to protect and enhance shores and **littoral zones**. It also provides shoreline dwellers with some appealing solutions for restoring the health and beauty of environments that have been altered over time. This Primer will help you be a better caretaker of your own little piece of paradise.

## THE SHORE: A DIVERSIFIED, RICH ENVIRONMENT

The shore is the land that surrounds aquatic environments. It usually extends inland from the **high-water mark**. It begins where the littoral zone ends, and in its natural state, it forms a diversified, rich terrestrial environment.

Natural shores consisting of trees, shrubs and grasses generally play several important ecological roles in aquatic **ecosystems**: They provide a habitat for wildlife and plants and a barricade against erosion; they filter the excess influx of sediments, **nutrients** and chemical contaminants carried by **runoff**; they protect against excessive warming of the water; and they regulate the **natural cycle of water**. Over time, a balance is created between the different components of the natural shore (plants, rocks, slopes, drainage for runoff, etc.). These components constantly evolve and adapt to existing conditions in the environment.





### A NATURAL CEMENT PREVENTING EROSION

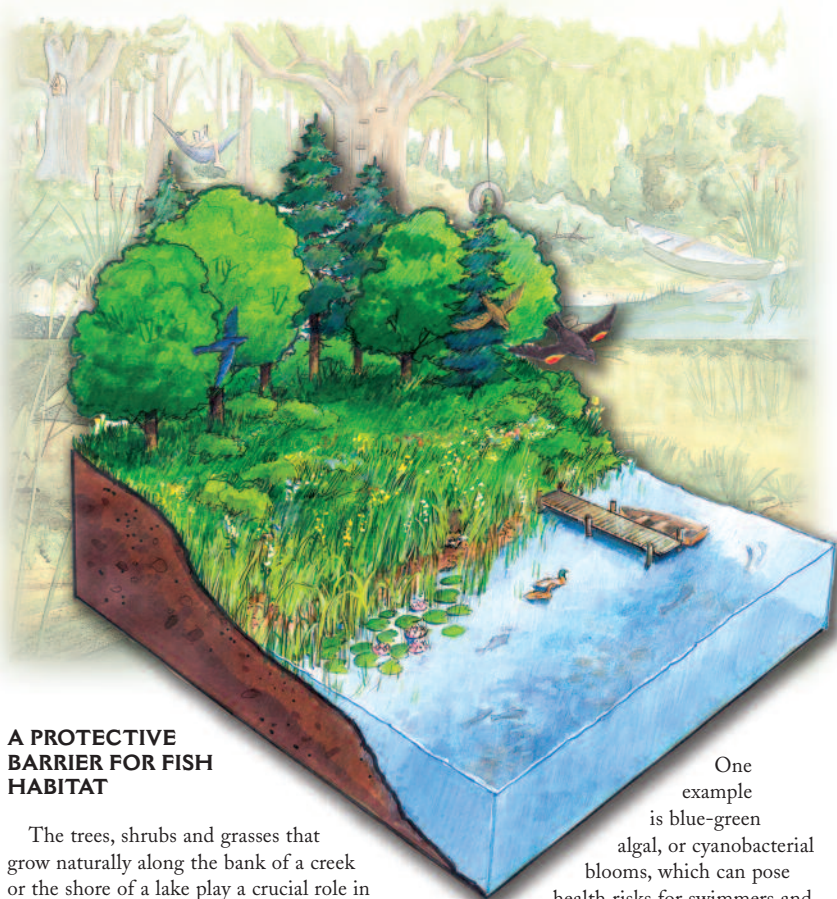
Over thousands of years, natural shores have evolved to provide one of the most effective, least expensive erosion controls. The diverse plants that colonize them form a complex web of roots and foliage that stabilizes the banks and enables them to withstand the impacts of wind, rain and waves.

The shore of a lake or a river often becomes less stable when a large portion of its vegetation is chopped down. The roots that held back the components of the soil

(earth, rocks, humus, nutrients, etc.) perish and can no longer play this important role. Particles of soil from the shores can then be released into streams, be transported in the water over long distances and wind up settling on the bed of slow flowing aquatic environments such as lakes. The settling of sediments may well cause the quality of certain zones that fish use for feeding or **spawning** to deteriorate. Take lake trout for example: it lays its eggs on rocky or pebbly bottoms so that the water can circulate between the eggs and properly oxygenate the embryos. If the eggs are covered in sediment, the embryos will be deprived of oxygen and suffocate to death.



Natural shores resist the effects of wind, rain and waves.



## A PROTECTIVE BARRIER FOR FISH HABITAT

The trees, shrubs and grasses that grow naturally along the bank of a creek or the shore of a lake play a crucial role in the conservation of fish habitat. They act as a filter between the soil and the water. The network of roots serves just as much to filter runoff than to stabilize the shore. As a filter, it traps contaminants before they reach the water body, in particular, phosphorus, a naturally occurring nutrient, but which is also found in various products such as detergents and fertilizers. In excessive quantities, phosphorus may disrupt the balance in a body of water and cause the pervasive growth of algae and aquatic plants.

One example is blue-green algal, or cyanobacterial blooms, which can pose health risks for swimmers and other users of an aquatic environment.

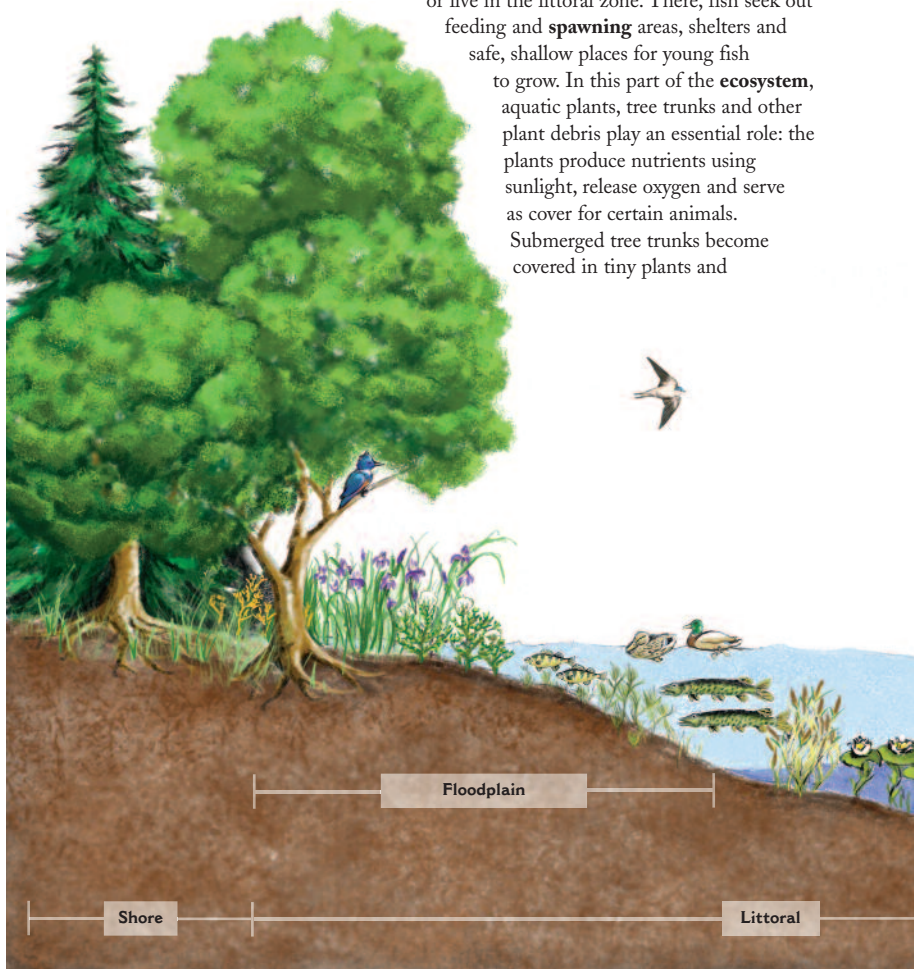
What's more, thanks to leaves and branches, which lessen the impact of heavy rains, and dead leaves, pine needles and broken twigs, which slow the flow of runoff, the soil can more easily absorb rainwater, and thus limit flooding and shore erosion. Without this natural line of defence, nearby banks and aquatic habitats are unprotected and become very vulnerable to natural forces.

### THE LITTORAL ZONE: ONE OF THE MOST PRODUCTIVE HABITATS

When you sit on your dock, you are perched in the **littoral zone**. This is the transition zone between the terrestrial habitat and the aquatic habitat. It extends from the shore toward the centre of the water body, roughly to the depth at which submerged

plants are rooted. The upper portion of the littoral zone temporarily floods in spring but dries up in summer. It is very important to many fish species and for this reason it must be considered an integral part of the water body.

The littoral zone comprises a large mix of habitats. As much as 90% of the animal species who live in lakes either pass through or live in the littoral zone. There, fish seek out feeding and **spawning** areas, shelters and safe, shallow places for young fish to grow. In this part of the **ecosystem**, aquatic plants, tree trunks and other plant debris play an essential role: the plants produce nutrients using sunlight, release oxygen and serve as cover for certain animals. Submerged tree trunks become covered in tiny plants and





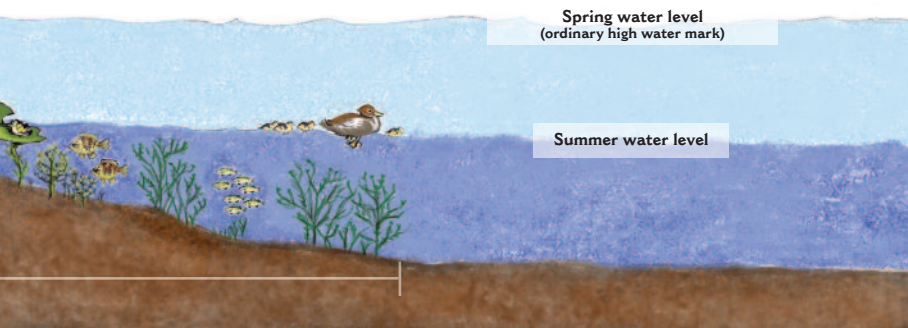


90% of the animal species that live in lakes frequent the shallow waters of the littoral zone.

invertebrates and provide an important source of food for crayfish and small fish. The plant debris (branches, leaves, etc.) that falls into the water provide shelter for small fish and excellent spawning areas for certain fish species such as yellow perch.

Although the role of aquatic plants seems more obvious, rocks and tree trunks are also

important components that can protect the shore from erosion. As well, in lakes with very small streams feeding them, rocky areas in shallow water are often the only place where some species can successfully spawn. If you do a thorough "house-cleaning" of your littoral zone and withdraw the logs, the rocks and the vegetation, you may well destroy essential fish habitat.





## ALTERING SHORES: A THREAT TO THE AQUATIC ENVIRONMENT

**T**he shore and the littoral zone are particularly vulnerable to alterations brought about by various types of construction, such as launching ramps and docks, stabilizing structures such as retaining walls or riprap, parking areas, landscaping, access paths and certain types of buildings. Such alterations can cause significant damage to aquatic environments. Here is an example:

To counteract erosion of their shore, many shoreline dwellers build a retaining wall out of concrete, stones, wood or steel. In environmental terms, such practices turn a natural, diverse shore into a sterile environment where life cannot really exist. What's more, concrete or riprap surfaces store the sun's heat and transfer it to nearby water. This warms the water, which is not good for all fish. The construction of artificial structures destroys a part of the shore and directly damages fish habitat. It can also amplify the erosion of abutting property, referred to as the end effect (creation of eroded areas on either side of the structure).

The construction, maintenance and repair of retaining walls often involve significant costs. Furthermore, a great deal of work is required to prevent them from failing. In many cases, it is much easier and less

expensive to stabilize the shore by planting native plants. Natural stabilization becomes more resistant as the plants grow, develop their root systems and spread.



**Artificial structures destroy the shore and damage fish habitat.**

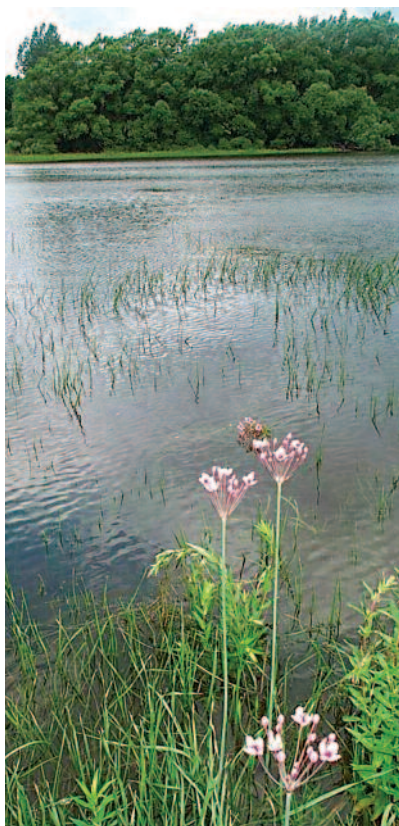


## SAVE YOUR LAKE FROM PREMATURE AGING

**T**he way in which shoreline dwellers treat the natural shore of their lake may have positive or negative consequences for its lifespan.

Just like human beings, lakes are subject to a natural aging process. The aging process of a lake, called eutrophication, begins with an increase in the quantity of nutrients transported by runoff from the surrounding land. This results in the proliferation of aquatic plants and their decomposition. Over several thousands of years, decomposing plants and animals that are deposited at the bottom of the water form a thick layer of sediments. This layer constantly grows thicker and gradually turns the lake into a marsh, and then, at the outcome of the process, into more or less dry land.

Spread over thousands of years, this process is normal and even desirable, because a healthy eutrophic lake supports all kinds of warmwater fish, such as largemouth bass and northern pike. However, if humans speed up this process by dumping too many nutrients into the lake, such as phosphorus for example, the qualities of the water body are altered too rapidly for the life that depends on it. Plants and algae growth explodes, and they decompose at a faster pace, consuming oxygen that is essential to aquatic fauna.



**Eutrophication begins with an increase in the quantity of aquatic plants.**



## THE SHORE PRIMER

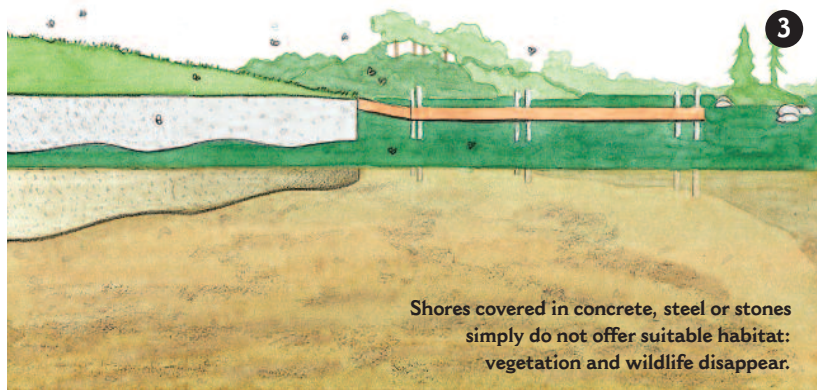
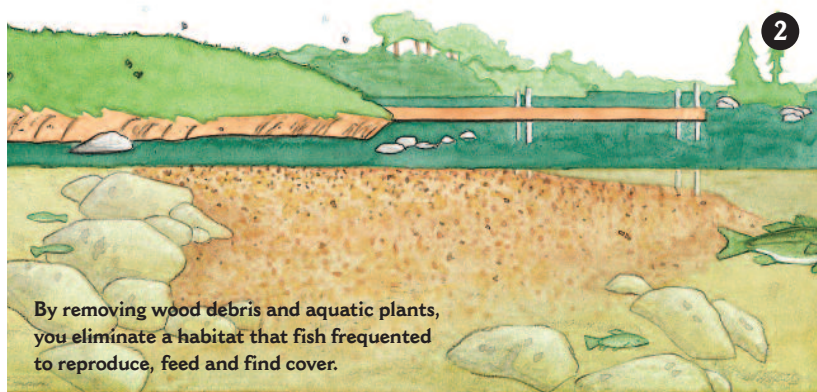
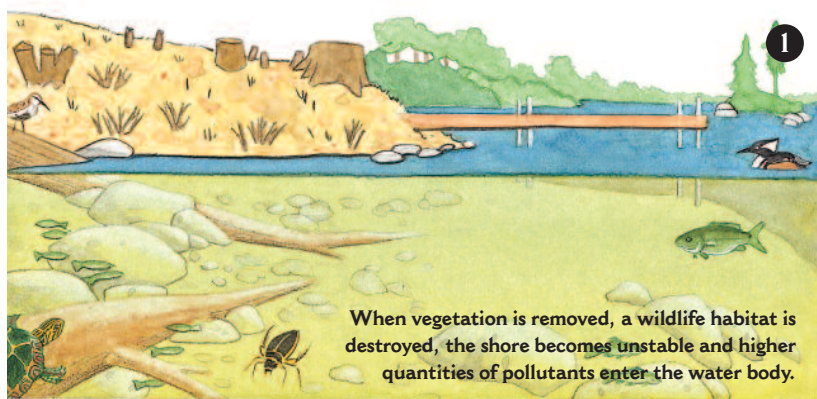
Sensitive species such as trout suffocate in lower oxygen conditions, whereas more tolerant species, such as carp, flourish. As a result, the food chain is disrupted and the lake ages before its time.

The accelerated eutrophication of a lake is often caused by many factors of which poor septic systems, the use of high phosphate detergents, and the removal of shore plants.



**In excessive quantities, phosphorus may disrupt the balance in a water body and cause blue-green algae, or cyanobacterial blooms.**







## RESTORING SHORES: WITHIN EVERYONE'S POWER

**I**t is important to know that living near the edge of water can be compatible with maintaining healthy aquatic **ecosystems** because after all, you can perform work that respects the natural balance of the shore and the **littoral zone**. Even sites that have been heavily damaged can be restored so as to significantly lessen their impact on the aquatic environment. To bring a water body back to its natural state, it is usually less expensive and less difficult to work with nature. There is no universal solution, because every shore is unique, but the following advice can help you.

### PLAN THE CONSTRUCTION OF YOUR RESTORATION WORK

The best way to get off to a good start is to sketch a scale map of your property on graph paper. Illustrate the buildings and other developments such as the dock and the boat launch, etc. Indicate the high and low water points (see the Figure illustrating the littoral and shore zone boundary, pp. 8 and 9), and show the location of water intakes and all shore components that should be preserved (rocks, vegetation on the land and in the water, fallen tree trunks in the water, etc.). You can also include the location of the wildlife habitats that you know about, in particular fish **spawning** areas and problem shore areas such as eroded zones or areas





where vegetation has been clear cut. Also note prevailing winds and currents. This map will be very handy if you are required to provide information to the authorities to obtain authorization to proceed with your work.

Next, note the state of retaining walls, docks and heavily used areas, such as shore access paths or the patch of lawn used as badminton or volleyball courts.

Take the time to gather sufficient documentation about new processes, good practices and materials appropriate to your

work. Get information about the habits of the fish species that live in your water body and about the impacts your project could have on fish and fish habitat. Brainstorm with your family, your neighbours and shoreline development experts to find environmentally friendly ways of doing things. Here are three sample restoration plans that could serve as a guide for your restoration work:

### RESTORATION PLAN 1: RESTORATION OF RIPARIAN VEGETATION

Shoreline property owners are doing more and more landscaping near aquatic environments, particularly near lakes. However, the installation and maintenance of lawns or the construction of paved pathways (asphalt, concrete slabs, stones, etc.) may have an adverse impact on water quality and on aquatic habitats.

When most properties located around a lake have lawns or paved areas instead of natural shores, many problems may arise.





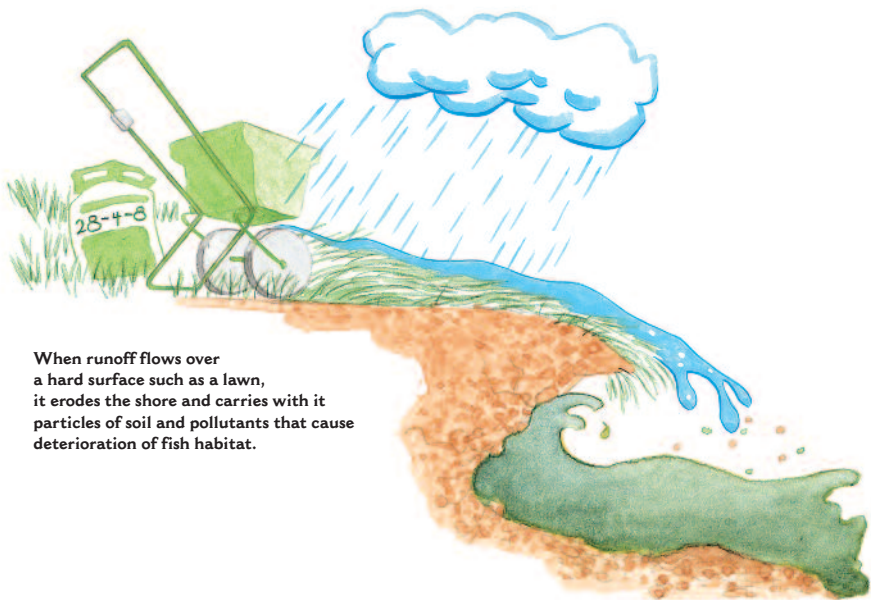
In fact, here is why lawns and paved areas make bad partners for lakes:

The rain that falls on a natural shore is nearly entirely absorbed by the soil before it reaches the water body.

**ecosystem.** Here is what you can do to remedy this situation:

### a) **Buffer your lawn from the lake**

Start by analyzing your property to determine the sections where lawn is



When runoff flows over a hard surface such as a lawn, it erodes the shore and carries with it particles of soil and pollutants that cause deterioration of fish habitat.

When rain falls on hard surfaces, even on lawns, most of it flows directly into lakes and streams. During heavy rains, lawns and paved areas speed up the flow velocity of the **runoff**. At the same time, soil particles are carried into the water body, which may degrade habitats that are important for fish, such as **spawning** areas. This runoff also carries pollutants (fertilizers and pesticides, etc.) into aquatic habitats. These pollutants harm fish, aquatic plants and the insects they feed on and they contribute to degrading the quality of the water and of the entire aquatic

essential. It is possible to preserve lawn to create an area for games or relaxation, or simply to camouflage a septic bed. In this case the lawn should be as far away from the water body as possible. Less frequently used areas could be converted into areas mainly planted with a variety of vegetation. The simplest thing to do is to let nature resume its course. This way, wild plants, usually including beautiful flowers, shrubs or trees will flourish naturally, without any effort or maintenance, creating diversified landscaping effects.



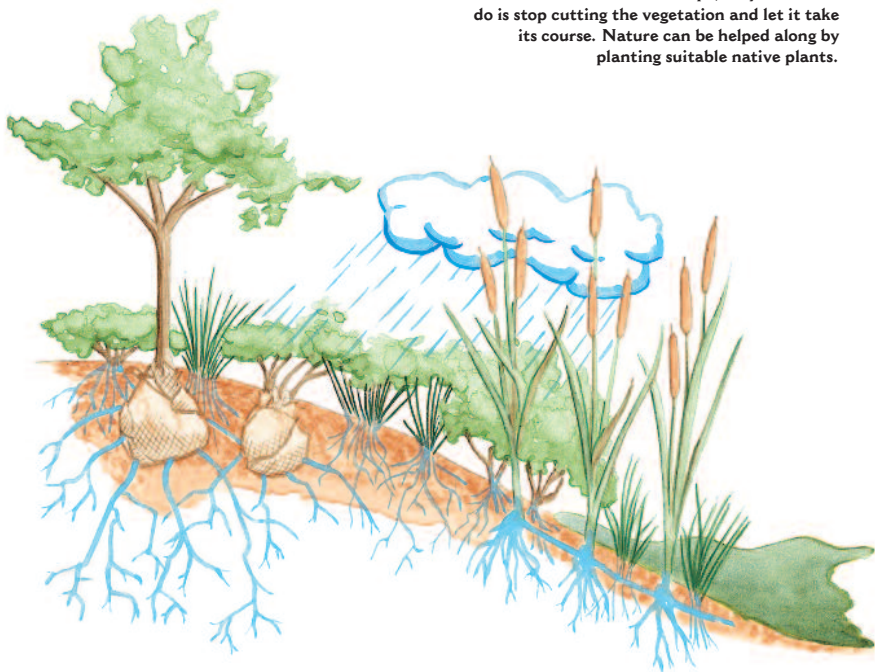
### b) Build a barrier with vegetation

To turn a lawn into a barrier of protection, all you have to do is stop mowing it and let nature take its course. In one season, you'll see many grasses grow that will gradually give way to shrubs and then over the years, trees. This buffer of natural plants will trap the contaminants contained in runoff, provide shelter for wildlife and give you greater privacy. To encourage the growth of the plants you prefer and preserve a view of the lake, you can cut back the plants you are less fond of. You can also nudge nature along a little by adding plants of your choosing to which you wish to give pride of place. Nurseries and garden centres offer many varieties of perennials and

ornamental shrubs that produce magnificent flowers and small berries that will enhance your environment throughout the seasons. That said, do try to incorporate the native plants of your region to conserve the existing biodiversity and to optimize your chances of success.

As a rule of thumb, the deeper a vegetation buffer, the more effective it is. To protect most coldwater lakes, you must preserve a zone of 30 metres back from the bank because the fish found there are less resistant to the effects of nutrient discharge. A 15-metre buffer is sufficient to protect cool water lakes. The grounds with steep slopes are more prone to erosion; they require a deeper buffer.

**To restore a shore in bad shape, all you have to do is stop cutting the vegetation and let it take its course. Nature can be helped along by planting suitable native plants.**



The vegetation buffer can be restored gradually. You can follow nature's example and proceed in phases, adding a new two- or three-metre deep strip each year, extending back from the water's edge.

### c) Build your pathway to the lake

If you must create a path through your buffer to provide or maintain access to the lake, here are some suggestions:

Use a meandering trail, angled along the slope, not running down straight to the water body, to give it a more natural appearance. Next, cover it with gravel or wood chips to allow water to penetrate the soil instead of flowing over the trail to the water body. If you decide to build a wood walkway, leave sufficient space between the boards for the rain and sunlight to freely infiltrate. You can also opt for an elevated walkway built on posts rising 15 to 30 cm above the ground or build a bridge over fragile areas. These structures will protect vegetation and provide cover for small animals such as frogs and salamanders. If your property has steep slopes, it is best to build stairs on posts to prevent erosion. Cutting into the ground to lay steps will only encourage erosion. Furthermore, concrete steps and sidewalks will create a channel for runoff to flow directly into the water body.

### d) Limit paved surfaces

Just as you have done with lawn areas, take the time to assess whether the paving of areas with asphalt, concrete slabs and stones, etc. could be accomplished with softer, more permeable materials. These may be seldom used lanes or parking areas or places where rainwater tends to pool before flowing toward the lake. Many alternative materials can be used, in particular, wood chips, gravel

or wooden structures with small spaces between the planks that allow water to flow. These materials will slow the velocity and reduce the amount of rainwater runoff and will prevent the flow of sediments and chemical contaminants to the water body. You can make these changes gradually, as the existing structures need to be replaced.



## RESTORATION PLAN 2: REPLACING A DOCK

Many docks built to facilitate access to water bodies span the shore and the **littoral zone**, a zone comprising habitats that are of great value to aquatic wildlife because they contain **spawning** and feeding areas as well

as cover for fish. When you decide to replace your old, failing dock, it is important that you follow a few recommendations to make sure that your new dock does not harm fish and their habitat. You'll find more detailed information about building a waterfront-friendly dock in *The Dock Primer*. To obtain a copy of this guide, please see the section *Further reading*, p. 25.

### RESTORATION PLAN 3: REPLACING A RETAINING WALL

If you compare a shore held in place by a retaining wall with a shore whose natural components have been preserved, you will see major differences in the animal and plant life. Shores covered in concrete, steel or stones simply do not offer suitable habitat. Land and water plants cannot spread their roots, and there are few shelters for living organisms. When a shore has been extensively covered in artificial materials, it can no longer support life: vegetation and wildlife disappear. In contrast, natural shores and the surrounding littoral zone provide shelter for abundant life, including land and water plants, insects, birds, amphibia and fish.

The construction of a retaining wall is a temporary solution to an erosion problem often caused by the absence of shore vegetation. Here's why: when the waves strike a vertical wall, the energy of the impact is deflected upwards where the waves break against the top of the wall and erode the soil behind it, and downwards, where the waves scour the soil in front of the wall. Gradually, the wall weakens, cracks and eventually, it topples over.

If a retaining wall has been built on your property, there are ways of limiting the impact of waves while improving the shore habitat.

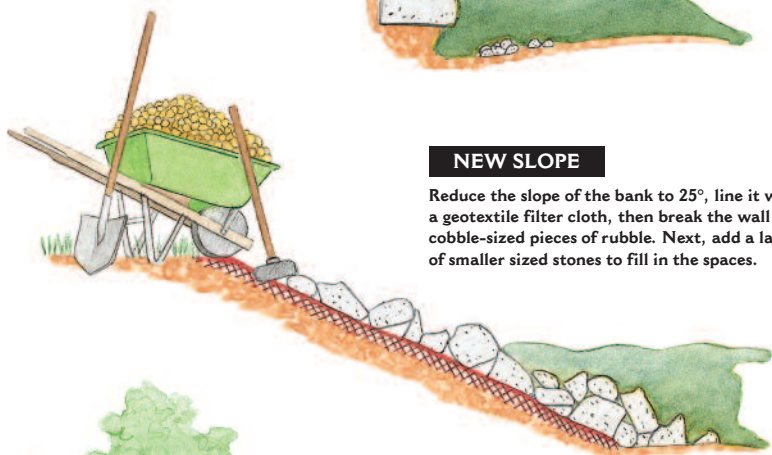
1. You can plant a strip of vegetation behind the wall using a lot of deep-rooted native shrubs to hold the soil in place and prevent gullies from forming behind the wall.
2. If your wall is in bad shape, this is the right time to replace it with a more natural structure that will strengthen the shore and improve habitat for aquatic wildlife. Dig out some of the earth behind the wall in order to reduce the slope of the bank (to a maximum of 25°), then line it with geotextile filter cloth to hold the soil in place. If it is impossible or too difficult to remove the wall, and if it is made of concrete, pull it back onto the new slope, then break it into cobble-sized pieces of rubble. Next, add a layer of smaller sized stones (15 to 20 cm in diameter) to cover the geotextile filter cloth and fill in the spaces between the pieces of concrete. Lastly, stabilize the soil by planting trees and shrubs behind the layer of stones. Over time, they will colonize the stony portion of the shore, because the sediments and plant debris that flow in with high water will create a substrate for them to take root. This type of development will make the shore more hospitable to plants and wildlife, and at the same time counteract wave-caused erosion (see Figure p. 20).

You need not have a retaining wall requiring restoration to help nature along. All you need to do is replant any bare areas of the shore with plants having roots that will stabilize the soil, such as shrubs. Shoreline development experts can advise you and even find someone to do the work for you.



### RETAINING WALL

The construction of a retaining wall is a temporary solution. Over time, the action of the waves will weaken the wall and it will crack and eventually topple over.



### NEW SLOPE

Reduce the slope of the bank to 25°, line it with a geotextile filter cloth, then break the wall into cobble-sized pieces of rubble. Next, add a layer of smaller sized stones to fill in the spaces.



### FINAL TOUCH

Stabilize the soil by planting trees and shrubs. Over time, the wildlife that had abandoned the shore will return.





## GET THE REQUIRED AUTHORIZATIONS BEFORE YOU START YOUR WORK

**W**hether you are a seasonal or permanent resident, a farmer or a developer, and you wish to perform work in or near water, you must be familiar with the regulations that apply to your project. The federal government's *Fisheries Act* protects fish and their habitat, in both fresh and salt water and on public and private land. Since the development of a shore and the construction or maintenance of a structure in or near an aquatic environment may alter or damage fish habitat, an authorization under the *Fisheries Act* could be required. It is advisable to find out which authorizations are required from federal, provincial and municipal authorities and to make sure you obtain them before you proceed with your work.

### Operational Statements for Low-Risk Activities

Fisheries and Oceans Canada has formulated Operational Statements to provide you with advice about standard measures that apply to activities causing few impacts for fish habitat. When the conditions and measures described in these statements are met, Fisheries and Oceans Canada does not need to review your project. If applicable, all you need to do is complete a notification form and send it to the Department. To find out more about the Operational Statements and to

evaluate whether you must submit your project to the Department, visit our Web site: [www.qc.dfo-mpo.gc.ca](http://www.qc.dfo-mpo.gc.ca) and select the *Regional Publications* tab.

### Don't Forget Species at Risk

When planning your project, check whether or not there are species at risk living near the area where your work will take place. If this is the case, you must also make sure that you comply with the *Species at Risk Act*. To find out more about the status of aquatic species and the permits that must be obtained before carrying out work near or in the habitat of a species at risk, consult the Species at Risk Public Registry at: [www.sararegistry.gc.ca](http://www.sararegistry.gc.ca) or the Fisheries and Oceans Canada Web site about aquatic species at risk: [www.dfo-mpo.gc.ca/species-especes](http://www.dfo-mpo.gc.ca/species-especes).



## HABITAT APPEARANCES CAN BE DECEIVING

While fluctuating water levels in lakes change the appearance of fish habitat, they do not change the boundaries. If, for example, a lake shore slopes gradually, you will notice that a slight drop in the water level in summer translates into a large retreat of the water's edge. Beaches extend further out into the lake, and the terrestrial vegetation tends to colonize the space left vacant by the retreat of the water. Don't make the mistake of using this part of the exposed shore and **littoral zone** as though it is no longer a part of the water body (see the Figure defining the boundaries of littoral and shore, pp. 8 and 9), because its fish habitat characteristics will most certainly return during spring flooding. This recommendation also holds true for creeks and rivers where the real habitat boundaries may be different than those observed during low flow.

Even if water levels of creeks, lakes and rivers rise to the point of submerging the terrestrial vegetation during snow melt and heavy rains, curb the urge to control flooding and above all, do not build anything to prevent these areas from flooding. For certain fish species, such as northern pike and yellow perch, flooded areas are the main reproductive sites.

## FISH HABITAT LOSSES: TO BE AVOIDED

Make your job easier! As soon as you begin designing your project, plan on measures to protect and preserve fish habitat. This way, you will be able to go ahead as soon as possible and you will avoid unpleasant surprises associated with committing an offence under the *Fisheries Act* because you will have taken steps to avoid damaging fish habitat.

The *Fisheries Act* prohibits causing the harmful alteration, destruction or disruption of fish habitat unless authorized by the Minister. If you believe that your project will not cause fish habitat loss, you do not have to obtain authorization from Fisheries and Oceans Canada. If, however, your project may cause a harmful alteration, destruction or disruption of fish habitat, the Department will evaluate whether these losses are acceptable and can be compensated through the implementation of a habitat restoration or creation program.

**Harmful alteration:** Any change to fish habitat that indefinitely reduces its capacity to support one or more **life processes** of fish, but does not completely eliminate the habitat.

**Destruction:** Any permanent change to fish habitat that completely eliminates its capacity to support one or more life processes of fish.

**Disruption:** Any change to fish habitat occurring for a limited period of time that reduces its capacity to support one or more life processes of fish.



## SHARING INFORMATION IS VITAL FOR THE PROTECTION OF AQUATIC ENVIRONMENTS

If you are among the first waterfront property owners in your area to adopt any of the good practices suggested in this guide, you may well provoke the curiosity or, hopefully, attract the interest of your neighbours. Don't hesitate to talk to them about the benefits of natural shore conservation or restoration. Offer them this guide, or refer them to the Web site where they can obtain a copy or to any other documentation you think is

relevant (see the section *Further reading*, p. 25). If there is a local association of waterfront owners working to protect or restore the lake to health, you can influence the course of events by getting involved. If there is no such association, you can always invite waterfront property owners to meet to talk about shore restoration techniques and the principles of conservation.



To sum up, to keep an aquatic environment healthy, you have to:

- preserve vegetation on land and in the water in both the **littoral zone** and the shore;
- avoid building artificial structures on the shore (retaining wall, riprap, etc.);
- avoid digging out or removing rocks and plant debris in the littoral zone;
- properly plan restoration or development work; and lastly,
- obtain the required authorizations.

Once the future of the natural shores of your patch of paradise is safeguarded, all you have to do is enjoy your hammock and let nature do its work!

## GLOSSARY

**Ecosystem:** A whole formed by a community of living beings and its atmospheric, soil and geologic environment. The components of an ecosystem develop a network of interdependencies that sustain and develop life.

**High water mark (HWM):** The maximum level reached by a lake or stream during periods of flooding.

**Life processes** (of fish): Events linked to the survival of fish: spawning, fry rearing, growth, overwintering, feeding, migration.

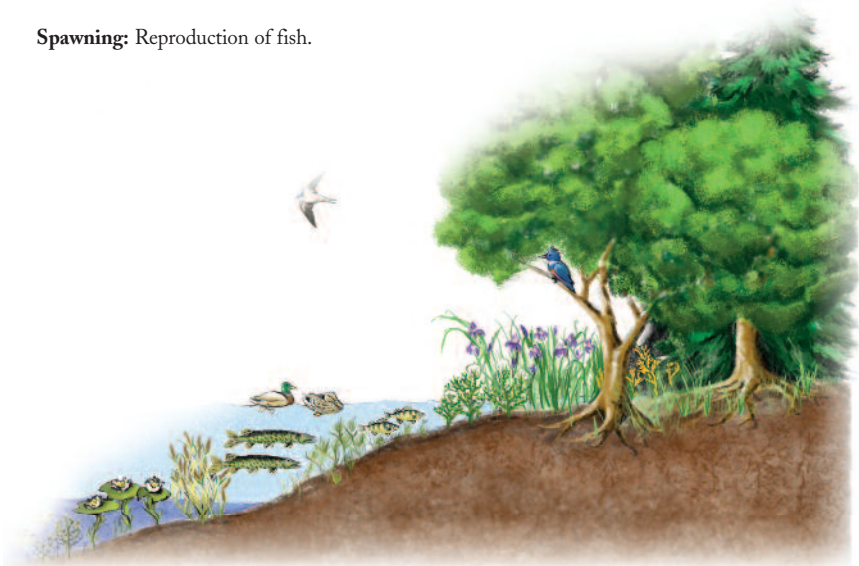
**Littoral zone** (ecological definition): The part of a water body that extends from the high-water line to middle of the water body to the depth at which submerged plants are rooted.

**Natural cycle of water:** Concept comprising the phenomena of the movement, evaporation and precipitation of water everywhere on the earth.

**Nutrient:** Simple substance that can be assimilated by an organism without digestive transformation (e.g. phosphorus and nitrogen).

**Runoff:** Rain water or water from melted snow that is neither absorbed by the soil nor retained by vegetation and that flows at the surface before flowing into streams and lakes. Also called surface runoff.

**Spawning:** Reproduction of fish.





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## FURTHER READING

### *The Fish Habitat Primer*

Fisheries and Oceans Canada, Quebec Region

This guide presents the types of habitats on which depend the varied fish and their ecological roles. It also proposes approaches to carry out work in the fish habitat without harming the latter. For an electronic copy, visit the Fisheries and Oceans Canada Web site, [www.qc.dfo-mpo.gc.ca](http://www.qc.dfo-mpo.gc.ca) and select the *Regional Publications* tab.

### *The Dock Primer*

Fisheries and Oceans Canada, Quebec Region

This guide outlines docks types that minimize adverse impacts on fish and fish habitat. For an electronic copy, visit the Fisheries and Oceans Canada Web site, [www.qc.dfo-mpo.gc.ca](http://www.qc.dfo-mpo.gc.ca) and select the *Regional Publications* tab.

### *Fish Habitat: More Than Meets the Eye*

Ministère des Ressources naturelles et de la Faune and  
Fisheries and Oceans Canada, Quebec Region

This guide outlines the various habitats that fish depend on and deals with their ecological roles. It suggests work methods that will have few or no impacts on fish habitat. For an electronic copy, visit the Fisheries and Oceans Canada Web site, [www.qc.dfo-mpo.gc.ca](http://www.qc.dfo-mpo.gc.ca) and select the *Regional Publications* tab.

### *Fish Traffic ... Yield the right of way!*

Fisheries and Oceans Canada, Quebec Region

This brochure explains the importance of allowing fish to move freely between the various habitats they frequent over their life cycle. For an electronic copy, visit the Fisheries and Oceans Canada Web site, [www.qc.dfo-mpo.gc.ca](http://www.qc.dfo-mpo.gc.ca) and select the *Regional Publications* tab.

### *Living at the water's edge*

Regroupement des associations pour la protection de l'environnement des lacs et des cours d'eau de l'Estrie et du haut bassin de la Saint-François (RAPPEL) and Fisheries and Oceans Canada, Quebec Region

This poster presents a series of good and bad developments conducted around water bodies. For an electronic copy, visit the Fisheries and Oceans Canada Web site, [www.qc.dfo-mpo.gc.ca](http://www.qc.dfo-mpo.gc.ca) and select the *Regional Publications* tab.

### *Trousse des lacs*

Conseil régional de l'environnement des Laurentides

This kit (in French only) contains a set of information sheets, protocols and supporting documents for characterization of the riparian strip and the visual monitoring of blue-green algae bloom, a health booklet and two plasticized property information sheets. For a copy of this kit, send your request by e-mail to [www.troussedeslacs.org](http://www.troussedeslacs.org)

### *Le répertoire des végétaux recommandés pour la végétalisation des bandes riveraines du Québec*

Fédération interdisciplinaire en horticulture ornementale du Québec. (FIHOQ), in collaboration with the Association québécoise des producteurs en pépinière, its affiliated associations and the Ministère du Développement durable, de l'Environnement et des Parcs

For an electronic copy (in French only), visit the FIHOQ Web site: [www.fihq.qc.ca/html/vegetalisation\\_des\\_bandes\\_rive.html](http://www.fihq.qc.ca/html/vegetalisation_des_bandes_rive.html)

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# INFORMATION

*To obtain more information, contact the Fish Habitat Management Division or the area offices of Fisheries and Oceans Canada. You will also find information on our Web site: [www.qc.dfo-mpo.gc.ca](http://www.qc.dfo-mpo.gc.ca)*

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