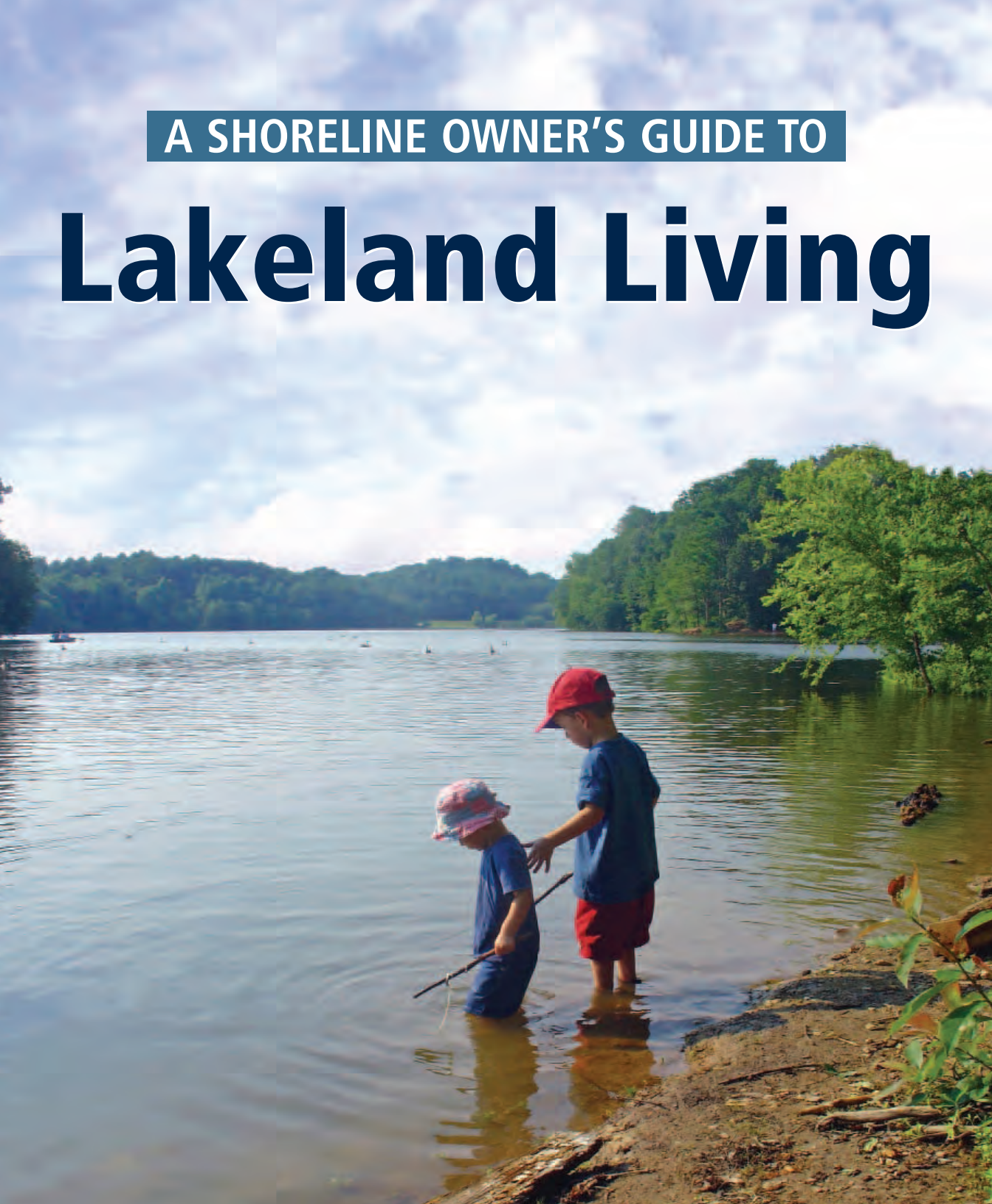
A SHORELINE OWNER'S GUIDE TO

Lakeland Living



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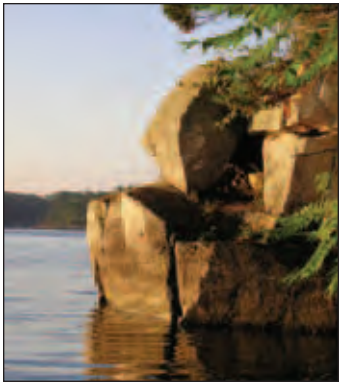
Introduction

For generations, picturesque lakes have lured families from across Ontario to fish, boat and swim. At the lake, people discover the enchanting call of the loon, the sight of painted turtles basking on logs and the magnificent sight of osprey soaring above crisp blue waters.

The appeal of retreating to Ontario's lakes for rest and recreation is growing in popularity. As a result, development on the shorelines of our lakes is taking place at an unprecedented rate. In addition to this increased development, more and more people are extending their time at the cottage to live there year round. To preserve the lake environment that brought us there in the first place, it is imperative for us to understand our impacts and to know how to reduce them.



This guide offers you the information that you'll need to make the most of your shoreline property while living in cooperation with your lake's fragile ecosystem.

What is a Watershed?

Lakes are part of a larger system called a watershed. A watershed is defined as all of the land area drained by a river and its tributaries. You could look at it as the path of a raindrop once it hits the ground. That path is shaped by the contours of the land and by climate and vegetation. These factors moderate the flow of water from land to streams and lakes.

Land use has an important impact on the water that moves through a watershed. As human activity reduces forestation, fills wetlands and paves over open land, less water gets filtered back into the watershed. Unfiltered surface runoff increases, and nutrient and contaminant concentrations in bodies of water may reach levels that pose a concern for the health of aquatic ecosystems. It is important to recognize that our lifestyle choices may contribute to the declining health of our lakes. The impact of lakeshore activities is not confined to the legal boundaries of one lakeshore lot. A lake benefits – or suffers – from the cumulative actions of all the lake users within the watershed.

What Type of Lake Do You Live By?

There are three types of lakes found in Ontario. You can learn more about your lake's unique characteristics by contacting your local Conservation Authority, Ontario Ministry of Natural Resources (MNR) or cottage association.

Oligotrophic Lakes

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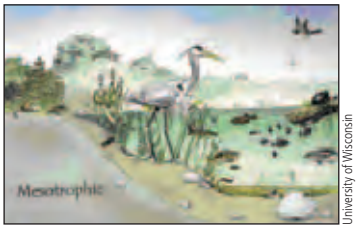
- Generally deep
- Minimal aquatic plant growth
- Low nutrient levels
- Support cold-water fish such as trout and whitefish
- Low levels of phosphorus and chlorophyll
- Most lakes on the Canadian shield are oligotrophic (Halls, Boshkung and Dickie) with some exceptions (Brady, Esson and Salmon Trout)

Mesotrophic Lakes



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- Medium depth
- Usually good for fishing; support a wide variety of fish such as walleye and bass
- More nutrients than oligotrophic lakes, but not nearly as much as eutrophic lakes
- Occasional algae bloom at the surface
- Buckhorn, Stony and Chandos Lakes are mesotrophic

Eutrophic Lakes

University of Wisconsin

- Generally shallow with abundant vegetation
- Support warm-water fish such as perch, bass and pan fish
- Frequent algae blooms
- Susceptible to oxygen depletion
- High phosphorus or chlorophyll readings
- On average, Rice and Scugog Lakes are eutrophic

Eutrophication is a lake's aging process. Sediments, erosion and the growth and decomposition of aquatic plants eventually leads to the lake bottom being filled in. Over time the lake is converted to a wetland (e.g., a bog or marsh) and later, dry land. This process normally takes tens of thousands of years to progress.

Human activity can accelerate lake-eutrophication. Excessive amounts of nutrients, particularly phosphorus, enter a water body from a variety of sources: from fertilized lawns and golf courses, as runoff from urban or agricultural areas, and from septic waste.

Water Quality Impacts Associated With Eutrophication

- Frequent blooms of undesirable algae* (toxic, giving water poor taste and odour)
- Excessive growth of aquatic plants leading to a loss of open water
- Decrease in water clarity
- Lower levels of dissolved oxygen, which may lead to fish kills and affect fish diversity
- Increased levels of coliform and E. coli bacteria present in surface waters
- Possible increase in the presence of carcinogens, such as chloroform, resulting from increased organic matter reacting with disinfectants such as chlorine

*Note that nutrients are only one of the variables that influence algal blooms. Blooms are also exacerbated by temperature and water column stability.

To find out more information about the water quality of your particular lake or to participate in water quality sampling on your lake contact the MOE Lake Partner Program at 1-800-470-8322 or visit them on the Web at www.ene.gov.on.ca

Lake Health Dynamics

Climate Change

It is uncertain how climate change will impact Ontario's lakes. Some common weather changes attributed to climate change include drought and higher temperatures. These weather variables control such things as water temperature, water levels (through evaporation), number of ice-free days, and nutrient input from watersheds into lakes. For example, increased water temperatures in lakes will change the numbers and types of bacteria and algae in lakes though it is not known how this will affect water quality. These factors also control certain physical aspects of the lake such as mixing depths and other elements that control biological functions like the length of growing season. In addition, the timing of seasonal events that are used to regulate ecosystem function may be offset from their "normal" dates (such as fish spawning).

Another major issue that we will certainly all face as property owners will be the increase in extreme weather events. These intense storms bring high winds and heavy rainfall. Large amounts of water running off the land into lakes will increase the affects of erosion and may affect shoreline infrastructure. As we will learn in later chapters, the best defense against these forces of nature is a well-established and well-rooted naturalized shoreline along with thoughtfully designed dock systems. Accompanying the rain will be high winds that will damage trees, buildings and power lines. It is always important to be prepared for emergency situations like power outages at the cottage. Be sure to have adequate supplies of drinking water, extra food and alternative light sources to get you through.

To see projected changes due to climate change in Ontario under different scenarios of change, visit:
www.gogreenontario.ca/maptool.php

Dorset Environmental Science Centre

Characteristics of a Healthy Lake:

- Natural shorelines providing a buffer that filters runoff and pollutants
- Well vegetated to provide shade (trees, shrubs, etc.)
- Good water quality that has low levels of pollutants or excess nutrients
- Water clarity remains constant or normal
- Relative absence of invasive species around or within the lake
- Abundant and healthy fish and wildlife
- Lake conditions changing gradually and naturally over time, not rapidly

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Characteristics of an Unhealthy Lake:

- Lack of natural shoreline (advanced shoreline development, erosion and hardened shorelines)
- Poor water quality, with high levels of E. coli, phosphorus and other pollutants
- Frequent changes in water clarity
- Consistently excessive aquatic plant and algae growth, possibly due to high levels of phosphorus
- Invasive species affecting lake health, native species and human use
- Loss of fish and wildlife habitat with declining populations

A Healthy Lake Makes For Healthy Fish Habitat

Each alteration to the natural landscape leaves an imprint along the water's edge, where 90 percent of all the lake and river life is born, raised and fed. These ribbons of life foster cattails, pickerelweed, ferns and reeds. They also provide habitat for fish and wildlife. A stable fish population is not only a valuable recreational resource, but also an indicator of a healthy lake ecosystem.

Factors affecting declining fish populations

Loss of fish habitat

Removal of rocks, weeds and woody debris, to "clean up" the shoreline or provide more suitable swimming areas, can be devastating to fish populations. Underwater structures such as logs and rock piles not only allow fish to have a place to rest, feed, and spawn, but also provide them with protection from predators.

Shoreline erosion

Shorelines may begin to wash away or become susceptible to erosion with the absence of natural vegetation. Sediment carried away by wind or water reduces the size of waterfront properties and buries spawning beds, negatively impacting the reproductive potential of fish in your lake.

Harmful substances

What goes on your lawn and down your drain goes into your lake! For tips on how to keep other pollutants out of your lake check out the "Low Impact Lake Living" chapter.

Fish Friendly Dock Structures

Choose a dock design that best suits your needs. Work done in and around water may require an approval or a permit. Fisheries and Oceans Canada has produced "Operational Statements" which provide advice on activities that include Dock Construction and aquatic weed removal. There is often no need for Fisheries and Oceans Canada (DFO) to review the project provided the conditions and measures in the Operational Statements are followed. You can also contact your local Conservation Authority or local office of the MNR when planning to install a dock. They can direct your inquiry and let you know what steps you need to consider prior to beginning any construction on the shoreline.

Floating Dock

- Simply designed and easy to build
- Causes minimal direct disruption of lake bed
- Minimal shading of aquatic plants
- Free flow of water underneath
- Least environmental impact

Pipe Dock

- Little contact with lake bed
- Minimal shading of aquatic plants
- Adjustable to water fluctuations
- Free flow of water underneath
- Minimal environmental impact

Crib Dock

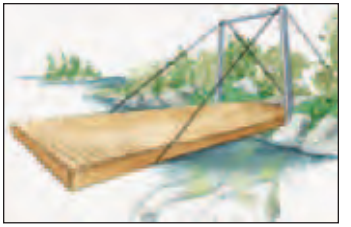
- Imported rubble and rock in crib bed
- Covers large area of submerged ground, smothering everything beneath
- May provide structure in otherwise sterile lake bed environments

Permanent Pile Dock

- Requires professional installation
- Minimal contact with lake bed
- Free flow of water underneath

Cantilever and suspension or lift dock

- Not suitable for areas with extreme water fluctuations
- Both types cause the least amount of destruction to lake bed
- Sunlight to aquatic plants is restricted
- Installed properly can cause minimal shoreline damage



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Work done in or around the water (including building a beach, dredging, constructing a pond, removing sunken logs, building a dock, or controlling aquatic plants) must not result in the harmful alteration, disruption, or destruction of fish habitat and it is important to plan your project with these things in mind.

To ensure the protection of fish habitat, contact your local Conservation Authority, the Ontario Ministry of Natural Resources, and Fisheries and Oceans Canada. If your lot fronts onto the Trent Severn Waterway or any of its associated lakes, please contact Parks Canada.

Low Impact Lake Living

Leave No Trace

After camping and shoreline meals, be sure to leave your site looking as though no one had been there. This will benefit wildlife as well as future outdoor enthusiasts. By cooking with gas stoves and by practicing good outdoor etiquette, we can minimize our impact on lake ecosystems. The "Leave No Trace" principles are:

- Plan ahead and prepare
- Travel and camp on durable surfaces
- Dispose of waste properly
- Leave what you find
- Minimize campfire impacts
- Respect wildlife
- Be considerate of other visitors

"If you pack it in, pack it out."

On the Water

James Wilkes

The primary impacts of human activity—for example, boating—on lakeshore ecology include wake effects, wildlife disturbance, noise and pollution. Many animals respond to human disruptions by altering their behavior and location. In particular, breeding birds such as loons are often affected by the wake of boats and other personal watercraft, Many waterfowl nests are located at the waters edge. A high wake can swamp nests, destroying or damaging nests and eggs. Disturbances such as noise can result in the abandonment of young chicks.

"Clean Marine"

It is equally important to prevent avoidable pollution, such as oil and gas spills and chemical contamination, from entering our lakes. It is vital that boat operators take appropriate precautions and use the appropriate facilities when refilling tanks or discharging used water. Remember to use absorbent pads to soak up oil, fuel or anti-freeze spills before discharging your bilge water. Also consider installing a bilge filter. For more information regarding Ontario's Clean Marine program, please look for the Eco-Rated Clean Marina nearest you or contact the Ontario Marine Operators Association (OMOA).

"Watch Your Wake!"

Here are some important reminders the next time you are out on the lake:

- 10 km/h within 30 metres of the shoreline is the law!
- Always avoid waterfowl nests and other sensitive wildlife habitat.
- Always follow safe refueling guidelines to avoid polluting water.
- Consider using non-lead fishing tackle.
- Obey posted speed limits and "No Wake" zones and know your boat's wake-free speed.
- Remember that operating your boat on plane creates a smaller wake than when 'plowing' through the water at lower speeds.

The impact of our recreational activities on lake ecosystems can be small or large depending on the choices we make. By limiting the negative effects of our actions and choosing low impact recreation activities, lake users will enjoy a better relationship with their human and wildlife neighbors.

Invasive Species

Non-native, exotic or invasive species are all terms used to describe organisms that have been introduced into habitats where they are not native and do not belong. Exotic introductions are a problem around the world and a serious threat to biodiversity. They can cause widespread and unpredictable changes to the habitats that they invade which results not only in damage to the ecosystem but also to the native fish and wildlife species that depend on them. Aquatic ecosystems are especially vulnerable and at risk from invasive species. Once established in an aquatic ecosystem, an invasive species is almost impossible to eliminate and measures to control the invasion can be costly.

Common Aquatic Invaders of Ontario

Zebra Mussels

Tolerant of a wide range of environmental conditions, these mussels have managed to spread throughout all of the Great Lakes as well as into many inland lakes. They filter the water and because of their high numbers rid the lake of not only pollutants but also much needed nutrients, resulting in a change in the lake's physical attributes. This can destroy the habitat of some native species while making the lake better suited for other native species. In addition, mussel introductions can also cause considerable damage to property and significant changes to the recreational quality of the waterfront.

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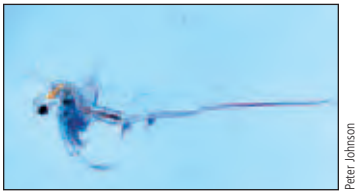
Spiny Water Flea

Because it has an extremely sharp tail spine, this invasive crustacean has very few predators. Spiny water fleas can out-compete native zooplankton species and reduce the availability of food for small fish.



Peter Johnson

Round Goby

Accidentally introduced into the Great Lakes by way of ballast water from ships, the round goby is an aggressive competitor to native species. It consumes large numbers of toxic snails and mussels. When other animals eat the goby, the toxins perpetuate within the food chain.

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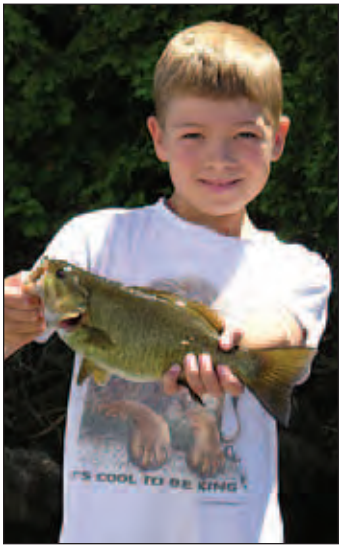
Preventing the Spread of Aquatic Invasive Species

With over 180 non-native species already established in the Great Lakes and a new one arriving every 8 months, preventing their spread can seem like an overwhelming task. Yet, there are simple things that you can do to stop their spread.



Boaters

- When removing your boat from a lake, inspect the boat, trailer and all accessory equipment that has been in the water. Remove all plant and animal material before leaving the launch.
- Drain water from motor, live wells, bilge and transom wells immediately, before leaving water access area.
- Before transporting your boat to another water body, wash your boat, tackle, downrigger cables, trailer, and other equipment with hot water, or spray with high-pressure water; or, let your boat dry out in the sun for five days.

Anglers

- Empty bait buckets on land. Never dump a bait bucket into a lake if it has water from another water body in it, and never dump live fish from one water body into another. Not only can this result in the introduction of a new species into a lake, it is also **illegal**.
- Learn to identify the different species of baitfish and distinguish them from invasive fish such as the round goby. Buy your bait where you fish and dispose of unused bait and water on land or in the trash.

Gardeners

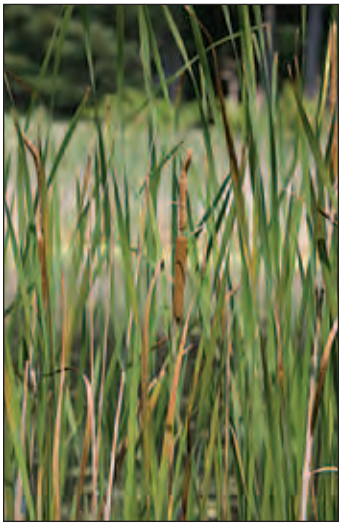
- Exotic plants can add beauty and variety to your garden. But take care – some species can become invasive if they escape to our natural waters or woodlands.
- Learn how to identify exotic/invasive species. Remember that they thrive in disturbed areas; so wherever possible, keep it natural.
- Choose contained areas for your exotic plants; or, better yet, use native plants.

Call the Ontario Federation of Anglers and Hunters' Invading Species Hotline @ 1-800-563-7711 (toll-free in Ontario) to report a sighting or to obtain more information on how to protect your lake against invading species.

To learn more about invasive exotic plant species, check out Peterborough Green-Up's "Invasive Exotic Plants in Ontario" factsheet at www.greenup.on.ca.

When Aquatic Plants Become a Nuisance

Aquatic plants do more than just tangle up in boat propellers or swimmer's feet. They support the microorganisms that fish require for food and they provide natural habitat and are a primary food source for aquatic birds.



Aquatic Plants are Essential to the Life of a Lake

In addition to providing a source of oxygen in the water, aquatic plants help stabilize loose sediment and are an effective natural breakwater, keeping waves from eroding the shoreline. The spread of aquatic plants can be a natural process of lake evolution. As a lake gets older, an accumulation of nutrients in the sediment causes an increased growth in aquatic plants (eutrophication). Some lakes are naturally eutrophic; it is important to consider this before attempting to control vegetation growth.

Pollution and Erosion

Pollution and erosion are two reasons for excessive plant and algae growth in lakes. When a lake receives an overload of nutrients from either sewage, added fertilizers leaching through the soil, or erosion, aquatic plants and algae tend to overgrow. This effect is multiplied in lakes that are already old and eutrophic, or naturally high in nutrients with a wide littoral (shoreline) zone where aquatic plants can grow. Eliminating sources of pollution and reducing erosion can help prevent the over-fertilization of plants in the lake.

A Special Note on the Use of Fertilizers
Remember, what goes on the lawn goes into the lake! That includes fertilizers applied to lawns near the water. Rain and irrigating will carry these fertilizers into the lake and encourage rapid and prolific growth of aquatic plants and algae.

Water Temperature
Water temperature also has a profound effect on aquatic plant growth. If the water temperature of the lake increases, aquatic plants will grow more rapidly. Increases in water temperature are mainly caused by the destruction of natural shoreline vegetation, which shades shallow waters from the heat of the sun. If the streams and rivers that feed a lake have unprotected banks, pre-warmed water entering the lake adds to the increase in temperature.

Controlling the Growth of Aquatic Plants

Cutting is an expensive and labour intensive method of controlling aquatic vegetation; it may not even be productive, as cutting can stimulate growth. Fragments left in the water can re-root and create a denser patch of vegetation than was originally there. In smaller areas, plants might be pulled out, rather than cut.

Toxic herbicides should be avoided! They may control aquatic plants quickly in the short term, but they are expensive, must be used often to be effective, and have negative side effects. Herbicides are especially discouraged within a wide area where children and young people will be swimming. Using these chemicals has health and environmental risks, and always requires a Ministry of the Environment and/or Trent Severn Waterway permit.

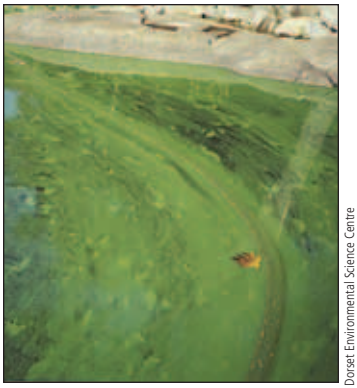
Maintain a lakeside buffer zone by using trees to shade the shores and tributaries. This can reduce erosion as well as stop any excess nutrients from entering the lake.

Reduce or eliminate the use of fertilizers. For every 1 pound of phosphorus in the water, 500 pounds of aquatic vegetation is produced.

Maintain your septic system. Have your septic system pumped and then inspected in 2 years. That should provide you with information on the volume and patterns of use and guidance on frequency of pumping.

Be careful with soap. The use of soaps and other detergents – even those that are biodegradable – can kill some wildlife species and create algae blooms if the suds directly enter the water. Soaps should always be phosphate-free and all dishwashing and bathing should be done on land, far away from shore.

For more information on dealing with aquatic plants, acquiring permits or any other shoreline related questions, please contact the Department of Fisheries and Oceans, or your local Conservation Authority.



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Wildlife Management

Wherever you live in "Lakeland," chances are you have had many experiences with wildlife. Most often, these encounters are peaceful and awe inspiring. Unfortunately, you may be noticing that these chance encounters with some species are becoming increasing rare. On the other hand however, the wildlife we share habitat with may visit us often and may become a nuisance. The information in this chapter will help you to protect those species at risk, deal effectively with "pesky" raccoons who keep you up all night, and offer ways to attract birds and butterflies to your home and garden.

Species at Risk

As our natural landscape is altered through development, pollution and the spread of invasive species, many native species are finding it difficult to cope. In most cases, a loss of habitat forces some species out of their natural range and can result in declining populations. Those species that are especially sensitive may begin to disappear. These stresses are felt by mammals, fish, reptiles and plant species alike. There are now several species whose existence is threatened but, with careful consideration for their habitat requirements and an awareness of what we can do to alleviate their challenges, we can make a difference on our own individual properties.

Mark Peck

The Black Tern

The Black Tern is a small, boldly marked tern with black head and underparts during the breeding season. They are mainly insect predators, hovering just above the water as they pick their prey off the surface. They build floating nests in loose colonies in shallow marshes, especially in cattails.

Black tern population declines have been occurring since the 1980s. Threats include wetland drainage and alteration, water pollution and human disturbance at nesting colonies due particularly to boat traffic that can swamp the floating nests.

You can help protect the Black Tern by respecting their habitat requirements. Do your part to keep pollution out of our lakes and wetlands and keep your boat speed to10km/h within 30 metres of the shoreline – it's the law.

Northern Map Turtle

The Northern Map Turtle is a shy medium sized turtle that gets its name from the irregular yellow or light brown markings along the shell that resemble the markings of a contour map. A distinctive yellow blotch is located behind each eye. The Northern Map Turtle can be found in large soft bottomed bodies of water such as lakes and rivers.

Increased shoreline development, the decline in habitat quality and increased human disturbance has caused population declines. In addition, the invasion of zebra mussels has caused declines in traditional prey species of the Map turtle. The pet trade may also be unwittingly contributing to population declines.

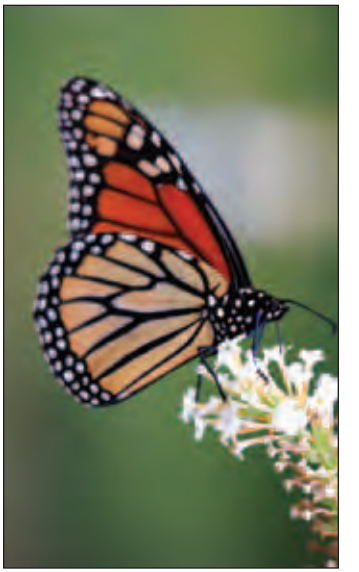
Help protect the Northern Map Turtle by keeping your shoreline natural!

Monarch Butterfly

The Monarch Butterfly can be found in Ontario wherever there are milkweed plants for its caterpillars and wildflowers for a nectar source.

Declines in the Ontario populations of Monarchs are due to logging of the overwintering sites in Mexico, and the widespread use of pesticides and herbicides in Ontario.

To help protect the Monarch Butterfly do not remove milkweed plants from your property or shoreline. Avoid using pesticides and herbicides. In other words, keep it natural!



To report turtle sightings, call the Trent Severn Waterway (TSW) Turtle Hotline at 705-875-2240 or, to learn more, visit the TSW's Green Pages at www.tswgreenpages.ca.

To get help for injured turtles contact the Kawartha Turtle Trauma Centre at 705-292-0691 or visit www.kawarthaturtle.org.

For more species at risk information and how to help, visit the Royal Ontario Museum's website at www.rom.on.ca/ontario/risk.php.

Nuisance Wildlife

Animal-proof your home or cottage

Squirrels, raccoons, chipmunks and other rodents can invade your home or cottage by way of tree limbs and cracks in the ceiling, walls and floors. To discourage these animals, simply remove tree limbs that give access to your home and seal up all openings with wire mesh, metal flashing or caulking. Don't forget to check for any young (or any other adults) that might be still inside before you seal the access point. The parents will try everything to back inside! Small mammals such as skunks and mice make their homes in and around woodpiles, so be sure to store your wood a good distance away from your home.

If **geese** are your problem, you can make your yard less attractive by allowing the naturally occurring tall sedges and grasses to grow. Geese prefer fertilized short grass that provides them with an open view of the water to keep an eye out for predators. Vegetation along a shoreline needs to be about 60 cm (24 inches) high, and dense enough to keep geese from seeing through.

To discourage **nuisance bear** visits, securely store garbage inside, and don't leave pet food outdoors. Thoroughly clean outdoor grills after use and don't put meat, fish or sweet food (including fruit) in your household composter.

Beneficial Wildlife

Attracting wildlife to your property can have positive effects. Consider the natural beauty of a leaping deer, and the important role in pest control of bats and dragonflies.

Enhance the Natural Habitat

Be sure to leave specific areas "untouched." Keep some large rocks, fallen tree limbs and aquatic vegetation wherever possible, to provide habitat for a diversity of wildlife. Hawks and owls will keep your rodent population to a minimum if you allow some dead trees to remain standing. Cavities (holes) in the trees will provide nesting and resting habitat. Rocks and debris from trees create perfect habitat for reptiles, mammals and amphibians, all of which play an important role in maintaining a diverse population of wildlife.

Gardening and Birdfeeding

When gardening, be sure to **plant native flowering vegetation** that will attract the birds and butterflies native to your area. Flowering plants left in the garden after the summer provide food for seed-eating birds throughout the fall and winter, keeping some species around your property year-round—a natural birdfeeder. Proper maintenance and care are the most important aspects of an installed birdfeeder. A bird will return to your feeder each day providing there is a consistent amount of food and the feeder is cleaned regularly to avoid transmitting disease and bacteria.

To learn more about native plants and trees contact Peterborough Green-Up

Mosquitoes and the West Nile Virus

West Nile Virus can be transmitted by a mosquito bite. Although the chances of contracting the virus are quite low, people who live in mosquito infested areas may feel better protected if certain precautionary measures are taken. Repellents containing DEET and mosquito netting are among the best forms of protection from mosquito bites. To further discourage mosquitoes on your property, you should consider draining sources of standing water in places like buckets, barrels, tires, bird baths to reduce the amount of mosquitoes that breed around your home. At the cottage, make sure you store small boats and canoes upside down, cover large boats to prevent accumulation of water, and keep drains open. Consider staying indoors during peak times for mosquitoes (dawn, dusk and in the early evening). Mosquitoes begin laying eggs in mid-May, so this is the right time to eliminate these breeding areas.

University of Wisconsin

To learn more about West Nile Virus, contact your local Health Unit or Public Health Department

Water Quality and Testing

Untreated surface water should never be ingested! Even healthy lakes can harbour harmful bacteria and parasites that can affect human health. Drinking contaminated water can make you sick and may even be fatal. Bacterial contamination, such as E. coli, causes stomach cramps and diarrhea, along with other problems. Harmful bacteria such as Giardia (which causes the illness known as "beaver fever") and cryptosporidium will cause major gastro-intestinal problems. Chemical contamination can be just as dangerous to your health. You can have the surface water of your lake tested by an accredited private lab for a fee.

Test your well water for bacteria at least three times a year and after any major plumbing work. Testing for excess nitrates and phosphorus is also recommended. If you are near an agricultural or urban area, you may want to test for other contaminants such as pesticides, gasoline and/or solvents.

Unusual tastes in your drinking water may indicate excess amounts of iron, chlorine, bacteria and other substances. Strange smells may indicate sewage overflow (after excessive rainfall or flooding), or other pollutants. But water contamination isn't always noticeable. The only way to make sure your drinking water is safe is to have it tested regularly.

Your local public health unit or the Ministry of Health will test well water and treated lake water. Water bottles for testing are supplied by the Ministry of Health and are available for pick-up at the public health unit. Be sure to follow the directions explicitly as there is a high possibility for cross contamination. This could lead to an inaccurate test of your water.

Water Conservation Tips

James Wilkes

- Install water-saving plumbing fixtures; e.g., low flow aerators
- Use laundry and dishwashers only with full loads
- Take shorter showers, rather than full baths
- Fix leaky faucets
- Avoid using sink situated garbage disposal units
- Consider installing a composting toilet

Simple Steps to Improve Water Quality

- Clean debris from your well, make sure the lid is vermin proof and fits tight, and check for erosion or other problems in a 50ft. radius of your well.
- Properly decommission unused wells and ensure maintenance of existing wells.
- Ensure that your well is at least 100 feet away from your septic bed (and your neighbours' septic beds).
- Confirm that your aquifer is not affected by septic runoff through regular testing.
- Monitor the water levels of your well on a regular basis. This will give you an idea of your daily usage and of your aquifer's recharge time.
- Install and maintain catch basins for storm water runoff from parking lots.
- Never dispose of any toxic chemical waste down the toilet or drain. Paints, oil, gasoline, antifreeze or chlorine can be disposed of at your local hazardous waste centre — for free!
- Prevent the loitering of Canada geese by planting and maintaining a buffer zone of thick and tall vegetation around shorelines.
- Avoid using any fertilizers or pesticides near a lake or water source. Choose eco-alternatives such as organics, naturalized and native lawns and gardens.
- Be conscious of what substances you flush down the drain or toilet: avoid putting fats, oils or antibacterial products into your septic system.
- Use less water whenever possible. The amount of water that goes through your septic system affects the amount of nutrients or pollutants being washed into the lake.

Well Aware

Maintain Your Septic System

- First pump your septic system then have it inspected in 2 year's time. This will provide the qualified technician with sufficient information to recommend how often your septic system should be pumped. (Frequency will depend on use and household size)
- Avoid the construction of patios, decks, parking areas or tennis courts in the area of the septic tile bed. Extra weight could crush pipes or compact the soil, limiting its permeability.
- Do not use snowmobiles over the leaching bed area in winter; this will reduce the snow cover's insulating effect. In addition, ATVs and snowmobiles can also compact filtration material.
- Have an effluent filter installed in your septic tank, to reduce the amount of solids entering the leaching bed, which prevents clogging.
- Ensure access to the septic tank for proper maintenance and servicing.
- Avoid planting certain species of trees around the leaching bed area. Willow roots can clog pipes and shade the septic area, slowing evaporation.
- Do not water your lawn around leaching bed area; extra water can reduce the bed's ability to absorb and treat waste water from the house.
- Direct rainwater from roofs, patios and driveways away from the leaching bed to avoid system overload.

Contact your local health unit for more information and visit www.wellaware.ca .

Shoreline Erosion and Stabilization

Caring for your shoreline means less work, not more! You will help preserve water quality and safeguard your family's health. You will also help protect the beauty of your paradise, maintaining its investment value. Extra benefits include more time to relax and enjoy!

– Waterfront Living, www.livingbywater.ca

Shorelines erode for various reasons: natural wave and wind action, ice action (freezing and thawing) and such human activities as altering the waterfront with lawns, docks and break walls. When soil is exposed and vegetation is cleared or kept mowed to the water's edge, the stabilizing effect of root systems is lost, which in turn opens the land to the power of the waves, ice and surface runoff. It is important to remember that erosion is a natural process and no shoreline treatment will stop it. At best we can implement practices that will reduce the impacts of erosion.

Kawartha Conservation

Despite their popularity, natural erosion cannot be prevented with concrete shore walls or sloped rock. Both of these measures are expensive and temporary fixes. Major storms, ice damage and the effects of time eventually cause these to fail. Hardened shores in one place may also mean more erosion problems at neighbouring shoreline areas, when wave, flow and ice energy is deflected elsewhere.

Although simple sloped rock protection may offer small feeding and refuge spaces for fish and aquatic invertebrates, a fully naturalized shoreline is generally considered the best multi-purpose approach to protecting the lake's edge. Water and ice energy is easily dissipated as it washes up the shore slope, and deep-rooted vegetation acts to further stabilize near-shore soils. Restoring your shoreline or leaving it in a fairly natural state is the best strategy for shoreline property owners to use against shoreline erosion.

Before

Kawartha Conservation

After

Kawartha Conservation

Joe Fowler Park, Port Perry, Ontario. Restoration undertaken by Scugog Lake Stewards.

Techniques to Reduce Shoreline Erosion

- Encourage a buffer zone of native vegetation. The buffer zone can be as little as three metres wide, as long as it contains a variety of native species.
- Maintain a smaller lawn away from the waterfront; a pathway may be mowed for access down to the water, but keep any development well back from the lake.
- "Rip rap" (stabilizing a shoreline with rocks) can be expensive and in certain situations may reduce fish habitat.
- Existing armour stone or gabion baskets can be modified to incorporate some slope and natural vegetation to extend the life of your retaining wall and improve habitat.

Kawartha Conservation

Kawartha Conservation

Kawartha Conservation

Restoring Developed or Damaged Shorelines

Vegetated Buffer Zone

Plant native species of trees and shrubs with a variety of other aquatic and upland plants. Biodegradable erosion-control fabric can be effective when used with native plants; it holds the soil while allowing plants to grow through it.

Loose Rock Buffer Zone

In some instances, loose rocks can be placed on a gradual slope and used to stabilize an eroding shoreline. Native shrubs and vines should be planted among rocks and will provide natural protection to absorb and dissipate wave action.

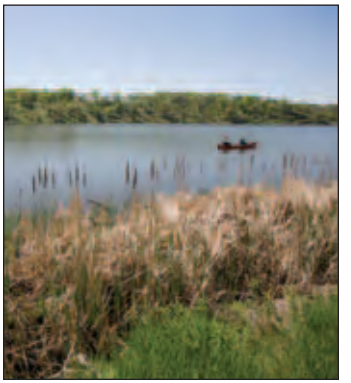
Bioengineering Techniques

Vegetated geogrids and bundles of branches, or "wattles," staked into the bank will protect the shoreline from eroding. (See photo at right) Live stakes or posts of willow or red osier dogwood also work to stabilize eroding shorelines. Brush layers can be used on steeper banks where deeper reinforcement of the soil is needed.

Buffer Zones Help Protect Our Lakes

There are many benefits of maintaining a shoreline buffer zone:

- Provides food and shelter for many fish and wildlife species
- Protects your property and investment
- Prevents Canada geese from becoming a nuisance animal
- Holds onto fine bottom sediments, keeping them in place
- Absorbs wave energy, preventing shoreline erosion and ice damage
- Takes less work to maintain than a larger lawn
- Prevents surface runoff and contaminants from entering lake water
- Restores the ecological functions of the lake's ecosystem
- Protects your health



Protect the natural shoreline by replanting areas that lack trees and shrubs, and maintaining those areas that already exist. Keep a smaller lawn and leave a wide buffer area of trees, shrubs and indigenous vegetation around all shoreline areas. All development should be kept at least 30 metres away from the shoreline.

Consult with your local authorities whenever you plan to restore or alter the aquatic area of a shoreline buffer. For more information, check with your local Conservation Authority, Ministry of Natural Resources (OMNR) or Trent-Severn Waterway (TSW) before making any changes or restorations to your shoreline. Your restoration project may even be eligible for government funding and free assistance!

Other agencies who may be able to help include Peterborough Green-Up, the Department of Fisheries & Oceans Canada, the Federation of Ontario Cottagers' Association, your local stewardship council, the Gaming Centre for Sustainable Lakeshore Living, the Kawartha Lake Stewards and the Scugog Lake Stewards.

(Please refer to the Contact Information page.)

Planting Local Native Species

"Native plants are an important part of our natural heritage. They have adapted to our soils and climate, and they provide homes and shelter for many other types of life. This in turn fosters a healthy, balanced ecosystem, which is more resistant to damage by pests and diseases."

– Peterborough Green-Up, Native Plants Factsheet

"Why Should I Plant Native Species?"

Native (indigenous) plants thrive on minimal care and maintenance. They are so well adapted to living in their natural ecosystems that they do not need the chemical support their exotic counterparts depend on to survive. Native plants will even withstand moderate drought conditions.

By providing shelter to local wildlife species that are losing their natural habitat, native plants contribute to biodiversity and the preservation of local gene pools. Native plants also give your property a sense of place. Indigenous wildlife species such as birds, bees and butterflies all help to bring a native plant garden to life. With a wide variety of beautiful wildflowers, such as the black-eyed susan (left), your landscape will be a splendour of colours throughout the seasons.

Ask for native plants at your local garden centre and make sure that the plants you purchase are native to the immediate area. Never dig plants from the wild. The risk of damaging a flourishing natural area is unnecessary when many sources of cultured native plants are becoming available. Some native species to consider would be Virginia Creeper, Highbush Cranberry, Red Osier Dogwood, Wild Grape, Shrubby Willow, Meadowsweet, Sweetgale, Sumac, and Alder. Take a look at what species grow naturally in your area. Those species should do well on your site as well. Be sure to also check out Peterborough Green-Up's (www.greenup.on.ca) "Restoring Healthy Shorelines" factsheet for a comprehensive list of native trees, shrubs and grasses. You'll also find a list of local area suppliers.

Lake Management Planning

"There is an amazing amount of knowledge and experience around every lake."
– Don and Ruth Benson, Mountain Lake, Minden

If there isn't a lake management plan in place already for your lake, consider getting one started. Lake management plans give you the big picture, helping you to recognize and protect the unique character of a lake while you consider land use and larger watershed matters. A well-developed plan empowers the community and brings the public together around the sustainable future use of our lakes.

Lake management plans

- Encourage partnerships between concerned citizens, lake users, resource managers, municipalities and other special interest groups
- Identify concerns that people feel are important to address
- Set realistic goals, objectives, and action plans

The main role of the lake management planning advisory committee is to make sure all viewpoints and interests are considered during the planning process. A comprehensive management plan includes information about the size of the watershed, hydrology and precipitation patterns. It should also address key issues including:

Water quality	Exotic species
Land use and zoning	Surface water use conflicts
Public water access	Fisheries management
Aquatic vegetation	Wildlife

Securing Your Shoreline Property for the Future

More and more waterfront owners want to leave a legacy for the health of their lake or river. There are several options for doing so, each with potential for significant tax benefits. These options include:

- donating all or a part of the land to a conservation organization
- leaving it to such a group in your will, or now with rights to still use it
- transferring it to a good steward or with conservation conditions, and
- entering into a conservation agreement that allows your continued enjoyment of the property but puts conditions on use to ensure your stewardship efforts will be maintained long into the future, regardless of who may come to own it.

James Wilkes

New tax rules now allow a donation of ecological land, conservation agreement or securities to a conservation charity to be exempt from capital gains tax and qualify for enhanced claim limits. In some cases, such arrangements can reduce your property or other taxes or make it easier for a purchaser to acquire land. U.S. residents may also be able to benefit from U.S. tax incentives. These options can allow creative arrangements to meet owners' specific needs. To explore these further, it is helpful to contact a local conservation organization with experience, such as the Kawartha Heritage Conservancy, Haliburton Highlands Land Trust or your local conservation authority. With the right option, your shoreline stewardship can become a long-term legacy for your lake or river and your community.

Kawartha Heritage Conservancy: 705-743-5599
Website: www.kawarthaheritage.org

Haliburton Highlands Land Trust: www.haliburtonlandtrust.ca
705-754-2532

Best Management Practices for Lake Stewardship

- Maintain a smaller lawn, or get rid of the lawn and avoid mowing altogether.
- Plant and maintain a buffer zone of native vegetation around the shoreline and avoid removing vegetation that is close to water.
- Eliminate the use of toxic pesticides, herbicides and fertilizers. If absolutely necessary, use organic and low impact products.
- Plant only native species of flowers, shrubs and trees.
- Clean and inspect your boat before moving it to other lakes to control the spread of invasive aquatic species.
- Contact your local conservation authority, Ministry of Natural Resources or Trent-Severn Waterway office if you intend to build on or near the water's edge.
- Maintain your septic system.
- Practise water conservation both inside and outside your cottage.
- Use caution with the storage and use of gas, oils and other chemicals.
- Keep your speed under 10 km/h within 30 metres of shorelines to protect fish habitat and limit erosion.

James Wilkes

Take care of your lake so future generations can enjoy it too!

In addition to this using this valuable resource, we encourage you to learn more, to attend events and to get involved in lake stewardship. Contact our partners or visit their websites frequently for details.

"When one tugs at a single thing in nature, he finds it attached to the rest of the world."

- John Muir

Glossary

Aquifer: an underground layer yielding groundwater for wells and springs

Ballast water: water taken up or released by boats to keep steady when lightly loaded

Buffer zone: a strip of vegetation, including native vegetation, located between developed land and a lake, stream or wetland. A buffer zone protects the water, adds beauty and provides habitat for wildlife.

Dissolved oxygen: the amount of free oxygen dissolved in the water. This is used by aquatic organisms to "breathe."

Exotic species: plants or animals that are not native to an area

Gabion: a cylindrical wire basket filled with earth and stones

Invasive species: exotic plants or animals that compete with (and overtake) native species

Littoral: the area of shallow water along the lake edge

Permeable: porous; allows water to pass through

Rip rap: small pieces of blast rock, usually limestone, placed to prevent erosion

Sediment: material that has settled at the bottom of a body of water

Vegetated geogrid: natural or synthetic material wrapped around soil with live branch cuttings placed in it

Contributors

The Lakeland Living Guide has been produced by the

"Natural Shorelines, Healthy Waters."

The Lakeland Alliance is a collaboration of the following organizations and government agencies that are working together for natural shorelines and healthy waters throughout the greater Kawartha Lakes watershed.

- Bancroft Area Stewardship Council
- Federation of Ontario Cottagers' Associations
- Fisheries and Oceans Canada
- Haliburton Highlands Stewardship Council
- Kawartha Conservation
- Ministry of the Environment- Lake Partner Program
- Otonabee Conservation
- Peterborough County Stewardship Council
- Peterborough Green-Up
- Victoria Land and Water Stewardship Council

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Contact Information

Stewardship Councils www.ontariostewardship.org

Bancroft Area Stewardship Council	613-332-3940 xt. 260
Haliburton Highlands Stewardship	705-286-5206
Peterborough County Stewardship	705-755-1951
Victoria Land and Water Stewardship Council	705-755-3362 or 705-324-1478

Conservation Authorities

Kawartha Conservation www.kawarthaconservation.com 1-800-668-5722
Otonabee Conservation www.otonabee.com 705-745-5791

Provincial Government

Ministry of the Environment's Lake Partner Program
www.ene.gov.on.ca/envision/water/lake_partner/. 1-800-470-8322

Federal Government

Fisheries and Oceans Canada www.dfo-mpo.gc.ca 705-750-4012
Trent-Severn Waterway
www.pc.gc.ca/lhn-nhs/on/trentsevern/index_e.asp 705-750-4900

Other Organizations

Federation of Ontario Cottagers' Associations (FOCA)
www.foca.on.ca 416-429-0444.
Gaming: Centre for Sustainable Lakeshore Living
www.Gaming.org 705.799.7083
Kawartha Lake Stewards Association
www.trentu.ca/academic/oliver/KLSA.shtml
kawarthalakestewards@yahoo.ca
Peterborough Green-Up www.greenup.on.ca 705-745-3238
Scugog Lake Stewards scugoglakestewards@yahoo.ca

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