



Dear Shoreline Property Owner,

Thank you for ordering your personalized Love Your Lake shoreline property report!

Your report is full of important information about your shoreline property. You'll learn about what we've noticed about your shoreline and how it impacts your lake health and wildlife. We've outlined easy and affordable steps you can take to protect or restore your shoreline and provide suggestions that will directly impact the health of Stoco Lake. Your report also includes other important property information about erosion, docks, wildlife habitat and more.

Once you've had a chance to read through your shoreline property report, would you do us a favour and complete a short Evaluation Survey at LoveYourLake.ca? We would really love to know what you think about your report and it would help us serve you and your lake better.

We're committed to working with shoreline property owners across Canada, providing this free evaluation to help protect and improve your lake health and wildlife. You can help us deliver this program to more communities by donating at LoveYourLake.ca today!

We hope that you will make good use of your shoreline property report. If you have any questions about your report or the program, please contact Friends of Stoco Lake by visiting <https://www.facebook.com/groups/1509064695989329/> or you can contact Watersheds Canada by visiting <https://watersheds.ca>.

Sincerely,

The Love Your Lake Team

Love Your Lake has been brought to Stoco Lake by:

Friends of Stoco Lake, Watersheds Canada, the Canadian Wildlife Federation and several enthusiastic volunteers! Thank you to everyone involved for making this program possible.

Friends of Stoco Lake



<https://www.facebook.com/groups/1509064695989329/>
info@friendsofstocolake.ca

<https://watersheds.ca>
loveyourlake@watersheds.ca
613-264-1244

For more information about the program, visit **LoveYourLake.ca**.

The Love Your Lake program is coordinated by



CanadianWildlifeFederation.ca
1.877.599.5777 | info@cwffcf.org



Watersheds.ca
613-264-1244 | info@watersheds.ca

SID 54759



SHORELINE PROPERTY REPORT





Stoco Lake

Shoreline Property Report | Summer 2023

A project of



Watersheds Canada
(serving Eastern Ontario)

115-40 Sunset Boulevard
Perth, Ontario K7H 2Y4

613. 264.1244 | loveyourlake@watersheds.ca
Watersheds.ca

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CanadianWildlifeFederation.ca
1.877.599.5777 | info@cwffcf.org



Watersheds.ca
613-264-1244 | info@watersheds.ca

Acknowledgements



The Canadian Wildlife Federation and Watersheds Canada wish to thank the following for supporting the Love Your Lake program:



Rogers Foundation

Love Your Lake is a shoreline evaluation and stewardship program that can be applied to any shoreline community. The program includes:

- A detailed protocol where locally trained staff evaluate shorelines, noting the degree of impact on and near the shore
- Property-specific reports for each shoreline property owner outlining voluntary actions that improve the health of their lake
- Follow up support on recommendations such as access to native plant sources, assistance with shoreline restoration, wildlife habitat creation and additional resources



For more information on this program, please visit **LoveYourLake.ca**.



About Shoreline Assessments

To create your personalized property report, trained staff travel around your lake during the summer, viewing each property from a boat.

For each property, photos are taken and recorded observations include:

- Classification of the shoreline
- Development such as docks, stairs, decks and retaining walls
- Terrestrial and aquatic wildlife habitat
- Presence/absence of natural shoreline vegetation
- Presence of erosion

RESTORATION OR PROTECTION OPPORTUNITIES

The observations recorded on a datasheet for each property is used to develop a personalized property report that is unique to your property. Along with information on actions you have already taken to protect your shoreline, you will find helpful tips on further actions you can take to improve your shoreline health. Not only will you benefit from a clean and healthy lake, but so will future generations and wildlife.

Recommendations may include:

- native planting
- erosion control
- wildlife habitat enhancements
- shoreline access improvements

PROTECTING YOUR PRIVACY

The intent of the shoreline assessments and personalized property reports is to engage you in efforts to protect your lake. Many shoreline property owners have an interest in protecting water quality, yet may not know that their actions are negatively affecting water quality. These reports are developed to provide you with simple, effective recommendations that are relevant to your property! The assessment data is NOT used for regulatory purposes, and the project partners will not share personal information.



CWF

The overall goal of the Love Your Lake program is intended to help increase individual and community engagement on your lake for a cleaner, healthier lake for all to enjoy. Thank you to the many generous community volunteers for their enthusiasm and participation!

- * As this assessment is conducted from a boat there are limitations in what we can see and therefore record about your property. Some lakes may experience fluctuating water levels which could influence the content of the reports. Utmost care is taken to ensure accurate information is included in all reports. We do apologize if something is reflected incorrectly.



HIGHLIGHTS FOR YOUR SHORELINE PROPERTY

You have great vegetation along your shoreline.

You have great habitat on your property.

Please read your full report for more information.

Stoco Lake

Report # 54759
Address Butternut Island
Assessment # 12313280200465000000

GENERAL INFORMATION ABOUT SHORELINES

Shorelines are unique and sensitive areas that warrant special attention. Due to their ecological, aesthetic and recreational value, protecting waterfront properties benefits you and your lake. The purpose of this report is to suggest individual action you can take on your property to help maintain healthy water quality and improve wildlife habitat for Stoco Lake. In no way, do these suggestions imply that action must be taken. However, any changes made on individual properties will positively impact your lake.

A natural shoreline has important biological functions. First it acts as a filter, reducing the amount of pollutants that enter the lake. It protects against erosion by supporting the soil and provides vital habitat for fish and wildlife. The shallow waters and first 10-15 metres (30-50 feet) of shore around lakes and rivers contributes leaves, insects and wood to these ecosystems. These supplies are important sources of food and habitat for aquatic life. Keeping shorelines natural is the easiest way to protect water quality and the value of shoreline properties.

YOUR PROPERTY'S RIPARIAN ZONE

Riparian zones exhibit characteristics of both the terrestrial and aquatic ecosystems, as well as having unique properties of their own. It is the ribbon of trees, shrubs and grasses growing along your lake, extending back 30 metres (100 feet) from your shoreline. Natural and healthy riparian

zones are among the most productive and diverse environments on the planet, supporting a vibrant community of plants, microorganisms, insects, amphibians, reptiles, birds, mammals and fish.

Currently there appears to be no development on your shoreline property. If you decide to build on your property in the future, there are a few considerations to take into account. It is important to maintain a healthy shoreline buffer - a strip of trees, shrubs and grass lining the edge of your shoreline. By keeping as much natural vegetation as you can, you are helping to protect against erosion as well as trap and filter sediments, pathogens, pesticides, fertilizers and other nutrients that reduce water quality. Buffers also shade and cool the water, and provide protective cover for birds, mammals and other wildlife that feed, breed and rear young near water. When nutrients are not captured it can lead to the accelerated growth of algae and aquatic plants. For new developments on shoreline properties, it is recommended to leave 75% of your property natural, leaving 25% for your personal use. This will help protect the health of your property and the health of Stoco Lake, while still allowing you to enjoy your shoreline property. If you decide to create shoreline access in the future, by creating either a well-formed pathway that follows the contours of the slope or constructing raised, open-backed stairs, you can direct foot traffic leading to your shoreline and limit possible erosion in these high traffic areas. Covering pathways with wood chips, bark mulch, or crushed gravel will help reduce soil loss on the pathways; and, raised open-backed stairs will allow vegetation to grow underneath, helping to hold soils in place. During construction, it is important to take proper precautions to prevent soil erosion and runoff into your lake. Refer to the Shoreline Information Resource for more information.

Thank you for maintaining such a great shoreline buffer - the strip of trees, shrubs and grasses lining the edge of your shoreline. You're helping protect against erosion as well as trapping and filtering sediments, pathogens, pesticides, fertilizers and other nutrients that reduce water quality, harm the delicate gills of fish and smother the eggs of fish and small aquatic organisms essential to the food chain. When nutrients are not captured it can lead to accelerated growth of algae and aquatic plants. You're also shading and cooling the water, and you're providing protective cover for birds, mammals and other wildlife that feed, breed and rear young near water. The recommended ideal buffer depth is 30 metres (100 feet). However, if a 30-metre buffer is not possible, a shoreline buffer of any size is better than no buffer at all. See the Shoreline Information Resource for more information on buffers.

WILDLIFE HABITAT

You have several great habitat features on your property! By maintaining them you can continue to support wildlife. There are many different types of important habitats. Fallen trees and branches on your property provide essential habitat for small mammals, certain woodpeckers, toads and salamanders. Native meadows provide important wildlife habitat, help reduce soil erosion and help filter runoff. Brush piles provide small mammals with shelter from predators and sources of food. Dead standing trees provide great habitat for wildlife, including cavity-nesting birds. To many birds and mammals, these trees are a vital source of food and shelter. Cavity trees (trees with holes in the trunk or branches) are used by many species of birds and mammals for creating nests, raising young and feeding.

SHORELINE ACCESS

The slope to your shoreline is moderate. In areas of exposed soil, this slope can be a source of erosion and runoff if not well covered by vegetation. We strongly recommend keeping any existing vegetation and enhancing it, if possible, with more native plants.

YOUR SHORELINE AND AQUATIC ZONE

A variety of aquatic plants and substrates is important to a healthy aquatic zone. Aquatic plants help maintain water quality and stabilize wave energy to help reduce erosion. The lake bed and plants provide growth surfaces for algae and insects, cover for prey species and protection for young fish. Many species of insects, fish, birds, amphibians and reptiles all depend on the resources provided by the aquatic zone during at least a portion of their lives.

AQUATIC HABITAT

You have aquatic vegetation along your shoreline — an important part of a healthy lake environment, especially in shoreline areas. These plants provide food and habitat to a variety of wildlife species, including mammals, waterfowl, reptiles and fish. Aquatic plants also maintain water quality by stabilizing sediments, oxygenating the water and taking up nutrients. By maintaining this aquatic vegetation, you will support a healthy lake environment.

The wetland bordering your shoreline is a very important component of the lake ecosystem. Wetlands are home to fish, birds, amphibians and other wildlife. They provide fish with spawning and nursery areas and provide other wildlife with shelter, nesting sites and food sources. Wetlands also play a key role in controlling floods by absorbing rain water and snow melt and slowly releasing it into the lake during dry periods. By maintaining the wetland vegetation along your shoreline, you can contribute to the health of this important habitat for Stoco Lake.

The majority of your shoreline has vegetation overhanging the water - great work! Overhanging vegetation shades and cools the water and provides important habitat for wildlife, including fish, amphibians and reptiles. Fish and frogs often feed and spawn below overhanging vegetation and the leaves, twigs, fruit, flowers and even insects found on overhanging vegetation provide an important food source for many species. Continue to allow native trees and shrubs to grow along your shoreline. By maintaining this vegetation, you will continue to provide shade and cover for species that feed, breed and rear young in and around water.

You have little to no woody debris along your shoreline. Fallen trees, logs and large branches that are partially or fully in the water reduce erosion, provide insects with resting sites and offer fish and amphibians protective cover and shade. Some fish species use these wood features for spawning and nest protection. You can help bring this important feature back to your shoreline by keeping any shoreline vegetation that you currently have and by planting native trees and shrubs along your shoreline to help jump start the process. In the future, if trees fall on your property or wood accumulates, allow these features to remain in place when safe to do so. You will be helping to contribute to the health of Stoco Lake. Please note that removing these features from the water may require a permit.

The aquatic substrate (the rocks and sediments making up the lake bottom) is a very important part of the lake. Aquatic substrates can be made up of bedrock, boulders, gravel, sand, fine

sediments or organic matter. Aquatic substrate provides nutrients for aquatic plants, food sources and cover for insects, and spawning and rearing habitat for fish. It is important to maintain the aquatic substrate that is found in Stoco Lake.

INVASIVE SPECIES

Invasive species are those that originate from other countries or regions, and most are introduced through human activities. For more information on aquatic invasive species, refer to the Shoreline Information Resource. We noticed Purple Loosestrife along your shoreline. Purple Loosestrife is an invasive wetland plant that establishes itself in wetlands, ditches and disturbed areas. It crowds out native plants and can significantly reduce nutrient intake for other plants. It has thick woody stems and can grow up to 2.5 metres high and 1.5 metres wide. Its leaves range from three to ten centimetres in length. It has a pink/purplish flower and individual flowers have five to seven petals. An individual Purple Loosestrife plant can produce millions of seeds each year. You can help reduce the spread of Purple Loosestrife by planting only native species in your garden. Also avoid areas that are known to contain this plant, and if you come into contact with it, brush off clothing and clean equipment to prevent seeds from spreading. We noticed Zebra Mussels along your shoreline. Zebra Mussels are freshwater bivalves that typically grow around hardened structures such as docks, boats and retaining walls. Zebra Mussels filter nutrients out of water, ultimately altering food webs. They can also result in harmful algal blooms, affect fish spawning habitat and can be a nuisance to recreational activities. To help prevent the spread of Zebra Mussels, carefully inspect and clean your boats, trailers or other recreational equipment before entering a new waterbody and remove any plants, animals and substrate. Drain excess water while on land from motors, live wells, bilges and transom wells. Don't forget to rinse recreational equipment at a high pressure with hot water, then allow your equipment to dry on land.

SEPTIC

Island properties often have less land available between the cottage and the lake for underground water filtration and above ground buffers. This land is important to cleanse wastewater before re-entering the lake. Because your property is located on an island, you may have additional challenges to maintain your septic or wastewater treatment system. Installing a composting toilet can reduce 90% of the concentrated solid wastes from entering the septic tank, which can reduce the need for an island pump out.

If you have a septic system or holding tank, maintaining it is one of the most effective ways to protect Stoco Lake. When not functioning properly, these systems can leach phosphates, nitrates, pathogens and other contaminants directly into the lake and groundwater. This can contribute to algal blooms, decreased water quality and create health risks to people, wildlife and fish. You can maintain your septic system properly by having it inspected regularly, pumping it every three to five years and making repairs when necessary. By using an effluent filter, you can extend the life of your system by preventing sediments from the tank from entering the drain field, which can lead to clogged pipes. These filters should be cleaned yearly to maintain proper flows. You can maintain your holding tank by having it inspected every one to three years, having a licensed contractor pump your holding tank regularly and making repairs when necessary. For

more information on septic system and holding tank care, refer to the Shoreline Information Resource.

Your property provides wildlife habitat and helps protect the water quality of Stoco Lake. By maintaining its natural beauty, you can enjoy the benefits for years to come. The following Shoreline Information Resource contains tips for maintaining a healthy shoreline property, and resources for more information.

Your Shoreline Property Report

These local groups support this project:

The Natural Edge Program

Shorelines are one of the richest environments on earth, but they are also among the most threatened. Shorelines are the “ribbon of life” where 90% of lake life and 70% of terrestrial life is born, raised, and fed.

The Natural Edge Program provides shoreline property owners with tools to naturalize their shoreline by creating a planting plan using native trees, shrubs, and wildflowers. Watersheds Canada supplies all materials and expertise during the process at a reduced cost to the landowner. We are connected with partners across Canada who use our Native Plant Database and iOS App to make every project a success.



Planning for our Shorelands

Watersheds Canada and its program steering committee are leading the path towards an ecosystem-based approach to land use management. Planning for our Shorelands is for municipal staff, waterfront property owners, elected officials, and everyone who cares about decisions affecting the future enjoyment of our waterways. It is a growing information hub where the science of natural climate solutions is explained in plain language, practical toolkits are created and shared, and education and outreach on the numerous benefits of shoreland restoration is provided.



Nature Discovery Programming

Use Watersheds Canada's free Ontario-curriculum linked lesson plans, activity sheets, videos, and more to help your family connect with your local freshwater and nature!

Freshwater Stewardship Community

This free, online community is a centralized place for individuals, river and lake associations, students, and Indigenous and grassroots groups to connect and work together to protect their freshwater. Join over 2,200 Canadians who attend monthly webinars, use education resources, and network with other stewards across the country to take action!



2023 Partners

Thank you to all our partner organizations and volunteers for making Love Your Lake such a success this year!

Chaffey's Area Lakes Association (CALA)
c/o 8 Wild Apple Lane, Elgin, ON K0G 1E0
<https://remembercala.ca/>
remembercala@gmail.com



Shawano Ratepayers Inc.
<https://shawano.ca/>



Inverary Lake Association
kuzmam@kingston.net

Twin Sister Lakes Rate Payers Association (TSLRA)
<https://www.facebook.com/groups/646212618796799/>

Friends of Stoco Lake
info@friendsofstocolake.ca
<https://www.facebook.com/groups/1509064695989329/>

Fish Habitat Programs



Looking to protect, enhance, or restore freshwater fish habitat on your lake? Partner with Watersheds Canada to restore walleye or trout spawning beds, enhance cold-water creek habitats, or add woody debris back with brush bundle projects. Also use a free Fish Habitat Enhancement Toolkit which helps grassroots groups identify suitable sites for fish projects.

Connect With Us Online!



WatershedsCanada



@WatershedsCAN



@WatershedsCanada



Watersheds Canada



watersheds.ca/blog



Watersheds Canada

Eastern Ontario Contacts

EASTERN ONTARIO CONTACTS

Fisheries and Oceans Canada (DFO)

867 Lakeshore Rd
Burlington, ON L7S 1A1
(905) 336-4999
dfo-mpo.gc.ca/index-eng.htm

Ministry of the Environment, Conservation and Parks

8th floor, 5775 Yonge St.
North York, ON M2M 4J1
1-800-810-8048 | ontario.ca/page/ministry-environment-conservation-parks

Ministry of Natural Resources and Forestry

300 Water St.
Peterborough, ON K9J 8M5
1-866-686-6072 | ontario.ca/page/ministry-natural-resources-and-forestry

NATIVE PLANT SOURCES

Ferguson Tree Nursery

Tree and shrub seedlings
275 County Rd 44
Kemptville, ON K0G 1J0
(613) 258-0110
admin@fergusontreenursery.ca | fergusontreenursery.ca

Natural Themes Native Plant Nursery & Organically Grown Produce

219 Maybee Rd
Frankford, ON K0K 2C0
navheifarms.com/

Grow Wild! Native Plant Nursery

3784 Hwy 7
Omeme, ON K0L 2W0
nativeplantnursery.ca/

Richardson's Pineneedle Farms

423 Highway #35 Box 220
Pontypool, ON L0A 1K0
(705) 277-9993
pineneedlefarms.ca

CONSERVATION AUTHORITIES

Cataraqui Conservation

1641 Perth Rd, P.O. Box 160
Glenburnie, ON, K0H 1S0
cataraquiconservation.ca

Rideau Valley Conservation Authority

3889 Rideau Valley Dr
Manotick, ON K4M 1A5
rvca.ca

Crowe Valley Conservation Authority

70 Hughes Lane, Box 416
Marmora, ON K0K 2M0
crowevalley.com

Quinte Conservation

2061 Old Highway 2
Belleville, ON K8N 4Z2
quinteconservation.ca

OTHER CONTACTS

Township of Rideau Lakes

1439 County Road 8
Delta, ON K0E 1G0
(613) 928-2251 or 1-800-928-2250
rideaulakes.ca

Municipality of Marmora and Lake

12 Bursthall St. P.O. Box 459
Marmora, ON K0K 2M0
(613) 472-2629 or 1-866-518-2282
marmoraandlake.ca

Municipality of Tweed

255 Metcalfe St. Postal Bag 729
Tweed, ON K0K 3J0
(613) 478-2535 | tweed.ca

South Frontenac Township

4432 George St. Box 100
Sydenham ON, K0H 2T0
southfrontenac.net

Federation of Ontario Cottagers' Associations

foca.on.ca

The Natural Edge Planting Program

naturaledge.watersheds.ca

Water Rangers | waterrangers.ca

Ontario's Invading Species Awareness Program

invadingspecies.com

Shoreline Information Resource



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The first 10 to 15 metres of land surrounding lakes and rivers contributes leaves, insects and wood to these ecosystems which are important sources of food and habitat for aquatic life. Sometimes called the ribbon of life, these areas are up to 500 per cent more diverse than other areas upland from lakes and rivers.

THE FUNCTIONS OF A HEALTHY SHORELINE

1. **Help Maintain Clean Water/Water Quality**

The shoreline vegetation on your property is vital to retaining, treating and filtering surface runoff before it can reach the water. Runoff is rain and melted snow that runs along the surface of the ground. Runoff can contain pollutants such as fertilizers, pesticides, sediment, manure, pet feces, trash, motor fluids (oil, grease, gas) and road salt. These pollutants have negative effects on our waterways: nutrients act as fertilizers, which stimulate algae and plant growth contributing to algal blooms; pathogens can contaminate drinking water and sediment affects fish habitat and nursery areas.

2. **Prevent Soil Erosion**

The underground root systems of shoreline vegetation help keep soil in place and prevent topsoil from being exposed and washed away into the lake or river.

3. **Reduce Impacts of Flooding**

Well-vegetated shorelines provide barriers against moving water by slowing the water's movement downstream and by reducing the force, height and volume of floodwaters. This allows them to spread out horizontally across the floodplain, thereby reducing the potential for damage to your property.



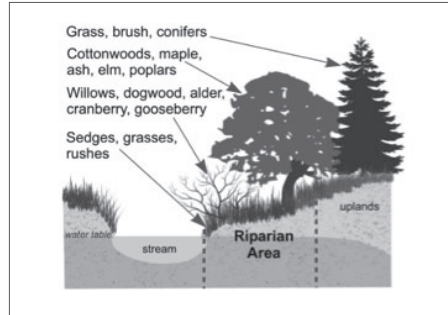
The Importance of a HEALTHY SHORELINE

Healthy shorelines are vital to maintaining the overall health of lakes and other bodies of water. Shorelines help filter pollutants, protect against erosion and provide habitat for fish and other wildlife.

Shorelines are some of the most ecologically productive places on Earth. They support plants, microorganisms, insects, amphibians, birds, mammals and fish.

4. Provide Wildlife with Food and Habitat

Shorelines are vital to many different animals throughout their development and life. Healthy shorelines protect wildlife from weather and predators; woody debris, such as tree trunks or roots in the water provide cover for fish to hide, basking areas for turtles and resting sites for waterfowl.



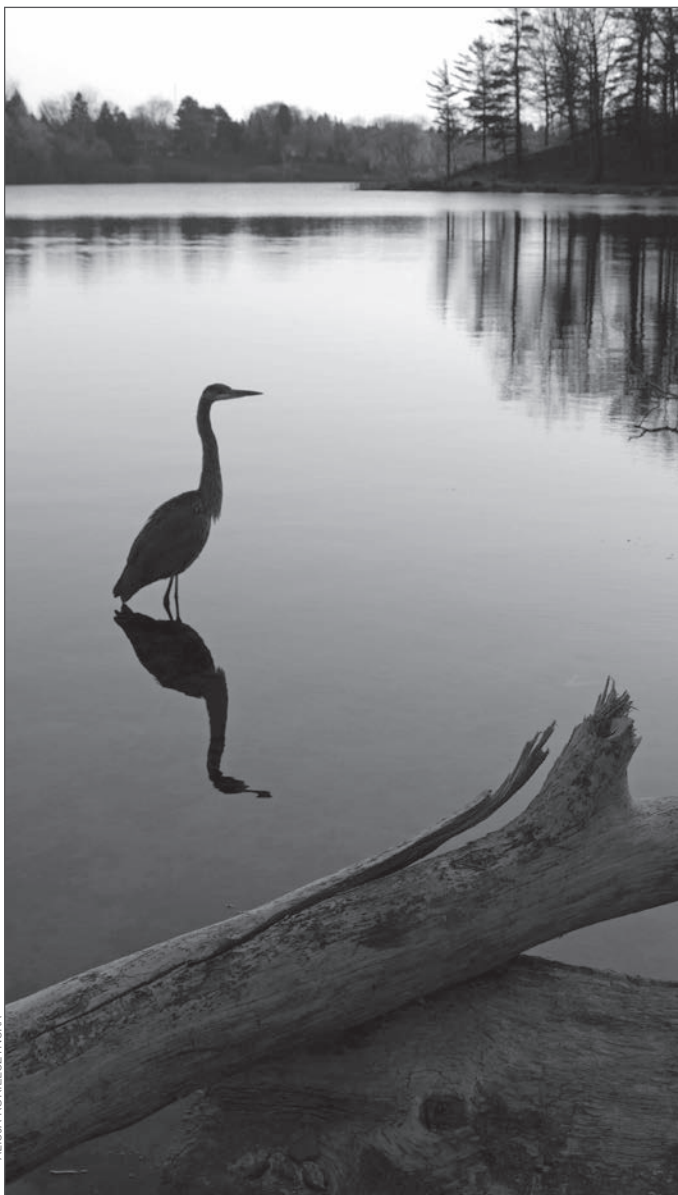
COMMON SIGNS OF A HEALTHY SHORELINE

- Lots of native vegetation
- Different levels of vegetation, from taller trees to smaller shrubs and plants
- Deadwood, rocks and stones
- Birds, fish and other wildlife



COMMON SIGNS OF AN UNHEALTHY SHORELINE

- Area(s) cleared of all or most vegetation
- Lawn that extends right to the water's edge
- The natural shoreline replaced by a hardened structure such as a breakwall or gabion baskets (large stones contained in wire baskets)
- Problems such as shoreline erosion and poor water quality
- Prominent algal blooms



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? Did you know?

SHORELINE ECOSYSTEMS – WHAT YOU SHOULD KNOW

On a shoreline there are three overlapping but distinct zones that contribute to the overall health of a property.

1. Upland Zone

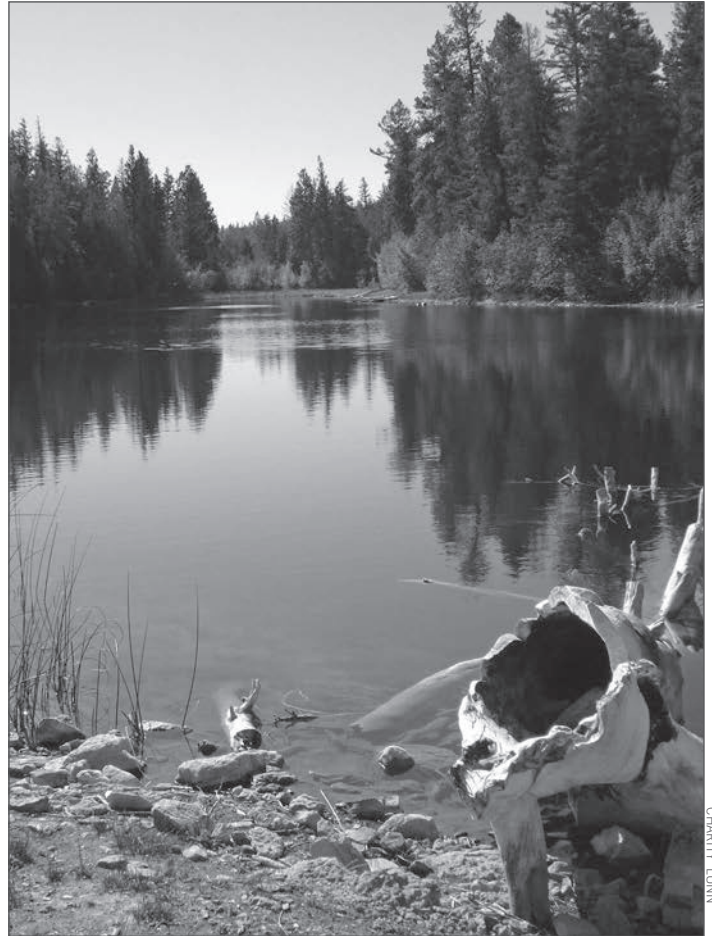
Generally, this higher and drier ground will be home to various trees and shrubs, along with animals that prefer shoreline habitat. This area, depending on when your home or cottage was built, is often the zone where the residence is located.

2. Riparian Zone

This zone is the transitional area between dry land and water. Here you will find a wide variety of plants and wildlife because water provides organisms with food and shelter. The vegetation in this area of your property helps reduce runoff and soil erosion. It also shades and cools shallow water.

3. Littoral Zone

The littoral zone extends from the water's edge to the area in the lake where sunlight no longer penetrates. It is home to organisms such as algae and aquatic plants, fish, amphibians and waterfowl.



CHARITY LUNN



GENERAL DISCLAIMER

The need for permits for work in or near water, and the governing body responsible for those permits, varies from region to region. Be sure to check with your local municipality, conservation authority (if applicable), appropriate provincial ministry and/or appropriate federal department for the permits to do work in or around water. See the contact information at the end of this report for a list of these organizations.



SHORELINE BUFFERS

A buffer is a permanent strip of trees, shrubs, grasses and ground cover alongside a watercourse that helps to protect or buffer the water body from impacts, both natural and human-induced. The proper size for the buffer strip is unique to each property and is dependent on the property owner's preferences. The best buffer strip is one that is at least 30 metres wide and extends from the lake upland. A buffer strip of this

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size is not feasible in all areas; however, any size buffer is better than none at all.

Without buffers a shoreline can experience accelerated runoff, increased erosion and a greater quantity of nutrients entering the water, particularly nitrates and phosphates. Large amounts of these nutrients are harmful to aquatic environments, triggering a process known as cultural eutrophication. Cultural eutrophication stimulates massive algal blooms, which can result in a water body that is so polluted and void of oxygen that it is unable to support many plants and animals.

HOW TO IMPROVE YOUR SHORELINE BUFFER

Before beginning a buffer strip, consider how the lot is laid out, how the property is used (e.g., as a pathway or for recreation), how large your budget is, how much time you want to spend on it, what you want it to look like and how much privacy you would like. There are three available buffer options:

1. Natural

- Decide what size buffer you would like – the bigger, the better
- Stop mowing and let nature take over. Dormant seeds, as well as seeds brought by birds and other wildlife, will start to grow
- Leave natural debris such as fallen trees, stumps and boulders in place (if they are not hazardous)
- Weed out competing and invasive species, especially in highly developed areas

2. Enhanced

- Help nature along by actively planting a few native plants. This will allow the buffer to be established more quickly than by natural processes alone.

3. Landscaped

- Combine the important functions of a natural shoreline with the visual appeal of plants, well-defined and curving edges and other accents like benches and stepping stones. Please see page 28 for information on shoreline access and landscaping.



SHORELINE PLANTING TIPS

When naturalizing your shoreline:

1. Plant Native Species of Plants

Survey the area around your property and take note of the plants and trees that are abundant and healthy. This will give you an indication of what type of vegetation will have the best chance for success on your property.

2. Plant a Variety of Species and Ages

Planting a variety of native species and species of various ages will increase the diversity on your property and help minimize the chance of a disease being transferred from the new plants to the already existing plants.



For more information on species and where and when to plant, see

- naturaledge.watersheds.ca/plant-database
- GardeningForWildlife.ca
- ontariotrees.com



3

The process of erosion from ice, wind or water is natural but normally occurs at a very slow rate, much slower than we would notice. Altering the natural features on your property can accelerate this process and create unsafe conditions.

By taking preventative measures you can help control erosion on your property, helping create and maintain a strong and healthy shoreline.

HUMAN DISTURBANCES

In addition to natural erosion, there are a number of human disturbances that can greatly accelerate the rate of shoreline erosion:

- **Removal of Shoreline Vegetation** – Without plants to grip the soil with their roots, erosive forces such as wind, rain and waves can erode soil into the water
- **Runoff** – When the vegetation of a shoreline is replaced by a hard surface like patio stones or pavement, water flows along these surfaces rather than soaking into the ground
- **Boat Wake** – Motorized watercraft create waves, which wash onto the shoreline and eat away at the soil bit by bit
- **Construction** – Construction along or near the shoreline can contribute to erosion if proper precautions aren't taken; cleared lots and freshly exposed soil are particularly susceptible to erosion
- **Foot Traffic** – When you travel the same routes on your property over and over again, the vegetation ends up trampled, creating areas of bare soil. If the soil isn't covered up by gravel, mulch or wood

EROSION

Shoreline erosion is a common and natural process that many waterfront properties encounter. There are various causes for shoreline erosion that all have the same outcome: a loss of valuable waterfront property that can result in unsafe shorelines and deteriorating natural shoreline environments.

chips it becomes susceptible to wind, rain and other causes of erosion

- **Shoreline Alterations** – Alterations to a shoreline can cause significant erosion; when vegetation along the shoreline is replaced by hard structures such as break walls, wave energy is no longer absorbed but is deflected onto neighbouring shorelines, where it can cause erosion

IMPACTS OF EROSION

Sediments deposited as a result of erosion are considered pollutants when excessive levels due to human activities occur. Sediment is one of the most common pollutants in rivers, streams and lakes. Most comes from upland erosion, but some comes from shoreline erosion, which affects water quality, wildlife habitat and shoreline stability.

HOW TO PREVENT EROSION

There are a number of steps you can take to protect your property and prevent erosion:

1. **Protect the Natural Shoreline**

The best insurance policy against erosion is to retain the natural characteristics of the shoreline. This means keeping lots of vegetation, maintaining a good buffer strip (no mowing up to the water's edge) and leaving in place all of the stones, boulders, snags and dead branches found along the shoreline. These materials absorb the energy from erosive forces like waves and keep the shoreline "glued" together.

2. **Reduce Runoff**

Wherever possible plant and retain native vegetation to keep large amounts of runoff from entering the lake. In addition, encourage rainwater to infiltrate the soil rather than travelling over it, where it can wash the soil away. To encourage

infiltration, minimize the amount of paved or hard surfaces on your property (i.e., driveways, decks, patios). Runoff from the driveway can be directed into a settling area, and runoff from the roof should go into a rain barrel or soaking area. This will help maintain the natural, gradual water renewal process rather than allowing large volumes of water to enter the river or lake at one time.



3. **Minimize the Wake from Boats (and Other Motorized Watercraft)**

Boat wakes not only erode the shoreline, but they can also disturb aquatic ecosystems, swamp the nests of loons and other waterfowl, damage docks and boats, upset canoes and small boats and endanger swimmers. The best way to reduce the effects of boat wash and wake on shorelines is to simply slow down. In Ontario, by law, boats must slow down to 10 kilometres per hour within 30 metres of the shore. If the boat doesn't have a speedometer, remember that at this speed there will be little or no wake.

4. **Take Precautions during Construction**

If you are starting a new building project on your property, plan to control erosion and keep the disturbed area as small as possible. Ask your contractor to be aware of potential erosion and provide them with a copy of the protection plans. We strongly recommend the use of erosion control equipment such as filter cloths, hay bales and silt fences. Fill piles should be covered with tarps to prevent soil from being carried away by runoff. If possible, construction

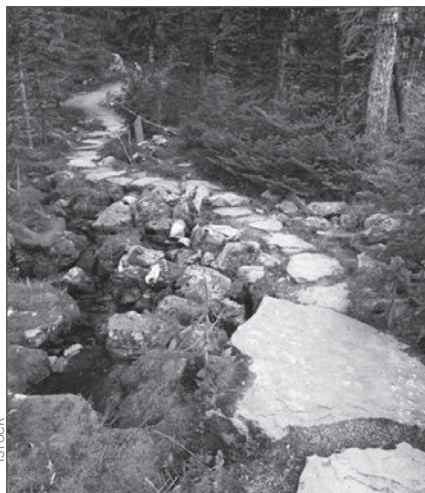
should be avoided during wet seasons, since softer soil is more prone to damage by heavy equipment.

5. Limit Impacts of Foot Traffic

Foot traffic can trample vegetation – especially on steep slopes – causing soil to loosen and fall from the shore. Depending on the degree of the problem, you can control access to that portion of the shoreline using fences, hedges, brush, terraces, boardwalks or stairs.



6. Contour and Cover Pathways



Pathways that extend from a building to the water's edge tend to take the shortest route to the water, which is often a direct downward route. This encourages erosion, since gravity can pull soil and runoff straight

down the path toward the water. A better option is to position (or, if necessary, re-route) pathways to follow the contours of the slope in an S curve pattern. Any exposed soil on pathways and heavy traffic areas should be covered up with the appropriate cover (tread material). See page 28 for more information.



HOW TO CONTROL EROSION IF IT'S ALREADY OCCURRING

Many methods can be used to control soil erosion. Sometimes the best course of action is to use a combination of methods. There are three basic erosion control methods to consider:

1. Using the buffer technique, allow natural vegetation to grow along upland slopes and shorelines. Vegetation grips the soil with its roots and keeps soil from blowing or falling away.
2. Active planting is recommended in areas where erosion problems require a more dynamic approach. It uses living plant material to immediately control erosion and becomes more effective over time as plants take root.
3. Install rip rap. Please see page 15 for more information.



4

LAWNS

In North America, more than 16 million hectares of land is covered by lawns. Often chemical or organic fertilizers are applied to these lawns, and it is not uncommon for lawns to have 10 times more chemical pesticides than what is used in agricultural settings. One of the main problems with overuse of chemical or organic fertilizers on shoreline properties is that up

to 35 per cent of precipitation can run off lawns. On a shoreline property, the runoff goes directly to the adjacent water body, where it can upset the natural ecosystem.

Where lawns can't be eliminated they can be placed farther back from the shore and natural lawn care methods should be used, as discussed next.

PESTICIDES

In 2009, Ontario's Cosmetic Pesticides Ban came into effect, prohibiting the use of pesticides for aesthetic purposes. More than 250 pesticide products are banned for sale, and over 95 pesticide ingredients are banned for cosmetic uses. For more information regarding pesticides, visit the Pesticides section of the Ministry of Environment, Conservation and Parks website (ontario.ca/page/pesticides). Thankfully, lower-risk pesticides, biopesticides and pesticide alternatives do exist.



The best “green” action you can take for your lake and wildlife is to stop using pesticides. Think of your shoreline as a small ecosystem where all the living organisms exist in balance. When we introduce pesticides (chemicals designed to kill) we alter this balance. Pesticides often harm organisms other than those targeted as well as the surrounding environment, having serious negative effects. For instance

- Fish and aquatic animals are exposed to pesticides by absorbing them through their skin or through their gills during respiration, by drinking pesticide-contaminated water or by eating pesticide-contaminated prey. This can lead to death, cancer, reproductive failure, tumours, lesions and deformities.
- Pesticide runoff can stimulate algal blooms.
- Pesticides can have serious negative effects on populations of beneficial insects including pollinators. These good insects make up the vast majority of insects and are important to the health of our gardens.
- By wiping out certain insect or weed populations with chemicals you also affect those species that depend on them for food. Butterfly populations dwindle when their food sources disappear through herbicide use. Many birds, frogs, toads, bats and other animals depend on a good supply of insects to remain healthy.

NATURAL LAWN CARE

The best defence against pests and diseases is to have a healthy lawn. Since more and more people are becoming aware of the negative impacts pesticides and fertilizers have on wildlife and humans, alternative natural methods of lawn care are being developed. Try these gardening practices:

- Leave your lawn approximately 10 centimetres high to encourage the growth of stronger and deeper roots
- Leave grass clippings on the lawn where they will decompose and nourish the grass rather than wash into the water
- Do not overwater as fungus and disease often prosper in these conditions



CONTROL OF GARDEN PESTS

Garden Beds:

- Remove insects with pressure sprayers of air or water or with pheromone traps, baits or lures
- Consider planting insect deterrents and attractant plants in other areas of the garden. For deterrents, use garlic oil with insecticidal soap, baking soda or cinnamon.
- Prevent weeds from growing using physical barriers (such as mulch) around plants
- Remove weeds by hand

Lawns:

- Use natural weed killers (such as corn gluten), which can feed turf grass and help eliminate weeds
- Prevent further weed growth after removal by covering the weeded area with a blend of topsoil and organic matter and grass seeds; this natural mixture will also help the soil regain a healthy composition
- For more information on controlling garden pests naturally, visit GardeningForWildlife.ca



HOW TO RETIRE A LAWN

You can naturalize your lawn in manageable sections by adding or increasing wildflower gardens or shrub borders and expanding forest and field habitat. The first step in lawn retirement is to simply stop mowing. There should still be enough dormant native seeds in the soil to regenerate the site naturally. Take note of the native plants in your region and either encourage them to populate your retired lawn area or purchase plants, shrubs and trees for installation.

ARTIFICIAL LAWN

An artificial lawn, such as turf, is not a good option for groundcover near shorelines. Artificial lawns lack root systems. Without a root system in place, precipitation can run directly off the turf surface and into lakes, carrying with it contaminants that can harm water quality and wildlife. Contrary to what many people believe, this artificial groundcover is not maintenance free, it eliminates habitat for wildlife, and may contain toxic chemicals and heavy metals.

If you have an artificial lawn or are thinking of installing an artificial lawn, consider the benefits of establishing a low maintenance natural shoreline buffer instead. By allowing native species to establish on their own or by actively planting native species found around your area, a natural shoreline buffer will improve the health of your lake by reducing erosion, reducing the amount of contaminants that enter your lake and providing habitat for wildlife.



RETIRING A LAWN

Transforming your lawn to a more natural state will help protect both your lake and groundwater. In areas close to shorelines, grass is not a good choice of ground cover. Grass has a short root system and does not bind to the soil as well as many native grasses; this can cause erosion along the shoreline. Grass along a shoreline also permits much more runoff and pollutants to pass over it toward the surface water. Remember that organic plant foods, manures and compost will also leach undesirable amounts of nitrogen and phosphorus into the water. By retiring areas of your lawn that are not actively being used and establishing a buffer, you will reduce maintenance and protect your shoreline from erosion. Leaving a naturalized buffer along the shoreline will also discourage Canada geese from enjoying your garden.

5

WHAT HAPPENS WHEN YOU HARDEN YOUR SHORELINE?

Hardened shorelines deflect wave energy instead of absorbing it – the energy is deflected to the sides, passing the erosion problem on to neighbouring sites, and down, scouring away any sediment or plant life near the base of the wall. These structures completely obliterate the natural shoreline environment, eliminating food and habitat for creatures in and out of the water. Installing these structures requires heavy machinery, which is both costly and environmentally damaging. Worst of all, these structures will eventually fail.

TYPES OF HARDENED STRUCTURES

Retaining walls, also known as bulkheads, breakwalls or seawalls, are completely solid structures generally made of concrete, metal or wood. Retaining walls are built to prevent the sliding of soil or to protect against wave action. However, no retaining wall will last in the long term as it deflects waves, which end up scouring the bottom right in front of the wall, undercutting it and eventually causing it to fail. As waves hammer the wall,



CONCRETE, STONE AND STEEL SHORELINES

Structures made out of rock, concrete, metal and other materials were once commonly used when it was thought that the only way to combat erosion was to take a hard and aggressive approach. People began putting in retaining walls. These structures do work well in the short term to prevent erosion, but they ultimately do much more harm than good.



RIP RAP IS A GOOD OPTION FOR REPLACING A HARDENED SHORELINE

Rip rap is used to protect shorelines, streambeds and other shoreline structures against scour and water or ice erosion. It can be beneficial for erosion control as long as the rock is placed on a gentle angle (3:1 angle is best). Rip rap is a fair choice because it absorbs and deflects waves and boat wake, greatly reducing erosion. At the same time, you can place live stakes of willow or dogwood between the rocks which will benefit wildlife and further protect your shoreline from the damaging effects of erosion.

cracks and fractures will appear. In addition, the inside (landward) face of a retaining wall is very vulnerable to surface erosion. Any overland runoff will carry away soil from the inner face, digging channels and robbing the wall of support.

SOFTENING A RETAINING WALL

If your shoreline has been hardened with a retaining wall that is in good condition, restore or plant a strip of deep-rooted vegetation along the top of the wall; this will help filter runoff before it enters the water and reduces the risk of erosion by holding the soil together.



For more information on how to deal with retaining walls contact your local Ministry of Natural Resources and Forestry office.



Note: You will need to obtain a permit to retire or replace your retaining wall



6



Note: Docks running between islands (i.e., floating bridges) and rafts fall under Transport Canada's authority. To obtain approval for these projects contact Transport Canada before you start your project.

PERMANENT DOCK TYPES

This type of dock remains in place year round and is sometimes used in conjunction with floating docks to accommodate changes in water levels.

These docks are stable and can last for years, but they do have environmental implications. Supports made from



cribs or concrete piers can alter or damage fish habitat and prevent water from flowing through and underneath the dock. Generally, permits are no longer issued for permanent dock types.

There are three types of permanent docks:

1. Crib Docks

A "crib" filled with rock is used as the foundation for this type of dock. From an environmental point of view, crib docks work best when the crib is above the high water mark. The crib is then used as an anchor for more environmentally friendly dock types such as floating docks, cantilever docks and pipe docks.

DOCKS

If you need to replace your existing dock or are installing one for the first time, you will require a permit prior to construction. Keep in mind that you are more likely to get permission if the type of dock you want to install is environmentally friendly and located away from wetlands and fish spawning grounds.



2. Permanent Pile Docks

A permanent pile dock is similar in appearance to the more environmentally friendly pipe dock (see below) but instead of resting on the surface of submerged land, the poles (or piles) are sunk into the sediment in pre-drilled holes. The poles can be made of wood, plastic, or tubes of steel. Flow-through underneath the dock is still permitted, and there is limited contact with submerged lands.

3. Concrete Piers

A concrete pier is a huge block of cement. This type of dock is very expensive to construct and is the most environmentally destructive. Concrete piers restrict the flow of water and consequently destroy aquatic habitat. They usually cover a large area and smother anything beneath them.

ENVIRONMENTALLY FRIENDLY DOCKS

Environmentally friendly docks can be taken out of the water for the winter season and cause minimal disturbance to fish and shoreline habitat. There are three types of environmentally friendly docks:

1. Cantilever Docks

Generally, a cantilever dock's frame stretches from the shore out over the water. A cantilever dock sits completely out of the water, so that water levels do not affect the installation of the dock. Having no contact with the water, cantilever docks do not disturb river or lake bottoms, do not restrict the natural movement of water and do not disrupt fish habitat.

2. Floating Docks

Floating docks cause little disturbance to fish and shoreline habitat by having minimal contact with the land and substrate interface. Floating docks are relatively inexpensive, easy to build and very versatile in fluctuating water levels and difficult installation sites.

3. Pipe Docks (also called post docks)


Typically, simple pipe docks are the least disruptive to the aquatic environment. They have minimal contact with the lake bottom, are smaller than other dock types and sit out of the water.



For more information on docks, see Department of Fisheries and Oceans
waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/255782.pdf


ENVIRONMENTALLY FRIENDLY DOCKS

1 Cantilever Docks

CANTILEVER DOCKS	ADVANTAGES	DISADVANTAGES
	More protection from winter ice, which helps increase the dock's life span	Can be made out of wood but may need steel reinforcement if on a large body of water with heavy wave action
	No disruption to water or water body floor	May be expensive to buy or build
	Can be used in shallow water	May not be suitable for places with large changes in water levels

Note: Picture Taken from Department of Fisheries and Oceans, waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/255782.pdf

2 Floating Docks

FLOATING DOCKS	ADVANTAGES	DISADVANTAGES
	Usually considered an acceptable choice by regulatory agencies	Can lack stability if too small; a minimum size of two by six metres is recommended
	Relatively easy to build and inexpensive	Blocks sunlight to aquatic plants
	Distance between the top of the dock's deck and water surface remains constant	Heavy; pulling ashore may not be practical and can damage banks

Note: Picture Taken from DFO, waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/255782.pdf

3 Pipe Docks

PIPE DOCKS



Note: Picture Taken from DFO, waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/255782.pdf

ADVANTAGES

Generally the least costly dock option and easiest to construct

Least environmental impact, with minimal damage to submerged lands; sunlight can penetrate the water below

Usually considered an acceptable choice by regulatory agencies

Lightweight design makes them easily removed for winter

DISADVANTAGES

Maximum water depth is two metres

Distance between dock surface and water surface varies due to fluctuations in water levels; adjustable legs may be possible

Very sensitive to ice pressures; should be removed for winter

Vulnerable to wave action damage in unprotected shore areas

Not suitable in muddy conditions



BOAT HOUSES

Like docks, boathouses should be constructed to minimize disturbance to the lake bed, water flows and light penetration. Boathouses often contain a variety of marine-related chemicals such as gas and oil, which can get into the water if flooding occurs. Chemicals should be stored in a separate structure located well above the high water mark or, if in the boathouse, stored on shelves that are not susceptible to flooding.



7

It originates from the water cycle. It starts with precipitation such as rain or snow, which is then filtered through the soil and rock, ending up in the water table. If you have a well on your property, you are drawing on the groundwater.

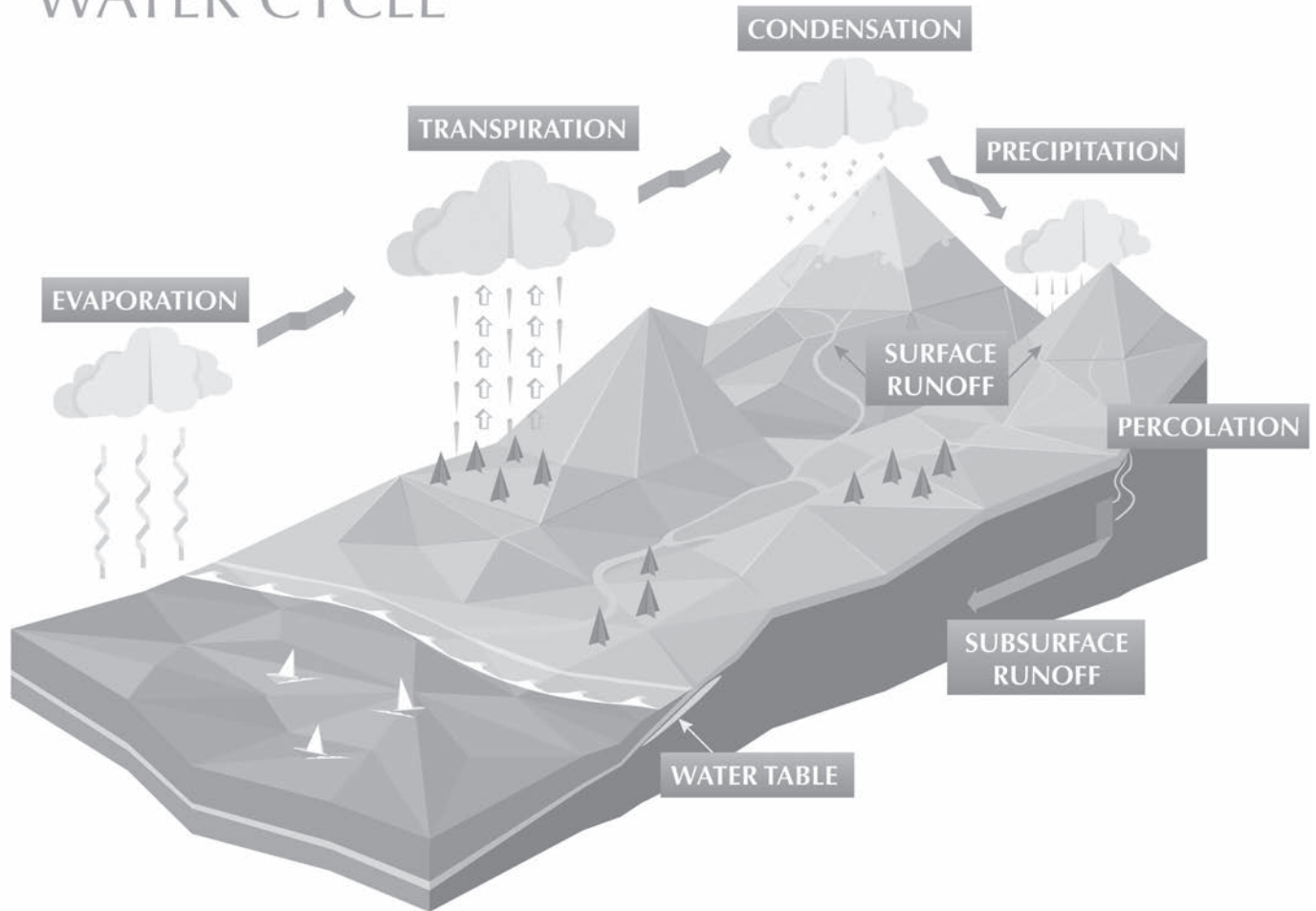
Both surface water and groundwater are subject to contamination from many sources. Contamination can originate from manure storage (if farming operations are nearby), landfills, mishandled fuels, pesticides, fertilizers, solvents and other chemicals. What you use and put on your property eventually ends up in the lake. Be water wise.



DRINKING WATER

Water is usually abundant on your shoreline property, and it comes from two sources: the surface and the ground. Surface water is water from lakes, streams and rivers. It's the water we like to swim, fish and play in. It is also used for drinking and other uses in waterfront properties. In a lake environment, it runs the highest risk of contamination from outside sources. Groundwater is the water you don't usually see.

WATER CYCLE



WELLS

If you have a well on your property, it's likely the source of your drinking water. Well care and maintenance are essential for clean, healthy water for your family and your local environment. It is recommended that you have your well water tested three times per year. Groundwater quality may change for many reasons. Some water contaminants that may be found in your water include pathogens (bacteria or viruses), nitrates and lead.

i More information about wells, contaminants and water treatment methods can be found at guelph.ca/wp-content/uploads/WellAware.pdf, the Wells on your property section of the Ministry of the Environment, Conservation and Parks website (ontario.ca/page/wells-your-property) or the Drinking Water section of your local health unit.

8

HOW DO SEPTIC SYSTEMS AFFECT THE HEALTH OF YOUR LAKE?

In areas near shorelines it is particularly important to maintain your septic system properly because soil and water conditions near the shore may make the system less efficient in treating wastewater. Incomplete treatment can result in health risks and water quality problems that affect you, your property value and wildlife.

Health risks are the most serious concern related to failing septic systems. Hepatitis, dysentery and other diseases are spread by bacteria, viruses and parasites in wastewater. These disease-causing organisms, called pathogens, could make near-shore water unsafe for recreation.

Inadequate treatment also allows excess nutrients to reach your lake or stream, promoting algae or weed growth. Algal blooms and abundant weeds not only make the lake unpleasant for swimming and boating, but they also affect water quality for fish and wildlife habitat. If too many solids escape from the tank to the drain field, the entire system will ultimately clog up.

There are several types of septic tanks – including steel, concrete, plastic or fibreglass – each with their own benefits and limitations. If you do not know what type of septic tank you have you should find out and have it inspected for decay. If you have a steel tank, you should replace it as soon as possible.

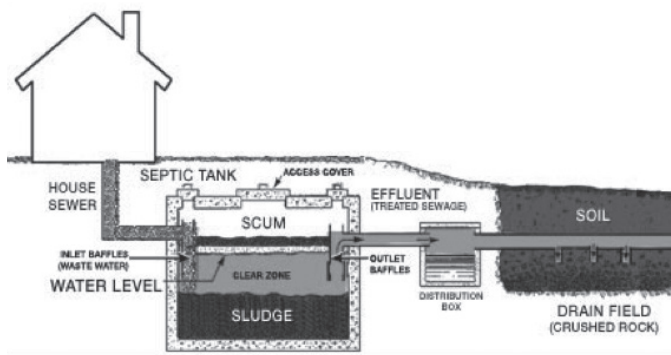
WHAT IS A SEPTIC SYSTEM?

A properly functioning septic system uses natural processes to treat contaminants so they will not harm

SEPTIC SYSTEMS

A septic system is a good way to treat waste – as long as it functions properly. Faulty septic systems can be extremely hazardous since improperly treated effluent can harm both your health and the health of the environment.

the environment or human health. Septic systems have two main components: the septic tank and the drain field (also called the leaching bed or tile bed). Both components use a combination of physical, chemical and biological processes.



WASTE TO WATER: HOW IT WORKS

- **Step 1:** Raw sewage and grey water (water from laundry, showers and dishwashing) moves from your house or cottage into the septic tank.
- **Steps 2 & 3:** In the tank, the sewage flows through a series of chambers, where it separates into solid portions, which remain in the tank to break down, and liquid portions (effluent), which move to the drain field. Beneficial bacteria work to break down the solid portions (known as the scum and sludge layers).
- **Step 4:** The partially treated effluent leaves the septic tank when new wastewater flows into the tank.
- **Step 5:** The effluent moves through a distribution system to the drain field.
- **Step 6:** The effluent reaches the drain field and flows through a series of perforated pipes.
- **Step 7:** Some of the effluent is drawn upward and is absorbed by the vegetation covering the drain field. Gravity then carries the rest into the soil, which filter the remaining pollutants from the effluent.

ent. Bacteria found in the soil then breaks down the toxins remaining in the effluent. The effluent travels down from the soil until it reaches the groundwater and is reconnected with the water cycle.

APPROVAL PROCESS

If you are planning to install or replace a septic system, it must meet requirements outlined in the Ontario Building Code, and an approval from your health unit or municipality must be obtained prior to the installation of the system. Once completed, the system must be inspected before filling takes place. Refer to the Contact List for information on how to contact your municipality or health unit.

Q WANT TO PROLONG THE LIFE OF YOUR LEACHING BED?

A TRY AN EFFLUENT FILTER.

Effluent filters are strainers installed in the outlet pipe from the tank. They are strongly recommended as they put less stress on the drain field. Filters can be added to new systems or retrofitted to older systems.



? Did you know?

Effluent filters remove 90 per cent of the suspended solids that would have otherwise moved to the drain field.

The role soil plays is a vital one – 40 per cent of wastewater treatment happens in the septic tank, but the remaining 60 per cent happens in the soil.

HOW TO MAINTAIN YOUR SYSTEM AND AVOID PROBLEMS AND DANGERS

The maintenance and care of your septic system is your responsibility. If a septic system is not properly maintained, it is more susceptible to malfunction. The wastewater from a failing septic system can contaminate your well, your neighbour's well and the shoreline. If you notice a problem, deal with it right away. It is important to be familiar with your system. You need to know where the tank and drain field are and what type of a system it is. Keep a written history of when it was installed, pumped, inspected, etc. Aside from knowing your system, there are four main things you can do to properly maintain it:

1. Regular Pump-Outs

The easiest and most important thing is to have the tank pumped out on a regular basis. The majority of system failures occur because the tank wasn't pumped often enough.

Depending on the use and size of your septic system you should have your system pumped every three to five years.



2. Regular Inspections

It is important to inspect a septic system regularly. A good opportunity is when the tank is being pumped out. At this point you should take the opportunity to



- Check the scum and sludge depth
- Inspect the structure of the tank and baffles, looking for any large cracks or deterioration
- Check the fit of the access lids and arrange for repairs as necessary



- Listen for water running into the tank once it's been emptied. Excess water causes strain on your drain field.

If you are unable to inspect your septic system yourself, hire a professional such as a septic inspector, a licensed contractor who installs or repairs septic systems, or a representative of a firm that pumps out septic tanks.

3. Protect the Drain Field

The drain field is a sensitive area of the septic system. The breakdown process in this area involves both bacteria and soil. When these components are compromised or removed, the system does not completely treat the wastewater running through it.

You need to

- Avoid compacting the soil or damaging the distribution pipes in the drain field by keeping heavy machinery (like cars) and heavy foot traffic off the drain field. Compacting the soil can crack the distribution pipes, which causes greater volumes of effluent to be released into the drain field, saturating and ultimately clogging it

- Avoid watering your lawn over the drain field to keep your system working properly
- Keep trees away from the septic system, especially ones with creeping roots such as willow, birch, poplar and cedar. It is recommended that a 5 metre perimeter around the edge of the drain field be kept clear of trees and shrubs (at least 10 metres for poplar and willow trees). Ensure there is a vegetated buffer between your drain field and lake or stream.

4. Control Inputs

To reduce stress on the septic system and the environment, control the amount of liquids and solids put into the system. It is recommended that you

- Install water-saving devices (i.e., water-saving taps, showerheads, toilets and appliances)
- Practice-water saving techniques: don't leave the tap running; fix leaky taps or running toilets; use dishwashers and washing machines only when they are full and spread loads out over the week
- Avoid using commercial cleaners and opt for more environmentally friendly alternatives. Chemical cleaners, solvents, antifreeze and cigarette butts all kill the beneficial bacteria in a septic system. Reduce the amount of solids that have to be broken down. A good rule to follow is, "If you didn't produce it, it shouldn't be going down your system."
- Avoid using septic additives as they are not effective and may harm your system



Note: To maintain a healthy system, watch what goes down the drain and have the tank inspected and pumped out regularly.

HOW TO TELL IF THERE IS A PROBLEM

Unfortunately it isn't always easy to tell when there is a problem with a septic system. Since most of the components are underground, you may not discover a problem until long after the breakdown has occurred. However, there are a few symptoms that may indicate a problem:

- Patches of abnormally healthy-looking grass or vegetation on the drain field are signs that the drain field is full
- Soft or spongy ground over the drain field can indicate that the drain field is saturated, or full
- Pools of dark water on the surface point to the same problem
- Toilets and drains that start backing up or make gurgling noises can be an indication of a blockage or a full system
- Strong odours can warn of a saturated drain field; foul smells in the house can indicate that wastewater is backing up into the house, or that the house-to-tank pipe is broken

ALTERNATIVE WASTEWATER TREATMENT TECHNOLOGIES

Conventional septic systems don't meet everyone's needs. For more information on alternative wastewater treatments, such as composting toilets, check the Ontario Building Code website: ontario.ca/page/ontarios-building-code.

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NEGATIVE IMPACTS LIVESTOCK CAN HAVE ON SHORELINES AND LAKES:

- Overconsumption of plant material
- Trampling of plants
- Erosion of banks
- Nutrient inputs
- Bacterial contamination

This can result in changes to the vegetation communities, a reduction in habitat diversity, an increase in suspended sediment and possible algal blooms.

SUSTAINABLE MANAGEMENT OF SHORELINE AREAS

The amount of nutrients, sediments, pesticides and bacteria that enter a lake can be reduced through sustainable management of shoreline areas on agricultural lands. Taking small steps, such as maintaining a healthy shoreline buffer, installing exclusion fencing, creating an upland water source, giving plants time to rejuvenate and minimizing grazing during vulnerable periods, can all help improve the health of the shoreline and ensure the long term use of the grazing area.

SUSTAINABLE AGRICULTURE

The key to maintaining healthy shorelines is to balance and monitor the possible level of disturbance. When livestock is given free range to our lakes and shorelines, these sensitive areas can be negatively impacted.

THINKSTOCK

FOUR MAIN PRACTICES TO CONSERVE SOIL AND WATER WITHOUT SACRIFICING PRODUCTIVITY:

1. Find a balance between animal demand and available forage supply

- Vary the number of livestock that are on the pasture at different times. This balances the carrying capacity of the land, ensuring available forage is maintained while protecting the health of the shoreline.

2. Disperse livestock evenly

- Recent research indicates that by implementing an upland water source, environmental impacts of livestock along shoreline areas can be greatly reduced.

3. During vulnerable times, reduce the grazing of the area

- Shoreline areas are most vulnerable to grazing damage in the spring and early summer. This is when soil around the banks are saturated

making the banks susceptible to trampling damage. Allowing pastures to rest during these vulnerable times, allows for plant regrowth and minimizes the degradation of shorelines.

4. Provide time for the pasture plants to grow during vulnerable times

- Plants along the shoreline area require rest during the growing season. This gives the plants time to replenish their energy reserves and to rebuild their root systems, allowing for increased forage production.

By taking these practices into consideration, property owners can better manage their use of shoreline areas. These practices provide benefits to livestock, croplands and shorelines.

For more information on sustainable agriculture, contact the Ontario Ministry of Agriculture, Food and Rural Affairs at omafra.gov.on.ca.



THINKSTOCK



10

- The type of cover (tread material) you use to cover your path will depend on the slope of your property. See the table below.
- On steep slopes, build stairs with landings instead of a path to access the waterfront; stairs make shoreline access easier and safer, help your shoreline withstand frequent use and decrease erosion; strategically placed landings also give you a place to rest and enjoy the view
- Add a step or two on the path, especially where the slope has a greater than 10 per cent incline
- When constructing paths, place them in areas where they will not interfere with runoff

Slope	Pathway	Tread Material
Gentle Slope	Curved or Straight	Pineneedles/leaves, woodchips & crushed gravel, or erosion control mix
Moderate Slope	Curved	Woodchips & crushed gravel and/or erosion control mix
Steep Slope	Curved	Erosion control mix although stairs that are raised with open backs are better in this situation

*Erosion control mix is a type of mulch made of partially composted bark, sand, gravel, stone and wood fragments.

STAIRS, DECKS AND OTHER STRUCTURES

When constructing stairs, decks, gazebos or other structures, consider some structural procedures to make them environmentally friendly as well as functional.

- Build a boardwalk, stairs or deck 10 to 50 centimetres over vegetation, with boards spaced 2.5 centimetres apart and no backs on stairs. This will allow sunlight and rain to penetrate between the boards,

As a waterfront property owner you need access to your shoreline for various activities. Any kind of regular access through your buffer to the water's edge can have an impact on the sensitive soil and fragile banks that are often associated with shorelines. You can minimize these effects with the following recommendations:

- Avoid a steep path that cuts straight down to the water; use gentle S-curve switchbacks instead

allowing vegetation to grow underneath; vegetation will keep soil intact and protect against erosion

- Avoid removing ground cover from areas that may easily erode, such as areas beside structures
- Try to use materials that are environmentally friendly and do not contain chemicals



Note: To determine whether you have appropriate lighting, look to see if the light source is more apparent than what it is illuminating. If it is, then your lighting methods could be improved.

LIGHTING AND LIGHT POLLUTION

When placing lights on your property, remember that they may also be shining on your neighbours' property, as well as on the surface of the water. Light bounces off the water, which can severely limit the night vision of boaters. Excessive light also affects wildlife by changing foraging, mating, hibernation and migration patterns. Light pollution occurs when excessive amounts of light and undirected light are present or when light levels exceed requirements. You can reduce undirected lighting by placing lights closer to their intended location. For instance, light pathways with solar lights placed in the ground.



Did you know?

Creosote is a combination of chemicals that is used to preserve wood and railway ties. Do not use railway ties or other creosote-preserved materials for any of your projects. The chemicals not only put you and your family's health at risk, but as they leach from the treated wood they also contaminate soil and water.

SIX EASY STEPS TO RESPONSIBLE LIGHTING

1. Determine what lighting is needed to illuminate targeted areas. Determine if you need light for safety, as a marker (such as low-voltage garden path lights) or for aesthetic reasons.
2. Use the right amount of light. More light is usually not better. Too much light reduces visibility by creating glare and forming dark shadows. It also wastes energy. Your eyes will adjust more easily where there are smooth transitions from light to dark areas.
3. Avoid letting the light shine sideways or upwards. Use full cut-off, shielded fixtures and aim light to the area where you need it.
4. Use infrared and motion detectors that turn lights on and off as needed. This improves security and reduces electricity consumption. Use timers to control when lights come on.
5. Use efficient lamps. Remember that shielded fixtures with good reflectors waste little light, so you can use lower wattage bulbs. You can also try 'silver half moon' light bulbs. These have a coating on the top half of the light bulb that reduces glare and directs light down. A 15 watt bulb is often all that is needed to get great illumination.
6. Use lights that are certified by the International Dark-Sky Association (IDA).

NOISE POLLUTION

Noise pollution is excessive sound that is harmful to the well being of the environment and wildlife. Noise pollution is human made and comes from activities such as boating and driving. Human activities have large implications on wildlife survival and can affect reproductive success and habitat choice. Noise can also carry great distances over water, so be considerate of neighbours and wildlife and keep noise to a minimum.

BEACHES



Beaches are often viewed as a desirable feature for a waterfront property, but there are several things that you should consider if you are thinking of creating a beach on your property.

- Imported sand, especially unwashed building sand, can bring in unwanted seeds or insects that may be inappropriate for your area
 - When you clear shoreline vegetation to create space for a beach, you lose one of your critical tools for runoff and erosion control, as well as habitat for wildlife
 - The creation of new beaches is not permitted by approval agencies in many areas. Most land below the high water mark or “natural boundary” of a water body belongs to the Crown and is public land. If you alter it without approval you can be fined
- An artificial beach will disappear; waves, currents, ice and other erosive forces remove sand over time. Even pulling up your boat or constantly walking on sloping sand can push the sand from an artificial beach downhill and into the water
 - By adding more sand to an eroding beach, you risk gradually filling in your lake, silting the habitat of fish and other animals and possibly damaging the quality of your drinking water. Drifting sand can also inflict all these problems on your neighbours

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Cavity Trees

Large trees with hollow cavities are a vital source of food, shelter and safety for many species. In Ontario, more than 50 species of birds and mammals (including Pileated Woodpeckers and Barred Owls) depend on cavity trees for nesting, rearing young, roosting, feeding, storing food, escaping predators and hibernating. By retaining cavity trees on your property, you provide important habitat for wildlife.

Fallen Logs

Fallen logs are essential habitat for small mammals, such as moles, as well as certain woodpeckers, toads and many insects. As the log rots, reptiles and amphibians lay their eggs in the moist wood. A decaying log is also great habitat for beetles and ants that burrow under the bark or lay eggs.

Coniferous Forest

Conifer forests, also known as deer wintering yards, are areas of mainly coniferous trees (pine, hemlock, cedar, spruce) with a canopy closure of more than 60 per cent, which provides shelter, ease of movement and protection from predators. The land surrounding the core area is usually mixed or deciduous forest.

Mast Producing Trees

Mast is fruit and seeds produced by maple, elm and ash, and nuts from oak, Black Walnut and beech. Mast is the primary fall and winter food for most forest wildlife species as they build fat reserves for hibernation.

WILDLIFE HABITAT: WHAT YOU CAN DO

Wildlife provides us with many enjoyable and beneficial activities from bird watching and wildlife photography to pest control, seed dispersal, nutrient cycling and pollination, to name only a few.

You may have some of the following property features that help to attract wildlife species:



Vernal Pools

These are temporary wetlands formed in depressions by rain and melting spring snow. Short-lived, they last anywhere from a few days to three to four months before drying up. They are an important breeding habitat for amphibians since they do not contain predators such as fish and reptiles that are found in permanent water bodies.

Reptile Hibernacula

These are sites that can often be found in large forested areas that have rocky outcrops with crevasses. Rocky habitats also provide nesting, den sites and cover for many other types of wildlife including birds, amphibians and mammals such as foxes, skunks, squirrels and rabbits. A male Ruffed Grouse may also find this an attractive drumming site.

Brush Piles

Brush piles can be constructed with the cut materials from trail clearing or woodlot management (pruning). Pile the brush waist-high on a stump, log or boulder, or along fencerows. These provide habitat for Snowshoe Hares, cottontail rabbits and others. For added benefit, train climbing vines, such as Virginia Creeper, onto the brush pile.

Leave Dying Material in Place

You can help attract wildlife by leaving dead standing trees, fallen logs and the mast fallen off of trees on your property, when it is safe to do so. However, note that dead elm trees should be removed as they can provide habitat for elm bark beetles, which are carriers of Dutch Elm disease.

ATTRACTING AQUATIC WILDLIFE THROUGH HABITAT

You can attract wildlife in the lake as well.

- Pending permitting and with the aid of a professional you can help create or enhance a spawning bed for species in your lake
- Plant trees, shrubs and flowers above the high water mark as a source of food and shade
- Leave hanging or downed trees in the water



For more ideas on attracting wildlife go to the Canadian Wildlife Federation's website at GardeningForWildlife.ca, the Ministry of Natural Resources and Forestry's website at ontario.ca/page/creating-wildlife-habitat or your local fish and game club.

LIVING WITH WILDLIFE

If proper precautions are not taken, conflicts can occur between people and wildlife. Some recommendations to help minimize wildlife conflicts include:

Block Access

- In the fall, rodents often take shelter in people's homes. Able to access homes through dime-sized holes, mice often use openings around dryer vents, utility pipes, gaps in soffits, roof vents and the common wall between an attached garage and a house to gain entry. Cover any openings around cabinets and pipes with metal lath or for smaller openings try stainless steel or copper scouring pads. Generally speaking, vents are made to stay closed when not in use. You don't want to do anything to impede air flow or create safety hazards. Make sure your vents are working properly. Also be sure to keep food well stored.
- Bats often roost in trees with crevices or cavities but they can also choose our attics as warm summer roosts to have their young - they can have dependent young that are unable to fly between May and August - or as winter hibernation sites. Bats provide important environmental and economic services but they are facing many threats. A disease called White-nose Syndrome has killed millions of bats in North America, but habitat loss (including human structures), pesticides and wind power pose additional threats to already stressed populations – many species are even at risk. To avoid trapping bats in your attic, important steps must first be taken. For information on proper timing and exclusion techniques, visit cwf-fcf.org/en/explore/bats/evicting-bats.html.
- Other animals such as squirrels and raccoons can also take up residence in our attics. Depending on the time of year, dependent young may also be present. Check with your local wildlife rehabilitation centre on when there could be dependent young for your area, how to ensure all animals have left and the proper timing and methods for excluding your guests and proper animal proofing.

Discourage Contact

- Trim tree limbs that touch your roof or the walls of your home or outbuildings
- Store firewood and lumber away from main buildings or in a special shelter
- Minimize outdoor light use and use yellow light bulbs in all outside light fixtures to reduce the number of flying insects attracted to the house light



JEAN-DANIEL GAGNE

Keep Food Away

- Use animal-proof garbage cans and, if feasible, keep garbage cans in a shed or garage until garbage can be removed. If there are bears in your area and you can't safely store your garbage indoors, construct a very sturdy container to put your garbage bin in and make sure it is sealed well to minimize any odours; remove your garbage often
- Keep pet food inside to avoid attracting wildlife; if you must feed pets outdoors, remove food dishes and any leftover food after feeding
- Keep all food (including pet food) in sturdy rodent- and insect-proof containers
- Maintain your compost; turn it regularly and cover with dirt or leaves; improperly maintained compost piles and bins attract many animals, including skunks and raccoons
- If there are bears in your area, consider indoor worm composting
- Keep barbecue equipment clean and store your barbecue in a secure area; wildlife is attracted to the rich odours
- Prevent bird feed from accumulating on the ground; fill feeders only when bears are hibernating if bears are attracted to your property

INVASIVE SPECIES

Invasive species are one of the greatest threats to the biodiversity of Ontario's waters and woodlands. Originating from other regions and in the absence of their natural predators, diseases and competitors, some non-native species are left to flourish as they take over their new surroundings and become invasive – eliminating native species populations and resulting in less biodiversity and a changed ecosystem.

Invasive species can be introduced by many methods, including:

- Recreational boating
- Ballast water
- Release of live bait
- Horticultural trade
- Seed mixtures
- Aquarium and water garden trade
- Firewood

However, there are actions we can all take to help reduce the spread of invasive species:

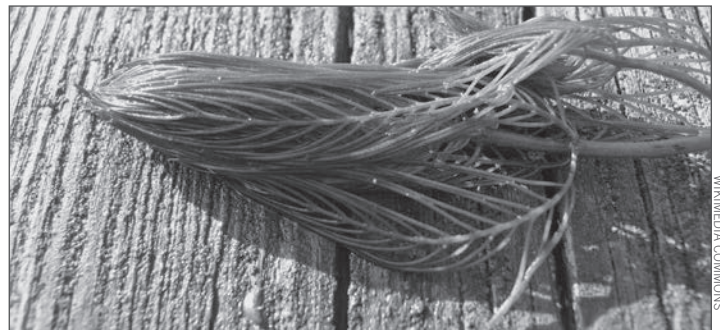
- Learn to identify some of Ontario's invasive species
- Never move/release live baitfish or other fish from one body of water to another
- Inspect, clean and thoroughly dry all boats, trailers, water skis, scuba gear or other equipment before introducing them to a new water body
- Plant native species
- Never release aquarium plants, fish or other animals (ie. turtles) into a natural system
- If camping, buy local firewood rather than bringing your own
- Report sightings to Ontario's Invading Species Awareness Program at 1-800-563-7711



Learn more about invasive species from the Invading Species Awareness Program website (invadingspecies.com) and the Ontario Invasive Plant Council (ontarioinvasiveplants.ca) or the Invasive Species section of the Ontario Government website (ontario.ca/page/invasive-species-ontario).



PURPLE LOOSESTRIFE



EURASIAN MILFOIL



We hope this document provides you with the necessary information to maintain the health of your shoreline and lake – a place that you and your family as well as future generations can enjoy and make many great memories.

For general information, resource downloads and more – please visit LoveYourLake.ca.

CONTACT LIST

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GOVERNMENT ORGANIZATIONS

Fisheries and Oceans Canada (DFO)

Provides information and permits regulating fish habitat

dfo-mpo.gc.ca

Parks Canada

Water levels, work permits for docks, fill and construction along federal canals.

pc.gc.ca

Transport Canada

Responsible for enforcing the *Canadian Navigable Waters Act*. It should be contacted for permits and to obtain information on docks, floating rafts or any other structure that could infringe on navigable waters.

330 Sparks Street, Ottawa, ON K1A 0N5

613-990-2309

toll free 1-866-995-9737

tc.gc.ca

Ontario Ministry of the Environment, Conservation and Parks

Responsible for protecting air, land and water. Contact for water quality, algal blooms and air and water pollution.

ontario.ca/page/ministry-environment-conservation-parks

Ontario Ministry of Natural Resources and Forestry

Responsible for species at risk, invasive species, nuisance wildlife, forestry and resources.

1-800-667-1940

ontario.ca/page/ministry-natural-resources-and-forestry

SEPTIC SYSTEM INFORMATION
Ontario Onsite Wastewater Association PO Box 2336, Peterborough, ON K9J 7Y8 1-855-905-6692 oowa.org
Sewage and Land Control healthunit.org/health-information/sewage-land-control/
Ministry of Agriculture, Food and Rural Affairs - SepticSmart! omafra.gov.on.ca/english/environment/facts/sep_smart.htm
OTHER USEFUL CONTACTS
Ontario Federation of Anglers & Hunters (OFAH) Provides anglers and hunters with information and resources, involved in the conservation of Ontario's fish and wildlife resources. 4601 Guthrie Drive, PO Box 2800, Peterborough, ON K9J 8L5 705-748-6324 ofah@ofah.org ofah.org
Ducks Unlimited Canada (DUC) Provides programs and services for the conservation of wetlands. 705-721-4444 ducks.ca
Federation of Ontario Cottagers' Associations (FOCA) Serves as an information centre, providing assistance and leadership to Ontario's cottage associations and their members. #201-159 King Street Peterborough, ON K9J 2R8 705-749-FOCA (3622) info@foca.on.ca foca.on.ca
Landowner Resource Centre (LRC) Provides information for landowners, resource materials and answers to questions. Box 599, 3889 Rideau Valley Drive Manotick, ON K4M 1A5 613-692-3571 1-800-267-3504 info@lrconline.com lrconline.com

Ontario's Invading Species Awareness Program

Information and resources about invasive species in Ontario.

1-800-563-7711 | info@invadingspecies.com | invadingspecies.com

Conservation Ontario

A non-profit association that represents Ontario's Conservation Authorities.

905-895-0716 (phone), 905-895-0751 (fax)

info@conservationontario.ca

conservationontario.ca

TREES AND NURSERIES**Forests Ontario**

Provides education programs and community outreach, helping to plant millions of trees in Ontario every year.

1-877-646-1193

forestsontario.ca

Wildflower Farm

Mail order seeds

10195 Hwy 12, Coldwater, ON L0K 1E0

1-866-476-9453

wildflowerfarm.com



The Love Your Lake program is coordinated by



CanadianWildlifeFederation.ca
1.877.599.5777 | info@cwffcf.org



Watersheds.ca
613-264-1244 | info@watersheds.ca

