

A Shoreline Owner's Guide to Invasive Species



*With support from
the Ministry of Natural
Resources and Forestry*

F  **C A**
Federation of Ontario Cottagers' Associations

What are invasive species?	01
Invasive species in Ontario	02
Ontario's Invasive Species Act	03
Impacts of invasive species in Ontario	03
Invasive species and your waterfront property	06
Address pathways of introduction	09
Practice prevention	10
Information for managing invasive plants on your property	12
Top 7 Actions Shoreline Owners Can Take	13

FOCA is very concerned about the potential impacts of invasive species and the negative effects they may have on our quality of life in Ontario. We have already seen the impacts from the many existing and looming invasive species introductions, including forest pests like the Emerald Ash Borer, aquatics like the Zebra Mussel and Asian Carp and invasive plants such as Phragmites and Garlic Mustard. These invaders have proven to alter the environment, damage our economy, and negatively impact our communities.

We feel each of us has a role to play to ensure the resources we enjoy today will be here for future generations. Long-term and meaningful conservation in Ontario can only be accomplished through the thousands of individual actions carried out by private landowners.

Invasive species can take over lakes, forested areas, grasslands and cottage gardens. Invasive species can permanently alter the landscape by killing trees that provide valuable shade, reducing the abundance and variety of native fish and aquatic life, squeezing out desirable plants, and clogging up waterways. In addition to their direct impact on the landscape, invasive species also hurt the pocketbooks of cottage owners by damaging private property, reducing property values, affecting health and safety, and compromising the enjoyment of recreational activities such as boating, swimming, watersports, and fishing (*Invasive Species Centre, 2014*).

What are invasive species?

Invasive species are defined as harmful, non-native plants, animals and micro-organisms whose introduction or spread threatens the environment, the economy, or society, including human health. Non-native refers to any plant, animal or microorganism that has been introduced into areas beyond their range; whether this introduction be deliberate or accidental. It is important to note that not all non-native species are considered invasive.

There are a wide range of species in Ontario that waterfront property owners should be aware of; including plants, animals, fungi, fish, invertebrates and diseases. Once established, invasive species are extremely difficult and costly to control and eradicate, and their ecological effects are often irreversible.

Ontario's definition of an invasive species may include species native to Ontario, which have been introduced to a new geographic region due to human activity. Species may be considered invasive if their introduction or spread can be linked to our changing climate (*OMNRF, 2012*).



Garlic mustard: K. Towle

Ontario is at Higher Risk for Invasive Species Introduction

Historically, Ontario has had more non-native species establish within its borders than any other province or territory. This is due to our environmental conditions and the nature of our society that supports non-native species movement.

Ontario is industrialized, urbanized and has a high population density. Our economy is supported by large quantities of imports and a significant goods-producing industry sector. Ontario's geographic location also makes it more vulnerable due to the proximity to a major international shipping channel, the great lakes St. Lawrence Seaway, and multiple land and water entry points on Ontario's borders. Degraded habitat and ecosystems in many of Ontario's ecological regions also create favorable conditions for invasive species to enter and become established (OMNRF, 2012).

ONTARIO'S ECONOMY

Ontario has a large and increasing population that supports an active and growing economy. Compared to any other province and territory, Ontario imports the most goods from the most places around the world, and many of these goods are shipped onward to other parts of Canada. This activity brings with it benefits and risks. Increased cross border trading increases the chance of inadvertently introducing an invasive species. Invasive species may hide in packaging, in containers on ships, or in ballast water. It is worth noting that approximately 64% of the overseas containers that arrive in Canada are opened in the Ontario portion of the Great Lakes basin (OMNRF, 2012).



Round goby; D. Coppelstone

Did you know?

Compared to other provinces, Ontario has the highest number of invasive plant species, with 441. This can be compared to Quebec, with 395; and British Columbia, with 368. The lowest numbers are in Nunavut, with 16 species (CFIA, 2008).

In Ontario, there are rules to prevent and control the spread of invasive species in the natural environment. On November 3, 2016 the Invasive Species Act, 2015 (ISA) came into effect in Ontario and with it is a regulation that prohibits and restricts a number of invasive species, such as Asian carp and Phragmites. Preventing invasive species from arriving and becoming established in Ontario is critical in the fight against this growing threat.

There are two classifications of invasive species regulated under the ISA:

- **PROHIBITED:** No person shall bring an invasive species into Ontario, deposit, release, possess, transport, propagate, buy, sell, lease or trade these species.
- **RESTRICTED:** No person shall bring an invasive species into Provincial Parks and Conservation Reserves; or deposit or release in Ontario.
- Additional prohibitions may be applied through regulation

Impacts of invasive species in Ontario

Invasive species pose a significant threat to Ontario's economy and natural environment. Invasive species negatively affect the habitats they invade, displacing native species and causing a serious threat to biodiversity. Aquatic ecosystems are especially vulnerable to invasive species. Once established in an aquatic ecosystem, an invasive species is almost impossible to eliminate and control measures can be costly.

As a waterfront property owner, you are part of the ever changing environment and the threats and challenges it faces. You may have certain aspects of your property that you value, whether it be swimmable/fishable water, supporting wildlife or just enjoying nature. Unfortunately, invasive species can affect all of this in various ways:

Did you know?

Early detection and response can increase the chance of eradication and reduce the cost of control and management.

If you've seen an invasive species in your community, or the wild, please report it online at eddmaps.org/ontario or contact the toll free Invading Species Hotline at **1-800-563-7711**.

1. Impacts to Biodiversity

Invasive species impact biodiversity by outcompeting native species for the resources required to survive and degrading habitats.

NATIVE PLANTS AND TREES: Invasive Phragmites (European common reed) is an invasive grass that is impacting the biodiversity of wetlands in Ontario. It is an aggressive perennial grass that spreads quickly and outcompetes native plant species for water and nutrients. This invasive plant can grow extremely tall, blocking waterfront views and causing significant habitat losses for several species of wetland and dune dependent wildlife. As it grows the plant releases toxins into the soil that can hinder the growth of surrounding native plants. This invasive species has already caused extensive damage to native plant communities across the southern part of the province, with scattered occurrences as far north as Lake Superior. Until recently invasive Phragmites was sold as an ornamental plant in Ontario. It is now regulated in Ontario as a restricted invasive species, and is illegal to provide for sale.

NATIVE WILDLIFE: The Round goby is native to the Black and Caspian seas in Eastern Europe, it was first found in North America in 1990 in the St. Clair River north of Windsor, Ontario. It is a small, bottom dwelling fish that feeds aggressively on insects and other small organisms found on lake and river bottoms. The Round goby is threatening Ontario's aquatic biodiversity due to its voracious eating habits and ability to spawn several times a season. The Round goby competes with native bottom dwelling fish for resources and it is depleting the population of many popular sport fish (such as small mouth bass) by consuming large numbers of their eggs and larvae. This fish was most likely brought to North America in the ballast water of ships from Europe. Since 1990 the Round goby has successfully spread through all five Great Lakes and has begun to appear in a few location inland. Round goby is illegal to possess live in Ontario under the Ontario Fishery Regulations.



Water soldier: F. MacDonald, MNRF



Eurasian water-milfoil: J. Hardy

2. Impacts to Recreation

Water soldier is an invasive perennial aquatic plant. It is native to Europe and northwest Asia and is a popular ornamental plant used in water gardens. When a population of water soldier is established it forms dense mats of floating vegetation. Not only does this negatively impact native biodiversity, the aquatic plant can also hinder recreational activities such as swimming, boating and fishing. This aquatic plant also has sharp serrated leaf edges that can cut swimmers and individuals who handle the plants. So far water soldier has only been found in the wild within the Trent River and the Black River in Ontario. The Ontario Ministry of Natural Resources and Forestry, the Ontario Federation of Anglers and Hunters, Parks Canada and other partners are working collaboratively to prevent the spread of and eventually eradicate this invasive species. Water soldier is regulated in Ontario under the Invasive Species Act as a prohibited invasive species.

3. Impacts to Landscape and Structures

Eurasian water-milfoil is an invasive aquatic plant. It is native to Asia and northern Africa and was introduced to North America in the 19th century most likely from shipping ballast or aquarium release. This aquatic perennial grows very fast and creates dense underwater mats that shade other aquatic plants. Once a population is established the landscape of a waterfront will change very dramatically. Native aquatic plants are soon replaced by the invasive milfoil and as large stands die off the process of decomposition creates anoxic conditions that can result in fish kills. These stands can become so thick that they create areas of stagnant water, which is an ideal habitat for mosquitos. Many lakes in Ontario have already seen the landscape and structures of their waterfront change drastically due to Eurasian water-milfoil invasions. In Ontario, this invasive aquatic plant can be found in the Great Lakes, the St. Lawrence River and many inland lakes throughout southern and central Ontario.



Phragmites: J. Gilbert, MNRF

Invasive species and your waterfront property

As a waterfront property owner it is important to be aware of invasive species that can threaten your property and your lake. Learn which invasive species may be present in your area already and how to identify them.

INVASIVE SPECIES ALREADY IN ONTARIO

ZEBRA AND QUAGGA MUSSELS

Zebra and Quagga mussels are native to the Black, Caspian and Azov Seas of Eurasia and were introduced to North America in the late 1980s. It is believed they arrived as a freshwater ballast stowaway in commercial vessels from Europe. These mussels can have negative impacts on cottage country because they are capable of heavily colonizing hard and soft surfaces, including docks, boats, break walls and beaches. Invasions of these species are responsible for clogging intake structures in power stations and water treatment plants. These mussels will firmly attach to hard structures and surfaces causing significant damage affecting shoreline property owners and recreational boating.

EUROPEAN WATER CHESTNUT

European water chestnut is an aquatic plant native to Europe, Asia and Africa, and is used in North America as an ornamental water garden plant. Ontario has regulated European water chestnut as a prohibited invasive species under the Invasive Species Act, 2015. Populations of European water chestnut in Ontario are causing a number of impacts. It forms dense mats on the surface of the water that make boating and angling extremely difficult. The plant also grows hard seeds that have sharp barded spines that can accumulate on shore and cause injury if stepped on. This species also outcompetes native shoreline plants for light and can create lower dissolved oxygen levels as the plant decomposes.

EMERALD ASH BORER

The Emerald ash borer is a forest pest native to Asia. The Canadian Food Inspection Agency has prohibited the movement of firewood and any material made from ash trees outside of designated areas under an Infested Places Order. This pest is a highly invasive insect that has killed millions of ash trees in Ontario and the north-eastern United States. It attacks both healthy and stressed ash trees when its larvae tunnel through the tree's vascular system which delivers water, nutrients and sugars throughout the tree. Once an ash tree is infested, the mortality rate of the tree is nearly 100%. An invasion of this insect in cottage country will result in loss of habitat and food for other native species and a loss of biodiversity.



Emerald ash borer: E. Czerwinski, MNRF

DOG-STRANGLING VINE

Dog-strangling vine refers to two invasive plants native to Eurasia; Black dog-strangling vine (also known as black swallowwort) and Dog-strangling vine (also known as pale swallowwort). Ontario has regulated these invasive plants as restricted under the Invasive Species Act, 2015. This invasive plant grows aggressively by wrapping itself around trees and other plants, or trailing along the ground and can grow up to two meters in height. The dense stands these plants form can crowd out native plants and young trees, preventing forest regeneration. The dense mats of interwoven vines can also be difficult to walk through and may interfere with forest management and recreational activities at the cottage.

WHITE NOSE SYNDROME

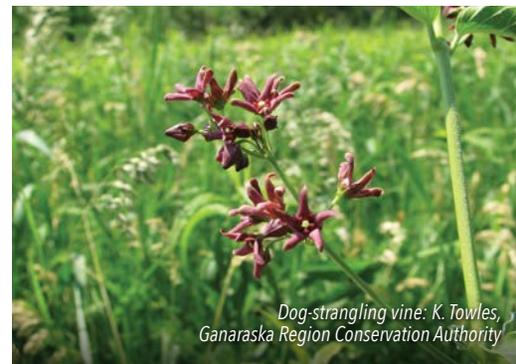
White nose syndrome is a fungal infection that causes high mortality rates in hibernating bats. The invasive fungus (*Pseudogymnoascus destructans*) originally came from Eurasia and was accidentally transported to North America by humans. As of January 2015 more than six million bats in eastern North America have been killed by the fungus. White nose syndrome has been found in five species of bats native to Ontario (*OMNRF, 2015*). Declining bat populations in Ontario has the potential to greatly impact ecosystem function. Bats are predators of insects, including many crop and forest pests. Reductions in predation pressure from bats on insect populations will lead to increased numbers of insect pests at the waterfront (such as mosquitos).



Zebra mussels on native clam: C. Parks



European water chestnut: F. MacDonald



Dog-strangling vine: K. Towles, Ganaraska Region Conservation Authority



White nose syndrome: L. Hale, MNRF

GIANT HOGWEED

Giant hogweed is a perennial ornamental garden plant originally from southwest Asia. Giant hogweed is a health concern for nature enthusiasts as it can cause severe skin burns if you get the sap on your skin and the skin is then exposed to sunlight. Symptoms occur within 48 hours and consist of painful blisters. Eye contact with the sap has also been reported to cause temporary blindness.

INVASIVE SPECIES TO BE ON THE WATCH FOR

ASIAN CARP

Asian carps were introduced to North America from Asia in the 1960's and 1970's. To prevent these unwanted invaders from coming into the province, Ontario has regulated four species of Asian carp (Silver carp, Bighead carp, Grass carp, Black carp) as prohibited invasive species under the Invasive Species Act, 2015. Asian carp can have extreme impacts on cottage country. Some species of Asian carp have the ability to eat the food supply that our native fish depend on and crowd them out of their habitat. The decline of native fish species could damage sport fishing in Ontario's lakes.

Silver carp are also a hazard for boaters. The vibration of boat propellers can make Silver carp jump up to three meters out of the water. Boaters and water-skiers in areas of the Mississippi and Illinois rivers have already been seriously injured by the jumping fish.

RED SWAMP CRAYFISH

Red swamp crayfish (*Procambarus clarkii*) are a species of crayfish that are native to the Gulf Coast and Mississippi River drainage to Illinois. The Red swamp crayfish can quickly dominate lakes, rivers and wetlands. They feed voraciously on plants, snails, fish, and amphibians, aggressively competing with native crayfish and other species for food and habitat. Their presence can lead to declines in native crayfish. The Red swamp crayfish is not established in Ontario but poses a serious threat to biodiversity if it arrives in the province. Never release aquarium species into the environment.

Pathways are the routes by which invasive species move from one geographical location to another and how they are spread to new areas once they arrive.

Natural pathways may include wind, water and animal dispersal. However these natural pathways are less to blame for species introductions and act more as a means of spreading an invasive species after it has already arrived.

Human activity is the cause of most invasive species introductions. Invasive species can be transported unintentionally as "stowaways" in shipping containers, recreational boats and vehicles, firewood etc. They can also sometimes be introduced intentionally as products in trade (e.g. garden plants, aquariums etc.)

Climate change is also a cause for concern with regards to the spread of invasive species into Ontario. A warmer climate may result in species that are adapted to warmer temperatures expanding their range northward as the environment becomes more suitable. An example of this kind of invasive species is Water lettuce. Water lettuce is an aquatic plant that is native to the southeastern United States. While not usually able to tolerate cold temperatures, several populations of water lettuce have been observed in Ontario, and they may be successfully reproducing. As winter temperatures increase so does the chance of survival of these aquatic plants. If Water lettuce continues to spread it could disrupt the plant and animal life in other waterways and interfere with recreation.

Did you know?

Asian carp can consume up to 40% of their body weight each day; this leaves little food for native fishes to eat. They typically weigh 2-4kg (4-9lbs) but can weigh up to 40kg (88lbs) and reach more than a metre (3.3ft) in length. (OFAH *Invading Species Awareness Program*)



Giant hogweed: L. Assinck, MNRF



Grass carp: J. Henry, MNRF



Red swamp crayfish, iStock



Water lettuce: H. Smith, OFAH

With over 180 non-native species already established in the Great Lakes, preventing the spread may seem like an overwhelming task. Yet, there are some simple things you can do to stop their spread.

Boaters

- Clean your boat and gear. Before leaving the water, clean any mud, vegetation, mussels, or anything suspicious from your boat, motor, trailer, or fishing equipment.
- Drain before you leave. Drain all standing water by pulling the plug on your transom and live well at the boat launch. Never take an aquatic invasive species from one waterbody to another.
- Dry or disinfect. Some aquatic invasive species can survive up to 2 weeks out of water, and not every invader attached to your boat can be seen with the naked eye. To remove invaders you can't see, dry your boat for 2-7 days in sunlight or clean your boat from top to bottom with hot water over 50°C or pressurized water over 250 psi before travelling to a new waterbody.

Did you know?

Proper cleaning of boats and fishing equipment can help prevent the spread of whirling disease, a potentially fatal disease that affects juvenile trout, to Ontario rivers.

REMEMBER THESE QUICK TIPS:

GOOD	BETTER	BEST
Clean, Drain	Clean, Drain, Dry	Clean, Drain, Disinfect
<ul style="list-style-type: none"> • CLEAN off all visible mud, vegetation and other debris • Pull and store the DRAIN plug, lower your outboard to drain standing water and drain live wells before leaving the launch 	<ul style="list-style-type: none"> • In addition to cleaning and draining: • DRY your boat and equipment in hot or sunny weather for 2-7 days before transporting them to another body of water 	<ul style="list-style-type: none"> • Use a pressure washer to spray off your boat and trailer (250psi) OR rinse off your boat and trailer with hot water (greater than 50°C) • To prevent the spread of waterborne pathogens, rinse live wells with 10% household bleach/water solution (i.e. 100ml of bleach to 1L water). Rinse well with water to remove any residual chlorine.

Anglers

- It's illegal to release your bait or dump the contents of your bait bucket in or near the water. Dispose of your bait at least 30 metres away from the shore.
- Where possible buy locally sourced bait.
- Learn to identify the different species of baitfish and distinguish them from invasive fish such as the Round goby.
- To find out more about invasive aquatic species in your waterway visit www.ontario.ca/page/invasive-species-fact-sheets

Landowners & 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.
- Choose native or non-invasive species to make sure all of your flowers are friendly. Don't relocate plants from your home to your cottage garden, and vice versa or you may spread an invasive species without meaning to.
- Leave native trees and plants alone; natural landscapes offer the best defense.
- To find out more about invasive woodland and aquatic plants on your property visit www.ontarioinvasiveplants.ca/resources/best-management-practices

Campers

- Refrain from moving any firewood to prevent the spread of pests. Moving untreated firewood to or from a campground or cottage, can spread invasive species and diseases. Buy Local. Burn Local.
- Inspect clothing and equipment for seeds, insects, etc. before leaving your camping area.

Hikers, bikers, ATV riders and other recreational users

Mud on ATV's and trail equipment can harbor invasive plant seeds.

BEFORE YOU LEAVE HOME:

- Make sure your belongings are free of mud and plant debris
- Pack cleaning tools and supplies for your trip (brush or broom, etc.)

BEFORE YOU LEAVE THE TRAIL OR SITE:

- Inspect your pets, belongings, boots, clothing and equipment; remove any mud or plant debris
- Dispose of plant debris and weed seeds in the trash

Aquarium/Pet Owners

- Like to take your dog for a swim? Make sure to remove plants or animals or any debris that has collected on the dog's coat before taking the dog home. At home, wash your dog with clean water and brush its coat.
- Don't release aquarium fish and plants or other exotic animals into the wild. If you plan to own an exotic pet, do your research and plan ahead to make sure you can commit to looking after it.

Information for managing invasive plants on your property

If you find an invasive plant population on your property there may be control methods that you can apply to eliminate or prevent the species from spreading further. The options available to you depend on the severity of the invasion and what species you are dealing with.

The Ontario Invasive Plants Council provides Best Management Practices for many invasive plants. www.ontarioinvasiveplants.ca

Other Resources

- www.foca.on.ca/invasive-species/
- www.ontario.ca/page/cottager-action-plan
- www.invadingspecies.com/
- www.ontarioinvasiveplants.ca/
- www.eddmaps.org/ontario/
- www.invasivespeciescentre.ca/

Ministry of Natural Resources and Forestry. 2010. Field Guide to Aquatic Invasive Species. Ontario: Queens Printer for Ontario.

Ontario Ministry of Natural Resources and Forestry. 2012. Ontario Invasive Species Strategic Plan. Ontario: Queens Printer for Ontario.

Ontario Ministry of Natural Resources and Forestry. 2015. Ontario White-nose Syndrome Response Plan. Ontario: Queens Printer for Ontario.

Did you know?

Emerald ash borer will only travel a few kilometers per year on its own; however it can be easily dispersed long distances by people moving infested materials, such as firewood, logs, lumber, and woodchips.

Top 7 actions shoreline owners can take

1 Report all invaders

If you think you see an invasive species in your cottage area, take a picture, record the location and call the Invading Species Hotline at 1-800-563-7711. You may also download the EDDMapS Ontario App to report an invader on the spot at www.eddmaps.org/ontario/.

2 Watch for it

Learn what invasive species look like and then monitor your cottage property paying special attention to areas where they may appear such as the shoreline.

3 Stop the spread

Before heading home from the cottage, be sure to clean all of your gear. Make sure your watercraft, trailers, bicycles, all-terrain vehicles, camping/fishing equipment, clothes and boot bottoms are free of plant material and seed-spreading mud. Put unwanted bait in the garbage.

4 Use local firewood

Refrain from moving firewood to prevent the spread of pests. Moving untreated firewood to or from a campground or cottage can spread invasive species and diseases. Buy Local. Burn Local.

5 Keep your shoreline natural

A naturalized shoreline is generally considered the best approach to protecting the lake's edge. Removing native plants from natural areas leaves the area bare and vulnerable to invasive species.

6 Use native or non-invasive species

Use native or non-invasive species in your garden at the cottage. Use native plants to re-vegetate bare grounds near streams, rivers and lakes and encourage native species of flowers, shrubs and trees to limit your maintenance work and provide shelter to native wildlife. Refer to Grow Me Instead Guides for more information: www.ontarioinvasiveplants.ca/resources/grow-me-instead

7 Stay informed

It is important to stay informed and attuned to developments in science and research and incentive programs that may affect you and your waterfront property. Sign up to receive FOCA's free monthly Elert (electronic newsletter) today at <https://foca.on.ca/>

