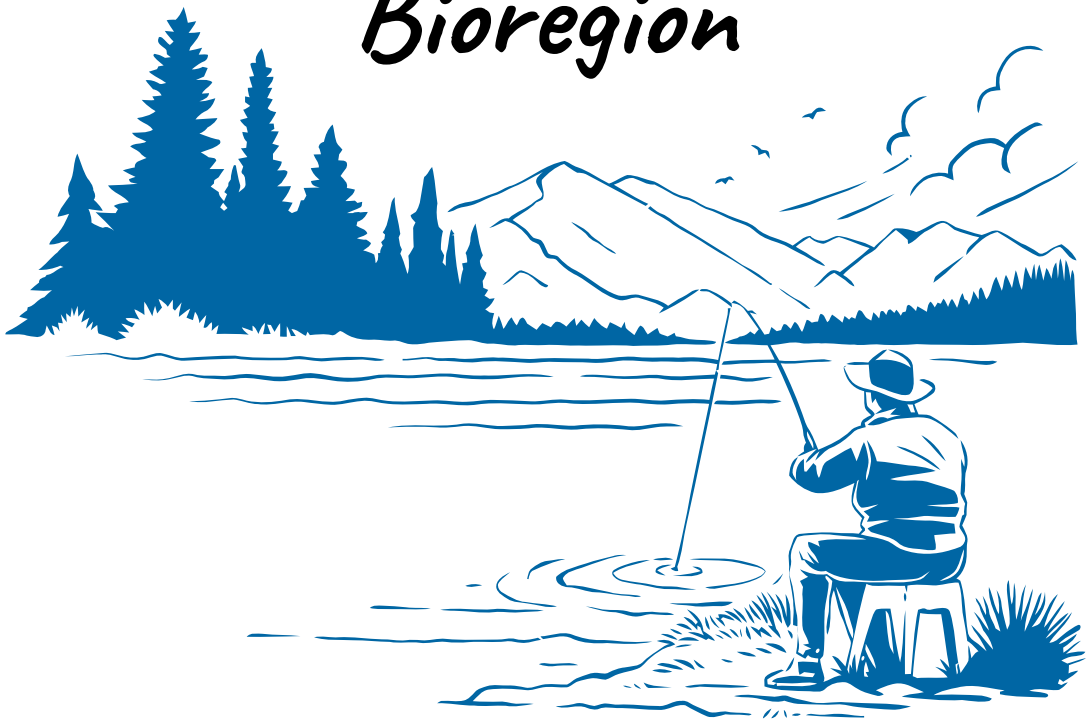
Aquatic Invasive Species Guide for Ontario's The Land Between Bioregion



Foreword

This guide has been compiled for the purpose of the Blue Lakes Project through The Land Between charity.

The purpose of this guide is to provide the user with relevant information about the invasive species currently found within Ontario's "The Land Between" bioregion, with a specific focus on aquatic invasive species.

This guide will provide information about the identification, potential issues, and ways of managing different invasive species.

Invasive aquatic plants will be designated by **GREEN** pages
Invasive fish species will be designated by **BLUE** pages
Invasive invertebrate species will be designated by **YELLOW** pages

If you think you see an invasive species, please report any signings online through EDDMapS Ontario OR by calling the Invading Species Hotline @ **1-800-563-7711**

Always follow protocols as outlined by the Ontario Ministry of Natural Resources (https://www.ontario.ca/page/managing-invasive-species-ontario) to ensure you are helping to manage the lake responsibly and within your jurisdiction.

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PLANT

Carolina Fanwort

Cabomba caroliniana

What Does It Look Like?

- Rooted, submergent plant
- Often found in shallow waters (< 3 m deep)
- Forms thick mats
- **Leaves**
  - **Submerged** = finely divided, fan-shaped, and oppositely arranged (appear feather-like)
  - **Floating** = small, oblong, up to 3 cm long
- **Stems** are green/red with white or red/brown hairs
- **Flowers** are 0.6-1.5 cm wide, white or pale yellow, and appear in late spring-early fall above the water

Why Are They Problematic?

- Can block sunlight from entering the water column
- Can disrupt fish habitat and change habitat composition
- Can clog waterways with dense mats
- Can interfere with recreational activities such as boating, fishing, and swimming
- Looks similar to many native plants, so it can be difficult to identify

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Avoid boating in infested areas
  - Propellors and wave activity can break off fragments of the plant and allow it to re-root in other places

Native Lookalikes

- Bladderwort (*Utricularia vulgaris*)
- Water Marigold (*Megalodonta beckii*)
- Northern Water-Milfoil (*Myriophyllum sibiricum*)

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PLANT

Curly-Leaved Pondweed

Potamogeton crispus

What Does It Look Like?

- Submerged aquatic plant
- **Leaves**
  - Alternately arranged, wavy in appearance
  - Light or dark green, may appear red when close to water's surface
  - Somewhat translucent
  - Sharp, finely toothed margins
- **Flowers**
  - Small, red-brown in colour
  - 4 petal-like lobes
  - 3-5 whorls of flowers on a spike
  - Appear May-September

Why Are They Problematic?

- Can grow in through winter and early spring to outcompete native species
- Can create dense monocultures that impact water flow and recreational activities
- When the plant dies off, it reduces oxygen levels and can cause fish kills
- Releases phosphorus when it dies which can contribute to algal growth

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Avoid boating in infested areas
  - Propellors and wave activity can break off fragments of the plant and allow it to re-root in other places

Native Lookalikes

- Richardson's Pondweed (*Potamogeton richardsonii*)

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PLANT

Eurasian Water-Milfoil

Myriophyllum spicatum

What Does It Look Like?

- Submerged aquatic plant
- **Leaves**
  - Green, circle the stem in groups of 4 or 5
  - 12 or more thread-like segments make leaves look feather-like
- **Flowers**
  - Tiny, reddish/pink flowers
  - Grow on spikes 5-20 cm long that
  - Rise above the water in August-September

Why Are They Problematic?

- Can reduce biodiversity by aggressively outcompeting native species
- When the plant dies off, it reduces oxygen levels and can cause fish kills
- Can impact recreational activities such as boating, fishing, and swimming
- Dense stands can cause stagnant water

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Avoid boating in infested areas
  - Propellors and wave activity can break off fragments of the plant and allow it to re-root in other places
- Clean, drain, and dry your boat and equipment after each use

Native Lookalikes

- Northern Water-Milfoil (*Myriophyllum sibiricum*)
- Coontail (*Ceratophyllum demersum*)

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PLANT

European Frog-Bit

Hydrocharis morus-ranae

What Does It Look Like?

- Can **float free or be rooted** (up to 40 cm long in shallow water)
- **Single white flower** with 3 rounded petals and a yellow centre up to 2 cm wide
- **Leaves**
  - 2.5-5 cm wide
  - Round or heart-shaped
  - Form a rosette up to 6 cm wide
  - Leaf bottom is purple-red with a spongy coating along the middle of the leaf vein

Why Are They Problematic?

- Fast-growing and can quickly outcompete native species
- Forms thick mats that can crowd out native species and reduce biodiversity
- When the plant dies and decomposes, it removes oxygen from the water which can cause fish kills
- Can impact recreational activities such as boating, fishing, and swimming
- Can clog drainage canals and streams

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Clean, drain, and dry your boats, vessels, and equipment after each use
- Remove all plants, animals, and mud from equipment before entering a new waterbody
- Avoid planting in your gardens or ponds

Native Lookalikes

- North American Frog-Bit (*Limnobium spongia*)
- Watershield (*Brasenia schreberi*)
- White Water-Lily (*Nymphaea odorata*)

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PLANT

European Water Chestnut

Trapa natans

What Does It Look Like?

- Floating
- **Leaves (floating)**
  - leathery, bright green, diamond or fan-shaped with sharply toothed margins
  - Form densely crowded rosette up to 30 cm in diameter
  - Leaf stems have spongy, swollen section
- **Leaves (submerged)**
  - Feather-like in appearance
- **Flowers**
  - Very small, white, with 4 petals
- Produce a **hard nut** (~3-4 cm wide) with sharp, barbed spines

Why Are They Problematic?

- Forms dense floating mats that outcompete native species and reduce biodiversity
- Can impact recreational activities such as boating, fishing, and swimming
- Sharp, barbed nuts can cause injuries when they accumulate on shore
- When the plant dies and decomposes, it removes oxygen from the water which can cause fish kills

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Clean, drain, and dry your boats, vessels, and equipment after each use
- Remove all plants, animals, and mud from equipment before entering a new waterbody
- Avoid planting in your gardens or ponds

Native Lookalikes

No native lookalikes

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PLANT

Flowering Rush

Butomus umbellatus

What Does It Look Like?

- Numerous flowers on an erect, leafless stalk
- Grows over 1.5 m tall
- **Flowers**
  - Umbrella-shaped clusters
  - Emergent
  - Pink with 3 sepals and 3 petals
  - 2-2.5 cm wide
- **Leaves**
  - Erect
  - Floating or submersed
  - 5-10 mm wide and up to 2.7 mm long
  - Triangular in cross-section
  - Spiral towards the tips

Why Are They Problematic?

- Can outcompete native species and reduce biodiversity
- Can impact recreational activities such as boating, fishing, and swimming
- Can negatively impact habitat for native wildlife

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Avoid boating in areas with Flowering Rush
  - Propellors and wave activity can break off fragments of the plant and allow it to re-root in other places

Native Lookalikes

- Arrowheads (*Sagittaria spp.*)
- Bur-Reeds (*Sparganium spp.*)
- Cattails (*Typha spp.*)

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PLANT

Japanese Knotweed

Reynoutria japonica

What Does It Look Like?

- Semi-woody
- **Stems** are round, reddish-purple, and smooth
  - Bamboo-like appearance
- **Leaves** are ovate with a flat base and pointed tips; 8-16 cm long and 5-13 cm wide
- **Flowers** are greenish-white
- **Fruit** is small, white, and has wings that help it disperse
- **Seeds** are brown and shiny

Why Are They Problematic?

- Spreads quickly and creates dense thickets that degrade habitat
- Outcompetes native vegetation and reduces biodiversity
- Very aggressive root system
  - Known to break through pavement and concrete!
- Very resilient and persistent
- Can reproduce from root fragments and has **weak roots**
  - Likely to have pieces break off and re-establish somewhere else

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Do not purchase Japanese Knotweed
  - It is **illegal** to buy, sell, trade, propagate or purposely grow it
- When hiking, stay on designated trails and keep pets on leash to avoid spreading seeds to other areas

Native Lookalikes

- Dogwoods (*Cornus spp.*)
- Native Viburnums *Viburnum spp.*)
  - Can include Nannyberry, Hobblebush, some Arrowwoods, etc.

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PLANT

Phragmites

Phragmites australis subsp. australis

What Does It Look Like?

- Erect, perennial grass
- Grows 4-6m tall
- **Seed** heads are densely tufted
- **Leaves**
  - Alternate
  - 70 cm long
  - Ligule of hairs up to 1.5 mm long
  - Blades are flat, up to 60 cm long and 8-60 mm wide

Why Are They Problematic?

- Can create dense monoculture stands and decrease biodiversity
- Provides poor habitat quality for wildlife
- Can transpire water much faster than other native species, causing lower water levels
- Increases fire hazard due to dense stands of dead material
- Can impact recreational activities such as boating, swimming, and fishing

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- When hiking or exploring shorelines, stay on designated trails to avoid spreading seeds
- Do not plant invasive Phragmites
  - It is **illegal** to import, deposit, release, breed/grow, buy, sell, lease, or trade in Ontario
- **DO NOT MOW**! This will promote spread
- Join monitoring programs such as The Land Between's Phrag Fighters!

Native Lookalikes

- Native Phragmites (*Phragmites americanus*)

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PLANT

Purple Loosestrife

Lythrum salicaria

What Does It Look Like?

- Stems are woody and square
- Can grow up to 2.4 m tall and 1.5 m wide
- **Flowers**
  - Spike-like clusters
  - 5-7 petals that are pink/purple
  - ~10 mm long
- **Leaves**
  - Opposite or whorled
  - 3-10 cm long
  - Smooth margins
  - Hairy surface

Why Are They Problematic?

- Can form dense stands with thick mats of roots, degrading habitat for wildlife
  - **One underground stem (rhizome) can produce 30-50 above-ground stems**
- Can crowd out native species and reduce biodiversity
- Large stands can clog irrigation canals, degrade farmland, and reduce property values

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- When hiking, stay on designated trails and keep pets on leash to avoid spreading seeds to other areas

Native Lookalikes

- Blue Vervain (*Verbena hastata*)
- Blazing Stars (*Liatris spp.*)
- Fireweed (*Epilobium agustifolium*)

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PLANT

Reed Canary Grass

Phalaris arundinacea subsp. arundinacea

What Does It Look Like?

- Stems are smooth, steady, and usually hollow
- Can grow 1-2 m in height
- **Leaves**
  - Open sheath, clasping auricles, **transparent ligules**
  - Blades are 0.5-2 cm wide
  - Flat, long, tapered
  - Held at a **45 degree angle** from the stem
  - Roughly textured
- **Seed heads** are dense, spiky, and narrow... green when young, and grow to become more purple/brown

Why Are They Problematic?

- Can aggressively displace native wetland species
- Can clog wetlands and waterways and increase flooding and sediment build-up
- Can spread quickly (through seed and rhizome) to quickly take over large areas and reduce biodiversity

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Reduce nutrient inputs around your property to prevent creating ideal conditions for growth
- Stay on designated trails and keep pets leashed to avoid spreading seeds
- Clean equipment and clothes before exploring new areas

Native Lookalikes

- Bluejoint Grass (*Calamagrotis canadensis*)

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PLANT

Rough Mannagrass

Glyceria maxima

What Does It Look Like?

- Emergent
- Can grow 1-2.5 m tall
- Stems are unbranched
- **Leaves**
  - Blades are 30-60 cm long, flat, pointed
  - Shallowly grooved, prominent midribs, visible transverse veins
  - Bright green but can be red-tinged
  - Leaf margins are hairy
- **Flowers**
  - Appear June-August
  - In long, open branches... branches have stiff hairs

Why Are They Problematic?

- Can form large, dense monocultures and reduce biodiversity
- Can form dense floating mats in deeper water and block sunlight used by other native species
- Thick root mats can alter flow regimes and cause sediment build-up and flooding
- Creates poor food and habitat for native wildlife

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Stay on designated trails and keep pets leashed to avoid spreading seeds
- Ensure to clean and remove any plant parts all equipment, clothes, or tools before travelling to a new area

Native Lookalikes

- American Mannagrass (*Glyceria grandis*)

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PLANT

Starry Stonewort

Nitellopsis obtusa

What Does It Look Like?

- Macroalgae
- **No roots**
- Thin stems and branchlets, similar to thick fishing line
- Whorls of 4-6 branchlets from 1 main shoot
  - Branchlets have blunt tips
- White, **star-shaped bulbils** at the nodes
  - 3-6 mm wide
- Can form dense mats up to 3 m thick in water 2-10 m deep

Why Are They Problematic?

- Can form dense mats (sometimes called “pillows”) that can compete aggressively with native plants and reduce biodiversity
- Can impact the movement of fish, water flow, and recreational activities like boating, fishing, and swimming
- Able to spread very quickly when introduced to a new area via plant fragments

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Do not boat in infested areas
  - Propellors and wave activity can break off fragments of the plant and allow it to re-root in other places
- Remove all plant fragments from equipment, clothes, or other tools when moving between areas to prevent re-growth

Native Lookalikes

- Muskgrass (*Chara spp.*)

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PLANT

Water Hyacinth

Pontederia crassipes

What Does It Look Like?

- Emergent aquatic plant. ~60-120 cm tall
- **Leaves**
  - Thick and shiny, almost **glossy**
  - Roundish/elliptic with a rounded top and cylindrical base, ~15 cm wide
  - 6-8 leaves per plant
  - **Petioles are inflated** up to 30 cm long that help the plant float
- **Flowers**
  - Single spike with 8-15 flowers up to 30 cm long
  - Violet-blue
  - **One petal has a darkened middle area with a yellow spot**
  - Appear between early spring - late fall

Why Are They Problematic?

- Grows and spreads rapidly
- Forms dense, floating, tangled mats of vegetation that can shade out native plants
  - Mats can also **speed up succession**, making areas more desirable to terrestrial plant species and reduce biodiversity
- Can restrict water flow and increase flood risk
- Can impact navigation and recreational activities like boating, fishing, and swimming

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Clean, drain, and dry your boats and equipment before entering new areas to prevent seed spread

Native Lookalikes

- Water Arum (*Calla palustris*)
- Pickerelweed (*Pontideria cordata*)

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Water Lettuce

Pistia stratiotes

What Does It Look Like?

- Free-floating aquatic plant
- Has **roots** that float freely under the plant
- Resembles a head of lettuce, 6-30 cm wide and ~15 cm long
- **Leaves**
  - Form a tight rosette
  - Thick, velvety, spongy
  - Light green
  - 7-15 prominent ridges run parallel to each other
  - Rounded at the top
- **Flowers**
  - Small, white to pale green

Why Are They Problematic?

- Form large, dense mats that can impede water flow and interfere with recreational activities (boating, fishing, swimming)
- Decomposing plant matter reduced oxygen in the water, impacting fish and other aquatic organisms
- Can reproduce from fragments and break apart very easily
- Can change physical and chemical aspects of the water (pH, velocity, nutrient levels, etc.)

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Do not boat in infested areas
  - Propellors and wave activity can break off fragments of the plant and allow it to reproduce in other places

Native Lookalikes

No native lookalikes

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PLANT

Water Soldier

Stratiotes aloides

What Does It Look Like?

- Submerged with emergent leaves
- Resembles an aloe plant
- **Leaves**
  - Sword-shaped, up to 40 cm long
  - Bright green
  - Have sharp spines (serrated)
  - Form a large rosette
- **Flowers**
  - White with 3 petals
  - Not common to flower in Ontario
- **Roots** can either be lightly rooted in the mud or unattached

Why Are They Problematic?

- Form dense mats that crowd out native plants and reduce biodiversity
- Can impact recreational activities (boating, fishing, swimming)
- Potential to alter water chemistry, which can harm algae and other aquatic organisms
- Have sharp, serrated leaves that can cut swimmers or those who handle the plant
- Can produce clones, similar to a spider plant

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Do not buy Water Soldier
  - It is **illegal** to import, possess, deposit, release, transport, breed/grow, buy, sell, lease, or trade it in Ontario.
- Avoid infested areas when boating
  - Propellors and wave activity can break off fragments of the plant and allow it to re-root in other places
- Clean, drain, and dry your boat and equipment after each use to prevent plant spread

Native Lookalikes

- Bur-Reeds (*Sparganium spp.*)
- Arrowheads (*Sagittaria spp.*)

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Yellow Floating-Heart

Nymphoides peltata

What Does It Look Like?

- Aquatic, bottom-rooted, perennial plant
- **Stems** are located beneath the water's surface, are long and branched, reaching up to 1m or more
- **Leaves** are ~3 to 10 cm and circular or heart-shaped
- **Flowers** are bright yellow with 5 petals
- **Seed capsules** contain numerous flat, oval seeds

Why Are They Problematic?

- Shade out native aquatic plants
- Degrade fish and other wildlife habitats
- Decrease oxygen levels in water, creating stagnant water environments
- Impact recreational activities such as boating, fishing, and swimming

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Avoid infested areas when boating
  - Propellors and wave activity can break off fragments of the plant and allow it to re-root in other places

Native Lookalikes

- Variegated/Bullhead Pond-lily (*Nuphar variegata*)

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Yellow Iris

Iris pseudacorus

What Does It Look Like?

- **The only iris in North America that is entirely yellow**
- Can grow 30 cm to 1 m tall in groups of 2 to 10
- **Flowers**
  - 3 drooping, deep-yellow sepals with purple/brown markings
  - Bloom between April and July
- **Leaves**
  - Flattened, 2-3 cm wide and up to 1 m long
  - Fan out from the plant base

Why Are They Problematic?

- Can form dense stands with thick mats of rhizomes and dead leaved
  - Can displace native plants and dry out wetlands
  - Can block water flow
- Reduces habitat available for wildlife
- Dangerous to both humans and wildlife
  - Poisonous if ingested
  - Contact with sap can cause dermatitis

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Stay on designated trails and paths when exploring to prevent spreading plant fragments and seeds

Native Lookalikes

- Blue Flag Iris (*Iris versicolor*)
- Cattails (*Typha spp.*)
- Sweet Flags (*Acoraceae spp.*)

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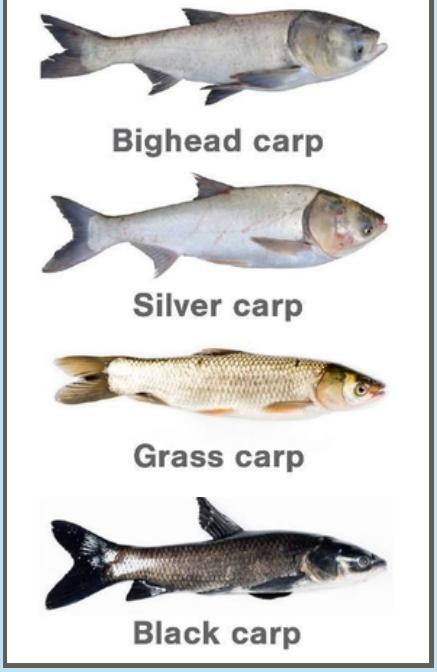
Asian Carps



Hypophthalmichthys nobilis

Hypophthalmichthys molitrix

Ctenopharyngodon idella

Mylopharyngodon piceus

What Does It Look Like?

- **Bighead Carp**
  - 2-4 kg (can weigh up to 40 kg)
  - Large heads with toothless mouths
  - Dark grey in colour; mottled
  - Eyes sit below the mouth
- **Silver Carp**
  - Smaller than Bighead Carp
  - Silvery colour with white belly
  - Eyes sit below the mouth
- **Grass Carp**
  - Large scales, appear cross-hatched
  - Eyes sit in line with the mouth
- **Black Carp**
  - Look similar to Grass Carp, typically darker in colour

Why Are They Problematic?

- Can displace and outcompete native species for food and resources
  - Can eat 40% of their body weight **EACH DAY**!
- Grow quickly
- Reproduce quickly
  - Can lay **more than 1 million eggs in a single spawning event**
- Can grow very large and create dangers to lake users

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Inspect your boat, trailer, or fishing gear before leaving or getting to a new fishing spot.
- Release water from your motor, live well, bilge, and transom wells **once on land**
- Do not capture Asian Carps
  - It is **illegal to possess them in Canada** unless they are dead and eviscerated

Native Lookalikes

- Many common baitfish [ex. Shiners, Minnows, Lake Herring (Cisco), Blacknose Dace, Creek Chub, Fallfish]

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Chain Pickerel

Esox niger

What Does It Look Like?

- Can measure up to 95 cm long
- Green sides with dark, interconnecting lines over yellow-green areas... resemble a chain pattern
- Jaws are elongated with large, sharp teeth
- Dorsal fin is large and located far back, close to the tail
- Cheeks and gills are fully scaled
- Has a **dark, vertical bar** that extends from the eye to the bottom of the cheek

Why Are They Problematic?

- **Highly predatory**, feeds on native fish and their young
- Outcompetes native fish for food and habitat
- Able to **hybridize with native species** (ex. Grass Pickerel or Northern Pike) and **decrease genetic diversity**
- Often **introduced to areas as a sportfish**

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Inspect your boat, trailer, or fishing gear **before leaving or getting to** a new fishing spot.
- Release water from your motor, live well, bilge, and transom wells once **on land**
- **Do not** release live fish into Ontario water bodies

Native Lookalikes

- Grass Pickerel (*Esox americanus*)
- Northern Pike (*Esox lucius*)
- Muskellunge (*Esox masquinongy*)

The Land Between
Cottage Country's Conservation Organization

The Blue Lakes Project

Eurasian Ruffe

Gymnocephalus cernua

What Does It Look Like?

- Perch-like body, lack dark vertical stripes like native Perch
- Less than 20 cm long
- Glassy eyes
- Turned down mouth
- **Front and dorsal fins are jointed**
  - **First fin** → 11-16 sharp, stiff spines with rows of dark spots between them
  - **Second fin** → soft, flexible rays
- Sharp spines on anal fins and gill covers
- No scales on their head

Why Are They Problematic?

- Capable of adapting to a **wide range of environmental conditions**... allows them to thrive in many areas
- Can directly compete with native Yellow Perch for food, habitat, and by preying on their eggs
- Reproduce and grow rapidly
- Have few predators
  - Sharp fin spines make it difficult for other organisms to eat them

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline

- **Do not** release live fish into Ontario lakes or rivers
- Empty bait buckets on dry land or dispose of in the garbage... if you want to save your bait for later, salt or freeze it

Native Lookalikes

- Juvenile Walleye (*Sander vitreus*)
- Yellow Perch (*Perca flavescens*)
- Trout Perch (*Percopsis omiscomaycus*)

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Goldfish

Carassius auratus

What Does It Look Like?

- Elongated bodies, average 12-22 cm long but can grow up to 40 cm long
- Typically bright orange, can be olive green or creamy white
- Head and eyes are large relative to the rest of the body
- **Dorsal fin** is long with a single stout, serrated spine
- Anal fin is short with a single stout, serrated spine
- **Tail is deeply forked**
- Mouth is small with **no trailing whiskers (barbels)**

Why Are They Problematic?

- Competes with and is a predator of native fish and other organisms (insects, snails)... reduces biodiversity
- Stirs up mud when they feed, increasing water cloudiness and impacting plant growth
- Potential to live many years (30-40) in proper conditions
- **Can carry diseases** (such as the Koi herpesvirus) which can harm local fish populations
- Often are released from aquariums, which is **illegal**

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- **Do not** release live fish into Ontario waterbodies
  - If you have unwanted aquarium fish, return or donate to a pet store or somewhere able to take fish
- Remove all mud, plants, and animals from equipment **before using them in another water body**

Native Lookalikes

No native lookalikes

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Rainbow Smelt

Osmerus mordax

What Does It Look Like?

- Long, slim bodies ~19 cm long
- Olive green on the back, purple, pink or blue **iridescence** on the sides, silver belly
- Mouth is large relative to the fish
- **Protruding lower jaw** and **large canine teeth** on the roof of the mouth and tongue
- **Single dorsal fin** in the middle of its back
- **Adipose fin present**
- Scales are small and easily detached when handling

Why Are They Problematic?

- Have eating habits that can disrupt food webs
- Can decline zooplankton populations for other native species
- Prey on native fish eggs and juveniles
- Has reduced native fish populations of Walleye, Yellow Perch, Lake Herring (Cisco), Lake Whitefish, and Lake Trout

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Do not use live Rainbow Smelt as bait; it is **illegal**
  - Dead Rainbow Smelt ***MAY*** be used, but **check your local Fisheries Management Zone to review rules set in place**
- Do not release live fish or bait into Ontario waterbodies
- When cleaning Rainbow Smelt, ensure you **do not dump entrails** into nearby waterbodies

Native Lookalikes

- Minnows (*Cyprinidae sp.*)
- Lake Whitefish (*Coregonus clupeaformis*)
- Lake Herring (Cisco) (*Coregonus artedi*)

The Land Between
Cottage Country's Conservation Organization

The Blue Lakes Project

Round Goby

Neogobius melanostomus

What Does It Look Like?

- Bottom-dwelling
- 6-16 cm long
- Cylindrical body
- Rounded/blunt snout
- **Nostril tubes do not reach the upper lip**
- **Prominent black spot on dorsal fin**
- **Fused, scallop-shaped pelvic fin**
- Brown or olive in colour with dark brown spots… can appear almost entirely black
- Fully scaled body

Why Are They Problematic?

- Compete with and prey on native, bottom-dwelling fish species
- Reduce populations of sportfish by eating their eggs and young and by outcompeting for food resources
- Research suggests they are **linked to outbreaks of botulism type-E** in Great Lakes fish and fish-eating birds

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Never use Round Goby as bait; it is **illegal**
- Round Goby cannot be released into waterbodies… if you catch one, it is recommended to destroy it
- Always clean, drain, and dry your boat, trailer, and other equipment **after each use**

Native Lookalikes

- Mottled Sculpin (*Cottus bairdii*)
- Slimy Sculpin (*Cottus cognatus*)

The Land Between
Cottage Country's Conservation Organization

The Blue Lakes Project

Rudd

Scardinius erythrophthalmus

What Does It Look Like?

- Relatively large, 10-25 cm long
- Deep-bodied minnow
- Small, upturned mouth
- **Fins are bright red**
- **Fully scaled belly** (keel)
- Eyes are red or have a red spot

Why Are They Problematic?

- Can adapt to a variety of environmental conditions and are **tolerant of poor quality water**
- **Able to breed with Golden Shiner**, an important native baitfish
  - Offspring are also considered invasive
  - Can create **loss of genetic diversity** in Golden Shiner
- Compete with native species for habitat and food
- Can degrade spawning and nursery habitat along shorelines for native fish

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Never buy or keep live Rudd; it is **illegal**
- Inspect your boat, trailer, or fishing gear before leaving or getting to a new fishing spot.
- Release water from your motor, live well, bilge, and transom wells **once on land**

Native Lookalikes

- Golden Shiner (*Notemigonus crysoleucas*)

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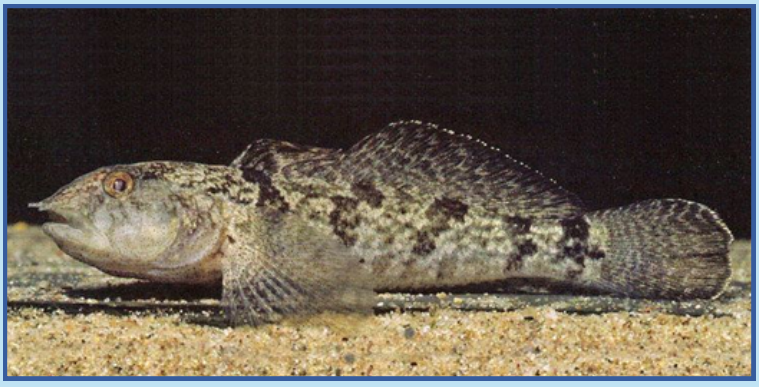
Tubenose Goby

Proterorhinus semilunaris



What Does It Look Like?

- Small, bottom-dwelling fish
- Fused scallop-shaped fin
- Light grey, light brown, olive, or tan
- Black or reddish-brown mottling
- **Small nostril tubes extend over upper lip**
- Fully scaled body

Why Are They Problematic?

- Many long-term impacts not yet known
  - Further research is necessary
- Compete with native fish species for food and habitat
- Eat the young of other native fish species
- Prefer areas near shores of lakes and rivers... may compete with other native species in these area

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Never use Tubenose Goby as bait; it is **illegal**
- Tubenose Goby cannot be released into waterbodies... if you catch one, it is recommended to destroy it
- Remove all mud, plants, and animals from equipment **before using them in another water body**

Native Lookalikes

- Mottled Sculpin (*Cottus bairdii*)
- Slimy Sculpin (*Cottus cognatus*)

The Land Between
Cottage Country's Conservation Organization

The Blue Lakes Project

Asian Clam

Corbicula fluminea

INVERTEBRATE

What Does It Look Like?

- Oval/triangular shaped shell up to 25 mm wide
- Light green and brown in colour
- **Elevated concentric ridges**
- Serrated lateral teeth (must be seen through a magnifier)
- Muscular foot extends out from the shell with travelling

Why Are They Problematic?

- Can fertilize their own eggs
- Population densities can reach a whopping **10,000 per square foot**
- Negatively impact food webs
- Reduce biodiversity
- Clog intake pipes and interfere with infrastructure
  - Can cost millions of dollars in damages
- Are commonly used as fishing bait or eating in some areas
- **Not yet identified in The Land Between, but is in surrounding areas**

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Do not release leftover live bait into water bodies - it is **illegal**
  - You can **freeze or salt the bait** to save for next time, OR
  - Throw it in the garbage
- Inspect your boats, fishing gear, and trailer before leaving and entering new areas
- Release water from your motor, live well, bilge, and transom once you **are on land**

Native Lookalikes

- Fingernail or Pea Clams (*Pisidiids*)

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The Blue Lakes Project

Chinese & Banded Mystery Snails

INVERTEBRATE

Cipangopaludina chinensis

Viviparus georgianus

What Does It Look Like?

- **Chinese Mystery Snail** (top)
  - 6.5 cm or less
  - Spherical shoulder whorls separated by prominent grooves
  - Brown or olive-green in colour
  - Operculum is oblong with concentric growth lines
- **Banded Mystery Snail** (bottom)
  - 3.5 cm or less
  - Spherical with whorls separated by prominent grooves
  - Yellow/greenish-brown in colour
  - 3-4 dark reddish-brown spiral bands
  - Operculum is ear-shaped with concentric growth lines

Why Are They Problematic?

- Can reproduce and spread rapidly
- Can prey on fish eggs
- Out-compete native snails for food and habitat, reducing biodiversity
- Chinese Mystery Snail has been reported to clog water intake pipes
  - Can be expensive to fix damages
- Can thrive in degraded areas including fresh or brackish waters with silt, sand, and mud substrates

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Clean all equipment with a high pressure wash, hot water, OR let it dry in the sun for **at least 5 days** before using again
- Drain water from motor, live well, bilge, and transom wells once you **are on land**

Native Lookalikes

- Similar looking native freshwater snails can be found in Quebec, but experts are often needed to differentiate them

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The Blue Lakes Project

Rusty Crayfish

Bythotrephes longimanus

What Does It Look Like?

- 7.5-13 cm long (from rostrum to tail)
- **Rusty patches** on each side of the shell, about where you would place your fingers if picking one up
- Grayish-green to reddish-brown claws; **black bands near their tips**
- Claws have an oval gap when closed
- Rostrum is smooth, pinched, and distinctly concave

Why Are They Problematic?

- Outcompete native crayfish species for food and resources, reducing biodiversity and severely impacting native crayfish populations
- Better at avoiding being eaten by fish, so less likely to be preyed upon
- Eat large amounts of aquatic vegetation, reducing fish habitat
- Females can carry fertilized eggs under their tail for long distances, allowing them to spread rapidly

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- If you want to use crayfish as bait, you can **only use them in the waterbody that they were caught from**
  - It is **illegal** to transport them over land
  - The **maximum number of live crayfish you can have is 36**

Native Lookalikes

- Northern Clearwater Crayfish (*Orconectes propinquus*)
- Virile Crayfish (*Orconectes virilis*)

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INVERTEBRATE

Spiny Waterflea

Bythotrephes longimanus

What Does It Look Like?

- Total length can reach 1.5 cm
  - **About 60% of their length is made up of the tail spine**
- Tail is straight or slightly angled with 1-3 barbs and a pointed end
- **Red stripe runs half the length of the tail**
- May have orange, blue, or green colouring
- Single dark eye
- Four pairs of legs
- Branched antennae
- Balloon-like egg pouches

Why Are They Problematic?

- Compete with native fish for food resources (zooplankton)
- Greatly reduce zooplankton populations
  - **Can reduce by 30-40%**
- Can multiply quickly
- Easily spread through water bodies via fishing equipment, bait buckets, bilges, and live wells
- Can impact fishing... their tail spines catch on fishing gear, making it difficult to reel lines and can clog nets

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline

- Clean all equipment with a high pressure wash, hot water, OR let it dry in the sun for **at least 5 days** before using again
- Drain water from motor, live well, bilge, and transom wells once you **are on land**

Native Lookalikes

- Daphnia (*Daphnia longispina*)

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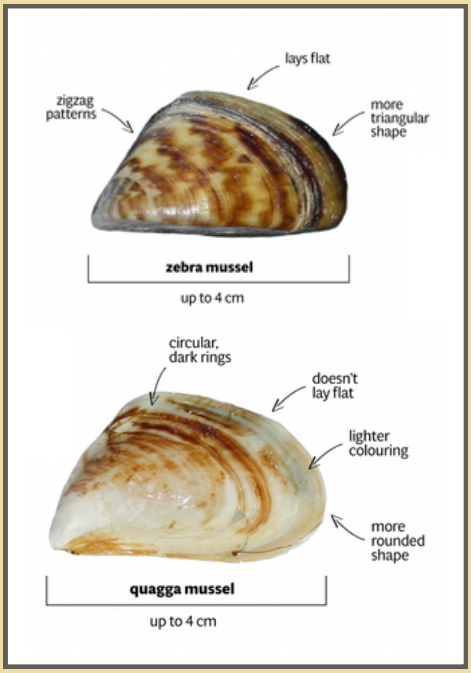
Zebra & Quagga Mussels

Dreissena polymorpha

Dreissena bugensis



What Does It Look Like?

- Freshwater bivalves
- **Zebra Mussels**
  - Average 2-2.5 cm long, can be up to 4 cm long
  - Sits flat on its underside
  - Triangular shape, like a "D"
  - Black or brown with white/yellow zigzags
- **Quagga Mussels**
  - Average 2 cm long, can be up to 3 cm long
  - Does not sit flat
  - Round in shape
  - Dark concentric rings on shell
  - Pale colour near hinge

Why Are They Problematic?

- Filter water excessively to a point where food sources (plankton) are removed from the system
  - Can alter food webs
- Makes water clearer and lets more sunlight in causing:
  - Shifts in aquatic vegetation growth
  - Growth of **harmful algal blooms** as they do not feed on toxic algae
  - Increases in **pathogenic bacteria**, avian botulism, and anoxia
- Can increase
- Very sharp shells **can cause injuries** to fishers and swimmers

How Can I Manage Them?

- **IF YOU SEE IT:**
  - Report it on EDDMapS
  - Report it on iNaturalist
  - Report it using the Invading Species Hotline
- Drain water from motor, live well, bilge, and transom wells when you **are on land**
- Clean your equipment with a high pressure wash, hot water, OR let it sit in the sun for **at least 5 days** before using again

Native Lookalikes

- Some native freshwater mussels, experts may be needed to help differentiate species

The Land Between
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Glossary

Adipose Fin: a small, fleshy, rayless fin found between the dorsal and caudal fins

Baitfish: small-sized fish (usually minnows) caught and used by anglers to catch other fish

Barbels: slender, whisker-like sensory organs near a fish's mouth

Biodiversity: the variety of life in a particular ecosystem... the amount of different species present

Brackish Water: Natural waters that are more salty than freshwater, but not as salty as sea water

Bulbil: a small, bulb-like structure that can form a new plant

Concave: curves inward

Concentric: arcs that are stacked on top of one another, sharing the same middle-point. Ex. a rainbow

Dermatitis: skin irritations or rashes caused by various sources

Elliptic Leaf: a leaf that is widest in the middle and tapers at both ends. Similar shape to an eye

Emergent Plant: A type of rooted aquatic plant that roots in the sediment and has leaves or flowers that grow above the water

Food Web: All food chains in an ecosystem

Free-Floating Plant: A type of aquatic plant that is not rooted to anything and floats along the surface of the water

Genetic Diversity: the variety of genes within a species

Harmful Algal Bloom: large growths of algae that can cause health issues to humans and wildlife. Typically made of blue-green algae (cyanobacteria)

Hybridize: to cross-breed between species

Glossary

Invasive Species: a species that has not historically been reported in the area. Typically cause some kind of financial stress or harm

Iridescence: showing luminous colours that seem to change colours when seen from a different angle

Large Stand: greater than or equal to 15 individuals of a species

Leaf Margin: the outer edge of a leaf

Ligule: a membranous scale on the inner side of the leaf sheath... grows at the meeting point between the leaf sheath and the blade

Midrib: the central vein of a leaf

Monoculture: a dense growth of only one species

Native Species: a species that has been reported to be historically present in an area. Typically, it evolved in the area or arrived there naturally, without human intervention

Node: a specific point along a plant's stem where leaves, buds, or branches originate

Operculum: a specialized structure that covers the shell opening when a snail retracts into its shell. Similar to a trapdoor or a lid

Ovate Leaves: a leaf that is broad at the base and gets narrower towards the leaf's tip. Egg-shaped.

Pathogenic Bacteria: bacteria capable of causing or spreading disease in living organisms

Perennial: a type of plant that regrows every year

Petiole: the stalk that joins a leaf to the stem on a plant

Plant Fragment: a piece of a plant; leaf, stem, root

Rhizome: a stem that grows horizontally underground that can put out lateral shoots to form new plants from one original plant

Glossary

Rooted Plant: a plant that roots itself in the ground

Rosette: a formation of leaves that is circular or spirally arranged radiating out from the base of the plant

Rostrum: a beak-like projection (stiff snout or prolongation of the head) found in insects, crustaceans, or cetaceans

Serrated: a leaf whose margin is jagged or saw-like

Sepals: the small, green, leaf-like growth on the underside of a flower… encloses the petals before a flower blooms

Small Stand: less than 15 individuals of a species

Spawning Event: the period of time when fish breed… the release of eggs and sperm into the water for the purpose of fertilization and reproduction

Sport Fish: a fish that is pursued for the enjoyment of the fishing experience rather than for its value as food

Stagnant Water: water that is not circulating or flowing… can become a breeding ground for bacteria, parasites, mold, and other microorganisms

Submergent Plant: a type of aquatic plant that is rooted in sediment and grows entirely underneath the water

Succession: the progressive change in the composition of an ecosystem over time. Ex. a grassland will eventually turn into a forest via succession.

Transpiration (transpire): the exhalation of water vapor by a plant through its stomata

Transverse Veins: smaller veins that connect larger, longitudinal veins… creates a network or grid-like structure

Whorl(ed) Leaves: 3 or more leaves emerging from the same point on a stem. These leaves are typically evenly spaced, creating a circular or spiral pattern when viewed from above

Zooplankton: very small animals that live in water bodies. A very important piece of many food chains

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