

Queensnake Stewardship Guide



**A Practical Guide to
Queensnake and its Recovery**



(Photo: Jory Mullen)

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This guide will assist landowners and other community members to:

- Identify a Queensnake
- Become familiar with Queensnake habitat and behaviour
- Prevent negative impacts to the Queensnake and its habitat
- Participate in stewardship activities that may lead to Queensnake recovery
- Report Queensnake observations



(Photo: Joe Crowley)

What is stewardship, and why should we care?

Stewardship refers to responsible management of the natural environment through conservation activities. Stewardship empowers landowners, land users, and interested citizens to contribute to the protection and recovery of wildlife. Stewardship activities range from wildlife monitoring to creating, improving, or maintaining habitat.

Due to increasing threats, many species in Canada now depend on voluntary stewardship by the public for continued survival. Collective stewardship improves our watersheds by restoring natural habitats, which are important for healthy ecosystems. A healthy environment is beneficial for long-term human, animal, and plant health, for the community and the economy.

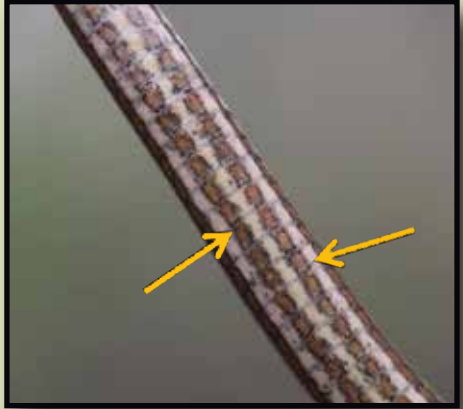
Most snake species have declined across Ontario due to human activities. The harmless and endangered Queensnake is one of the rarest reptile species in the province! It is up to us to help reverse its decline.

By practicing stewardship, you too can protect the Queensnake. There are several stewardship activities included in this guide that could help prevent the loss of this endangered species.

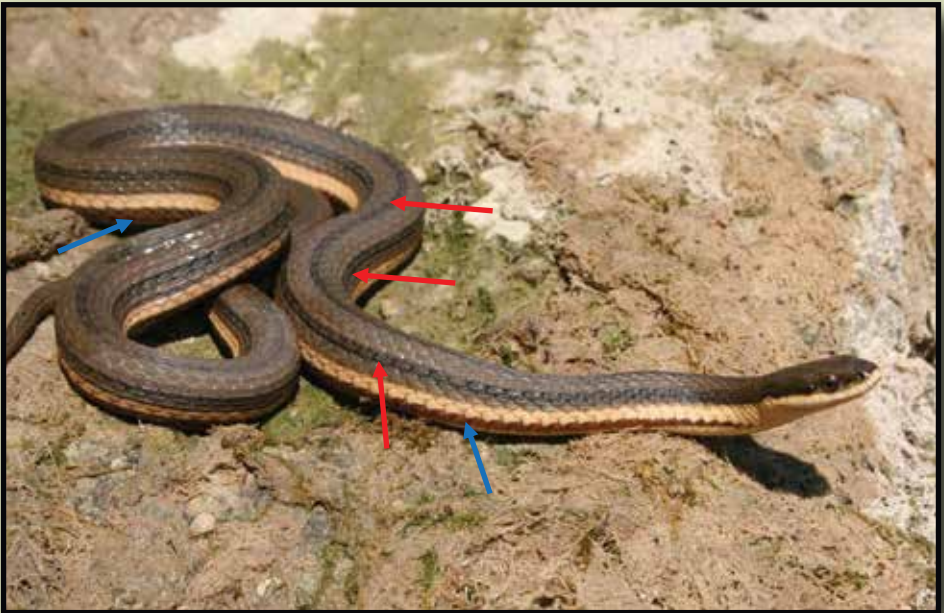


Queensnake Identification

- Total length: 34-92 cm (13-36 inches)
- Background colour: brown, olive or grey
- 7 thin dark stripes running from head to tail:
 - 3 along back (dorsal), can be hard to see
 - 2 along sides (lateral)
 - 2 on belly (ventral)
- Cream coloured belly with brown stripes



Striped Queensnake belly
(Photo: Scott Gillingwater)



Dorsal (red) and lateral (blue) stripes on a Queensnake (Photo: Joe Crowley)

Queensnake Biology

Native to Southern Ontario, the Queensnake is endangered under both Ontario's Endangered Species Act and Canada's Species at Risk Act. "Endangered" means the species currently lives in the wild in Ontario but is at risk of disappearing from the landscape. This non-venomous, semi-aquatic snake spends most of its time in or near water. The Queensnake is the least reported snake species in Ontario due to its rarity and secretive behaviour.

Similar Species

The Queensnake is most commonly mistaken for the Eastern Gartersnake.

Similarities between these 2 snakes include:

- Slender build and medium size
- 3 stripes along the back
- Cream coloured belly (without stripes)

Differences include:



Gartersnake without distinct stripes
(Photo: Scott Gillingwater)

Features	Queensnake	Gartersnake
Colouration	Olive brown with <u>3 dark stripes</u> down back. These can be difficult to see, especially as snakes age.	Most are dark brown to black with <u>3 yellow stripes</u> . <u>Two of these stripes are along the sides and one runs down the centre of the spine.</u> Some variations exist.
Belly	Striped belly	Unpatterned belly



Queensnake
(Photo: Scott Gillingwater)



Eastern Gartersnake
(Photo: Jory Mullen)

Queensnake Range in Ontario

Queensnakes are at the northern limit of their range in Ontario, which is the only province in Canada where Queensnakes are found. Queensnakes occur in small isolated populations throughout southwestern Ontario. They can be found along sections of larger river systems including the Ausable, Grand, Maitland, and Thames Rivers. Queensnake populations have also been recorded on the Bruce Peninsula, Detroit River, Long Point Basin, the eastern shore of Lake St. Clair and St. Clair River.



5 Quick Queensnake facts:

1. No other snake in Ontario has lengthwise stripes along the belly
2. Female Queensnakes grow larger than male Queensnakes
3. When threatened, Queensnakes, like other snake species, will emit a smelly liquid called 'musk' as a defense mechanism
4. Queensnakes reach maturity at three or four years of age in Canada
5. Queensnakes can live for more than 20 years

Queensnake Habitat



Bruce Peninsula
(Photo: Jennifer McCarter)



Canard River
(Photo: John Urquhart)



Thames River
(Photo: Scott Gillingwater)

Queensnakes are typically found in rivers, lakes, streams, and wetlands with an abundance of crayfish. This semi-aquatic snake spends most of the active season (early to late April to mid-October) within 3 metres (10 feet) of the shoreline. Rocks, logs, and shoreline plants provide Queensnakes with shelter from predators and the elements. Queensnakes are 'ectotherms', which means they use the environment to regulate their body temperature. To warm up, Queensnakes often lie in the sun or 'bask' amongst shoreline grasses and shrubs or beneath and on top of sun-warmed cover items, such as rocks. Around mid-October Queensnakes begin to make their way to a hibernaculum, the underground habitat they use in the winter months.



Maitland River
(Photo: Joe Crowley)

Queensnake Habitat

What is a hibernaculum?

A hibernaculum is a place where Queensnakes go to seek refuge in the winter. It is usually underground, below the frost line and wet at the bottom. Queensnakes will move up or down within the hibernaculum to regulate their body temperature and moisture level. Queensnake hibernacula can include old bridges and rock crevices. Queensnakes can hibernate communally, meaning they may hibernate in a group. There can be more than one snake species in this group and even amphibians and crayfish! In the early spring or late fall, Queensnakes do not stray far from the hibernaculum. Currently, we are unsure how far they travel inland to reach their hibernacula.

What's in a name?

The Queensnake's scientific name is "Regina septemvittata".

Regina is derived from the Latin word *regius*, which means Queen.

Septemvittata is derived from the Latin *septem* (seven) and *vitta* (stripe).

Queensnakes are the "queen with seven stripes".



Neonate
(Photo: Scott Gillingwater)

A Year in the Life

April: The active season for the Queensnake begins upon emergence from hibernation around early to late April. Queensnakes typically mate soon after emerging from hibernation.

July – September: The Queensnake is 'viviparous', meaning females give birth to live young. Females typically give birth to 10-12 young in late summer, usually between August and September. Newborn snakes are called neonates. Neonates are about 20 cm (~8 inches) long, and weigh about 2.5 grams at birth. Neonates spend a lot of time under cobble-sized rocks.

October – April: The Queensnake's active season ends around mid-October upon return to hibernation sites. Queensnakes hibernate when conditions cool down through late fall and winter.

Queensnake Diet

Queensnakes are 'prey specialists' because they predominantly eat one thing: crayfish. Queensnakes feed on crayfish that have recently moulted (shed their hard, outer shell). Recently moulted crayfish have a soft outer shell and move more slowly. This specialized diet makes Queensnakes especially vulnerable; if crayfish populations decline, so will Queensnake populations. Protecting native crayfish populations is essential for the survival of the Queensnake.



Crayfish

(Photo: Scott Gillingwater)

Threats

1. Habitat loss and degradation

Queensnake habitat is being lost due to development along shorelines, which can alter the way Queensnakes use their habitat and impact their survival. Some farming practices, such as clearing riparian buffers or allowing cattle free access to the river, can also substantially degrade the habitat.

More frequent and extreme flooding events anticipated as a result of climate change may have a negative impact on Queensnakes (e.g. if they are washed downstream) and can reduce the quality of their habitat. Flooding is more extreme when wetlands and riparian buffers are removed from the landscape.

2. Pollution

Queensnakes are thought to have more permeable skin and may be more sensitive to pollution than other snake species in Ontario. Changes in water quality from pollution or sediment runoff could have a negative impact on the Queensnakes' health and/or survival. Crayfish, Queensnakes' primary food source, are very sensitive to changes in water chemistry and require good water quality. Therefore, changes in water quality can have unforeseen consequences for Queensnakes.

3. Infectious Disease

Like other wildlife, Queensnakes can get infectious diseases, such as snake fungal disease. The impacts of disease on the Queensnakes' survival is not known.



Queensnakes with symptoms consistent with snake fungal disease

(Photos: Monique Aarts)

Threats

4. Unintentional mortality

Sometimes people accidentally crush Queensnakes when walking on shoreline rocks that Queensnakes take cover under. Walking along shorelines may also force rocks into the soft substrate, closing off hiding spots for Queensnakes.

5. Intentional mortality

Intentional killing of Queensnakes might have contributed to the decline of the Queensnake in Ontario. Some humans purposely kill snakes out of fear. Killing a snake out of fear or hatred is unethical and illegal.

6. Invasive plants and wildlife

The introduction of non-native species into aquatic environments has the potential to damage Queensnake habitat. A non-native species can out-compete native species that are important for Queensnakes, such as crayfish. Many invasive species can be found in Queensnake habitat including Zebra Mussels and Phragmites. The impact of these non-native species on the Queensnake is currently unknown.

Unfortunately, Queensnakes have already been lost from much of their former range in Ontario.



Zebra Mussels (left) and Phragmites (right)
present in Queensnake habitat on the Thames River

(Photo: Scott Gillingwater)

What you can do to help protect Queensnakes

1. Naturalize your shoreline. Plant native riparian plants along your shoreline to filter runoff and prevent waste from entering the water body. Do not mow your lawn to the water's edge. Removing riparian vegetation increases erosion and reduces water clarity. Do not remove natural cover objects such as wood or rocks from the shoreline. By doing so, you may be destroying Queensnake habitat.

2. Create Queensnake habitat. Carefully place natural cover objects (logs and rocks) along shorelines. You can also create a hibernaculum! Consult a local species expert for advice on project design.

3. Report your Queensnake sightings. Observations can be reported to the Ontario Reptile and Amphibian Atlas. Take a photo of the snake if possible so experts can confirm the identity of the species. www.ontarionature.org/atlas

4. Appreciate snakes from a distance. Queensnakes should not be handled unless it is necessary, since it is stressful for the snakes and causes them to waste energy trying to escape. They might even regurgitate a recent meal. In Ontario, it is illegal under both the Fish and Wildlife Conservation Act and the Endangered Species Act to capture or harass Queensnakes. Activities such as scientific research require authorizations from the Ministry of Natural Resources and Forestry.



(Photo: Joe Crowley)

What you can do to help protect Queensnakes

5. Volunteer your time. Volunteer with local conservation groups to participate in surveys or stewardship work focused on Queensnakes or other species at risk. Contribute to a healthier environment by picking up litter in the waterways and shorelines. Check out Ontario Nature's Directory of Ontario Citizen Science (DOCS) for volunteer opportunities: <https://www.ontarionature.org/directory-of-citizen-science/home.php>

6. Educate others. Share your knowledge about Queensnakes. Teach others about the stewardship actions they can do to contribute to the recovery of the Queensnake. Encourage others not to kill snakes, even if they are fearful.

7. Be a responsible angler. Use native bait species and never use non-native Rusty Crayfish for bait. Avoid using barbed hooks or lead fishing weights. Do not dump unused bait, hooks or fishing line into waterways.



(Photo: Jory Mullen)

What you can do to help protect Queensnakes

8. Stick to the trail. If you are hiking along shoreline habitat, stay on the trail to create as little disturbance as possible. Use designated crossings wherever possible. Only use ATVs where permitted and avoid driving along shoreline habitats. Queensnakes can be found under rocks, logs, in grasses and other shoreline debris throughout the active season (April - October). If you must walk along a rocky shoreline walk on large, sturdy boulders that won't shift under your weight to ensure you do not injure any Queensnakes.

9. Be a responsible pet owner. Make sure to keep dogs on leash when travelling near a shoreline in Queensnake habitat and keep cats indoors. Dogs and cats can harm and potentially kill snakes.

10. Drive carefully. Avoid hitting Queensnakes on the road by slowing down near bridges between April and October. If you do see a Queensnake on the road, gently encourage it off the road.

11. Keep your livestock out of waterways. Use fences to create a barrier between livestock and the nearest water body and provide an alternate water source for your livestock. Also, make sure manure and farm waste water is properly contained. Contact your local Conservation Authority (conservationontario.ca) or the Ontario Soil and Crop Improvement Association (ontariosoilcrop.org) for information on potential funding sources to implement these projects.



Conservation Projects

Through our research efforts, we know that Queensnakes have declined from many historic sites. We are aware of fewer than 20 locations where this species can still be found in Ontario. Conservation actions are necessary to prevent the Queensnake from disappearing from more locations in Ontario.

Multi-year studies are taking place in Ontario to investigate Queensnake population sizes, demographics, threats, predator-prey dynamics, and habitat. One multi-partner, range-wide study involved surveying eight areas in Ontario with recent and historic Queensnakes observations. This study investigated Queensnake genetics, habitat use, and diet. Queensnakes that were captured were measured and weighed. Blood samples were taken to analyze their genetics. Queensnakes were individually marked using a PIT (Passive Integrative Transponder) tag, which is similar to a microchip used for pets. This method of marking is the least invasive way to conduct long-term monitoring of Queensnake populations. Crayfish surveys were conducted to see what species were available for Queensnakes to eat. The chance of finding a Queensnake if it's present (detection probability) was estimated using data from repeated surveys.

Even with many years of recovery projects completed, there is still a lot to learn about Queensnakes.



Measuring (left) and taking blood (right) from Queensnake *(Photos: Jory Mullen)*

Report what you see!

1. Report Queensnake and other reptile and amphibian observations to:

The Ontario Reptile and Amphibian Atlas: www.ontarionature.org/atlas

If possible, take a photo to help experts confirm identification.

2. Report illegal harming of a Queensnake or its habitat to:

The Ministry of Natural Resources and Forestry TIPS line

1-877-847-7667

or

Crime Stoppers (anonymous)

1-800-222-TIPS (8477)

3. Report invasive species to:

Ontario Federation of Anglers and Hunters

Invading Species Hotline at 1-800-563-7711

Or e-mail info@invadingspecies.com

Or use the app EDDMapS Ontario www.eddmaps.org/



Want to learn more about Queensnakes?

Search “Queensnake” at each of the following sites:

Canadian Herpetological Society (CHS) Queensnake species page
<http://www.canadianherpetology.ca/>

Ontario Reptile and Amphibian Atlas Queensnake species listing
www.ontarionature.org/

The MNRF Queensnake Factsheet and Recovery Strategy
www.ontario.ca/page/ministry-natural-resources-and-forestry

Committee on the Status of Endangered Wildlife in Canada (COSEWIC)
Queensnake Status Report
publications.gc.ca



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Links

Huron Stewardship Council
hsc.huronstewardship.ca
The Nature Conservancy of Canada
www.natureconservancy.ca
Ontario Nature
www.ontarionature.org
rare Charitable Research Reserve
raresites.org
Long Point Basin Land Trust
www.longpointlandtrust.ca



Help protect endangered wildlife in Ontario! Many of our snake species are dying out across the province, including the harmless Queensnake. Find out how you can help this endangered species on the path to recovery.



(Photo: Joe Crowley)