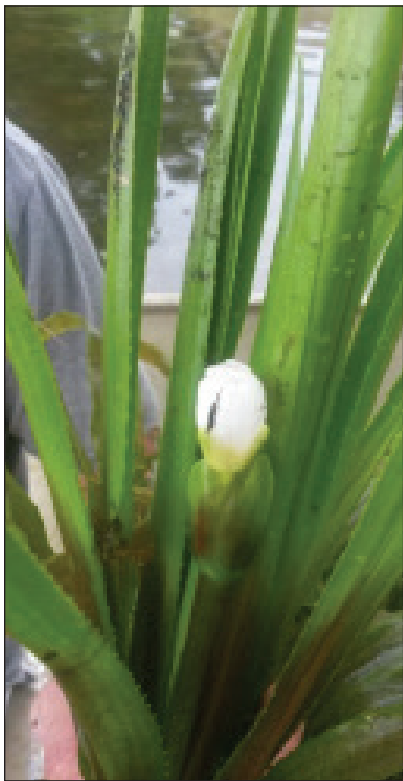


WATER SOLDIER – AN INVASIVE AQUATIC PLANT ON THE DOORSTEPS OF CHARLESTON LAKE

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Invasive species are among Canada's greatest threats to biodiversity, also causing economic and societal impacts, as well as risks to human health. In the absence of natural predators and disease, invasive species can kill, over-crowd, and negatively impact native species and important ecosystems.

European water soldier is a prohibited species under the Ontario Invasive Species Act, and threatens to invade lake and river ecosystems throughout Ontario and the Great Lakes basin. This could cause significant harm to biodiversity, and negatively impact recreation, tourism, and navigation within these waterways. The first known wild population in North America was found in the Trent River in 2008, near the Hamlet of Trent River, Ontario. Since that time, it has spread downstream of the original infestation within the Trent-Severn Waterway and has also been documented in both offline ponds and natural waters including the Black River, a tributary of Lake Simcoe and more recently in Red Horse Lake north of Gananoque, Ontario.



Native to Europe and northwest Asia, water soldier is a perennial aquatic plant with long, thin, serrated leaves that grow in a rosette formation, similar in appearance to the top of a pineapple. Water soldier grows below the surface of the water for most of the year and may rise to the surface of the water as new leaves mature during the summer months. Water soldier typically grows in shallow waters (0.5-1.5 metres) but may be able to grow in depths of up to 5 metres depending on the conditions.

Water soldier forms dense floating mats of vegetation, aggressively outcompeting native aquatic plants thereby reducing biodiversity, and impeding recreational activities such as boating, swimming, and angling. It has the potential

to alter surrounding water chemistry, which may harm phytoplankton and other aquatic organisms. Sharp serrated leaf edges can cut swimmers and individuals who handle or pass by the plants. Water soldier can also interfere with infrastructure, including water intake pipes and, navigation canals and locks, which are costly to repair.

Red Horse Lake Case Study

In September 2020, the Invading Species Awareness Program (ISAP) followed up with a report of water soldier in Red Horse Lake, between the villages of Lyndhurst and Lansdowne, and is one of a 28 km long chain of lakes that comprises the Upper Gananoque River System. Charleston Lake is one of several nearby lakes, and although there is little to no flow between the two lakes, they share a portage route and likely watercraft recreational enthusiast like anglers and boaters.

Immediately upon detection of the water soldier population in Red Horse Lake ISAP began to survey the surrounding area, removing any scattered plants that were found outside of the main population, 6 leaf bags full of water soldier were removed. On August 3, 2021, ISAP staff returned to Red Horse Lake to assess the efficacy of the herbicide treatment and to survey for water soldier from Cold Spring Bay to Rockcliffe Lane and collect environmental DNA (eDNA) samples as part of the Green Shovels Collaborative. It was decided that a rapid response to the infestation in Red Horse Lake was the best decision, and in early October 2020 an herbicide treatment was applied to control the invasive plants.



Photo credit: Rob McGowan, *Invading Species Awareness Program*

Water soldier population on Red Horse Lake pre-herbicide treatment (September 8, 2020).



Photo credit: Rob McGowan, Invading Species Awareness Program

Water soldier population on Red Horse Lake post-herbicide treatment (August 4, 2021).

On August 3, 2021, ISAP staff returned to Red Horse Lake to assess the efficacy of the herbicide treatment and to survey for water soldier from Cold Spring Bay to Rockcliffe Lane and collect environmental DNA (eDNA) samples as part of the **Green Shovels Collaborative**.

Moving forward into 2022, ISAP staff hope to be back on Red Horse Lake with a monitoring and surveillance plan that will inform future management actions.

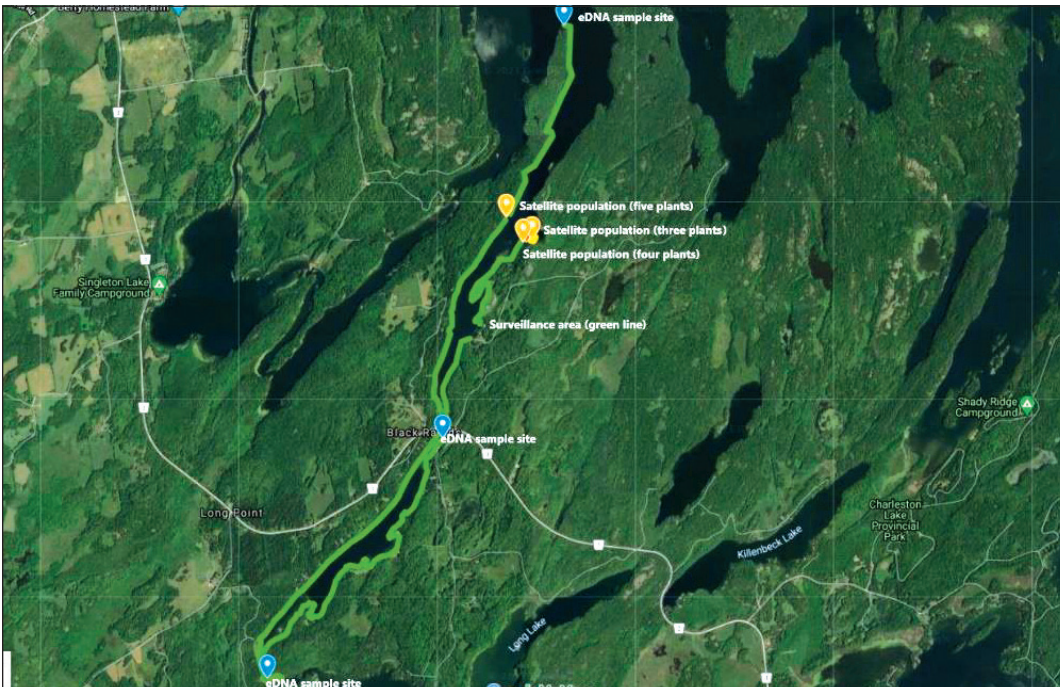
Red Horse Lake's water soldier population demonstrates the transmissibility of the aquatic plant. Since it has been newly introduced into the area, it either traveled a long distance on boating equipment (from Trent Severn Waterway) or was disposed of in the lake from an aquarium or pond. For this reason, it is imperative that locals understand this nearby threat and learn how to prevent the introduction and spread of water soldier, as well as learn to identify and report sightings.

What you can do

Learn more about how to identify water soldier and how to prevent accidentally spreading the plant with your watercraft or fishing equipment. This is especially important if you are planning to do work or participate in recreational activities in known infested areas.

- Avoid infested areas and reduce your speed when travelling near water soldier infestations.

- As of January 2022, it is now the law to inspect your boat, trailer, and equipment after each use (**Watercraft Regulated as Carrier of Invasive Species**). You must remove all plant material and dispose of it in the garbage or at least 30 meters away from any body of water before transporting your boat over land.



Map of 2021 surveillance and satellite populations on Red Horse Lake

As a result of the surveillance around Red Horse Lake and down into connected waterbodies, three small (three to five plants) satellite populations were located and removed. Two satellite populations were immediately adjacent to the main population, whereas the third satellite population, found by locals, was directly to the west on the other side of the lake. To maximize monitoring efforts, only prime habitat for water soldier was surveyed (i.e., back bays, soft, muddy sediments, 0.5-1.5 meters of water).

- Never buy or keep water soldier in your water garden or aquarium. It is against the law to import, possess, deposit, release, transport, breed/grow, buy, sell, lease or trade water soldier in Ontario. Never deposit unwanted aquarium or water garden plants into Ontario lakes or rivers.

- Explore online reporting tools, such as the Early Detection and Distribution Mapping System (EDDMapS) and the provincial Invading Species Hotline (1-800-563-7711) to communicate possible detections of water soldier and other invasive species.