

A photograph of a lake with several water soldier plants (Sagittaria arifolia) growing in the water. The plants have long, pointed, green leaves that rise vertically from the water. The water is calm and reflects the sky and the plants. In the background, there is a line of trees and a small building under a blue sky with light clouds.

SINKING WATER SOLDIER PERMANENTLY

Alison Morris (Kirkpatrick)

Ontario Federation of Anglers and Hunters

Ontario Federation of Anglers and Hunters

- Ontario's largest, non-profit, fish and wildlife conservation-based organization, representing 100,000 members, subscribers and supporters, and 735 member clubs.
- Our vision ...
A future that includes healthy lakes and forests, bountiful fish and wildlife, and accessible opportunities for all Ontario residents.



Invading Species Awareness Program

Joint education/awareness partnership of the OFAH and the MNRF since 1992

- Focus on education and outreach for aquatic and terrestrial invasive invertebrates, fish and plants
- Focus on key pathways for invasive species introductions and/or spread
- Develop and deliver programs designed to monitor the occurrence and distribution of invasive species
- Contribute towards surveillance, control, and rapid response of invasive species



Water Soldier

- Native to Europe and Northwest Asia
- First wild population in NA located in Trent River
- Asexual reproduction by way of offsets and turions
- Forms dense mats of floating and submerged vegetation



Water Soldier

In fall, plant sinks for the winter, rosette shoots and turions survive on the bottom of the lake

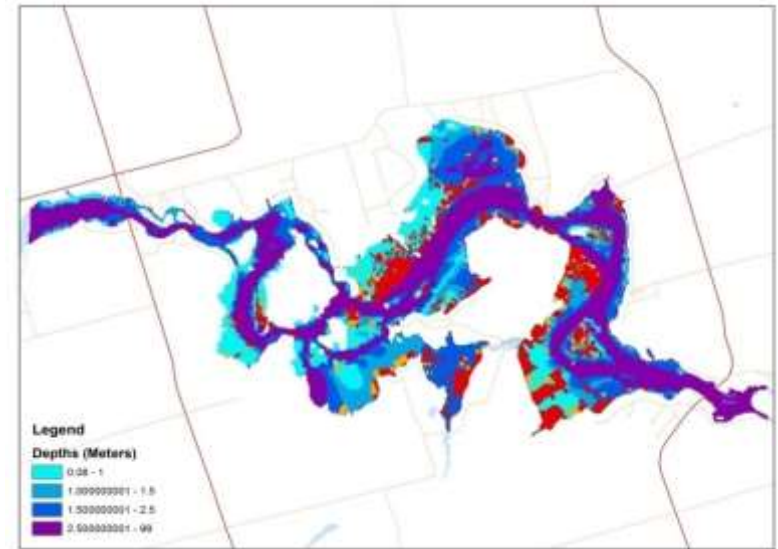


In spring, plants rise to water surface and form new roots, offsets become active, and vegetative reproduction begins again

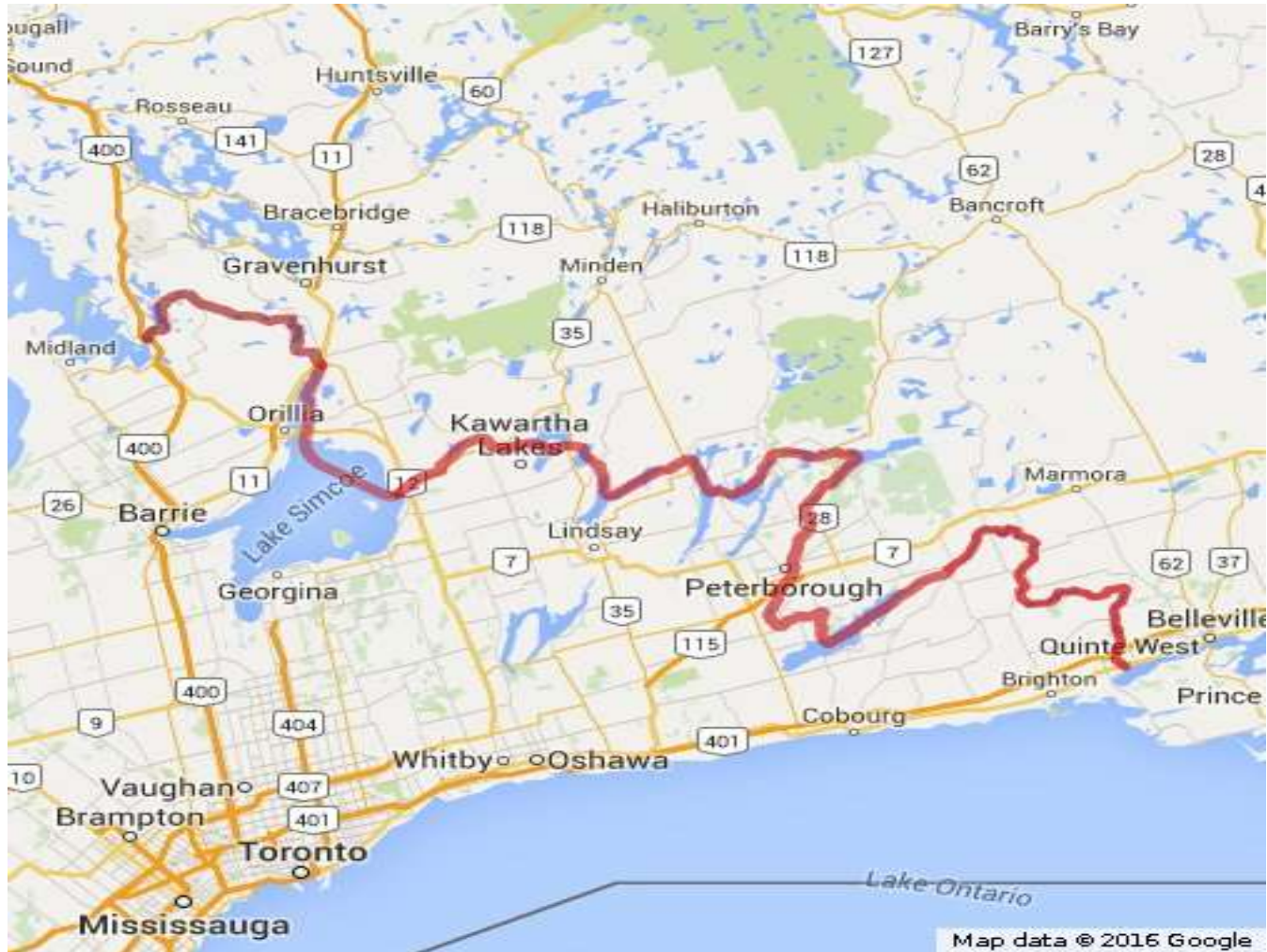


Water Soldier - Habitat

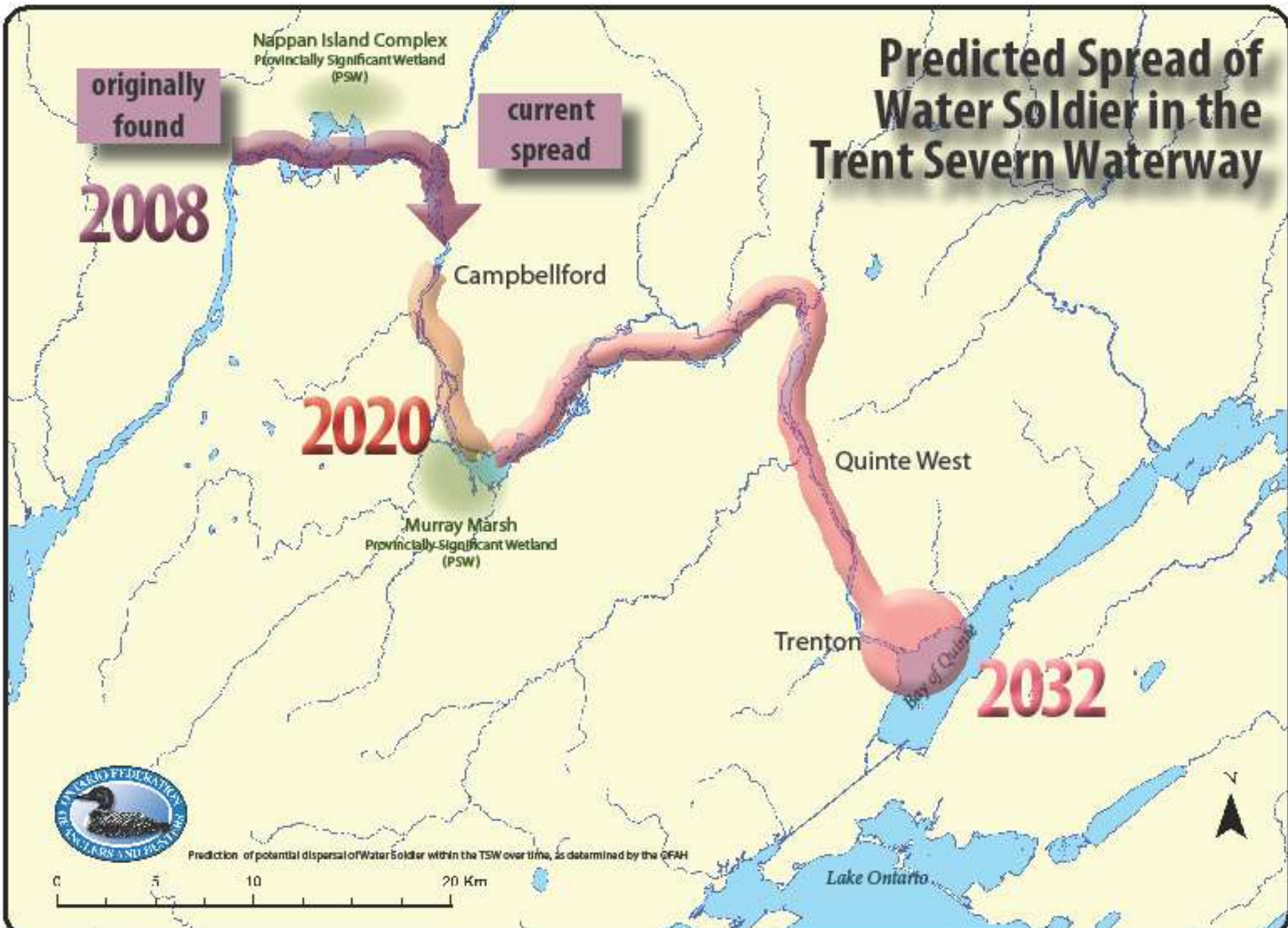
- Slow moving or still meso-eutrophic waters (Trent River is Eutrophic)
- Not found in fast moving water
- Grows in 1-5 metres (average depth 1.5 m)
- Prefers back bays and shorelines in Lake Seymour



Trent Severn Waterway



Predicted Spread of Water Soldier in the Trent Severn Waterway



Integrated Management Plant

- The IMP has three main objectives:
 1. Prevent the introduction and spread of water soldier to new locations in Ontario,
 2. Early detection and rapid response to new water soldier populations detected within Ontario, and
 3. Eradicate established populations of water soldier from public waters in Ontario



Water Soldier Working Group



US Army Corps of Engineers



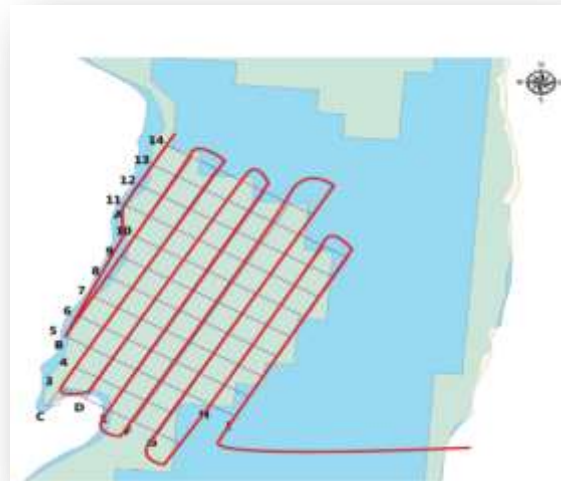
Objective 1 – Prevention

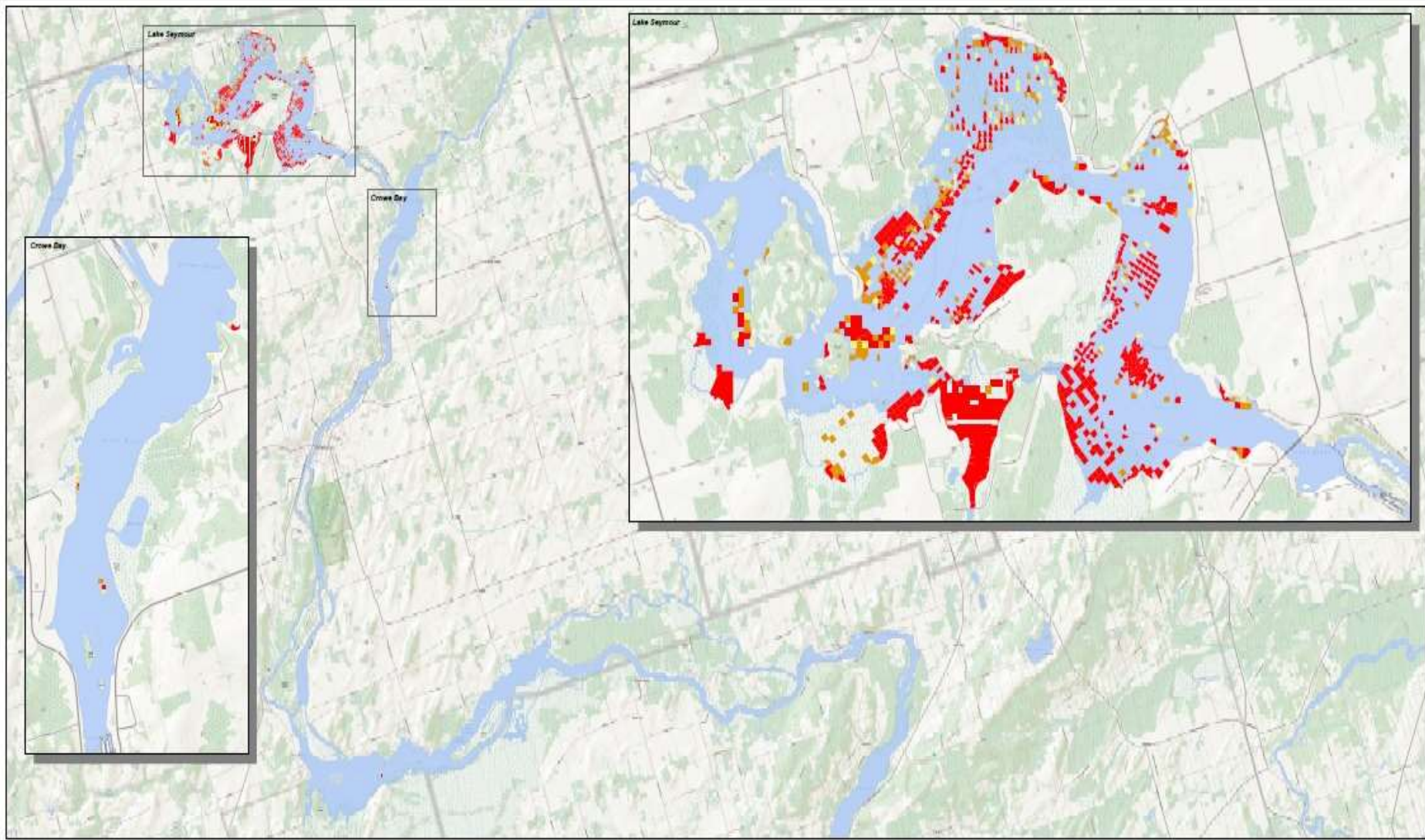
- Education & outreach
 - Water Soldier Watch Day
 - Open House
 - Direct Ad Mail



Objective 2 – Early Detection/Rapid Response

- Systematically sample TSW 50x50 metre grid
 - 2014 – 5,700 point intercepts
 - 2015 – Over 21,000 point intercepts
- Each point intercept is given a value of water soldier present
- Shallow areas are sampled with canoes





Legend

Water Soldier Values

- 1 - Single Plant
- 2 - Scattered Plants
- 3 - Dense Colony

Notes:
Produced by Ministry of Natural Resources
and Forestry, Peterborough District GIS
Map Projection: UTM Zone 18, NAD83

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indication of location or location, nor as a guide
to navigation. The Ontario Ministry of Natural
Resources and Forestry (OMNR) shall not be
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Ontario Ministry of Natural Resources and Forestry - Peterborough District

Water Soldier Distribution 2015



August 31, 2015



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North arrow
(NAD 83 UTM)

Il ne faut pas prétendre que cette carte indique
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Peterborough District Key Map



= Map detail area

Objective 2 – Early Detection/Rapid Response

Invading Species Hotline – 1-800-563-7711

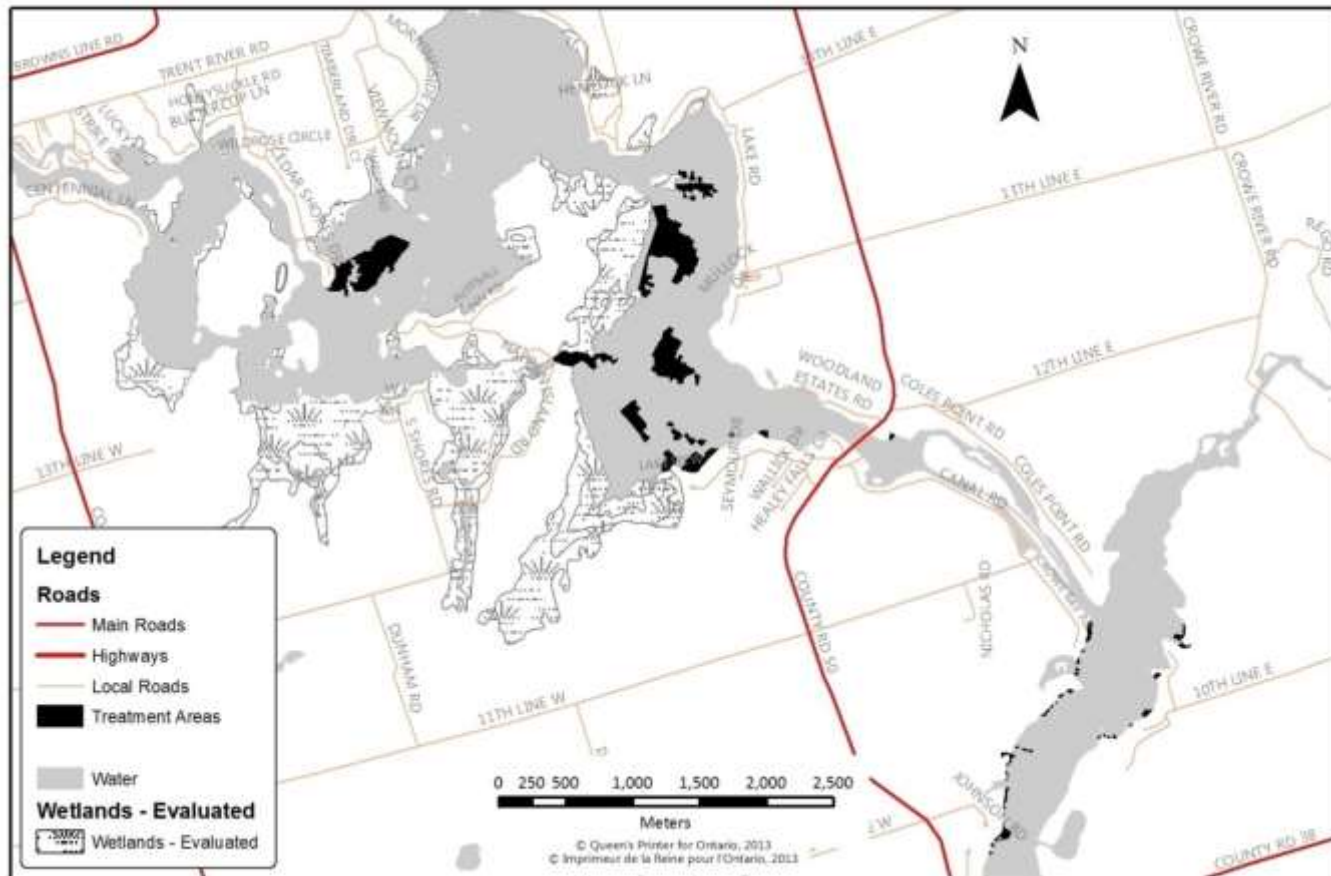
EDDMapS Ontario - www.eddmaps.org/Ontario

- New small, isolated populations (5-6) ~ 18 km's downstream (Percy's Reach)
- Reported through the Invading Species Hotline



Objective 3 - Eradicate

- 2014 Control efforts
 - 8.3 Ha treated in Crowe Bay, 42 Ha treated in Lake Seymour

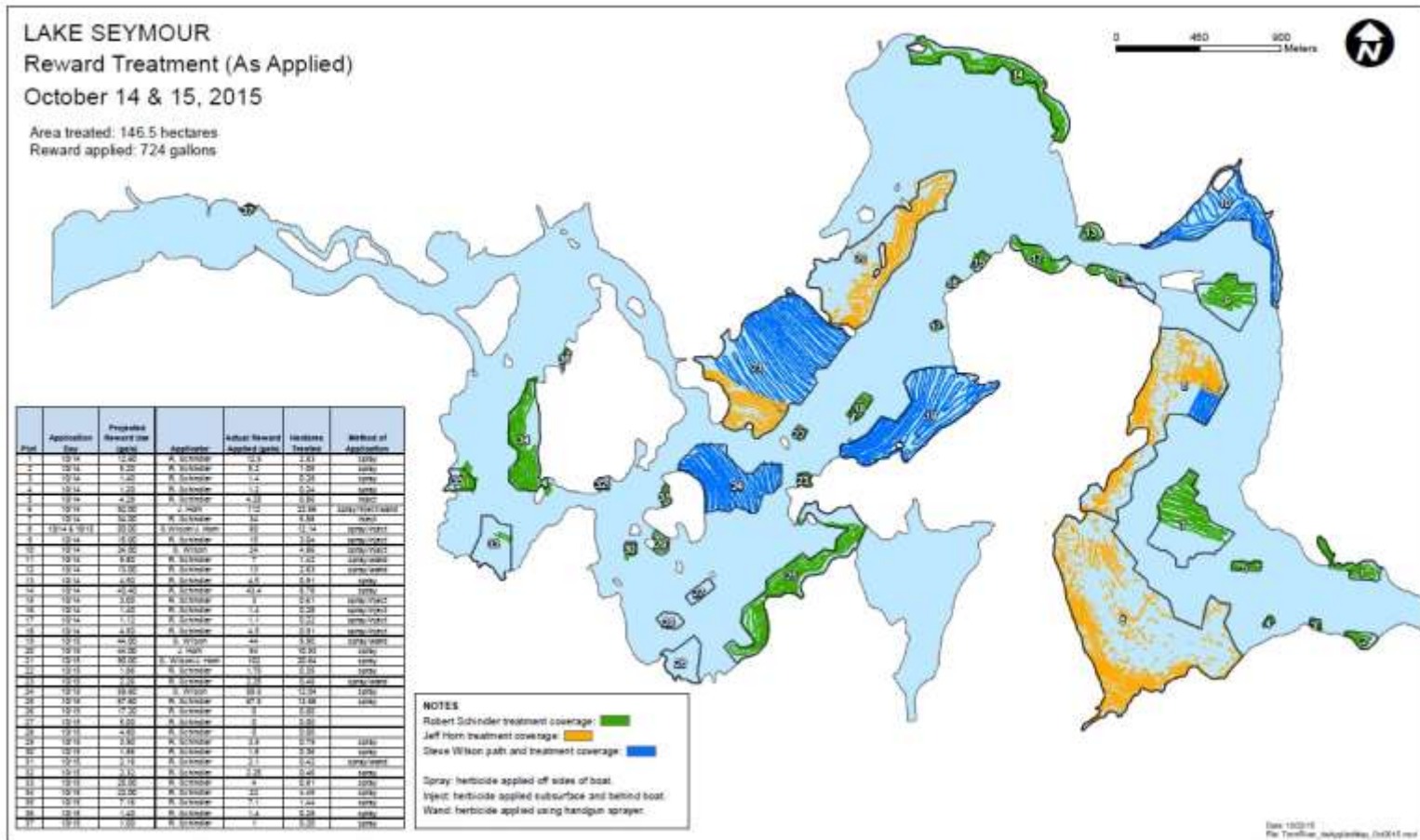


Post Chemical Control - 2014



Objective 3 - Eradicate

- 2015 Control efforts
 - 146.5 Ha treated in Lake Seymour



Objective 3 - Eradicate

- Mechanical harvester
 - Two acres of area covered
 - 190 cubic yards removed
 - 40 cubic yards put into Bio digester



2013



2014



2015



Moving Forward

- How to sustain multi-year efforts
 - Funding
- Small scale efforts to control small populations
 - D.A.S.H.
 - Jute Mats
- Overall impact of repeated control efforts
- Education & awareness
 - Invading Species Hotline/EDDMapS Ontario for new sightings
- Continued monitoring



Acknowledgments

- Invasive Species Centre
- Ministry of Natural Resources
- Ministry of the Environment and Climate Change
- Trent University
- United States Army Engineers Research and Development
- Ontario Invasive Plant Council
- Lower Trent Conservation
- Parks Canada

Questions?

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Invading Species Hotline

1-800-563-7711

www.eddmaps.org/Ontario

www.invadingspecies.com

