



Water Soldier Control and Eradication in Ontario

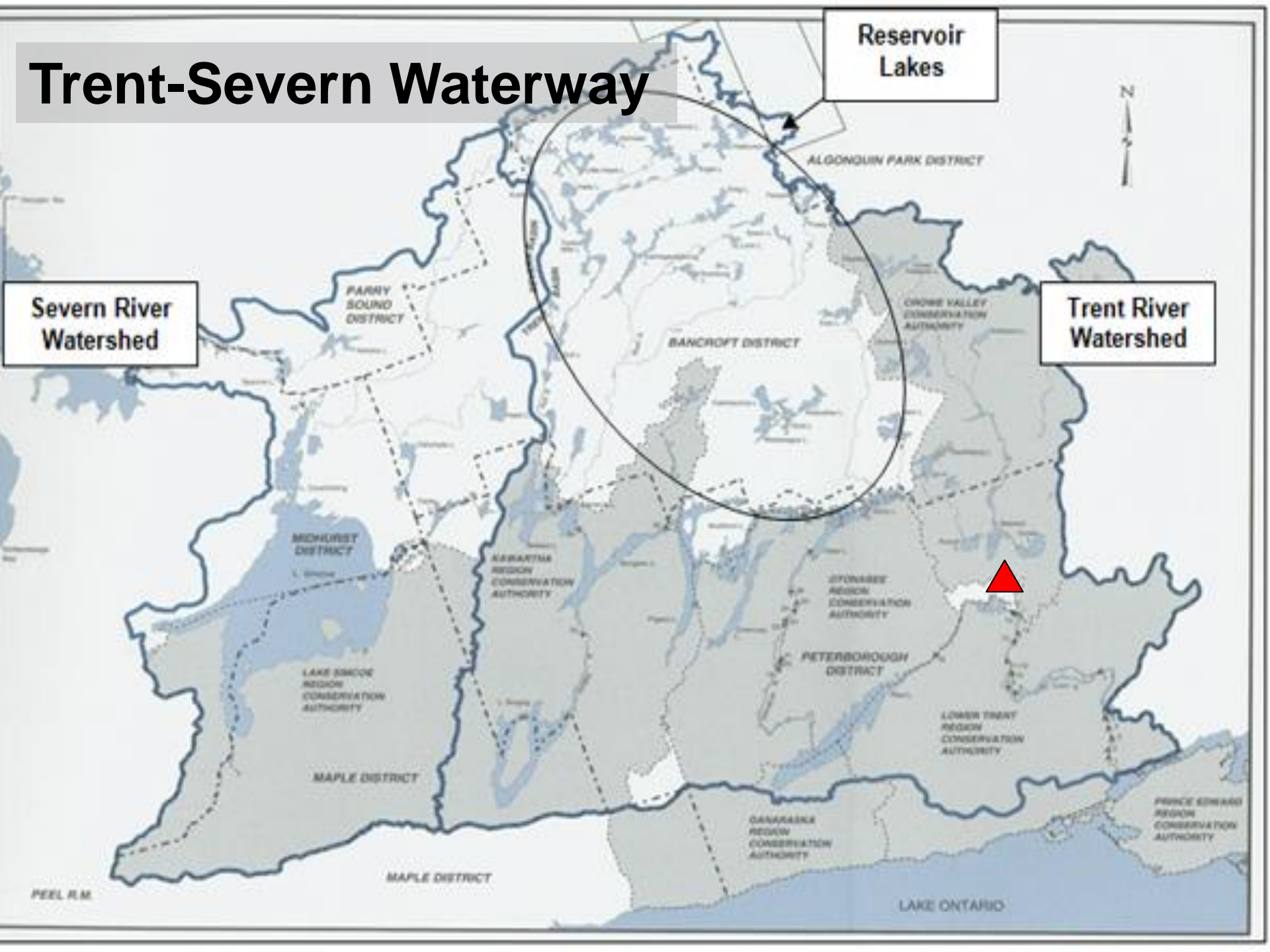
Great Lakes Panel on Aquatic Nuisance Species – Spring Meeting
April 15, 2015

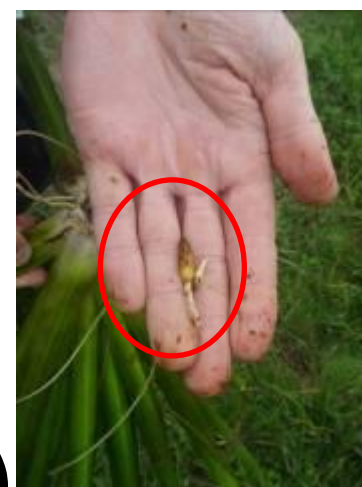
Background

- Water soldier (*Stratiotes aloides*) is an aquatic invasive perennial plant, native to Europe.
 - Sharp serrated leaves can cut, when handled.
- First detected in Ontario, in the Trent Severn Waterway in 2008
 - Only report of this plant in the wild in North America
 - Ornamental pond trade is likely pathway for introduction
 - Poses a high risk to Ontario’s biodiversity and natural environment (ecological risk assessment)
- Identified by the Council of Great Lakes Governors and Premiers of Ontario and Quebec as a priority for prevention and response in 2013
 - “Least Wanted” Aquatic Invasive Species List for the Great Lakes basin



Trent-Severn Waterway



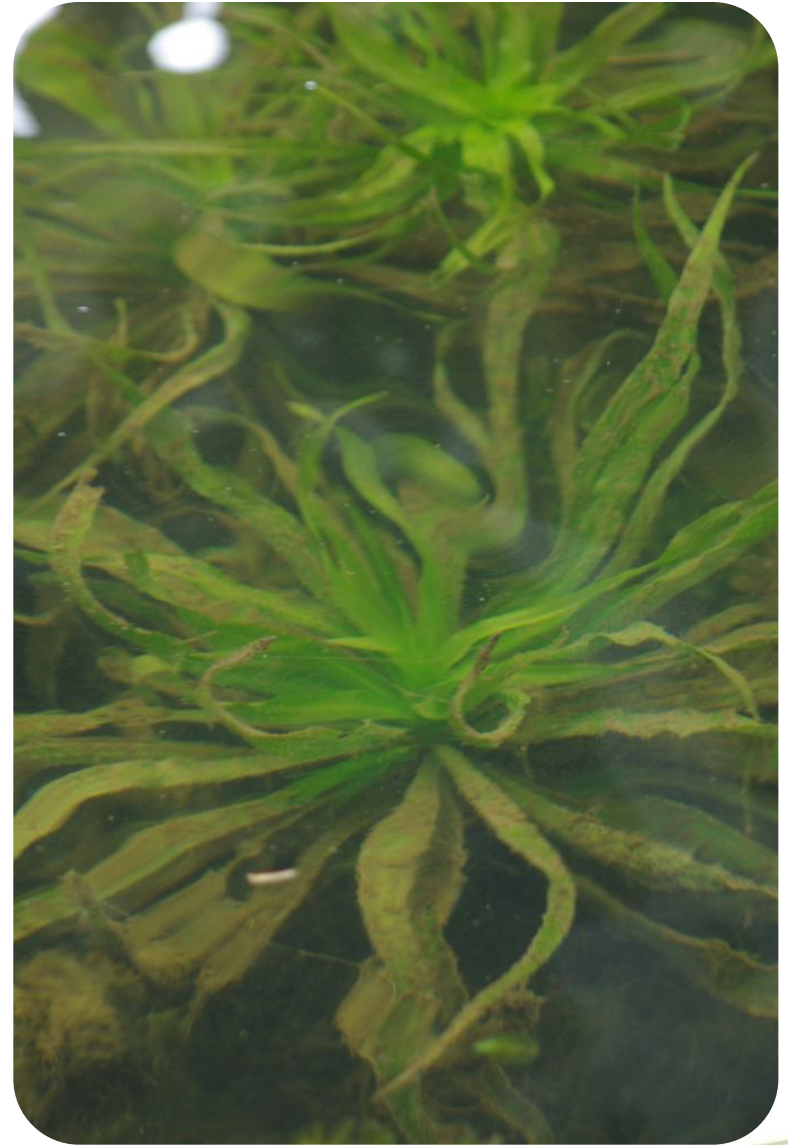


Water Soldier (*Stratiotes aloides*)

- Perennial
- Vegetative reproduction (offsets and turions)



Emergent form



Submergent form

Example of infestation



Grows rooted in shallow, slow flowing waters, water depth (0.5m-1.5m), up to 5m



Water Soldier Response – Context

- No clear agency responsible for addressing aquatic invasive plants
 - Trent Severn Waterway is a federal waterway, but does not have an aquatic plant management program.
- Legislative gaps to address import, sale, possession and transport of aquatic invasive plants such as Water Soldier
- Water Soldier had no history of management in North America (or Europe); limited information available on control
- Established inter-agency working group to provide technical and field support to guide response
 - MNRF, MOECC,, US Army Engineers Research and Development Center, Ontario Federation of Anglers and Hunters, Trent University, Parks Canada

Water Soldier Response Timeline



Detection and Rapid Response

Initial herbicide treatments with emergency label extension for REWARD (diquat)

Manual removals

2009 to 2011



Research

Biology/ Life History

Control techniques

Surveillance

Lab and field efficacy testing of REWARD (diquat)

2012 -2014



Policy Development

Legislative tools for prevention

Education and outreach

Engaging public/citizens

Label expansion approved for Reward

2012-present



Control and Eradication Plan

Development of an integrated management plan

Initiated Fall 2014/15

The Ontario Invasive Species Strategic Plan (OISSP) provided the basis for a provincial response to address Water Soldier including prevention, detection, control and eradication actions.

Control and Eradication Plan for Water Soldier – Year 1

Objective: Eradicate Water Soldier from Trent Severn Waterway and prevent its spread

Surveillance
Summer
2014

- Water Soldier population confirmed (150ha)
- Lake Seymour (140ha), and Crowe Bay (8.3ha)
- Majority of population in water depths <1.5m

Public Notification
September
2014

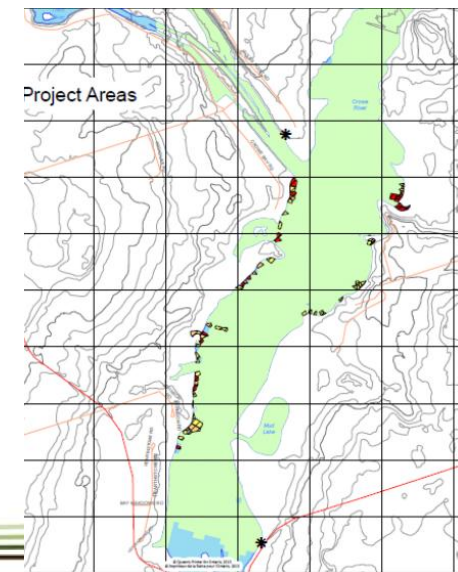
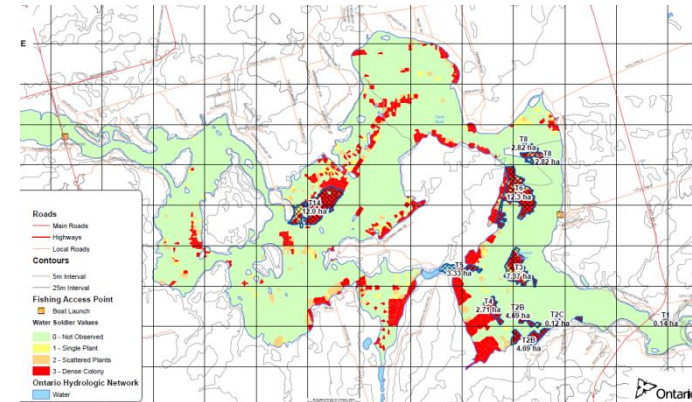
- 30 day public comment period as per provincial Class EA requirements
- Public was strongly supportive of herbicide as the primary control tool.

Implement
October
2014

- Application for permits (MOECC and Parks Canada)
- Awarded contract to successful company
- Medium to large scale herbicide treatments (approx. 50 ha)
- Focus on largest populations, and preventing downstream dispersal

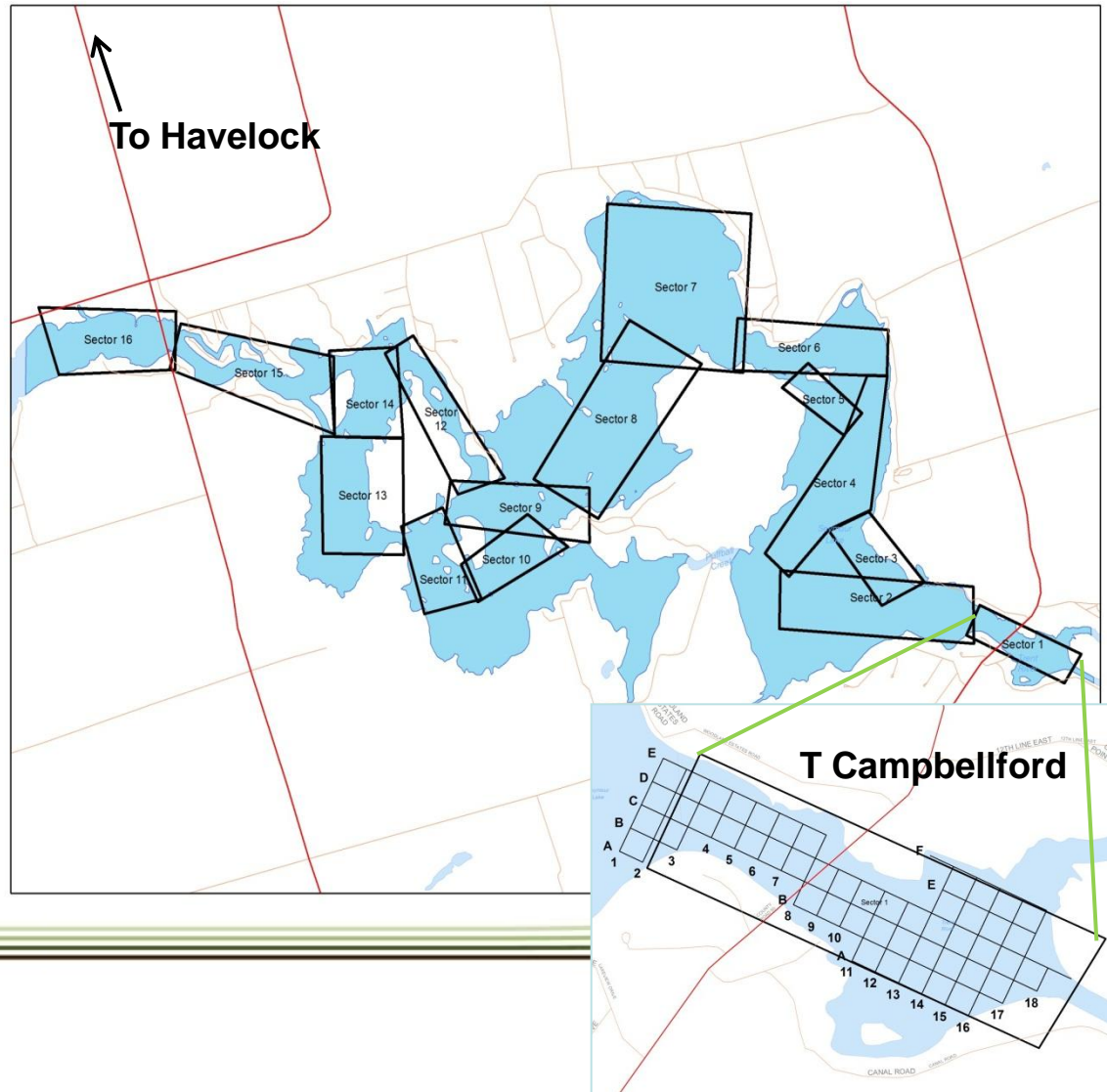
Evaluate
Spring 2015

- Evaluation of control treatments and refine approaches
- Assess long-term needs to achieve eradication and draft 5 year plan

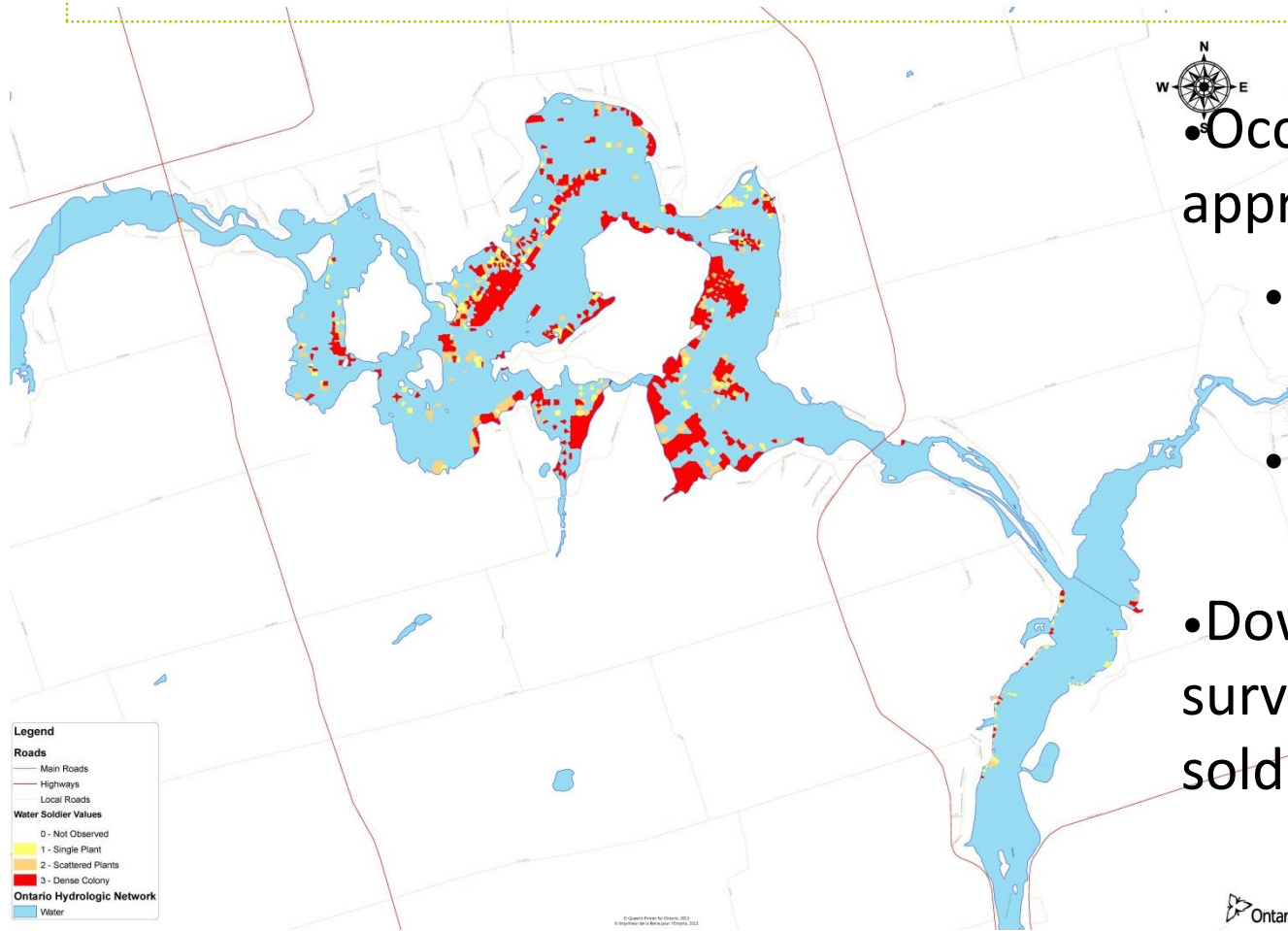


Water Soldier Surveillance - Summer 2014

- 50m x 50m grid of approx. 15 km reach of Trent River
- At each point intercept, recorded, depth, and presence of Water Soldier



Water Soldier Surveillance Results

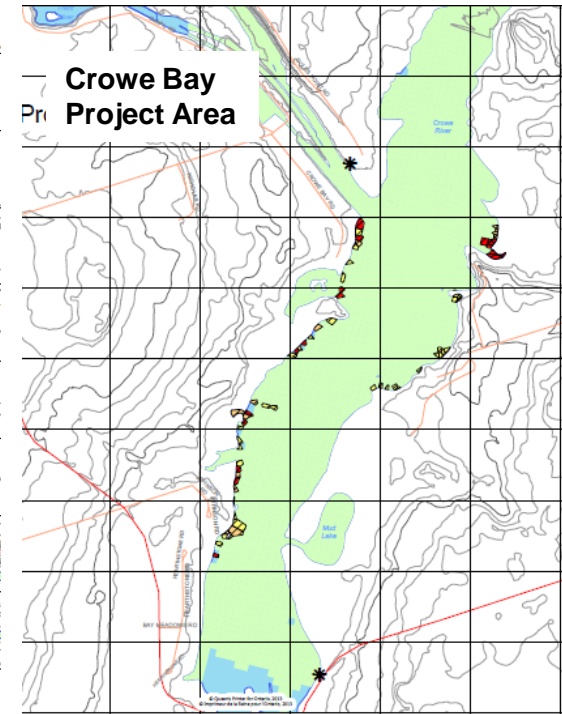
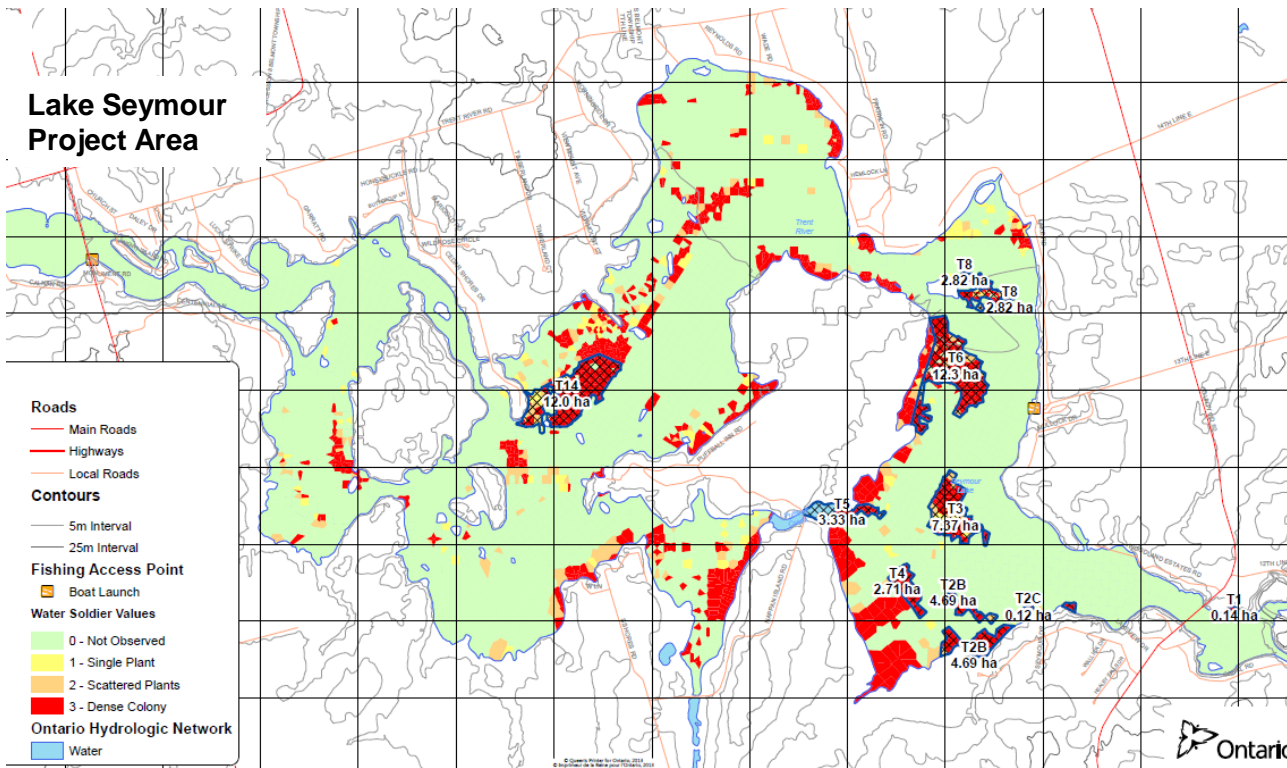


- Occurs over approximately 15km
 - Lake Seymour - ~140ha
 - Crowe Bay – 8ha (downstream)
- Downstream areas also surveyed, no water soldier detected.

Public Notification – Sept/Oct 2014

- A Public Notice was issued by MNRF as part of Class Environmental Assessment requirements (30 days).
- Distributed to ~1400 residents in area
- Public meeting and formal comment period
 - Overwhelming support for control of water soldier, with herbicide treatment as the primary control method.
 - Public called for **strong** and **aggressive action** to address water soldier, with greater investments from federal and provincial governments.

Water Soldier –Control treatments (October 22-27 2014)



Lake Seymour

- Aquatic herbicide (REWARD) applications of up to 41.7 ha
- Focus on largest populations and preventing downstream dispersal.

Crowe Bay

- Aquatic herbicide application to all populations (8.3ha in total)

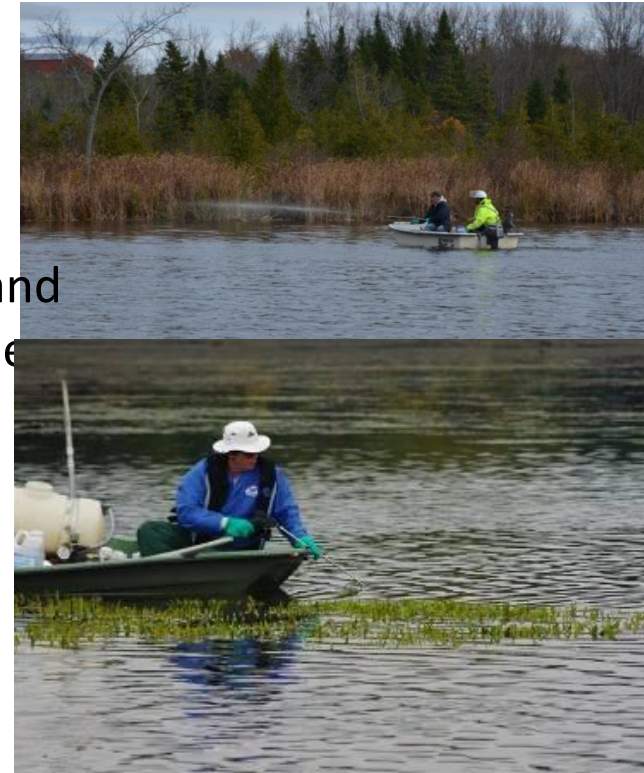
Herbicide Application -Approach

Landowner Notification (Oct 18/19)

- Shoreline residents within the treatment area were notified via “in person” visit, or notice on door

Application (Oct 22-27)

- **Timing** in fall, optimal to reduce non-target impacts and when Water Soldier is still actively growing/vulnerable
 - Fewer recreational users
 - BUT – weather unpredictable, large rain events, impacting water flow and stability of system, shortening day length
- **Site Conditions** – Shallow waters (0.5 – 1.5m), many obstacles
 - Flat-bottom skiff with some modifications was able to access most of the treatment areas.
 - Potential for sediment disturbance, may require more specialized watercraft (i.e. airboat)



Post Treatment Monitoring

Before Treatment (1 week)



Post Treatment (1 week)



- Difficult to assess impact immediately following treatment
 - Differentiate impacts from herbicide vs. “frost bite”
 - Typical of late season herbicide treatments.
 - Cold water temperatures slows decay rate, and herbicide will act in combination with winter conditions to further weaken plant
- Full assessment in Spring 2015 is planned.

Water Soldier Response

Key Lessons Learned

Project Leadership

- MNRF and OFAH have played a leadership role to date, but in the long-term federal agencies roles/responsibilities need to be clarified and formalized.

Public Engagement

- Strong public support for use of herbicide over-water, as the most effective control tool; ongoing communications/outreach will be important

Research Support is Critical

- Understanding biology, reproductive strategies, and efficacy of control tools for new plants is essential to development of integrated management plan.

Access to effective herbicide tools

- Diquat is the only registered product available for overwater use in Canada for control of aquatic vegetation.
 - It is fortunate that REWARD is effective on Water Soldier; it may not be effective on other aquatic invasive plants that threaten Ontario
 - Label modifications would be helpful (e.g. aerial application,)

Partnerships are key – funding, expertise, community support

Next Steps

- Assess long-term needs to achieve eradication and draft 5 year plan– Winter 2015.
- Evaluation of control treatments and refine approaches -Spring 2015
- Continue surveillance and eradication program – Fall/Summer 2015 -2020
- Continue research (biology, eDNA, remote sensing)
- Address key policy/legislative gaps for Water Soldier