



Early Detection Surveillance Methods for Asian Carps in the Canadian Great Lakes



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Outline

- DFO's Asian Carp Early Detection Surveillance Program
- Sampling Location Selection
- Traditional Surveillance Gears





DFO's Asian Carp Program - Overview

Program Goal

Protect the integrity of the Great Lakes basin by preventing the introduction (arrival, establishment and spread) of Asian carps.

Program Framework

Multi-discipline approach within **4 Program Pillars**:

1. Prevention	2. Early Warning	3. Response	4. Management
<ul style="list-style-type: none">• Outreach• Research• Risk assessment	<ul style="list-style-type: none">• Surveillance	<ul style="list-style-type: none">• Advice and analysis• Action	<ul style="list-style-type: none">• Regulations• Pathway management



Asian Carps as Invaders

Asian Carps = 4 Species



Grass Carp



Bighead Carp



Silver Carp



Black Carp



Surveillance Site Selection

- Establish early detection sites in areas at highest risk for arrival and establishment
- Targeted and repeated sampling
- Pre-impact baseline





2. Early Warning

Surveillance Site Selection

- Started in 2013
- May to November
- 34 locations in lakes Superior, Huron, Erie, Ontario
- site selection based on modelling of suitable spawning habitat
- Large wetlands included in monitoring





Traditional Gear Surveillance

- 2012 and 2013 training in Illinois
- Training with partners to develop sampling protocols





Traditional Gear Surveillance

- Training
- Coordination
- Targeting Grass Carp





Traditional Gear Surveillance

Fyke Net (3 mm ace mesh, 0.6m tall by 1.2m wide; 4.5m lead)

- Detection of small fishes
- Wetland habitats, high vegetation, low flow shallow habitats





Traditional Gear Surveillance

Hoop Nets Large: 6.35 cm bar mesh, 1.83 m diameter; 6.7 m overall length
Small: 6.35 cm bar mesh, 0.91 m diameter; 3.7 m overall length

- Large fishes
- Deployed in flowing waters





Traditional Gear Surveillance

Trap Net (1.2 m depth; 27.4 m lead; 1.2 m box, 2.54 cm bar mesh)

- Detection of larger fishes
- Wetland habitats, high vegetation, low flow





Traditional Gear Surveillance

Tied-down **Gill and Trammel Nets** (7.6-10.2 cm bar mesh; 3.1-5.5 m depth tied to 2.4-4.3 m depth; 91-273 m length)

- Detection of larger fishes
- Low flow; nearshore vegetated or open waters





Traditional Gear Surveillance

Bag Seine (15.24 m length, 1.82 m depth, 1.82 m bag, 6.35 mm ace mesh)

- Detection of small fishes
- Wadeable habitats





Traditional Gear Surveillance

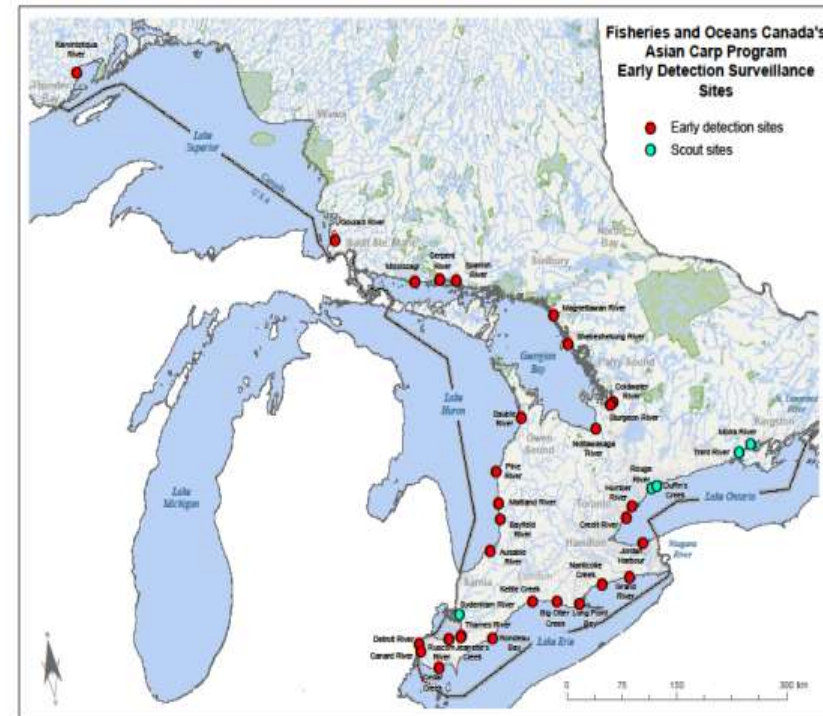
Boat electrofishing (21' Smith-Root; 24' Henley; dual-boom; 7.5 kW Generator Powered Pulsator)

- Standard and Targeted sampling
- Multiple boats (driving fish)



Traditional Gear Surveillance

- Started in 2013 (3 crews – 289 sites, 21411 fishes); 2014 (4 crews – 745 sites, 43928 fishes); 2015 (5 crews – 1049 sites, 67221 fishes)
- May to November
- 34 locations in lakes Superior, Huron, Erie, Ontario
- 97 species of fishes in 2015
- Buffalo *sp.* and Common Carp used as surrogate species for Asian carps





Traditional Gear Surveillance

Larval and Egg Sampling in 2016

Bongo Nets: 50 cm diameter frame, 2 m x 500 micron plankton net



Light Traps: 30 cm diameter, 25 cm height, four 5 mm entry slits.





Summary

Prevent introduction of Asian carps – important to detect early so proactively looking

Modelling, scouting, and surrogates to identify early detection sites

Variety of traditional gears, integrating new gears and techniques into surveillance sampling



Thank you!

