

Golden Lake Walleye

Golden Lake Property Owners Association

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Presentation Outline



Golden Lake

- Watershed description
- Lake habitat
- Fish Community

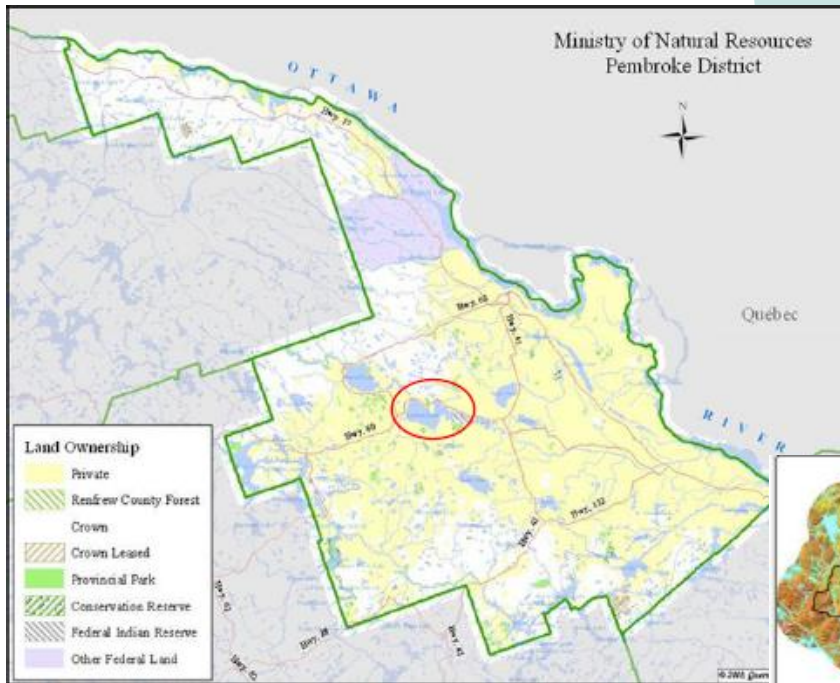
Walleye in Golden Lake

- Introduction
- Assessments
- Management actions
- BsM Assessment – 2015

Moving Forward

- Biological and habitat considerations
- Stocking Considerations
- Regulation Changes

Background



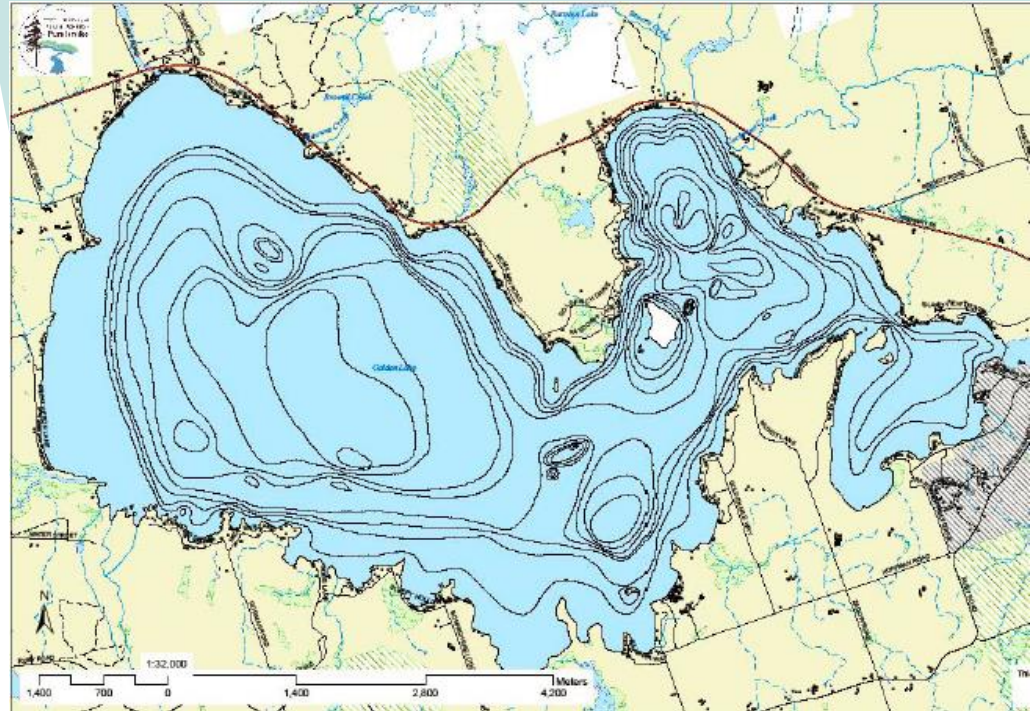
Bonnechere River Watershed is
2400 km²



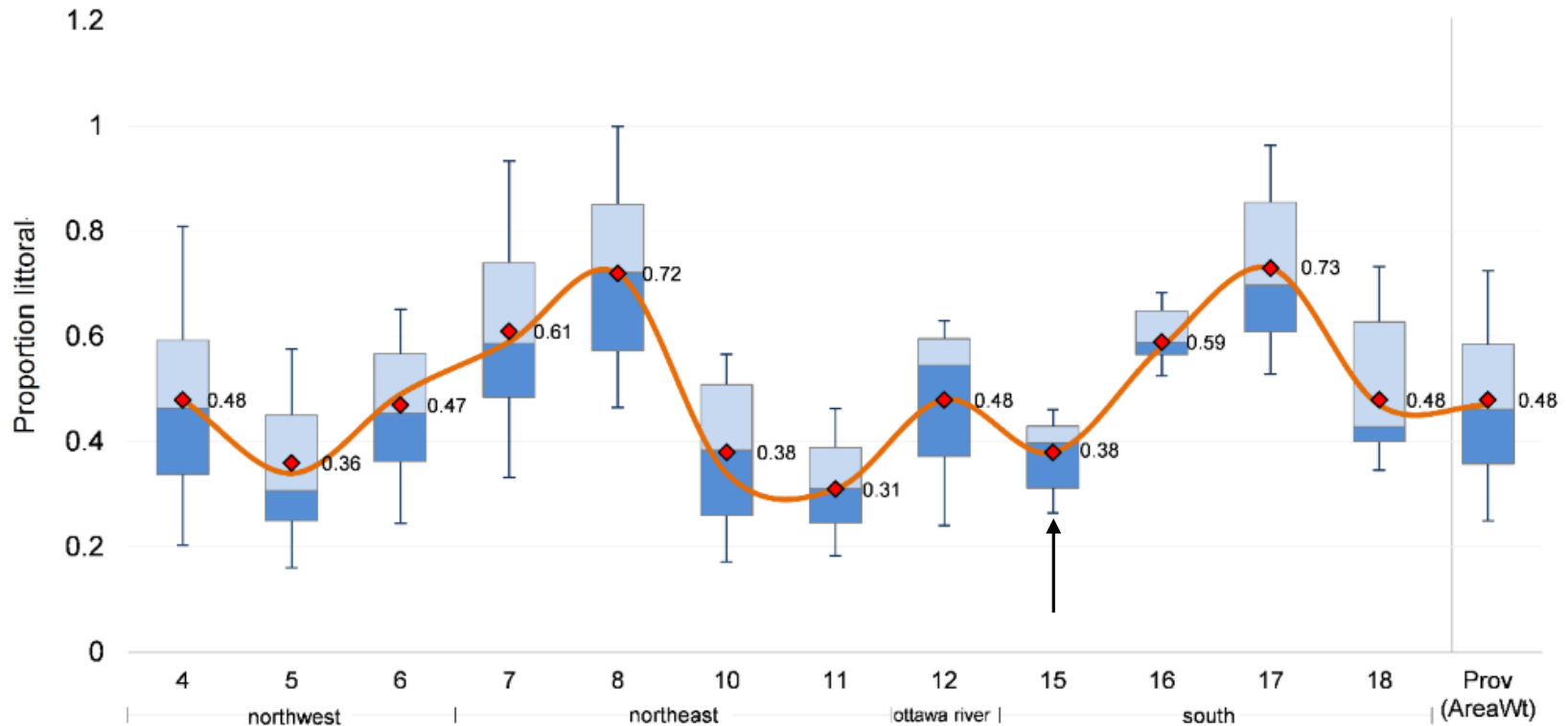
Golden Lake Metrics

Area	3,613 ha
Lake Class	4 (1500 – 5000 ha)
Depth (max)	24 m
Depth (ave)	8.6 m
Secchi (Spring)	3.6 m
Secchi (Summer)	3.4 m
TDS/TP	62.1/12.8

*BsM netting data
(Cycle 2; June 2015)

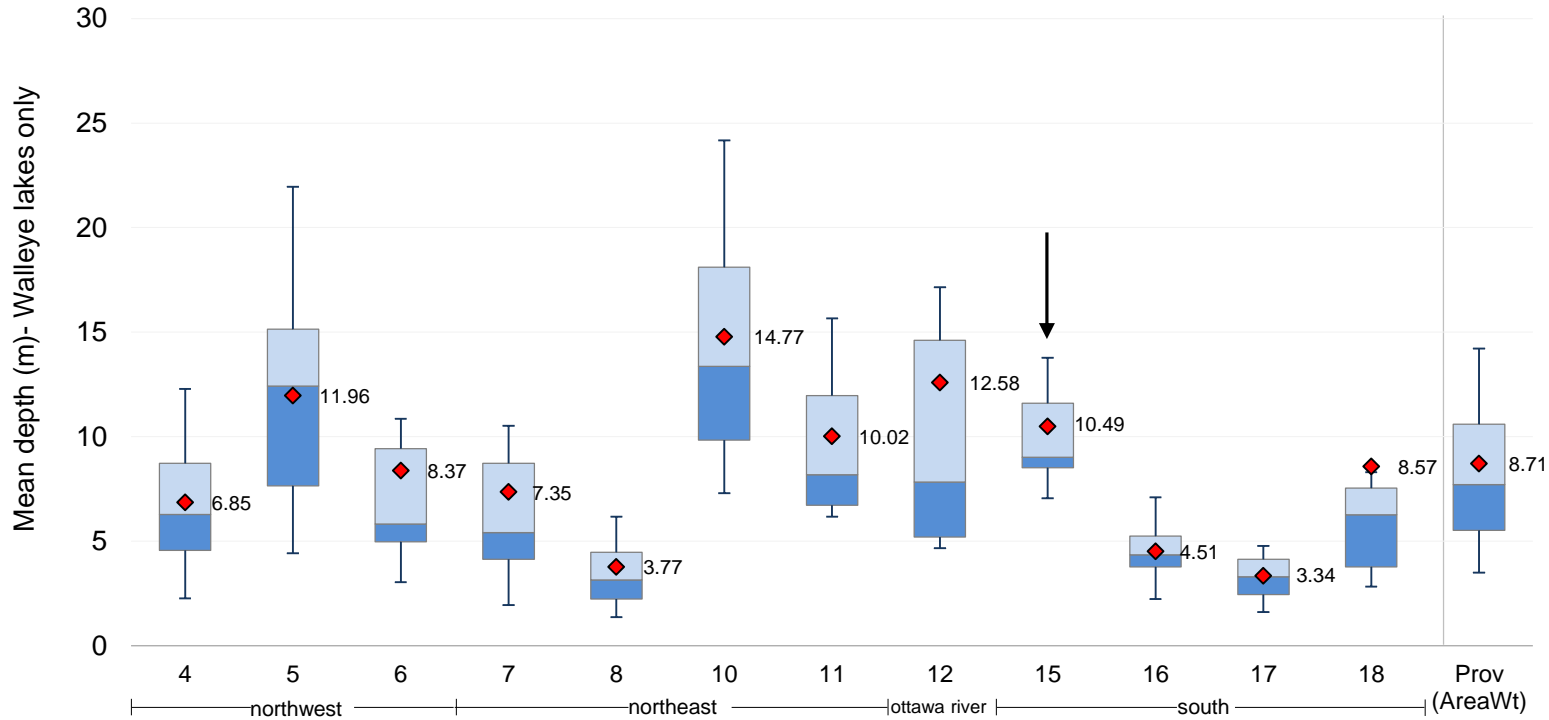


Golden Lake habitat – littoral zone



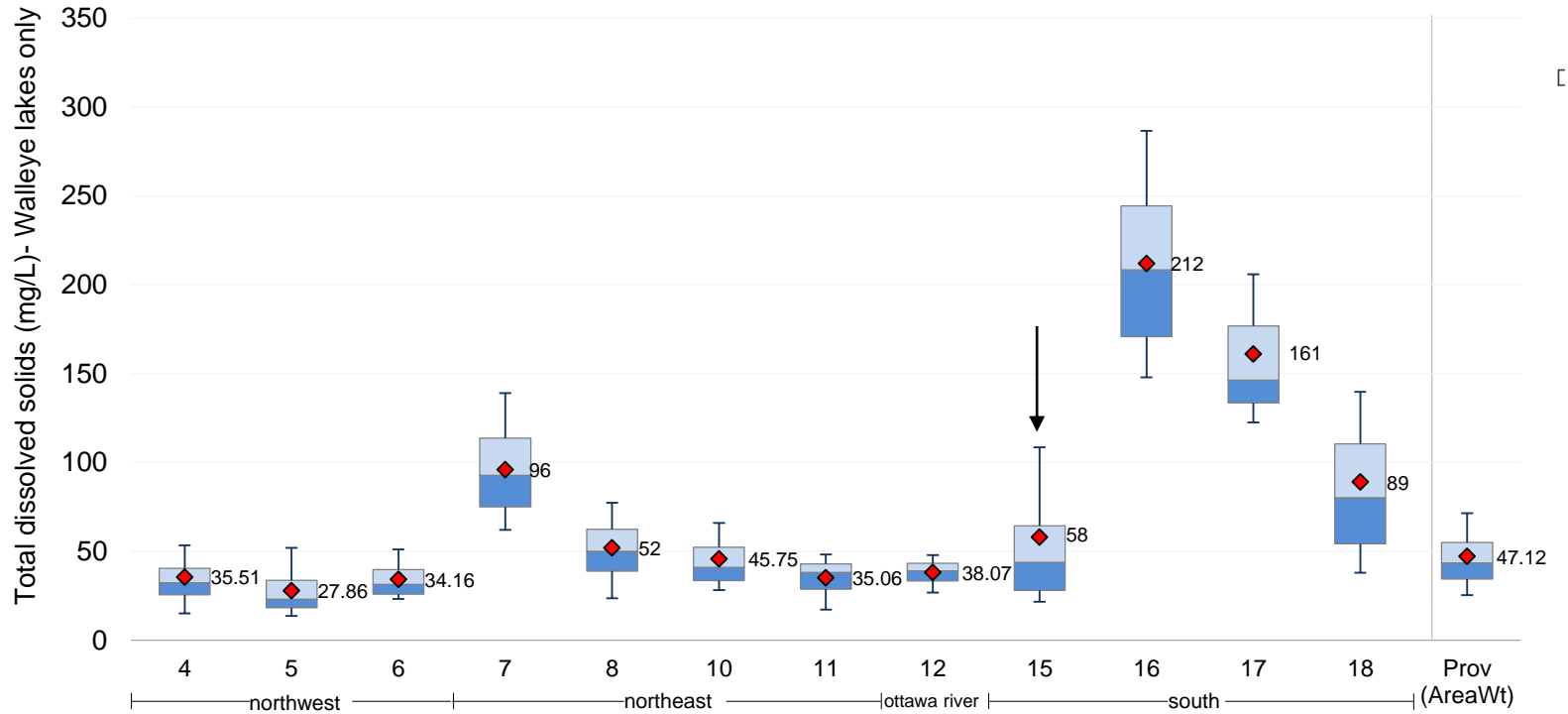
Average percent littoral area of Walleye trend lakes by FMZ, BsM Cycle 1 (redline) and cycle 2 (box plot)

Golden Lake habitat – mean depth



Average depths of Walleye trend lakes by FMZ, BsM Cycle 1

Golden Lake habitat total dissolved solids



Total dissolved solids (mg/L) of Walleye trend lakes by FMZ, BsM Cycle 1

Golden Lake Fish Community

Walleye

Smallmouth Bass

Largemouth Bass

Northern Pike

Brown Bullhead

Pumpkinseed

Yellow Perch

Rainbow Smelt

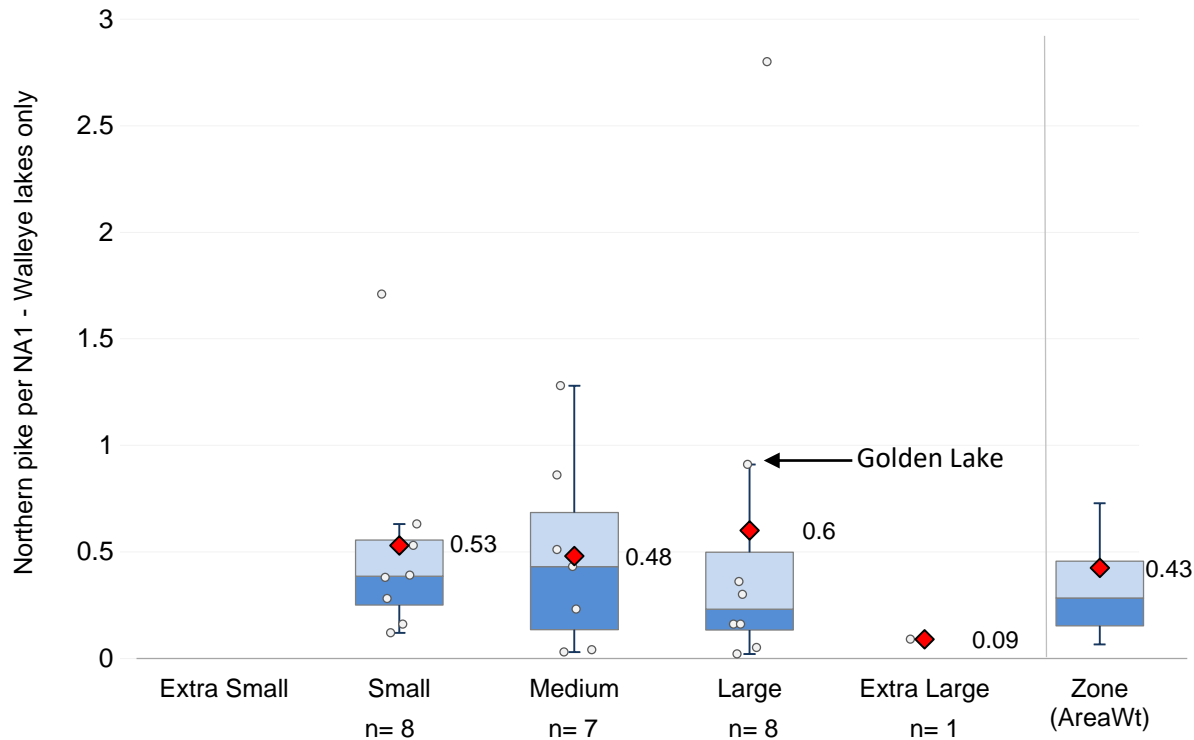
Black Crappie (2006)

Cyprinids



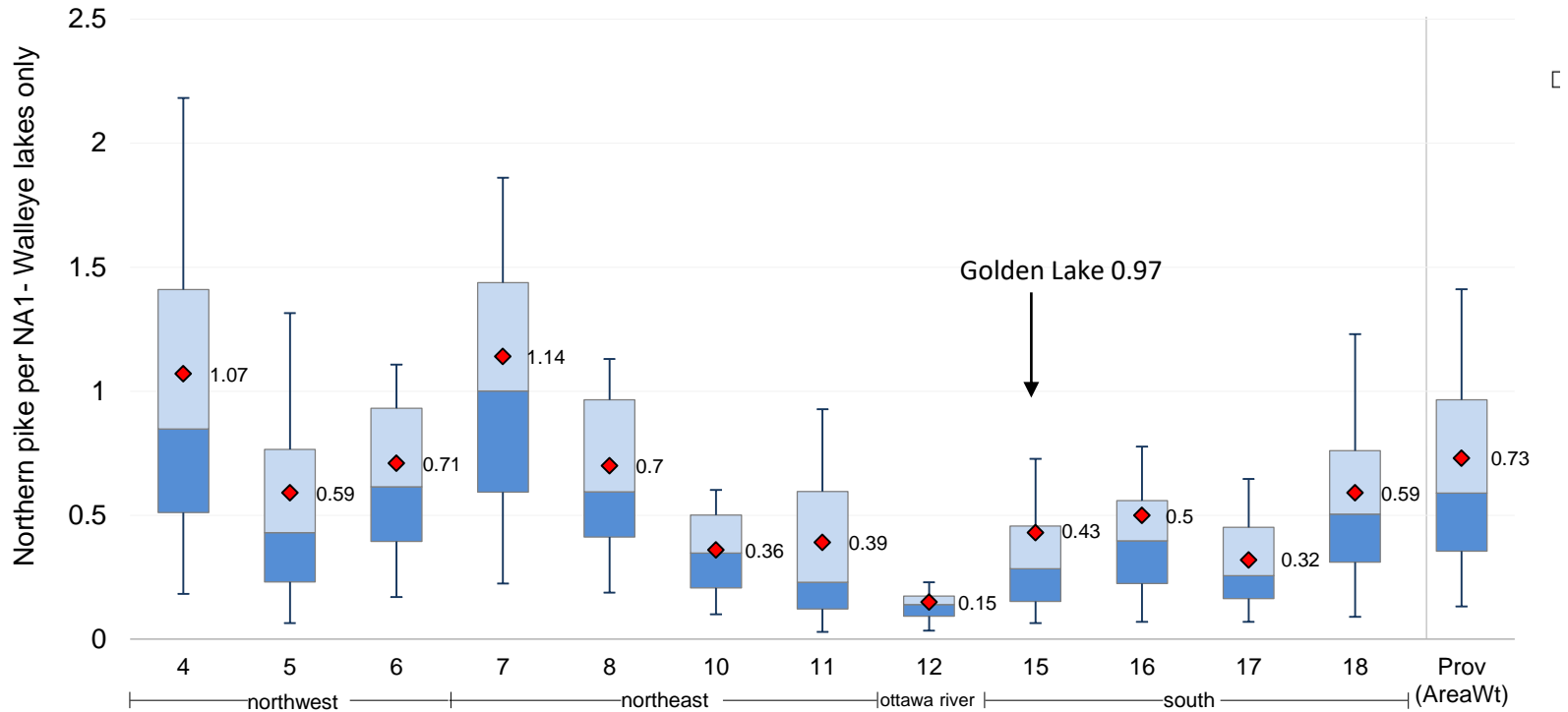
Golden Lake Fish Community

Northern Pike



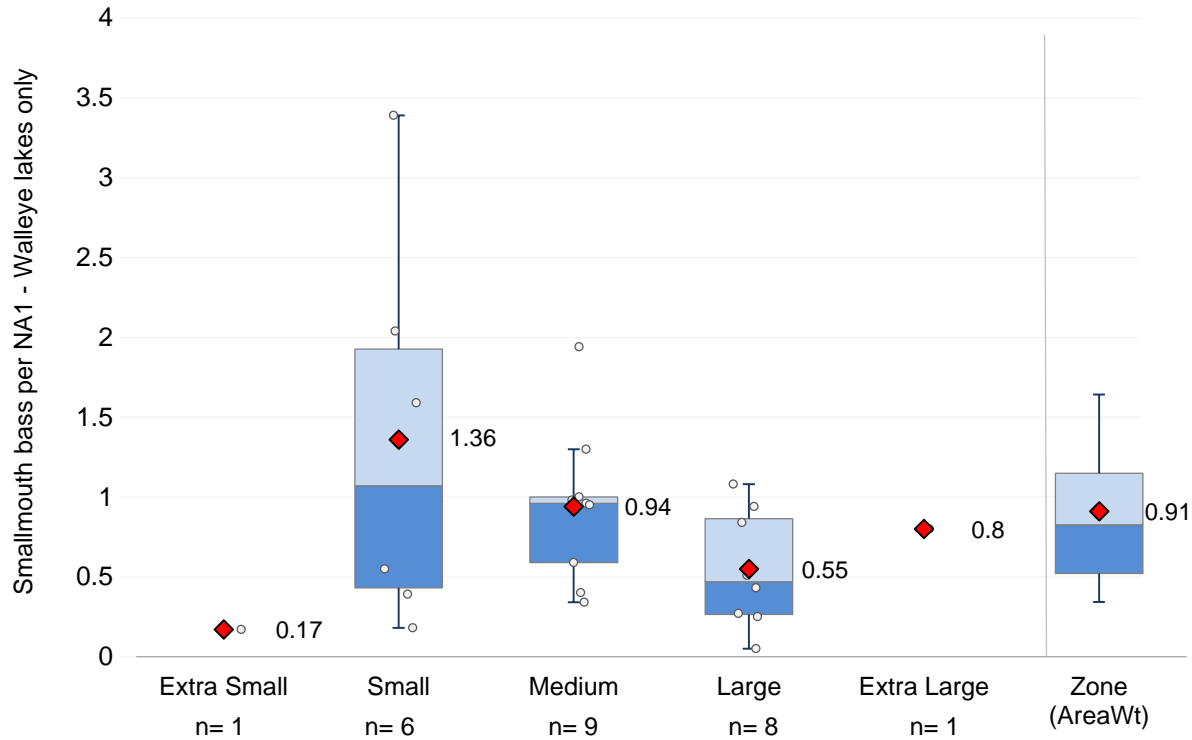
Northern Pike CUE (fish/net) for walleye trend lakes by FMZ, BsM Cycle 1

Northern Pike - CUE (fish/net)



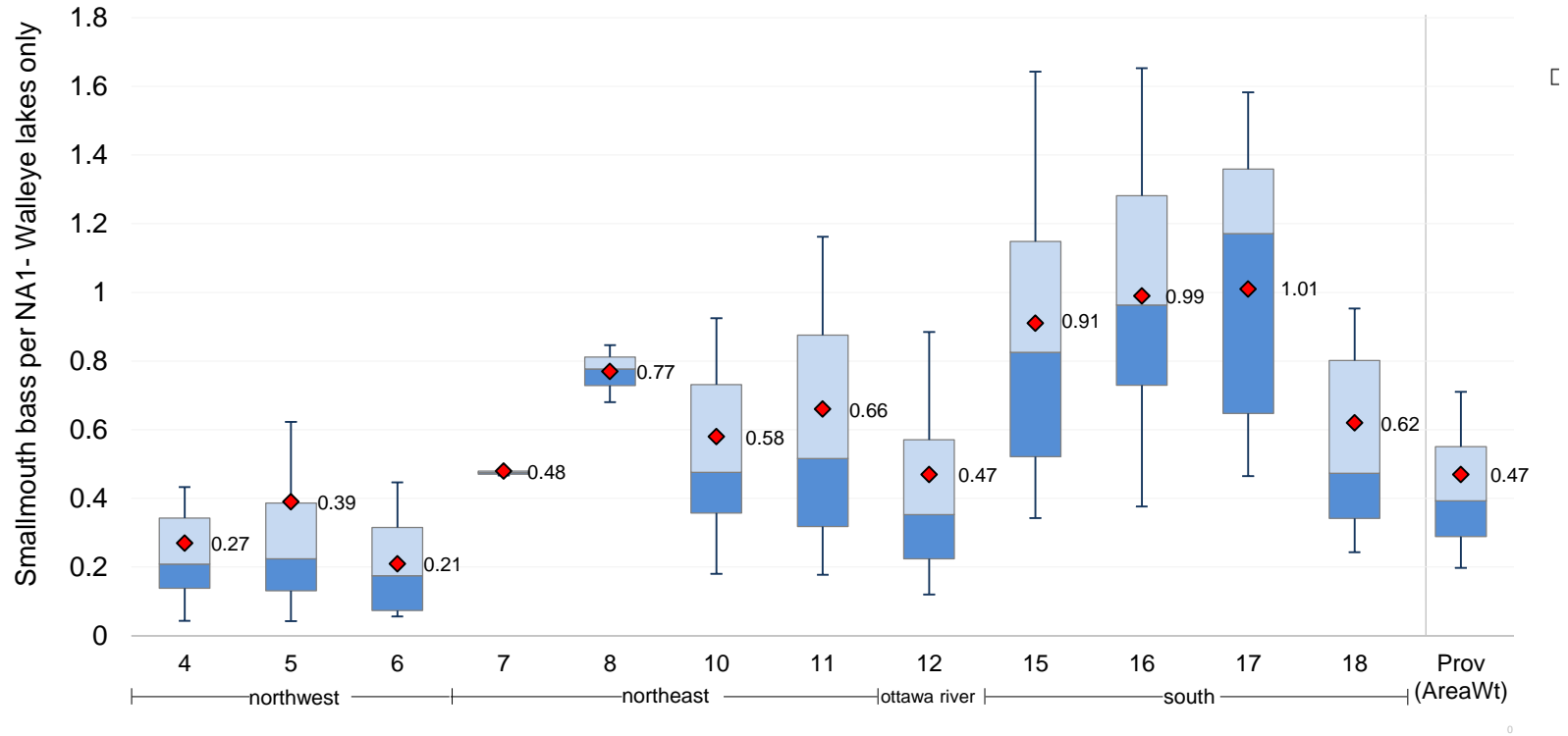
Northern Pike CUE (fish/net) for walleye trend lakes by FMZ, BsM Cycle 1

Golden Lake Fish Community Smallmouth Bass (CUE)



Smallmouth Bass CUE (fish/net) for trend lakes in FMZ 15, BsM Cycle 1

Smallmouth Bass - CUE (fish/net)



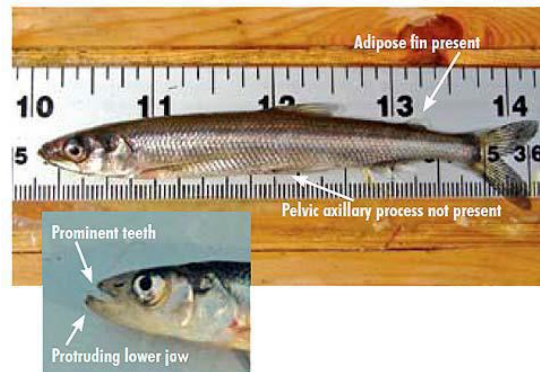
Smallmouth Bass CUE (fish/net) for walleye trend lakes by FMZ, BsM Cycle 1

Rainbow Smelt

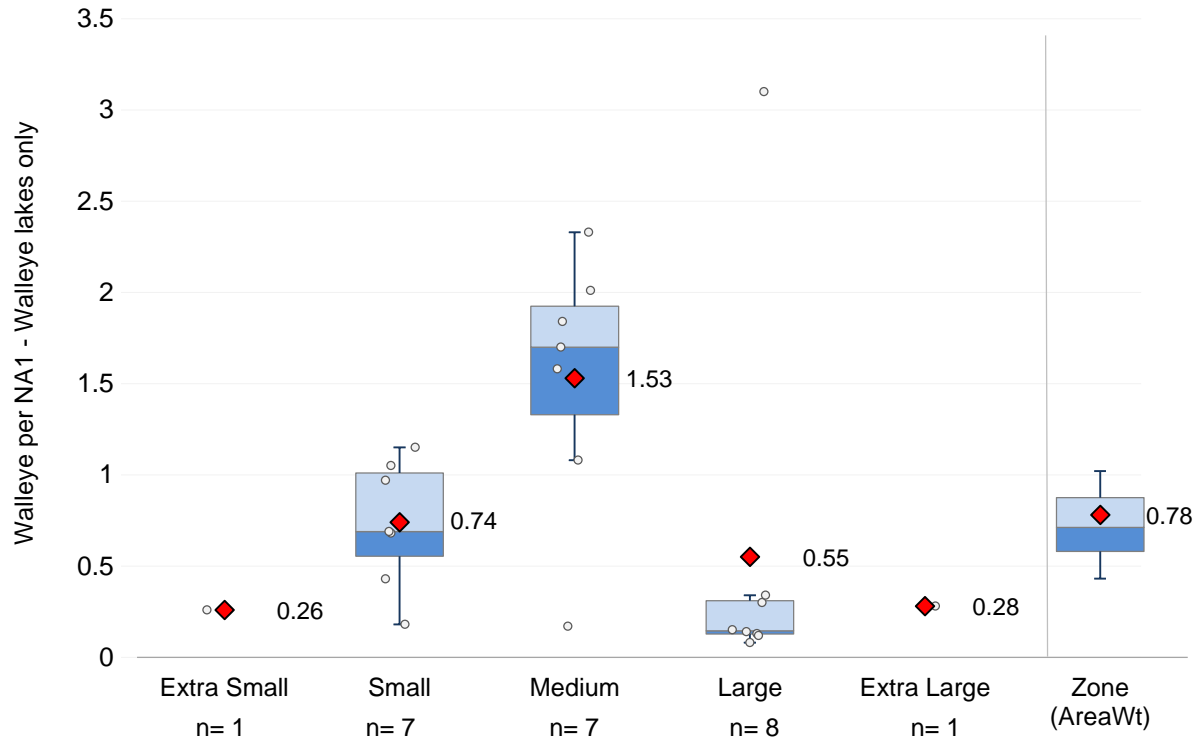


- Acoustic Work 2009 - rainbow smelt in high abundance (10,000/ha)
- Are considered an invasive species in Great Lakes and most parts of Ontario
- However isolated pockets of native smelt occur in Ontario and Quebec
 - trapped / landlocked during the recession of the Champlain Sea
- Pembroke District smelt - thought to be native to a select few waters
 - (Ottawa River, Muskrat Lake, Mink and Dore)

*Rainbow Smelt $CUE_{ave} = 20.4$ fish/net; about **40 x** higher than average for lake class size = 0.7

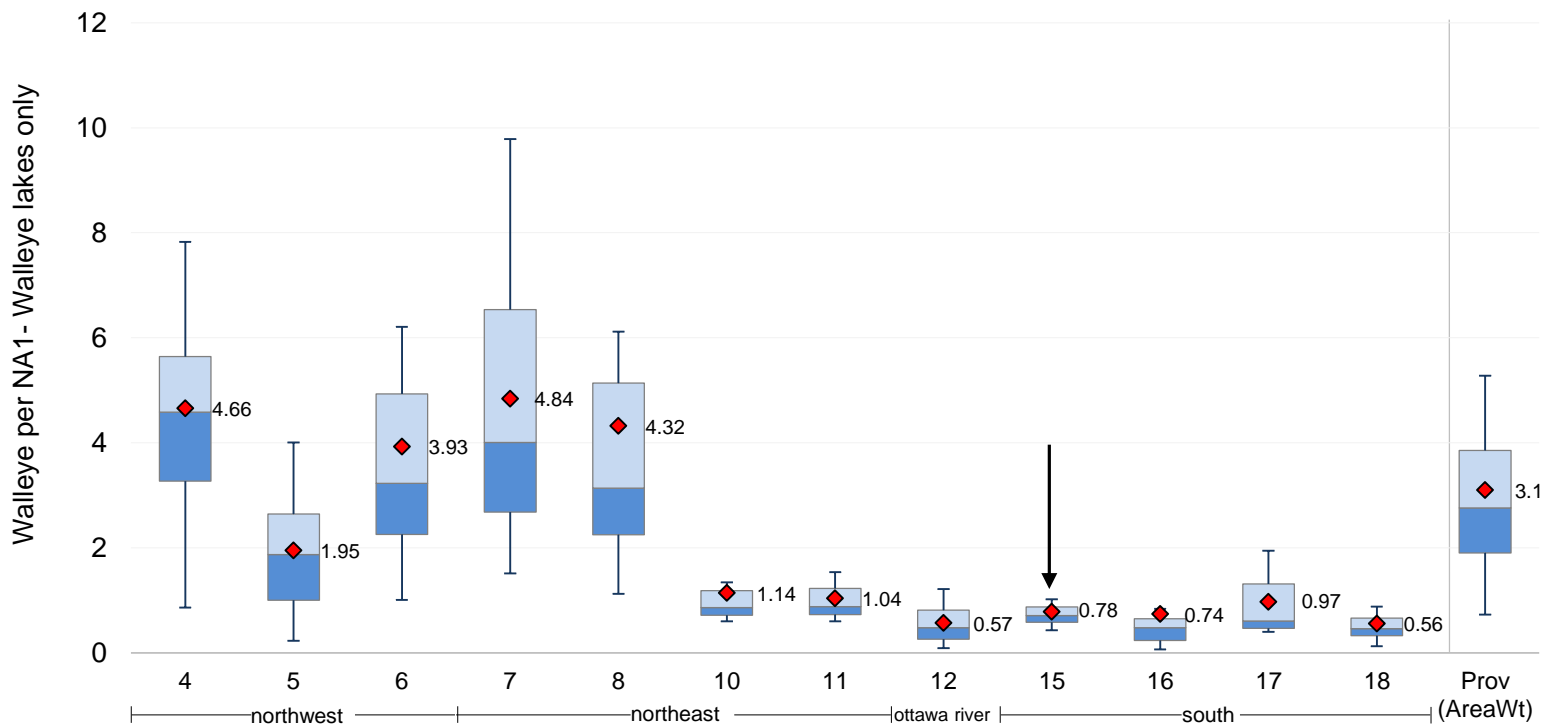


Golden Lake Fish Community Walleye



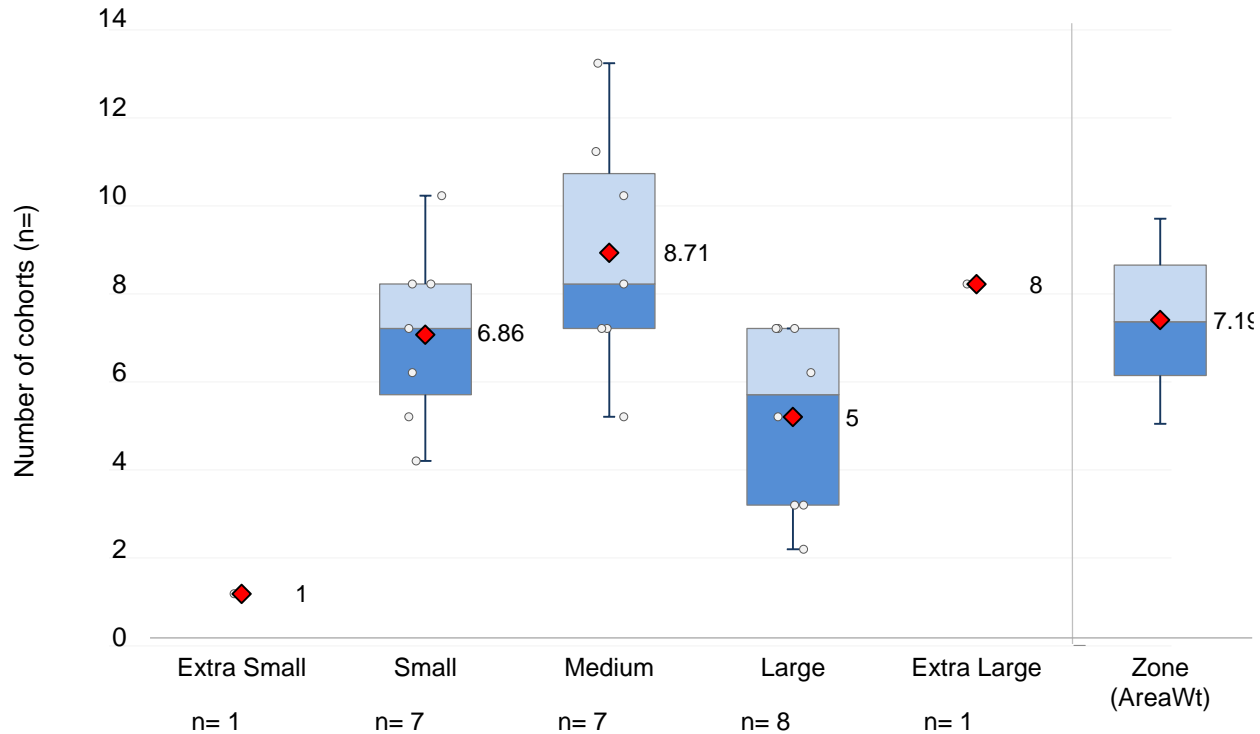
Walleye CUE (fish/net) for trend lakes in FMZ 15, BsM Cycle 1

Walleye - CUE (fish/net) across fishery zones in Ontario



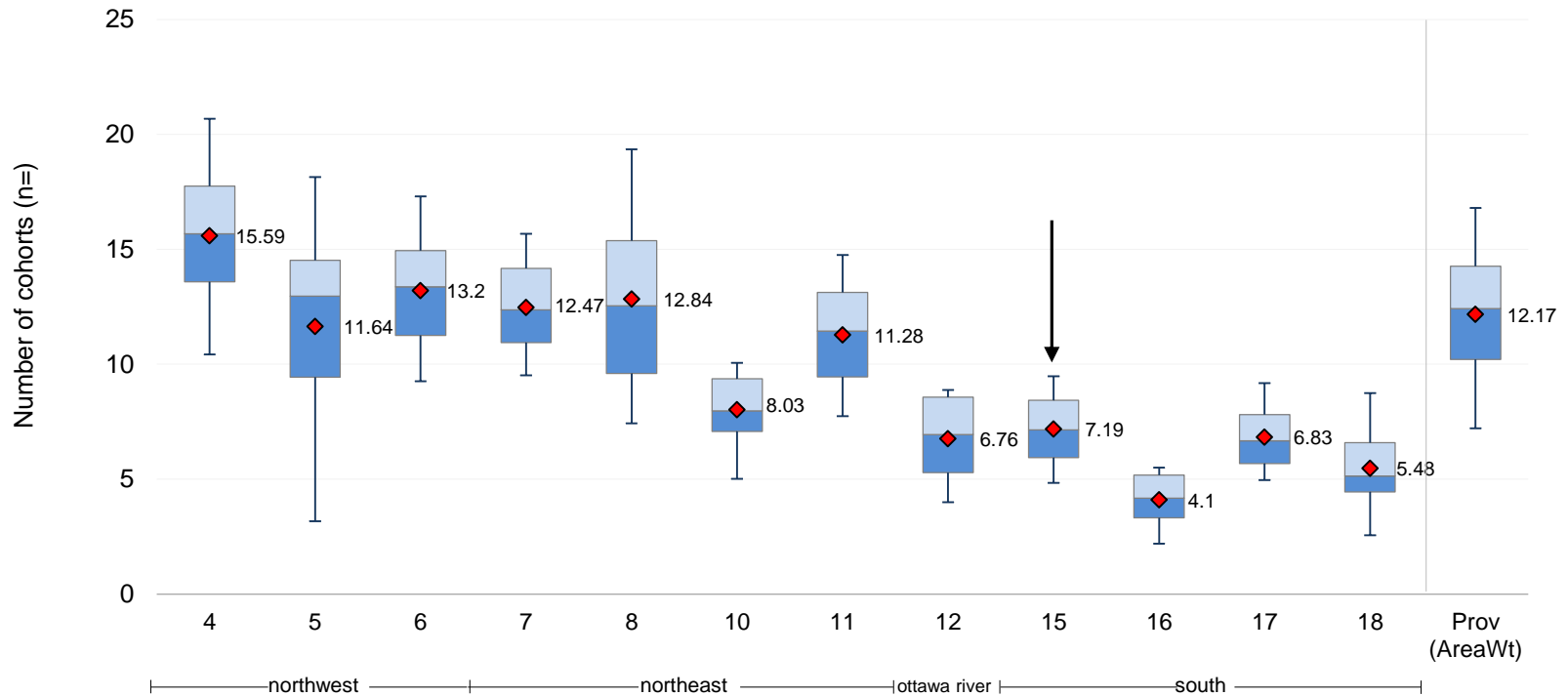
Walleye CUE (fish/net) for walleye trend lakes by FMZ, BsM Cycle 1

Golden Lake Fish Community Walleye – number of age classes



Number of walleye age classes for trend lakes in FMZ 15, BsM Cycle 1

Walleye – number of age classes for fishery zones in Ontario



Number of Walleye cohorts for walleye trend lakes by FMZ, BsM Cycle 1

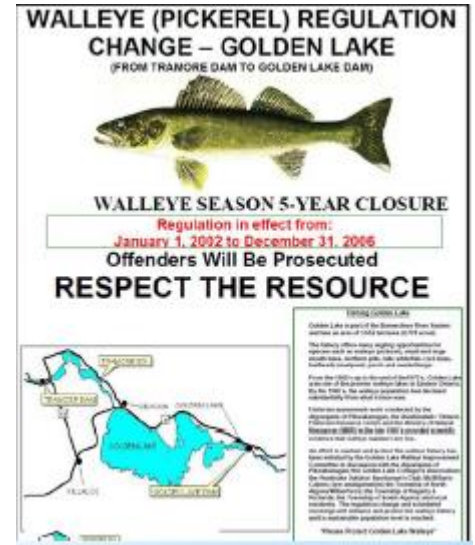
Walleye history (as we know it)



- Walleye introduced in 1922 by Department of Lands & Forests
- Stocked 21 times between 1922 and 1954 with eggs, fry and fingerlings
- Walleye population thrived in the 1960's and 70's
- Population steadily declined since the 1980's
 - Possible causes
 - Changes to lake productivity (Killaloe sewage plant install, likely less nutrient effluent)
 - Changes in water management (less littoral zone)
 - Migration through dams (e.g. Tramore)
 - Over harvest and high angling pressure
 - Changes to fish community

Walleye Assessments

- Walleye Watch
- Various angler creels
- Netting (FWIN, ESTN, NSCIN, BsM)
- Adult tagging
- Electrofishing for fry
- Most recent assessment - Broadscale Monitoring Program
 - Lake sampled in 2009 (cycle 1) and 2015 (cycle 2)
 - Landscape approach to fisheries assessment



Management Actions

Lake Closure

- Five Year Moratorium imposed (2002-2007)

New Walleye Regulation

- Imposed 2007
- 2-fish limit & 50 cm minimum size restriction

Walleye stocking

- 130,994 fingerlings stocked (2003-2005)
- 2K fall fingerlings stocked in 2014

WALLEYE (PICKEREL) REGULATION CHANGE – GOLDEN LAKE
(FROM TRANORE DAM TO GOLDEN LAKE DAM)

WALLEYE SEASON 5-YEAR CLOSURE
Regulation in effect from:
January 1, 2002 to December 31, 2006
Offenders Will Be Prosecuted
RESPECT THE RESOURCE

SPRING CLOSURE
Golden Lake is part of the Simcoe River System and is one of 100 lakes in the province. The Ministry of Natural Resources and Forestry is responsible for the management of the Simcoe River System. Golden Lake is a valuable resource and is closed to fishing from January 1, 2002 to December 31, 2006. This closure is necessary to protect the walleye population and to allow for the implementation of a new management plan for the lake. The closure will be in effect from January 1, 2002 to December 31, 2006. Offenders will be prosecuted. Respect the resource.

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Broadscale (BsM) Assessment 2015

Walleye captured in large-mesh nets

- Length (ave) 600 mm
- Age (years) 5(2), 6(2), 10(1)
- $CUE_{recruits}$ 0.11
- CUE recruits 0.23 kg/ha
- $CUEW_{proportion}$ 0.04 (proportion of biomass (4%) in nets that was walleye)

Comments

- $CUE_{recruits}$ (0.11) less than lake class average for the zone (0.19)
- $CUEW_{recruits}$ (0.23) = lake class average
- $CUEW_{proportion}$ (0.04) was half the value for lake-class zone average (0.08 or 8%)

*Rainbow Smelt CUE = 20.4 fish/net; **40 x** higher than average for lake-class size = 0.7

So...moving forward?



Moving Forward - #1

Biological and Habitat Considerations

- Lake-specific approach versus a landscape approach
- Is the habitat still suitable (water clarity, productivity, quality of spawning sites)
- Significant change in fish community
 - exponential growth of smelt population
 - Complex fish community (pike, smallmouth and largemouth bass, muskellunge)
 - Competition for space and food resources with other top predators
 - Climate change – many walleye lakes in south and central Ontario may be lost

Moving Forward - #2

Stocking Considerations

- Lake-specific approach versus a landscape approach
- How many years to stock (rehabilitation vs. supplemental stocking)?
 - Low productivity of walleye in donor lakes
- MNRF stocking policy does not support supplemental stocking
- Stocking guidelines recommend a maximum of 400 adult fish being transplanted each year from a source lake
- Cost of annual transfers
- Things to consider
 - Number of adult fish that would need to be transferred (source?)
 - How many stocking sources (lakes) to use?
 - Number of transfer events
 - Need enough walleye to reduce smelt population to support walleye recruitment
 - Season closure or lake closure
 - Regulations post re-establishment (if successful)

Moving Forward - #3

Changes to Walleye Regulations

Regulation Considerations:

- Will need agreement from all parties to restore and support a regulation change and/or closure
- Season closure or lake closure
- No “quick fix”, given the complex fish community, and many social aspects
- Need for changing regulations for bass (i.e. encouraging bass angling)

Options moving forward:

- Monitoring – beyond BsM (tagging/telemetry, spawning assessments, diet studies?)