



Relative Abundance of Invasive Fish Species in
Ontario Ministry of Natural Resources
Lake Erie Management Unit
Assessment Programs

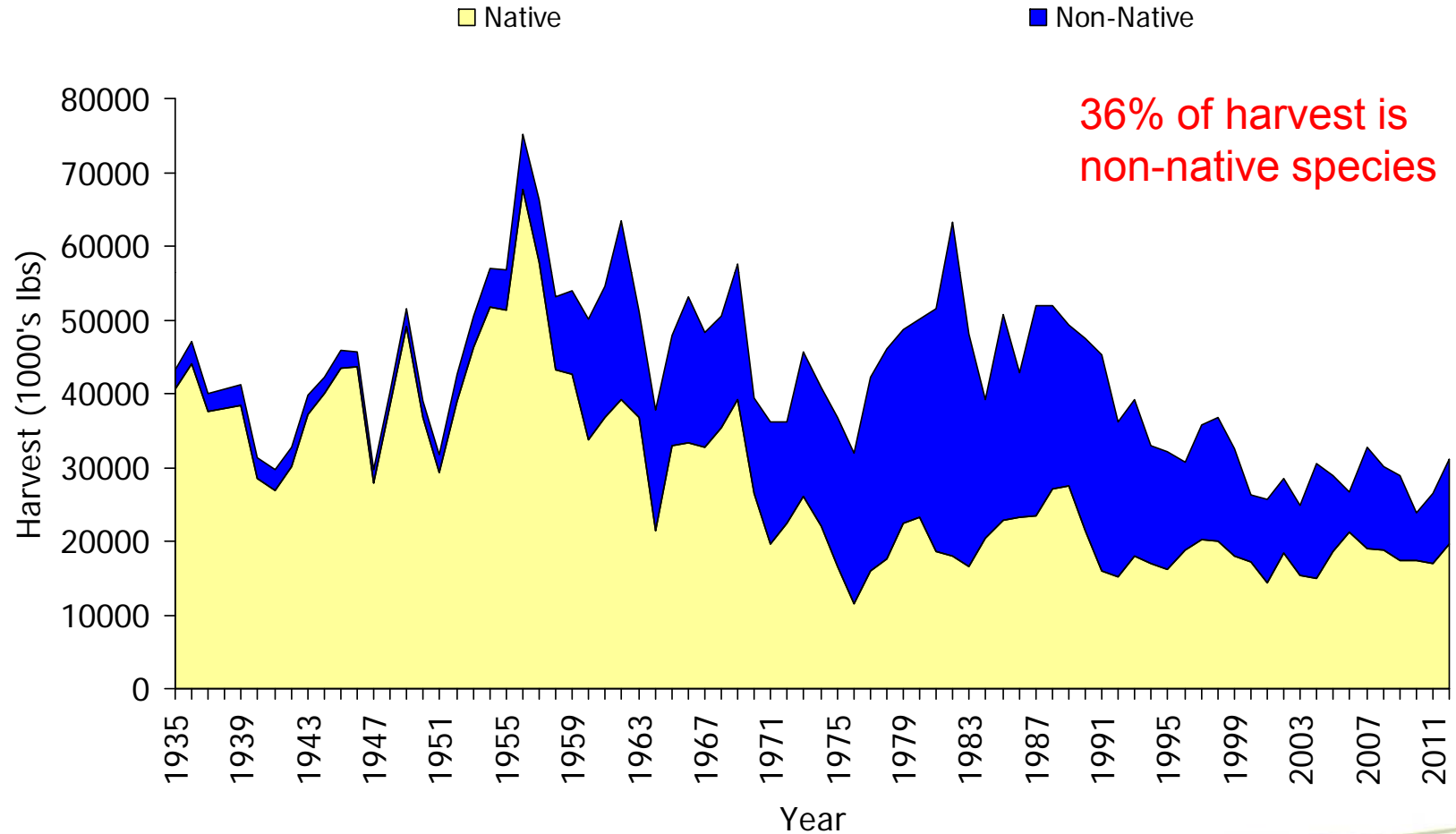
Megan Belore, Larry Witzel, Andy Cook, Brian Locke

Some Introduced Fish Species

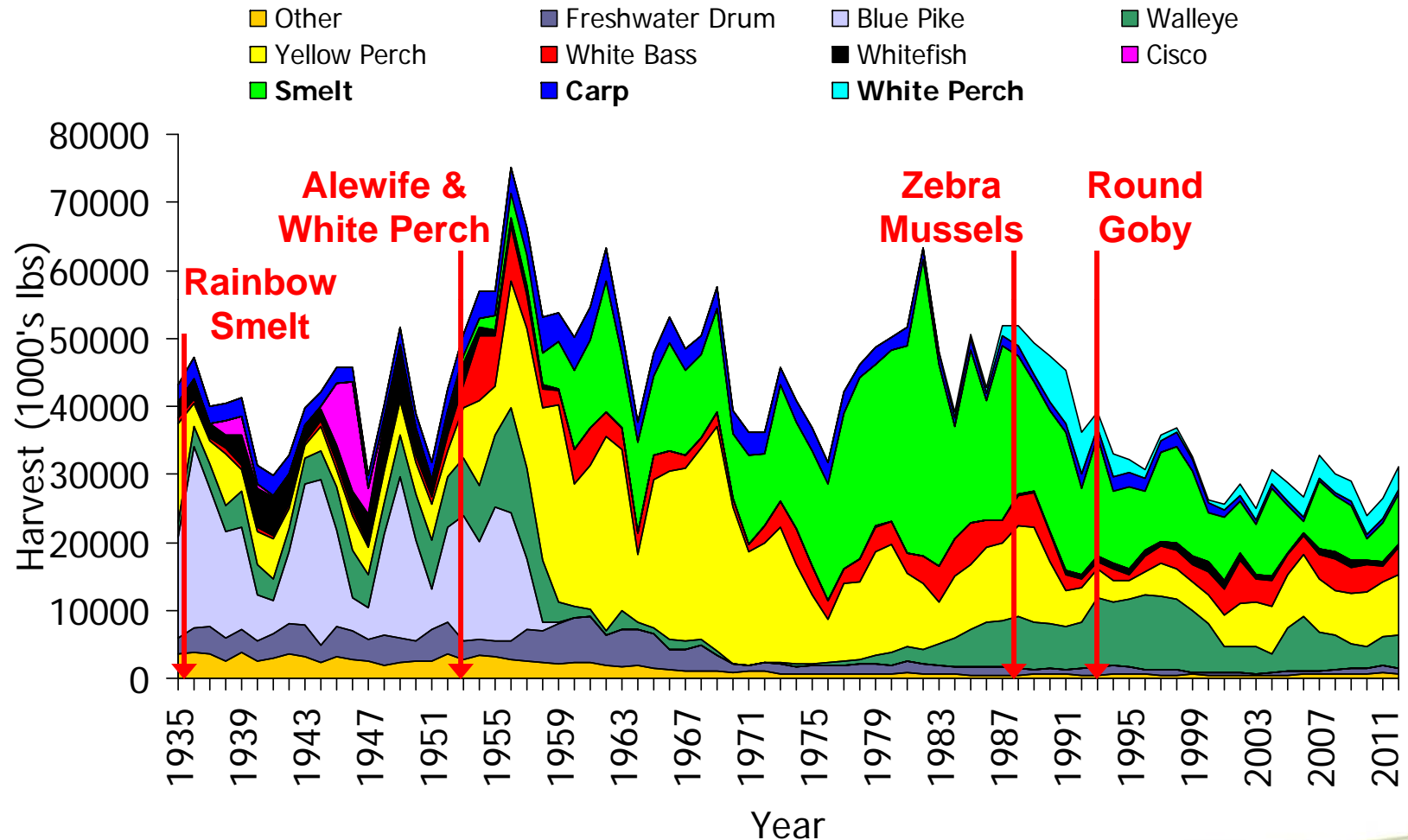
- ~23 reproducing introduced fish species in Lake Erie
- >100 native fish species
- Introduced species impact competition, predation, reproduction, habitat, and trophic pathways

Species	Introduction Date
Chinook Salmon	1873
Common Carp	1896
Rainbow Trout	1895
Sea Lamprey	1921
Rainbow Smelt	1935
Alewife	1953
White Perch	1953
Coho Salmon	1969
Pink Salmon	1979
Brown Trout	1982
Round Goby	1993
Tube-nose Goby	1996

Lakewide Commercial Harvest



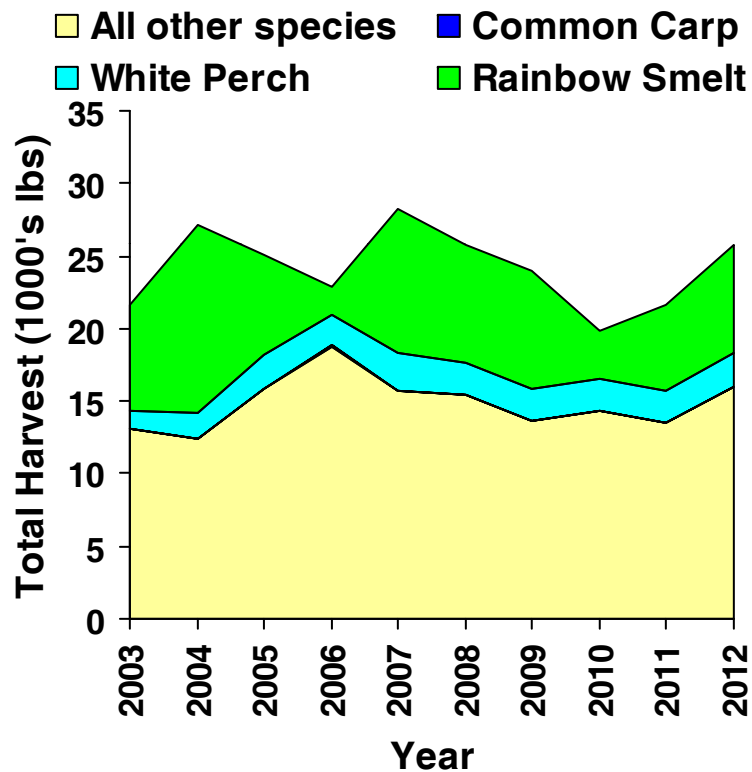
Lakewide Commercial Harvest



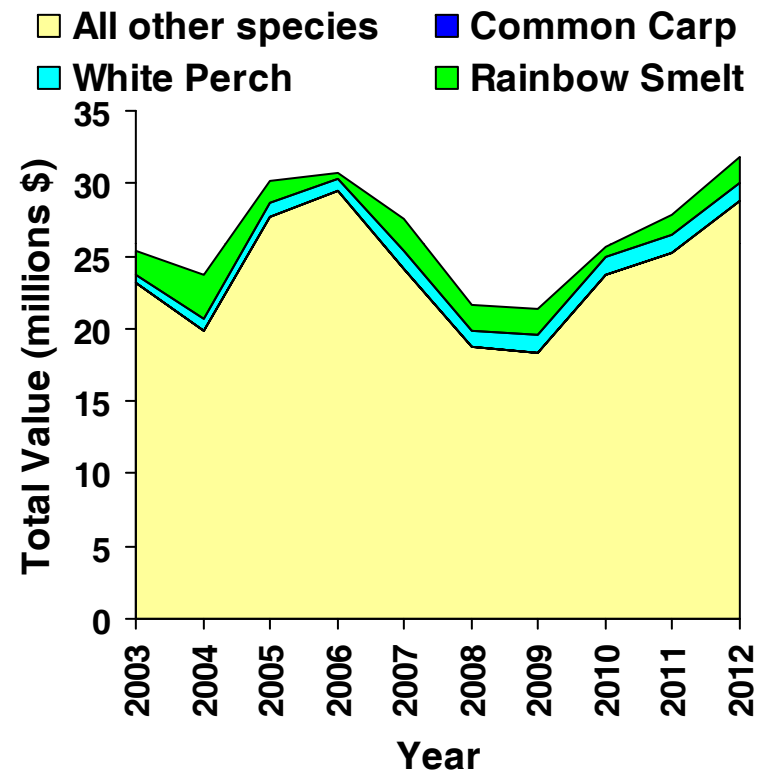
From: Baldwin, N. A., R. W. Saalfeld, M. R. Dochoda, H. J. Buettner, and R.L. Eshenroder. Commercial Fish Production in the Great Lakes 1867-2006. <http://www.qlfc.org/databases/commercial/commerc.php>



Ontario Commercial Harvest



38% of harvest is non-native species



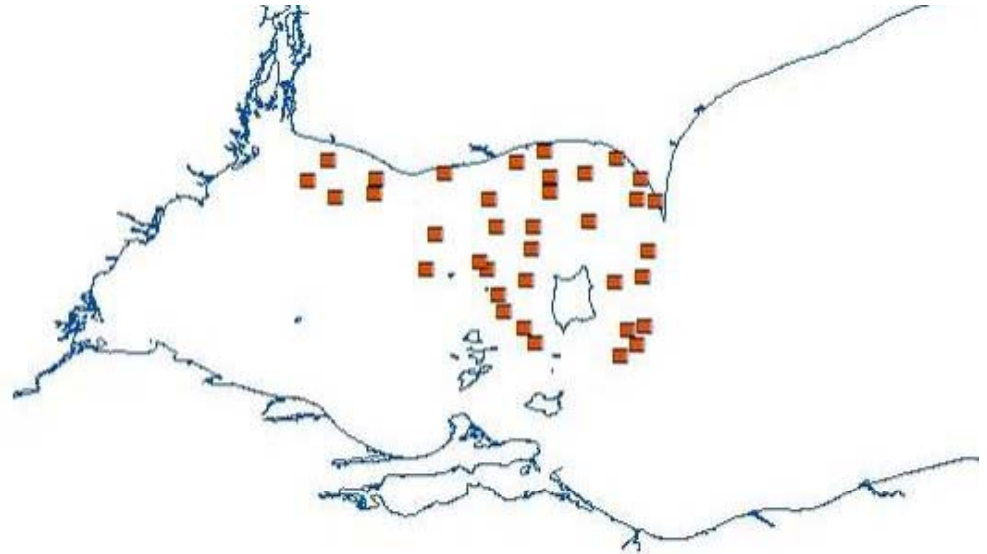
10% of value is from non-native species

Assessment Surveys

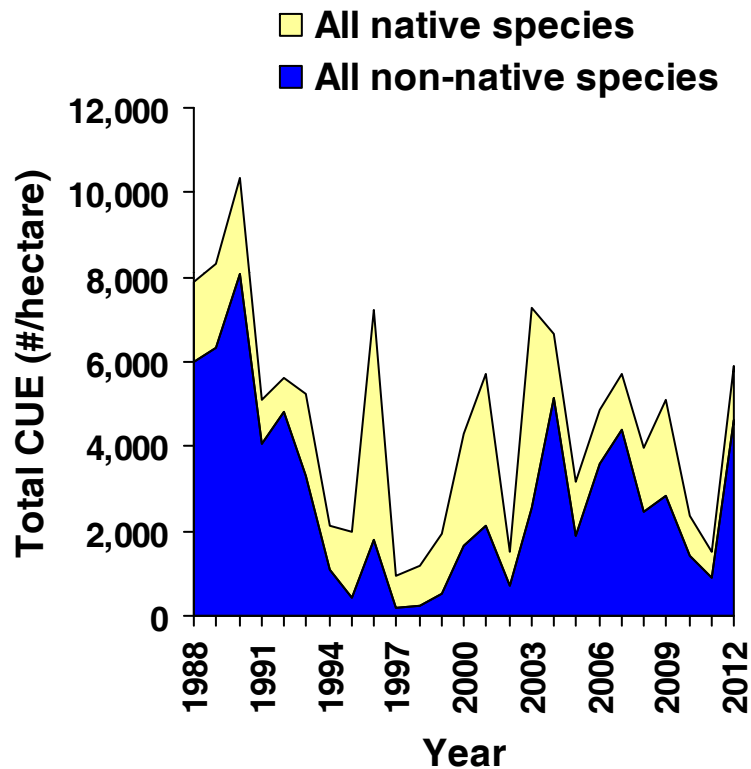
- MNR LEMU operates several programs that include AIS surveillance
 - West basin bottom trawl
 - Lake wide partnership gill net
 - Long Point Bay trawl
 - Long Point Bay gill net

West Basin Trawl

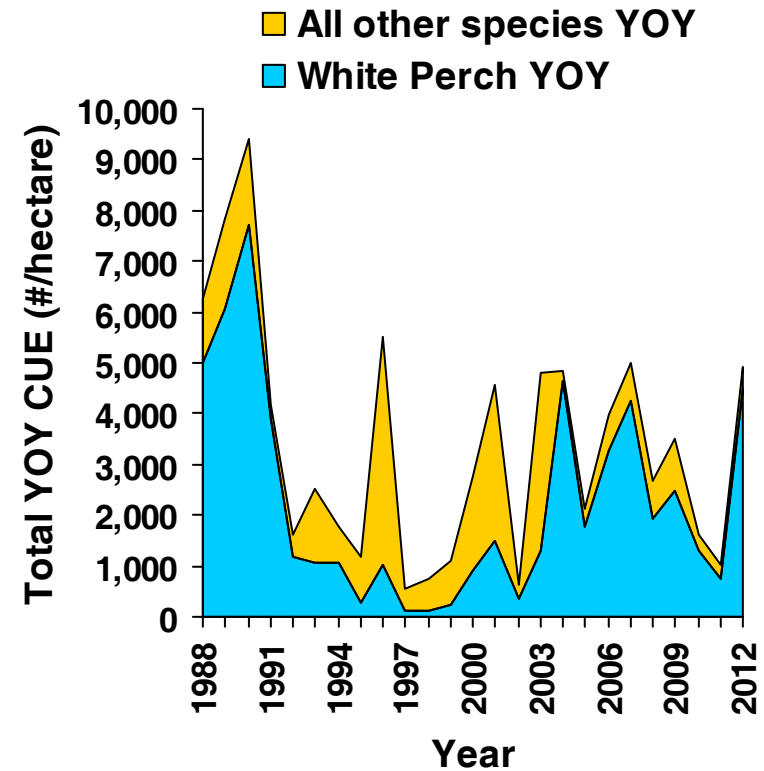
- 10 minute bottom trawl in west basin
- ½ inch cod end
- August, 1988 – present
- 36 fixed sites
- Used to estimate abundance of juvenile and forage fish



West Basin YOY Trawl



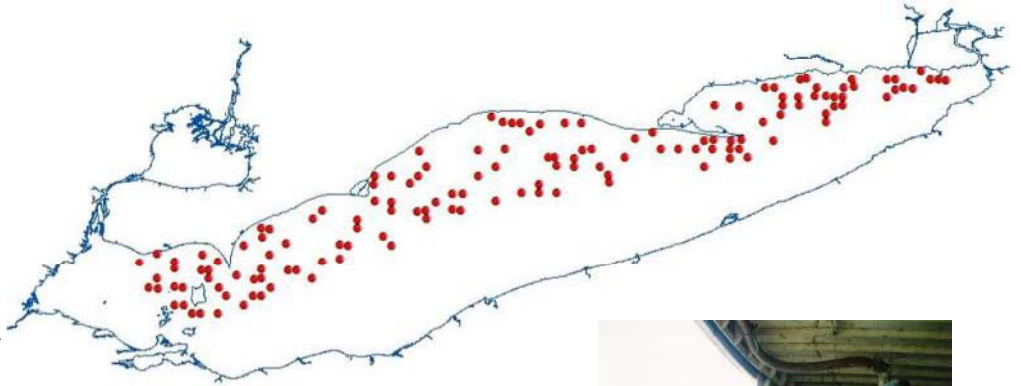
64% of all ages catch is non-native
(78% in 2012)



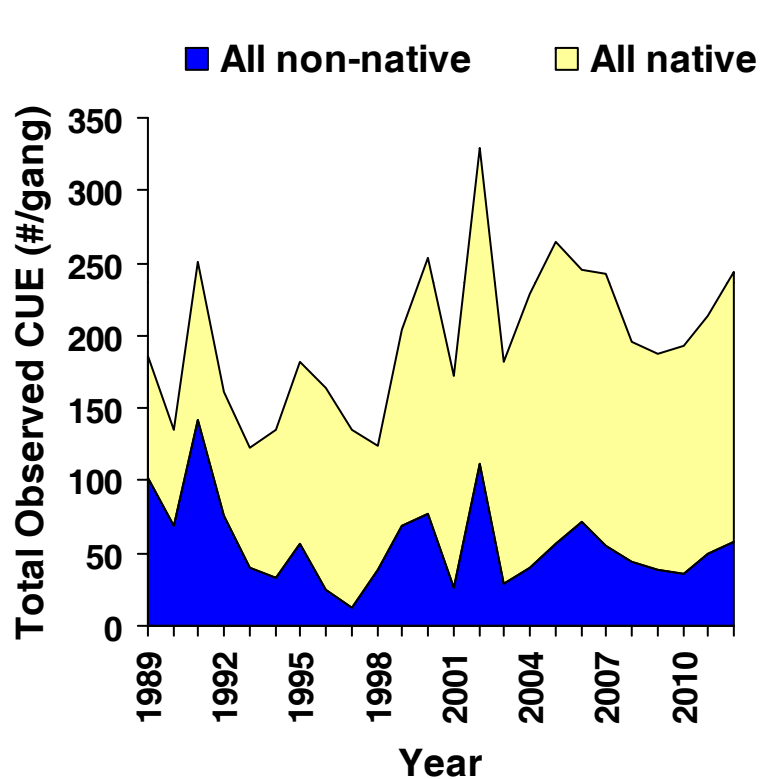
76% of YOY catch is white perch
(91% in 2012)

Partnership Gill Net Survey

- Lakewide gill net survey done in partnership with the Ontario Commercial Fisheries Association
- Late August to October, 1989 – present
- Number of sites varies by year (58 – 144)
- Stratified random survey with canned and bottom nets
- Mesh size ranges from 32 mm to 152 mm
- Used to estimate abundance of adult fish

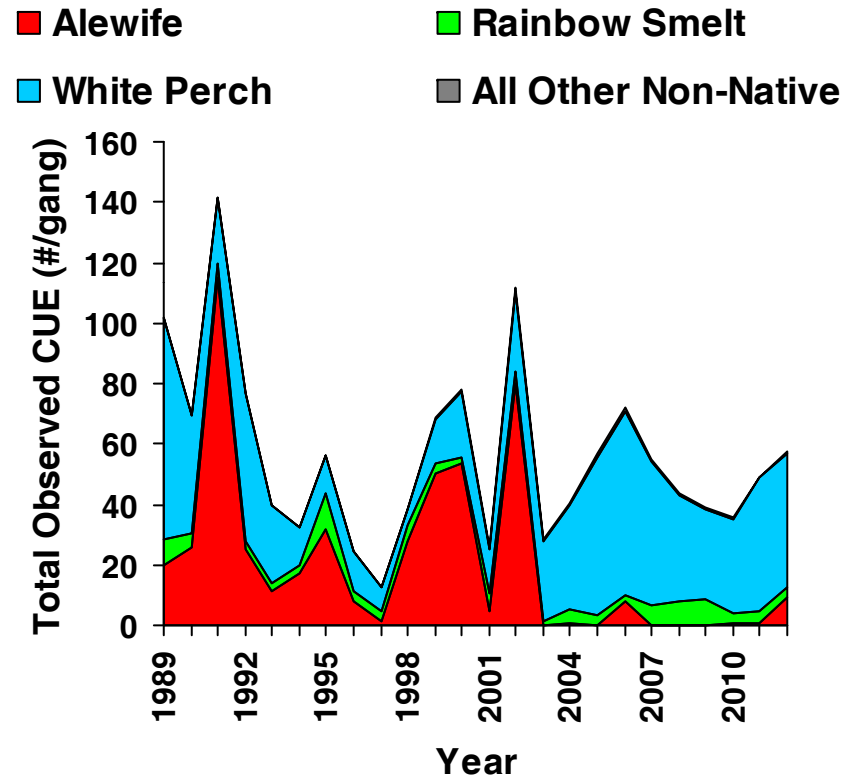


Partnership Gill Net Survey



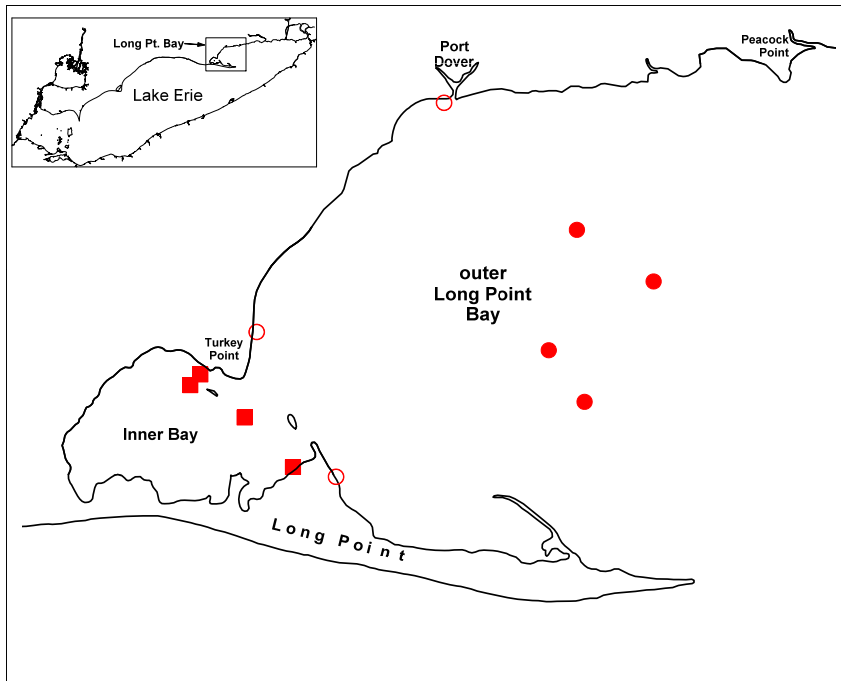
All Catch

21% of catch is non-native



Invasive Species Catch

Long Point Bay Trawl

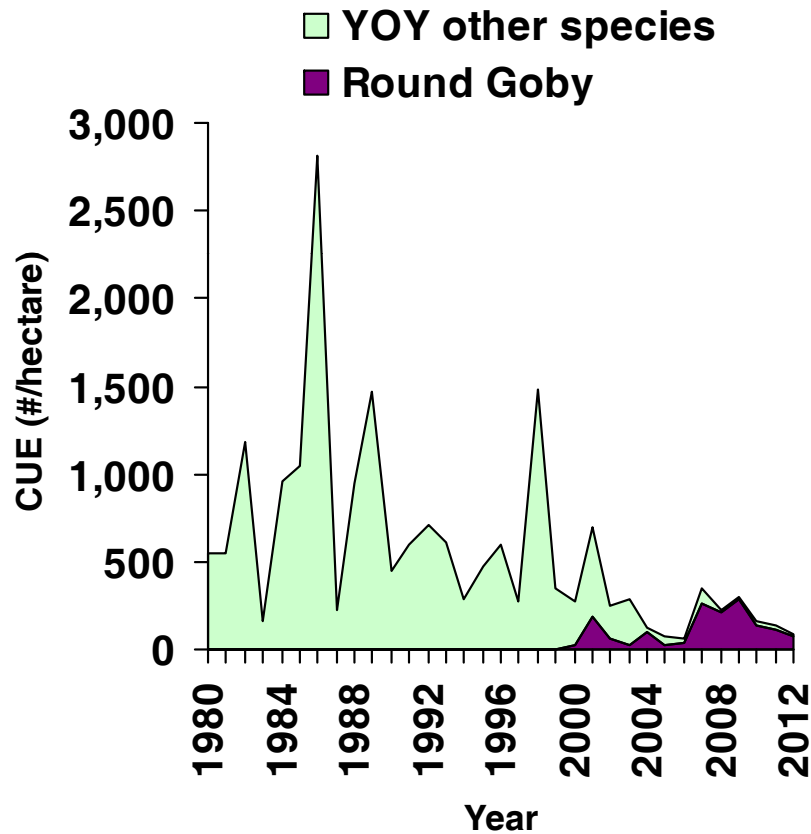


- Inner LPB trawl
- Nearshore Outer LPB Trawl
- Offshore Outer LPB Trawl

- Three surveys
 - Inner
 - Nearshore outer
 - Offshore outer
- September to October
- To assess juvenile and forage fish



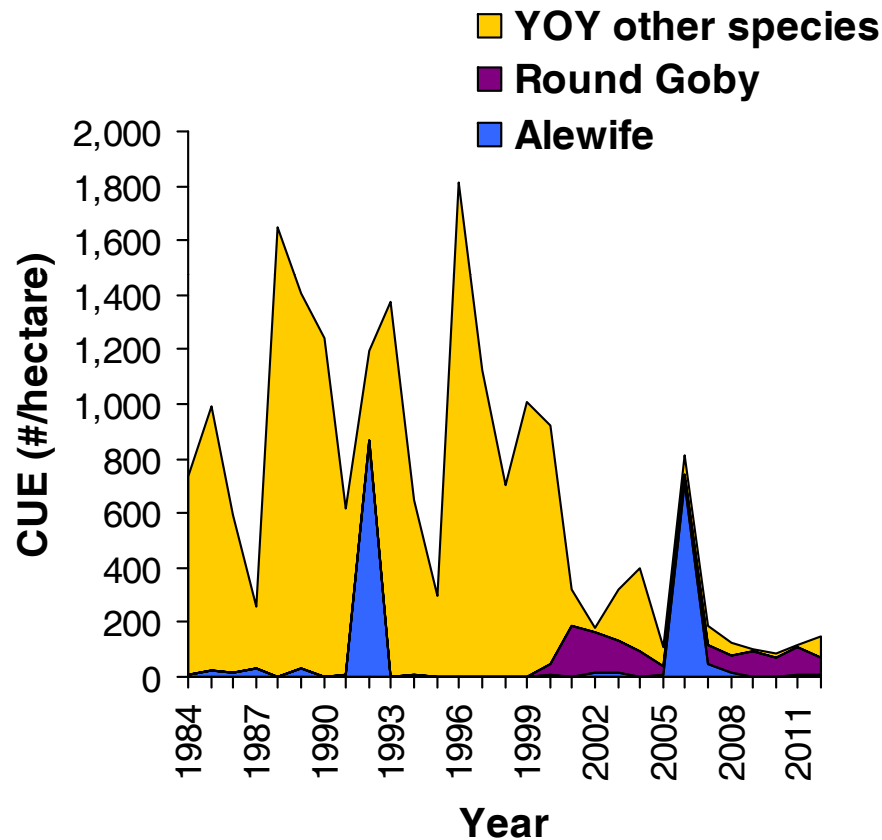
Long Point Bay Trawl



Inner LPB Trawl

- Round Goby
 - First appeared in 1999
 - 69% of catch (2003-12)
 - 91 % of catch (2012)

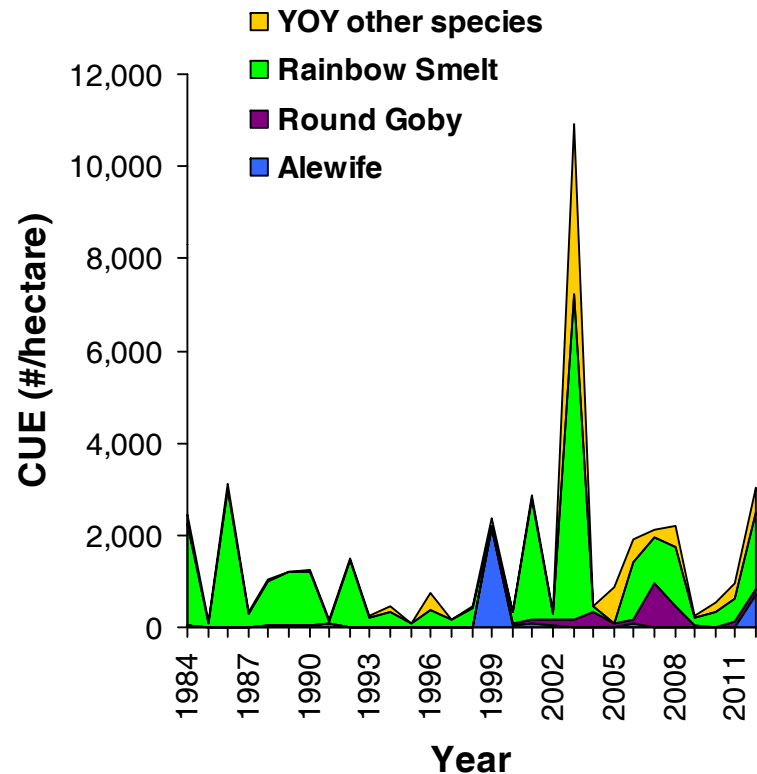
Long Point Bay Trawl



Nearshore Outer LPB Trawl

- Round Goby
 - First appeared in 1999
 - 48% of catch (2003-12)
 - 46 % of catch (2012)
- Alewife
 - 15% of catch (2003-12)
 - 4 % of catch (2012)
- Total AIS
 - 63% of catch (2003-12) vs. 9% (1984-93)

Long Point Bay Trawl

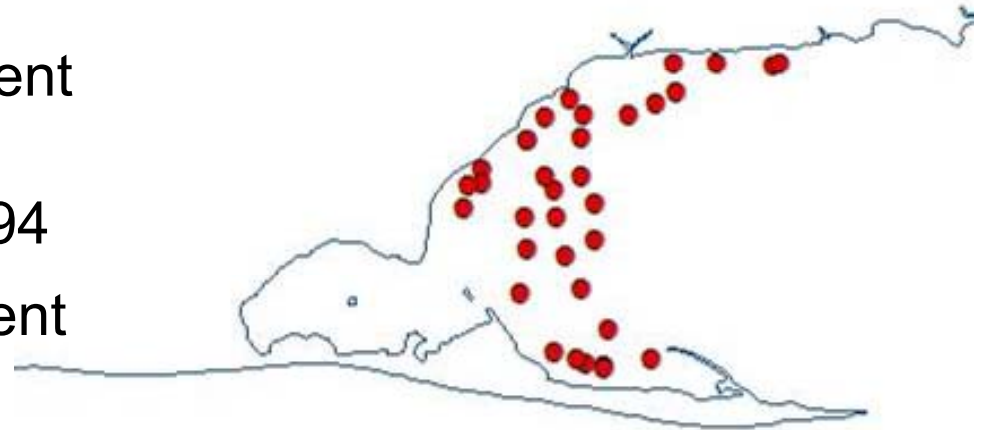


Offshore Outer LPB Trawl

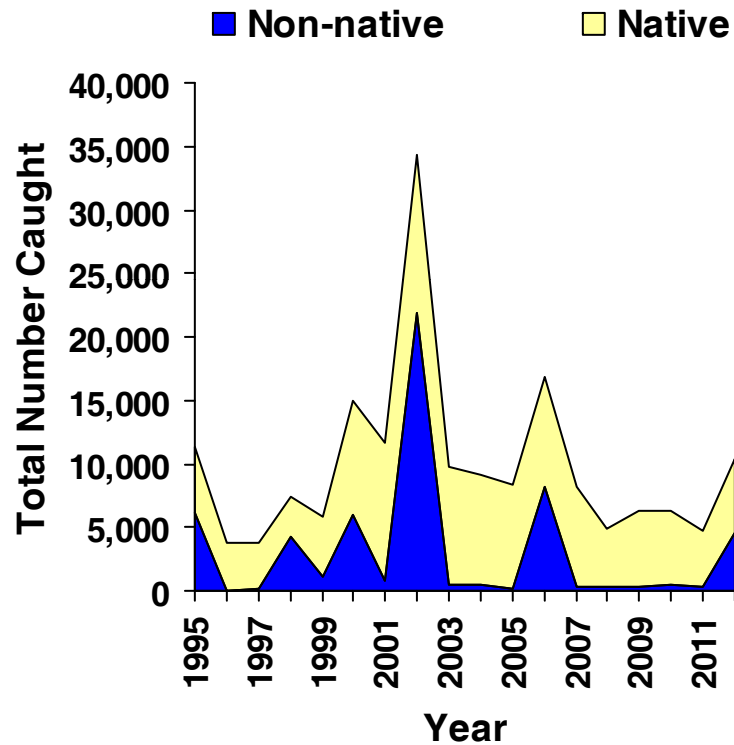
- Round Goby
 - First appeared in 1999
 - 19% of catch (2003-12)
 - 4 % of catch (2012)
- Alewife
 - 3% of catch (2003-12)
 - 23 % of catch (2012)
- Rainbow Smelt
 - 49% of catch (2003-12)
 - 55 % of catch (2012)
- Total AIS
 - 71% of catch (2003-12)

Long Point Bay Gill Net

- June – August, 1986 – present
- Transitioned from multi to monofilament nets 1991-1994
- Only data from 1995 – present shown
- 40 sites
- Mesh sizes 32 mm to 152 mm
- Used to estimate abundance of adult fish

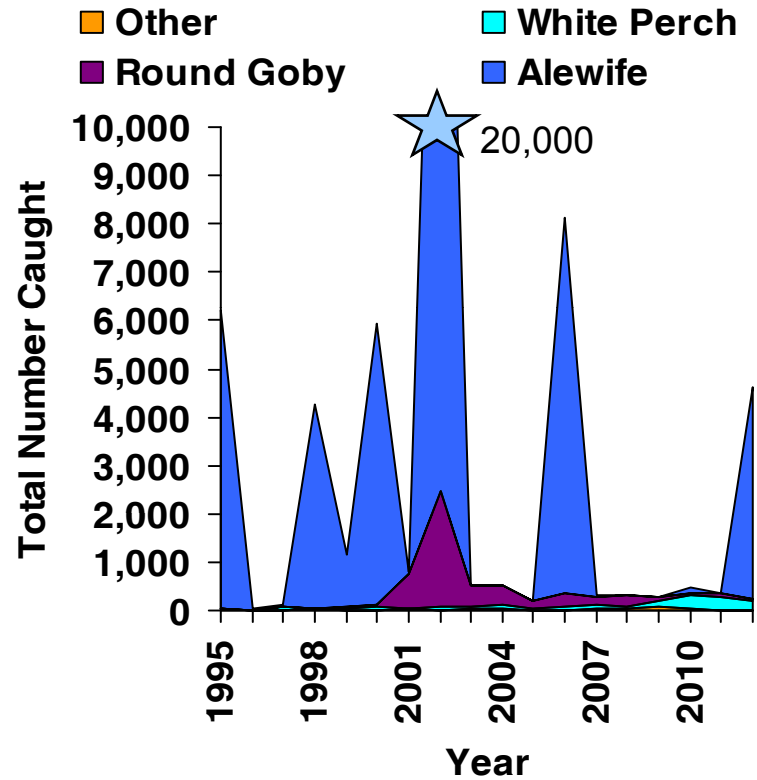


Long Point Bay Gill Net



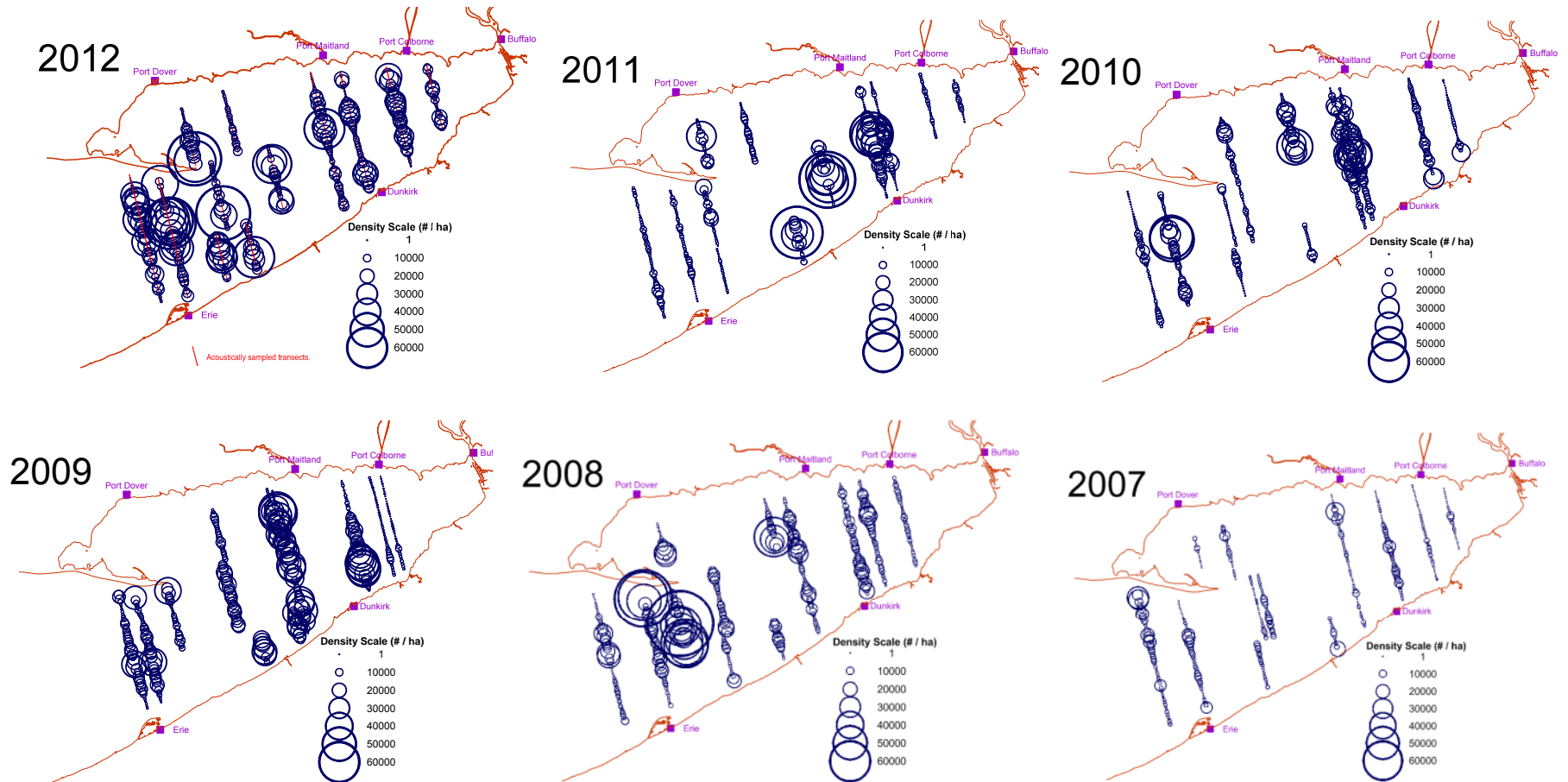
All Catch

14% of catch is non-native
(44% in 2012)



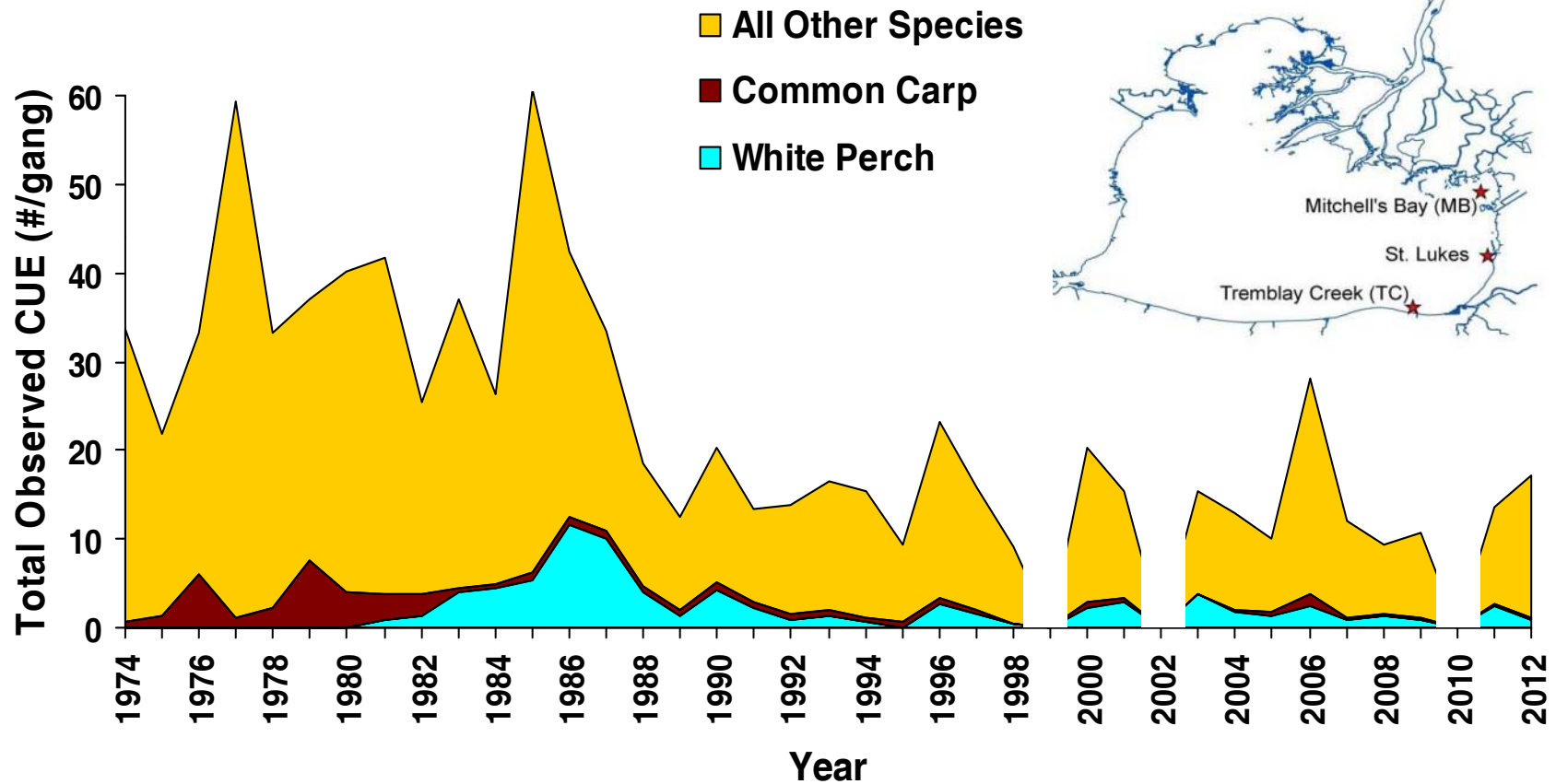
Invasive Species Catch

East Basin Hydroacoustics



Total forage fish (YAO-Smelt size) densities along 800-m segments of East Basin
Acoustic Transects

Lake St. Clair Trap Net



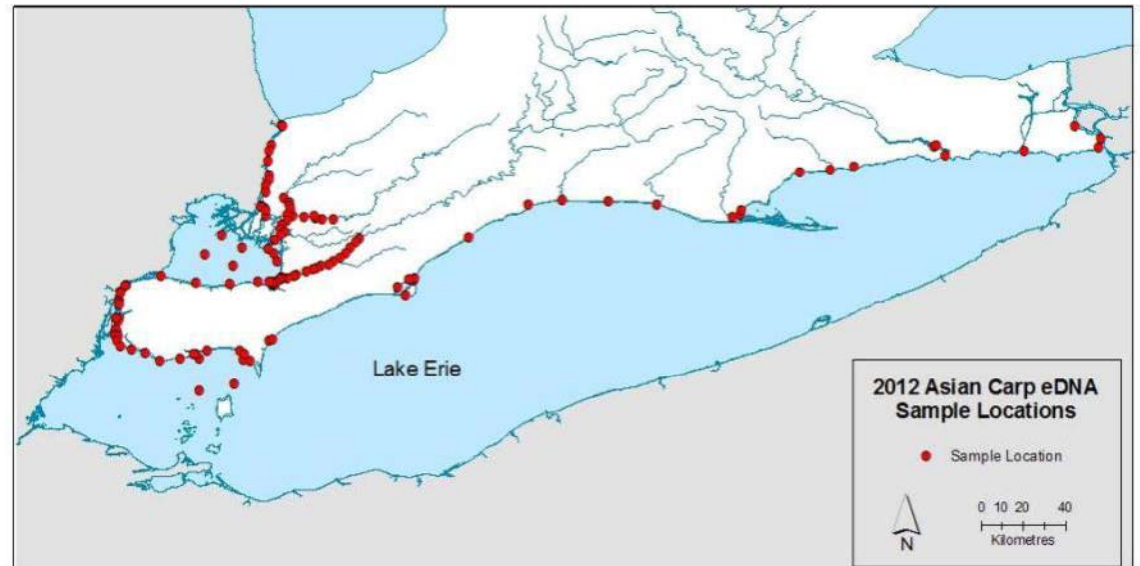
13% of catch is white perch
(4% in 2012)

Asian Carp Surveillance



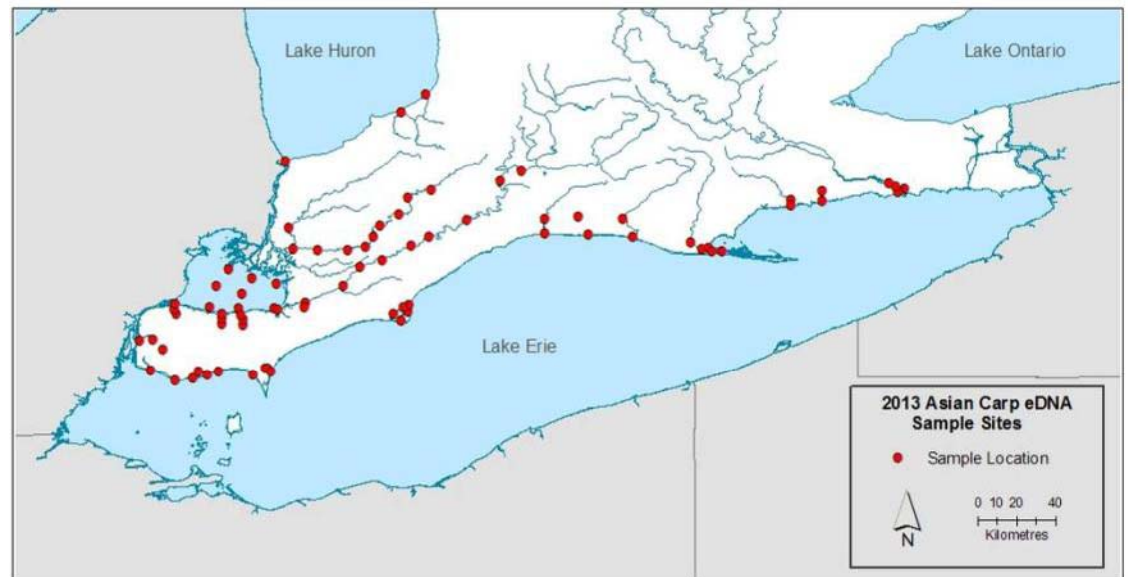
2012 Asian Carp eDNA Detection Program

- Purpose: to determine if Bighead, Silver, and Grass carp are present in the Canadian waters of Lake Erie, Lake St. Clair and their tributaries
- September to November 2012
- 124 sites, 96 sites sampled twice
- 3 water samples per site
- 71 sites electrofished
- No Asian carp eDNA found



2013 Asian Carp eDNA Detection Program

- Purpose: to determine if Bighead, Silver, and Grass carp are present in the Canadian waters of Lake Erie, Lake St. Clair and their tributaries
- May to July 2013
- 79 sites, 69 sites sampled twice
- 3 water samples per site
- No Asian carp eDNA found



Additional Species Observed

- Occasional reports of non-native species in Lake Erie & tributaries include:

- Grass Carp – 1985, 2013
- Bighead Carp – 1995, 2000



- Piranha – 1995

- Pacu – 1992, 1995, 2004



- Wiper – 2006

- American Shad – 1991

- Chinese Mitten Crab – 1973, 2004, 2009

- European Flounder – 1974, 1976, 1987, 1988,
1989, 1991, 1996, 2000



