Inland Seas Angler

GREAT LAKES BASIN REPORT©

Special Report – Lakes Erie & St. Clair

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Highlights of the Annual Lake Committee Meetings

Great Lakes Fishery Commission proceedings, Toronto, Ontario

This first of a series of annual special reports is an extensive summary of Lakes Erie & St. Clair. These lake committee reports are from the annual Lake Committee meetings hosted by the Great Lakes Fishery Commission in March/April 2018. We encourage reproduction with the appropriate credit to the GLSFC and the agencies involved. Our thanks to the staffs of the GLFC, OMNR, USFWS, USGS, NYSDEC and Michigan & Ohio DNRs for their contributions to these science documents. Thanks also to the Great Lakes Fishery Commission, its staff, Bob Lamb & Marc Gaden, for their efforts in again convening and hosting the Lower Lake Committee meetings in Toronto, Ontario.

Lake Erie

Index of Reports

Abbreviation	**Expansion**
CPH	Catch per hectare
CWT	Coded Wire Tag
DEC	NY Dept. of Environment Conservation
DFO	Dept. of Fisheries and Oceans
LEBS	Lake Erie Biological Station
LEC	Lake Erie Committee
MDNR	MI Dept. of Natural Resources
ODNR	Ohio Dept. of Natural Resources
OMNR	ON Ministry Natural Resources
OSU	The Ohio State University
SLCP	Sea Lamprey Control Program
USFWS	U.S. Fish and Wildlife Service
WTG	Walleye Task Group
YAO	Age 1 and older
YOY	Young of the year (age 0)

Highlights

- Great walleye hatches from 2014 and 2015 are expected to contribute to exceptional fishing opportunities.
- Anglers pursuing yellow perch in Lake Erie's Western Basin will likely find excellent numbers and size.
- The 2018 Ohio daily bag limit will be six walleye from May 1 through Feb. 28, 2019.
- The 2018 Pennsylvania creel limits are being held at the 2017 limits."
- The yellow perch daily bag limit will be 30 from May 1 through April 30, 2019.
- The 2017 walleye hatch was near average, giving the population its third average or larger year class in the past four years.

- Smallmouth bass fishing in 2018 is expected to be consistent with recent years.
- Beginning June 30, the daily bag limit for bass will be five, with a 14-inch minimum length limit.
- Steelhead anglers should enjoy another year of great fishing in 2018.
- Steelhead daily bag limit remains at five fish per angler from May 16-Aug. 31, two per angler Sept. 1 to May 15, 2019.
- White bass continue to provide excellent seasonal fishing opportunities in the Maumee and Sandusky rivers and in the open lake.
- The total allowable catch (TAC) in quota area waters of the west and central basins for 2018 is 7.109 million walleye.
- The total allowable catch (TAC) in 2018 for yellow perch is 10.498 million pounds.
- Lake Erie has 842 tributaries (525 Canada, 317 U.S.).
- Thirty tributaries (11 Canada, 19 U.S.) have historical records of larval Sea Lamprey production.
- 17 tributaries (7 Canada, 10 U.S.) have been treated with lampricides at least once during 2008-2017.

Lake Erie Walleye and Yellow Perch Catch Levels for 2018

Walleye and yellow perch bag limits announced

COLUMBUS, OH – Lake Erie anglers should experience another year of diverse fishing opportunities in 2018, according to Ohio DNR. Great walleye hatches from 2014 and 2015 are expected to contribute to exceptional fishing opportunities in Lake Erie this year. Anglers pursuing yellow perch in Lake Erie's Western Basin will likely find excellent numbers and size.

Lake Erie walleye and yellow perch fisheries are managed through an interagency quota system that involves Ontario, Michigan, Pennsylvania, New York and Ohio. Each jurisdiction regulates its catches to comply with annually determined safe harvest levels that minimize the risk of over-fishing these species. Quotas for the upcoming fishing season are determined through consensus agreement by these jurisdictions through the Lake Erie Committee of the Great Lakes Fishery Commission, which were just recently announced for 2018.

Currently, the walleye daily bag limit is four, and the yellow perch daily bag limit is 30 per angler in Ohio waters of Lake Erie until April 30. As a result of the 2018 quota allocation, the daily bag limit will be six walleye from May 1 through Feb. 28, 2019. From March 1, 2019, through April 30, 2019, the daily walleye bag limit will be four. A 15-inch minimum size limit is in effect during the entire season for walleye. The yellow perch daily bag limit will be 30 from May 1 through April 30, 2019, with no minimum size limit. Lake Erie anglers can find walleye and yellow perch bag limit information at ODNR offices, in special publications at bait and tackle shops and at wildohio.gov.

Walleye

Ohio walleye anglers will catch fish mostly from the 2015 and 2014 hatches, with some fish from the 2010 through 2013 year classes. Additional trophy opportunities from 2007 and 2003 will also be encountered by anglers. Many of the previously undersized walleye from the 2015 hatch will range from 15 to 20 inches during the 2018 season. Walleye from the 2014 hatch will range from 16 to 24 inches and accounted for just over half of the 2017 harvest of 1.3 million fish. Fish from the 2003 and 2007 hatches will continue to provide "Fish Ohio" opportunities (greater than 28 inches) and may give Ohio a new state record walleye. The 2017 walleye hatch was near average, giving the population its third average or larger year class in the past four years. Anglers should expect to catch undersized walleye until these fish grow to legal size late in the 2019 season. Anglers are encouraged to release these fish with as little handling as possible so they can contribute to the fishery in the future.

Yellow Perch

Anglers can expect excellent perch fishing in the Western Basin in 2018. Perch anglers in the west will primarily catch fish from 2014 and 2015, providing a good range of sizes. Fall fishing in 2017 produced both excellent sizes and catch rates. The largest perch in the Western Basin will come from 2013 and older year classes. In the Central Basin, anglers should expect perch fishing to be similar to 2017. Central Basin yellow perch populations have declined from the record levels set 10 years ago, but remain near their long-term average despite lower than expected catch rates. Anglers fishing in the Central Basin will primarily catch fish from the 2014 year class, and older year classes will provide the potential for trophy yellow perch.

Black Bass

Smallmouth bass fishing in 2018 is expected to be consistent with recent years. In 2017, smallmouth bass catch rates remained strong for the sixth consecutive year, and in 2018, anglers should expect more of the same, including an excellent size range of 14 to 22 inches and fish weighing up to 6 pounds. The best fishing for smallmouth bass will continue to be in areas with good bottom structure, which is the available habitat across much of the entire Ohio nearshore and islands.

Continuing the trend from previous years, largemouth bass fishing should be excellent in 2018. This fishery continues to

produce exceptional catch rates and some large fish in nearshore areas and harbors across Ohio's Lake Erie. All black bass (smallmouth and largemouth) must be immediately released from May 1 through June 29. Beginning on Saturday, June 30, the daily bag limit for bass will be five, with a 14-inch minimum length limit.

Steelhead

Steelhead anglers should enjoy another year of great fishing in 2018 in Ohio's Lake Erie open waters and in tributaries. Peak summer steelhead action on Lake Erie can be found offshore from June through August between Vermilion and Conneaut, with catches measuring 17 to 29 inches. Most Lake Erie anglers troll for steelhead in deep waters using spoons with divers or downriggers until fish move close to shore in the fall. The daily bag limit remains at five fish per angler from May 16 through Aug. 31, and two fish per angler between Sept. 1 and May 15, 2019. A 12-inch minimum size limit is in effect throughout the year.

White Bass

White bass continue to provide excellent seasonal fishing opportunities in the Maumee and Sandusky rivers and in the open lake. The 2018 catch will again be dominated by fish from the 2012 and 2010 year classes, along with younger fish from 2016. Fish from older year classes could be as large as 16 inches. Anglers should focus on major Western Basin tributaries during May and June and nearshore areas of the open lake during the summer. There is no white bass daily bag limit or size limit.

Other Species

Bays, harbors and main lake shorelines offer excellent fishing for panfish, as well as occasional northern pike and muskie in vegetated areas.

Anglers are reminded that fishing conditions on Lake Erie can change hourly, and adjustments are often necessary to improve success. Anglers should take into account factors, such as water temperature, cloud cover, water clarity, boat traffic, wave action, structure, currents and the amount of baitfish in the area. Anglers are also reminded to carefully monitor Lake Erie weather and to seek safe harbor before storms approach.

Updated Lake Erie fishing reports are available at wildohio.gov or by calling 888-HOOKFISH (888-466-5347). Information is available from ODNR Division of Wildlife staff from 8 a.m. to 5 p.m. weekdays at the Fairport Harbor station (440-352-4199) for the Central Basin and at Sandusky Station (419-625-8062) for the Western Basin.

Information on the ODNR Division of Wildlife's Lake Erie research and management programs, fisheries resources, fishing reports, maps and links to other Lake Erie web resources are available at **www.wildohio.gov.** ✧

Walleye Task Group Report, 2018 (LEC)

2017 Fishery Review

The total allowable catch (TAC) in quota area waters of the west and central basins for 2017 was 5.924 million fish. This allocation represented a 20% increase from the 2016 TAC of 4.937 million fish. In the TAC area, the total harvest was 4.551 million fish, or 77% of the quota **(Table 1**). Harvest in the non-TAC area of the eastern basin amounted to 0.362 million fish. Lake-wide Walleye harvest was estimated at 4.913 million fish in 2017. The sport fishery (1.636 million fish) harvest level reported for 2017 was below the long-term mean for the 1975-2016 time series (2.274 million fish), while the commercial fishery harvest (3.277 million fish) was above the long-term (1976-2016) mean of 2.008 million fish.

Table 1. Summary of walleye harvest by jurisdiction in Lake Erie, 2017

In number of fish:	TAC Area (MU-1, MU-2, MU-3)				Non-TAC Area (MU-4 & MU-5)				All Areas
	Michigan	Ohio	Ontario	Total	NY	Penn.	Ontario	Total	Total
TAC	345,369	3,027,756	2,550,874	5,924,000	-	-	-	-	5,924,000
TAC % Share	5.83%	51.11%	43.06%	100.00%	-	-	-	-	100.00%
Harvest	56,938	1,261,327	3,232,817	4,551,082	70,010	162,949	129,217	362,176	4,913,258
Harvest %TAC	16.5%	41.7%	126.7%	76.8%					

Table 2. Ontario walleye gillnet effort in 2017

	Unit 1	Unit 2	Unit 3	Units 4 & 5
Effort (km)	8,056	7,239	3,636	1,527
change from 2016	15%	-9%	-20%	5%

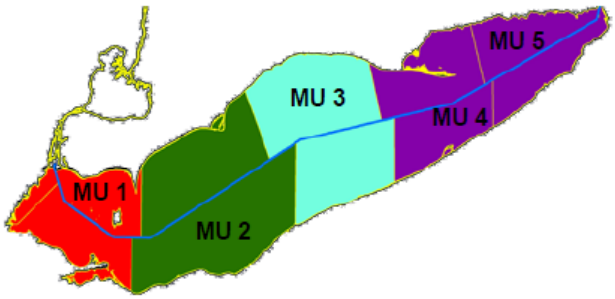

Fig 1-Lake Erie walleye management unit

Total lake-wide commercial Walleye fishery effort decreased 2% in 2017 from 2016. Commercial gill net effort increased in MU 1 (15%), decreased in MU 2 (9%) and MU 3 (20%), and increased in MU 4&5 (5%). Historically MU 1 has been the largest component of the commercial effort, which continued in 2017 **(Table 2).** The total commercial effort of 20,458 km of gill net fished during 2017 was 9% above the long-term average (18,714 km). Across the lake, 2017 sport fishery effort increased 9% relative to 2016. Sport effort in MU 1 decreased in Michigan waters by 20% and in Ohio waters by 11%. Central basin sport effort increased, and was 65% higher in Ohio waters of MU 2 and 26% higher in Ohio waters of MU 3 compared to 2016. Sport effort increased in Pennsylvania (62%) and decreased (2%) in New York waters of MUs 4&5 **(Table 3)**. The 2017 Walleye sport effort (3.207 million angler hours) was 63% of the long-term mean (5.103 million angler hours).

The 2017 harvest rates in the lake-wide sport fishery (0.48 fish/hour) and commercial fishery (160. 2 fish/km gill net) increased from 2016 and are above the long-term means (0.43 fish/hour and 120.0 fish/km gill net). Compared to 2016, the 2017 sport harvest rates increased in all MU's (MU 1 = 14%; MU 2 = 38%; MU 3 = 100%; and MU4&5 = 125%). Gill net catch rates increased in MU 1 (59%), MU 2 (70%), MU 3 (81%), and MU 4&5 (10%). Age distribution of fish in the harvest was dominated by age 3 and younger Walleye from the 2014 (age 3, 36%) and 2015 (age 2, 45%) year classes. Age 7 and older Walleyes were the next most harvested age group, representing 8% of the total lake-wide harvest in 2017.

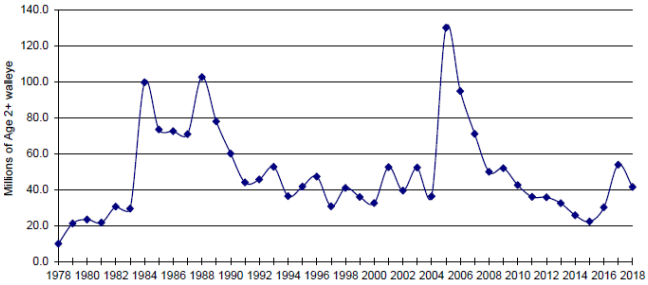

Fig 2. Population estimate of Lake Erie Walleye ages 2 and older from 1978– 2017, and the projection for 2018

2018 Population Abundance

Using the 2018 integrated SCAA model, the projected abundance of Walleye in the west-central population is 41.405 million Walleye **(Table 4).** The most abundant year class (56%) in the population is projected to be age 3 Walleye from the 2015 cohort (23.293 million fish). The next most abundant year class is 2014 (age 4) at 6.678 million fish (16%). The 2016 (age 2), 2013 (age 5) and 2012 (age 6) year-classes are expected to contribute 14%, 4%, and 2% to the population, respectively. Age 7 and older fish are expected to account for 8% of the 2018 population size. The projected spawning stock biomass (SSB) for 2018 is 44.958 million kilograms.

2018 Harvest Strategy and Recommended Allowable Harvest (RAH*)*

Beginning in 2015, the WTG implemented the Walleye Management Plan, which includes the integrated Walleye

assessment model and a Walleye Harvest Control rule (HCR). The HCR sets the target fishing rate at 60%Fmsy, with an accompanying limit reference point which will reduce the target fishing rate beginning at 20% of the unfished spawning stock biomass (20%SSB0). This probabilistic control rule, P-star (P*) was set at 0.05 and incorporated to ensure that SSB in 2019 is not below the SSBo threshold after fishing in 2018. In addition, there is a limitation of TAC variation from one year to the next of 20% to implement a measure of fishery stability. Using results from the 2018 integrated SCAA model, the harvest policy used for 2018, and selectivity values from the current fisheries, a mean RAH of 8.809 million fish was calculated for 2018, with a range of 6.698 to 10.921 million fish **(Table 4).** The TAC range for 2018 based on minimizing variation from the 2017 TAC, ± 20%, would be 6.698 to 7.109 million fish.

	2018 Stock Size (millions of fish)	60% F_{msy}		Rate Functions			2018 RAH (millions of fish)			Projected 2019 Stock Size (millions)
Age	**Mean**	**F**	**Sel(age)**	**(F)**	**(S)**	**(u)**	**Min.**	**Mean**	**Max.**	**Mean**
2	5.973		0.316	0.102	0.656	0.083	0.367	0.497	0.628	12.276
3	23.293		0.981	0.317	0.529	0.234	4.199	5.456	6.712	3.917
4	6.678		0.997	0.322	0.526	0.238	1.198	1.586	1.975	12.324
5	1.464		0.930	0.300	0.538	0.224	0.243	0.327	0.412	3.515
6	0.676		0.935	0.302	0.537	0.225	0.112	0.152	0.192	0.788
7+	3.321		1.000	0.323	0.526	0.238	0.579	0.791	1.003	2.109
Total (2+)	41.405	0.323				0.213	6.698	8.809	10.921	34.928
Total (3+)	35.432						6.331	8.312	10.293	22.652
SSB	44.958	mil. kgs								36.037

Table 4. Stock size estimates and RAH values

Catch-at-Age Analysis Population Estimate and Projected Recruitment for 2018 and 2019

Based on the 2018 integrated SCAA model, the 2017 west-central population estimate was 53.725 million age 2 and older Walleye **(Fig 2).** An estimated 34.025 million age 2 (2015 year class) fish comprised 63% of the age 2 and older Walleye population. Age 3 (2014 year class) represented the second largest (20%) and age 7 and older (2009 and older year classes) the third largest (7%) components of the population. Using the 2018 integrated SCAA model, the number of age 2 recruits entering the population in 2018 (2016 year-class) and 2019 (2017 year-class) will be 5.973 million and 12.276 million Walleye.

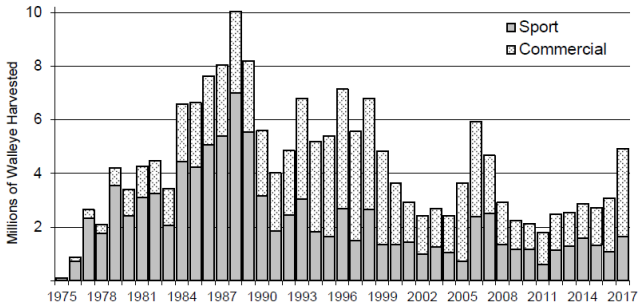

Fig 2-Lake-wide harvest of Walleye by sport and commercial fisheries, 1975-2017.

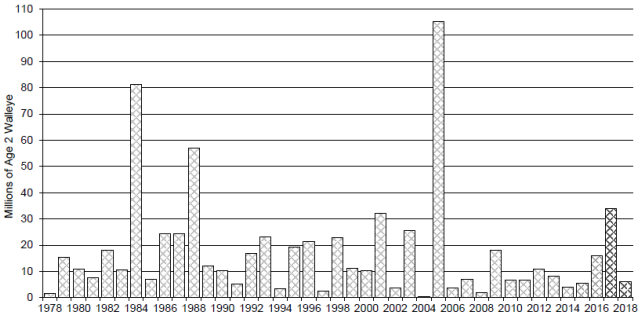

Fig 8-Estimated (1978 – 2016) and projected (2017 and 2018) number of age-2 Walleye in the west-central Lake Erie Walleye population from the latest ADMB integrated model run.

Year		TAC Area (MU-1, MU-2, MU-3) Michigan	Ohio	Ontario [a]	Total	Non-TAC Area (MUs 4&5) NY	Penn.	Ontario	Total	All Areas Total
1983	TAC	572,000	3,406,000	2,522,000	6,500,000				0	6,500,000
	Har	**145,847**	**1,864,200**	**1,416,101**	**3,426,148**				**0**	**3,426,148**
1984	TAC	676,500	4,028,400	2,982,900	7,687,800				0	7,687,800
	Har	**351,169**	**4,055,000**	**2,178,409**	**6,584,578**				**0**	**6,584,578**
1985	TAC	430,700	2,564,400	1,898,800	4,893,900				0	4,893,900
	Har	**460,933**	**3,730,100**	**2,435,627**	**6,626,660**				**0**	**6,626,660**
1986	TAC	660,000	3,930,000	2,910,000	7,500,000				0	7,500,000
	Har	**605,600**	**4,399,400**	**2,617,507**	**7,622,507**				**0**	**7,622,507**
1987	TAC	490,100	2,918,500	2,161,100	5,569,700				0	5,569,700
	Har	**902,500**	**4,433,600**	**2,688,558**	**8,024,658**				**0**	**8,024,658**
1988	TAC	397,500	3,855,000	3,247,500	7,500,000				0	7,500,000
	Har	**1,996,788**	**4,890,367**	**3,054,402**	**9,941,557**	**85,282**			**85,282**	**10,026,839**
1989	TAC	383,000	3,710,000	3,125,000	7,218,000				0	7,218,000
	Har	**1,091,641**	**4,191,711**	**2,793,051**	**8,076,403**	**129,226**			**129,226**	**8,205,629**
1990	TAC	616,000	3,475,500	2,908,500	7,000,000				0	7,000,000
	Har	**747,128**	**2,282,520**	**2,517,922**	**5,547,570**	**47,443**			**47,443**	**5,595,013**
1991	TAC	440,000	2,485,000	2,075,000	5,000,000				0	5,000,000
	Har	**132,118**	**1,577,813**	**2,266,380**	**3,976,311**	**34,137**			**34,137**	**4,010,448**
1992	TAC	329,000	3,187,000	2,685,000	6,201,000				0	6,201,000
	Har	**249,518**	**2,081,919**	**2,497,705**	**4,829,142**	**14,384**			**14,384**	**4,843,526**
1993	TAC	556,500	5,397,000	4,546,500	10,500,000				0	10,500,000
	Har	**270,376**	**2,668,684**	**3,821,386**	**6,760,446**	**40,032**			**40,032**	**6,800,478**
1994	TAC	400,000	4,100,000	3,500,000	8,000,000				0	8,000,000
	Har	**216,038**	**1,468,739**	**3,431,119**	**5,115,896**	**59,345**			**59,345**	**5,175,241**
1995	TAC	477,000	4,626,000	3,897,000	9,000,000				0	9,000,000
	Har	**107,909**	**1,435,188**	**3,813,527**	**5,356,624**	**26,964**			**26,964**	**5,383,588**
1996	TAC	583,000	5,654,000	4,763,000	11,000,000				0	11,000,000
	Har	**174,607**	**2,316,425**	**4,524,639**	**7,015,671**	**38,728**	**89,087**		**127,815**	**7,143,486**
1997	TAC	514,000	4,986,000	4,200,000	9,700,000				0	9,700,000
	Har	**122,400**	**1,248,846**	**4,072,779**	**5,444,025**	**29,395**	**88,682**		**118,077**	**5,562,102**
1998	TAC	546,000	5,294,000	4,460,000	10,300,000				0	10,300,000
	Har	**114,606**	**2,303,911**	**4,173,042**	**6,591,559**	**34,090**	**124,814**	**47,000**	**205,904**	**6,797,463**
1999	TAC	477,000	4,626,000	3,897,000	9,000,000				0	9,000,000
	Har	**140,269**	**1,033,733**	**3,454,250**	**4,628,252**	**23,133**	**89,038**	**87,000**	**199,171**	**4,827,423**
2000	TAC	408,100	3,957,800	3,334,100	7,700,000				0	7,700,000
	Har	**252,280**	**932,297**	**2,287,533**	**3,472,110**	**28,599**	**77,512**	**67,000**	**173,111**	**3,645,221**
2001	TAC	180,200	1,747,600	1,472,200	3,400,000				0	3,400,000
	Har	**159,186**	**1,157,914**	**1,498,816**	**2,815,916**	**14,669**	**52,796**	**39,498**	**106,963**	**2,922,879**
2002	TAC	180,200	1,747,600	1,472,200	3,400,000				0	3,400,000
	Har	**193,515**	**703,000**	**1,436,000**	**2,332,515**	**18,377**	**22,000**	**36,000**	**76,377**	**2,408,892**
2003	TAC	180,200	1,747,600	1,472,200	3,400,000				0	3,400,000
	Har	**128,852**	**1,014,688**	**1,457,014**	**2,600,554**	**27,480**	**43,581**	**32,692**	**103,753**	**2,704,307**
2004	TAC	127,200	1,233,600	1,039,200	2,400,000				0	2,400,000
	Har	**114,958**	**859,366**	**1,419,237**	**2,393,561**	**8,400**	**19,969**	**29,864**	**58,233**	**2,451,794**
2005	TAC	308,195	2,988,910	2,517,895	5,815,000				0	5,815,000
	Har	**37,599**	**610,449**	**2,933,393**	**3,581,441**	**27,370**	**20,316**	**17,394**	**65,080**	**3,646,521**
2006	TAC	523,958	5,081,404	4,280,638	9,886,000				0	9,886,000
	Har	**305,548**	**1,868,520**	**3,494,551**	**5,668,619**	**37,161**	**151,614**	**68,774**	**257,549**	**5,926,168**
2007	TAC	284,080	2,755,040	2,320,880	5,360,000				0	5,360,000
	Har	**165,551**	**2,160,459**	**2,159,965**	**4,485,975**	**29,134**	**116,671**	**37,566**	**183,371**	**4,669,346**
2008	TAC	209,530	1,836,893	1,547,576	3,594,000				0	3,594,000
	Har	**121,072**	**1,082,636**	**1,574,723**	**2,778,431**	**29,017**	**74,250**	**34,906**	**138,173**	**2,916,604**
2009	TAC	142,835	1,252,195	1,054,970	2,450,000				0	2,450,000
	Har	**94,048**	**967,476**	**1,095,500**	**2,157,024**	**13,727**	**42,422**	**27,725**	**83,874**	**2,240,898**
2010	TAC	128,260	1,124,420	947,320	2,200,000				0	2,200,000
	Har	**55,248**	**958,366**	**983,397**	**1,997,011**	**34,552**	**54,056**	**23,324**	**111,932**	**2,108,943**
2011	TAC	170,178	1,491,901	1,256,921	2,919,000				0	2,919,000
	Har	**50,490**	**417,314**	**1,224,057**	**1,691,861**	**31,506**	**45,369**	**28,873**	**105,748**	**1,797,609**
2012	TAC	203,292	1,782,206	1,501,502	3,487,000				0	3,487,000
	Har	**86,658**	**921,390**	**1,355,522**	**2,363,570**	**36,975**	**44,796**	**28,260**	**110,031**	**2,473,601**
2013	TAC	195,655	1,715,252	1,445,094	3,356,000				0	3,356,000
	Har	**54,167**	**1,083,395**	**1,274,945**	**2,412,507**	**34,553**	**60,332**	**30,591**	**125,476**	**2,537,983**
2014	TAC	234,774	2,058,200	1,734,026	4,027,000				0	4,027,000
	Har	**42,142**	**1,303,133**	**1,324,201**	**2,669,476**	**61,982**	**84,843**	**52,675**	**199,500**	**2,868,977**
2015	TAC	239,846	2,102,665	1,771,488	4,114,000				0	4,114,000
	Har	**65,740**	**1,073,263**	**1,382,600**	**2,521,603**	**55,201**	**46,523**	**89,882**	**191,606**	**2,713,209**
2016	TAC	287,827	2,523,301	2,125,872	4,937,000				0	4,937,000
	Har	**65,816**	**855,820**	**1,959,573**	**2,881,209**	**50,963**	**32,937**	**112,743**	**196,643**	**3,077,852**
2017	TAC	345,369	3,027,756	2,550,874	5,924,000				0	5,924,000
	Har	**56,938**	**1,261,327**	**3,232,817**	**4,551,082**	**70,010**	**162,949**	**129,217**	**362,176**	**4,913,258**

Table 1- Annual Lake Erie walleye total allowable catch (TAC, top) and measured harvest (Har; bottom, bold), in numbers of fish from 1983 to 2017.

	Sport Fishery														Commercial Fishery					
	Unit 1				Unit 2			Unit 3			Units 4 & 5					Unit 1	Unit 2	Unit 3	Unit 4		Grand
Year	OH	MI	ON[a]	Total	OH	ON[a]	Total	OH	ON[a]	Total	ON[a]	PA	NY	Total	Total	ON	ON	ON	ON	Total	Total
1983	1,626	146	41	1,813	212	--	212	26	--	26	--	--	--	0	2,051	1,129	167	80	--	1,376	3,427
1984	3,089	351	39	3,479	787	--	787	179	--	179	--	--	--	0	4,445	1,639	392	108	--	2,139	6,584
1985	3,347	461	57	3,865	294	--	294	89	--	89	--	--	--	0	4,248	1,721	432	225	--	2,378	6,627
1986	3,743	606	52	4,401	480	--	480	176	--	176	--	--	--	0	5,057	1,651	558	356	--	2,565	7,622
1987	3,751	902	51	4,704	550	--	550	132	--	132	--	--	--	0	5,386	1,611	622	405	--	2,638	8,024
1988	3,744	1,997	18	5,759	584	--	584	562	--	562	--	--	85	85	6,990	1,866	762	409	--	3,037	10,026
1989	2,891	1,092	14	3,997	867	35	902	434	80	514	--	--	129	129	5,542	1,656	621	386	--	2,663	8,206
1990	1,467	747	35	2,249	389	14	403	426	23	449	--	--	47	47	3,148	1,615	529	302	--	2,446	5,595
1991	1,104	132	39	1,275	216	24	240	258	44	302	--	--	34	34	1,851	1,446	440	274	--	2,160	4,011
1992	1,479	250	20	1,749	338	56	394	265	25	290	--	--	14	14	2,447	1,547	534	316	--	2,397	4,844
1993	1,846	270	37	2,153	450	26	476	372	12	384	--	--	40	40	3,053	2,488	762	496	--	3,746	6,800
1994	992	216	21	1,229	291	20	311	186	21	207	--	--	59	59	1,806	2,307	630	432	--	3,369	5,176
1995	1,161	108	32	1,301	159	7	166	115	27	141	--	--	27	27	1,635	2,578	681	489	--	3,748	5,384
1996	1,442	175	17	1,634	645	8	653	229	27	256	--	89	39	128	2,671	2,777	1,107	589	--	4,473	7,143
1997	929	122	8	1,059	188	2	190	132	5	138	--	89	29	118	1,505	2,585	928	544	--	4,057	5,563
1998	1,790	115	34	1,939	215	5	220	299	5	304	19	125	34	178	2,641	2,497	1,166	462	28	4,153	6,793
1999	812	140	34	986	139	5	144	83	5	88	19	89	23	131	1,349	2,461	631	317	68	3,477	4,827
2000	674	252	34	961	165	5	170	93	5	98	19	78	29	125	1,354	1,603	444	196	48	2,291	3,645
2001	941	160	34	1,135	171	5	176	46	5	51	19	53	15	87	1,449	1,004	310	141	20	1,475	2,924
2002	516	194	34	744	141	5	146	46	5	51	19	22	18	59	1,000	937	309	146	17	1,409	2,409
2003	715	129	34	878	232	5	237	68	5	73	2	44	27	73	1,261	948	283	182	14	1,427	2,688
2004	515	115	34	664	272	2	274	72	0	72	2	20	8	30	1,040	866	334	175	11	1,386	2,426
2005	374	38	27	438	110	2	112	126	0	126	2	20	27	49	725	1,878	625	401	15	2,920	3,645
2006	1,194	306	27	1,526	503	2	505	170	0	170	2	152	37	191	2,392	2,137	784	545	66	3,532	5,924
2007	1,414	166	27	1,607	578	2	580	169	0	169	2	116	29	147	2,502	1,348	450	333	35	2,167	4,669
2008	524	121	44	689	333	2	335	225	0	225	2	74	29	105	1,354	954	335	241	35	1,565	2,919
2009	553	94	44	691	287	2	288	128	0	128	2	42	14	58	1,166	705	212	135	28	1,079	2,244
2010	587	55	44	686	257	2	259	114	0	115	2	54	37	93	1,152	607	184	147	23	962	2,115
2011	224	50	44	318	104	2	106	89	0	90	2	45	32	79	593	736	262	181	29	1,208	1,801
2012	596	87	44	726	233	2	235	93	0	93	2	45	37	84	1,138	834	285	191	28	1,338	2,476
2013	757	54	44	855	190	2	192	136	0	136	2	60	35	97	1,280	737	297	195	31	1,260	2,540
2014	909	42	45	996	177	13	190	218	13	231	13	85	62	160	1,577	756	259	238	40	1,292	2,869
2015	746	66	45	857	187	13	200	140	13	153	13	47	55	115	1,325	633	354	325	77	1,388	2,713
2016	577	66	45	688	139	13	152	140	13	153	13	33	51	97	1,090	946	594	348	100	1,988	3,078
2017	592	57	45	694	316	13	330	353	13	367	13	163	70	246	1,636	1,735	918	508	116	3,277	4,913
Mean	1,489	254	40	1,784	267	10	273	165	12	174	8	66	38	63	2,274	1,354	434	287	38	2,008	4,281

Table 2-Annual harvest (thousands of fish) of Lake Erie walleye by gear, management unit, and agency. Means contain data from 1975 to 2016.

	Sport Fishery [a]														Commercial Fishery [b]				
	Unit 1				Unit 2			Unit 3			Units 4 & 5								
Year	OH	MI	ON[c]	Total	OH	ON[c]	Total	OH	ON[c]	Total	ON[c]	PA	NY	Total	Total	Unit 1 ON	Unit 2 ON	Unit 3 ON	Units 4&5 ON	Total
1983	4,168	451	118	4,737	568	--	568	128	--	128	--	--	--	0	5,433	11,205	5,352	5,814	--	22,371
1984	4,077	557	82	4,716	1,322	--	1,322	392	--	392	--	--	--	0	6,430	11,550	6,008	2,438	--	19,996
1985	4,606	926	84	5,616	1,078	--	1,078	464	--	464	--	--	--	0	7,158	7,496	2,800	2,983	--	13,279
1986	6,437	1,840	107	8,384	1,086	--	1,086	538	--	538	--	--	--	0	10,008	7,824	5,637	3,804	--	17,265
1987	6,631	2,193	84	8,908	1,431	--	1,431	472	--	472	--	--	--	0	10,811	6,595	4,243	3,045	--	13,883
1988	7,547	4,362	87	11,996	1,677	--	1,677	1,081	--	1,081	--	--	462	462	15,216	7,495	5,794	3,778	--	17,067
1989	5,246	3,794	81	9,121	1,532	77	1,609	883	205	1,088	--	--	556	556	12,374	7,846	5,514	3,473	--	16,833
1990	4,116	1,803	121	6,040	1,675	33	1,708	869	83	952	--	--	432	432	9,132	9,016	5,829	5,544	--	20,389
1991	3,555	440	144	4,200	1,220	79	1,320	715	155	880	--	--	440	440	6,840	10,418	5,055	3,146	--	18,619
1992	3,955	715	105	4,775	1,169	81	1,249	640	145	786	--	--	299	299	7,109	9,486	6,906	6,043	--	22,435
1993	3,943	691	125	4,759	1,349	70	1,418	1,062	125	1,187	--	--	305	305	7,669	16,283	11,656	7,420	--	35,359
1994	2,808	788	125	3,721	1,025	65	1,090	599	130	729	--	--	355	355	5,894	16,698	9,968	6,459	--	33,125
1995	3,188	277	125	3,589	803	65	868	355	130	485	--	--	259	259	5,201	20,521	12,113	7,850	--	40,484
1996	3,060	521	125	3,706	1,132	65	1,197	495	130	625	--	316	256	572	6,100	19,976	15,685	10,990	--	46,651
1997	2,748	374	88	3,210	864	45	909	492	91	583	--	388	273	661	5,363	15,708	11,588	9,094	--	36,390
1998	3,010	374	103	3,487	635	51	686	409	55	409	217	390	280	670	5,252	19,027	19,397	13,253	818	52,495
1999	2,368	411	--	2,779	603	--	603	323	--	323	--	397	171	568	4,273	21,432	10,955	7,630	1,444	41,461
2000	1,975	540	--	2,516	540	--	540	281	--	281	--	244	177	421	3,757	22,238	11,049	7,896	1,781	43,054
2001	1,952	362	--	2,314	697	--	697	261	--	261	--	241	163	404	3,676	9,372	5,746	5,021	639	20,778
2002	1,393	606	--	1,999	444	--	444	246	--	246	--	130	132	262	2,951	4,431	4,212	4,427	445	13,515
2003	1,719	326	--	2,045	675	--	675	236	--	236	30	159	162	321	3,277	4,476	3,946	3,725	365	12,512
2004	1,257	504	--	1,761	736	27	736	178	7	178	--	88	101	189	2,864	3,875	2,977	2,401	240	9,493
2005	1,180	212	40	1,392	573	--	573	261	--	261	--	109	142	251	2,477	7,083	4,174	4,503	174	15,934
2006	1,757	587	--	2,344	899	--	899	260	--	260	--	239	137	376	3,879	5,689	4,008	3,589	822	14,107
2007	2,076	448	--	2,524	1,147	--	1,147	321	--	321	--	232	135	367	4,358	4,509	2,927	2,665	383	10,484
2008	1,027	392	63	1,419	809	--	809	356	--	356	--	187	156	343	2,927	4,990	3,193	1,909	497	10,590
2009	1,063	310	--	1,373	777	--	777	289	--	289	--	124	100	224	2,663	3,537	2,164	1,746	478	7,925
2010	1,403	226	--	1,629	652	--	652	219	--	219	--	188	140	328	2,828	1,918	1,371	1,401	247	4,937
2011	862	165	--	1,026	346	--	346	217	--	217	--	156	145	301	1,891	2,646	1,884	1,572	489	6,591
2012	1,283	242	--	1,525	560	--	560	182	--	182	--	160	169	329	2,597	4,674	2,480	2,298	352	9,804
2013	1,424	182	--	1,606	503	--	503	236	--	236	--	154	143	297	2,641	3,802	2,774	2,624	304	9,503
2014	1,552	131	101	1,683	459	85	459	441	71	441	70	171	187	358	2,940	7,351	4,426	2,911	254	14,943
2015	1,430	165	--	1,595	564	--	564	341	--	341	--	162	215	377	2,876	6,980	6,487	5,379	792	19,637
2016	1,514	236	--	1,750	439	--	439	397	--	397	--	141	217	358	2,944	6,980	7,969	4,523	1,448	20,920
2017	1,351	187	--	1,538	726	--	726	501	--	501	--	228	213	441	3,207	8,056	7,239	3,636	1,527	20,458
Mean	2,944	676	102.4	3,682	748	61.9	763	414	111	447	106	208	231	264	5,103	8,876	5,577	4,518	630	18,714

Table 3-Annual fishing effort for Lake Erie walleye by gear, management unit, and agency, 1975 to 2016

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Yellow Perch Task Group Report, 2018 (LEC)

2017 Fisheries Review

The lakewide total allowable catch (TAC) of Yellow Perch in 2017 was 10.375 million pounds. This allocation represented a 13% increase from a TAC of 9.208 million pounds in 2016. For Yellow Perch assessment and allocation, Lake Erie is partitioned into four management units (MUs; **Fig 1).** The 2017 TAC allocation by MU was 3.062, 3.237, 3.776, and 0.300 million pounds for MUs 1 through 4, respectively. The lakewide harvest of Yellow Perch in 2017 was 7.789 million pounds, or 75% of the total 2017 TAC. This was an 8% increase from the 2016 lakewide harvest. Harvest from Yellow Perch MUs 1 through 4 was 2.773, 2.142, 2.639, and 0.235 million pounds, respectively (**Table 1).** The portion of TAC harvested was 91%, 66%, 70%, and 78%, in MUs 1 through 4, respectively. In 2017, Ontario harvested 4.983 million pounds, followed by Ohio (2 .387 million lbs.), Michigan (0.256 million lbs.), Pennsylvania (0.123 million lbs.), and New York (0 .040 million lbs.).

Targeted gill net effort in Ontario waters in 2017 decreased from 2016 in all MUs (-7% in MU1, -5% in MU2, -20% in MU3, and -57% in MU4). Similarly, angling effort in U.S. waters in 2017 decreased from 2016 in all MUs (-9% in MU1, -42% in MU2, -35% in MU3, and -1% in MU4). U.S. trap net effort in 2017 increased in MU1 (+57%), but decreased in MU2 (-43%), MU3 (-25%), and MU4 (-16%). Fishing effort by jurisdiction and gear type is presented in **Table 2.**

Targeted gill net harvest rates in 2017 increased in MU1 (+46%), MU2 (+21 %), MU3 (+22%), and MU4 (+78%) from 2016 rates. Angling harvest rates, in fish harvested per angler hour, decreased in Ohio and Michigan waters of MU1 (- 12% in each, respectively), in Ohio waters of MU2 (-19%) and MU3 (-16%), and in Pennsylvania waters of MU4 (-5%), but increased in in the Pennsylvania waters of MU3 (+8%) and New York waters of MU4 (+42%). In 2017, the trap net harvest rate increased in all fv1Us (176% in MU1, 51 % in MU2, 66% in MU3, and 29% in fy1U4) compared to 2016 harvest rates.

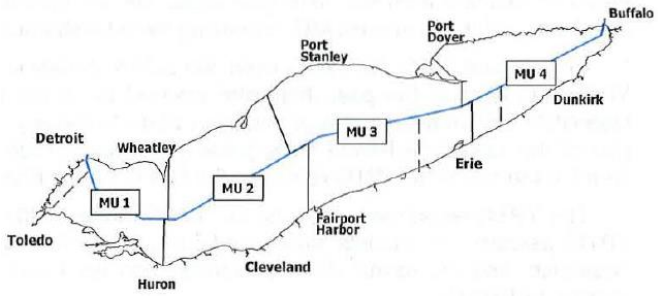

Fig 1-Yellow Perch Management Units (MUs) of Lake Erie

MU	Harvest by jurisdiction (lbs)								Total (lbs)
	Michigan	Ontario	Ohio		Pennsylvania		New York		
	sport	all commercial*	sport	commercial trap net	sport	commercial trap net	sport	commercial trap net	
1	255,605	1,277,587	792,312	447,263					2,772,767
2		1,498,437	53,107	590,447					2,141,991
3		2,027,235	54,244	449,979	61,594	45,741			2,638,793
4		179,730			16,078	0	27,232	12,366	235,407
Total	255,605	4,982,989	899,663	1,487,689	77,672	45,741	27,232	12,366	7,788,958

Table 1- Lake Erie Yellow Perch harvest by jurisdiction and gear type for 2017

MU	Effort by jurisdiction							
	Michigan	Ontario	Ohio		Pennsylvania		New York	
	sport (angler hours)	commercial (km gill net)*	sport (angler hours)	commercial (trap net lifts)	sport (angler hours)	commercial (trap net lifts)	sport (angler hours)	commercial (trap net lifts)
1	204,877	5,656	775,334	3,830				
2		6,094	119,163	2,567				
3		4,775	58,119	1,679	98,302	262		
4		565			12,843	0	26,154	248
Total	204,877	17,090	952,616	8,076	111,145	262	26,154	248

Table 2- Lake Erie Yellow Perch fishing effort by jurisdiction and gear type for 2017

Statistical Catch-at-Age Analysis and Recruitment Estimate for 2018

Population size for 1975 to 2017 for each MU was estimated by statistical catch-at-age analysis (SCAA). Stock size estimates for 2018 (age-3-and-older) were projected from SCAA estimates of 2017 population size and age-specific survival rates in 2017. Age-2 Yellow Perch recruitment in 2018 was predicted by multi-model averaging of juvenile Yellow Perch survey indices against SCAA abundance estimates of age-2 Yellow Perch within each MU. Projected age-2 Yellow Perch recruitment from the 2016 year class was incorporated into the 2018 population estimate along with estimates of age-3-and-older fish in each MU, producing the total standing stock of age-2-and-older fish in 2018.

In 2017 and 2018, the YPTG used two SCAA models in each MU to estimate abundance. The first was the model the YPTG has used in the past (hereafter referred to as the YPTG model), the second was the model developed by the Quantitative Fisheries Centre at Michigan State University (hereafter referred to as the Peterson-Reilly or PR model) as part of the Lake Erie Percid Management Advisory Group process. Descriptions of the YPTG and PR models can be found in the complete YPTG report on the GLFC's Lake Erie Committee Yellow Perch Task Group website (see below).

The YPTG recommended using the YPTG model in 2017 and 2018. The current harvest policy was developed for the YPTG assessment models after conducting a stock recruitment simulation to evaluate the risks of various fishing strategies, and the formal risk assessment has yet to be completed for the PR models, which is currently underway through LEPMAG.

Using the YPTG model, abundance estimates of age-2-and-older Yellow Perch in 2018 are projected to decrease by 40% in MU1 and 25% in MU2, and increase by 19% in MU3 and 54% in MU4, compared to the 2017 abundance estimates. Age-2-and-older Yellow Perch abundance in 2017 is projected to be 41.341, 43.279, 49.543, and 17.292 million age-2-and-older Yellow Perch in MUs 1 through 4, respectively. Using mean weight-at-age information from assessment surveys, 2018 biomass estimates are projected to decrease in MU1 (-35%), MU2 (-25%), and MU3 (-5%), and to increase in MU4 (+30%), compared to 2017 estimates.

Using the PR model, abundance estimates of age-2-and-older Yellow Perch in 2018 are projected to decrease by 35% and 26% in MU1 and MU2, respectively, and to increase by 5% and 4% in MU3 and MU4, respectively, compared to the 2017 abundance estimates. Age-2-and-older Yellow Perch abundance in 2018 is projected to be 37.901, 53.868, 77.644, and 16.983 million age-2-and-older Yellow Perch in MUs 1 through 4, respectively. Using mean weight-at-age information from assessment surveys, biomass estimates in 2017 are projected to decrease in MU1 (-35%), MU2 (-27%), and in MU3 (-9%), and to increase in MU4 (+12%), compared to 2017 estimates.

Recommended Allowable Harvest (RAH) for 2018

Standard errors and ranges for population estimates were calculated for each age in 2017, and projected forward into 2018 using estimated survival rates from catch-at-age. RAH min, mean, and max values are based on mean population estimates minus or plus one standard deviation. Proposed target fishing rates for RAHs in 2018 are the same as 2017. The fishing rates applied to abundance estimates from the PR model were the same as those used for the YPTG model. A formal risk assessment has not been completed for harvest strategies applied to the PR model. RAH ranges are presented in **Table 3** for management units 1 through 4.

MU	Fishing Rate	Recommended Allowable Harvest (millions lbs.)					
		YPTG Model			PR Model		
		MIN	MEAN	MAX	MIN	MEAN	MAX
1	0.670	1.871	3.533	5.072	2.060	2.516	3.031
2	0.670	1.889	3.150	4.434	3.159	3.698	4.251
3	0.700	1.457	2.578	3.714	3.065	3.633	4.207
4	0.300	0.246	0.431	0.632	0.390	0.478	0.583
Total		5.463	9.691	13.853	8.675	10.324	12.071

Table 3- Lake Erie Yellow Perch fishing rates and RAH (in millions of pounds) for 2018 bv management unit.

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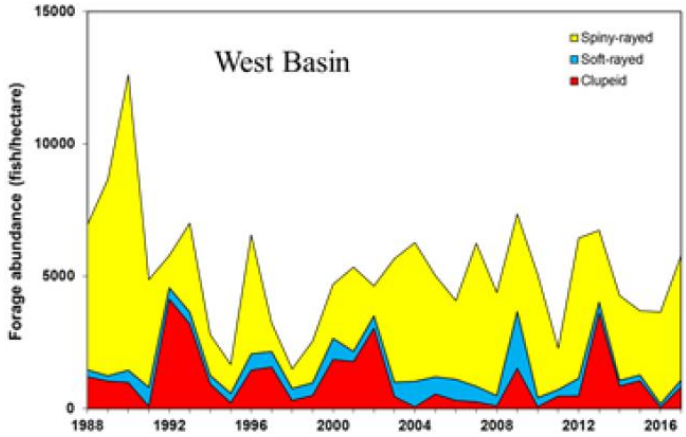
Forage Task Group, 2018 (LEC)

West Basin Status of Forage

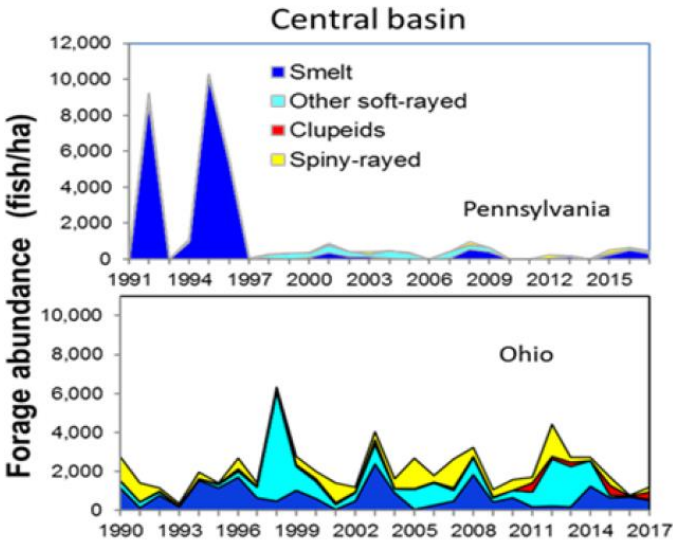
In 2017, hypolimnetic dissolved oxygen levels were below the 2 mg per liter threshold at only one site during the August trawling survey. In total, data from 72 sites were used in 2017. Total forage abundance increased 58%, to above the long-term mean. Total forage biomass declined slightly. Relative biomass of clupeids increased to well above historic averages. Young-of-theyear Yellow Perch age-0 density was above the long-term mean. Young-ofthe-year Walleye abundance was below the long-term mean. Young-of-theyear Gizzard Shad, Rainbow Smelt and Round Goby indices were at long-term means. White Bass abundance was the highest since 2009. Densities of Emerald Shiners were very low. Michigan initiated a trawling

program to assess the forage community in August of 2014. The 2017 survey had the highest density of forage sized fish (3,315.4 fish/ha) across the four-year time series.



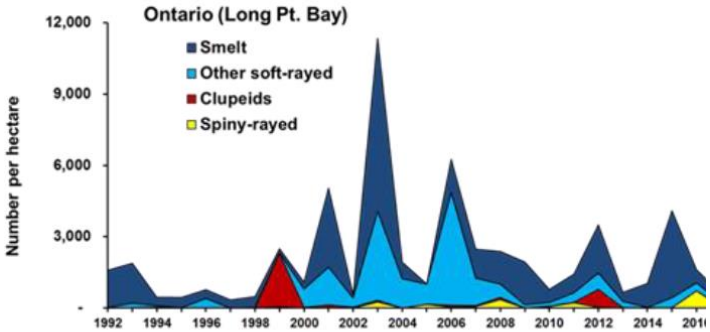
Central Basin Status of Forage

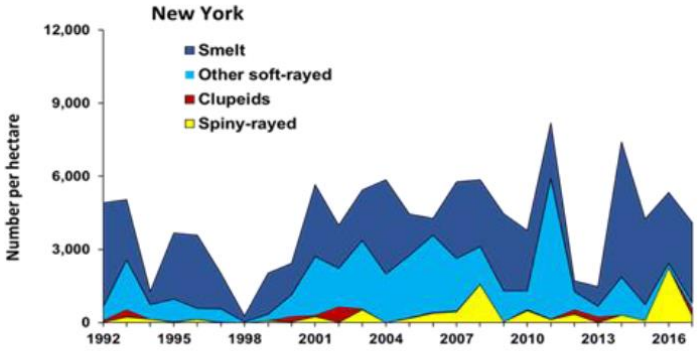
In the central basin, forage densities in both Pennsylvania and Ohio remain low. All forage group indices were below the 25-year mean. Emerald Shiner indices continue to be well below long-term means throughout the basin. Young-of-the-year Rainbow Smelt indices were at or above long-term means; age1+ Rainbow Smelt were well below long-term means. Young-of-the-year Yellow Perch indices in Ohio remain below long-term means. In contrast, Pennsylvania index was the third highest in the time series. In Ohio, age-0 Gizzard Shad and Alewife indices were some of the highest in the time series. Round Goby indices in Pennsylvania are above long-term means, while Ohio indices are below long-term means.

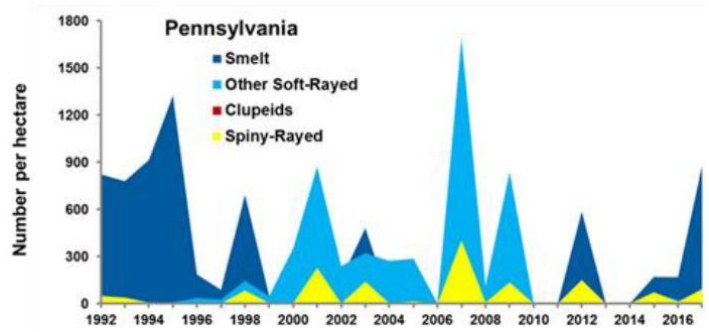


East Basin Status of Forage

In 2017, forage fish densities decreased in Ontario and New York and increased in Pennsylvania. Rainbow Smelt are the most abundant forage species in most years and jurisdictions, and 2017 was no exception. However, this was primarily age-0 Rainbow Smelt in 2017. Very low densities of age-1+ Rainbow Smelt were caught in New York, Ontario and Pennsylvania. Young-of-the-year Emerald Shiners remained at very low densities across the basin. Alewife densities were above long-term means in New York and Ontario. Spiny-rayed fishes were above long-term means in Pennsylvania, driven by high densities of White Perch. Round Goby indices are generally below long-term means throughout the basin.







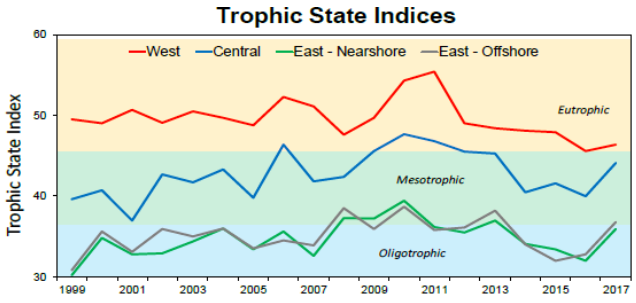
Hydroacoustic Assessments

The Forage Task Group introduced fisheries hydroacoustic technology on Lake Erie to provide a more comprehensive assessment of pelagic forage fish species abundance and distribution. Beginning with surveys of the eastern basin in 1993, coverage was expanded to the central basin in 2000 and western basin in 2004. In 2017 the east basin survey was conducted from July 17- 25, the central basin survey from July 17-21, and the west basin survey from July 18-21. East basin forage fish density was moderate, with a mean of 3,201 forage fish the size of age-1+ Rainbow Smelt per hectare. The largest density of forage fish occurred between Long Point, ON and Erie, PA. In the central basin, age-0 Rainbow Smelt tended to be higher in the eastern transects

compared to the west, and uniformly distributed from north to south across the basin. Yearling-and-older Rainbow Smelt densities were concentrated off Erieau, Ontario. Emerald Shiner have been generally declining since 2011, and have been in very low abundance in the survey since 2015. Western basin forage fish densities were marginally highest on the middle transect (9,007 fish/ha) and lowest on the eastern transect (1,626 fish/ha). Western basin forage fish density (4,726 fish/ha) was the lowest since 2008-2011 and less than half of 2016 densities.

Interagency Lower Trophic Level Monitoring

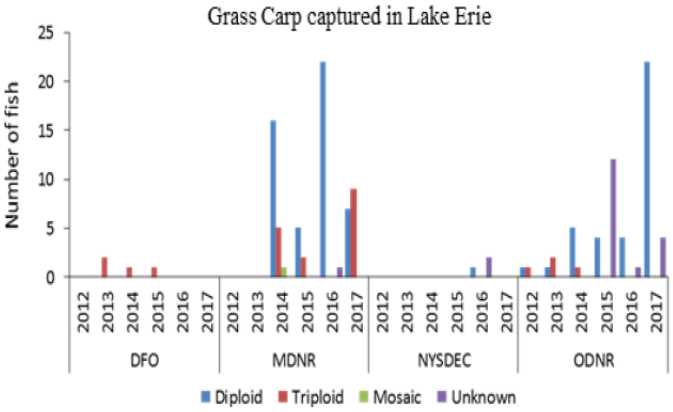
The lower trophic level monitoring (LTLA) program has measured nine environmental variables at 18 stations around Lake Erie since 1999 to characterize ecosystem trends. The Trophic State Index, which is a combination of phosphorus levels, water transparency, and Chl a measures, indicate that the western basin is slightly above the targeted mesotrophic status, the central basin is within targeted mesotrophic status, which favors percid production, and the nearshore waters of the eastern basin are borderline mesotrophic/oligotrophic. The offshore eastern basin waters remain near targeted oligotrophic status. Trends across Lake Erie in recent years indicate that overall productivity is slowly declining. Low hypolimnetic dissolved oxygen continues to be an issue in the central basin during the summer months.



Trophic state indices for Lake Erie, 1999-2017. Trophic ranges are in shaded and labelled.

Aquatic Invasive Species

The Aquatic Invasive Species charge was developed in recognition of the need for a systematic, centralized, lake-wide effort to track records of new, non-native species that might become invasive. In 2017, FTG members reported 3 species on the Injurious Species list or other unusual non-native species. One Clown Knifefish was reported by a private citizen from Van Buren Bay, New York. This species is believed to pose little threat as it is not adapted to cold winter water temperatures. One Rudd was captured in Cleveland Harbor in the Central Basin. Forty-Two Grass Carp were reported from Michigan (N=16), and Ohio (N=26) waters of Lake Erie or its connected waterways in 2017. The majority were reproductively-capable diploid fish. Eighteen Grass Carp captured in OH were released alive following surgical implantation of acoustic tags as part of collaborative research to track Grass Carp movements. The remaining 24 Grass Carp were killed and samples taken for ploidy and other testing. Annual fish community surveys (electrofishing, gill nets, trawls, seines, and trap nets) provide extensive spatial coverage on Lake Erie. There were no Bighead or Silver carp captured in assessment surveys in 2017. In addition, neither species was reported from commercial or recreational fisheries



Status of Fisheries in Michigan Waters of Lakes Erie and Lake St. Clair, 2017

Highlights for 2017

The purpose of this report is to provide an update on the status of the fisheries in the Great Lakes and connecting waters of Southeast Michigan. Sources of information used in compiling this report include creel surveys, charter boat reports, an angler diary program, the Michigan DNR Master Angler program, commercial fishery records, and fisheries survey results.

Some of the highlights described in detail include:

- Michigan non-charter anglers captured over 1 million Lake Erie Yellow Perch and harvested over 870 thousand of these fish. Catch rates were the second highest observed since 1986, second only to 2016.
- The 2017 non-charter angler harvest rate for Lake Erie yellow perch was the second highest recorded since 1986,

while the walleye harvest rate was below the long-term average.

- Michigan non-charter anglers on Lake Erie caught 214,111 Walleye and harvested 56,938 of those fish. The high release rate was due to the abundance of sub-legal fish from the large 2015 year class.
- Lake St. Clair continues to be the premier Michigan water for trophy Muskellunge and Smallmouth Bass based on the number of entries recorded in the Master Angler program in 2017.
- Non-charter recreational Lake St. Clair anglers harvested more than 42 thousand Walleye in 2017, a 71% increase from 2016.
- Trap netting and trawling in Lake St. Clair resumed in 2017 after a hiatus in 2016.
- The Lake St. Clair trawl survey revealed better than average recruitment of Yellow Perch and Smallmouth Bass in 2017.
- The 2017 catch of two-year old Walleye in the MDNR's Lake Erie assessment gill nets reflects the strong 2015 year class, which will fully recruit to the fishery during 2018 and result in impressive catch rates of Walleye in Michigan waters of Lake Erie and the St. Clair-Detroit River System for years to come.
- Brook Silversides and Emerald Shiners were the numerically dominant species in the 2017 nearshore electrofishing survey.

Sport Fishery Summary

Information on angler catch rates, effort, and opinion of Michigan's sport fisheries is collected with angler surveys. An angler survey can be conducted on-site where anglers are interviewed or counted while on the water, or off-site when anglers are interviewed by mail or telephone. Onsite methods, also known as creel surveys, have been used extensively by the MDNR on various Michigan waters to estimate angler effort, harvest, and catch. In Southeast Michigan, on-site creel survey data are collected each year from the noncharter recreational fishery of Lake Erie. An onsite creel survey was also conducted on Lake St. Clair during 2017. Charter boat harvest, release, and angling effort are also recorded by Lake Erie and St. Clair-Detroit River System charter operators, who are required to report this information to the MDNR on a monthly basis.

Another example of an off-site angler survey is an angler diary program, where anglers keep their own records of angling activity and success. A
voluntary Sport Fishery Diary Program is used to collect catch and effort data for recreational fishing on Lake St. Clair. The program was initiated by the Ontario Ministry of Natural Resources and Forestry (OMNRF) in 1985 to monitor trends in the Muskellunge catch rate for Lake St. Clair. Five years later the program was expanded to include other species. The MDNR became involved in the program in 1993. Since that time, the program has been a cooperative effort between the OMNRF and MDNR to provide annual estimates of catch rates for the major sport fish species in Lake St. Clair. The MDNR Master Angler program, established in 1973 to recognize anglers who catch unusually large fish, also provides information on trends in voluntary reports of "trophy" catches throughout the Great Lakes waters of Southeast Michigan.

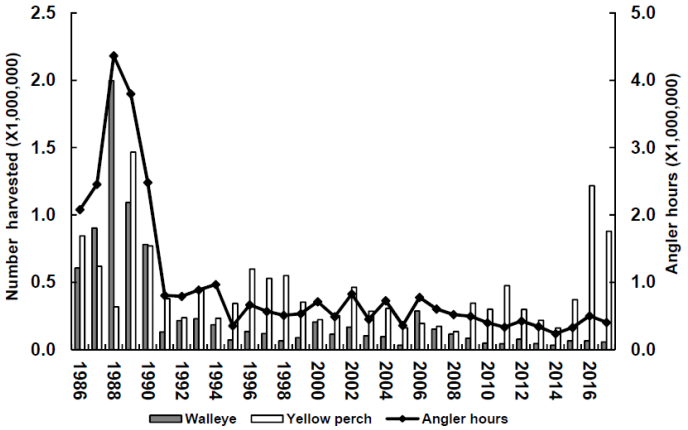


Fig 1-Estimated harvest and effort for Michigan's Lake Erie sport fishery, 1986-2017.

Lake Erie non-charter recreational fishery

The annual creel survey conducted by the MDNR during 2017 produced a total harvest estimate of 948,062 fish (**Table 1)** for Michigan's Lake Erie non-charter sport fishery, representing a modest decline when compared to harvest in 2016 (1,297,684), but is still substantially higher than 2015 (461,826). Yellow Perch alone accounted for 93% of the total harvest, reflecting their continued dominance of the recreational sport fishery.

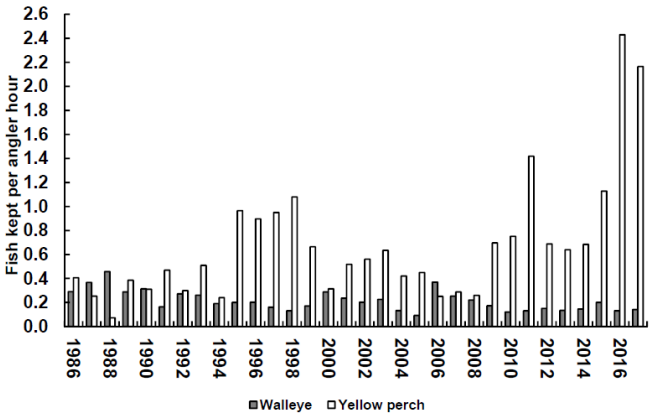


Fig 2-Walleye and Yellow Perch harvest rates for Michigan's Lake Erie sport fishery, 1986-2017.

Table 1-Estimated harvest and total harvest rate for Michigan's 2017 Lake Erie non-charter boat fishery.

Species	Harvest rate (fish/hr)	Month Apr	May	Jun	Jul	Aug	Sep	Oct	Season
HARVEST									
Yellow Perch	2.17	95	4,227	16,754	6,287	102,698	666,400	82,234	878,695
Walleye	0.14	4,039	18,647	23,455	6,321	2,198	2,221	57	56,938
Channel Catfish	0.008	0	164	674	484	532	1,595	0	3,449
White bass	0.01	1,190	2,477	242	326	121	0	7	4,363
White Perch	0.003	0	206	213	97	147	436	0	1,099
Freshwater Drum	0.002	0	20	71	40	0	545	0	676
Largemouth Bass	0.006	0	1,237	1,040	104	167	0	0	2,548
Total Harvest	2.34	5,324	26,968	42,653	13,687	105,935	671,197	82,298	948,062

Non-charter anglers harvested an estimated 56,938 Walleye in Michigan waters of Lake Erie, which declined when compared to the harvest in 2016 (65,816), though catch rates improved slightly (2017 total catch rate: 0.14 Walleye/hr; 2016: 0.13). Angler effort in 2016 declined 19% from 2016 **(Fig 1**). The Walleye harvest rate in 2017 (0.14 fish/angler hour) remained below the long term mean of 0.21 fish/angler hour (**Fig 2**). The Yellow Perch total harvest rate (2.17 fish/angler hour) decreased 11% compared to 2016, but still represented the second highest catch rate in the time-series **(Fig 2).** Trends in angler effort and harvest rates for Walleye and Yellow Perch since the mid-1980s suggest that the level of angler effort on Lake Erie is affected by many factors in addition to harvest rates. Other factors, including weather, prey fish abundance, fishing success on other Great Lakes waters, fuel expenses, and regional economic conditions have likely contributed to the comparatively low level of fishing effort since 1991.

Biological data were collected from Walleye and Yellow Perch during the 2017 on-site creel survey. The age composition of harvested Walleye was dominated by ages 2 through 4 (2013 to 2015 year-classes), collectively representing 68% of the harvest; though the 2014 year class (age 3) singlehandedly made up 43% of the catch. Similar to last year, age 11 and older Walleye accounted for only 7% of the harvest **(Fig 3).** The average length of Walleye harvested in the sport fishery in 2017 was 18.8 inches.

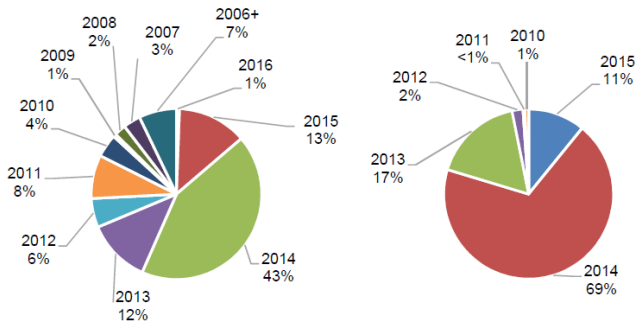


Fig 3 -Year-class contribution to Michigan sport harvest for Walleye and Yellow Perch from Lake Erie in 2017.

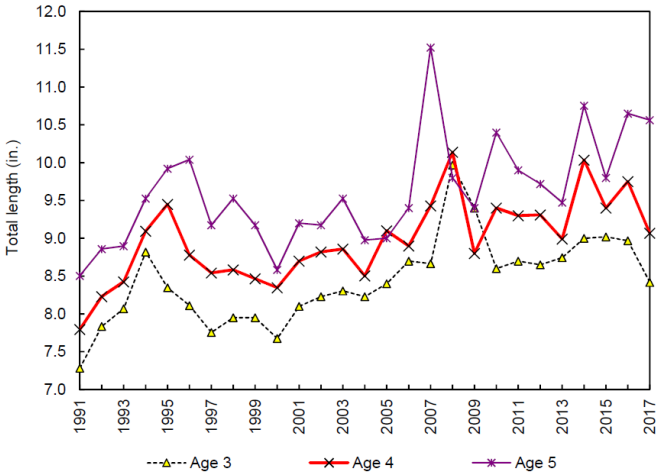


Fig 4-Mean length at age for sport-harvested Yellow Perch from Michigan's waters of Lake Erie, 1991-2017

Yellow Perch harvest was dominated by age 3 fish (2014 year-class), which accounted for 69% of the total harvest (Figure 3). The overall average length of Yellow Perch harvested in the sport fishery in 2017 was 8.6 inches. The mean length-at-age for Yellow Perch taken in the Michigan sport fishery decreased for ages 3, 4 5 fish in 2017 relative to 2016 **(Fig 4).**

Lake St. Clair non-charter recreational fishery

In 2017 the MDNR conducted a creel survey of the American waters of Lake St. Clair. Recreational anglers spent 540,779 hours (down from 553,457 hours in 2016) fishing the American waters of Lake St. Clair. Anglers harvested a total of 137,511 fish up from 117,658 fish in 2016 **(Table 2**). Yellow Perch were the most commonly harvested species in the American waters of Lake St. Clair during 2017, representing 49% of the total harvest. A total of 66,946 Yellow Perch were harvested, yielding a total harvest rate of 0.12 fish/angler hour, both down slightly from 2016. Non-charter anglers harvested a total of 42,620 Walleye, up 71% from 2016 (13,396 Walleye harvested in 2016), representing a total harvest rate of 0.08 fish/angler hour. Over 155,000 legal sized black bass (Largemouth and Smallmouth combined) were captured in the American waters of Lake St. Clair, and 96% were released. Additionally in 2017, 1,339 legal-sized Muskellunge were captured and 39 were estimated harvested. Anglers are reminded that beginning with the 2018 license year any harvested Muskie must be reported within 24 hours at www.michigan.gov/registerfish or by calling 1-844-345-3474.

Species	Harvest rate (fish/hr)	Month							
		Apr	May	Jun	Jul	Aug	Sep	Oct	Season
HARVEST									
Yellow Perch	0.12	311	1744	4,069	25,884	9,453	11,994	13,491	66,946
Walleye	0.08	231	6,870	6,077	21,696	4,057	1,926	1,763	42,620
Bluegill	0.01	43	693	256	573	204	1,081	311	3,160
Pumpkinseed	0.01	9	183	556	2,189	0	23	58	3,017
Smallmouth Bass	0.01	0	79	752	3,285	841	642	119	5,717
Rock Bass	0.01	0	2,235	3,755	910	580	0	0	7,481
Largemouth Bass	0.002	0	0	298	1,043	0	57	21	1,419
Total Harvest	0.25	781	17,096	16,451	55,773	15,372	16,058	15,980	137,511

Table 2-Estimated harvest and total harvest rate for the 2017 Lake St. Clair non-charter boat fishery.

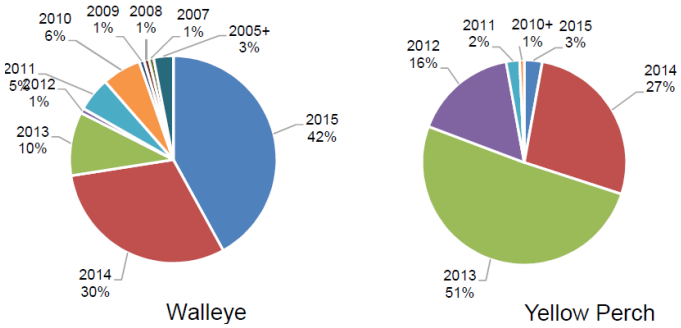


Fig 5-Year-class contribution to Michigan sport harvest for Walleye and Yellow Perch from Lake St. Clair in 2017.

Similar to Lake Erie, biological data were collected from Walleye and Yellow Perch during the 2017 on-site Lake St. Clair creel survey. The age composition of harvested Walleye was dominated by age 2 and age 3 (2014 and 2015 year-class), which together accounted for 72% of the harvest (**Fig 5).** Age 10 and older Walleye accounted for only 4% of the harvest. The average length of Walleye harvested in the sport fishery in 2017 was 17.1 inches.

Yellow Perch harvest was dominated by age 4 fish (2013 year-class), which accounted for 51% of the total harvest (**Fig 5).** This year-class was the most numerically dominant in last year's (2016) harvest as well. The average length of yellow perch harvested in the sport fishery in 2017 was 8.7 inches.

Charter fishery

In 2017, Michigan charter boat operators reported a total harvest of 53,383 fish of all species from Lake Erie. In combination, Yellow Perch and
Walleye accounted for over 99% of the total harvest. The Walleye targeted harvest rate in 2017 (0.83 fish hour, **Table 3)** was down from 2016. The total Walleye harvest rate (0.56) remained slightly below the long-term mean total harvest rate of 0.71 fish/angler hour (**Fig 6**). The Yellow Perch targeted harvest rate increased substantially from 2016, exceeding the long-term mean of 0.70 fish/angler hour for the 8th consecutive year (**Fig 6).**

			Month							
Species	Catch per hour	Catch per excursion	Apr	May	Jun	Jul	Aug	Sep	Oct	Season
Harvested										
Yellow perch	6.279	149.16	0	0	224	2,298	7,950	20,958	8,844	40,274
Walleye	0.825	17.701	1,122	2,310	6,075	1,961	162	5	30	11,668
Small. bass	0	0	0	0	0	0	0	0	0	0
Muskellunge	-	-	-	-	-	-	-	-	-	-
Released										
Yellow perch	0.226	157.54	0	0	15	97	322	582	435	1,451
Walleye	0.910	37.243	1,138	2,819	6,745	2,096	79	0	1	12,878
Small. bass	1.857	40.857	0	0	267	0	0	19	0	286
Muskellunge	-	-	-	-	-	-	-	-	-	-

Table 3-Total targeted harvest per hour and targeted harvest per excursion for charter boats on Lake Erie, 2017.

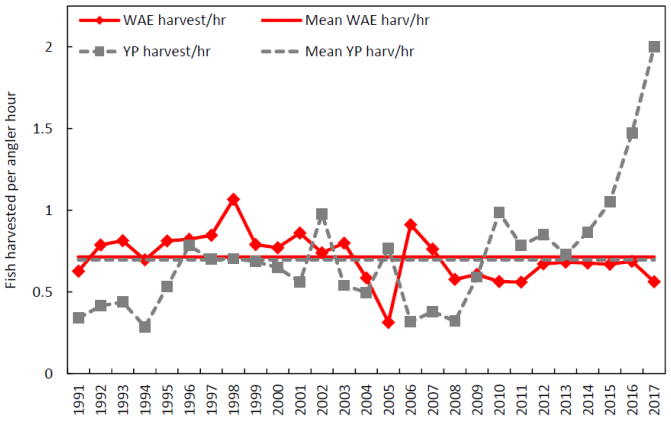


Fig 6-Michigan Lake Erie charter boat harvest rates for walleye and yellow perch, 1991-2017.

Beginning in 2010, Michigan charter boat operators were required to report catch-and release fishing activity as well as harvest. For Lake Erie, charter operators reported releasing 18,630 fish of all species in 2017. About 72% of the released fish were Walleyes, suggesting a high abundance of sub-legal sized fish associated with the strong 2015 and 2016 year-classes. Lake Erie charter boat operators reported the catch and release of 15 Muskellunge in 2017, all non-targeted catch.

For the St. Clair-Detroit River System, charter boat anglers reported a harvest of 22,014 fish of all species. Walleye (74%) and Yellow Perch (15%) made up the bulk of the harvest. In 2017, the charter boat targeted harvest rate for Walleye increased substantially when compared to 2016 and

was well above long-term mean Walleye harvest rate of 0.21 fish/angler hour (**Fig 7).** The Yellow Perch harvest rate decreased slightly from 2016, and remained well below the long-term mean harvest rate of 0.43 fish/angler hour (**Fig 7).**

Charter operators on the St. Clair-Detroit River System reported releasing 30,780 fish. Smallmouth Bass (49%) and Walleye (24%) accounted for the majority of the fish that were captured and released. For charters targeting Smallmouth Bass, charter operators released 96% of the 15,853 fish caught in 2017. Of the 857 Muskellunge reported caught, seven were harvested for an overall release rate of 99.2% **(Table 4**).

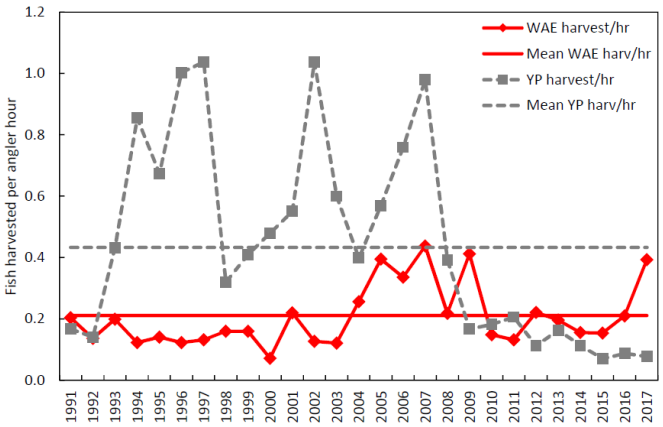


Fig 7-Michigan St. Clair-Detroit River system charter boat harvest rates walleye and yellow perch, 1991-2017

Species	Catch per hour	Catch per excursion	Month							
			Apr	May	Jun	Jul	Aug	Sep	Oct	Season
Harvested										
Yellow perch	2.203	49.315	0	114	0	134	267	1,183	965	2,663
Walleye	0.766	15.883	7,344	4,765	2,125	756	534	221	249	15,994
Small. bass	0.027	0.549	0	26	5	109	122	48	0	310
Muskellunge	0.001	0.024	0	0	0	0	7	0	0	7
Released										
Yellow perch	1.294	28.981	0	0	0	98	111	620	736	1,565
Walleye	0.350	7.237	2,790	2,936	914	480	124	23	21	7,288
Small. bass	1.281	25.380	275	2,915	3,793	2,905	2,168	1,166	1,118	14,340
Muskellunge	0.115	2.629	0	0	150	165	160	119	171	765

Table 4-Total targeted harvest per hour, targeted harvest per excursion and number harvested, for charter boats on the Detroit River, Lake St. Clair, and the St. Clair River, 2017

The number of reported Michigan charter excursions on Lake Erie decreased slightly in 2017 but was the second highest amount since 2007
(Fig 8). In 2017, charter boat excursions on the St. Clair-Detroit River System increased 9% from 2016, continuing a trend of increased charter activity since 2012. The reporting requirement of catch and release fishing implemented in 2010 may explain some of the increased activity that was reported; however, it is likely that the continuing upward trend in charter excursions since 2012 represents a true increase in charter activity. The charter fishing activity on the St. Clair-Detroit River System is primarily catch-and-release oriented, and was largely unreported prior to 2010 making long-term trends in charter effort difficult to assess in the St. Clair system.

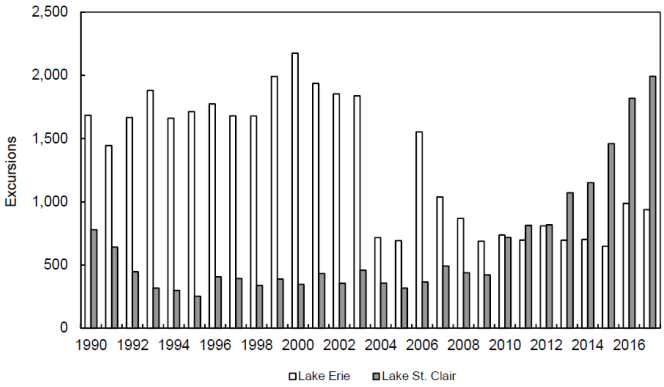


Fig 8-Reported charter boat excursions on Lake Erie and the St. Clair-Detroit River system, 1990-2017

Sport Fishery Diary and Master Angler programs

Muskie catch rates derived from the Sport Fishery Diary Program on Lake St. Clair improved through the late 1980's and early 1990's, but were more variable in the 2000's. In 2017, the catch rate increased slightly from the previous year (**Fig 9).** The increase in Muskie catch rates for 2017 continues a pattern of increased variability in catch rates over the past 17 years. We suspect this increased variability may be more reflective of the lower number of Muskie anglers involved in the diary program, than of actual changes in the Muskie population.

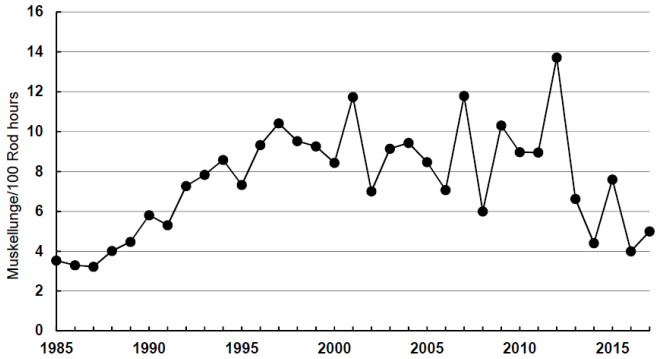


Fig 9-Lake St. Clair muskellunge catch rate from Angler Diary Program, 1985-2017

For years, the quality of the Lake St. Clair Muskie fishery was reflected in the MDNR's Master Angler program. Lake St. Clair continued to dominate the statewide Master Angler entries for Muskellunge in 2017 with 32 of the 55 total entries. The previous three years have shown an increasing trend in the number of Master Angler entries from Lake St. Clair (**Fig 10**). There has been a general decline in entries since the peak in 2001. We suspect this is largely a reflection of waning interest in submitting Master Angler entries for Muskie less than 50 inches in length, which has become a local benchmark for "trophy" status for Muskellunge from the St. Clair-Detroit River System. By all accounts, the Muskie population continues to provide excellent fishing opportunities. We expect that the following factors will continue to contribute to a strong Muskie population and fishery in Lake St. Clair and the connecting waters: 1) a 44 inch minimum size limit (MSL) for Ontario waters and a 42 inch MSL for Michigan waters of the St. Clair system; 2)

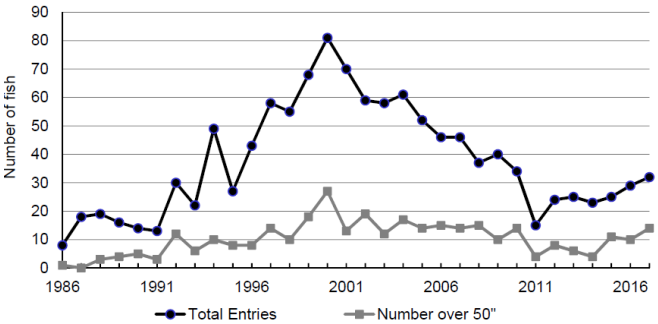


Fig 10-Lake St. Clair muskellunge entered in the Michigan DNR Master Angler Program, 1986-2017

physical and biological changes in the lake such as clearer water and increased aquatic plant growth resulting in improved habitat for Muskie; and, 3) extensive voluntary practice of catch-and-release fishing for Muskie in Lake St. Clair by both charter and non-charter anglers.

Statistics from the Master Angler program indicate that Lake St. Clair is one of the premier waterbodies in the state for trophy Smallmouth Bass. With 27 entries in the Master Angler program in 2017, Lake St Clair represented 21% of the total entries statewide. The next highest waterbody had 5 total entries. This represents a substantial increase from the general decline that had been observed from 2013 – 2016 on Lake St. Clair **(Fig 11).** The continued strong representation of Lake St. Clair Smallmouth Bass in the statewide Master Angler program is likely a reflection of an abundance of trophy-size Smallmouth Bass in the lake, a high degree of angler effort targeting the species, and widespread practice of catch-and-release among Smallmouth Bass anglers.

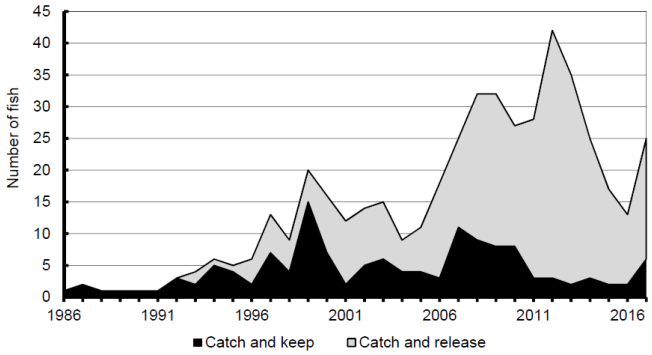


Fig 11-Lake St. Clair smallmouth bass entered in the Michigan DNR Master Angler Program, 1986-2017

Commercial Fishery Summary

Since 1979 the commercial fishery in Michigan waters of Lake Erie has primarily harvested rough fish species using seines in the shallow embayments along the shoreline, although a small-mesh trap net license has been active since 2006. In 2017, a total of three Michigan commercial fishing licenses were active on Lake Erie. The 2017 commercial harvest included 11 types of fish for a total of 348,115 pounds. In combination, Channel Catfish (23%), White Bass (18%), Common Carp (13%) and Gizzard Shad (12%) accounted for 67% of the total harvest by weight. The total value of the 2017 Lake Erie commercial harvest from Michigan waters was estimated at $194,936 **(Table 5).** The 2017 total harvest was the lowest since 2004 with harvest declining for all species besides Gizzard Shad **(Table 6).** The harvest of Common Carp was the lowest since 1981.

Summary of Fisheries Surveys

The MDNR conducts a number of annual assessments using a variety of gear types to target the diverse fish communities present in Lake Erie and the St. Clair-Detroit River System. Since 1978, the Lake St. Clair Fisheries Research Station has fished variable mesh multi-filament gill nets at two fixed (index) locations in western Lake Erie each fall, as part of

the interagency walleye assessment program. In 2014, a bottom trawl survey was added to our standard assessments of the Michigan waters of Lake Erie in order to measure recruitment of important fish species. Trap nets have been deployed in Anchor Bay of Lake St. Clair each spring since 2002 to sample adult fish populations, while juvenile and forage fish populations in the lake have been assessed with bottom trawls each spring and fall since 1996. A setline survey has been used to monitor the Lake Sturgeon population in the North Channel of the St. Clair River since 1997; beginning in 2013 the MDNR modified its bottom trawl to increase its success in capturing Lake Sturgeon in Lake St. Clair. After a hiatus in 2016 associated with the repower of our primary work platform, the R/V *Channel Cat*, the annual trap net and trawl surveys resumed in 2017. In 2017 we also continued our fall nearshore electrofishing survey for a second year utilizing our electrofishing boat, the R/V *Mooneye*.

Lake Erie

Eight sites, including the two index gill net stations, were sampled during the 2017 Lake Erie bottom trawl fish community survey. A total of 11,492 fish representing 22 different species were captured during 8 trawl tows for an average catch-per-effort (CPE) of 1,444 fish/10-minute tow. Age 0 White Perch had the highest average CPE (759 fish/10-minute tow) for forage-sized fish, followed by age 0 Gizzard Shad (292 fish/10-minute tow), Yellow Perch (133 fish/10-minute tow), Mimic Shiner (50 fish/10-minute tow), and White Bass (41 fish/ 10-minute tow). Trout Perch, Round Goby, Age 0 Walleye, Logperch, Silver Chub, Rainbow Smelt, Spottail Shiner, and Tubenose Goby were also captured. The non-forage size (adult) catch was dominated by Yellow Perch (50 fish/10-minute tow), followed by Freshwater Drum (44 fish/10-minute tow), White Perch (20 fish/10-minute tow), White Bass (14 fish/10-minute tow), and Walleye (7 fish/10-minute tow). Also captured were Channel Catfish, Common Carp, Rock Bass, Shorthead Redhorse, Pumpkinseed, Quillback, White Sucker, and Smallmouth Bass (all less than 2 fish/10-minute tow). While 2017 brought the highest overall CPE observed since Michigan's modern-day bottom trawl survey began in 2014, this was only the fourth trawl survey in recent memory, making it is difficult to put the catch rates that we observed into a broader context for Michigan waters of Lake Erie.

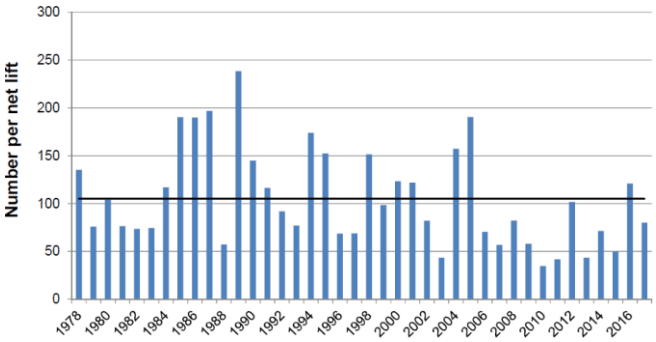


Fig 12-Average total walleye catch per unit effort, by year, for Michigan Lake Erie index gill nets, 1978-2017

In 2017 a total of 1,110 fish representing 10 species were captured during four net lifts at two index sites completed during the annual October gill net survey in Michigan waters of Lake Erie. White Perch (36%), Walleye (29%), and Gizzard Shad (20%), comprised over three-quarters of the catch by number, followed by White Bass (9%), Channel Catfish (3%), Freshwater Drum (1%), White Sucker (1%), and Yellow Perch (1%). The remaining two species (Goldfish and Shorthead Redhorse) accounted for less than 1% of the total catch. The average Walleye catch rate for the two index sites (80 fish/lift) in 2017 was two-thirds that observed during 2016 **(Fig 12).** Two year-old fish from the robust 2015 year class accounted for 71% of the total catch, followed by age 1 (2016 year class; 17%) and age 3 (2014 year-class; 10%) Walleye. The average catch rate of yearling Walleye (13 fish/lift) decreased 84% from 2016, and was well below the average of 37 fish/lift for the 1978-2016 time series **(Fig 13),** which reflects the smaller size of the 2016 year class compared to the strong 2015 year class. The 2015 Walleye year class, which will be fully recruited to the fishery in 2018, is expected to be a strong contributor to the Lake Erie fishery in upcoming years.

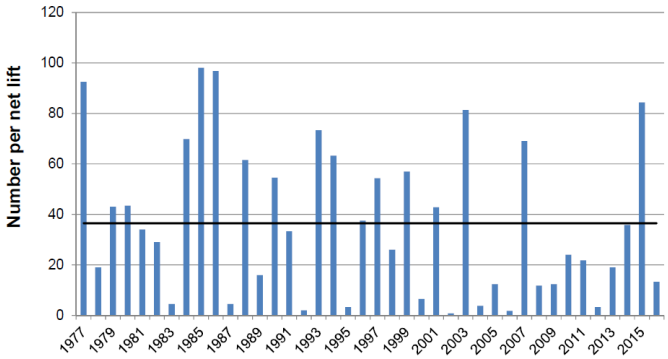


Fig 13-Average yearling walleye catch per unit effort, by year-class, for Michigan Lake Erie index gill nets

Lake St. Clair and St. Clair River

The 2017 trap net survey ran between April 24th and May 18th culminating in 36 net lifts. Total catch per lift was 49.06 fish which was higher than the average over the time series (39.9 fish/lift), and the highest observed since 2012 (50.8 fish/lift). Rock Bass and Walleye were the two most commonly observed species making up 56 and 15% of the catch, respectively (**Fig 14**). Age was estimated for 203 Smallmouth Bass and 99 Northern Pike (**Fig 15**). Year-class contribution to Smallmouth Bass catch was relatively uniform **(Fig 15),** with the 2011 year class being most abundant (21% of the catch).

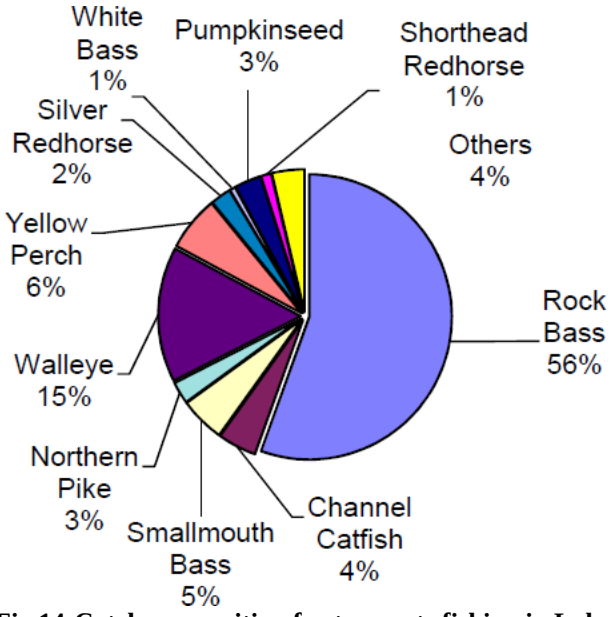


Fig 14-Catch composition for trap nets fishing in Lake St. Clair during April – May 2017

For Northern Pike, the 2013 (33%) and 2014 (34%) year-classes made up the majority of the catch. Smallmouth Bass averaged 17.2 inches in length and Northern Pike averaged 27.9 inches in length. Additionally four Muskellunge were captured, averaging 43.1 inches in total length, and ranged between 8 and 15 years old. In addition to the trap net survey we continued Smallmouth Bass sampling by electrofishing along the "Mile Roads" area east of St. Clair Shores. A total of 146 individuals were sampled with an average length of 16.9 inches and an age range of 3 to 12. Together these surveys indicate strong populations of sportfish in Lake St. Clair, with an abundance of large, and relatively old individuals.

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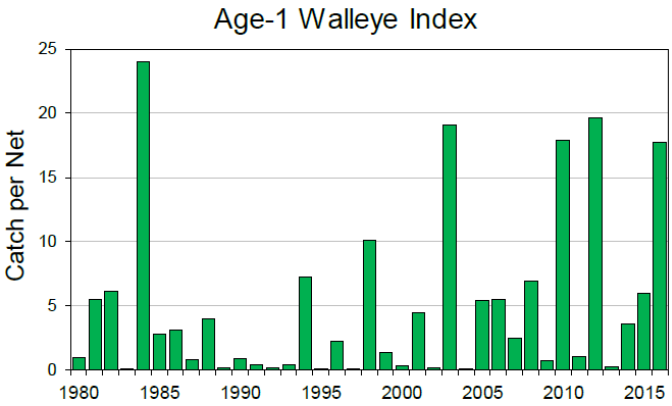
New York Lake Erie 2017 Annual Report

Program Highlights

The New York State Department of Environmental Conservation's Lake Erie Fisheries Research Unit is responsible for research, assessment and fisheries management activities for one of New York's largest and most diverse freshwater fishery resources. A variety of annual monitoring programs are designed to improve our understanding of the Lake Erie fish community, guide fisheries management, and safeguard this valuable resource for current and future generations. This document shares just a few of the highlights from the 2017 program year. Our complete annual report is available on DEC's website at *http://www.dec.ny.gov/outdoor/32286.html*, or by contacting DEC's Lake Erie Unit office (contact information below).

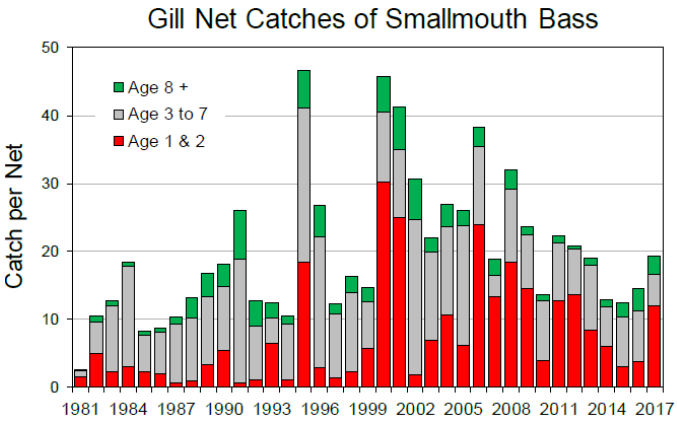
Walleye

Lake Erie's eastern basin walleye resource is composed of local spawning stocks as well as substantial contributions from summertime movements of west basin spawning stocks. Walleye fishing quality in recent years has generally been very good and largely attributable to excellent spawning success observed in 2003, 2010, 2012, 2014, & 2015. Measures of walleye fishing quality in 2017 were the highest recorded in the 30-year survey. New York's most recent juvenile walleye survey indicates an exceptional spawning year in 2016. Overall good recruitment through recent years, especially in 2010, 2012, and 2016, suggests adult walleye abundance in the east basin will remain satisfactory for the next several years. The west basin of Lake Erie experienced a record high walleye recruitment event in 2015, which should also help support New York's walleye fishery for years to come. Preliminary results from a new research initiative that began in 2015 using acoustic telemetry indicate that western basin migrants make a substantial contribution to the New York walleye fishery. A $100 reward is associated with the return of each tagged fish along with the internal acoustic tag.



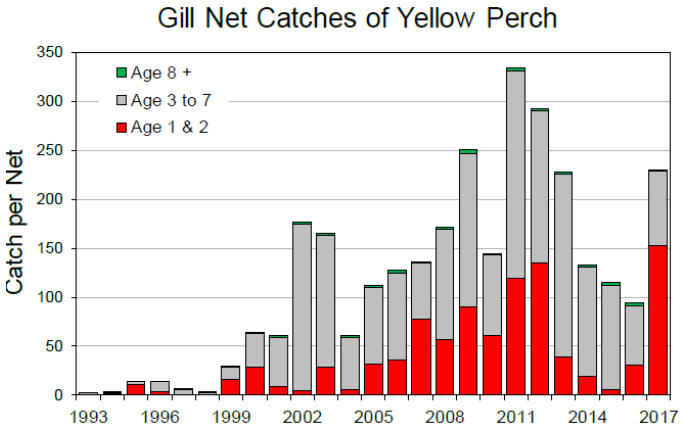
Smallmouth Bass

Lake Erie supports New York's, and perhaps the country's, finest smallmouth bass fishery. Bass fishing quality in 2017 was below the 30-year average for the first time in eight years, with the peak observed in 2013. Generally stable spawning success, coupled with very high growth rates and acceptable survival, produce relatively high angler catch rates and frequent encounters with trophy-sized fish. Recent data indicate a very gradual decline in abundance to near long term average measures. Juvenile abundance measures suggest 2016 was a below average smallmouth bass year class.



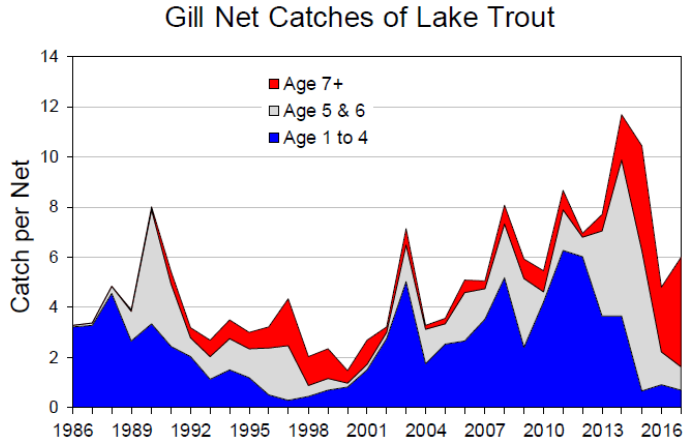
Yellow Perch

Lake Erie yellow perch populations have experienced wide oscillations in abundance over the last 30 years, from extreme lows in the mid-1990's to an extended recovery that has now lasted well over a decade. Poor recruitment in 2011-2013 resulted in a declining adult population and more recently a decline in angler catch rates. However, perch fishing quality began to increase 2017 and is now above the long-term average. Strong year classes observed in 2014, 2015, & 2016 should result in continued improvements in fishing quality in upcoming years.



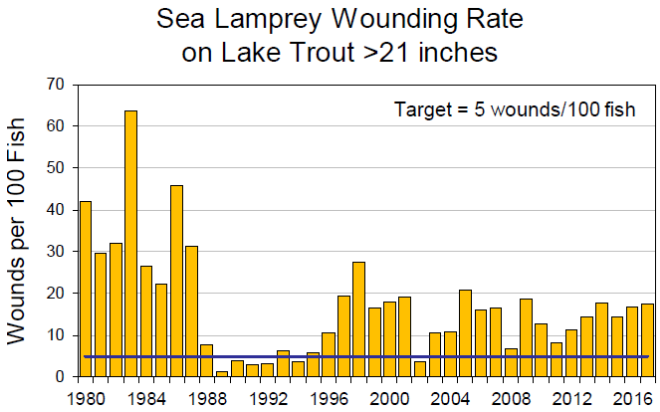
Lake Trout Restoration

Re-establishing a self-sustaining lake trout population in Lake Erie continues to be a major goal of Lake Erie's coldwater program. Lake trout have been stocked since 1978 and annual assessments monitor progress towards restoration objectives. A revised lake trout rehabilitation plan was completed in 2008 and guides current recovery efforts. The overall index of abundance of lake trout in the New York waters of Lake Erie increased 30% in 2017. Overall abundance has met or exceeded the Plan objective of 8.0 fish/lift in five of the past ten years. Adult lake trout (age 5+) measures slightly increased in 2017, remaining high relative to the entire time series; older fish (age 10+) remain scarce. Basinwide estimates of adult abundance remain below targets for the second time in the past five years. Adult survival for some lake trout strains remains low, mainly due to high sea lamprey predation. Natural reproduction has not yet been detected in Lake Erie. Significant stocking and sea lamprey control efforts must be continued to build and maintain the levels of adult population necessary to support natural reproduction. An acoustic telemetry study began in 2016 to determine spawning locations and habitats used by stocked lake trout.



Sea Lamprey

Sea lamprey invaded Lake Erie and the Upper Great Lakes in the 1920s and have played an integral role in the demise of many native coldwater fish populations. Great Lakes Fishery Commission (GLFC) coordinated sea lamprey control in Lake Erie began in 1986 in support of lake trout rehabilitation efforts, and regular treatments are conducted to reduce sea lamprey populations. Annual monitoring undertaken by NYSDEC includes observations of sea lamprey wounds on lake trout and other fish species, and lamprey nest counts on selected stream sections. Wounding rates on lake trout have been steady over the past five years but remain well above targets. Inspections of sportfish species documented sea lamprey wounding on warmwater species as well. GLFC surveys conducted in recent years indicate the largest source of Lake Erie's sea lamprey production may be the St. Clair River rather than traditionally monitored and treated Lake Erie streams.

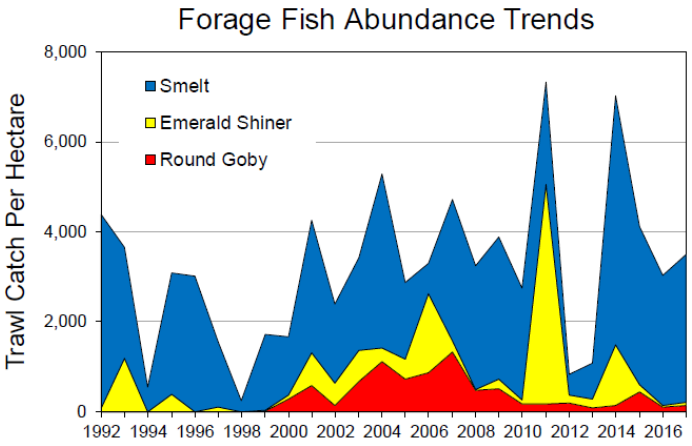


Salmonid Management

New York annually stocks approximately 255,000 steelhead and 35,000 brown trout into Lake Erie and its tributaries to provide recreational opportunities for anglers. Wild reproduction of steelhead also occurs in some tributaries but remains a minor contributor to the overall fishery. Steelhead stocking was above the target in 2017 due to a surplus of fish at the Salmon River Hatchery. A tributary angler survey conducted in 2014-15 found steelhead catch rates were 0.32 fish/hour, which represents some of the highest fishing quality in the country. A new angler survey is now being conducted in 2017-18. A study examining two different stocking sizes of steelhead and two different stocking strategies began in 2015, and will to continue through 2018. This research will provide guidance on the role of stocking size and location on adult returns with the goal of improving fishing quality.

Prey Fish

The Lake Erie Unit conducts a number of surveys to assess forage fishes and components of the lake's lower trophic levels that further our understanding of factors shaping the fish community. Current surveys include trawling, predator diet studies, and lower food web monitoring. A variety of prey fish surveys that began 20+ years ago identified rainbow smelt as the dominant component of the open lake forage fish community. Beginning in 2000, there was a notable increase in prey species diversity accompanied by slightly lower smelt abundance, and in some year's high abundances of round gobies and emerald shiners. In recent years overall prey fish abundance has become highly variable with a notable decline of goby abundance in trawl surveys. Overall abundance of soft-rayed forage fishes slightly increased in 2017 but stayed at average levels compared to the previous decade. Young-of-the-year (YOY) rainbow smelt were the most abundant soft-rayed prey species for the fourth consecutive year. YOY alewife were also abundant in 2017. Trawl catches of round gobies indicate low but stable abundance, and many sources of information suggest emerald shiners were scarce again in 2017. Lower trophic monitoring indicates near shore waters are within the mesotrophic productivity zone typically favored by yellow perch and walleye.



2017 Lakes Erie/Huron Lake Sturgeon Working Group Report (USFWS)

The 2017 Lakes Erie/Huron Lake Sturgeon Working Group Reports, comprised of fisheries biologists from USFWS (multiple offices), U.S. Army Corp of Engineers, the Great Lakes Center at SUNY Buffalo State, New York Department of Environmental Conservation, USGS Great Lakes Science Center, Ontario Ministry of Natural Resources and Forestry (OMNRF, U of Windsor, U of Toledo, Michigan DNR, Ohio DNR and West Virginia U are collectively collaborating in twelve ongoing projects to collect life history and population demographics for the lake sturgeon population in and about Lakes Erie, Huron & St. Clair; and the Maumee, St. Clair, Detroit and Niagara Rivers.

Some sample projects:

- Molecular diet data quantify factors affecting levels of larval lake sturgeon predation by piscivorous fishes in the Black River, MI.

- Behavior of juvenile lake sturgeon stocked above a hydropower dam.

- Variation in retention time: how riverine characteristics influence female spawning behavior, reproductive success, and ovarian quality in lake sturgeon.

- Effects of parentage and microhabitat variation within adult-selected spawning sites on lake sturgeon growth during early life stages

- Lake Sturgeon Population Assessment in Southern Lake Huron

- Lake Sturgeon Gamete Collection in Southern Lake Huron

- Lake Sturgeon Rehabilitation in the Saginaw River Watershed

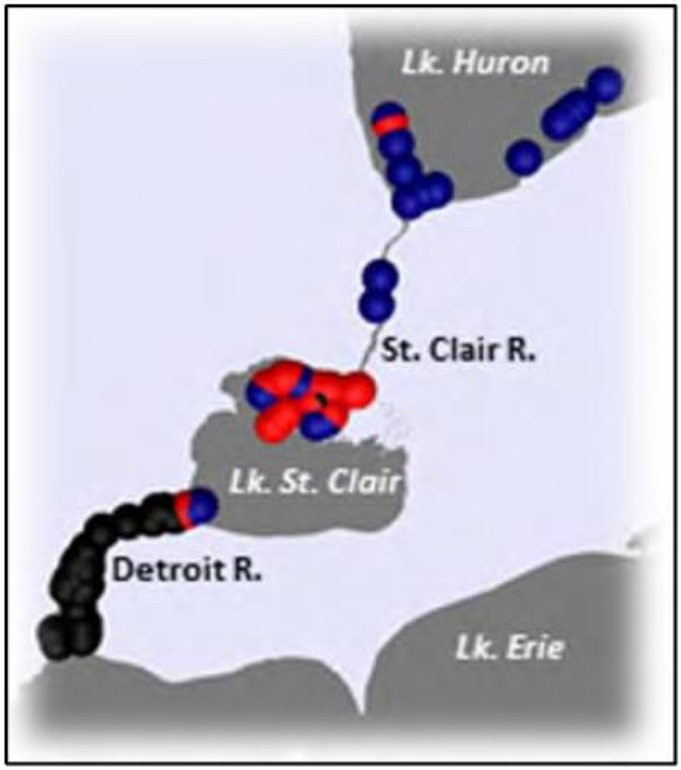
- Geographic organization and population structure of lake sturgeon in the Lake Huron-to-Lake Erie corridor as inferred from long-term, population-scale movement patterns.

- Investigation of Lake Sturgeon Spawning Migration and Larval Drift Dynamics in the Garden River

- Scent Enhancement and Tagging Effects in Juvenile Lake Sturgeon

- Great Lakes Acoustic Transmitter Observation System (GLATOS)

- Assessment of Lake Sturgeon Spawning Habitat in the AuSable River, MI



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PA 2018 Creel Limits For Lake Erie Yellow Perch and Walleye

HARRISBURG, PA. – The Pennsylvania Fish and Boat Commission (PFBC) announced that the 2018 creel limit for Lake Erie yellow perch will remain at 30 per day and the creel limit for walleye will stay at six per day. "The 2017 assessment showed that both yellow perch and walleye populations remain at maintenance levels," said Chuck Murray, the PFBC's Lake Erie biologist. "Based on this, the 2018 creel limits are being held at the 2017 limits."

At its March 29 meeting, the Lake Erie Committee allotted to Pennsylvania a yellow perch total allowable catch (TAC) of 627,668 pounds, a 3% increase from 2017, and 15% above the long-term average of 546,000 lbss. The 2018 level includes a yellow perch TAC for the commercial trap net fishery of 100,000 pounds.

Since 1996, the average harvest of yellow perch by Pennsylvania's combined recreational (135,500 lbs.) and commercial fisheries (13,000 lbs.) has been 148,500 pounds.

Based on a 2018 abundance estimate of 41 million walleye age two or older, the walleye population has decreased by about 23% from 2017 levels, but should provide excellent fishing in 2018. The 2015 year class (age-3) is estimated to represent 56% of the population and should contribute significantly to the harvest.
"Adaptive fishing regulations are based on the most recent fishery assessment results and are better aligned with the current status of the yellow perch and walleye stocks," Murray added. "This regulatory flexibility gives fisheries managers the ability to change daily harvest limits prior to the onset of the summer boat fishing season on Lake Erie." ✧

Fisheries Research/ Monitoring; Lake Erie Biological Station, 2017 (USGS)

Summary

Lake trout investigations from annual gill net surveys and more recent acoustic telemetry of spawning migration and habitat use in coordination with Ontario, New York, and Pennsylvania were reported in the Coldwater Task Group annual report to the Great Lakes Fishery Commission (GLFC) and the CLC (http://www.glfc.org/lake-erie-committee.php). Likewise, interagency forage fish assessments conducted with hydroacoustics were summarized and reported in the Forage Task Group annual report. Additionally, at the request of the Lake Erie Committee (LEC) in 2016, we worked with Ohio and Ontario to develop a bottom trawl survey in the central basin that addressed current uncertainties in the yellow perch stock assessment. The USGS contribution to this effort has been incorporated into the Ontario database, which included a trawl comparison study in 2017, summarized in the Yellow Perch Task Group annual report

This report presents biomass-based summaries of fish communities in western Lake Erie derived from USGS bottom trawl surveys from 2013 to 2017 during June and September. The survey design provided temporal and spatial coverage that does not exist in the interagency trawl database, and thus complemented the August Ohio-Ontario effort to reinforce stock assessments with more robust data. Analyses herein evaluated trends in: total biomass, abundance of dominant predator and forage species, non-native species composition, biodiversity and community structure. This data can be explored interactively online (https://lebs.shinyapps.io/western-basin/), and future analyses will be supported by public data and metadata records available on Science Base

Lake Erie is the most populated of the Great Lakes basins (approximately 12 million people; and as such has undergone dramatic anthropogenic changes. Since the 1800s, stresses such as overexploitation, habitat destruction, exotic species introduction, industrial contamination, and changes in nutrient loading have resulted in substantial changes to the fish community. The most notable changes have been declines in or extirpation of many native species. Since the implementation of the Clean Water Act and Great Lakes Water Quality Agreement in the 1970s, habitat conditions for fish improved, which in part resulted in several strong percid year-classes. These strong year-classes benefited from more restrictive management that ultimately rehabilitated Lake Erie percid stocks

Today, the primary goal of fishery resource managers in Lake Erie is "**To secure a balanced, predominantly cool-water fish community characterized by self-sustaining indigenous and naturalized species that occupy diverse habitats, provide valuable fisheries, and reflect a healthy ecosystem,**" yet there is little guidance on what fish community characteristics indicate a balanced and healthy

Lake Erie ecosystem. Historically, Lake Erie's mesotrophic cool water habitats supported harmonic percid and salmonid fish communities, and it is the aim of management to re-establish these communities.

Although Lake Erie management agencies have traditionally focused on numerical indices of a few economically important species (primarily Walleye, Yellow Perch, Lake Trout, and Smallmouth Bass), aquatic ecosystem models are typically evaluated in terms of biomass. Most time series of fish community data from Lake Erie do not contain measurements of biomass. Therefore, our understanding of fish community structure and ecosystem dynamics from mass-balance models has been limited to short-term investigations and proxy measurements (e.g., length-weight conversion).

In 2012, the USGS trawl program was revised to provide biomass-based measurements of fish population dynamics and ecosystem condition for Lake Erie. This was coincident with the switch to a new research vessel, the R/V Muskie. Trawl gear used by the previous vessel, the Musky II, did not maintain proper orientation in the water when fished with the R/V Muskie, therefore a different bottom trawl was developed. As this situation marked the beginning of a new time series of data, the sampling design was expanded for greater spatial coverage and increased sample size. Note that traditional numerically-based catch data (e.g., number per hectare) for individual species can be explored and downmloadedmonline (from 2013 to present - https://lebs.shinyapps.io/western-basin/, https://doi.org/10.5066/F7KK9B1R,) or obtained via Science Base for earlier years (https://doi.org/10.5066/F75M63X0). The purpose of this report is to develop a more comprehensive understanding of the long-term changes and population dynamics of key fishes of interest to management agencies, including native percids and their forage. Here, we summarize survey results for the most recent series of western basin trawl data from 2013 through 2017.

Survey Results

Forage biomass averaged 0.19 and 1.32 kg/ha during 2017 spring and autumn sampling, respectively. Catches of Emerald Shiner peaked at 51.49 kg/ha in spring 2013 and were <0.01 kg/ha in autumn 2017 (**Fig 2**). Rainbow Smelt catches were low and varied from <0.01 kg/ha to 4.99 kg/ha (**Fig 2**). Similarly, Gizzard Shad were also low and variable, but typically higher in autumn than spring, reflecting the occurrence of young-of-year fish (**Fig 2**).

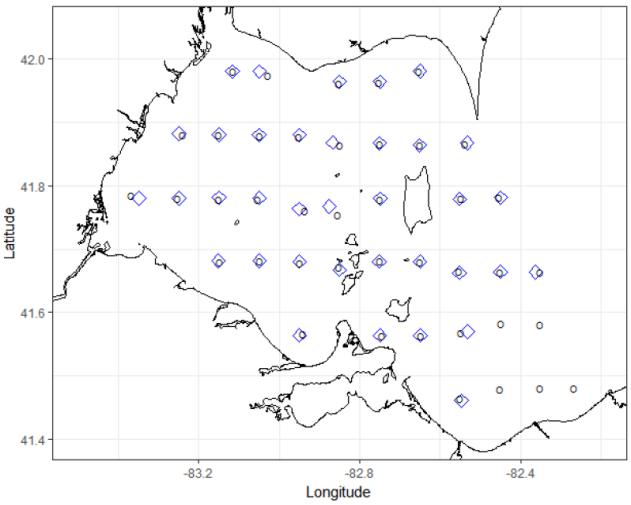

Fig. 1. Western Lake Erie trawl survey sites sampled by Lake Erie Biological Station in spring (diamonds) and autumn (circles) in 2017.

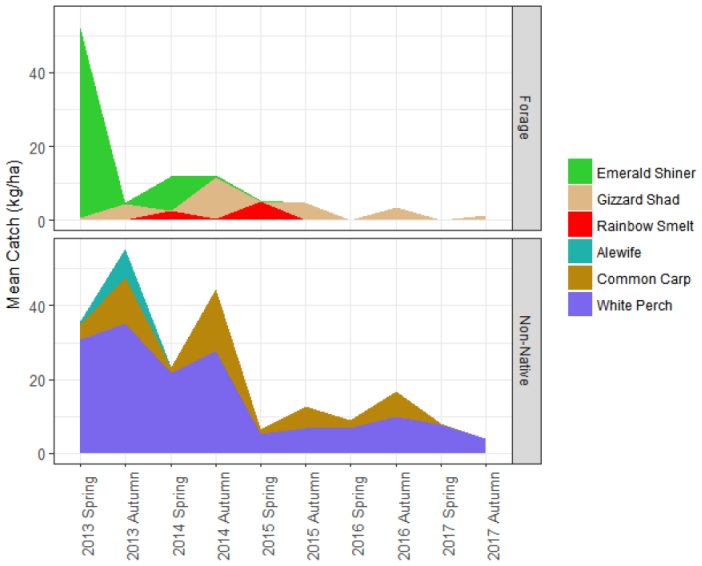

Fig 2. Stacked area plots of catch of primary forage (upper panel) and non-native (lower panel) fishes from trawls in western Lake Erie. Rainbow Smelt belong to both categories but are only plotted in the upper panel. Also, note that Round Goby, Sea Lamprey, and Goldfish are non-native species that were not plotted due to very low abundances in trawls.

The biomass proportion of catch of non-native species was generally less than 25%, averaging 0.16 (s.d. = 0.06) over the five years. The dominant non-native species either declined or showed little evidence of trends. White Perch averaged 15.69 kg/ha (s.d. = 32.36) across the series, with catch rates of 7.74 kg/ha and 2.20 kg/ha respectively in spring and autumn caught of 2017 (**Fig 2).** Common Carp represented the second most abundant non-native species by biomass, and varied from 0.2 to 17 kg/ha (mean = 5.1 kg/ha, s.d. = 5.6; **Fig 2).** After relatively large mean catches of Alewife in 2013 (0.69 kg/ha and 7.69 kg/ha in spring and autumn, respectively) none were captured from 2014-2016, and few were captured in 2017 (<0.01 kg/ha, **Fig 2).** Other non-native species (Round Goby, Goldfish, Sea Lamprey) were captured in low abundances (<0.1 kg/ha).

Despite decreasing trends in total biomass, biodiversity of trawl catches varied seasonally with an increasing trend in spring and no prominent trend in autumn. In previous years, Index values were higher autumn than spring; but in 2017, increased diversity was observed in spring rather than autumn due to one additional species – Lake Whitefish.

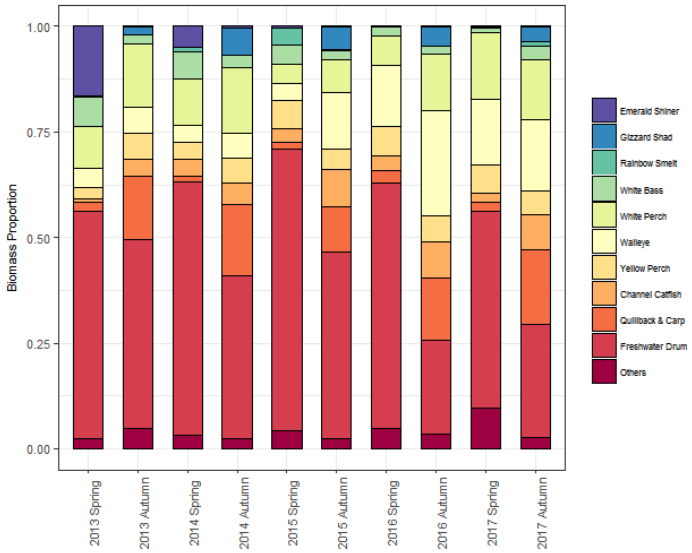

Fig. 3. Biomass proportion of fish in bottom trawls in western Lake Erie.

Like the numerically-based Index estimates of fish community structure, species biomass composition varied little across the series. While large benthic species were not numerically dominant, they accounted for 50% or more of the total catch biomass during nearly every sampling season (Fig 3; numerical versus biomass summaries can be explored here: https://lebs.shinyapps.io/western-basin/).

Freshwater Drum dominated the biomass proportion with percentages as high as ~70% in spring 2015 (**Fig 3**). Although it has remained the dominant single species by biomass (except in autumn 2016), Freshwater Drum biomass fluctuated from 25% to 53% since autumn 2016. By comparison, the proportions of other large benthic species, such as Channel Catfish, Common Carp and Quillback, have remained relatively constant across the series. Other non-forage species that dominated the biomass composition of the catch were percids (Walleye and Yellow Perch) and moronids (White Perch and White Bass). Both moronid species and Yellow Perch biomass proportions were relatively constant across the series, but Walleye (adults and juveniles) increased since 2014 from 10% to 20% of the catch biomass (**Fig 2).** The proportion of Gizzard Shad to the overall catch has remained stable over the 5-year survey (~5-10%), while contributions from other forage species (Emerald Shiner and Rainbow Smelt) declined across the series to below 5%.

Trends in Percids

Young-of-year (YOY) Yellow Perch catch rates in 2017 were low (32.31 fish/ha), varying little compared to the previous two years, and smaller than 2013 and 2014 catch rates by an order of magnitude **(Fig 3).** Young-of-year Yellow Perch catch rates peaked in 2014, and although we expected a corresponding peak in age-1 catch rates one year later, the data did not exhibit such a pattern (**Fig 3**). By comparison for Walleye, a lagged year-class signal was evident in YOY and age-1 catch rate peaks corresponding to the 2015 year-class (69.67 fish/ha; **Fig 3**). Further, an increase in YOY catch rate from 2013 to 2014 was also reflected in an increase in age-1 catch rates from2014 to 2015. Similar cross-validations of Walleye year-class variability from this survey will depend upon additional years of data.

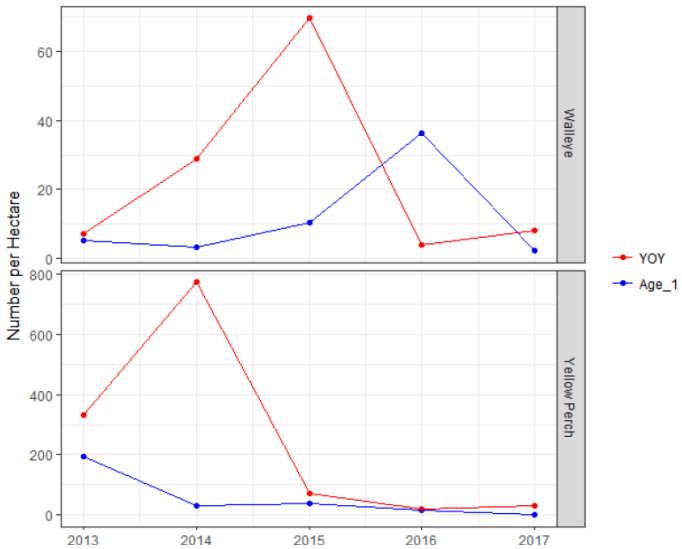

Fig 4. Mean number per hectare of young-of-year (YOY) and age-1Walleye (upper panel) and Yellow Perch (lower panel) in bottom trawls from western Lake Erie during autumn of years 2013-2017.

Summary

Although biomass of bottom trawl catches from western Lake Erie has declined dramatically over the past five years, in the other Great Lakes, cycles of fish population abundance are often longer than five years. Thus, trends from a five-year data series should be interpreted cautiously. The survey results reported here provide new perspectives not immediately available from existing monitoring efforts to support fish community goals of a mesotrophic ecosystem with a harmonic cool-water species assemblage of forage fish and percids. Notably, other Lake Erie surveys have underemphasized the importance of Freshwater Drum because they tend to report numerical instead of biomass-based measures of relative abundance. The potential for Freshwater Drum to impact invasive Dreissenid mussels has only been evaluated superficially, but due to its dominance in the fish community, this species has potential to contribute substantially to the remineralization of phosphorous in Lake Erie through the consumption of mussels.

These data also highlight the need to better understand mechanisms driving forage fish abundance. Adult Walleye and Yellow Perch rely on Gizzard Shad and Emerald Shiner as primary forage. Particularly for Walleye, which have experienced a strong recent year-class in 2015, the low abundance of forage in western Lake Erie may result in reduced growth and early emigration. Diet investigations that incorporate ontogenetic changes in spatial distribution may be needed to better inform potential management actions that would ensure sustainable fisheries in Lake Erie. Such efforts will require surveys like the one presented in this report. ✧

Sea Lamprey Control In Lake Erie, 2017

Introduction

This report summarizes Sea Lamprey control activities conducted by the United States Fish and Wildlife Service (Service) and Fisheries and Oceans Canada (Department) as agents of the Great Lakes Fishery Commission (Commission) in Lake Erie during 2017. The Sea Lamprey is a destructive invasive species in the Great Lakes that contributed to the collapse of Lake Trout and other native species in the mid-20th century and continues to affect efforts to restore and rehabilitate the fish community. Sea Lampreys subsist on the blood and body fluids of large bodied fish. It is estimated that about half of Sea Lamprey attacks result in the death of their prey and up to 18 kg (40 lbs) of fish are killed by every Sea Lamprey that reaches adulthood. The Sea Lamprey Control Program (SLCP) is a critical component of fisheries management in the Great Lakes because it facilitates the rehabilitation of important fish stocks by significantly reducing Sea Lamprey induced mortality.

Lake Erie has 842 tributaries (525 Canada, 317 U.S.). Thirty tributaries (11 Canada, 19 U.S.) have historical records of larval Sea Lamprey production. Of these, 17 tributaries (7 Canada, 10 U.S.) have been treated with lampricides at least once during 2008-2017. Nine tributaries (3 Canada, 6 U.S.) are treated every 3-5 years. Details on lampricide applications to Lake Erie tributaries and lentic areas during 2017 are found in **Fig 1**. In addition, larval production has been documented in the St. Clair River, three of its U.S. tributaries, and two tributaries to Lake St. Clair (one Canada, one U.S.), one of which required treatment during 2008-2017.

• Lampricide treatments were completed in 4 tributaries (2 Canada, 2 U.S.).

• Big Creek was treated from the lamprey barrier for the first time in 2017.

• The Grand River (Ohio) was successfully treated after being deferred in 2016

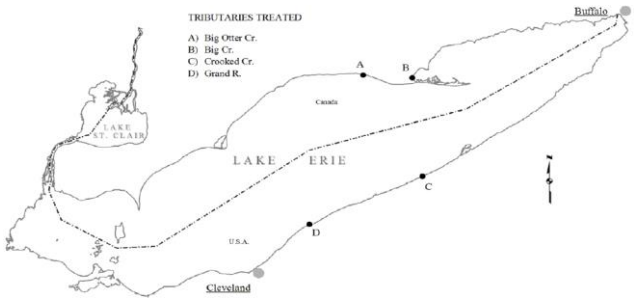

Fig 1- Location of Lake Erie tributaries treated with lampricides (corresponding letters in Table 1) during 2017.

Barriers

The Sea Lamprey barrier program priorities are:

1) Operate and maintain existing Sea Lamprey barriers that were built or modified by the SLCP.

2) Ensure Sea Lamprey migration is blocked at important non-SLCP barrier sites.

3) Construct new structures in streams where they: a. provide a cost-effective alternative to lampricide control;

b. provide control where other options are impossible, excessively expensive, or ineffective;
c. improve cost-effective control in conjunction with attractant and repellent based control, trapping, and lampricide treatments; and
d. are compatible with a system's watershed plan.

Field crews visited one structure on a tributary to Lake Erie to assess Sea Lamprey blocking potential and to improve the information in the BIPSS database.

Operation and Maintenance

▪ Routine maintenance, spring start-up, and safety inspections were performed on 11 barriers (7 Canada, 4 U.S.).

▪ Repairs or improvements were conducted on three Canadian barriers:

▪ Big Otter Creek – Plans to rehabilitate the Black Bridge Dam as a Sea Lamprey barrier were abandoned. The engineering consultant completed rehabilitation plans and specifications, and provided a Class A construction estimate of $1,446,680. This was more than twice the preliminary estimate, and the cost-benefit of rehabilitating the dam relative to ongoing, periodic lampricide treatment of the upstream larval infestation is unfavorable.

▪ Big Creek – Based on a site visit, Obermeyer Hydro Incorporated submitted a proposal for upgrading the existing components of the inflatable crest barrier, including replacement of the computer control system and sensors. The Department has reviewed the proposal and returned it with minor revisions. Upgrades will be implemented following the 2018 Sea Lamprey spawning migration.

▪ Little Otter Creek – The Department is replacing the barrier-integrated trap to improve its function and safety. Construction will be completed following the 2018 Sea Lamprey spawning migration.

▪ Cattaraugus Creek – The U.S. Army Corps of Engineers, along with project partners Erie County and New York DEC have approved the selected plan for the Springville Dam Ecosystem Restoration Project. The selected plan will lower a portion of the existing spillway but the structure will still serve as a Sea Lamprey barrier. Requests from the National Historic Registry will be fulfilled by preserving a portion of the original spillway on both banks to show the original structure. A 15-foot wide rock riffle ramp with seasonal trapping and sorting operations is also included in the design. Construction is targeted for 2021 following the Sea Lamprey spawning run.

New Construction

• Grand River – The USACE is the lead agency administering a project to construct a Sea Lamprey barrier to replace the deteriorated structure in the Grand River. The USACE has selected an onsite rebuild as the preferred alternative and barrier design is under review. Design considerations for the barrier include an 18" drop between crest height and tail water elevations and tail water velocities capable of preventing Sea Lamprey passage during high water events. Construction is targeted for completion by the end of 2019.

Larval Assessment

Tributaries considered for lampricide treatment during 2018 were assessed during 2017 to define the distribution and estimate the abundance and size structure of larval Sea Lamprey populations. Assessments were conducted with backpack electrofishers in waters <0.8 m deep, while waters ≥0.8 m in depth were surveyed with gB or by deep-water electrofishing (DWEF). Additional surveys are used to define the distribution of Sea Lampreys within a stream, detect new populations, evaluate lampricide treatments, evaluate barrier effectiveness, and to establish the sites for lampricide application.

The control agents continue to delineate the distribution and abundance of the larval Sea Lamprey population in the St. Clair River, a potential source of parasitic juveniles in Lake Erie. Results of these efforts form the basis for further actions and strategies for Sea Lamprey control in this important interconnecting waterway.

• Larval assessments were conducted on 64 tributaries (27 Canada, 37 U.S.) and offshore of 2 U.S. tributaries.

• Surveys to detect new larval populations were conducted in 42 tributaries (18 Canada, 24 U.S.). A new Sea Lamprey population was discovered in the Huron River in Huron and Erie Counties, Ohio. The Huron River is scheduled for treatment in 2018.

• Post-treatment assessments were conducted in 4 tributaries (2 Canada, 2 U.S.) to determine the effectiveness of lampricide treatments conducted during 2016 and 2017. Surveys indicated that all treatments were highly effective, precluding the need for re-treatment.

• Surveys to evaluate barrier effectiveness were conducted in 2 tributaries (1 Canada, 1 U.S.). All barriers assessed were effective in continuing to block Sea Lampreys.

• A total of 2.6 ha of the St. Clair River were surveyed with gB, including the upper river and the three main delta channels. Forty-nine Sea Lamprey larvae were captured throughout the river with no additional areas of high density detected.

• Larval assessments were conducted in non-wadable lentic and lotic areas using 21.00 kg active ingredient of gB (8.96 Canada, 12.04 U.S.

Tributary	Bayluscide (kg)1	Area Surveyed
Canada		
St. Clair R.	8.96	1.6
Total (Canada)	**8.96**	**1.6**
United States		
St. Clair R.	5.60	1.00
Buffalo R. (lotic)	1.12	0.20
Cattaraugus Cr. (lotic)	1.68	0.30
Cattaraugus Cr. (lentic)	0.56	0.10
Huron R. (lotic)	1.12	0.20
Sandusky R. (lentic)	0.84	0.15
Muddy Cr. (lentic)	0.56	0.10
Toussaint R. (lotic)	0.56	0.10
Total (United States)	**12.04**	**2.15**
Total for Lake	**23.81**	**3.75**

Table 1. Applications of granular Bayluscide to tributaries and lentic and lotic areas of Lake Erie for larval assessment purposes during 2017.

Juvenile Assessment

▪ Based on standardized fall assessment data, the marking rate during 2016 (plotted as the 2017 sea lamprey spawning year) was 15.0 A1-A3 marks per 100 Lake Trout >532 mm, up from 11.6 in 2015 (**Fig 2).** The marking rate has been greater than the target for the last 14 years.

▪In cooperation with Walpole Island First Nation, the Commission and partners completed the third year of an annual index for out-migrating juvenile Sea Lampreys in the St. Clair River (SCR). Ten floating fyke nets were deployed on November 15, 2017. Due to complications surrounding U.S. Coast Guard aids to navigation and ice flow, the nets were retrieved on December 29. Over the collection period, 98 juvenile Sea Lampreys were captured.

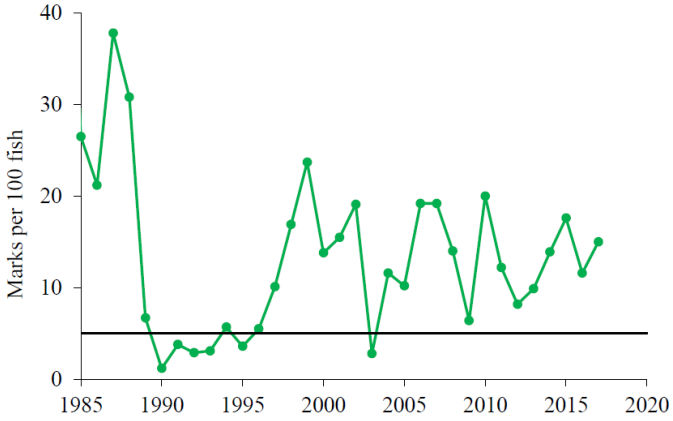

Fig 3 - Average number of A1-A3 marks per 100 Lake Trout >532 mm from standardized fall assessments in Lake Erie. The horizontal line represents the target of 5 A1-A3 marks per 100 Lake Trout. The spawning year is used rather than the survey year (shifted by one year) to provide a comparison with the adult index.

Adult Assessment

• A total of 3,827 Sea Lampreys were trapped in 5 tributaries during 2017, all of which are index locations. Adult population estimates based on mark-recapture were obtained from each index location (**Table 2, Fig 3**).

• The index of adult Sea Lamprey abundance was 14,743 (95% Confidence Interval 8,750 – 20,736), which was higher than the target of 3,039 (Figures 5-6). The index target was estimated as the mean of indices during a period with acceptable marking rates (1991-1995).

• The adult Sea Lamprey migration in Cattaraugus Creek was monitored through a cooperative agreement with the Seneca Nation of Indians.

Tributary	Number Caught	Adult Estimate	Trap Efficiency (%)	Number Sampled[1]	Percent Males[2]	Mean Length (mm) Males	Mean Length (mm) Females	Mean Weight (g) Males	Mean Weight (g) Females
Canada									
Big Otter Cr. (A)	---	---	---	---	---	---	---	---	---
Little Otter Cr.	164	2,069	8	12	58	506	506	247	249
Big Cr. (B)	1,825	3,218	57	---	---	---	---	---	---
Young's Cr. (C)	126	221	57	---	---	---	---	---	---
Total or Mean (Canada)	**2,115**	---	---	**12**	**58**	**506**	**506**	**247**	**249**
United States									
Cattaraugus Cr. (D)	1,079	5,901	18	16	94	518	554	284	394
Grand R. (E)	633	3,334	19	9	44	495	472	284	281
Total or Mean (U.S.)	**1,712**	---	---	**25**	**76**	**513**	**486**	**284**	**300**
Total or Mean (for Lake)	**3,827**	---	---	**37**	**70**	**511**	**495**	**274**	**277**

Table 2. Information regarding adult Sea Lampreys captured in assessment traps or nets in tributaries of Lake Erie during 2016 (letter in parentheses corresponds to stream in Figure 4). ✧
End