Inland Seas Angler

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Special Report – Lake Erie

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Highlights of the Annual Lake Committee Meetings

Great Lakes Fishery Commission proceedings, Windsor, ON

This last of a series of annual special reports is an extensive summary of the Lake Erie annual Lake Committee. These lake committee reports are from the annual Lake Committee meetings hosted by the Great Lakes Fishery Commission of late March 2012. We encourage reproduction with the appropriate credit to the GLSFC and the agencies involved. Our thanks to the staffs of the GLFC, OMNR, USFWS, NYSDEC and Jeff Tyson and Kevin Kayle, Ohio DNR; for their contributions to these science documents. Thanks also to the Great Lakes Fishery Commission, its staff, Chris Goddard & Marc Gaden, for their efforts in again convening and hosting the Lake Committee meetings in Windsor.

Lake Erie

Index of Reports

Key:
DFO = Department of Fisheries, Oceans
FWS = U.S. Fish & Wildlife Service
LEC = Lake Erie Committee
USGS = U.S. Geological Survey
CPE = Catch per effort
GB = (Granular Bayluscide)
Kt = kilotonnes
1 kiloton (kt) = 1000 metric tons
1 gram = 0.035 ounce
1 kg = 2.205 lbs

Ohio Lake Erie Regulations, through April 2013

The following regulations are currently in effect for Ohio's portion of Lake Erie and its tributaries:

►Daily bag limit for yellow perch is 30 per day through April 30, 2013, in all Ohio waters of Lake Erie

►A 15" minimum size limit for walleye

►Walleye daily bag limit 6 fish per angler per day May 1, 2012 - February 28, 2013, then returning to a daily bag limit of 4 walleye per angler March 1-April 30, 2012, and March 1-April 30, 2013

►No harvest of smallmouth bass from May 1 until the last Saturday in June, after which a 14" minimum size limit and daily bag of 5 bass (smallmouth + largemouth bass) is in effect on Lake Erie

►Steelhead and salmon (aggregate) daily bag limit of 5 May 16 - August 31, with the daily bag limit reduced to 2 in the aggregate during Sept. 1 - May 15. There is a 12" minimum size limit on trout and salmon
►Muskellunge bag limit 1 per day effective July 1, 2008
►Filleted fish rule changes: if you are filleting your catch away from home, you are reminded that a new rule states that you must keep the skin on the fillet, and they must be transported in a way that they can be easily identified and counted.
►Report the catch of a tagged fish here ✧

Recommended Walleye & Yellow Perch Bag Limits, 2012 (OH DNR)

Allowable walleye and yellow perch harvest to increase in 2012

WINDSOR, ON – The Lake Erie Committee, a binational board of fishery managers from Michigan, New York, Ohio, Ontario, and Pennsylvania, recommended a 2012 total allowable catch (TAC) of 3.487 million walleye and 13.637 million pounds of yellow perch1. These recommended harvest levels represent an increase in allowable walleye and yellow perch catch for 2012 over last year, reflecting updated stock assessment results. Extensive biological assessments and analyses—conducted and analyzed jointly by Canadian and American fishery agencies—inform these TAC recommendations.

The committee also engaged commercial and recreational stakeholders in a new and enhanced committee structure—called the Lake Erie Percid Management Advisory Group (LEPMAG)—to heighten awareness of stakeholder fishery objectives, to gain consensus about decisions, and to improve the process for binational dialogue among all interested parties.

The committee sought to maintain TACs at levels consistent with Lake Erie's biological conditions while providing commercial and recreational fishers with some level of stability, as indicated in LEPMAG discussions. However, the committee is concerned about environmental conditions in Lake Erie and potential impacts on fisheries in future years. The heightened stakeholder engagement reflects the committee's interest in involving the fishing community in discussions related to management of the lake's Percid fisheries.

Walleye

The Lake Erie Committee recommended a binational TAC for walleye in 2012 of 3.487 million fish, compared to the TAC of 2.919 million fish in 2011. Actual walleye harvest in 2011 was approximately 1.69 million fish, or 58% of the TAC. Scientists and field biologists from Ontario and the Great Lakes states—working together as the Walleye Task Group—reported that walleye recruitment in recent years has not been strong. Fish from the strong 2007 and the exceptional 2003 year classes remain the major contributors to the fishery. This recommended TAC is based on updated walleye abundance estimates from the Walleye Task Group. The increased TAC recommendation for 2012 reflects the committee's consensus that walleye harvest is being managed at a sustainable rate for fisheries lakewide.

The TAC is recommended by the Lake Erie Committee and is allocated to Ohio, Michigan and Ontario by an area-based sharing formula of walleye habitat within each jurisdiction in the western and central basins of the lake. Under a 2012 TAC of 3.487 million fish, Ohio will be entitled to 1.782 million fish, Ontario 1.502 million fish, and Michigan 0.203 million fish. The walleye fisheries of eastern Lake Erie remain outside the quota management area and harvest limits in that area are established separately by Ontario, Pennsylvania, and New York.

Yellow Perch

Based on the estimated abundance of yellow perch stocks in the lake, the Lake Erie Committee recommended a 2012 TAC of 13.637 million pounds, an increase from last year's allocation of 12.651 million pounds. As the committee considered the yellow perch TAC, it noted that stocks generally appear to be healthier as one moves west to east across Lake Erie, consistent with environmental conditions (such as nutrient loads) of recent years. Fisheries were afforded the highest allowable catches where stocks were the healthiest. The committee also noted that continued weak year classes will likely result in lower-than-average yellow perch allocations in the future.

The five jurisdictions on the lake divide the lakewide allocation of yellow perch based on allocation formulas by management unit. For 2012, Ontario's allocation is 6.701 million pounds, Ohio's allocation is 5.349 million pounds, and Michigan's allocation is 0.164 million pounds. New York and Pennsylvania will receive 0.259 million pounds and 1.163 million pounds, respectively. In 2011, actual lakewide yellow perch harvest was 9.620 million pounds or 76% of the TAC.

A New Lake Erie Percid Management Process (LEPMAG)

The Lake Erie Committee and the Lake Erie basin stakeholders marked the success of the first round of the Lake Erie Percid Management Advisory Group (LEPMAG), a new, ongoing process that represents a major change in how walleye and yellow perch management decisions are made on Lake Erie. LEPMAG was established by the Lake Erie Committee in late 2010 as a new approach to pursue cooperative and structured decision making; the process informs TAC recommendations. ✧

Walleye Task Group Report, 2012 (LEC)

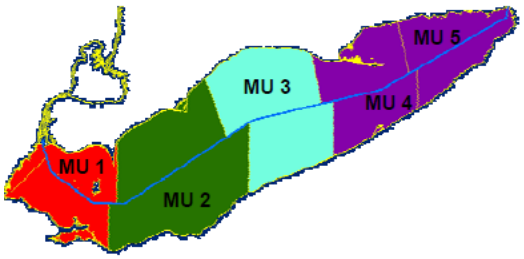

Fig 1-Lake Erie walleye management units

2011 Fishery Review

The total allowable catch (TAC) in quota area waters of the west and central basins for 2011 was 2.919 million fish. This allocation represented a 33% increase from the 2010 TAC of 2.200 million fish. In the TAC area, the total harvest was 1.692 million fish, or 58% of the quota **(Table 1**). Harvest in the non-TAC area of the eastern basin amounted to 105,748 fish. Lake-wide walleye harvest was estimated at 1.798 million fish for 2011. Sport fishery (0.593 million fish) and commercial fishery (1.208 million fish) harvest levels seen in 2011 were both below the long-term (1975-2011) means (2.407 and 2.083 million fish, respectively).

in number	TAC Area (MU-1, MU-2, MU-3)				Non-TAC Area (MU-4 & MU-5)				All Areas
of fish	Michigan	Ohio	Ontario	Total	NY	Penn.	Ontario	Total	Total
TAC	170,178	1,491,901	1,256,921	2,919,000	-	-	-	-	2,919,000
TAC % Share	5.83%	51.11%	43.06%	100.00%	-	-	-	-	100.00%
Harvest	50,490	417,314	1,224,057	1,691,861	31,506	45,369	28,873	105,748	1,797,609

Table 1-Summary of walleye harvest by jurisdiction in Lake Erie, 2011

Total commercial walleye fishery effort increased in 2011 compared to 2010 (**Table 2**). Commercial gill net effort in all MUs increased with the largest increases from 2010 in MU 1, MU 2 and MUs 4&5 (38%, 37% and 98% respectively). The total commercial effort of 6,591 km fished was the 5th lowest recorded since 1975, representing 34% of the long-term average (19,235 km). Commercial effort was greatest in the west basin, declining eastward in the lake. Sport fishery effort in 2011 decreased from 2010 by 27% in Michigan waters, and by 39% and 47% in Ohio waters of MU1 and MU2 respectively **(Table 3**). Sport effort in MU3 remained relatively the same as in 2010 (-1%). Sport effort also decreased by 17% for Pennsylvania but increased slightly in New York waters of MU 4&5 (**Table 3).** The walleye sport effort in 2011 (1.891 million angler hours) represented 35% of the long-term average.

	Unit 1	Unit 2	Unit 3	Units 4 & 5
Effort (km)	2,646	1,884	1,572	489
change from 2010	38%	37%	12%	98%

Table 2-Ontario walleye gillnet effort in 2011

	Unit 1 - MI	Unit 1 - OH	Unit 2 - OH	Unit 3 - OH	Units 4&5- PA	Units 4&5- NY
Effort (1000s hrs)	165	862	346	217	156	145
change from 2010	-27%	-39%	-47%	-1%	-17%	4%

Table 3-Summary of sport fishery effort in thousands of hours for 2011

Lake-wide catch rates in 2011 declined for both the sport fishery (fish per hour) and for the commercial fishery (fish per kilometer of net fished): catch rates in the sport fishery were below the long-term average but above in the commercial fishery. Compared to 2010, sport catch rates by MU decreased by 31% in MU1, 23% in MU2, 21% in MU3, and 7% in MU 4&5. Gill net CUEs decreased from 2010 by 12% in MU1 and 38% in MUs 4 and 5, but increased 3% in MU2, and 9% in MU3.

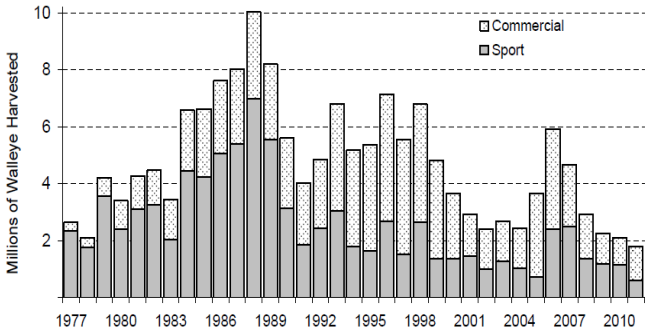

Fig 2- Lake-wide Walleye harvest by sport and commercial fisheries, 1977-2011

Age distribution of fish in the harvest was dominated by ages 7-and-older fish (including the 2003 year class); lake-wide, they comprised 38% of the commercial fishery and 58% of the sport fishery. The 2007 year class (age-4 walleye) represented 26% of the commercial harvest and 22% of the total sport harvest. Age 4 (2007 year class) and ages 7-and-older (includes the 2003 year class) contributed 25% and 44%, respectively, to the total lake-wide harvest.

Catch-at-Age Analysis & Recruitment for 2012

The WTG continued to use the Automatic Differentiation Model Builder (ADMB) catch-at-age analysis to estimate walleye population abundance from 1978 to 2011. The model includes fishery data from the Ontario commercial fishery (west and central basins) and sport fisheries in Ohio (west and central basins) and Michigan (west basin). In addition to fishery data, this model includes assessment data from two index gill net surveys from: Michigan-Ohio (west and west-central basins combined) and Ontario (west, west-central, and east-central basins combined). Lambda values for fishery and survey gears were set external to the model by an Expert Opinion WTG and MSU-QFC exercise completed in 2010. Age-2 fish in 2011 (2009 year class) were estimated using a regression of ADMB age-2 estimates and trawl index data. The 2011 west-central population estimate from the WTG 2012 model was 24.255 million ages 2 and older walleye. There were an estimated 14.815 million ages 4 and older walleye in 2011. The 2007 year class was estimated to contribute approximately 7.966 million age-4 fish to the population in 2011.

2012 Population Abundance

Stock size estimates for 2012 (ages 4 and older) were projected from ADMB catch-at-age analysis estimates of 2011 population size and age-specific survival rates in 2011. Age-3 abundance was estimated from the recruitment regression age-2 estimate for the 2009 cohort and age-specific survival rate in 2011. Projected age-2 recruitment from the 2010 year class added to the 2012 population estimate for ages 3 and older fish produces the total standing stock in 2012 of 26.132 million fish (**Table 4**). Statistical uncertainty surrounding population estimates is expressed as one standard error as in Table 4 for the standard model output.

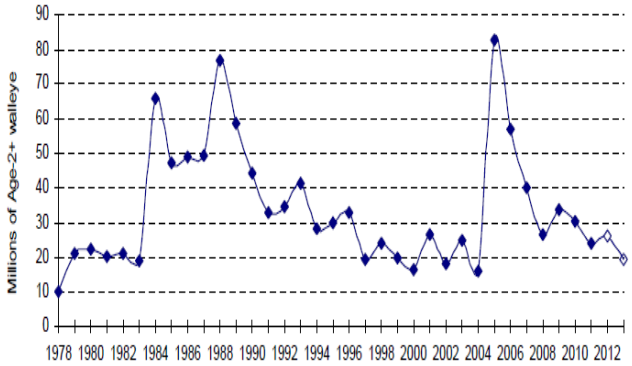

Fig 3-Population of walleye ages 2 and older from 1978-2011, and projections for 2012 and 2013

2012 Harvest Strategy and Recommended Allowable Harvest (RAH)

With the implementation of the Walleye Management Plan in 2005, yield strategies and RAH are linked to ages 2 and older walleye population levels of abundance. Using results from the WTG 2012 model, and based on the sliding-F scale harvest policy (**Figure 3**) and selectivity values from the current fisheries, an RAH of 3.487 million fish was calculated for 2012 with a range of 2.191-5.326 million fish (**Table 4**). Please refer to the complete 2012 WTG report for a more detailed explanation of the population abundance projections and RAH derivation.

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
1980	TAC	261,700	1,558,600	1,154,100	2,974,400				0	2,974,400
	Har	**183,140**	**2,169,800**	**1,049,269**	**3,402,209**				**0**	**3,402,209**
1981	TAC	367,400	2,187,900	1,620,000	4,175,300				0	4,175,300
	Har	**95,147**	**2,942,900**	**1,229,017**	**4,267,064**				**0**	**4,267,064**
1982	TAC	504,100	3,001,700	2,222,700	5,728,500				0	5,728,500
	Har	**194,407**	**3,015,400**	**1,260,852**	**4,470,659**				**0**	**4,470,659**
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**	**36,683**	**54,056**	**23,324**	**114,063**	**2,111,074**
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**

Table 4- Lake Erie walleye total allowable catch (TAC, top) and measured harvest (bottom, bold), in numbers of fish, 1980 - 2011.

Table 5-Annual harvest (thousands of fish) of walleye by gear, management unit, and agency, 1975 to 2011

	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
1975	77	4	7	88	10	--	10	--	--	--	--	--	--	0	98	--	--	--	--	0	98
1976	605	30	50	685	35	--	35	--	--	--	--	--	--	0	720	113	44	--	--	157	877
1977	2,131	107	69	2,307	37	--	37	--	--	--	--	--	--	0	2,344	235	67	--	--	302	2,645
1978	1,550	72	112	1,734	37	--	37	--	--	--	--	--	--	0	1,771	274	60	--	--	334	2,106
1979	3,254	162	79	3,495	60	--	60	--	--	--	--	--	--	0	3,555	625	30	--	--	655	4,211
1980	2,096	183	57	2,336	49	--	49	24	--	24	--	--	--	0	2,409	953	40	--	--	993	3,402
1981	2,857	95	70	3,022	38	--	38	48	--	48	--	--	--	0	3,108	1,037	119	3	--	1,159	4,268
1982	2,959	194	49	3,202	49	--	49	8	--	8	--	--	--	0	3,259	1,077	134	2	--	1,213	4,470
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	289	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	114	2	54	37	93	1,152	607	184	147	23	962	2,115
2011	224	50	44	318	104	2	106	89	0	89	2	45	32	79	593	736	262	181	29	1,208	1,801
Mean	1,594	280	40	1,913	278	10	284	168	13	178	8	69	36	56	2,407	1,434	444	291	31	2,083	4,490

http://www.glfc.org/lakecom/lec/WTG_docs/annual_reports/WTG_report_2012.pdf

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Yellow Perch Task Group Report, 2012 (LEC)

2011 Fisheries Review

The lakewide total allowable catch (TAC) in 2011 was 12.650 million lbs, a 3.7% decrease from a TAC of 13.137 million lbs in 2010. For yellow perch assessment and allocation, Lake Erie is partitioned into four management units (**Fig 1**). The 2011 allocation by management unit was 2.071, 3.537, 6.250, and 0.792 million lbs for Units 1 through 4, respectively.

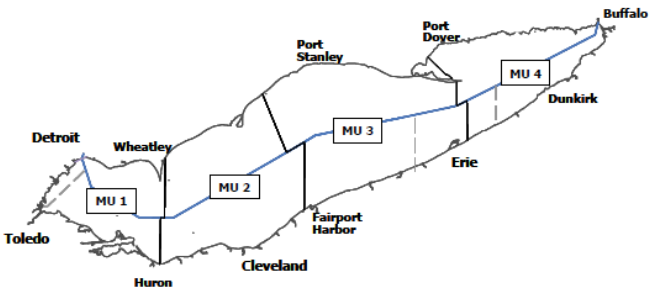

Fig 1-Yellow Perch Management Units (MUs) of Lake Erie

The lakewide harvest of yellow perch in 2011 was 9.620 million lbs, or 76.0% of the total 2011 TAC. This was a 0.7% decrease from the 2010 harvest of 9.689 million lbs. Harvest by Lake Erie Management Units 1 through 4 was 1.813, 3.065, 4.156, and 0.586 million lbs, respectively **(Table 1).** The portion of TAC harvested was 87.6%, 86.6%, 66.5%, and 74.0%, in MUs 1 through 4, respectively.

In 2011, Ontario harvested 6.370 million lbs, followed by Ohio (2.833 million lbs.), PA (190 thousand lbs.), MI (146 thousand lbs.), and NY (81 thousand lbs.).

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	145,960	870,802	640,309	156,138					1,813,209
2		1,665,258	328,686	1,070,817					3,064,761
3		3,366,412	308,815	327,871	151,691	1,542			4,156,331
4		468,001			37,040	0	65,803	15,045	585,889
Total	145,960	6,370,473	1,277,810	1,554,826	188,731	1,542	65,803	15,045	9,620,190

Table 1-Lake Erie yellow perch harvest by jurisdiction and gear type for 2011

Targeted gill net effort in Ontario waters in 2011 increased 11.4% in MU2, 6.0% in MU3, and 27.4% in MU4, but decreased 18.4% in MU1 from 2010. U.S. angling effort increased in 2011 from 2010 in MU3 (3.3%) and MU4 (59.5%), but decreased in MU1 (6.7%) and MU2 (21.3%). U.S. trap net effort (lifts) in 2011 increased in MU1 (23.5%), MU3 (4.1%), and MU4 (4.4%) compared to 2010, but decreased in MU2 (14.8%). Fishing effort by jurisdiction and gear type is presented in **Table 2**.

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	139,344	2,571	729,369	3,219				
2		4,214	395,407	5,707				
3		6,093	182,630	1,108	94,025	37		
4		1,564			48,537	0	50,479	383
Total	139,344	14,442	1,307,406	10,034	142,562	37	50,479	383

Table 2-Lake Erie yellow perch fishing effort by jurisdiction and gear type for 2011

ADMB Catch-at-Age Analysis and Recruitment Estimate for 2012

Population size for 1975 to 2011 for each Management Unit was estimated by catch-at-age analysis using modeling software Auto Differentiation Model Builder (ADMB). Stock size estimates for 2012 (ages 3 and older) were projected from catch-at-age analysis estimates of 2011 population size and age-specific survival rates in 2011. Age-2 yellow perch recruitment in 2012 was predicted by robust regression of juvenile yellow perch survey indices against catch-at-age analysis estimates of two-year-old abundance in each management unit. Projected age-2 yellow perch recruitment from the 2010 year class was added to the 2012 population estimate for older fish in each Unit, producing the total standing stock of age-2-and-older fish in 2012 (**Table 3**). Estimates of age-2 yellow perch recruitment for 2012 (the 2010 year class) were below average in MU1 and MU2, and above average in MU3 and MU4. Abundance estimates of age-2-and-older yellow perch in 2012 are projected to decrease by 6.0% and 10.5% in MUs 1 and 2 compared to the 2011 abundance estimates, and increase by 2.6% and 9.4% in management units 3 and 4. Age-3-and-older yellow perch abundance in 2012 is projected to be 11.8, 31.2, 44.3, and 12.4 million fish in Units 1 through 4, respectively (Table 3). Using weight-at-age information from assessment surveys, in 2012 biomass estimates are projected to decline from 2011 in MU 1 to 4 by 3.2%, 8.4%, 2.4%, and 1.1%, respectively.

MU	Fishing Rate	Recommended Allowable Harvest (millions lbs.)		
		MIN	MEAN	MAX
1	0.670	0.725	1.364	2.140
2	0.670	2.409	3.926	5.646
3	0.700	3.362	5.710	8.171
4	0.300	0.392	0.837	1.295
Total		6.888	11.837	17.251

Table 3-Yellow perch fishing rates; (RAH; in millions of lbs) for 2012

Recommended Allowable Harvest (RAH) for 2012

Standard errors and ranges for population estimates were calculated for each age in 2011, and following estimated survival from catch-at-age, for 2012. Min, mean, and max RAH values are based on population estimates minus or plus one standard deviation. Proposed target fishing rates for RAHs in 2012 are the same as 2011, and RAHs are presented in Table 4 for Management Units 1 through 4.

Table 4-Projection of the 2012 Lake Erie yellow perch population

MU	Age	2011 Mean Stock Size (millions fish)	Fishing Mortality (F)	Survival Rate (S)	2012 Mean Stock Size (millions fish)	Mean Weight in Population (kg)	Stock Biomass		
							2011 (millions kgs)	2012 (millions kgs)	2012 (millions lbs)
1	2	7.249	0.060	0.631	10.051	0.066	0.464	0.663	1.463
	3	6.218	0.285	0.504	4.576	0.111	0.616	0.508	1.120
	4	7.165	0.455	0.425	3.134	0.162	0.989	0.508	1.120
	5	1.365	0.474	0.417	3.047	0.198	0.202	0.603	1.330
	6+	1.213	0.604	0.366	1.014	0.252	0.352	0.256	0.563
	Total	*23.210*	*0.279*	*0.507*	*21.823*	*0.116*	*2.622*	*2.538*	*5.596*
2	2	4.966	0.026	0.653	19.186	0.071	0.323	1.362	3.004
	3	22.632	0.118	0.596	3.243	0.121	2.467	0.392	0.865
	4	17.266	0.271	0.511	13.482	0.164	2.521	2.211	4.875
	5	4.852	0.268	0.513	8.826	0.202	0.806	1.783	3.931
	6+	6.626	0.328	0.483	5.688	0.264	1.796	1.502	3.311
	Total	*56.343*	*0.190*	*0.554*	*50.426*	*0.144*	*7.912*	*7.250*	*15.987*
3	2	0.937	0.004	0.668	28.110	0.053	0.037	1.490	3.285
	3	30.365	0.029	0.651	0.626	0.102	3.006	0.064	0.141
	4	14.957	0.085	0.616	19.773	0.154	2.079	3.045	6.714
	5	11.584	0.096	0.609	9.209	0.200	1.946	1.842	4.061
	6+	12.737	0.111	0.600	14.695	0.269	3.579	3.953	8.716
	Total	*70.580*	*0.066*	*0.628*	*72.412*	*0.144*	*10.647*	*10.393*	*22.917*
4	2	0.832	0.008	0.665	9.479	0.096	0.096	0.910	2.006
	3	9.227	0.064	0.629	0.553	0.165	1.523	0.091	0.201
	4	4.045	0.082	0.618	5.802	0.248	0.938	1.439	3.173
	5	2.919	0.111	0.600	2.498	0.288	0.797	0.719	1.586
	6+	2.960	0.115	0.598	3.519	0.328	1.009	1.154	2.545
	Total	*19.982*	*0.079*	*0.619*	*21.850*	*0.197*	*4.363*	*4.314*	*9.512*

Table 5-Estimated 2011 Lake Erie yellow perch harvest by age and numbers of fish by gear and management unit (Unit)

Gear	Age	Unit 1		Unit 2		Unit 3		Unit 4		Lakewide	
		Number	%	Number	%	Number	%	Number	%	Number	%
Gill Nets	1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	2	24,918	0.8	16,819	0.3	0	0.0	1,650	0.1	43,386	0.2
	3	1,108,500	37.2	1,208,762	23.4	327,378	3.6	337,721	29.6	2,982,360	16.2
	4	1,289,358	43.3	2,391,354	46.4	2,021,496	22.0	469,363	41.1	6,171,572	33.4
	5	402,245	13.5	916,540	17.8	3,367,828	36.6	198,124	17.3	4,884,737	26.5
	6+	151,624	5.1	621,609	12.1	3,473,286	37.8	135,258	11.8	4,381,777	23.7
	Total	2,976,645	*45.9*	5,155,083	*56.0*	9,189,987	*81.6*	1,142,117	*81.6*	18,463,832	*65.1*
Trap Nets	1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	2	986	0.2	5,358	0.2	0	0.0	0	0.0	6,344	0.1
	3	67,330	13.6	410,725	13.6	114,033	13.5	2,233	6.0	594,321	13.5
	4	251,446	50.8	1,539,751	50.8	389,668	46.3	10,423	28.0	2,191,288	49.8
	5	86,312	17.4	528,321	17.4	172,125	20.4	8,438	22.7	795,196	18.1
	6+	88,645	17.9	546,719	18.0	165,902	19.7	16,131	43.3	817,397	18.6
	Total	494,719	*7.6*	3,030,874	*32.9*	841,728	*7.5*	37,225	*2.7*	4,404,546	*15.5*
Sport	1	11,518	0.4	0	0.0	3,048	0.2	744	0.3	15,310	0.3
	2	311,336	10.3	6,743	0.7	17,613	1.4	3,618	1.6	339,310	6.2
	3	1,191,127	39.6	335,833	32.9	309,581	25.0	56,902	25.7	1,893,443	34.5
	4	1,228,372	40.8	401,353	39.3	448,337	36.2	62,008	28.0	2,140,070	39.0
	5	169,212	5.6	164,608	16.1	209,862	17.0	49,128	22.2	592,810	10.8
	6+	97,882	3.3	113,628	11.1	248,682	20.1	48,740	22.0	508,932	9.3
	Total	3,009,447	*46.4*	1,022,165	*11.1*	1,237,123	*11.0*	221,140	*15.8*	5,489,875	*19.4*
All Gear	1	11,518	0.2	0	0.0	3,048	0.0	744	0.1	15,310	0.1
	2	337,240	5.2	28,920	0.3	17,613	0.2	5,268	0.4	389,040	1.4
	3	2,366,957	36.5	1,955,320	21.2	750,992	6.7	396,857	28.3	5,470,125	19.3
	4	2,769,176	42.7	4,332,458	47.1	2,859,501	25.4	541,795	38.7	10,502,930	37.0
	5	657,769	10.1	1,609,469	17.5	3,749,815	33.3	255,690	18.3	6,272,742	22.1
	6+	338,151	5.2	1,281,956	13.9	3,887,870	34.5	200,129	14.3	5,708,106	20.1
	Total	6,480,811	22.9	9,208,122	32.5	11,268,838	39.7	1,400,482	4.9	28,358,253	100.0

Table 6-Lake Erie yellow perch harvest in pounds by management unit (Unit) and agency, 2000-2011

		Ontario*		Ohio		Michigan		Pennsylvania		New York		Total
	Year	Harvest	%	Harvest	%	Harvest	%	Harvest	%	Harvest	%	Harvest
Unit 1	2000	980,323	47	1,038,650	50	67,010	3	--	--	--	--	2,085,983
	2001	813,066	45	915,641	51	70,910	4	--	--	--	--	1,799,617
	2002	1,454,105	50	1,316,553	45	147,065	5	--	--	--	--	2,917,723
	2003	1,179,667	44	1,406,385	53	84,878	3	--	--	--	--	2,670,930
	2004	1,698,761	59	1,090,669	38	94,732	3	--	--	--	--	2,884,162
	2005	1,513,890	60	965,231	38	49,485	2	--	--	--	--	2,528,606
	2006	1,325,464	54	1,055,378	43	62,854	3	--	--	--	--	2,443,696
	2007	727,678	41	982,677	55	62,815	4	--	--	--	--	1,773,170
	2008	580,050	56	409,705	39	47,934	5	--	--	--	--	1,037,689
	2009	853,137	61	463,564	33	87,319	6	--	--	--	--	1,404,020
	2010	879,358	47	889,512	48	83,725	5	--	--	--	--	1,852,595
	2011	870,802	48	796,447	44	145,960	8	--	--	--	--	1,813,209
Unit 2	2000	1,484,125	56	1,169,234	44	--	--	--	--	--	--	2,653,359
	2001	1,794,275	51	1,747,069	49	--	--	--	--	--	--	3,541,344
	2002	2,190,621	52	1,986,730	48	--	--	--	--	--	--	4,177,351
	2003	2,107,639	50	2,113,285	50	--	--	--	--	--	--	4,220,924
	2004	2,051,473	48	2,246,264	52	--	--	--	--	--	--	4,297,737
	2005	2,666,231	59	1,843,190	41	--	--	--	--	--	--	4,509,421
	2006	3,102,269	69	1,393,732	31	--	--	--	--	--	--	4,496,001
	2007	1,847,139	45	2,244,656	55	--	--	--	--	--	--	4,091,795
	2008	1,990,237	50	2,005,000	50	--	--	--	--	--	--	3,995,237
	2009	2,495,611	58	1,801,978	42	--	--	--	--	--	--	4,297,589
	2010	1,888,876	56	1,457,823	44	--	--	--	--	--	--	3,346,699
	2011	1,665,258	54	1,399,503	46	--	--	--	--	--	--	3,064,761
Unit 3	2000	771,646	62	443,250	36	--	--	32,613	3	--	--	1,247,509
	2001	999,450	64	464,811	30	--	--	91,211	6	--	--	1,555,472
	2002	1,192,691	60	640,104	32	--	--	140,821	7	--	--	1,973,616
	2003	1,667,133	72	481,558	21	--	--	177,516	8	--	--	2,326,207
	2004	1,453,419	62	659,447	28	--	--	244,063	10	--	--	2,356,929
	2005	1,771,800	75	457,593	19	--	--	142,028	6	--	--	2,371,421
	2006	3,451,499	90	271,144	7	--	--	106,260	3	--	--	3,828,903
	2007	2,997,101	84	391,285	11	--	--	193,065	5	--	--	3,581,451
	2008	2,200,168	74	629,366	21	--	--	155,014	5	--	--	2,984,548
	2009	2,266,727	74	597,214	20	--	--	190,742	6	--	--	3,054,683
	2010	3,370,099	85	476,808	12	--	--	117,640	3	--	--	3,964,547
	2011	3,366,412	81	636,686	15	--	--	153,233	4	--	--	4,156,331
Unit 4	2000	35,686	73	--	--	--	--	10,950	22	2,458	5	49,094
	2001	35,893	60	--	--	--	--	8,337	14	15,319	26	59,549
	2002	87,541	54	--	--	--	--	46,903	29	26,903	17	161,347
	2003	84,772	60	--	--	--	--	39,821	28	16,511	12	141,104
	2004	98,733	49	--	--	--	--	46,344	23	54,862	27	199,939
	2005	195,347	67	--	--	--	--	42,226	15	53,468	18	291,041
	2006	230,226	69	--	--	--	--	57,005	17	48,107	14	335,338
	2007	185,954	78	--	--	--	--	25,859	11	25,935	11	237,748
	2008	240,270	77	--	--	--	--	31,325	10	40,809	13	312,404
	2009	272,579	72	--	--	--	--	37,991	10	70,030	18	380,600
	2010	467,612	89	--	--	--	--	19,989	4	37,730	7	525,331
	2011	468,001	80	--	--	--	--	37,040	6	80,848	14	585,889
Lakewide Totals	2000	3,271,780	54	2,651,134	44	67,010	1	43,563	<1	2,458	<1	6,035,945
	2001	3,642,684	52	3,127,521	45	70,910	1	99,548	1	15,319	<1	6,955,982
	2002	4,924,958	53	3,943,387	43	147,065	2	187,724	2	26,903	<1	9,230,037
	2003	5,039,211	54	4,001,228	43	84,878	1	217,337	2	16,511	<1	9,359,165
	2004	5,302,386	54	3,996,380	41	94,732	1	290,407	3	54,862	<1	9,738,767
	2005	6,147,268	63	3,266,014	34	49,485	<1	184,254	2	53,468	<1	9,700,489
	2006	8,109,458	73	2,720,254	24	62,854	<1	163,265	1	48,107	<1	11,103,938
	2007	5,757,872	59	3,618,618	37	62,815	<1	218,924	2	25,935	<1	9,684,164
	2008	5,010,725	60	3,044,071	37	47,934	<1	186,339	2	40,809	<1	8,329,878
	2009	5,888,054	64	2,862,756	31	87,319	1	228,733	3	70,030	1	9,136,892
	2010	6,605,945	68	2,824,143	29	83,725	1	137,629	1	37,730	<1	9,689,172
	2011	6,370,473	66	2,832,636	29	145,960	2	190,273	2	80,848	1	9,620,190

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Ohio's Lake Erie Other Fisheries, 2011 (OH DNR)

Overview

In 2011, anglers made over 550,000 trips to fish Lake Erie. Private sport fishing effort topped 2.67 million hours. This was a 27% decrease compared to 2010. Most of the private boat effort was directed toward yellow perch (47.5%) and walleye (47.0%). Smallmouth bass (3.0%), largemouth bass (1.3%) and white bass (0.4%) were minor components of the open water fishery effort. Private boat anglers seeking "anything that bites" made up 0.7% of the 2011 estimated angler effort for the second consecutive year. Charter boat fishing effort was about 0.21 million hours; a 20% decrease from 2010 levels **(Fig 1**). Charter boat anglers mainly sought walleye (81%), followed by yellow perch (18%), then smallmouth bass (0.8%). Total harvest of sport fish decreased by 21% in 2011 relative to 2010, due primarily to decreases in harvests of both yellow perch (16%) and walleye (56%).

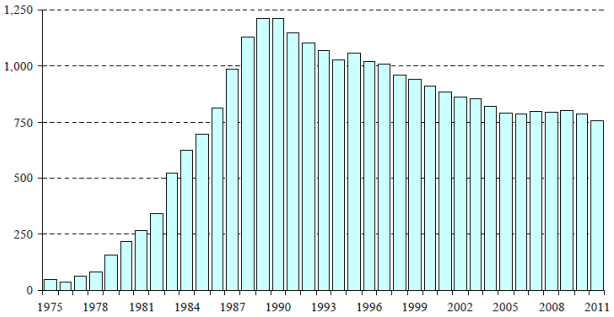


Fig 1-Number of licensed charter boat operators in the Ohio waters of Lake Erie, 1975-2011

In 2011, the Ohio commercial fishery harvested 4.45 million lbs of fish, an 8% increase from the 2010 harvest of 4.13 million lbs, but was down from the recent peak of 5 million lbs in 2009. The Ohio 2011 commercial fishery harvest of buffalo, bullhead, channel catfish, goldfish, suckers, white bass and yellow perch increased compared to 2010, remained relatively unchanged for quillback, white perch, and lake whitefish, and declined for carp, freshwater drum, and gizzard shad. Ohio's yellow perch commercial harvest (1.55 million lbs) was above the long-term average, and was the highest since the 2007 harvest of 1.95 million lbs. The bulk (81%) of the commercial harvest (in pounds) was harvested by the end of July; however, Lake Whitefish and channel catfish harvest was substantial in October and November. The dockside value of the Ohio commercial fishery in 2011 increased to $5.18 million; up from $4.12 million the previous year.

Assessment surveys during 2011 were completed by the Ohio DNR's two research units using bottom trawl, gillnet, hydroacoustic, and lower trophic sampling gears. Most of our fish assessment surveys tracked the continued persistence of the large 2003 year class that was produced by many fish species in Lake Erie. Growth and condition of Lake Erie fishes remains within acceptable ranges. Detailed trends in relative abundance, growth, maturity and diets are presented in the full annual report. From surveys for juvenile fishes, abundance of the 2007 year classes of walleye and yellow perch were generally near the long-term average in the west basin, and well above average for yellow perch in the central basin. The 2009 year classes of walleye and yellow perch appear to be well below average in all surveys and in all Districts; similar to hatches in 2000 and 2002. The 2010 year classes of walleye and yellow perch appear to be at or slightly below long-term averages in all surveys; however, their growth rates are average to above average, similar to those seen with the 2007 cohort.

The fall assessment surveys also showed that the 2011 cohorts for forage species were generally below average across both basins. Surveys saw reduced densities of age-0 rainbow smelt and emerald shiners compared to the long-term average in both basins. Gizzard shad numbers were up slightly compared to a year ago in the west, but they were still below the long term mean. Gizzard shad juveniles were abundant in the central basin. White perch juvenile catches were still high across the lake compared to other species, but were down compared to the previous year and were below the long-term mean. The only species registering a particularly strong hatch in all Ohio waters during 2011 was round goby. Declines in juvenile cohort strength were evident in all basins for silver chub and trout perch. Moderate catches near the long-term means were observed for juvenile and older freshwater drum.

Smallmouth Bass

Smallmouth bass sport fishing effort in 2011 declined moderately (down 16%) for private sport anglers compared to 2010, associated with declines in effort in all Lake Erie Districts, while the smaller charter boat angler effort increased by 36%. Tournament effort may be a bigger factor than charter boat effort in smallmouth bass dynamics. Harvest of smallmouth bass increased by 6% overall compared to the previous year, but harvest remains a small component of the overall sport fishery; only 5.4% of the estimated smallmouth bass catch of 53,787 fish were harvested. The 2011 overall catch rates are dominated by released fish (0.51 fish per angler hour) compared to harvested fish (0.02 fish per angler hour). However, there is a dynamic difference between private and charter fisheries: there were higher release rates in the private fisheries, where catch rates were 0.01 and 0.51 fish per hour for harvested and released smallmouth bass, respectively. In 2011, charter fishery catch rates were 0.40 and 0.17 fish per hour for harvested and released smallmouth bass, respectively. Overall catch rates did increase somewhat compared to 2010, especially for the private fishery. While 2011 catch rates declined for the charter fishery, the small number of interviews makes significance difficult to determine. In 2011, ages 4, 5 and 6 fish dominated the smallmouth bass harvest, but ages 8-12 and 16 also contributed to the harvest.

In 2006, we began a more robust population assessment survey to track recruitment and biological parameters. The smallmouth bass survey results indicated that younger fish are more numerous than earlier this decade. The 2010 smallmouth bass cohort is strong, particularly in the west. Catch rates for age-2 and older smallmouth bass in District 1were lower than those observed in 2007-2010. In 2011 assessment surveys in the central basin, smallmouth bass catch rates were higher than 2009 in District 2, but sharply lower in District 3. Fair to good numbers of cohorts appear to have been produced in 2005-2009, and good year classes appear to have been produced in District 3 in 2009 and 2010. A five-fish daily bag limit and a 14" minimum length limit remain in effect to reduce exploitation of smaller fish. Again this year, the bass "catch-and-immediate-release" season is in effect from May 1 through the last Friday in June (June 29, 2012) to reduce harvest of spawning bass.

Private boat angler harvest (-20%) and targeted effort (-16%) decreased, compared to 2010. Targeted effort was the lowest since the May-June seasonal regulation was implemented in 2004. Smallmouth bass was the third most sought species by private boat anglers, behind walleye and yellow perch, but at 80,264 hours it constitutes only 3% of the total angler hours for the fishery. As in previous years, the smallmouth fishery was mainly catch and release, as the release rate (0.51 fish per angler hour) was considerably higher than the targeted harvest rate (0.01 fish per angler hour; Table 4.1.8). Very few charter trips were made targeting smallmouth bass during 2011. Similar to the private boat fishery, estimated angler hours (1,581 angler hours) and harvest (993 fish) remained very low.

In 2011, the 2007, 2006 and 2005 year-classes each comprised 21% of the smallmouth bass harvest. Eight year-classes were present in the 2011 harvest. Mean age in the harvest was 7.0 yr, and lakewide the smallmouth bass mean size at harvest was 438 mm and 1,506 g.

Steelhead Trout

The open lake steelhead fishery in the central basin showed mixed results in 2011 relative to 2010. This fishery is reliant in part on "combo trips" of trolling anglers seeking walleye and steelhead. Open-water steelhead harvest increased from levels seen in 2011, but was well below the historic high seen in 2002. There remains minimal effort directed towards steelhead in the open water; there were no directed charter boat interviews recorded this past year. Private boat angler catch rates were estimated at 0.44 steelhead per angler hour in 2011 for those anglers seeking steelhead. These catch rates were much higher than those observed in recent years; however, they are based on a small sample size.

Tributary and lake fisheries will remain good with continued annual stocking of yearling Little Manistee River (MI) strain steelhead. Ohio DNR hatchery personnel raised and stocked 265,468 Little Manistee River strain steelhead yearlings in 2011. The number stocked in 2011 was lower than in recent years and below the target stocking number of 400,000 steelhead yearlings. Reductions were due to capital improvements at Castalia State Fish Hatchery which necessitated that we procure only fingerling steelhead from Michigan rather than a mix of fingerlings and eggs. Michigan hatcheries had electrical failures in 2010, and disease issues in the hatchery systems, which led to the reduction in numbers stocked in 2011. Steelhead stocking numbers are expected to return to target level in 2012. Excellent returns to anglers have been seen in the five Ohio stocked streams: Vermilion, Rocky, Chagrin and Grand Rivers and Conneaut Creek. A 12" minimum size limit remains in effect for steelhead and the daily bag limit is 5 fish May 16 -August 31, 2012, and 2 fish September 1, 2012- May 15, 2013.

The combined 2011 private and charter boat harvest of steelhead trout decreased 23% compared to 2010, and remained well below the ten-year average. Steelhead were primarily harvested in the central basin with 50% of the harvest from District 2 and 49% from District 3. Targeted angler effort remained low for the private boat fishery and no trips were recorded by the charter boat fishery. The targeted harvest and release rates were 0.43 fish per angler hour and 0.01 fish per angler hour, respectively. Beginning in 2000, an additional category was added to the target species list (walleye/steelhead or "combo") in order to measure the number of angler trips targeting both walleye and steelhead as both can be sought while trolling. While there were no charter trips targeting walleye/steelhead, private boat anglers reported 653 hours during 2011. The private boat targeted harvest rate for the combination trips was 0.07 fish per angler hour and the release rate was 0.13 fish per angler hour. Combining steelhead length-at-harvest data across all districts, harvested steelhead trout averaged 615 mm and 2,687 g.

The sea lamprey population and its predatory effect on steelhead and other Lake Erie coldwater species remains a concern. The nine biggest sea lamprey producing streams in Lake Erie were treated in spring 2008 and in fall 2009 in an effort to significantly reduce the sea lamprey sub-adult population. In 2011, lake-wide wounding rates were some of the highest on record, but were down from record highs observed in 2009 and 2010. Monitoring of sea lamprey populations and wounding rates will continue. The maintenance and repair of the dam on the Grand River, at Harpersfield, continues to be an issue, as its failure would open more river habitat to spawning sea lampreys.

White Bass

In 2011, sub-adult and adult white bass populations were higher than to 2010, with catches above the long-term averages in all Lake Erie Districts. The population is dominated by individuals from the 2008-2010 year classes, especially the strong 2010 cohort. Sport harvest of white bass in the 2011 open lake fishery increased 3% over the level observed in 2010. Targeted effort on the open lake for white bass decreased 35% from 2010 effort levels. Targeted harvest rates for white bass decreased 34% in 2011, relative

to 2010, due primarily to lower than average harvest rates in Districts 1 and 2. In 2011, reported commercial harvest of white bass increased 8%, relative to 2010, and was similar to the long-term average. Older adults (ages 3+) contributed more to fisheries in recent years, but the strong 2010 cohort is starting to exert its dominance in the fisheries.

The Maumee and Sandusky rivers' sport fisheries for white bass were again partially evaluated in 2011. White bass were assessed as a part of the creel survey designed to estimate walleye harvest; however, the entire white bass spawning run was not sampled. Estimated white bass angler effort was lower in both tributaries in 2010, owing to poor river conditions during the early part of the fishing season. Fisheries in both tributaries were well below the 1975-2010 average values in effort and harvest; however, these data are not comparable to earlier surveys which included the entire white bass spawning run during May.

The white bass private boat harvest increased 5%, while the targeted effort decreased 32% compared to 2010**.** The majority of the harvest came from District 1 (91%) followed by District 2 (6%). Targeted harvest rate decreased from 5.17 fish per angler hour, in 2010, to 3.42 fish per angler hour in 2011, and was below the ten-year average. As in past years, very few angler trips were targeted for this species and the majority of white bass were harvested as incidental catch from anglers targeting other species. There were no targeted charter boat trips for white bass during 2011. The 2010 year-class (59%) comprised the majority of the harvest followed by the 2008 (12%) and 2009 (11%) year-classes**.** Lakewide, the mean age in the harvest was 2.1 yr and the mean size was 279 mm and 302 g.

White Perch

The 2011 estimated sport harvest of 35,128 white perch was a 31% decrease, compared to 2010. Angler harvest occurred in all months except April with the peak harvest in July (38%). District 1 anglers accounted for 64% of the catch followed by 30% from District 2. There were no targeted angler trips for white perch in 2011. Harvested fish were from anglers targeting other species or the category 'anything that bites'. The 2008 year-class comprised 41% of the white perch sport harvest followed by the 2007 (28%) and 2009 (19%) year-classes**.** Lakewide white perch age in the harvest was 3.4 yr and mean size was 231 mm and 182 g.

Other Species

Private and charter boat anglers harvested 41,081 channel catfish, freshwater drum, and other species in 2011, with the peak harvest occurring in June and July (57%). These fish were primarily harvested by anglers as incidental catch while targeting other major species.

Forage and Lower Trophic Sampling

In 2011, District 1 August trawling indices for forage fishes indicated increases in abundance for spottail shiners, alewife, trout-perch, freshwater drum, and silver chub. Noted decreases in abundance occurred for rainbow smelt, gizzard shad, and emerald shiners. In District 2 and District 3 most trawling indices for forage fish were below the long-term mean in August. Age-0 gizzard shad were above the long-term mean in both districts and age-1+ emerald shiners and age-1+ trout-perch indices were above the long-term mean in District 2. In October, both age-0 and age-1+ round goby and trout-perch indices increased in District 2 and District 3 and were above the long-term mean. Age-0 gizzard shad abundance increased in District 2.

In District 1, 98 lower trophic level samples were collected May 5-Oct 4, 2011 at eight sites. Lower trophic samples in Districts 2 and 3 were collected May 5-Oct 28, 2011. Fifty-five samples were collected in District 2 and 44 samples in District 3. Samples included turbidity, dissolved oxygen, water temperature, zooplankton, phytoplankton, and water samples for phosphorus and chlorophyll-*a* analysis. These samples are a part of a larger sampling program through both the Ohio State University and the Forage Task Group of the Lake Erie Committee, and are used to monitor changes in the physical and chemical environment in Lake Erie and to explore changes in the biotic community.

Lake Sturgeon

In 2011, there were 10 Lake Erie sightings of lake sturgeon reported to the Ohio DNR. Only one of the 10 sightings were from commercial trap net fishermen, while seven were from recreational anglers and two were observed dead along the shoreline between Toledo and Port Clinton. Similar to past sturgeon sightings, the majority of fish were observed around the Bass Islands in the western basin (District 1).

Table 1-Private boat angler harvest (numbers of fish) of species, by district and month, in the Ohio waters of Lake Erie during 2011

District	Month	Walleye	Yellow Perch	White Bass	Smallmouth Bass	Freshwater Drum	Channel Catfish	White Perch	Steelhead Trout	Others[a]	Total
1	April	5,840	41	0	0	0	41	0	0	0	5,922
	May	27,380	53,845	69	0	0	0	2,182	0	0	83,476
	June	84,465	227,270	12,333	0	582	641	6,280	0	363	331,934
	July	56,109	933,999	65,008	256	128	556	5,850	0	384	1,062,290
	August	7,304	829,662	17,000	0	225	1,816	6,432	0	75	862,514
	September	7,169	302,291	162	1,400	0	208	324	0	0	311,554
	October	1,756	137,143	2,539	0	0	259	0	0	172	141,869
	Total	190,023	2,484,251	97,111	1,656	935	3,521	21,068	0	994	2,799,559
2	May	432	23,677	107	0	0	49	0	0	38	24,303
	June	27,015	118,712	257	95	261	666	1,998	95	4,039	153,138
	July	41,464	374,736	3,447	0	1,732	1,032	5,761	1,163	4,582	433,917
	August	14,839	294,684	412	0	0	389	1,240	46	1,093	312,703
	September	329	149,886	627	0	0	195	1,137	0	4,916	157,090
	October	9,472	37,444	2,002	0	0	68	60	0	354	49,400
	Total	93,551	999,139	6,852	95	1,993	2,399	10,196	1,304	15,022	1,130,551
3	May	19	5,055	0	0	0	0	0	0	264	5,338
	June	7,661	77,973	105	0	0	0	516	60	5,317	91,632
	July	33,714	128,421	466	86	0	0	1,389	598	460	165,134
	August	15,739	184,470	228	77	304	0	269	152	1,454	202,693
	September	1,357	188,035	1,342	0	0	0	0	25	3,096	193,855
	October	26	88,685	910	0	0	0	95	0	1,884	91,600
	Total	58,516	672,639	3,051	163	304	0	2,269	835	12,475	750,252
Lakewide	April	5,840	41	0	0	0	41	0	0	0	5,922
	May	27,831	82,577	176	0	0	49	2,182	0	302	113,117
	June	119,141	423,955	12,695	95	843	1,307	8,794	155	9,719	576,704
	July	131,287	1,437,156	68,921	342	1,860	1,588	13,000	1,761	5,426	1,661,341
	August	37,882	1,308,816	17,640	77	529	2,205	7,941	198	2,622	1,377,910
	September	8,855	640,212	2,131	1,400	0	403	1,461	25	8,012	662,499
	October	11,254	263,272	5,451	0	0	327	155	0	2,410	282,869
	Total	342,090	4,156,029	107,014	1,914	3,232	5,920	33,533	2,139	28,491	4,680,362

Table 2-Charter boat angler harvest (numbers of fish) of species, by district and month, in the Ohio waters of Lake Erie during 201

District	Month	Walleye	Yellow Perch	White Bass	Smallmouth Bass	Freshwater Drum	Channel Catfish	White Perch	Steelhead Trout	Others[a]	Total
1	April	5,065	0	0	0	0	0	0	0	0	5,065
	May	2,540	2,330	0	0	4	0	319	0	0	5,193
	June	12,058	4,436	325	0	0	139	627	17	0	17,602
	July	9,484	14,814	275	61	1,500	441	337	0	25	26,937
	August	2,751	18,353	73	334	4	0	43	0	0	21,558
	September	1,486	11,456	0	8	0	51	15	0	7	13,023
	October	104	2,080	0	550	0	0	0	0	0	2,734
	Total	33,488	53,469	673	953	1,508	631	1,341	17	32	92,112
2	May	47	0	0	0	0	0	0	0	0	47
	June	1,263	301	7	0	32	0	0	4	0	1,607
	July	8,833	6,562	0	40	71	0	36	190	79	15,811
	August	89	5,827	0	0	0	0	0	0	0	5,916
	September	0	8,951	72	0	0	0	0	5	200	9,228
	October	663	1,385	0	0	0	0	164	0	0	2,212
	Total	10,895	23,026	79	40	103	0	200	199	279	34,821
3	May	0	2,242	0	0	0	0	0	0	195	2,437
	June	5,206	8,270	10	0	97	4	16	113	293	14,009
	July	16,215	12,355	0	0	0	0	8	448	8	29,034
	August	8,785	11,515	12	0	0	0	16	76	8	20,412
	September	628	40,603	50	0	2	2	14	0	181	41,480
	October	7	17,117	54	0	8	0	0	4	87	17,277
	Total	30,841	92,102	126	0	107	6	54	641	772	124,649
Lakewide	April	5,065	0	0	0	0	0	0	0	0	5,065
	May	2,587	4,572	0	0	4	0	319	0	195	7,677
	June	18,527	13,007	342	0	129	143	643	134	293	33,218
	July	34,532	33,731	275	101	1,571	441	381	638	112	71,782
	August	11,625	35,695	85	334	4	0	59	76	8	47,886
	September	2,114	61,010	122	8	2	53	29	5	388	63,731
	October	774	20,582	54	550	8	0	164	4	87	22,223
	Total	75,224	168,597	878	993	1,718	637	1,595	857	1,083	251,582

Table 3-Smallmouth bass angler harvest (thousands of fish), targeted angler effort (thousands of angler hours), and targeted harvest rate (fish per angler hour), by district and fishery, 1975-2011

		District 1			District 2			District 3			Lakewide		
	Year	Private Boat	Charter Boat	Total [a]	Private Boat	Charter Boat	Total [a]	Private Boat	Charter Boat	Total [a]	Private Boat	Charter Boat	Total [a]
Total [b] Harvest	1975-77 mean	18.0	3.2	21.2	4.2	0.0	4.2	4.9	0.0	4.9	27.1	3.2	30.3
	1980-84 "	29.2	4.6	33.8	4.3	0.0	4.3	13.0	0.0	13.0	46.5	4.6	51.1
	1985-89 "	13.7	6.8	20.5	3.0	0.2	3.2	4.5	0.1	4.6	21.2	7.1	28.3
	1990-94 "	18.3	7.3	25.6	5.8	0.4	6.2	7.1	0.7	7.8	31.2	8.4	39.6
	1995-99 "	39.2	13.6	52.9	14.7	4.4	19.1	15.9	2.0	18.0	69.9	20.1	90.0
	2000	18.0	10.0	28.0	15.2	0.1	15.2	9.1	0.9	10.0	42.3	10.9	53.2
	2001	19.4	5.7	25.1	13.7	0.2	13.9	9.5	1.1	10.6	42.5	7.1	49.6
	2002	15.0	7.4	22.4	12.5	2.4	14.8	4.0	0.8	4.7	31.5	10.5	42.0
	2003	29.6	5.4	35.0	8.2	0.0	8.2	6.9	0.8	7.7	44.7	6.2	50.9
	2004	4.6	1.2	5.9	3.3	<0.1	3.3	0.9	0.0	0.9	8.8	1.2	10.1
	2005	4.6	0.5	5.2	1.4	<0.1	1.4	0.9	0.0	0.9	6.9	0.6	7.4
	2006	5.2	2.4	7.6	2.2	<0.1	2.2	1.3	0.0	1.3	8.7	2.4	11.1
	2007	2.4	0.3	2.7	1.2	0.0	1.2	1.4	0.1	1.4	5.0	0.3	5.3
	2008	0.1	0.1	0.2	0.4	0.0	0.4	0.6	0.1	0.6	1.1	0.2	1.3
	2009	1.5	0.3	1.9	1.5	0.0	1.5	0.0	0.0	0.0	3.1	0.3	3.4
	2010	1.0	0.4	1.4	1.2	0.0	1.2	0.2	0.0	0.2	2.4	0.4	2.7
	2011	1.7	1.0	2.6	0.1	<0.1	0.1	0.2	0.0	0.2	1.9	1.0	2.9
Targeted Effort	1975-77 mean	6.7	3.6	10.3	1.0	0.0	1.0	1.3	0.0	1.3	9.0	3.6	12.6
	1980-84 "	64.0	7.4	71.4	5.5	0.0	5.5	24.2	0.0	24.2	93.7	7.4	101.1
	1985-89 "	29.1	10.7	39.8	1.1	0.2	1.4	8.9	0.4	9.2	39.2	11.2	50.4
	1990-94 "	101.2	13.4	114.5	15.6	0.6	16.2	23.8	1.4	25.3	140.6	15.4	156.0
	1995-99 "	222.3	20.9	243.3	88.3	4.3	92.6	61.1	3.8	64.9	371.6	29.1	400.7
	2000	172.1	28.9	201.0	98.3	0.8	99.1	58.8	4.8	63.6	329.2	34.5	363.7
	2001	219.8	16.0	235.8	120.9	0.2	121.1	76.2	5.9	82.1	417.0	22.1	439.1
	2002	136.1	20.1	156.2	127.8	1.9	129.7	47.7	8.5	56.2	311.6	30.5	342.0
	2003	211.8	8.1	220.0	89.4	0.5	89.9	43.9	4.4	48.3	345.1	13.0	358.1
	2004	100.4	4.0	104.3	87.4	0.2	87.7	20.3	0.4	20.6	208.1	4.6	212.7
	2005	105.7	1.9	107.6	98.5	3.2	101.7	40.0	0.0	40.0	244.1	5.1	249.3
	2006	58.2	5.3	63.5	81.9	0.1	82.0	31.3	0.0	31.3	171.4	5.4	176.8
	2007	90.2	0.2	90.4	99.1	0.0	99.1	33.6	0.0	33.6	222.9	0.2	223.1
	2008	44.0	0.2	44.2	41.8	0.0	41.8	26.3	0.6	26.9	112.1	0.8	112.8
	2009	61.7	0.8	62.5	75.5	0.0	75.5	36.4	0.2	36.6	173.7	1.0	174.7
	2010	59.4	1.2	60.6	22.5	0.0	22.5	13.2	0.0	13.2	95.1	1.2	96.3
	2011	52.1	1.1	53.2	20.4	0.0	20.4	7.7	0.5	8.2	80.3	1.6	81.9
Targeted Harvest Rate [c]	1975-77 mean	0.14	0.73	0.31	0.13	--	0.13	0.13	--	0.13	0.14	0.73	0.43
	1980-84 "	0.27	0.43	0.29	0.17	--	0.17	0.25	--	0.25	0.25	0.43	0.26
	1985-89 "	0.20	0.46	0.27	0.21	0.27	0.28	0.30	0.31	0.30	0.22	0.45	0.28
	1990-94 "	0.12	0.37	0.15	0.10	0.32	0.10	0.22	0.41	0.24	0.13	0.37	0.16
	1995-99 "	0.11	0.43	0.14	0.08	0.79	0.11	0.19	0.46	0.22	0.13	0.50	0.15
	2000	0.05	0.38	0.10	0.12	0.03	0.12	0.12	0.17	0.12	0.08	0.35	0.11
	2001	0.09	0.24	0.10	0.09	0.00	0.09	0.09	0.18	0.10	0.09	0.22	0.10
	2002	0.07	0.37	0.11	0.07	0.60	0.08	0.05	0.10	0.06	0.07	0.31	0.09
	2003	0.06	0.57	0.08	0.04	0.13	0.04	0.16	0.21	0.16	0.07	0.43	0.08
	2004	0.05	0.31	0.06	0.02	0.00	0.02	0.02	0.00	0.02	0.03	0.27	0.04
	2005	0.04	0.24	0.04	0.00	0.00	0.00	0.02	--	0.02	0.02	0.09	0.02
	2006	0.06	0.44	0.09	0.02	0.15	0.02	0.04	--	0.04	0.03	0.43	0.04
	2007	0.02	0.00	0.02	0.01	--	0.01	0.04	--	0.04	0.02	0.00	0.02
	2008	0.00	0.27	0.00	0.00	--	0.00	0.02	0.00	0.02	<0.01	0.06	<0.01
	2009	0.01	0.36	0.01	0.01	--	0.01	0.00	0.00	0.00	0.01	0.30	0.01
	2010	0.02	0.36	0.03	0.02	--	0.02	0.01	--	0.01	0.02	0.36	0.02
	2011	0.02	0.56	0.03	0.00	--	0.00	0.00	0.00	0.00	0.01	0.40	0.02

✧

Habitat Task Group Report, 2012 (LEC)

Five charges were addressed by the HTG during 2011-2012: (1) Document habitat related projects. Identify and prioritize relevant projects to take advantage of funding opportunities; (2) Support Lake Erie GIS development and deployment; (3) Assist the Coldwater Task Group with the lake trout habitat assessment initiative; (4) With the assistance of the Walleye Task Group, identify metrics related to walleye habitat for the purpose of re-examining the extent of suitable adult walleye habitat in Lake Erie and (5) Develop strategic research direction for Environmental Objectives.

Habitat Project Documentation

Information pertaining to habitat related initiatives taking place throughout the Lake Erie and Lake St. Clair basins is compiled and made available as an interactive "clickable map" which allows for geographic sorting of projects (by watershed or lake basin). You can access the spatial inventory of projects at: www.glfc.org/lakecom/lec/spatial_inventory/inventoryindex.htm

Details of some notable projects can be found in the HTG Full Annual Report. The next steps for this charge include integration of a project wish-list, where HTG members will identify potential restoration opportunities within the Lake Erie watershed. Organizations looking for funding opportunities should find this list useful.

Lake Erie GIS

The Great Lakes GIS, including the Lake Erie GIS (LEGIS), was created in order to facilitate the sharing of data and holistic management of the Great Lakes basin as described in the Joint Strategic Plan for Management of Great Lakes Fisheries. The project includes map-delineated spatial units and associated habitat and biological attribute data for terrestrial, tributary rivers, nearshore, and offshore ecosystems.

In 2011-2012, the HTG updated several datasets, including substrate and habitat maps and yellow perch and walleye catch and harvest rates. We also will be providing data from the Forage Task Group's Lower Trophic Level Assessment database to the LEGIS. Lastly, a new project, the Great Lakes Aquatic Habitat Framework (GLAHF), was initiated by the University of Michigan and several other agencies. The GLAHF is a GIS database of georeferenced data for coastal and open water habitats, under which the LEGIS will be incorporated. The HTG encourages all interested individuals and groups to visit the GLGIS website (http://www.glfc.org/glgis) and consider how you might be able to use or contribute to this inventory.

Identifying Potential Lake Trout Spawning Habitat

As part of its commitment to work with the Cold Water Task Group, the HTG continues to make progress toward identifying potential lake trout spawning habitat in Lake Erie. Actions on this charge in 2011 focused on validation of substrate condition and interpretation using underwater video, acquisition and interpretation of additional north shore sidescan sonar data, standardization of substrate and habitat classifications, and the development of a method for comparing sites.

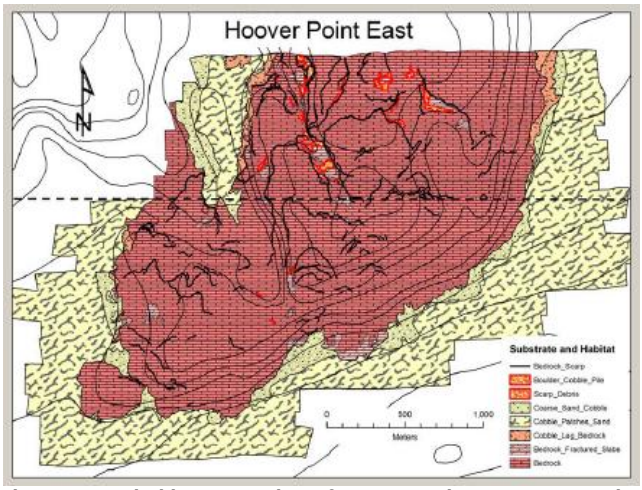


Fig 1- Expanded interpretation of Hoover Point East survey site. Additional sidescan sonar data were acquired below dashed black line in 2011.

Additional sidescan data collection occurred at Hoover Point East in 2011, identifying more potential lake trout spawning sites on the southern end of the point **(Fig 1).** Reconnaissance survey work was started at the Maitland Ridge, located east of previously investigated shoals. This large (15 x 25 km) feature appears to be covered with mostly sandy substrates, although bad weather forced the survey to be reduced. Further investigation is planned for 2012.

Fig 2-Underwater photo of bottom habitat off 18 Mile Creek in Lake Erie, July 2011

An underwater video survey of 18 Mile Creek Shoal, NY, in July found large cobble substrates that are valuable lake trout spawning habitat **(Fig 2).** These substrates were relatively free from silt and dreissenids, with adequate interstitial spacing. Fall gillnetting on the shoal found lake trout utilizing this site.

Identify metrics related to walleye habitat

The fishery quota for Lake Erie walleye is currently allocated based on a sharing formula (% surface area) that defines walleye habitat as nearshore water (<13m deep) in Michigan, Ohio and Ontario (Management Units 1-3; **Fig 3).**

With the assistance of the Walleye Task Group and lead by researchers at the University of Windsor, we utilized a logistic regression approach to establish the relationships between a variety of abiotic conditions and the probability of occurrence of walleye (presence / absence) from a set of fishery and environmental variable linked datasets (Ontario Partnership Index Gillnet). This species-habitat model for adult walleye uses environmental variables that were not only deemed appropriate for walleye but also for which datasets currently exist and provide somewhat broad-scale (location and time) coverage, including temperature, dissolved oxygen, and light attenuation (Secchi depth). Consistent with the literature, the probability of encountering walleye increased in shallower, warmer and more turbid waters.

Fig 3-Present quota sharing allocation (< 13m; light blue) by jurisdiction (red)

Continuous, rasterized (interpolated) maps for each environmental variable for the Ontario waters of the east and west basins were generated. A walleye suitability index (0 to 1) was calculated for each cell (50 m) using the species-habitat model and the total area of weighted walleye habitat for each region was derived. In general, the west basin had more suitable habitat than the east basin. There was less of habitat in epibenthic waters compared to subsurface waters in the east, but there was little difference in the west.

To date, a lakewide analysis, including examination of seasonal and inter-annual dynamics that may result in changes in the amount of habitat by jurisdiction, is difficult without the availability of a comprehensive database of the necessary abiotic variables. We will work towards collating various databases in order to make them more readily-available for such use.

Strategic research direction for Lake Erie's Environmental Objectives (EO)

The EO for Lake Erie describes the ecological conditions necessary for realizing the lake's Fish Community Goals and Objectives. As part of a strategic approach to habitat management, the HTG is proposing to summarize the current state, trends, and potential threats for each of the Environmental Objectives in a White Paper in order to better understand the types of research questions and answers that will be required by the Lake Erie Committee to achieve the FCGOs. We will utilize a scenario process designed to systematically identify and address data gaps, lack of knowledge, and lack of understanding by evaluating current and potential future threats and trends for each of the Environmental Objectives, and how those threats and trends may impact our ability to achieve the FCGOs.

As a first step, a matrix has been distributed to HTG members that will be used to identify and rank a potential stressor's impact on the Environmental Objectives. For example, will altered precipitation patterns caused by climate change effect Environmental Objective 1 (restore natural coastal systems and nearshore hydrological processes), and how large will the effect be? Once this matrix is completed, the HTG will identify what data will be necessary to answer these questions, and future research and collections will be directed proactively. The HTG anticipates completion of this exercise by the beginning of 2013.

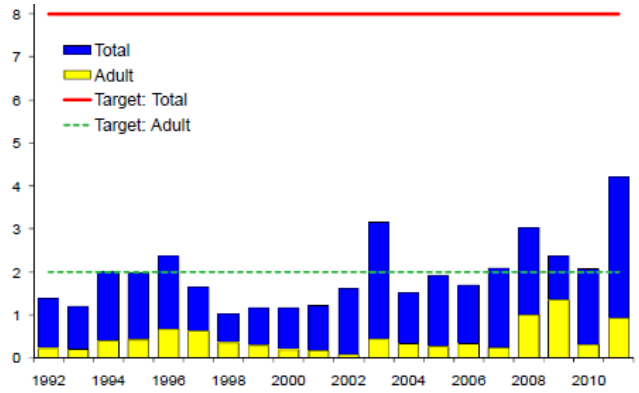
The EO document can be found at: http://www.glfc.org/lakecom/lec/lechome.php ✧

Coldwater Task Group, 2012 (LEC)

Seven charges were addressed by the CWTG during 2011-2012: (1) Lake trout assessment in the eastern basin; (2) Lake whitefish fishery assessment and population biology; (3) Burbot fishery assessment and population biology; (4) Participation in sea lamprey assessment and control in the Lake Erie watershed; (5) Electronic database maintenance of Lake Erie salmonid stocking information; (6) Steelhead fishery assessment and population biology, and (7) Development of a Cisco management plan.

Lake Trout

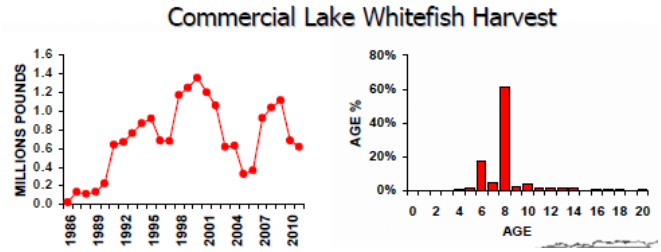
A total of 717 lake trout were collected in 89 lifts across the eastern basin of Lake Erie in 2011. Record lake trout catches were recorded in New York surveys and near-record in Ontario surveys. Young cohorts (ages 1-5) dominated catches with lake trout ages 10 and older only sporadically caught. Basin-wide lake trout abundance (weighted by area) increased to its highest value in the time series but remains below the rehabilitation target of 8.0 fish/lift. Adult (age 5+) abundance also increased in 2011 and remains below target.



Recent estimates indicate very low rates of adult survival. Klondike and Finger Lakes strain lake trout comprise the majority of the population. Successful natural reproduction has yet to be documented in Lake Erie despite more than 30 years of restoration efforts.

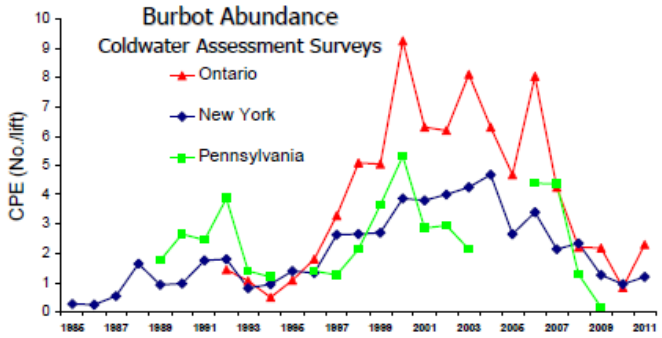
Whitefish

Lake Whitefish harvest in 2011 was 616,973 pounds, distributed among Ontario (86%), Ohio (13%), and Michigan (1%) commercial fisheries. The 2003 year class (age 8) dominated the population age structure in the observed harvest and assessment surveys in 2011. Ages present in the 2011 population ranged from 1 to 20, with no evidence of young-of-the- year in assessment surveys lake-wide. With recruitment sparse or absent, population abundance continues to decline. No significant recruitment is expected in 2011, although older lake whitefish persist in the population. Fisheries in 2011 will continue to rely on the 2003 year class followed by the 2005 cohort with some contribution from other adjacent year classes. In 2011, mean condition factor of mature female and male whitefish was above the historic average. Chironomids and isopods represented the largest fraction of prey observed in whitefish diets during 2011.



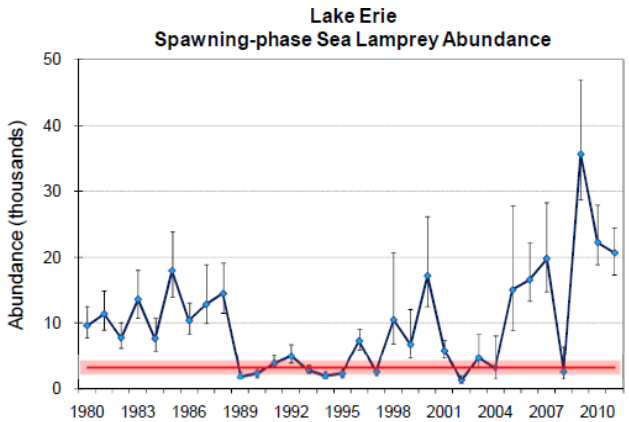
Burbot

Total commercial harvest of Burbot in Lake Erie during 2011 was 2,894 pounds, a 40% decrease from 2010. Burbot abundance and biomass indices from annual coldwater gillnet assessments increased slightly in 2011 reversing a downward trend observed across east basin areas following time-series maxima during the early- to mid-2000s. Agency catch rates during 2011 averaged 1.2 (New York) to 2.3 (Ontario) Burbot per lift which are about 3.5 to 3.1 times lower than mean catch rates observed from 2000 to 2004. Despite an improvement in age-4 recruitment during 2011, ongoing low catch rates of Burbot in assessment surveys, combined with increasing mean age of adults and persistent low recruitment, signal continuing troubles for this population. Round gobies and rainbow smelt continue to be the dominant prey items in Burbot diets in eastern Lake Erie.



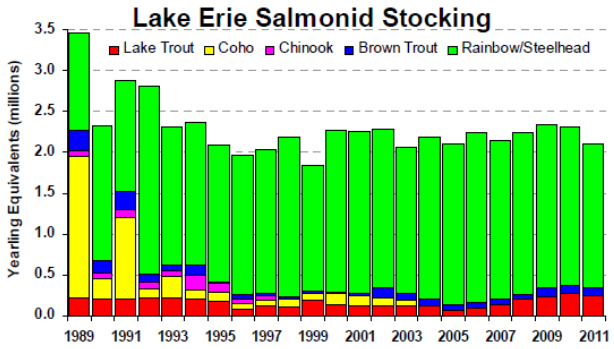
Sea Lamprey

The A1-A3 wounding rate on lake trout over 532 mm was 8.2 wounds per 100 fish in 2011. This was a 36% decline from the 2010 wounding rate of 12.8 wounds per 100 fish and a 58% decrease over the past two years. Despite the decline, likely attributable to a 2008-2010 accelerated lampricide treatment program, the current wounding rate still exceeds the target rate of five wounds per 100 fish. Wounding rates have been above target for 16 of the past 17 years. Large lake trout over 736 mm continue to be the preferred targets for sea lampreys. A4 wounding rates slightly decreased in 2011 to 53.9 wounds/100 fish, the third highest A4 wounding rate in the 27-year time series. A4 wounding rates on lake trout over 736 mm remain very high (163 wounds/100 fish). The estimated number of spawning-phase sea lampreys decreased from 22,179 in 2010 to 20,638 in 2011. However, this is the third highest population estimate in the time-series. Comprehensive stream evaluations in 2011 concluded that intensive streams treatments conducted in 2008-2010 were very effective, suggesting that the continued high abundance of the adult spawning population in Lake Erie is from an unknown and untreated source.



Lake Erie Salmonid Stocking

A total of 2,101,719 salmonids were stocked in Lake Erie in 2011. This was a 9% decrease in the number of yearling salmonids stocked compared to 2010 and the long-term average from 1989-2009. Declines were primarily due to temporary reductions in steelhead/rainbow trout stockings in 2011. By species, there were 240,133 yearling lake trout stocked in New York and Ontario; 100,370 brown trout stocked in New York and Pennsylvania waters, and a 1,761,217 steelhead/rainbow trout stocked in all five jurisdictional waters.



Steelhead

All agencies stocked yearling steelhead/rainbow trout in 2011. A summary of rainbow trout/steelhead stocking in Lake Erie by jurisdictional waters for 2011 is as follows: Pennsylvania (1,091,793; 62%), New York (305,780; 17%), Ohio (265,469; 15%), Michigan (61,445; 3%) and Ontario (36,730; 2%). Overall steelhead stocking numbers (1.761 million in 2011) represented a 4% decrease below the long-term average and a 9% decrease from 2010. Annual stocking numbers have been consistently in the 1.7-2.0 million range since 1993. The summer open lake fishery for steelhead was again evaluated by Ohio, Pennsylvania and New York. Open lake harvest was estimated at 4,480 fish, summed for all reporting agencies; Ohio (2,996), Pennsylvania (1,389), New York (92) and Michigan (3). Overall, this was a 51% decrease from the 2010 harvest and 81% below the average harvest between 1999 and 2010. Open lake steelhead harvest decreased in all jurisdictions from 2010, and was greatest in Pennsylvania (-73%), followed by Ohio (-23%) and New York (-16%). The steelhead harvest is negligible in Michigan and not reported in Ontario waters of Lake Erie. Catch rates in the open water fishery were mixed as well in 2011 and were slightly above the long-term average. Based upon creel surveys, the majority (>90%) of the fishery effort targeting steelhead occurs in the tributaries from fall through spring. Catch rates by tributary anglers in the New York cooperative diary program dropped to 0.52 fish/hour in 2010, declining 33% since 2008, but remained near the long-term average of 0.47 fish/hour.

Cisco

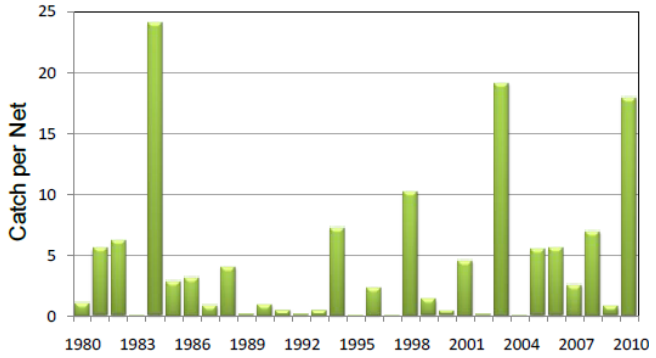
Cisco, considered extirpated in Lake Erie, have been reported in small numbers (1-6) in 10 of the past 15 years by commercial fishers; four were observed in 2011. Preliminary genetic testing of some of these fish found them to be most related to an historic Lake Erie stock, suggesting that a remnant Lake Erie stock may still exist. In 2010-11 observations of larval Cisco and juvenile coregonids in the Huron-Erie Corridor provide an alternate source of at least some of the Lake Erie observations. Actions undertaken by the CWTG in 2011 were directed at resolving issues which currently prevent the completion of a Cisco management plan (first undertaken in 2007). Consultation with Cisco experts from other lakes was used to identify deficiencies (in timing and location) of current fisheries programs for accurately targeting and assessing Cisco in Lake Erie. This resulted in preliminary gillnet sampling (USGS) at historic western basin spawning locations in the fall of 2011, which did not catch any Cisco. A genetic research strategy to address issues of remnant, historic and related stocks was developed which will utilize recent Cisco tissue samples and alternate historic DNA (scales). The task group will seek partnerships and funding to further both of these approaches in 2012. ✧

New York Lake Erie 2011 Annual Report (DEC)

This document shares a few of the highlights from the 2011 program year. The complete (123 page) annual report is available on DEC's website at http://www.dec.ny.gov/outdoor/32286.html,.

Walleye

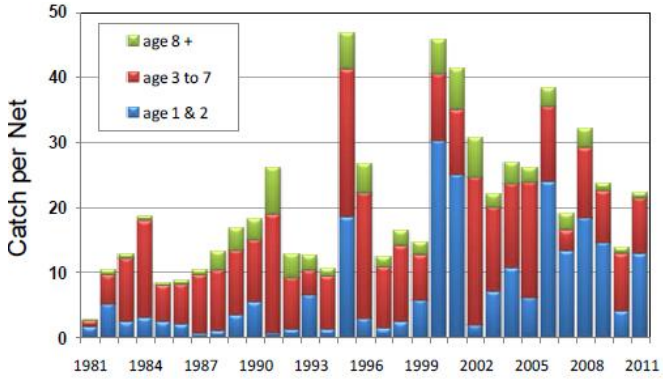
Lake Erie's eastern basin walleye resource is composed of local spawning stocks, as well as contributions from summertime movements from western basin spawning stocks. The annual movement of western basin stocks is now well known via long-term tagging studies conducted throughout the lake. Walleye fishing quality in recent years has generally been very good and largely attributable to excellent spawning success observed in 2003. However, the dominant 2003 year class has now begun to wane. Nevertheless, walleye fishing activity and quality continues to be very good due to average to good spawning success that occurred from 2005 to 2008. Our most recent juvenile walleye survey indicates excellent spawning success in 2010. The good recruitment in recent years, especially from 2010, suggests that walleye abundance in the eastern basin will increase over the next few years.



Age-1 Walleye Index, by Year class

Smallmouth Bass

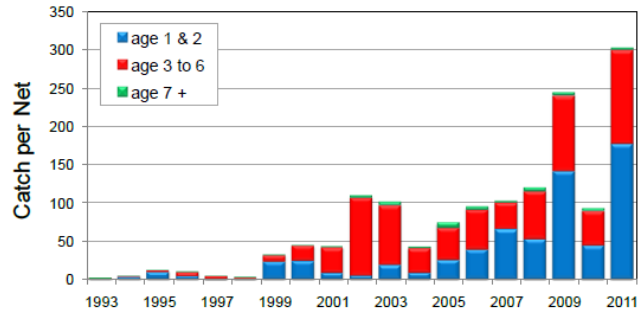
Lake Erie supports New York's, and perhaps the country's, finest smallmouth bass fishery. Generally stable spawning success, coupled with very high growth rates and acceptable survival, produces high angler catch rates and frequent encounters with trophy-sized fish. However, our most recent bass monitoring indicates a recent decline of the particularly large and older individuals. Our juvenile abundance measures indicate poor recruitment is expected from the 2009 year class; otherwise early signals suggest 2010 produced a much more abundant hatch of smallmouth bass.



Smallmouth Bass Index

Yellow Perch

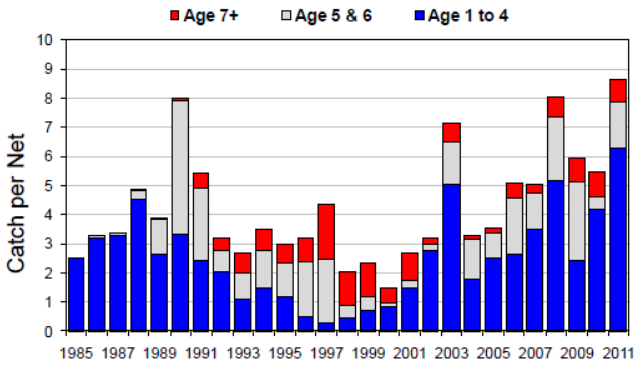
Lake Erie yellow perch populations have experienced wide oscillations in abundance over the last 30 years, from extreme lows in the mid-90's, to an extended recovery that's now lasted more than a decade. A large adult population continues to produce good angler catch rates, especially during spring and fall seasons. Abundance of juvenile perch in trawling and gill net surveys has been high in recent years, with record-high abundance of age-1 perch observed in 2011. Overall, this pattern of recruitment suggests that higher and more stable yellow perch abundance will extend at least another few years.



Gill Net Catches of Yellow Perch

Lake Trout

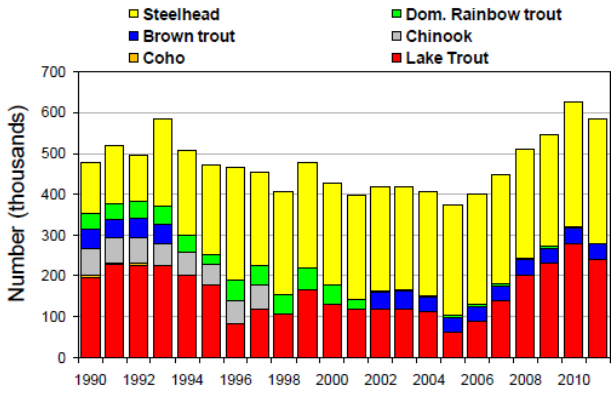
Rehabilitation of a self-sustaining lake trout population in the eastern basin of Lake Erie continues to be a major thrust in New York's Great Lakes coldwater fisheries management program. Lake trout have been stocked annually since 1978 and assessment programs monitor the status of progress. A revised lake trout rehabilitation plan was completed in 2008 and will guide future recovery efforts. Abundance of lake trout in the New York waters of Lake Erie increased dramatically to a time-series high in 2011. The majority of the increase was observed in younger lake trout ages 1-4, mainly due to increased stocking levels over the past 4 years. Adult stocks remain at relatively low levels; survival of adults is low due to a high sea lamprey population. Lakewide abundance estimates for all age groups still remain well below targets. Natural reproduction has not been detected in Lake Erie, and continued stocking and effective sea lamprey control are needed to build adult lake trout populations to levels where natural production is viable.



Gill Net Catches of Lake Trout

Salmonid Stocking

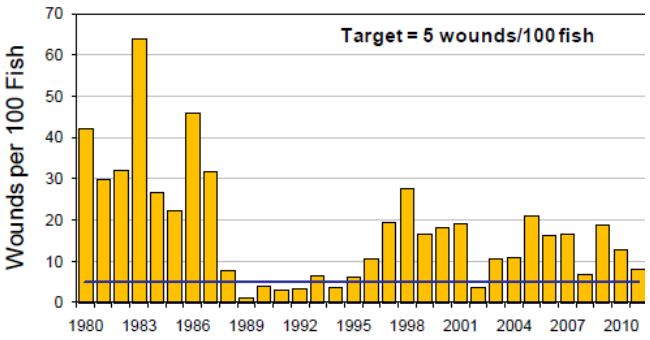
New York annually stocks around 270,000 steelhead and 35,000 brown trout into Lake Erie and its tributaries to provide recreational opportunities for both lake and stream anglers. Wild reproduction of steelhead also occurs which contributes to the fishery as well. Fall juvenile assessment programs conducted since 2001 confirmed substantial numbers of young-of-year steelhead present in many tributaries. Tributary angling for steelhead, assessed through an angler diary program, showed a sharp decline in fishing quality in 2010. A tributary creel survey is being conducted during the 2011-12 fishing season on the major Lake Erie tributaries. Combined with the 2011 cooperative diary program results, these surveys will help us determine the current status of the fishery.



Trout & Salmon Stocking in NY

Sea Lamprey

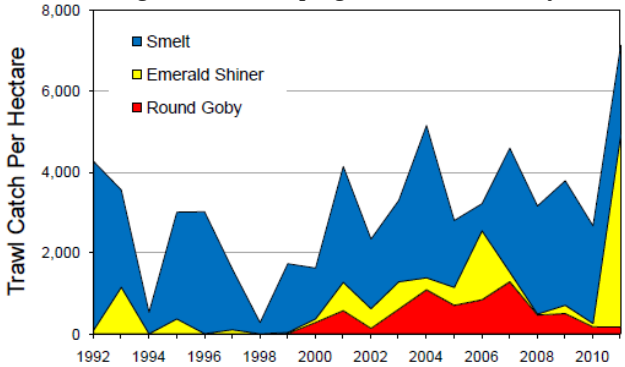
Sea lamprey invaded Lake Erie and the Upper Great Lakes in the 1920s and have played an integral part in the failure of many native coldwater fish populations. Sea lamprey control in Lake Erie began in 1986 in support of lake trout rehabilitation efforts, and regular treatments are conducted to control lamprey populations. Annual monitoring consists of observations of sea lamprey wounds on lake trout and other coldwater fish species, and lamprey nest counts on standard stream sections. Wounding rates on lake trout continued to decline in 2011, but nest counts increased to their highest level since 1984, indicative of a high sea lamprey spawning population. Surveys indicate that the consecutive lampricide treatments of all key Lake Erie tributaries in 2008 and 2009 were successful in those streams, but the sea lamprey population remains high due to an unknown source of production.



Lamprey Wounding Rate on Lake Trout >21"

Prey Fish

The Lake Erie Unit also participates in a number of surveys to assess forage fishes and other components of the lake ecosystem. These programs include trawl and sonar surveys of prey fishes, and predator diet studies. A variety of prey fish surveys beginning approximately 20 years ago found rainbow smelt as the dominant component of the open lake forage fish community. Beginning in 2000, there has been a notable increase in prey species diversity accompanied by somewhat lower smelt abundance, and in some years especially high abundances of round gobies and emerald shiners were encountered in both prey fish collections and predator diets. In recent years, overall prey fish abundance trended slightly downward, particularly the contribution by gobies in trawl surveys. In 2011, emerald shiner abundance increased dramatically while gobies remained at low abundance and smelt at average abundance. Over time we expect these investigations to be useful in furthering our understanding of factors shaping the fish community.



Forage Fish Abundance Trends

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Fisheries Research Lake Erie Biological Station, 2011 (USGS)

Abstract

The U.S. Geological Survey Lake Erie Biological Station sampled 25 stations in Ontario and Michigan waters of the western basin of Lake Erie with bottom trawls in June and September 2011. We calculated catch per hectare (CPH) and weight per hectare (kg) for 15 species in western Lake Erie. We also examined stomach contents from age-2 and older white perch and yellow perch. Most species had poor or moderate year classes in 2011. Only gizzard shad, freshwater drum, and rainbow smelt had CPH above the 8-year mean. Yearling-and-older silver chub increased for the second consecutive year, rebounding from 4 consecutive inter-annual declines. The non-native bloody red shrimp *Hemimysis anomala* was found in the diets of both yellow perch and white perch from east of Pelee Island, near the mouth of the Detroit River, and from Maumee Bay. This is the third consecutive year *Hemimysis* has been sampled in yellow perch and white perch diets suggesting *Hemimysis* is established in western Lake Erie.

Yellow perch and white perch diets

A maximum of five age-two and older yellow perch and white perch that showed no signs of regurgitation at each trawl site were kept for diet analysis. Total length, weight, and sex of the fish as well as the site and date were recorded. The digestive tract from each fish was removed and individually frozen in tap water in the field and brought back to the laboratory for diet analysis.

Trawling

All 25 sites were successfully sampled in spring and autumn. All completed samples in autumn were the prescribed 10-minutes in duration. Most species we monitored had moderate to poor reproductive success as measured by CPH of YOY in 2011. Catch per hectare (Table 1.1) of autumn YOY spottail shiner (-91% compared to 2010), trout-perch (-43%), walleye (-66%), white bass (-85%), and yellow perch (-77%) were lower than in 2010 and below their 8-year means. Reproductive success of non-native white perch (-34%) was also lower than in 2010 and below its respective 8-year mean. Catch-per-hectare of YOY emerald shiner (-10%), gizzard shad (+6%), logperch (+6%), and smallmouth bass (+3%) were similar to 2010. Emerald shiners were below their 8-year mean. Smallmouth bass were near their 8-year mean. Gizzard shad and logperch were well above their 8-year means. Catch-per-hectare of YOY freshwater drum (262%) and rainbow smelt (481%) were well above 2010 values. Catch-per-hectare of YOY freshwater drum was the highest of the 8-year time series. Catch-per-hectare of rainbow smelt and silver chub were moderate for their 8-year time series. Changes and trends in weight-per-hectare reflected those for CPH.

Autumn CPH was higher than in 2010 for YAO of several species. Emerald shiner (+498%), freshwater drum (+106%), silver chub (+386%), spottail shiner (+121%), and white perch (+111%) were all at least double their 2010 CPH. Catch-per-hectare of emerald shiner, freshwater drum, spottail shiner, and white perch were also above their 8-year means, while CPH of silver chub was slightly below its 8-year mean. Catch-per-hectare of YAO white bass (-90%) and round goby (-47%) were below those of 2010 and well below their 8-year means. Trout-perch and yellow perch YAO CPH were virtually unchanged from 2010 and only slightly below their 8-year means.

For all species except freshwater drum (14% higher) mean total lengths of YOY were within 10% of 8-year means. Four tubenose gobies were captured in Michigan waters approximately 10 km southwest of the mouth of the Detroit River. Total lengths were 36-59 mm, the largest of which were likely adults. These fish were captured at one of the same sites at which tubenose gobies were captured in 2008.

Yellow perch and white perch diets

Spring sampling provided 109 age-2-and-older yellow perch stomachs, 104 (95%) of which contained prey. In spring 2011, benthic macroinvertebrates were present in most yellow perch stomachs (94.2%) and *Hexagenia* sp., Chironomidae, and *Dreissena* sp. were the most common. Zooplankton were present in 25.0% of yellow perch stomachs. Fish prey were present in 16.3% of spring yellow perch diets, with round gobies observed most frequently. During autumn sampling, 89 age-2-and-older yellow perch stomachs were collected and 92% of stomachs contained prey. Most of the autumn yellow perch stomachs contained benthic macroinvertebrates (90.2%). Zooplankton occurred in 26.8% and fish were present in 15.9% of autumn stomach samples, with round goby occurring in 24.4% of stomachs containing fish. Individual prey items were found to have similar frequencies in both spring and autumn sampling efforts.

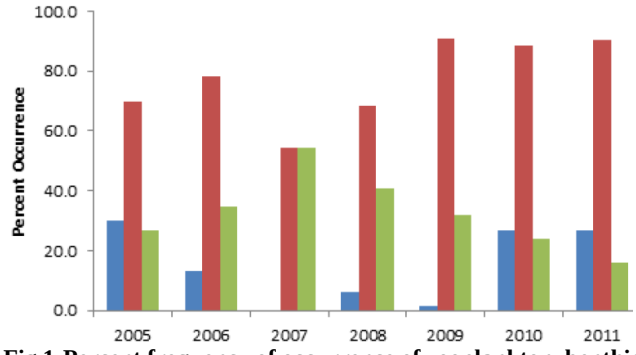


Fig 1-Percent frequency of occurrence of zooplankton, benthic invertebrates, and fish in the diet of age-2 and older yellow perch

Historically, zooplankton were more common in yellow perch diets in the spring than in autumn. In 2011, however, zooplankton occurrence in spring was the lowest ever observed in our data set with little change between spring and autumn (25.0% in the spring compared to 26.8% in autumn; **Fig 1.** For white perch, the historical trend of higher zooplankton occurrence in the spring compared to autumn remained consistent with zooplankton in 84.6% of stomachs in the spring and in only 62.3% of stomachs in autumn. Since 2006, benthic macroinvertebrates have represented an important component of the diets of both yellow and white perch, occurring in >50% of yellow perch stomachs and in >40% of white perch stomachs regardless of the season. *Hemimysis anomala*, a non-native shrimp, was found in the diet of yellow and white perch in both species during 2011 sampling efforts. There was not a noticeable difference between the occurrence of fish prey items found in yellow and white perch this year, however historically, both species have had a greater percentage of stomachs containing fish prey in autumn samples compared to spring samples.

Populations of several ecologically and economically important native fish species remain low in abundance or are on declining trajectories. Recent increasing trends in walleye and freshwater drum are encouraging, but both of these species, as well as yellow perch, remain at historically lower levels of abundance. Meanwhile, invasive species, such as white perch, remain among the most abundant in western Lake Erie. The invasive round goby - although much lower in abundance than at its peak - remains more abundant than most native species. The most recent non-indigenous species, tubenose goby, is established in Michigan waters near Monroe, MI, but is probably low in abundance. Alewife is the only invasive species to drastically decline in abundance. For the fourth consecutive year we captured no alewife in western Lake Erie.

Freshwater drum continued an increasing trend since reaching a low in 2007 following the outbreak of Viral

Hemorrhagic Septicemia, which corresponded with 3consecutive years of poor reproductive success. The increase in 2011 was greater in magnitude than the decrease between 2009 and 2010, hence the overall trend remains strongly increasing. Logperch is on a modestly increasing trajectory. Despite a decrease in CPH from 2010, CPH of YOY walleye was the second highest value since 2003 (**Fig 2).** The trend in CPH of YOY walleye is positive, although it remains far below desired values for sustaining fisheries (WTG 2011).

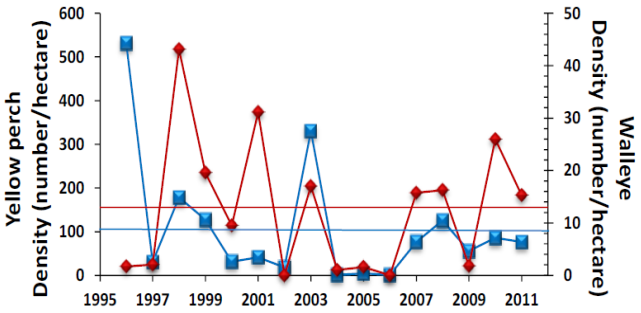


Fig 2-Catch per hectare for YOY yellow perch & walleye in western Lake Erie, 1996-2011; means are represented by horizontal bars

Sampling in 2011 occurred during the second full week of September, which is one week earlier than our typical prescribed sampling period and one week earlier than last year. Despite sampling one week earlier, cumulative degree days from 1 June through our mean sampling date were only 23 DD lower than last year. This minor difference results from warm temperatures in July and September that were well above those of last year and well above the 8-year mean. The minor differences in mean total lengths between 2010 and 2011 are partially attributable to similar cumulative DD when sampling occurred. Warm temperatures also contributed to production of a second gizzard shad cohort **(Fig 3),** which has occurred in all years except 2008 and 2009, the two years with lowest cumulative DD since at least 2003.

Gizzard Shad

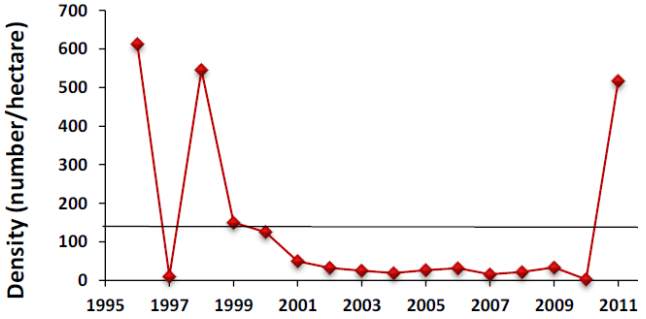


Fig 3-Catch per hectare for YOY gizzard shad in western Lake Erie, 1996-2011; Means are represented by horizontal bars

Estimated densities of silver chub YAO increased for the first year since 2005. Despite the observed strong decline since 2004 the population remains much more abundant than it was prior to the late 1990s. With the exception of occasional increases in CPH every 3-5 years, silver chub abundance was low between 1960 and 1996 (USGS Lake Erie Biological Station, unpublished data). Thereafter abundance increased more than 2 orders of magnitude and remained above previous high values for most of the period 1997-2001. Recent observed declines are from the historically very high CPH. In a historical context, current silver chub CPH is higher than the 51-year long-term average.

Emerald Shiner

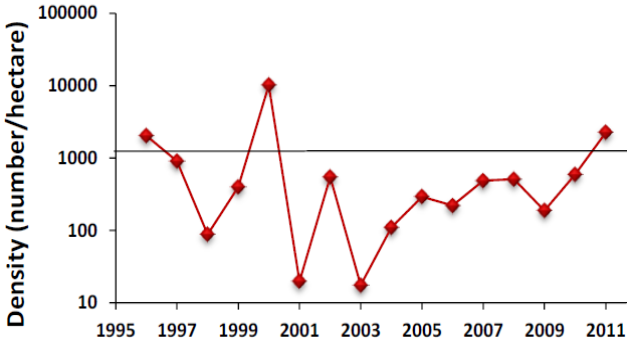


Fig 4-Catch per hectare for YOY emerald shiner in western Lake Erie, 1996-2011; Means are represented by horizontal bars

Silver chub was lamented as apparently extirpated from Ontario waters. Despite the comparatively recent increase in abundance, silver chub is a species of special concern in Canada. We captured silver chub **(Fig 5)** in Ontario waters at trawl stations nearest the outlet of the Detroit River, hence the species remains in Ontario waters. Little is known about the species biology; the only published record on life history is a doctoral dissertation by Kinney (1954). Spawning is thought to be in open water, but this has never been verified. We have begun a study of silver chub diets and population status in cooperation with Canadian colleagues and will examine CPH trends in the context of species invasions and other ecological changes in Lake Erie to identify and address potential hypotheses for population fluctuations in silver chub.

Silver Chub

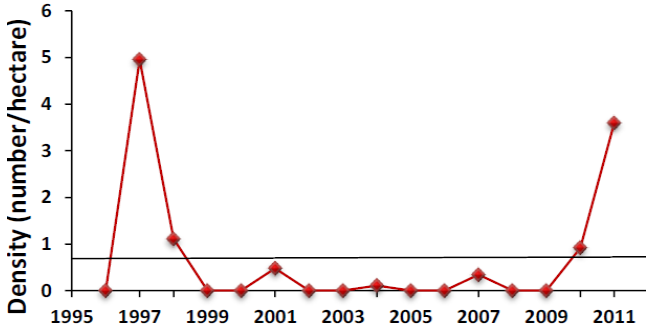


Fig 5-Catch per hectare for YOY silver chub in western Lake Erie, 1996-2011; Means are represented by horizontal bars

For the third consecutive year *Hemimysis anomala* was sampled in the diets of yellow perch and white perch. Three adult yellow perch and one adult white perch contained one or more *Hemimysis* in their diet. Based on diet data it seems

Hemimysis are now distributed throughout western Lake Erie extending from east of Pelee Island at the far eastern end of the western basin to Maumee Bay at the far southwestern end. There is no sampling program to monitor *Hemimysis*, hence no conclusions about abundance or distribution can be drawn. ✧

Status of Sea Lamprey Control in Lake Erie Fall 2011 (GLFC)

For fifty years, sea lamprey assessment crews have been monitoring adult sea lamprey migrations in spring and early summer. Mechanical traps and nets are used to capture the sea lampreys and biological information is recorded to understand population characteristics. A mark-recapture study is conducted on each stream to develop stream and lakewide population estimates.

The graphs below show the lakewide population estimates over time for each lake, beginning with an estimate of sea lamprey abundance before the control program began, and then estimates from 1980 to the present.

Sea Lamprey Abundance

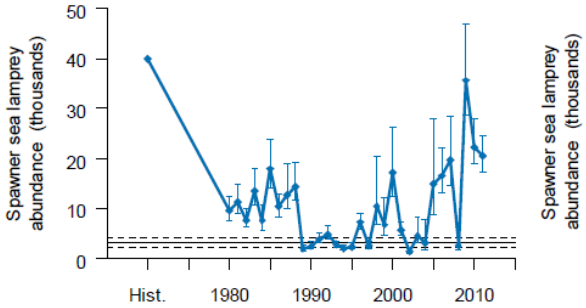


Fig 1 - Abundance estimates of spawning-phase sea lampreys, including historic pre-control abundance. Target abundance and range were estimated from abundances during a period with acceptable marking rates (horizontal solid and dashed lines).

Fig 2 - Sources of spawning-phase sea lampreys. Sources are based on the current year's estimates derived from mark/recapture (blue circles) or model (orange circle) methods. Larval-phase sources are the maximum larval-phase estimates. Named tributaries indicate the tributaries that contribute over half of the spawning-phase or larval-phase production for the entire lake. For reference, the Big Creek spawning-phase estimate is about 6,200 and the larval-phase estimate is about 213,000.

• The spawner abundance estimate is nearly six times above the target range and although it is lower than the record high abundance observed during 2009, spawner abundance remains at a pre-control level.
• Sources to watch include hard to treat tributaries like Cattaraugus Creek and the potential for unidentified sea lamprey producing tributaries and lentic areas (i.e. the Detroit and St. Clair rivers, and western basin of Lake Erie).

Lake Trout Wounding and Abundance

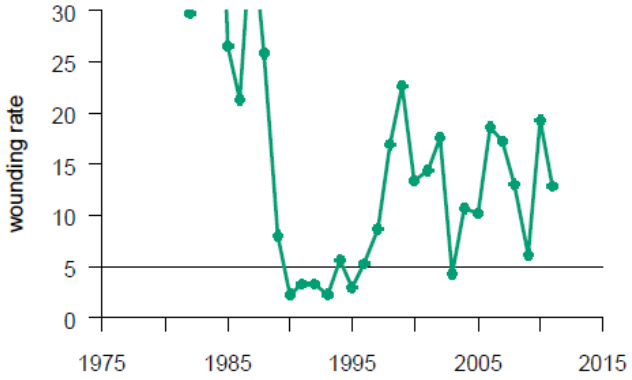
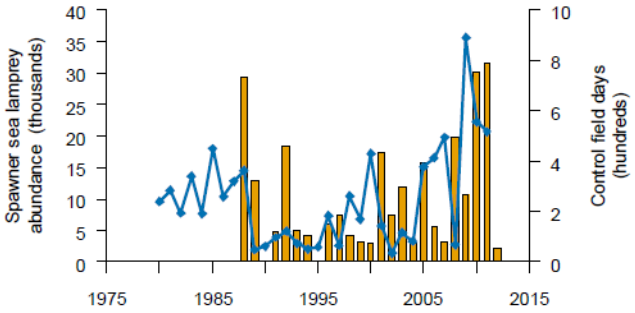


Fig 3 - Number of A1-3 wounds per 100 lake trout size >533 mm from standardized assessments plotted on sea lamprey spawning year. Horizontal green line represents the 5 wounds per 100 fish target.

Wounding rate is greater than the target.
• Lake trout abundance declined from the previous year, but is holding steady.
• Wounding rates on Burbot and steelhead have been increasing and are a concern.
• The commission is working to build lake trout wounding and abundance databases to allow for analyses to advance the assessment of success and guidance of the program.



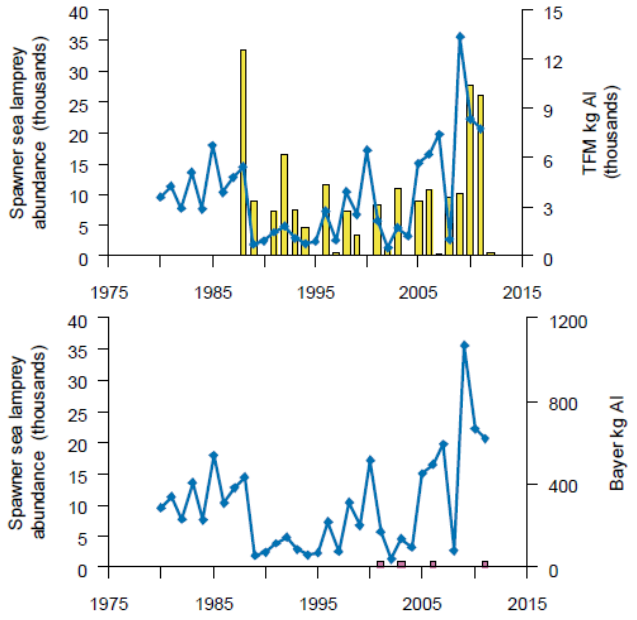


Fig 4 - Abundance of spawning-phase sea lampreys (blue diamonds) and number of control field days (orange bars), TFM used (Kg active ingredient; yellow bars), and Bayluscide used (Kg active ingredient; blue bars).

• 10 tributaries were treated during 2009 and 1 during 2010 (2011 and 2012 spawning years).
• Increased control effort has been implemented since 1999 (2001 spawning year) and a largescale treatment strategy in which all known sea lamprey producing streams are treated in consecutive years was implemented during 2008 - 2010.
• Spawning-phase sea lamprey abundance has yet to respond to increased treatment effort.
• Unidentified sources of sea lampreys remains a concern and more intense assessment survey plans have been proposed. ✧

Sea Lamprey Control in Lake Erie 2011 (USFWS)

Introduction

This report outlines the actions undertaken during 2011 by the U.S. Fish and Wildlife Service (Service) and the Fisheries and Oceans Canada (Department) to control sea lamprey populations in Lake Erie.

Spawning-phase sea lamprey abundance in Lake Erie was 20,638 during 2011, which is less than the previous year and greater than the target range. The current 5-year average of spawning-phase abundance is 20,181 sea lampreys. This average is 5-fold greater than target, and the 5-year trend demonstrates a divergence from targets.

The initial round of stream treatments during 1986 and suppression during the following eight years resulted in an annual sea lamprey population within the target range. During the late 1990s sea lamprey numbers recovered to pre-treatment levels, which was probably due to deferral of some treatments, failure to treat all sea lamprey-infested areas in some streams, and lower treatment efficacy resulting from changes in procedures to reduce lampricide use and protect non-target organisms. Beginning in 1999, the Commission responded to burgeoning sea lamprey abundance with the application of concerted control effort to the major sea lamprey producing streams in Lake Erie, resulting in suppression to target levels for four years, from 2001 to 2004.

Spawning-phase sea lamprey abundance rebounded during the period from 2005 to 2007, once again exceeding pre-control levels. In response to the observed increases, a whole-lake large-scale treatment strategy was implemented and all known infested tributaries to Lake Erie were treated in two consecutive years, beginning in the spring of 2008.

Despite increased treatment effort, spawning-phase sea lamprey abundance has remained at pre-control levels through 2011. Effort to assess the potential parasitic-phase sea lamprey production from new streams, the Huron-Erie corridor, and residual populations in treated streams remains a priority and has been dramatically enhanced.

Tributary Information

Lake Erie has 842 tributaries (525 Canada, 317 U.S.). Twenty-two tributaries (11 Canada, 11 U.S.) have historical records of larval sea lamprey production. Of these, 11 tributaries (5 Canada, 6 U.S.) have been treated with lampricides at least once during 2002-2011. Eight tributaries (2 Canada, 6 U.S.) are treated on a regular cycle. 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 (1 Canada, 1 U.S.), none of which have required treatment during 2002-2011.

Lampricide Control

A whole lake large-scale treatment strategy consisting of back to back treatments of eleven tributaries (5 Canada, 6 U.S.) was completed during the period of 2008 – 2010. Treatment evaluation surveys indicate that all 11 tributaries were treated with very high efficacy, and therefore, no Lake Erie streams were treated in 2011.

Alternative Control

Barriers

There are seven sea lamprey barriers on Lake Erie (**Fig 1)** that were purpose-built by the Commission to block sea lamprey spawning migrations. Routine maintenance, spring start-up, and safety inspections were performed on all Canadian barriers. Repairs or improvements were conducted

on two Canadian barriers and a feasibility study was approved to prepare for repairing or rebuilding one U.S. barrier:

Barrier site and fish community assessment surveys of barrier candidate streams were conducted on one Canadian tributary.
Big Otter Creek – Recent removal of the sea lamprey control barrier, Rock's Mill Dam, has allowed upstream access to sea lamprey spawning and nursery habitat. Identification of a future barrier site has been initiated. Fish surveys were conducted in the watershed during 2011. These surveys are a continuation of a multiple year assessment study designed to determine the fish community of Big Otter Creek. The cumulative results of these surveys have identified 49 fish species in the watershed. Round goby have been observed in a tributary to the main creek in the lower portion of the watershed. Grass pickerel, a federally and provincially listed species, was collected during 2009 and 2011 sampling.

Assessment

Larval-Phase

Tributaries were assessed during 2011 to evaluate efficacy of 2008, 2009 and 2010 treatments, to monitor recruitment in these streams, and to look for new infestations in streams with no history of larval sea lamprey recruitment. Assessments were conducted with backpack electrofishers in waters <1m deep. Waters ≥1m in depth were surveyed with GB.

•Larval assessments were conducted on 72 tributaries (11 Canada, 61 U.S.) and offshore of one U.S. tributary.

•Surveys to detect new larval populations were conducted in 54 Lake Erie tributaries (49 U.S., 5 Canada) and a new sea lamprey infestation was discovered in Chautauqua Creek, a New York tributary to Lake Erie. Based on the size structure of larvae captured, sea lampreys recruited to the stream in 2011.

•Portions of the St. Clair River substrate were mapped using RoxAnn seabed classification sonar. Granular Bayluscide was applied to estimate larval sea lamprey density. Approximately 150,000 sea lamprey larvae were estimated to be in the area mapped by the RoxAnn seabed classification method. A total of 2,650 ha in the upper and lower St. Clair were mapped, however some areas were excluded due to shallow depth and time restrictions.

•Bottom substrate was mapped using RoxAnn seabed classification sonar in the outflow area in the lower Detroit River.

•No larval populations were detected using GB in lotic surveys conducted in the Detroit, Huron, Sandusky, Maumee, Portage and Tousaint rivers, and Muddy Creek.

•The Huron-Erie Corridor Work Group was established to develop strategies and plans to determine the contribution of lamprey to Lake Erie from the St. Clair and Detroit rivers.

•A sampling protocol designed to monitor trends in larval sea lamprey abundance and evaluate the spatial distribution and density of larval sea lampreys is being developed for the St. Clair River.

Spawning-phase

•A total of 3,281 spawning-phase sea lampreys were trapped at 5 sites in 4 tributaries during 2011.

•The estimated population of spawning-phase sea lampreys during 2011 was 20,638 which was significantly greater than the fish-community objective target range of 3,000 (**Fig 3).**

•Traps were fished in the Huron River by Commission staff to determine feasibility of monitoring traps at the Flat Rock Dam. Two traps were set and four sea lampreys were captured.

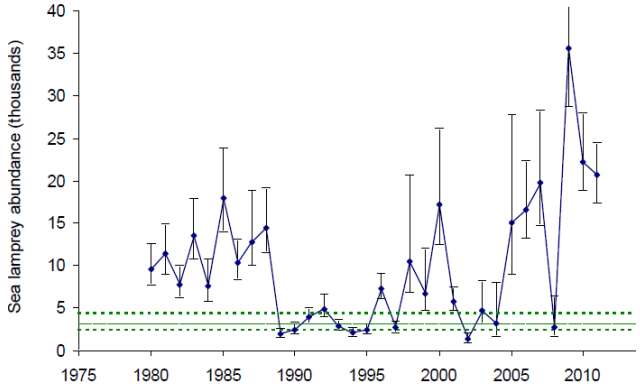


Fig 3 - Annual lake-wide population estimates of spawning-phase sea lampreys, 1980-2011

Parasitic-phase

The target rate for sea lamprey marking on lake trout in Lake Erie is 5 fresh (A1-A3) wounds per 100 fish >533mm. The number of A1-A3 wounds per 100 lake trout >533mm from standardized fall assessments in 2011 has not been analyzed.

The wounding rate in 2010 (from the 2011 spawning cohort) was 13 wounds per 100 lake trout, a decrease from the 19 wounds the previous year (**Fig 4**).

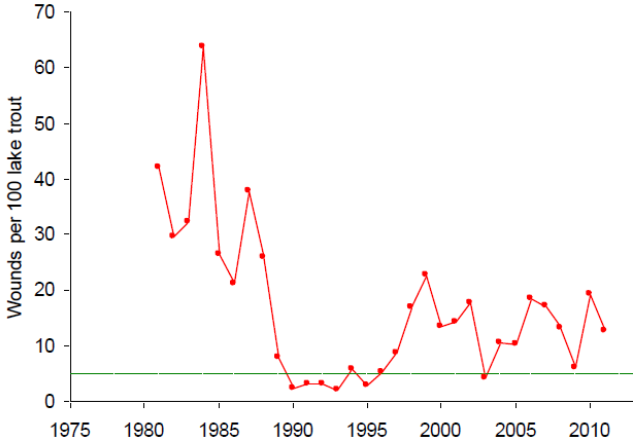


Fig 4 - Number of A1-A3 wounds per 100 lake trout >533mm from standardized fall assessments

End