

LAKE ERIE COMMITTEE WALLEYE TASK GROUP EXECUTIVE SUMMARY REPORT MARCH 2014

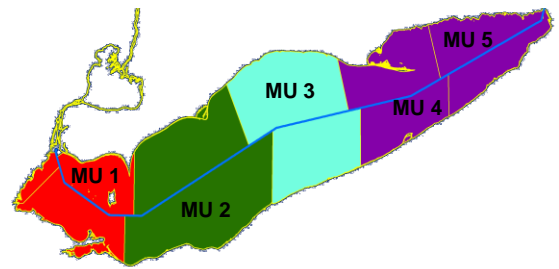


Figure 1. Lake Erie walleye management units

Introduction

This summary report highlights elements of the 2014 Walleye Task Group (WTG) annual report. The complete WTG report is available from the Great Lakes Fishery Commission's (GLFC) Lake Erie Committee (LEC) WTG website at <http://www.glfc.org/lakecom/lec/WTG.htm>, or upon request from an LEC, Standing Technical Committee (STC), or WTG representative.

The WTG partitions the lake into five management units (MUs) for data analysis and managing Walleye (Figure 1). Statistical catch at age (SCAA) population models are run for a combined west-central area (MUs 1 to 3) to produce estimates that are used with WTG Harvest Control Rules to generate a Recommended Allowable Harvest (RAH). The WTG assesses the status of Walleye and their resulting fisheries in MUs 4 and 5, but it does not generate an RAH due to uncertainties concerning stock delineation.

Five charges were addressed by the WTG during 2013-2014: (1) Maintain and update centralized time series of datasets and methodology required for population models and assessment; (2) Improve existing population models to produce the most scientifically-defensible and reliable method for estimating and forecasting abundance, recruitment, and mortality and continue to explore additional recruitment indices for incorporating into catch-at-age model and to explore ways to account of tag loss and non-reporting in natural mortality (M) estimates for statistical catch-at-age modeling; (3) Report RAH levels for 2014; (4) Review jaw and PIT tagging study results and provide guidance/recommendations for future tagging strategies to the LEC. Please see the full report for details of activities addressing all of these charges. This executive summary will focus on WTG Charges 1, 2, and 3.

2013 Fishery Review

The total allowable catch (TAC) in quota area waters of the west and central basins for 2013 was 3.356 million fish. This allocation represented a 4% decrease from the 2012 TAC of 3.487 million fish. In the TAC area, the total harvest was 2.412 million fish, or 72% of the quota (Table 1). Harvest in the non-TAC area of the eastern basin amounted to 125,476 fish. Lake-wide Walleye harvest was estimated at 2.538 million fish for 2013. Sport fishery (1.280 million fish) and commercial fishery (1.260 million fish) harvest levels reported for 2013 were both below the long-term (1975-2012) means (2.374 and 2.063 million fish, respectively).

Table 1. Summary of walleye harvest by jurisdiction in Lake Erie, 2013.

in number of fish	TAC Area (MU-1, MU-2, MU-3)				Non-TAC Area (MU-4 & MU-5)				All Areas Total
	Michigan	Ohio	Ontario	Total	NY	Penn.	Ontario	Total	
TAC	195,655	1,715,252	1,445,094	3,356,000	-	-	-	-	3,356,000
TAC % Share	5.83%	51.11%	43.06%	100.00%	-	-	-	-	100.00%
Harvest	54,167	1,083,395	1,274,945	2,412,507	34,553	60,332	30,591	125,476	2,537,983

Total commercial Walleye fishery effort decreased in 2013 compared to 2012 (Table 2). Commercial gill net effort in MU's 1, and in MU 4&5 decreased (19%, and 14% respectively), but effort increased in MU2 by 12% and in MU3 by 14%. The total commercial effort of 9,503 km fished was 50% below the long-term average (1975-2012: 18,980 km). Commercial effort was greatest in the west basin, declining eastward through the lake. Across the lake, sport fishery effort in 2013 increased slightly, relative to 2012, by 2%. Sportfish effort in MU1 decreased in Michigan waters by 25%, but increased in Ohio by 10%. Central basin sportfish effort was mixed, with a 10% decrease in Ohio's portion of MU2, but a 30% increase in effort in Ohio's MU3 waters (Table 3). Sport effort decreased in Pennsylvania (4%) and New York (15%) waters of MUs 4&5 (Table 3). The 2013 Walleye sport effort (2.641 million angler hrs) was 51% of the long-term mean.

Table 2. Ontario walleye gillnet effort in 2013.

	Unit 1	Unit 2	Unit 3	Units 4 & 5
Effort (km)	3,802	2,774	2,624	304
change from 2012	-19%	12%	14%	-14%

Table 3. Summary of sport fishery effort reported in thousands of hours for 2013.

	Unit 1 - MI	Unit 1 - OH	Unit 2 - OH	Unit 3 - OH	Units 4&5- PA	Units 4&5- NY
Effort (1000s hrs)	182	1,424	503	236	154	143
change from 2012	-25%	11%	-10%	30%	-4%	-15%

Lake-wide catch rates in 2013 increased for the sport fishery (fish per hour) and declined for the commercial fishery (fish per kilometer of net fished). The 2013 catch rate in the sport fishery (0.47) and the commercial fishery (132.6) are both higher than the long-term average. Compared to 2012, the 2013 sport catch rates by MU increased by 13% in MU1, decreased 24% in MU2, and up 14% in MU3 and 28% in MUs 4&5. Gill net catch rates increased by 9% and 25% in MU1 and MU4 respectively; while the commercial catch rate declined in MU2 (7%) and MU3 (11%). Age distribution of fish in the harvest was dominated by Walleye age 7-and-older (including the 2003 year class) and age 3's (2010 year class); lake-wide, age 7-and-older Walleye comprised 29% and the age 3's comprised 26% of the commercial fishery and sport fishery. The 2011 (age 2), 2009 (age 4) and 2007 (age 6) year classes each represented 12 to 13% of the total harvest in 2013. Age 5 (2008 year class) fish contributed 7% to the total lake-wide harvest.

Catch-at-Age Analysis Population Estimate & Recruitment for 2013 and 2014

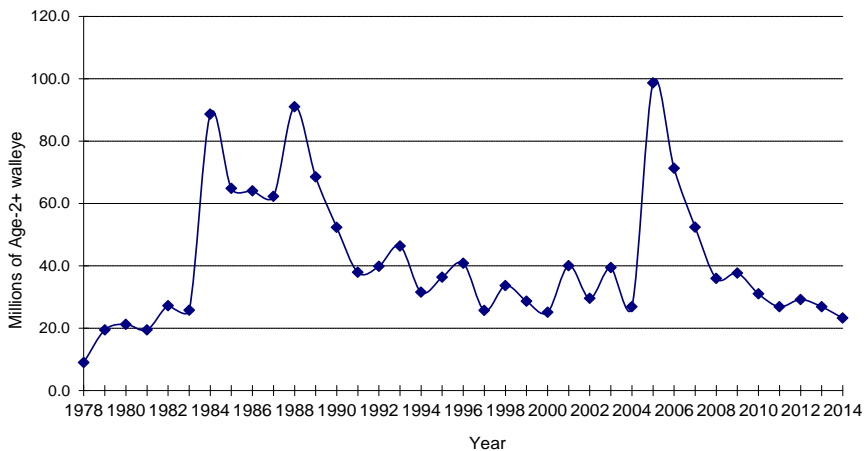


Figure 2. Population estimate of Lake Erie walleye ages 2 and older from 1978 to 2013, and the projection for 2014 from the integrated SCAA model.

(2013 year-class) will be 5.644 and 8.353 million Walleye, respectively.

2014 Population Abundance

Using the 2014 integrated SCAA model, the projected abundance of Walleye in the west-central population is 23.229 million Walleye (Table 4). The most abundant (24%) year-class in the population is projected to be age 2 Walleye from the 2012 cohort (5.644 million fish). With fish originating from the 2011 (age 3), 2010 (age 4) and 2003 (age 7 and older) year-classes are all expected to contribute equal proportions to the population, 23%, 21% and 20%, respectively. Age 3 and older fish are expected to account for 76% of the 2014 population size. The spawning stock biomass (SSB) projected for 2014 is 28.886 million kilograms.

In 2013, the Lake Erie Committee (LEC), with input from the Lake Erie Percid Management Advisory Group (LEPMAG), directed the WTG to modify the 2013 integrated statistical catch-at-age (SCAA) model to include a random walk catchability (q) to the age-0 recruitment dataset. Based on these changes the 2014 integrated SCAA model, the 2013 west-central population estimate was 26.864 million age 2 and older Walleye (Figure 2). The estimated number of age 3 fish (2010 year class) in 2013 was 7.657 million fish, and represented 29% of the Walleye (age 2 and older) in the population. The second-most abundant age group (28%) was age 2, followed by age 7 and older fish at 17%. Using the 2014 integrated SCAA model, the number of age 2 recruits entering the population in 2014 (2012 year-class) and 2015

Table 4. Stock size estimates and RAH values for mean and \pm one standard error.

Age	2014 Stock Size (millions of fish)		60% F_{msy}	Rate Functions			2014 RAH (millions of fish)			Projected 2015 Stock Size (millions)
	Mean	F		sel(age)	(F)	(S)	(u)	Min.	Mean	Max.
2	5.644		0.265	0.085	0.667	0.070	0.289	0.395	0.501	8.353
3	5.277		0.851	0.273	0.553	0.206	0.827	1.085	1.343	3.764
4	4.915		0.890	0.285	0.546	0.214	0.797	1.052	1.307	2.917
5	1.724		0.857	0.275	0.552	0.207	0.267	0.357	0.447	2.683
6	1.052		0.897	0.287	0.545	0.215	0.169	0.227	0.284	0.951
7+	4.617		1.000	0.320	0.527	0.237	0.808	1.092	1.377	3.007
Total (2+)	23.229	0.320				0.181	3.156	4.207	5.258	21.676
Total (3+)	17.584						2.868	3.813	4.758	13.323
SSB	28.886	mil. kgs								23.191 mil. kgs

probability of 2014 spawning stock biomass being less than 20% SSB_0 = 0.062%

2014 Harvest Strategy and Recommended Allowable Harvest (RAH)

After meeting with LEPMAG 12 times over the course of three years to discuss Walleye management objectives, management alternatives, and trade-offs between various management options, the LEC charged the WTG to employ the integrated Walleye assessment model that incorporates random walk catchability for the age-0 Walleye recruitment index. Beginning in 2014, the Walleye Harvest Control Rules policy will set a target fishing rate at 60% F_{msy} , with an accompanying limit reference point which will reduce the this target fishing rate beginning at 20% of the unfished spawning stock biomass (20% SSB_0). This probabilistic control rule, P-star (P^*) of 0.05 was incorporated to ensure that SSB in 2015 is not below the SSB_0 threshold after fishing in 2014. Also for LEC consideration was the limitation of TAC variation from one year to the next of 20% to implement a measure of fishery stability. For a complete description of the LEPMAG process and the harvest policy used to calculate the RAH for 2014, please refer to the complete version of the 2014 Walleye Task Group Report. Using results from the 2014 integrated SCAA model, the harvest policy adopted for 2014, and selectivity values from the current fisheries, a mean RAH of 4.207 million fish was calculated for 2014, with a range of 3.156 to 5.258 million fish (Table 4). The TAC range for 2014 based on minimizing variation from the 2013 TAC, plus or minus 20%, would be 2.685 to 4.027 million fish.