LAKE ERIE COMMITTEE
WALLEYE TASK GROUP
EXECUTIVE SUMMARY REPORT
MARCH 2018

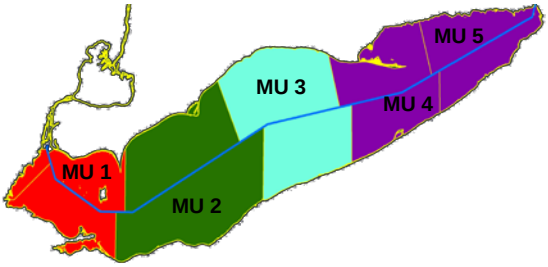

Figure 1. Lake Erie walleye management units

Introduction

This summary report highlights elements of the 2018 Walleye Task Group (WTG) annual report. The complete WTG report is available from the Great Lakes Fishery Commission's (GLFC) Lake Erie Committee website at http://www.glfc.org/lake-erie-committee.php, or upon request from a 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.

Four charges were addressed by the WTG during 2017-2018: (1) Maintain and update the centralized time series of datasets 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; (3) Report RAH levels for 2018; and (4) Provide guidance/recommendations for tagging strategies that are expected to be implemented beginning in 2018 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 and 3.

2017 Fishery Review

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

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

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

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

Table 2. Ontario walleye gillnet effort in 2017.

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

Table 3. Summary of sport fishery effort reported in thousands of hours for 2017.

	Unit 1 - MI	Unit 1 - OH	Unit 2 - OH	Unit 3 - OH	Units 4&5- PA	Units 4&5- NY
Effort (1000s hrs)	187	1,351	726	501	228	213
change from 2016	-20%	-11%	65%	26%	62%	-2%

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

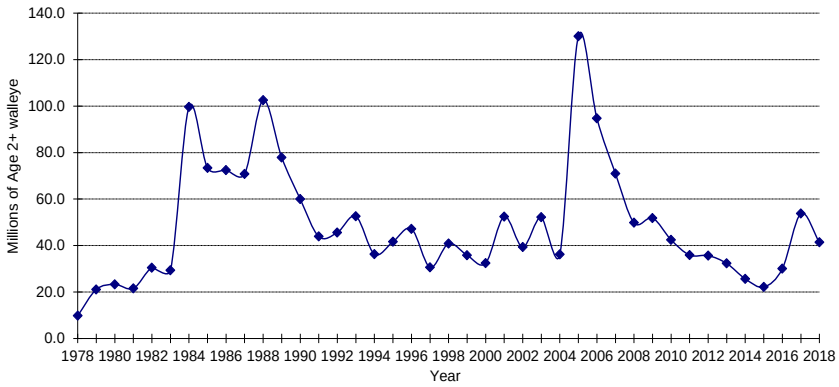

Figure 2. Population estimate of Lake Erie Walleye ages 2 and older from 1978 to 2017, and the projection for 2018, from the integrated SCAA model.

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

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

2018 Population Abundance

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

2018 Harvest Strategy and Recommended Allowable Harvest (RAH)

Beginning in 2015, the WTG implemented the Walleye Management Plan, which includes the integrated Walleye assessment model and a Walleye Harvest Control rule (HCR). The HCR sets the target fishing rate at 60%F_{msy}, with an accompanying limit reference point which will reduce the target fishing rate beginning at 20% of the unfished spawning stock biomass (20%SSB_0). This probabilistic control rule, P-star (P*) was set at 0.05 and incorporated to ensure that SSB in 2019 is not below the SSB_o threshold after fishing in 2018. In addition, there is a limitation of TAC variation from one year to the next of 20% to implement a measure of fishery stability. Using results from the 2018 integrated SCAA model, the harvest policy used for 2018, and selectivity values from the current fisheries, a mean RAH of 8.809 million fish was calculated for 2018, with a range of 6.698 to 10.921 million fish (Table 4). The TAC range for 2018 based on minimizing variation from the 2017 TAC, ± 20%, would be 6.698 to 7.109 million fish.

	2018 Stock Size (millions of fish)	60% F_{msy}		Rate Functions			2018 RAH (millions of fish)			Projected 2019 Stock Size (millions)	
Age	**Mean**	**F**	**Sel(age)**	**(F)**	**(S)**	**(u)**	**Min.**	**Mean**	**Max.**	**Mean**	
2	5.973		0.316	0.102	0.656	0.083	0.367	0.497	0.628	12.276	
3	23.293		0.981	0.317	0.529	0.234	4.199	5.456	6.712	3.917	
4	6.678		0.997	0.322	0.526	0.238	1.198	1.586	1.975	12.324	
5	1.464		0.930	0.300	0.538	0.224	0.243	0.327	0.412	3.515	
6	0.676		0.935	0.302	0.537	0.225	0.112	0.152	0.192	0.788	
7+	3.321		1.000	0.323	0.526	0.238	0.579	0.791	1.003	2.109	
Total (2+)	41.405	0.323				0.213	6.698	8.809	10.921	34.928	
Total (3+)	35.432						6.331	8.312	10.293	22.652	
SSB	44.958	mil. kgs								36.037	mil. kgs
probability of 2018 spawning stock biomass being less than 20% SSB_0 =										0.001%	

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