LAKE ERIE COMMITTEE
WALLEYE TASK GROUP
EXECUTIVE SUMMARY REPORT
MARCH 2023

Lake Erie Committee
REPRESENTING THE FISHERY MANAGEMENT AGENCIES OF LAKE ERIE & LAKE ST. CLAIR

Introduction

This summary report highlights elements of the 2023 Walleye Task Group (WTG) annual report. The complete WTG report is available from the Great Lakes Fishery Commission's Lake Erie Committee website at http://www.glfc.org/lake-erie-committee.php, or upon request from a Lake Erie Committee, Standing Technical Committee, or WTG representative.

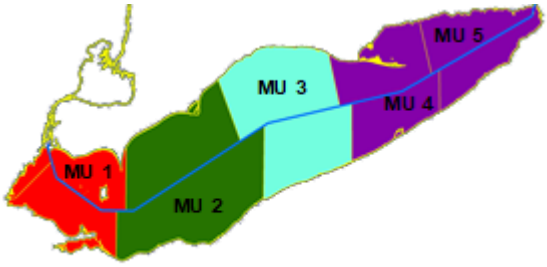

Figure 1. Lake Erie walleye management units

The WTG partitions the lake into five management units (MUs) for data analysis and managing Walleye (Figure 1). A statistical catch-at-age (SCAA) model is run for a combined west-central area (MUs 1 to 3) to produce abundance estimates that are used with a harvest control rule to generate a Recommended Allowable Harvest (RAH). The WTG assesses the status of Walleye and their resulting fisheries in MUs 4&5, but it does not generate an RAH due to uncertainties around the mixing of western and eastern basin populations.

2022 Fishery Review

The total allowable catch (TAC) for 2022 in the quota area (MUs 1 to 3) was 14.533 million fish. This allocation represented a 20% increase from the 2021 TAC. Total harvest in the quota area was 8.743 million fish, or 60.2% of the 2022 TAC (Table 1). Harvest in the non-TAC area (MUs 4&5) was 0.526 million fish. Lake-wide Walleye harvest was estimated at 9.269 million fish. Both sport fishery (3.089 million fish) and commercial fishery (6.180 million fish) harvest were above long-term (1975-2021) averages (sport = 2.311 million fish and commercial = 2.205 million fish). Total lake-wide commercial fishery effort was 17,596 km of gill net, which decreased from 2021 and was below the 1975-2021 average (18,576 km). Commercial effort increased in MU2 but decreased elsewhere (Table 2). Historically MU1 has been the largest component of the commercial effort, which was the case in 2022 (Table 2). Lake-wide sport effort was 4.412 million angler hours, which was below the 1975-2021 average (4.977 million angler hours). Sport effort increased in the eastern basin (MUs 4&5) but declined elsewhere in the lake (Table 3). The 2022 harvest rates in the lake-wide sport fishery (0.68 fish/hour) remained high, as did those for the commercial fishery (351.2 fish/km gill net). Sport harvest rates increased in all MUs. Similarly, gill net catch rates increased in all MUs. In all gear types combined, age 3 (43%; 2019 year class) and age 4 (23%; 2018 year class) Walleye were the two most commonly harvested ages lake-wide.

Table 1. Summary of walleye harvest by jurisdiction in Lake Erie, 2022.

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	847,274	7,427,816	6,257,910	14,533,000	-	-	-	-	14,533,000
TAC % Share	5.83%	51.11%	43.06%	100.00%	-	-	-	-	100.00%
Harvest	114,465	2,581,307	6,047,336	8,743,108	75,774	232,780	217,116	525,670	9,268,777
Harvest %TAC	13.5%	34.8%	96.6%	60.2%					

Table 2. Ontario Walleye gillnet effort in 2022.

	Unit 1	Unit 2	Unit 3	Units 4 & 5
Effort (km)	7,017	7,013	2,642	924
change from 2021	-4%	7%	-17%	-25%

Table 3. Summary of sport fishery effort reported in thousands of hours for 2022.

	Unit 1 - MI	Unit 1 - OH	Unit 2 - OH	Unit 3 - OH	Units 4&5- PA	Units 4&5- NY
Effort (1000s hrs)	275	1,891	1,219	498	306	224
change from 2021	-15%	-12%	-15%	-15%	18%	22%

Catch-at-Age Abundance Estimate and Projected 2023 and 2024 Recruitment

Based on the 2023 SCAA model, the 2022 population estimate was 71.0 million age 2 and older Walleye (Figure 2). An estimated 27.2 million age 3 (2019 year class) was the most abundant year class, with age 2 (2020 year class), age 4 (2018 year class), and age 7+ (2015 and older year classes) also abundant. Using the 2023 SCAA model, the number of age 2 recruits entering the population in 2023 (2021 year class) and 2024 (2022 year class) were projected to be 48.6 million and 15.2 million fish, respectively. The projected abundance of age 2 and older Walleye in the MU 1 to 3 population is 93.663 million Walleye in 2023 (Table 4). The most abundant year class (52%) in the population is projected to be age 2 Walleye from the 2021 cohort (48.6 million fish). The next most abundant year class is age 4 (2019 year class) at 16.9 million fish (18%). Age 7 and older fish are expected to account for 10% of the 2023 population, largely driven by the 2015 year class. The projected spawning stock biomass (SSB) for 2023 is 69.057 million kilograms (Table 4).

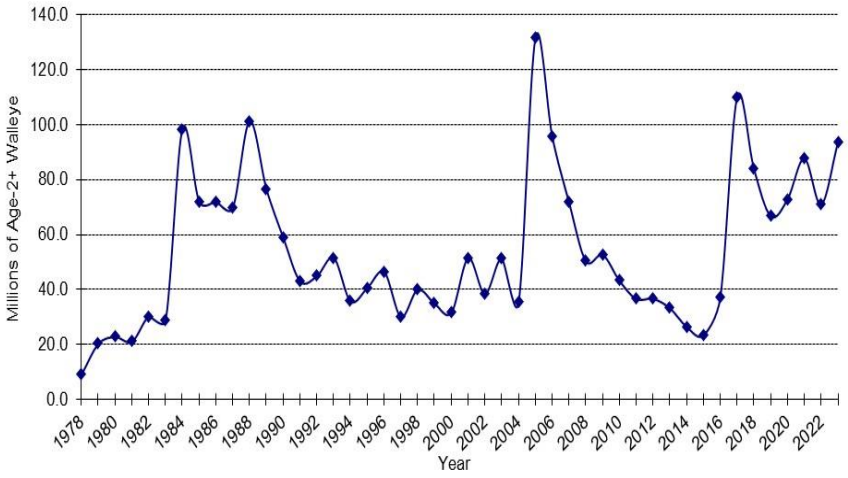

Figure 2. Population estimates of Lake Erie Walleye ages 2 and older from 1978 to 2022, and the projection for 2023, from the WTG's SCAA model.

2023 Harvest Strategy and Recommended Allowable Harvest (RAH)

Beginning in 2015, the current Walleye management plan was implemented and includes the WTG's SCAA model and a probabilistic harvest control rule (HCR). The HCR sets the target fishing rate at 60% of F_{msy}, with an accompanying limit reference point that will reduce the target fishing rate beginning at 20% of the unfished spawning stock biomass (20%SSB_0). A probabilistic control rule, P-star (P*), was set at 0.05 and was incorporated to ensure that SSB in 2024 is not below the 20% SSB_0 threshold after fishing in 2023. 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 2023 SCAA model, the harvest policy, and selectivity estimates from the current fisheries, a mean RAH of 13.526 million fish was calculated for 2023, with a range of 10.772 to 16.281 million fish (Table 4). The TAC range for 2023 based on the SCAA model, the harvest policy, and the ± 20% TAC constraint from the previous year is 11.626 to 16.281 million fish.

Table 4. Estimated harvest of Lake Erie walleye for 2023, and population projection for 2024 when fishing with 60% F_{msy}. The 2023 and 2024 projected spawning stock biomass values are from the ADMB-2023 recruitment-integrated model. The range in the RAH was calculated using ± one standard deviation from the mean RAH.

SSB_0=	64.236	million kilograms
20% SSB_0=	12.847	million kilograms
F_{msy} =	0.519	

	2023 Stock Size (millions of fish)	60% F_{msy}		Rate Functions			2023 RAH (millions of fish)			Projected 2024 Stock Size (millions)	
Age	**Mean**	**F**	**Sel(age)**	**(F)**	**(S)**	**(u)**	**Min.**	**Mean**	**Max.**	**Mean**	
2	48.567		0.271	0.084	0.667	0.069	2.539	3.372	4.205	15.165	
3	9.239		0.932	0.290	0.543	0.217	1.630	2.005	2.381	32.412	
4	16.902		1.000	0.311	0.532	0.231	3.189	3.900	4.611	5.020	
5	7.783		0.953	0.297	0.540	0.221	1.390	1.723	2.055	8.992	
6	1.897		0.917	0.285	0.546	0.214	0.324	0.406	0.488	4.202	
7+	9.275		0.989	0.308	0.534	0.229	1.699	2.120	2.541	5.986	
Total (2+)	93.663	0.311				0.144	10.772	13.526	16.281	71.776	
Total (3+)	45.097						8.233	10.154	12.076	56.611	
SSB	69.057	mil. kgs								66.549	mil. kgs

probability of 2024 spawning stock biomass being less than 20% SSB_0 = 0.000%