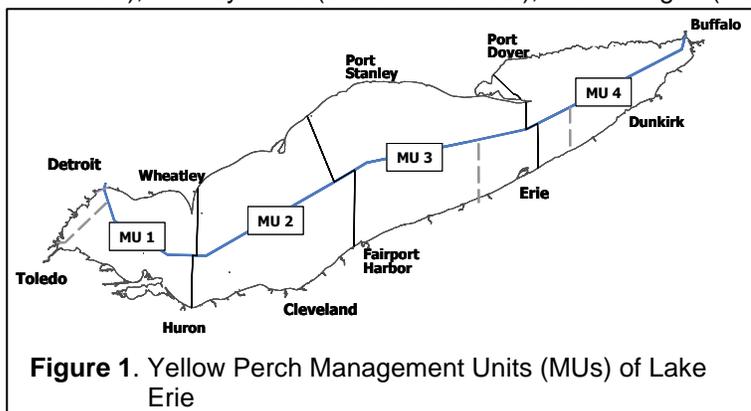


YELLOW PERCH TASK GROUP EXECUTIVE SUMMARY REPORT MARCH 2020



2019 Fisheries Review

The lakewide total allowable catch (TAC) of Yellow Perch in 2019 was 8.552 million pounds. This allocation represented a 19% decrease from a TAC of 10.498 million pounds in 2018. For Yellow Perch assessment and allocation, Lake Erie is partitioned into four management units (MUs; Figure 1). The 2019 TAC allocation was 2.425, 2.208, 3.374 and 0.545 million pounds for MUs 1 through 4, respectively. The lake-wide harvest of Yellow Perch in 2019 was 4.467 million pounds, or 52% of the total 2019 TAC. This was a 34% decrease from the 2018 harvest of 6.782 million pounds. Harvest from MUs 1 through 4 was 1.221, 1.174, 1.689, and 0.235 million pounds, respectively (Table 1). The portion of TAC harvested was 50%, 53%, 50%, and 70%, in MUs 1 through 4, respectively. In 2019, Ontario harvested 3.243 million pounds, followed by Ohio (1.112 million lbs.), New York (0.056 million lbs.), Pennsylvania (0.040 million lbs.), and Michigan (0.016 million lbs.).



Targeted (i.e., small mesh) commercial gill net effort in 2019 increased from 2018 in MU1, MU3, and MU4 (+24%, +34%, and +7%, respectively), but decreased in MU2 (-26%). Sport angling effort in U.S. waters decreased in 2019 from 2018, in management units 1, 2, and 3, by 46%, 46%, and 67%, respectively, and increased by 44% in MU4. Sport effort in 2019 was at its lowest in the time series for MU1, MU2 and MU3. Compared to 2018, commercial trap net effort (lifts) in U.S. waters in 2019 increased by 9% in MU1, 41% in MU2, 28% in MU3, and 66% in MU4. Fishing effort by jurisdiction and gear type is presented in Table 2.

Targeted gill net harvest rates in 2019 decreased relative to 2018 rates by 47% in MU1, 36% in MU2, and 46% in MU3, and increased by 12% in MU4. Angling harvest rates, in fish harvested per angler hour decreased in Michigan (-63%) and Ohio waters of MU1 (-41%), decreased in Ohio waters of MU2 (-47%), decreased in Ohio waters of MU3 (-93%), and increased in Pennsylvania waters of MU3 (+80%) and MU4 (+72%), and increased in New York waters of MU4 (+18%). In 2019, trap net harvest rates decreased in MU1 (-60%), MU2 (-44%), MU3 (-44%), and increased in MU4 (+6%), compared to 2018 harvest rates.

Table 1. Lake Erie Yellow Perch harvest by jurisdiction and gear type for 2019.

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	15,745	847,476	164,290	193,243					1,220,754
2		740,490	13,846	419,631					1,173,967
3		1,328,966	2,667	318,089	4,630	34,323			1,688,675
4		326,179			1,485	0	37,469	18,750	383,883
Total	15,745	3,243,111	180,803	930,963	6,114	34,323	37,469	18,750	4,467,278

*Small mesh gill net, large mesh gill net, trap net (MU1), and incidental trawl (MUs 2-4) harvest combined.

Table 2. Lake Erie Yellow Perch fishing effort by jurisdiction and gear type for 2019.

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	57,929	6,363	284,068	3,811				
2		4,431	24,826	2,192				
3		6,956	2,475	2,901	5,668	382		
4		947			2,730	0	30,285	224
Total	57,929	18,697	311,369	8,904	8,398	382	30,285	224

*Targeted small mesh gill net effort only.

Abundance Estimate for 2020

Population size for 1975 to 2020 for each MU was estimated by statistical catch-at-age analysis (SCAA). The PR ADMB model incorporates a recruitment index which is used to project total abundance estimates to 2020. Using the PR model, abundance estimates of age-2-and-older Yellow Perch in 2020 are projected to increase by 60% in MU1, and by 23% in MU2, and to decrease by 15% in MU3, and 30% in MU4, compared to the 2019 abundance estimates. Age-2-and-older Yellow Perch abundance in 2020 is projected to be 53.920, 47.247, 62.396, and 9.821 million fish in MUs 1 through 4, respectively. Using mean weight-at-age information from assessment surveys, age-2-and-older biomass estimates in 2020 are projected to increase in MU1 (+36%), and decrease in MU2 (-6%), MU3 (-11%), and MU4 (-23%), compared to 2019 estimates.

Recommended Allowable Harvest (RAH) for 2020

Following the completion of a Management Strategy Evaluation and adoption of a new harvest policy for the 2019 TAC setting year, the Lake Erie Percid Management Advisory Group (LEPMAG) completed an additional management strategy evaluation to evaluate four probabilistic risk tolerances ($P^* = 0.05, 0.1, 0.2, \text{ and } 0.5$), and compared the hierarchy of a 20% TAC constraint overriding the P^* rule to scenarios where invoking the P^* negates the 20% TAC constraint. The original review of the harvest control rules did not incorporate the 20% TAC constraints in the same manner that they were used during the 2019 TAC setting year. From this exercise new harvest control rules for Yellow Perch were selected. These harvest control rules will form the foundation of the Yellow Perch Management Plan for the next 5 years. The finalized harvest control rules (HCR) are comprised of:

- Target fishing mortality as a percent of the fishing mortality at maximum sustainable yield (F_{msy})
- Limit reference point of the biomass at maximum sustainable yield (B_{msy})
- Probabilistic risk tolerance, $P^*=0.20$
- A limit on the annual change in TAC of $\pm 20\%$ (when $P^* < 0.20$; see Yellow Perch Management Plan, STC, 2020)

Target fishing rates and limit reference points are estimated annually using results from the SCAA models. Limit reference points and target fishing rates for each management unit are presented in Table 3. Target fishing rates are reduced when the probability of the projected spawning stock biomass being equal to or less than the limit reference point (B_{msy}) is greater than 0.20 (P^*). Fishing rates are applied to population estimates and their standard errors, to determine minimum, mean, and maximum RAH values for each management unit (Table 4).

Table 3. Parameters used in the harvest control rule 2020. F actual may be reduced from F target if $P^*>0.20$.

MU	Spawning Stock Biomass			Limit Reference Point		Fishing Rate			
	SSB ₀	2020	2021 *	B _{msy}	P*	F _{msy}	% F _{msy}	F _{target}	F _{actual} **
MU1	5,711,580	2,714,810	3,994,330	1,585,842	0.00	2.40	28%	0.672	0.672
MU2	12,708,800	4,686,180	3,890,990	3,522,489	0.35	2.11	35%	0.739	0.487
MU3	13,424,200	6,843,120	5,507,670	3,682,414	0.05	2.04	32%	0.653	0.653
MU4	1,762,980	1,954,820	1,288,580	498,137	0.00	1.51	34%	0.513	0.513

*Spawning stock biomass when population is fished at target fishing rate

** In MU2 fishing at F_{target} exceeds a 0.20 probability (P^*) that the projected spawning stock biomass will be equal to or less than the limit reference point (B_{msy}), therefore the fishing rate was reduced until the probability was less than 0.20.

Table 4. Lake Erie Yellow Perch fishing rates and RAH (in millions of pounds) for 2020 by management unit.

MU	Fishing Rate	Recommended Allowable Harvest (millions lbs.)		
		MIN	MEAN	MAX
1	0.672	1.605	2.110	2.611
2	0.487	2.021	2.420	2.815
3	0.653	3.020	3.711	4.396
4	0.513	0.753	0.942	1.129
Total		7.399	9.182	10.951

The complete YPTG report is available from the GLFC's Lake Erie Committee Yellow Perch Task Group website at: <http://www.glf.org/lake-erie-committee.php>, or upon request from an LEC, Standing Technical Committee (STC), or YPTG representative.