YELLOW PERCH TASK GROUP EXECUTIVE SUMMARY REPORT MARCH 2016

Lake Erie Committee

REPRESENTING THE FISHERY MANAGEMENT AGENCIES OF LAKE ERIE AND LAKE ST. CLAIR

2015 Fisheries Review

The lakewide total allowable catch (TAC) of Yellow Perch in 2015 was 10.528 million pounds. This allocation represented a 5% decrease from a TAC of 11.081 million pounds in 2014. For Yellow Perch assessment and allocation, Lake Erie is partitioned into four management units (Units, or MUs; Figure 1). The 2015 TAC allocation by management unit was 1.592, 4.450, 3.962, and 0.524 million pounds for Units 1 through 4, respectively. The lakewide harvest of Yellow Perch in 2015 was 6.918 million pounds, or 65.7% of the total 2015 TAC. This was a 21% decrease from the 2014 harvest of 8.792 million pounds. Harvest from Yellow Perch management units 1 through 4 was 1.122, 2.621, 2.782, and 0.393 million pounds, respectively (Table 1). The TAC percentages harvested were 70.5%, 58.9%, 70.2%, and 75.1%, in MUs 1 through 4, respectively. In 2015, Ontario harvested 4.460 million pounds, followed by Ohio (2.190 million lbs.), Michigan (94 thousand lbs.), Pennsylvania (88 thousand lbs.), and New York (86 thousand lbs.).

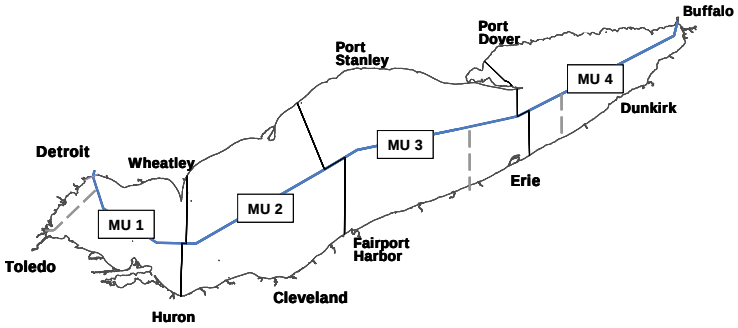

Figure 1. Yellow Perch Management Units (MUs) of Lake Erie.

Targeted gill net effort in Ontario waters in 2015 increased from 2014 by 19.9% in MU1, and by 42.2% in MU2, but decreased slightly from 2014 by 11.9% in MU3, and 12.0% in MU4. U.S. angling effort increased in 2015 from 2014 in MU1 by 12.5%, whereas U.S. angling effort decreased in MU2 (-22.3%), MU3 (-33.7%), and MU4 (-31.0%). U.S. trap net effort in 2015 increased in MU2 (+10.4%), MU3 (+79.5%), and MU4 (+107.0%) compared to 2014. There was no U.S. trap net effort in MU1 in 2015. Fishing effort by jurisdiction and gear type is presented in Table 2.

Table 1. Lake Erie Yellow Perch harvest by jurisdiction and gear type for 2015.

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	94,225	541,938	485,744	0					1,121,907
2		1,489,433	126,932	1,005,061					2,621,426
3		2,131,211	306,706	266,030	70,704	6,854			2,781,505
4		297,716			10,055	0	64,032	21,503	393,306
Total	94,225	4,460,298	919,382	1,271,091	80,759	6,854	64,032	21,503	6,918,144

*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 2015.

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	137,246	4,074	659,460	0				
2		9,459	217,637	6,309				
3		5,000	212,226	1,067	70,490	310		
4		1,774			18,638	0	44,029	441
Total	137,246	20,306	1,089,323	7,376	89,128	310	44,029	441

*Targeted small mesh gill net effort only.

Statistical Catch-at-Age Analysis and Recruitment Estimate for 2016

Population size for 1975 to 2015 for each management unit was estimated by statistical catch-at-age analysis (SCAA) using Auto Differentiation Model Builder (ADMB) modeling software. Stock size estimates for 2016 (ages 3 and older) were projected from SCAA estimates of 2015 population size and age-specific survival rates in 2015. Age-2 Yellow Perch

recruitment in 2016 was predicted by multi-model averaging of juvenile Yellow Perch survey indices against SCAA abundance estimates of two-year-old Yellow Perch within each management unit. Projected age-2 Yellow Perch recruitment from the 2014 year class was incorporated into the 2016 population estimate along with estimates of ages-3-and-older fish in each Unit, producing the total standing stock of ages-2-and-older fish in 2016 (Table 3). Abundance estimates of ages-2-and-older Yellow Perch in 2016 are projected to increase by 94.7% in MU1, 14.8% in MU2, and 35.7% in MU4, and decrease by 0.5% in MU3, compared to the 2015 abundance estimates. Ages-2-and-older Yellow Perch abundance in 2016 is projected to be 56.096, 47.826, 39.137, and 8.370 million fish in Units 1 through 4, respectively (Table 3). Using mean weight-at-age information from assessment surveys, in 2016 biomass estimates are projected to increase in MU1 (+85.8%) and in MU4 (+1.3%), and decrease in MU2 (-1.2%), MU3 (-14.1%) compared to 2015.

Table 3. Projection of the 2016 Lake Erie Yellow Perch population. Stock size estimates are derived from SCAA, and age-2 estimates for 2016 are derived from multi-model averaging of generalized linear models of ADMB age-2 abundance against YOY and yearling survey indices.

							Stock Biomass		
MU	Age	2015 Mean Stock Size (millions fish)	Fishing Mortality (F)	Survival Rate (S)	2016 Mean Stock Size (millions fish)	Mean Weight in Population (kg)	2015 (millions kgs)	2016 (millions kgs)	2016 (millions lbs)
1	2	21.474	0.131	0.588	39.997	0.078	1.696	3.120	6.879
	3	3.763	0.321	0.486	12.627	0.118	0.470	1.486	3.276
	4	0.608	0.369	0.463	1.830	0.142	0.091	0.260	0.573
	5	1.660	0.343	0.476	0.282	0.160	0.257	0.045	0.100
	6+	1.306	0.428	0.437	1.360	0.199	0.273	0.271	0.598
	Total	*28.811*	*0.182*	*0.559*	*56.096*	*0.092*	*2.788*	*5.182*	*11.426*
2	2	9.369	0.199	0.549	27.589	0.090	0.928	2.474	5.455
	3	23.147	0.276	0.509	5.147	0.132	3.079	0.678	1.494
	4	3.497	0.565	0.381	11.774	0.157	0.525	1.845	4.067
	5	2.452	0.612	0.363	1.332	0.193	0.483	0.258	0.568
	6+	3.192	0.672	0.342	1.984	0.257	0.820	0.509	1.123
	Total	*41.657*	*0.322*	*0.486*	*47.826*	*0.120*	*5.834*	*5.763*	*12.707*
3	2	8.141	0.019	0.658	17.507	0.071	0.554	1.237	2.728
	3	9.697	0.164	0.569	5.354	0.114	1.038	0.612	1.350
	4	5.002	0.250	0.522	5.517	0.143	0.690	0.789	1.740
	5	6.133	0.258	0.518	2.611	0.171	1.000	0.447	0.985
	6+	10.345	0.333	0.480	8.147	0.232	2.514	1.893	4.174
	Total	*39.318*	*0.198*	*0.550*	*39.137*	*0.127*	*5.795*	*4.978*	*10.976*
4	2	0.742	0.102	0.605	4.860	0.090	0.077	0.436	0.961
	3	2.143	0.139	0.583	0.449	0.158	0.334	0.071	0.156
	4	0.764	0.147	0.579	1.250	0.213	0.157	0.266	0.587
	5	1.648	0.212	0.542	0.442	0.267	0.445	0.118	0.260
	6+	0.871	0.207	0.545	1.368	0.326	0.306	0.446	0.983
	Total	*6.168*	*0.164*	*0.569*	*8.370*	*0.160*	*1.319*	*1.336*	*2.947*

Recommended Allowable Harvest (RAH) for 2016

Standard errors and ranges for population estimates were calculated for each age in 2015, and following estimated survival from catch-at-age, for 2016. RAH *min*, *mean*, and *max* values are based on mean population estimates minus or plus one standard deviation. Proposed target fishing rates for RAHs in 2016 are the same as 2015, and RAH ranges are presented in Table 4 for management units 1 through 4.

Table 4. Lake Erie Yellow Perch fishing rates and RAH (in millions of pounds) for 2016 by management unit.

MU	Fishing Rate	Recommended Allowable Harvest (millions lbs.)		
		MIN	MEAN	MAX
1	0.670	1.394	2.292	3.209
2	0.670	1.814	2.656	3.504
3	0.700	1.430	2.408	3.390
4	0.300	0.141	0.259	0.384
Total		4.779	7.615	10.487

The complete YPTG report is available from the GLFC's Lake Erie Committee Yellow Perch Task Group website at: http://www.glfc.org/lakecom/lec/YPTG.htm , or upon request from an LEC, Standing Technical Committee (STC), or YPTG representative.