

# YELLOW PERCH TASK GROUP EXECUTIVE SUMMARY REPORT MARCH 2012



## 2011 Fisheries Review

The lakewide total allowable catch (TAC) in 2011 was 12.650 million pounds. This allocation represented a 3.7% decrease from a TAC of 13.137 million pounds in 2010. For yellow perch assessment and allocation, Lake Erie is partitioned into four management units (Units, or MUs; Figure 1). The 2011 allocation by management unit was 2.071, 3.537, 6.250, and 0.792 million pounds for Units 1 through 4, respectively. The lakewide harvest of yellow perch in 2011 was 9.620 million pounds, or 76.0% of the total 2011 TAC. This was a 0.7% decrease from the 2010 harvest of 9.689 million pounds. Harvest by Lake Erie Management Units 1 through 4 was 1.813, 3.065, 4.156, and 0.586 million pounds, respectively (Table 1). The portion of TAC harvested was 87.6%, 86.6%, 66.5%, and 74.0%, in MUs 1 through 4, respectively. In 2011, Ontario harvested 6.370 million pounds, followed by Ohio (2.833 million lbs.), Pennsylvania (190 thousand lbs.), Michigan (146 thousand lbs.), and New York (81 thousand lbs.).

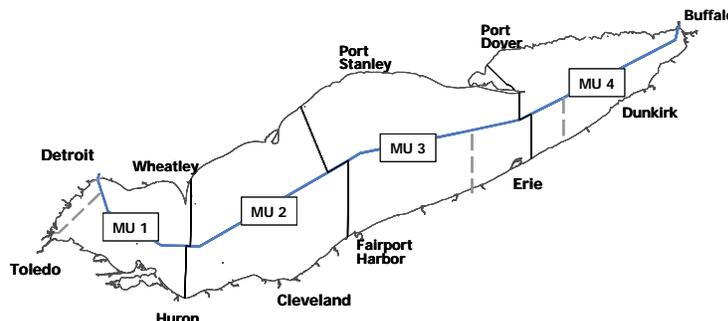


Figure 1. Yellow Perch Management Units (MUs) of Lake Erie.

Targeted gill net effort in Ontario waters in 2011 increased 11.4% in MU2, 6.0% in MU3, and 27.4% in MU4, but decreased 18.4% in MU1 from 2010. U.S. angling effort increased in 2011 from 2010 in MU3 (3.3%) and MU4 (59.5%), but decreased in MU1 (6.7%) and MU2 (21.3%). U.S. trap net effort (lifts) in 2011 increased in MU1 (23.5%), MU3 (4.1%), and MU4 (4.4%) compared to 2010, but decreased in MU2 (14.8%). 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 2011.

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	145,960	870,802	640,309	156,138					1,813,209
2		1,665,258	328,686	1,070,817					3,064,761
3		3,366,412	308,815	327,871	151,691	1,542			4,156,331
4		468,001			37,040	0	65,803	15,045	585,889
<b>Total</b>	145,960	6,370,473	1,277,810	1,554,826	188,731	1,542	65,803	15,045	9,620,190

\*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 2011.

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	139,344	2,571	729,369	3,219				
2		4,214	395,407	5,707				
3		6,093	182,630	1,108	94,025	37		
4		1,564			48,537	0	50,479	383
<b>Total</b>	139,344	14,442	1,307,406	10,034	142,562	37	50,479	383

\*Targeted small mesh gill net effort only.

## ADMB Catch-at-Age Analysis and Recruitment Estimate for 2012

Population size for 1975 to 2011 for each Management Unit was estimated by catch-at-age analysis using modeling software Auto Differentiation Model Builder (ADMB). Stock size estimates for 2012 (ages 3 and older) were projected

from catch-at-age analysis estimates of 2011 population size and age-specific survival rates in 2011. Age-2 yellow perch recruitment in 2012 was predicted by robust regression of juvenile yellow perch survey indices against catch-at-age analysis estimates of two-year-old abundance in each management unit. Projected age-2 yellow perch recruitment from the 2010 year class was added to the 2012 population estimate for older fish in each Unit, producing the total standing stock of age-2-and-older fish in 2012 (Table 3). Estimates of age-2 yellow perch recruitment for 2012 (the 2010 year class) were below average in MU1 and MU2, and above average in MU3 and MU4. Abundance estimates of age-2-and-older yellow perch in 2012 are projected to decrease by 6.0% and 10.5% in MUs 1 and 2 compared to the 2011 abundance estimates, and increase by 2.6% and 9.4% in management units 3 and 4. Age-3-and-older yellow perch abundance in 2012 is projected to be 11.8, 31.2, 44.3, and 12.4 million fish in Units 1 through 4, respectively (Table 3). Using weight-at-age information from assessment surveys, in 2012 biomass estimates are projected to decline from 2011 in MU 1 to 4 by 3.2%, 8.4%, 2.4%, and 1.1%, respectively.

**Table 3.** Projection of the 2012 Lake Erie yellow perch population. Stock size estimates are derived from ADMB and age-2 estimates for 2012 are derived from regressions of ADMB age-2 abundance against YOY and yearling survey indices.

MU	Age	2011 Mean Stock Size (millions fish)	Fishing Mortality (F)	Survival Rate (S)	2012 Mean Stock Size (millions fish)	Mean Weight in Population (kg)	Stock Biomass		
							2011 (millions kgs)	2012 (millions kgs)	2012 (millions lbs)
<b>1</b>	2	7.249	0.060	0.631	10.051	0.066	0.464	0.663	1.463
	3	6.218	0.285	0.504	4.576	0.111	0.616	0.508	1.120
	4	7.165	0.455	0.425	3.134	0.162	0.989	0.508	1.120
	5	1.365	0.474	0.417	3.047	0.198	0.202	0.603	1.330
	6+	1.213	0.604	0.366	1.014	0.252	0.352	0.256	0.563
	<i>Total</i>		<i>23.210</i>	<i>0.279</i>	<i>0.507</i>	<i>21.823</i>	<i>0.116</i>	<i>2.622</i>	<i>2.538</i>
<b>2</b>	2	4.966	0.026	0.653	19.186	0.071	0.323	1.362	3.004
	3	22.632	0.118	0.596	3.243	0.121	2.467	0.392	0.865
	4	17.266	0.271	0.511	13.482	0.164	2.521	2.211	4.875
	5	4.852	0.268	0.513	8.826	0.202	0.806	1.783	3.931
	6+	6.626	0.328	0.483	5.688	0.264	1.796	1.502	3.311
	<i>Total</i>		<i>56.343</i>	<i>0.190</i>	<i>0.554</i>	<i>50.426</i>	<i>0.144</i>	<i>7.912</i>	<i>7.250</i>
<b>3</b>	2	0.937	0.004	0.668	28.110	0.053	0.037	1.490	3.285
	3	30.365	0.029	0.651	0.626	0.102	3.006	0.064	0.141
	4	14.957	0.085	0.616	19.773	0.154	2.079	3.045	6.714
	5	11.584	0.096	0.609	9.209	0.200	1.946	1.842	4.061
	6+	12.737	0.111	0.600	14.695	0.269	3.579	3.953	8.716
	<i>Total</i>		<i>70.580</i>	<i>0.066</i>	<i>0.628</i>	<i>72.412</i>	<i>0.144</i>	<i>10.647</i>	<i>10.393</i>
<b>4</b>	2	0.832	0.008	0.665	9.479	0.096	0.096	0.910	2.006
	3	9.227	0.064	0.629	0.553	0.165	1.523	0.091	0.201
	4	4.045	0.082	0.618	5.802	0.248	0.938	1.439	3.173
	5	2.919	0.111	0.600	2.498	0.288	0.797	0.719	1.586
	6+	2.960	0.115	0.598	3.519	0.328	1.009	1.154	2.545
	<i>Total</i>		<i>19.982</i>	<i>0.079</i>	<i>0.619</i>	<i>21.850</i>	<i>0.197</i>	<i>4.363</i>	<i>4.314</i>

### Recommended Allowable Harvest (RAH) for 2012

Standard errors and ranges for population estimates were calculated for each age in 2011, and following estimated survival from catch-at-age, for 2012. *Min*, *mean*, and *max* RAH values are based on population estimates minus or plus one standard deviation. Proposed target fishing rates for RAHs in 2012 are the same as 2011, and RAHs are presented in Table 4 for Management Units 1 through 4.

**Table 4.** Lake Erie yellow perch fishing rates and Recommended Allowable Harvest (RAH; in millions of pounds) for 2012 by Management Unit.

MU	Fishing Rate	Recommended Allowable Harvest (millions lbs.)		
		MIN	MEAN	MAX
<b>1</b>	0.670	0.725	1.364	2.140
<b>2</b>	0.670	2.409	3.926	5.646
<b>3</b>	0.700	3.362	5.710	8.171
<b>4</b>	0.300	0.392	0.837	1.295
<b>Total</b>		6.888	11.837	17.251

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.