Lake Erie Committee Meeting
March 17-20, 2008

Ages and Lengths of Yellow Perch *Perca flavescens* in Commercial Trap Nets in Western Lake Erie*

Martin A. Stapanian, William H. Edwards, Michael J. Porta, Michael T. Bur, and Patrick M. Kocovsky,
U.S. Geological Survey, Great Lakes Science Center
Lake Erie Biological Station
6100 Columbus Avenue
Sandusky, OH 44870, USA

Abstract. We collected samples of yellow perch (*Perca flavescens*) in spring and autumn 2007 from commercial trap nets set in western Lake Erie. The spring sample (N = 86) was dominated (63.9% of the total sample) by the 2003 year class, followed by the 2001 year class (26.7%). This result was similar to commercial samples collected in spring 2006. Similarly, the autumn 2007 sample (N = 95) was also dominated (66.3% of the total sample) by the 2003 year class. This result was similar to the commercial samples collected in autumn 2006 and autumn 2005. Mean total length at age 4 in spring was greater for the 2003 year class than for the 2001 year class for both sexes. Similarly, mean total length at age 4 in autumn was greater for females from the 2003 year class than for females from the 2001 year class.

---

* Reported to: Great Lakes Fishery Commission
Lake Erie Committee Meeting
Niagara Falls, Ontario
March 17, 2008

Introduction

The U.S. Geological Survey Lake Erie Biological Station has collected fish samples from commercial trap nets in the western basin of Lake Erie since the 1960s (Bur *et al.* 2006). The objectives of this activity are to estimate growth rates and population age structures of commercially harvested species. These data are critical for estimating abundances and determining harvest limits. In this report we summarize age structure and mean total length-at-age for yellow perch *Perca flavescens* collected from commercial trap nets set in western Lake Erie in spring and autumn 2007. We also compare total length at age 4 in spring and autumn for two large year classes of yellow perch (2001 and 2003). The results are intended to provide insights into changes in yellow perch age structure and growth rates.

Methods

Samples of yellow perch were collected from landed catches from commercial trap nets set offshore of Kelleys Island (grid 906) in western Lake Erie in spring and autumn 2007. Ohio minimum allowable length is 8.5" (217 mm), with an allowable overage of 10% by weight for fish that are shorter than the minimum. Spring samples were collected on 14 May and 11 June. Autumn samples were collected on 9 November. Unlike previous years (*e.g.*, Stapanian *et al*. 2007), commercial samples of lake whitefish (*Coregonus clupeaformis*) were not collected in 2007.

Total length (nearest mm) of each yellow perch specimen was measured. Sex and maturity of each specimen were determined by inspecting the gonads. Sagittal otoliths were removed, and ages of specimens were estimated by examining the otoliths in the laboratory.

Prior to 2003, ages of yellow perch were estimated by examining scales. Due to the low number of years in which otoliths were examined and low sample sizes for most age classes, we were not able to compare length-at-age for fish collected in 2007 with those collected in most years. We used data collected during 2005-2007 (Bur *et al.* 2006, Stapanian *et al.* 2007, and this report) to calculate the 95% confidence intervals for mean total lengths of yellow perch at ages 4 through 6 for the 2001 year class in both spring and autumn. Separate confidence intervals were calculated for males and females. Similarly, for the 2003 year class we calculated the 95% confidence intervals for mean total lengths at ages 2 through 4 in autumn for both sexes, at ages 3 and 4 in spring for females, and at age 4 in spring for males. We then compared the confidence intervals for mean total length of age-4 individuals from both year classes in each season.

Results and Discussion

All individuals collected in the 2007 sample were sexually mature. Five year classes (1998 and 2001 through 2004) were represented in the spring 2007 commercial trap net sample (Table 1, N = 86). In contrast, eight year classes (1996-2003) were represented in the spring 2006 sample (Stapanian *et al.* 2007). The spring 2007 sample was dominated (64% of the sample) by age-4 individuals (2003 year class), followed by age-6 individuals (2001 year class: 27%). This result was similar to the 2006 spring sample, in which the 2001 year class accounted for about 70% of the individuals collected (Stapanian *et al.* 2007). However, the 2003 year class accounted for only 9.4% of the specimens collected in spring 2006. It is likely that the 2003 year class was not fully recruited to the commercial gear in spring 2006.

Table 1. Summary statistics for yellow perch (N = 86) caught in commercial trap nets in western Lake Erie during spring 2007. All individuals were sexually mature. Abbreviations: F = female, M = male, TL = total length, SE = standard error of mean TL.

Year class	Age (years)	Sex	n	%N	Mean TL (mm)	SE
2004	3	M	1	1.2	217.0	
		F	0	0.0		
2003	4	M	25	29.1	224.6	21.6
		F	30	34.9	244.8	28.1
2002	5	M	3	3.5	239.0	17.0
		F	2	2.3	274.5	10.6
2001	6	M	12	14.0	236.0	14.1
		F	11	12.8	286.4	21.5
1998	9	M	2	2.3	264.5	16.3
		F	0	0.0		

Six year classes (1998 through 2005) were represented in the autumn 2007 sample (Table 2, N = 95). The sample was dominated by the 2003 year class, which accounted for 66.3% of the individuals collected.

Table 2. Summary statistics for yellow perch (N = 95) caught in commercial trap nets in western Lake Erie during autumn 2007. All individuals were sexually mature. Abbreviations: F = female, M = male, TL = total length, SE = standard error of mean total length.

Year class	Age (years)	Sex	n	%N	Mean TL (mm)	SE
2005	2	M	1	1.1	202.0	.
		F	12	12.6	239.1	23.1
2004	3	M	0	0.0		
		F	1	1.1	271.0	.
2003	4	M	29	30.5	220.5	17.2
		F	34	35.8	263.2	23.3
2002	5	M	0	0.0		
		F	1	1.1	292	.
2001	6	M	4	4.2	229.8	17.4
		F	11	11.6	280.5	14.3
1998	9	M	2	2.1	238.0	11.3
		F	0	0.0		

This result was similar to the autumn 2006 sample, in which the 2003 year class accounted for 58.5% of the individuals collected (Stapanian *et al*. 2007). Although six year classes were also represented in the autumn 2006 sample (Stapanian *et al.* 2007), the 1999 and 2000 year classes (*i.e*., yellow perch ages 8 and 7 in 2007) were absent in the autumn 2007 sample. Further, the 2005 year class was not represented in the 2006 sample, probably because it probably because itwas comparatively weak or was not fully recruited to the gear.

For both sexes, mean total length at age 4 in spring was greater for the 2003 year class than for the 2001 year class (Figure 1). At age 4 in autumn, females from the 2003 year class were significantly longer than females from the 2001 year class (Figure 2). In contrast, there was no difference between the mean total lengths of age-4 autumn males from the two year classes.

Future reports will expand the analyses of length-at-age to additional year classes.

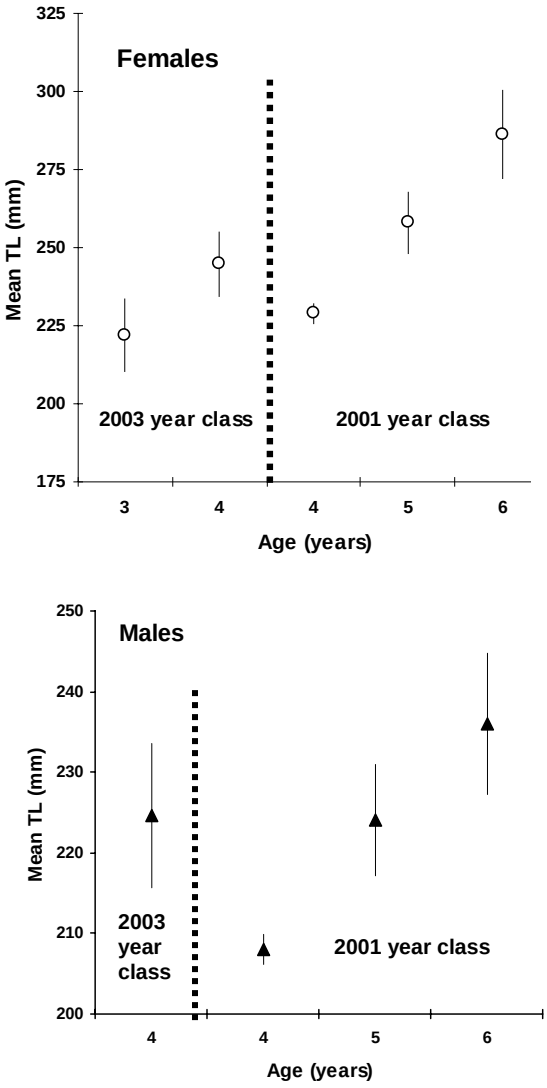

Figure 1: Mean total lengths (TL, showing 95% confidence intervals) at age for yellow perch collected from commercial trap nets in western Lake Erie during spring 2005-2007.

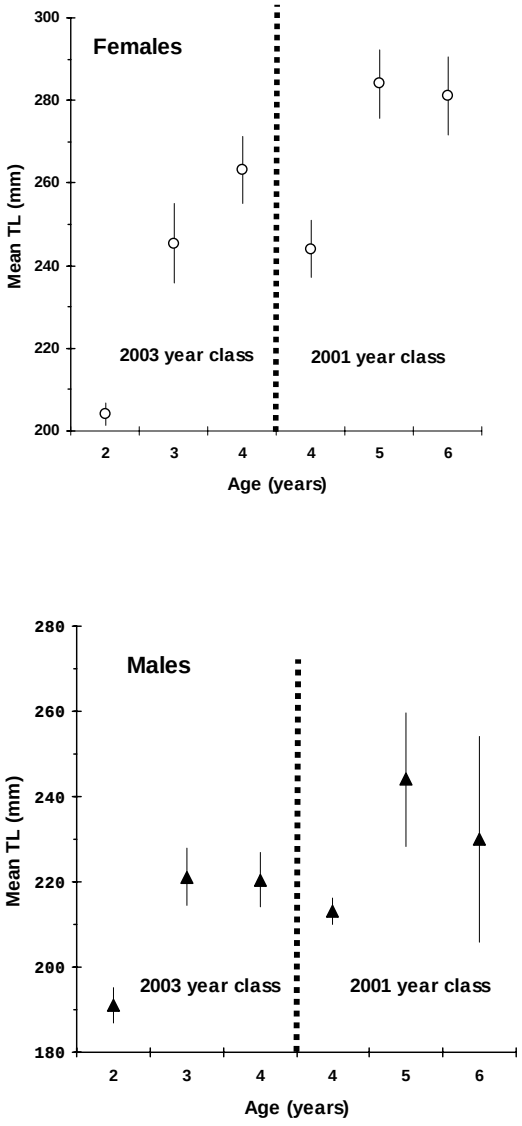

Figure 2: Mean total lengths (TL, showing 95% confidence intervals) at age for yellow perch collected from commercial trap nets in western Lake Erie during autumn 2005-2007.

Acknowledgments

We thank T. Reynolds for providing the samples and L. Kolb for assistance in preparing this report. M. Walsh, C. Knight, B. Lantry, J. Johnson, and J. Savino provided comments on earlier drafts.

References

Bur, M.T., M.A. Stapanian, P.M. Kocovsky, W.H. Edwards, and J.M. Jones. 2006. Surveillance and status of fish stocks in western Lake Erie, 2005. Report to the Standing Technical Committee of the Lake Erie Committee. Great Lakes Fishery Commission, Ann Arbor, MI. 23 p.

Stapanian, M.A., M.T. Bur, P.M. Kocovsky, W.H. Edwards, and M.J. Porta. 2007. Age structures of yellow perch (*Perca flavescens*) and lake whitefish (*Coregonus clupeaformis*) in commercial trap nets in western Lake Erie. Report to the Standing Technical Committee of the Lake Erie Committee. Great Lakes Fishery Commission, Ypsilanti, MI. 7 p.