

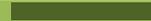
AGE AND GROWTH ANALYSIS OF YELLOW PERCH: *A Comparison of Onondaga Lake, Song Lake and Deer Pond*

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INTRODUCTION:

The purpose of this study is to understand Yellow Perch, *Perca flavescens*, growth rates under various situations. Based on differential traits between the sample sites, it is expected there will be variations in growth rate based on habitat suitability. Yellow Perch is a species with some economic importance, so it is necessary to get an understanding of their population dynamics. An assessment of health can be made based on relative lengths per weight as a standard for comparison between the systems. Onondaga Lake is a large, productive lake, and it is expected to find the most rapid growth rates here. Because Song Lake is a closed system, it is expected growth rates will be slightly slower, due to the increase of selective pressures. Finally, Deer Pond is a small, stained Adirondack Lake. Factors such as lower pH and lower rates of primary productivity are expected to yield perch with the slowest growth rates.

LOCATIONS: *About the Lakes*

	Onondaga	Song	Deer
Color Association			
Location	NW of Syracuse	Tully Valley	Adirondacks
Max Length (km)	7.8	2.8	1.06
Max Depth (m)	19.5	9.1	3
Mean Depth (m)	10.9	3.5	2.3
Max Width (km)	2	0.95	0.46
Trophic State	Eutrophic	Mesotrophic/ Eutrophic	Dystrophic
Defining Characteristics	Public, Highly Contaminated, Residence Time of 3 Months	Private, No Inlet or Outlet	Private, Stained



STUDY: *Materials and Methods*

Sampling took place at Onondaga and Song Lakes using trap nets, large, passive fishing gear. The nets were checked in 24 hour intervals. Specimens caught were kept and frozen. Lengths and weights were measured as well as a scale sample taken from each fish from under the pectoral fin. The radii of scales collected were measured along with the length to each yearly mark (annuli). For more accurate measuring, the scales were magnified using a microfiche reader. Data collected were analyzed and back calculations were performed to examine the populations on a yearly basis. ANOVA statistical analysis was performed as well as Tukey's Test to look for significant differences.

*Deer Pond data was collected using trap nets by the 2010 Fisheries Management Practicum. We found these data relevant and they were used for further comparison.

On the right, scales being prepared to read (Image 1), an examples of annuli (Image 2), and the microfiche (Image 3).



ACKNOWLEDGMENTS: *And Resources*

We would like to thank Dr. Kimberly Schulz, Stephanie Figary, Chad Walz, Eric Bauer and Emily Ogburn for helping us sample and lending us equipment. We would also like to thank the the Song Lake Homeowners for giving us access to their property and letting us use their boats. We would finally like to thank Dr. Karin Limburg and the 2010 Fisheries Management class for providing additional data.

Yellow perch image: www.michigan.gov/dnr/0,4570,7-153-10364_18958-45696--,00.html

RESULTS: *What We Found*

ANOVA statistical analysis was performed on each lake data set. In every instance, a statistically significant difference was found. Tukey's Test was also performed and found significantly different mean classifications, as indicated by each group letter on figures 1-4

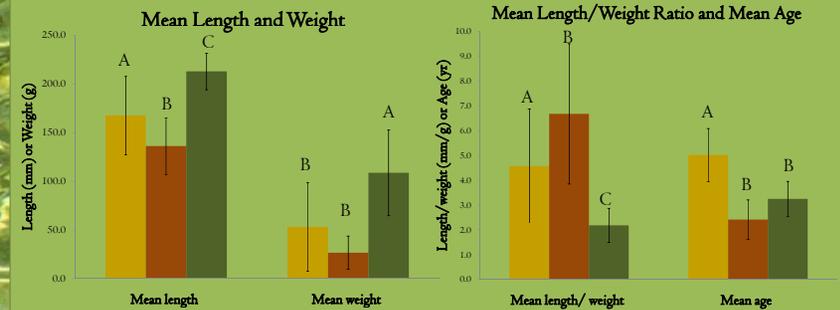


FIGURE 1: Comparison of average lengths and average weights between lakes. Onondaga had the longest and heaviest fish, followed by Deer, and finally Song

FIGURE 2: Length to Weight ratios were highest for Song Lake, and lowest for Onondaga. Higher values represent a fish skinnier for its length. Mean age is also compared, with Deer Pond having the relatively oldest sample, and Song the youngest.

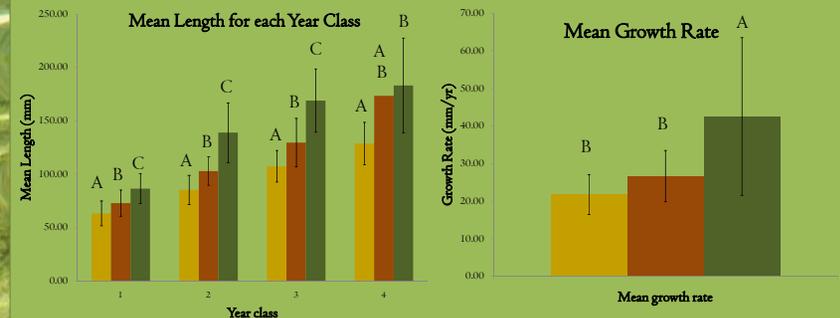


FIGURE 3: Mean lengths back calculated through scale analysis. Onondaga perch are longest through the first four years of life, followed by Song, and finally Deer Pond.

FIGURE 4: Average growth rates. Onondaga is highest around 45 mm/yr while Deer is the lowest, around 22 mm/yr.

DISCUSSION: *How We Interpreted Our Data*

Our results support the original predictions we made. Onondaga Lake was predicted to have highest growth rates because it is the largest and also eutrophic. This space and productivity is able to support a strong, healthy population of perch. Song Lake was predicted to provide the second most suitable habitat because, again, it is a very productive system, providing ample resources. In year class 4, there is less of a difference in mean length between yellow perch in Onondaga and Song Lake.s. This could mean Onondaga fish begin to grow slower, but could also mean Song fish grow faster with age, possibly due to a shift in diet (from macroinverts to fish). Length/weight ratio was highest for Song Lake, which is surprising because this means the fish are relatively the skinniest. However, the representative sample from Song is younger, which could explain these results. Deer Pond had the slowest growth rates, but also the oldest fish. This could be because the stained system is less suitable for yellow perch, and conditions like colder temperatures and less productivity limit growth.