Balsam Pond Centrarchid Survey 2013

Scott E. Prindle

Aquatic Biologist

Region 7 Fisheries
New York State Department of Environmental Conservation
1285 Fisher Ave.
Cortland, NY 13045

ABSTRACT

A fisheries survey of Balsam Pond in Chenango County was conducted in June 2013. This survey was completed because the pond had never had a formal fisheries survey before. The survey showed that pumpkinseed and bluegill sunfish were the most prevalent species in the pond, followed by yellow perch and largemouth bass. Largemouth bass over 10 inches (254mm) were caught at a rate of 7 fish per hour. Pumpkinseeds and bluegills were caught at 159 and 143 per hour, respectively. The growth rates for pumpkinseed and bluegill were generally slightly better than the reported statewide average, while largemouth bass grew a bit slower. One confounding factor in looking at the growth patterns in Balsam Pond is the partial draw-down which occurred in 2012 to facilitate construction of the new launch. This likely had a big impact on the fish populations in the pond since a large die-off of yellow perch occurred as a result of heat stress while the lake was drawn down.

INTRODUCTION

Balsam Pond (SR-44-23-41-P5648) is a 136 acre warmwater pond located in the Chenango County Town of Pharsalia. The pond was completed in 1968 with the construction of an earthen dam and concrete outflow structure. Prior to the project the pond existed for several decades due to beaver activity. The pond has a maximum depth of 10 feet. The shoreline is mixed forest and bog. The only development along the shoreline is the DEC campground and boat launch on the southeast corner of the pond. The littoral zone accounts for approximately two-thirds the area of the pond and consists of dense submersed vegetation.

The stocking history for Balsam Pond includes a planting of 500 brook trout (*Salvelinus fontinalis*) in 1968 in an attempt to establish a cold water fishery in the pond. Given the shallow nature of the impoundment it quickly became apparent that trout were not suitable and black bass (*Micropteris salmoides* and *M. dolomieu*) were stocked in the 1970s. Through the 1980s and up to 1994 as many as 900 tiger muskellunge (*Esox masquinongy x lucius*) were early fall stocked on a fairly regular basis. This was done in an attempt to diminish the overpopulated panfish community in the pond and establish a trophy fishery. There were no fisheries surveys completed to assess any changes in the panfish population as a result of the tiger muskellunge stocking program. Additionally with the exception of a winter ice fishing survey there was no effort made to determine the survival or success of the tiger muskellunge program. Anecdotal information suggested that few anglers caught them with this being the likely cause of the end of the Balsam Pond program.

A small beach launch had been present on the pond since it was created. While the beach launch was adequate for car top and small trailered boats it still limited access for a segment of the angling population. As proposed in the Division of Lands and Forests

Management Plan for the Five Streams Unit a new concrete launch, dock, and accessible fishing platform were constructed in 2011. As part of the development of the new launch, the water level was drawn down approximately four feet during the spring-early summer. Given the bathymetry of the pond this created expansive areas of dry pond bottom around its perimeter. A fairly serious yellow perch *(Perca flavescens*) die-off numbering in the thousands occurred during the draw down period, likely due to thermal stress (D.K. Lemon Personal Communication). During an inspection of the reported fish kill by Region 7 Fisheries staff no other species were observed as mortalities.

In June of 2013, Department of Environmental Conservation (DEC) Region 7 fisheries staff electrofished the perimeter of Balsam Pond. The intent of the survey was to provide basic population level fisheries information that was lacking for Balsam Pond. Other than a small ice fishing survey aimed at capturing stocked tiger muskellunge, there had never been a formal survey done on Balsam Pond. This report documents the results of that effort and how those compare to the respective New York State averages.

METHODS

Water Chemistry

Surface water temperatures, conductivity, pH, and dissolved oxygen were recorded mid-pond on June 5th 2013. The readings were taken using a YSI meter. The. The water temperature was 70 degrees Fahrenheit, with the remaining measurements presented in Appendix 1

Electrofishing

The 2013 Balsam Pond fisheries survey was carried out on June 5th using the DEC Region 7 electrofishing boat (DC-500 volts, 3 amps, 120 pulses/sec.). The crew consisted of two "scappers" and the driver. The centrarchid survey methodology was followed as outlined in Green (1989). Electrofishing was conducted starting ½ hour before sunset and consisted of five transects covering the entire shoreline of the pond. A map of the lake and the transect locations are presented in Figure 1.

Transects 1-4 were all fish runs, where we attempted to net every fish. Transect 5 was a gamefish only run, where only largemouth bass and chain pickerel were captured. The fish collected were identified to species and measured for length, with weights taken on chain pickerel (*Esox niger)*, brown bullhead (*Ameirus nebulosis*), pumpkinseed (*Lepomis gibbosus*), bluegill (*Lepomis macrochirus*), largemouth bass, yellow perch, black crappie (*Pomoxis nigromaculatus*), and rock bass (*Ambloplites rupestris*).

Scale samples were taken from up to five individuals per 10mm length interval for the selected species listed above that got weighed as well, with the exception of brown bullhead. The remaining fish of the species to be aged that did not have scales taken were assigned ages by using the proportion of aged fish in a specific size class that were a given age expanded to all the fish in that cohort. As an example, if there were 30 fish in the 100-109mm range and five scales were taken (four aged as 1-year old and one as 2-

year old) then 24 were assigned as 1-year olds and six were 2-year olds. This was done to look at age class distributions and growth rates of these species. All data gathered were entered on DEC Bureau of Fisheries (BOF) database forms and entered into the BOF database.

RESULTS AND DISCUSSION

Species Collected

Four hundred and eighty eight fish were caught representing nine species. Fish species and number collected during the 2013 survey are presented in Table 1. The most abundant species caught were pumpkinseed and bluegill, with 156 and 140 netted, respectively. Yellow perch (76 caught) and largemouth bass (50 caught) were also significant contributors to the catch total. Largemouth bass and chain pickerel (18 caught) were the only predators caught during the survey.

Largemouth bass

The electrofishing catch rate of largemouth bass equal to or greater than 254 mm long in Balsam Pond was 7.0 per hour (Table 2), was similar to the mean New York State (NYS) catch rate from the early-1980's of 7.89 per hour (Green 1989). But well below the more recent statewide average of 17 per hour (Perry *et al.* 2014).

The age distribution of largemouth bass shows fairly consistent recruitment in Balsam Pond (Figure 2). The lower number of age 1 and 2 largemouth bass collected may been a function of the vegetation density and the ability of the netters to observe and capture them compared to the larger individuals. The percent of catch based on age shows age-three fish being the most numerous, but not dominating the catch (Figure 2). The length frequency distributions based on percent of catch and catch-per-unit-effort (CPUE) for largemouth bass are quite similar and suggest a bi-modal distribution (Figures 3 and 4, respectively). This pattern may have been driven by the drawdown of the pond. Because the available habitat shrank to approximately 1/3 of normal pool level there was likely significant predation effects. The fish larger than 300mm were possibly large enough to have survived the draw down, while the fish less than 200mm may not have been. Alternatively a couple of poor year classes could have been affected by any lingering habitat effects caused by the large areas of the littoral zone that dried out during the 2011 draw down. The timing of the low water was not optimal and likely significantly impacted largemouth bass reproduction by greatly decreasing the amount of available habitat.

The largemouth bass proportional stock density (PSD) (Anderson 1980) was fairly high compared to the statewide average at 88 and 55, respectively (Table 2 and Perry *et al.* 2014). PSD indicates the percent of fish that are "quality" size (330mm) out of the total catch of "stock" fish (those >250mm), which totaled 22 and 25 fish respectively. Largemouth bass larger than 381mm (15 inches) were fairly common (RSD15 = 44). The

statewide RSD15 average was 19 (Perry *et al.* 2014). Relative stock density index (RSD) is the proportion of fish in a given size group within a population.

Mean relative weights (*Wr*) of largemouth bass were excellent at 99.5, which was right at the statewide average for spring surveys (Table 2 and Perry *et al.* 2014). Relative weight is a measure of how an individual fish's weight compares to a "standard" weight for a same length fish. Values near 100 indicate a balanced population with adequate forage, so the calculated average of 99.5 for Balsam Pond largemouth bass indicates favorable growth conditions.

The largemouth bass length at age results were consistently lower than the NYS slow growth values with the exception of age-6 (Figure 11) (Green 1989). This indicates that less than optimal growth conditions exist for largemouth bass in Balsam Pond, which runs counter to the relative weight index calculations described above. The spring survey results reported in Perry *et al.* 2014 have the average New York State largemouth bass being 187mm at age 2. The average 2 year old largemouth bass from the 2013 Balsam Pond survey was 153mm.

The largemouth bass and panfish PSD values for the Balsam Pond populations suggest limited reproduction, low exploitation, or a high degree of catch and release angling (Green 1989 Table 5, p 11-10 and 11-11). There are no angling pressure estimates for Balsam Pond, but fishing pressure is likely moderate at best due to its remote location. There are occasional bass fishing tournaments on the pond, which concentrate a great deal of fishing effort in a short period of time, but they are exclusively catch and release events. Additionally the moderate chain pickerel population in Balsam Pond is likely reducing the largemouth bass population itself as well as its prey availability through competition.

<u>Pumpkinseed</u>

Pumpkinseed were the most abundant species captured with 156 netted (Table 1) at a rate of 159 per hour (Table 2). The pumpkinseed population was dominated by fish larger than 150mm (Figures 5 and 6). The age frequency distribution had a similar pattern to the length results. Pumpkinseeds were skewed towards the older (larger) age groups (Figure 9).

Proportional stock densities (PSD) (Anderson 1980) were fairly high (78) for pumpkinseed in Balsam Pond (Table 2). The number of stock and quality fish were 151 and 118 respectively. Pumpkinseed over 203mm (8 inches) were not plentiful, with an RSD8 value of 1.3 (Table 2).

The pumpkinseed growth rates generally fell right around the NYS mean values in 2013, with four ages just above the mean and three just below (Figure 12). The age structure suggests low recruitment in the case of pumpkinseeds. The drawdown may have contributed to the relative lack of young fish in the catches.

Bluegill

Bluegill were the second most numerous species in the catch with a rate of 143/hr (Table 2). Bluegill distributions show a much wider range of fish lengths compared to the pumpkinseeds and there was no dominant size class in the population (Figures 7 and 8). The age frequency distributions have a similar pattern to the length results. Bluegills were predominantly ages 2 and 3, with some fish up to age 8 (Figures 9 and 10).

Bluegill had a comparatively low PSD value of 31 (Table 2), largely due to a higher proportion of younger and thus smaller fish compared to the pumpkinseed sample. Similarly the RSD8 estimate was 1.3, indicating there were few bluegill larger than 203mm (8 inches).

Chain Pickerel

There were 18 chain pickerel captured during the electrofishing survey. They ranged in size from 126 to 528mm (Figure 15). They were the second most numerous and only other predator species after largemouth bass to be caught.

Yellow Perch

Seventy six yellow perch were collected during the survey ranging from 83 to 289mm (Figure 16). The size distribution of the yellow perch sample was skewed towards smaller fish and dominated by the 120-129mm size range (Figure 16). Interestingly the fish in that size class were two year old fish, meaning they were produced in 2011, the year of the drawdown.

The growth of Balsam Pond yellow perch was somewhat slower than the statewide average after age 2 (Figure 17).

RECOMMENDATIONS

Based on the results of the 2013 sampling, it appears that the most appropriate plan for Balsam Pond would be to continue to manage the lake as a warmwater fishery using the existing statewide angling regulations. There is a fairly diverse and well-populated warmwater fish community present in the pond. Due to the apparently ineffective tiger muskellunge stocking in the past there are no plans to re-establish that program. It is anticipated that this survey will be replicated again at least once in the next decade to update and follow the population trends.

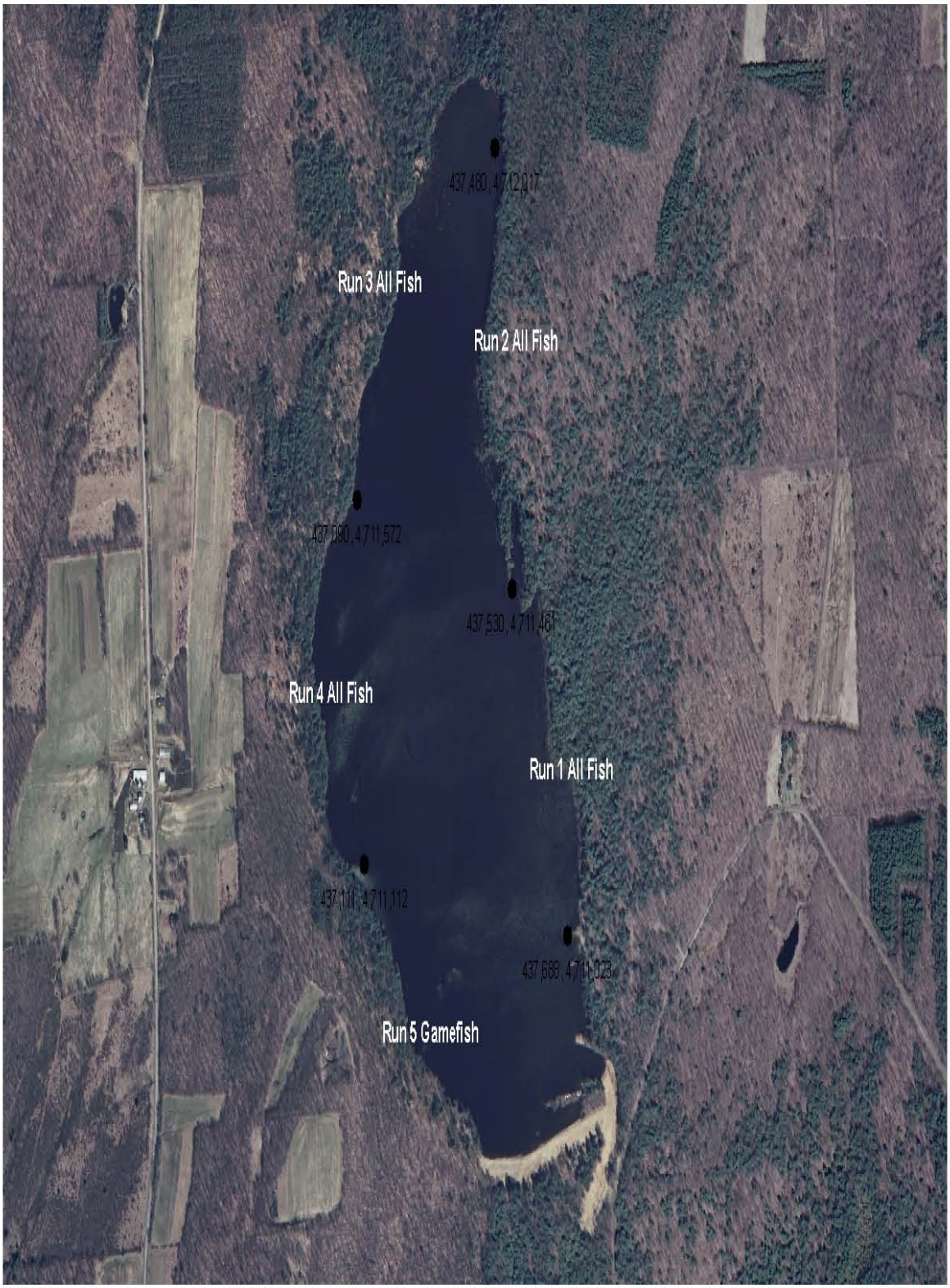

Figure 1. Map of Balsam Pond with the 2013 sampling transect locations. The end of one run was the start of the next.

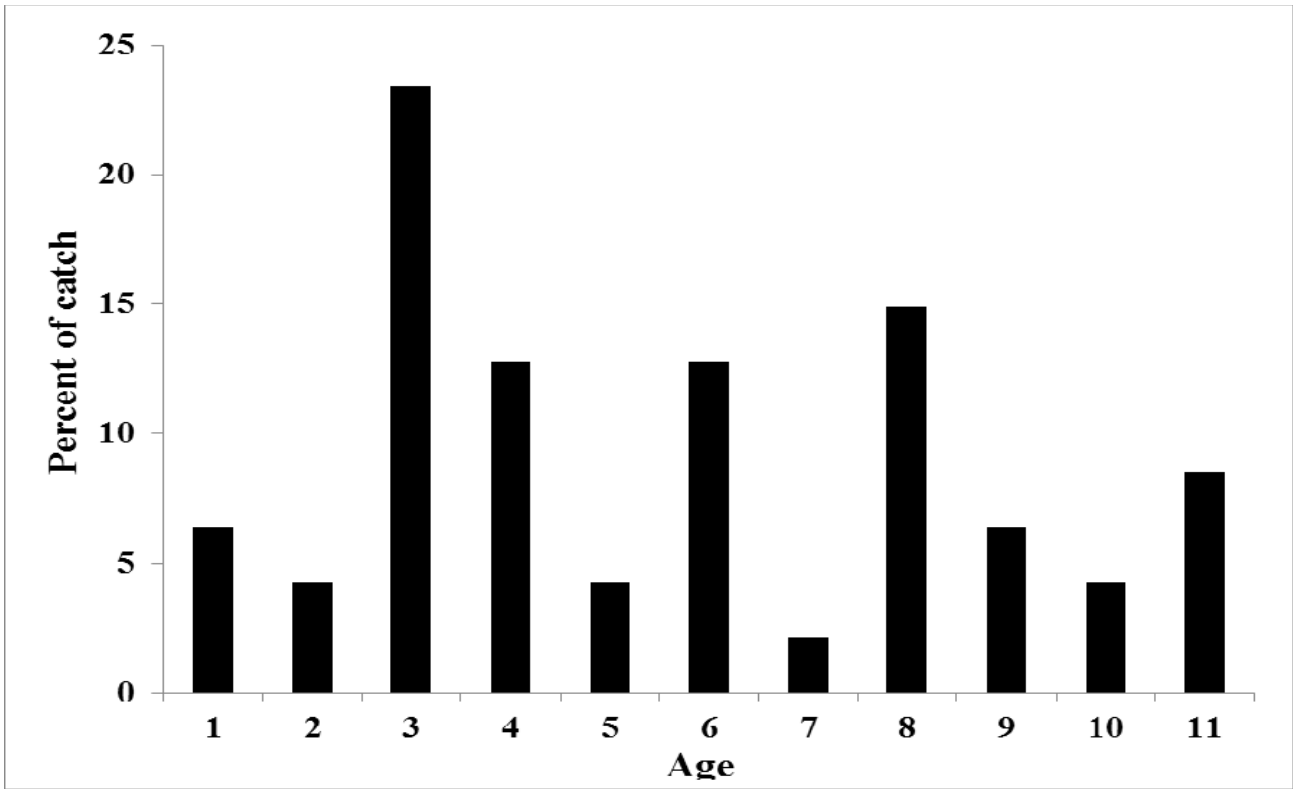

Figure 2. Age frequency distributions of largemouth bass sampled in Balsam Pond in 2013.

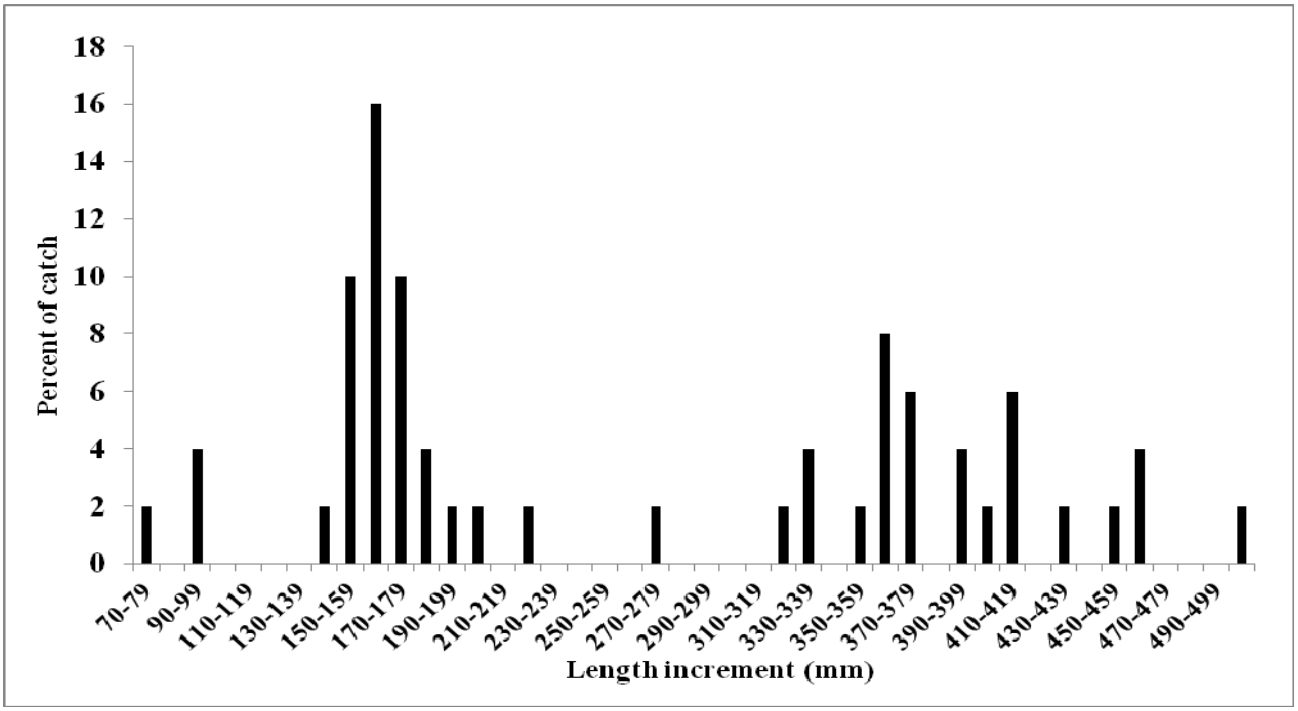

Figure 3. Length frequency distributions of largemouth bass sampled in Balsam Pond in 2013.

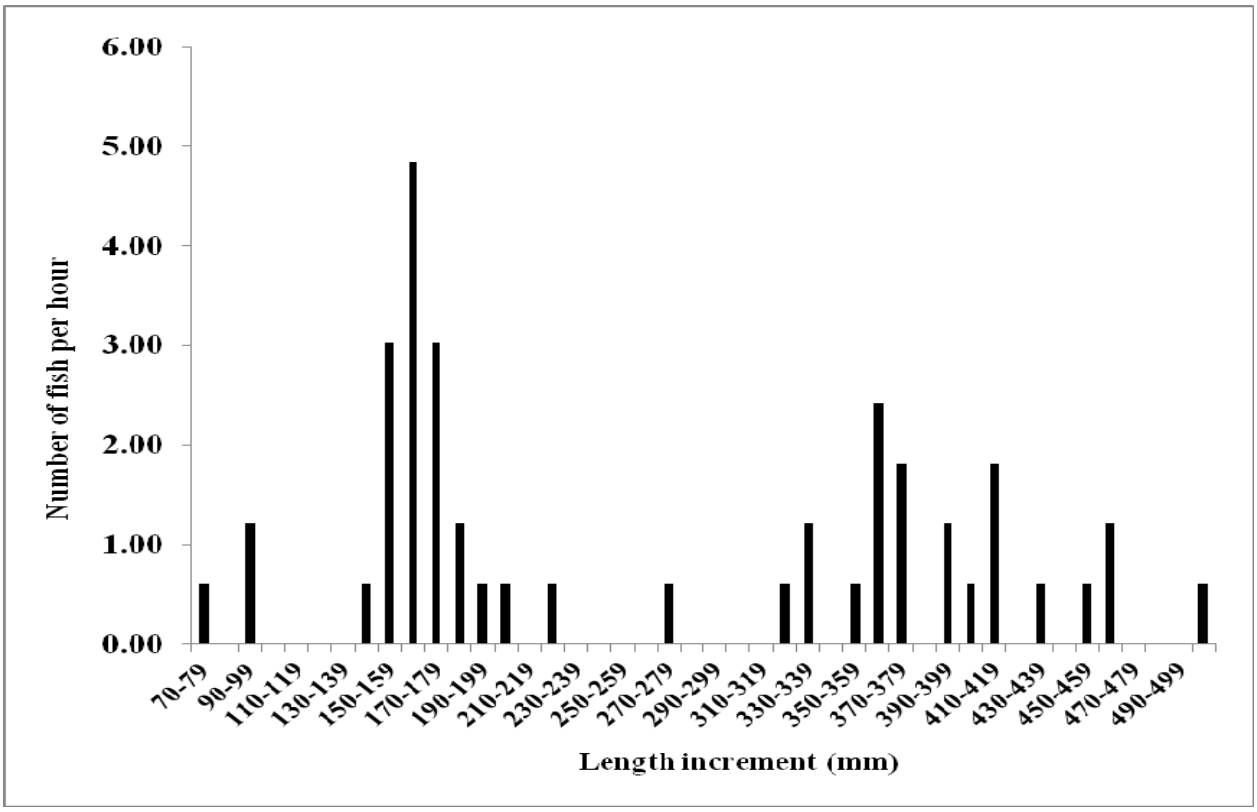

Figure 4. Catch per unit effort by length interval for largemouth bass in Balsam Pond in 2013.

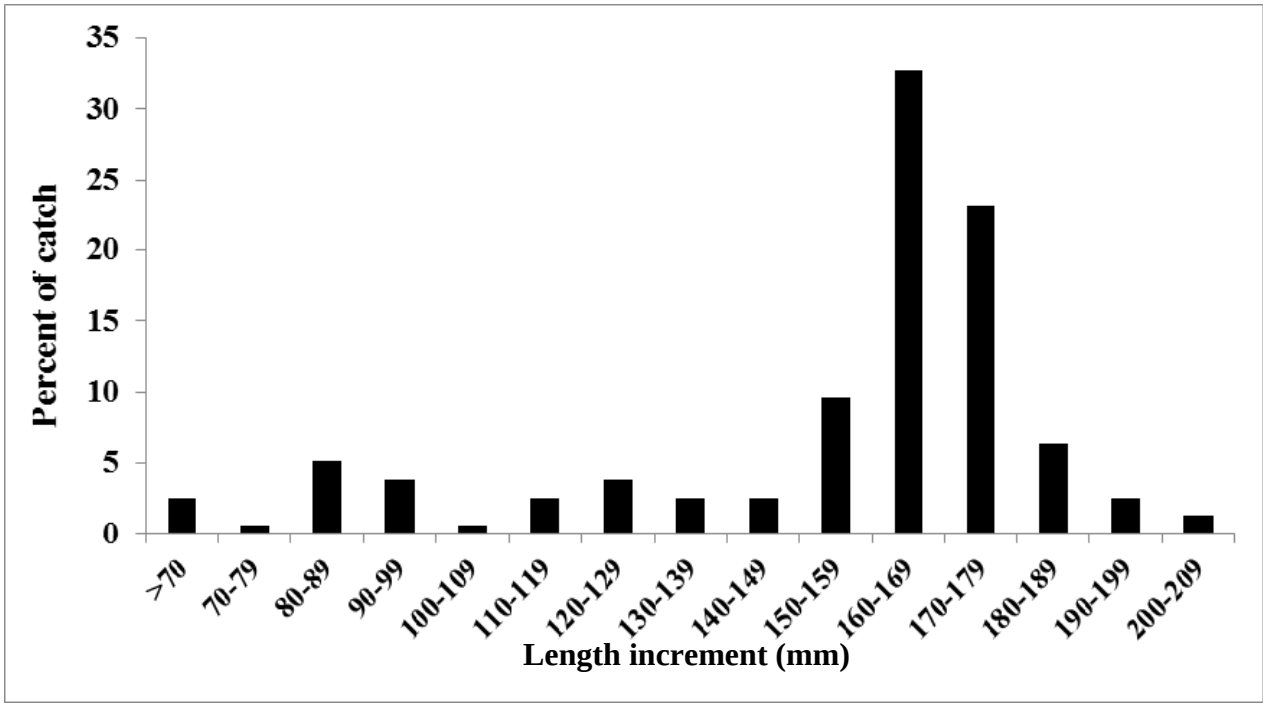

Figure 5. Length frequency distribution of pumpkinseed sampled in Balsam Pond in 2013.

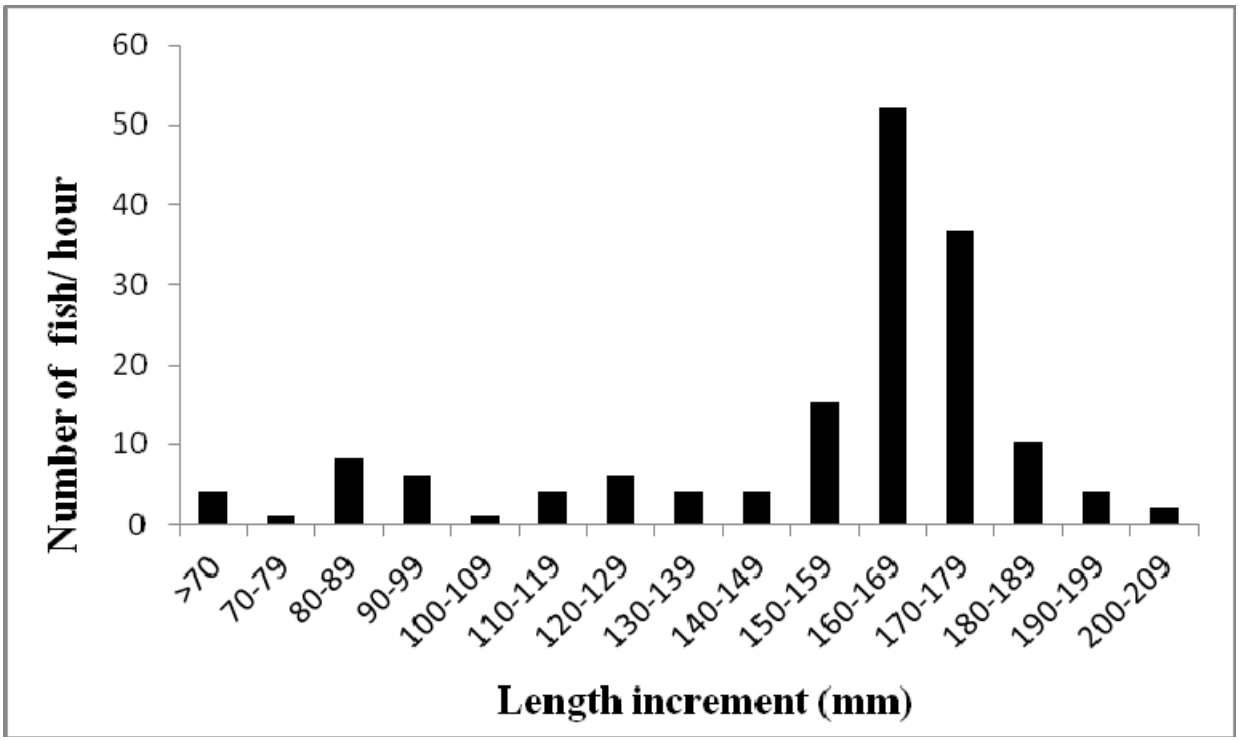

Figure 6. Catch per unit effort by length interval for pumpkinseed Balsam Pond in 2013.

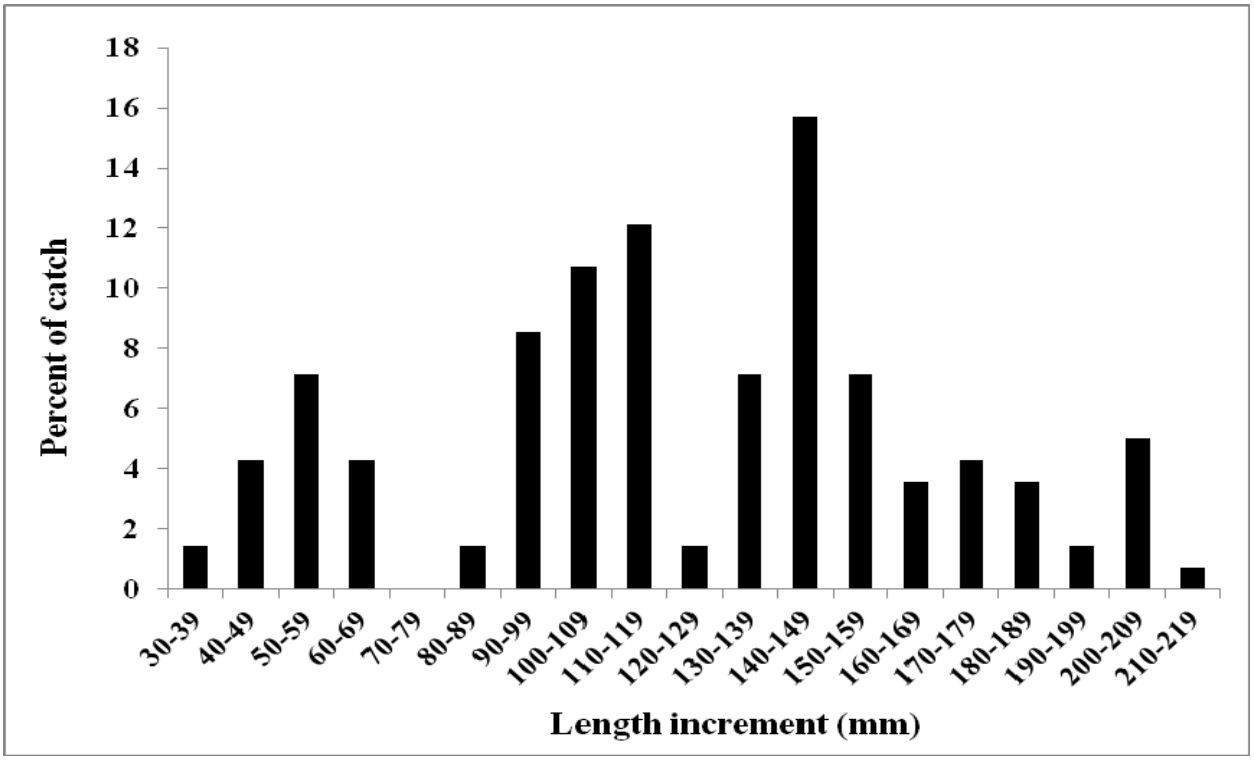

Figure 7. Length frequency distribution of bluegill sampled in Balsam Pond in 2013.

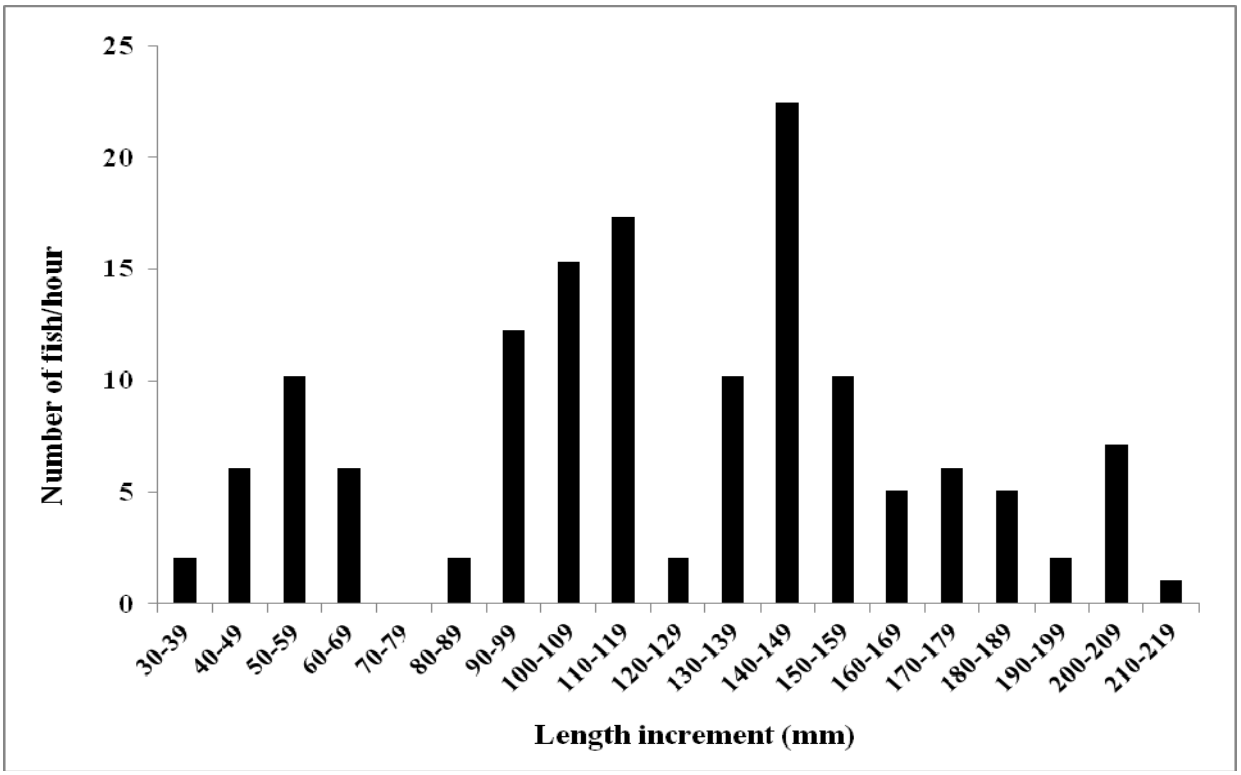

Figure 8. Catch per unit effort by length interval for bluegill in Balsam Pond in 2013.

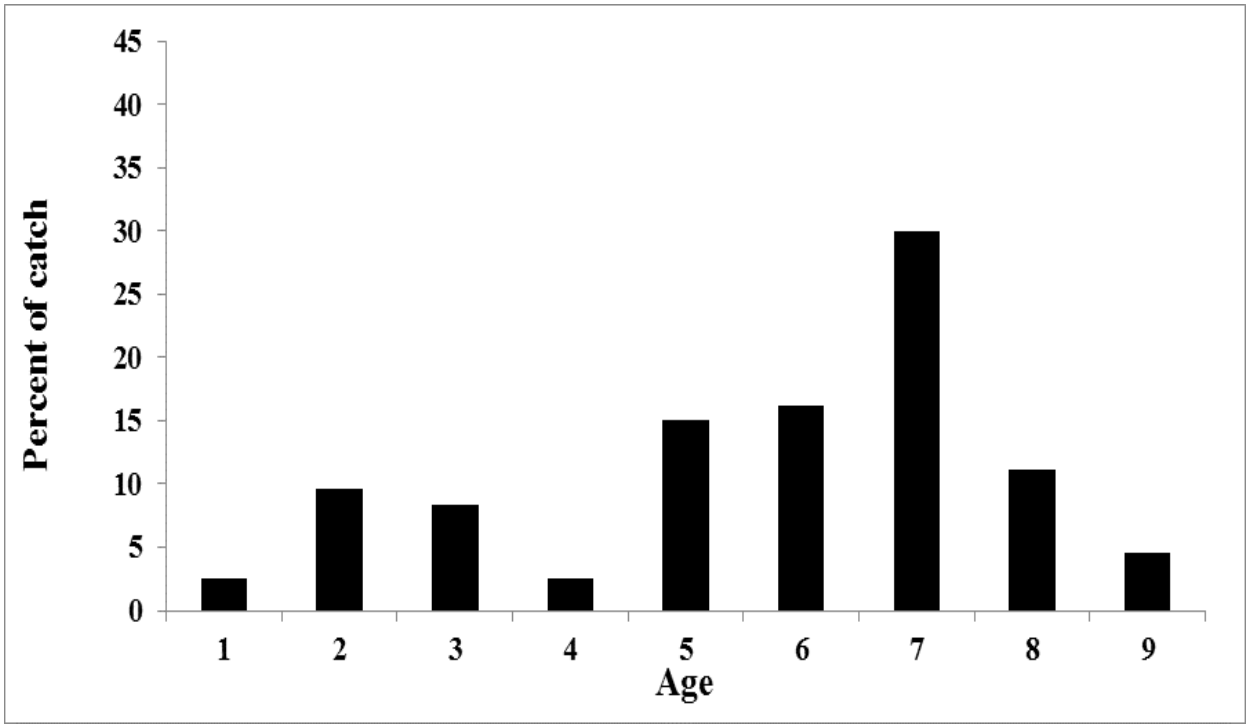

Figure 9. Age frequency distributions of pumpkinseed sampled in Balsam Pond in 2013.

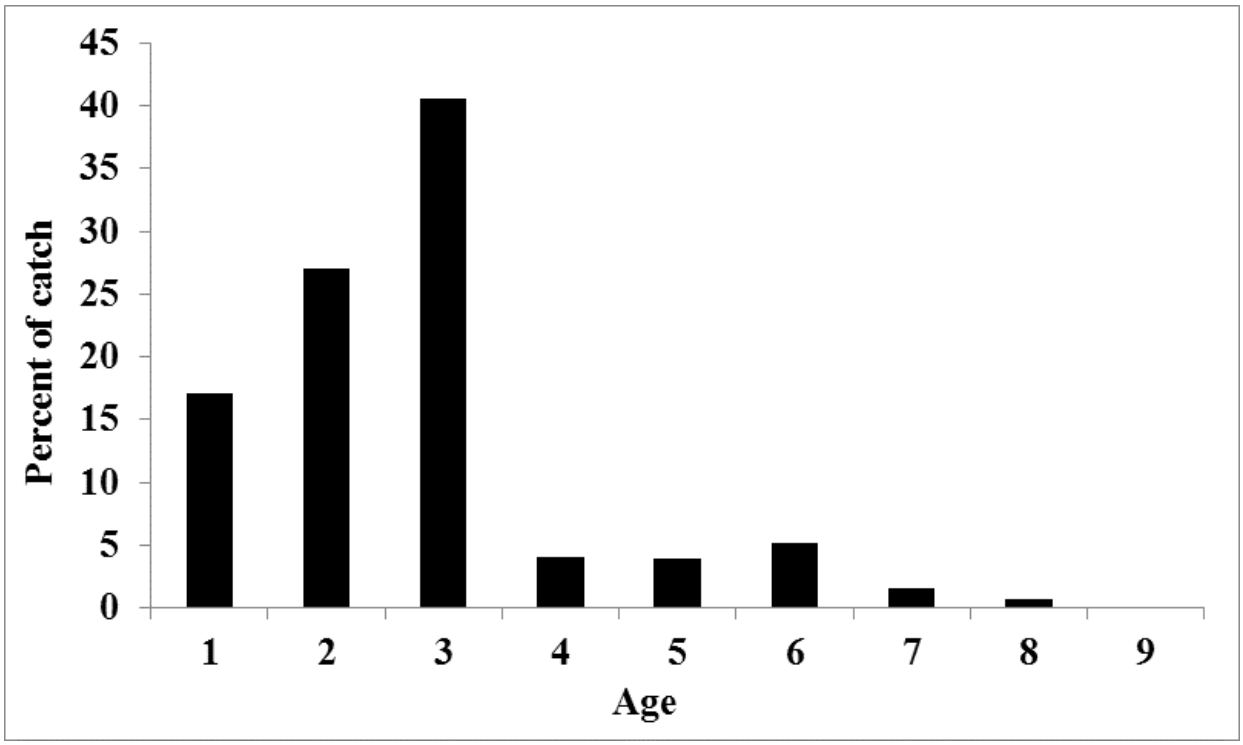

Figure 10. Age frequency distributions of bluegill sampled in Balsam Pond in 2013.

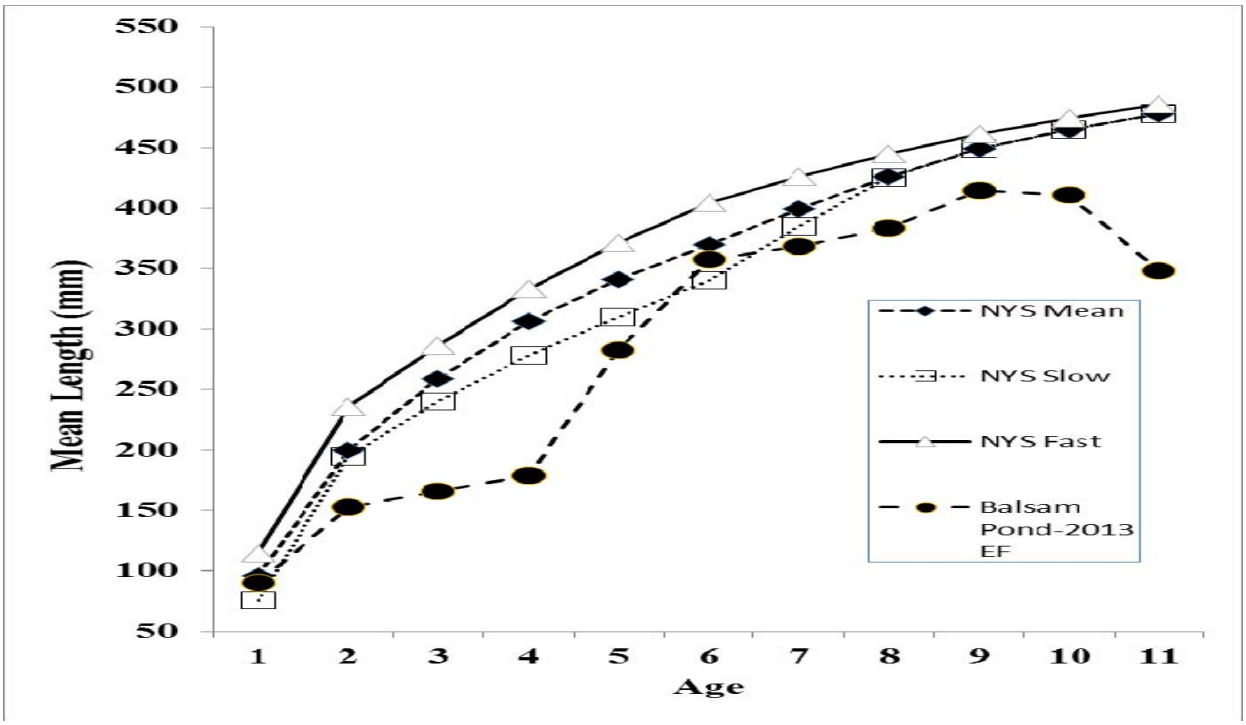

Figure 11. Comparison of largemouth bass growth in Balsam Pond compared to New York State standards.

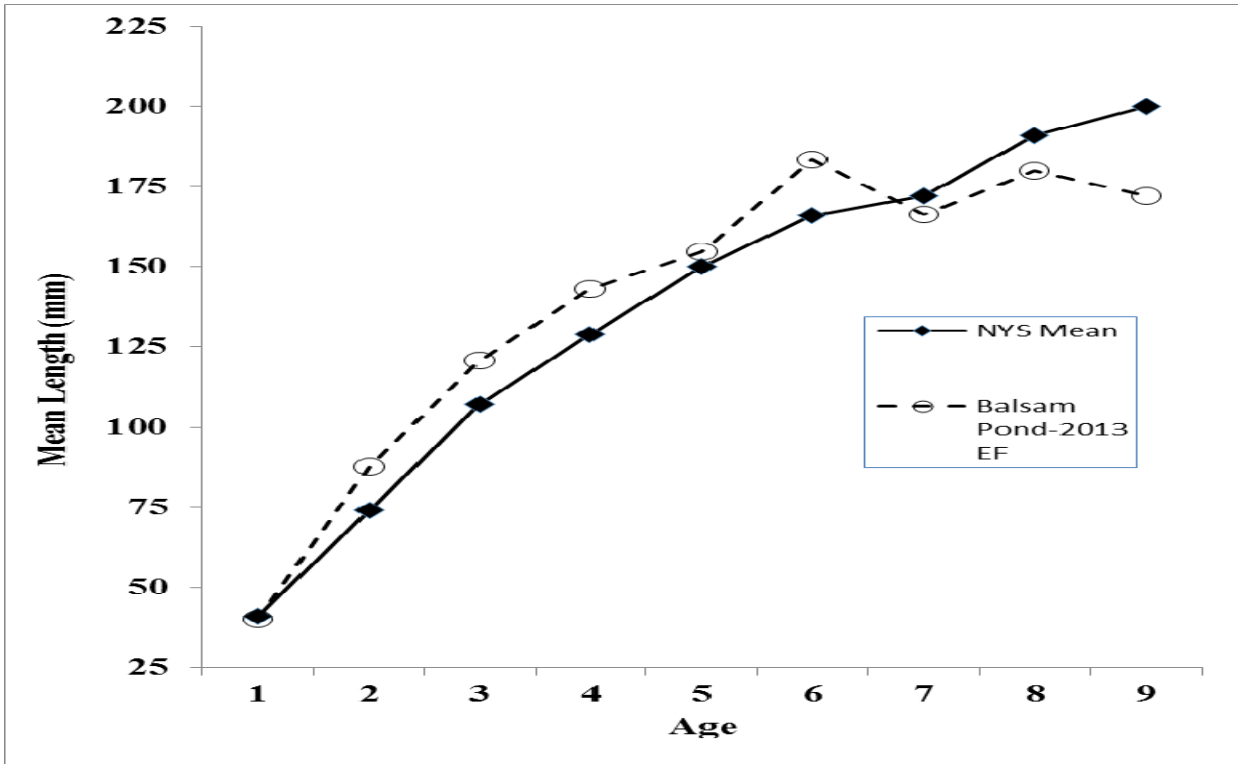

Figure 12. Comparison of pumpkinseed growth in Balsam Pond compared to New York State standards.

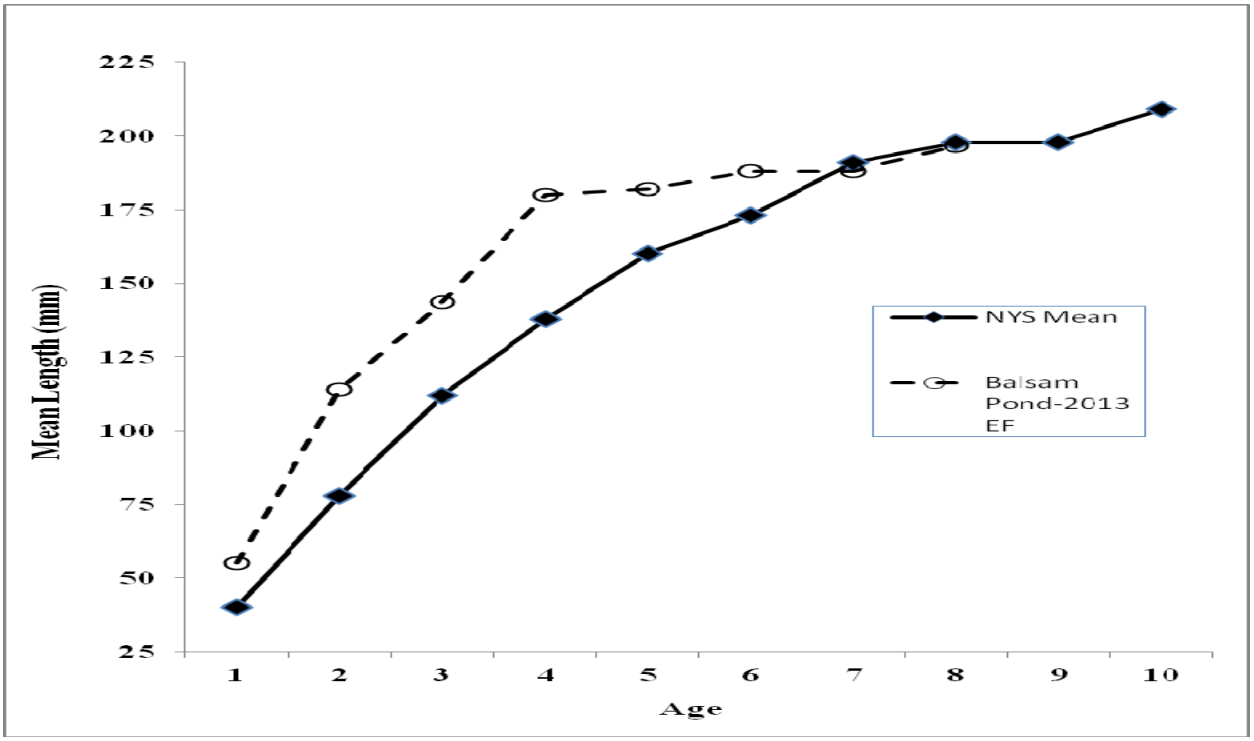

Figure 13. Comparison of bluegill growth in Balsam Pond compared to New York State standards.

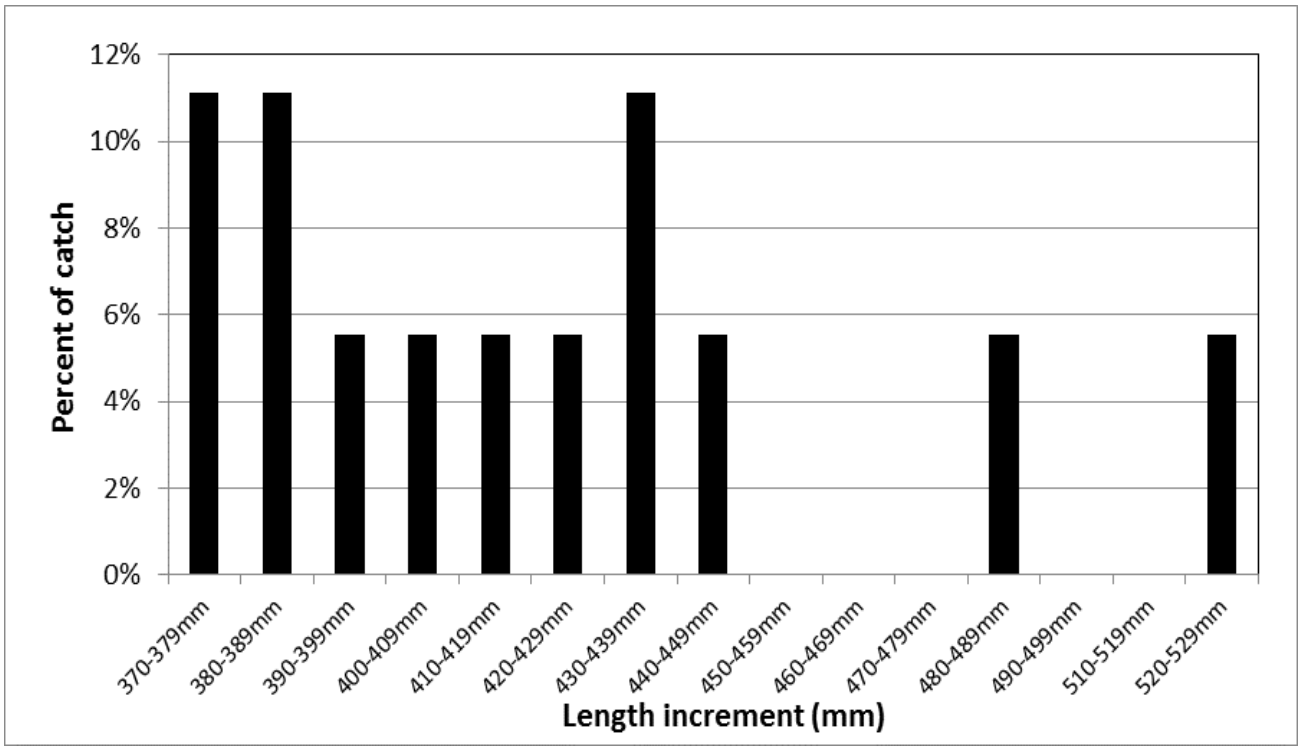

Figure 14. Length frequency distribution of chain pickerel sampled in Balsam Pond in 2013.

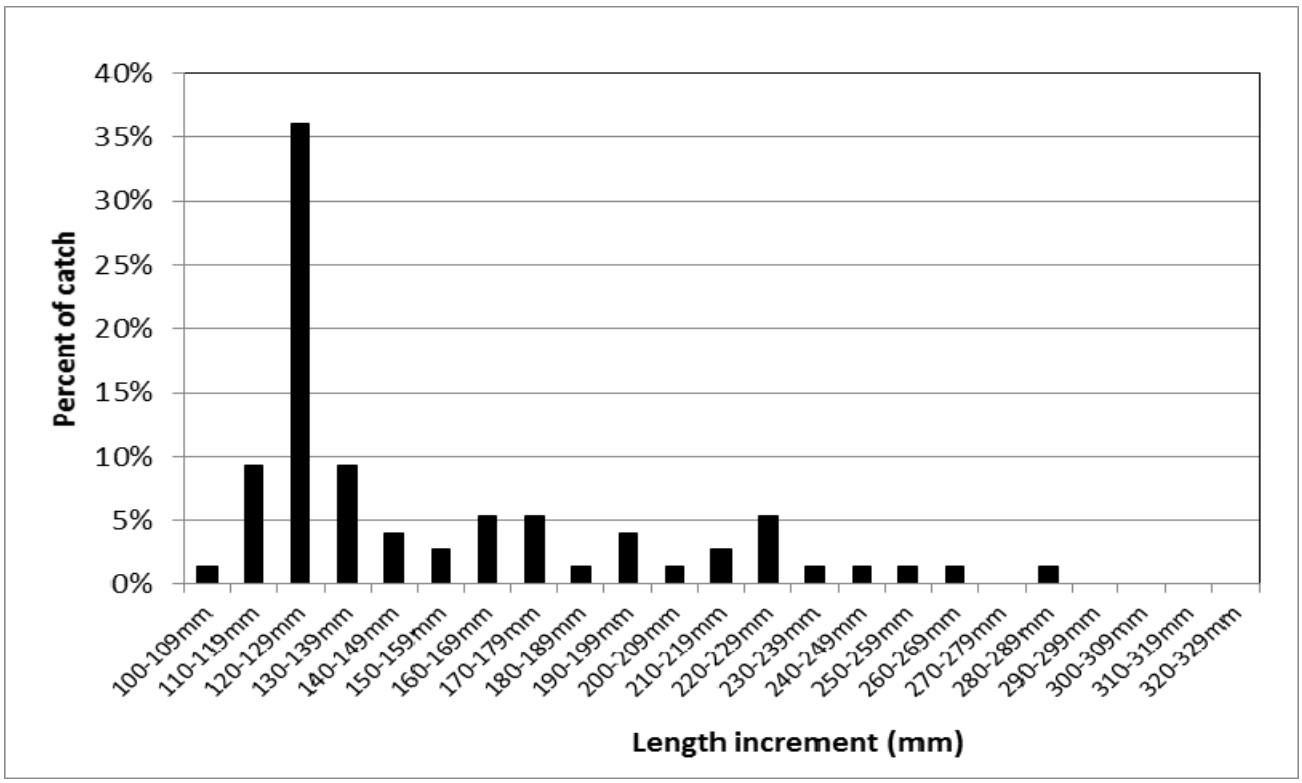

Figure 16. Length frequency distribution of yellow perch sampled in Balsam Pond in 2013.

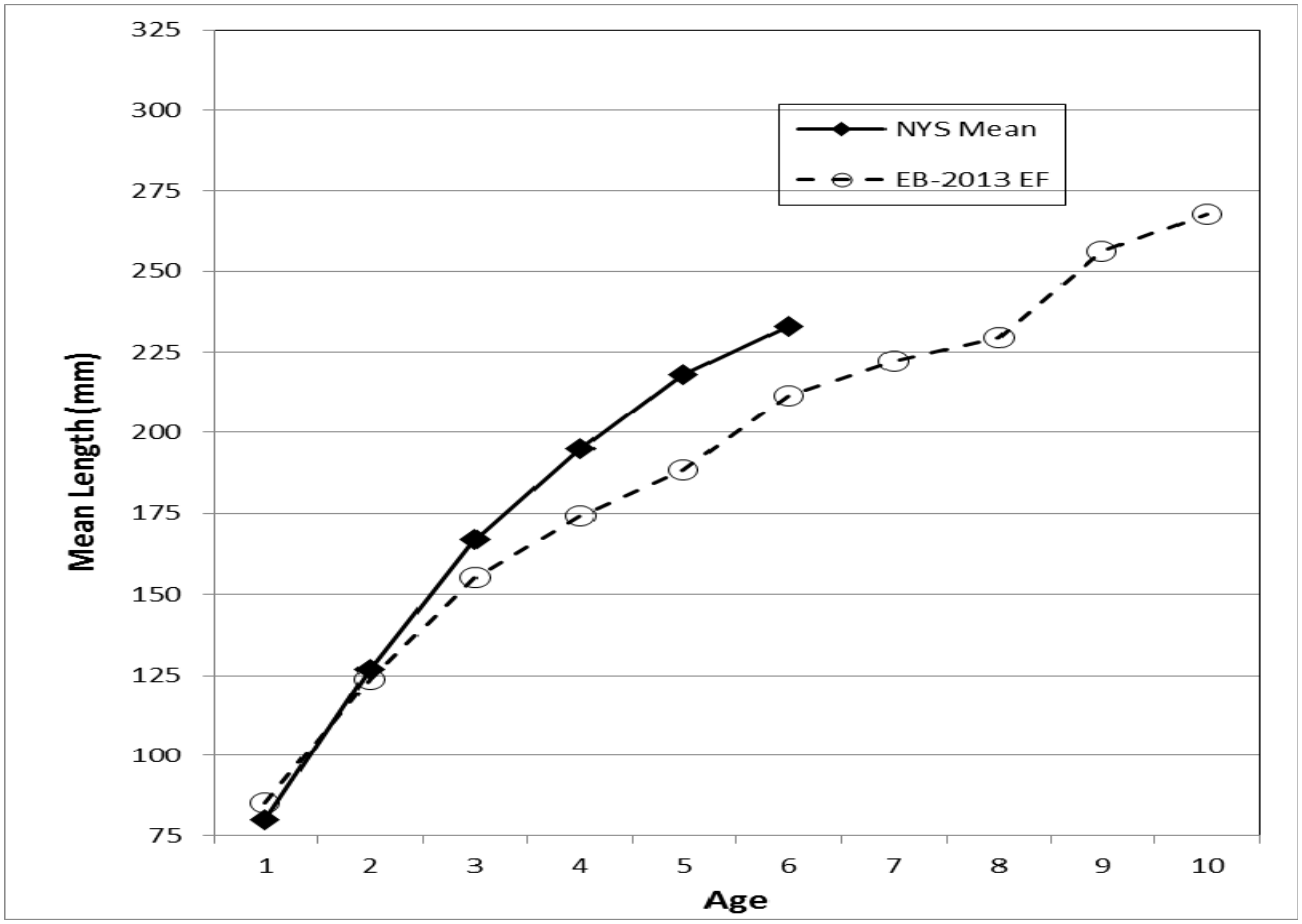

Figure 17. Comparison of yellow perch growth in Balsam Pond compared to New York State standards.

Table 1. Numbers of fish collected in Balsam Pond in 2013.

Species	Scientific name	Number caught
Pumpkinseed	*Lepomis gibbosus*	156
Bluegill	*Lepomis macrochirus*	140
Yellow perch	*Perca flavescens*	76
Largemouth bass	*Micropteris salmoides*	50
Golden shiner	*Notemigonus crysoleucas*	27
Chain pickerel	*Esox niger*	18
Rock bass	*Ambloplites rupestris*	11
Black crappie	*Pomoxis nigromaculatus*	7
Brown bullhead	*Ameirus nebulosis*	3

Table 2. Size structure characteristics and catch rates of centrarchids in Balsam Pond in 2013.

Species	Parameter[a]	Value
Largemouth bass	PSD	88
Largemouth bass	RSD15	44
Bluegill	PSD	31
Bluegill	RSD8	6.9
Pumpkinseed	PSD	78
Pumpkinseed	RSD8	1.3
Largemouth bass	*Wr*<15 in.(Std Dev)	99.5 (5.6)
LMB >=10 in. (254mm)	CPUE (fish/hour)	7.0
Bluegill	CPUE (fish/hour)	142.9
Pumpkinseed	CPUE (fish/hour)	159.2

Density estimates and CPUE's for largemouth bass are from runs where "gamefish" and "all fish" were targeted. CPUE's for pumpkinseed and bluegill were based on "all fish" runs only.

Appendix A

Water Chemistry

Water temp (^{0}F)	70.0
Dissolved oxygen (ppm)	6.3
pH	8.2
Conductivity	64

Literature Cited:

Anderson, R.O.. 1980. Proportional stock density (PSD) and relative weight (Wr): Interpretive indices of fish populations and communities. Pp. 27-35. In: S. Gloss and B. Shupp (eds.) Practical Fisheries Management: More with Less in the 1980's. Proceedings of the 1st annual workshop of the New York Chapter of the American Fisheries Society

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Green, D.M., 1989. Centrarchid Sampling Manual. New York State Department of Environmental Conservation, Albany, NY.