

Summer 2006 trap net monitoring of the littoral zone fish communities at Rat Cove and Brookwood Point

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INTRODUCTION

In the summer of 2006 a continuation of trap net monitoring was conducted to evaluate the fish communities at Rat Cove and Brookwood Point, Otsego Lake, NY. This is an on going study from previous years leading back to 1979 (MacWatters 1980) at Rat Cove and 2002 at Brookwood Point (Gray 2002). Both Rat Cove and Brookwood Point are littoral zones, defined as areas at which light can penetrate to the bottom allowing for aquatic plant growth. In turn, many species of fish use this area for reproduction, and as a nursery, the alewife (*Alosa pseudohargenous*) being one (Foster 1995). Alewives were released into the lake by an unauthorized stocking which occurred in 1986 (Foster 1989). This introduction has altered the food web in the lake since alewife effectively consume zooplankton and larval fish (Cornwell 2005). With the reduction of zooplankton and additional nutrient input from the watershed (Harman et al. 1997), the algal crop has increased, decreasing water transparency and increasing rates of hypolimnetic dissolved oxygen depletion in the lake. Since their introduction, trap netting has been utilized to evaluate alewife abundance.

To take advantage of this under utilized forage base, walleye (*Sanders vitreus*) were stocked with permission from the New York State Department of Conservation from 2000 through 2006. Walleye are considered to be a natural predator of alewife and historically were common in the lake (Cornwell 2005). Additional interest has focused on any trophic changes which might follow any reductions in alewife abundance. Trap net data, as well as electrofishing and hydroacoustic data, have been collected on alewife to monitor population levels. Zooplankton communities were evaluated bi-weekly, as were physical and chemical limnological parameters (Albright 2007). Chlorophyll *a* concentrations were evaluated weekly over the summer (Stevens 2007).

MATERIALS & METHODS

Pennsylvania trap nets were set daily at approximately 0900hrs at both Rat Cove and Brookwood Point Monday through Thursday from 23 May to August 11 (Figure 1). The net was set at the tip of Brookwood Point, perpendicular to the point. The net at Rat Cove was set slightly southwest of the tip on Rat Cove. Nets were checked Tuesday through Friday at 0900hr, making net soak time 24 hours for each net. Fish were held in totes and transported back to the field station dock where species were identified, measured to the nearest (mm) and weighed on a digital scale to nearest 0.1g. They were then released with the exception of alewife, which were placed in plastic bags labeled with location and date and placed in the freezer for later use.

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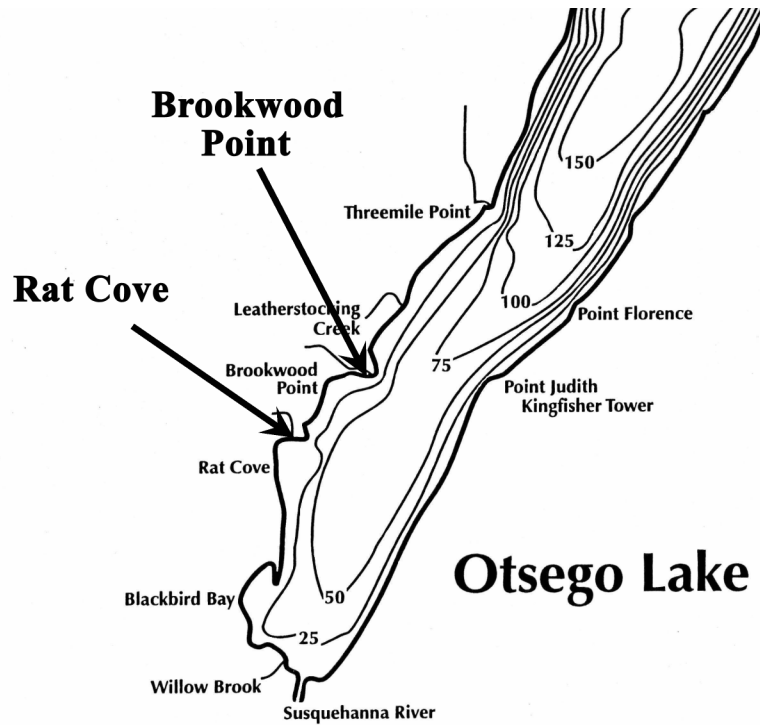


Figure 1. Otsego Lake, depicting trap net locations at Rat Cove and Brookwood Point.

RESULTS & DISCUSSION

The mean catch of both nets has continued to decline from previous years at both Rat Cove and Brookwood Point. Historically, that decline was primarily a reflection of declining numbers of alewife. In 2006, however, the total catch of non-alewife fishes declined as well. Tables 1 and 2 summarize the mean catch per week of all collected fish at Rat cove and Brookwood Point. Figures 2 and 3 graphically display the mean weekly catch of alewife and other fish at Rat Cove and Brookwood Point. The mean catch per week of combined species, and that of alewife, was lower at both sites than had ever been recorded. Also, the percentage of alewife of the total catch at both sites was lower than any previous year. During the current study year, no alewife were caught at Rat Cove. Figure 4 illustrates the decline in alewife catch per site.

While alewife abundance has declined since 2000, the mean length of alewife has generally increased in size from 2000-2006 (Figure 5.) This year's mean catch shows slightly smaller alewife than the previous 2 years, though the size distribution was quite variable (Figure 6). However, large bodied zooplankton have continued to rebound, suggesting less predation by alewife (Albright et al. 2007)

Worth noting were two large flooding episodes of Otsego Lake during the study period. During these time periods the lake level rose significantly enough to flood both

littoral zones. Both trap net sites experienced flooding beyond the normal shore line, perhaps rendering the traps ineffective. Also, visual observations were made of expired and expiring alewife on the surface of the lake after both large flooding episodes.

Rat Cove	2000	2001	2002	2003	2004	2005	2006
Total mean catch per week	141	96	41	87	25	8.7	5.5
Alewife	120.1	67.8	8	45.2	2.4	0.4	0
Golden Shiner	0.6	0.3	0.4	0.7	0.5	0.3	0
Pumpkinseed	9.7	20.8	15.1	32.8	12.9	4.6	2
Blue Gill	2	2.9	3.7	1.7	1.5	1.4	0.8
Redbreast Sunfish	0.8	0.6	0.3	0.4	0.3	0.1	0
Rock Bass	1.6	1.5	3.8	1	1.8	0.5	0.5
Largemouth Bass	0.1	0.6	0.3	0.3	0.1	0.1	0
Chain Pickerel	0.6	0.5	0.1	0.2	0.2	0.1	0.1
Atlantic Salmon	0	0.1	0	0.1	0	0	0
Yellow Perch	2.5	0.5	1.3	0.3	1.2	0.3	0.6
White Sucker	1.1	0.2	1.1	0.1	1.9	0.2	0.5
Common Carp	0.3	0.3	0.2	0.5	0.3	0.7	0.1
Brown Bullhead	1.7	0.1	6.4	2.6	1.6	0.1	0
Spot Tail Shiner	0	0	0.1	0	0	0	0
Smallmouth Bass	0	0	0.1	0	0	0	0
Emerald Shiner	0	0	0	0	0.4	0	0
European Rudd	0.1	0	0.3	0.7	0.2	0	0.1

Table 1. Total mean weekly catch at Rat Cove and the catch contributed by each species, 2000-2006 (modified from Reynolds and Summerville 2006).

Brookwood Point	2000	2001	2002	2003	2004	2005	2006
Total mean catch per week	258	151	101	121	37	9.4	4.2
Alewife	224.2	137.3	77.4	94.7	12.6	5.7	1.4
Golden Shiner	0.3	0.3	1.1	1.8	1.6	0.3	0.1
Pumpkinseed	3.1	7.4	12	13.1	12.2	1.1	0.8
Blue Gill	6.5	0.9	0.9	1	0.8	0.5	0.3
Redbreast Sunfish	0.3	0	0.9	0.2	0.7	0.1	0.1
Rock Bass	7.7	3.5	4	3.8	3	1.1	0.3
Largemouth Bass	0.3	0.3	0.7	0.8	0	0.1	0
Chain Pickerel	0.3	0	0.3	0.2	0.2	0.2	0
Atlantic Salmon	0	0.3	0	0	0	0.1	0
Yellow Perch	1.8	0.3	0.2	0	0.6	0.1	0.2
Walleye	0	0	0	0.1	0	0	0
White Sucker	4.9	0	1.7	0.7	0.6	0.2	0.3
Common Carp	2.1	0.3	0.6	0.1	0.3	0	0.2
Bluntnose Minnow	0.3	0	0	0	0	0.1	0
Brown Bullhead	6.7	0	1	3.6	4.2	0	0.1
Spot Tail Shiner	0	0.6	0	0	0	0	0
Smallmouth Bass	0	0	0	0.6	0.2	0	0
European Rudd	0	0.3	0	0.1	0.2	0	0.1
Common Shiner	0	0	0	0	0	0.1	0

Table 2. Total mean weekly catch at Brookwood Point and the catch contributed by each species, 2000-2006 (modified from Reynolds and Summerville 2006)

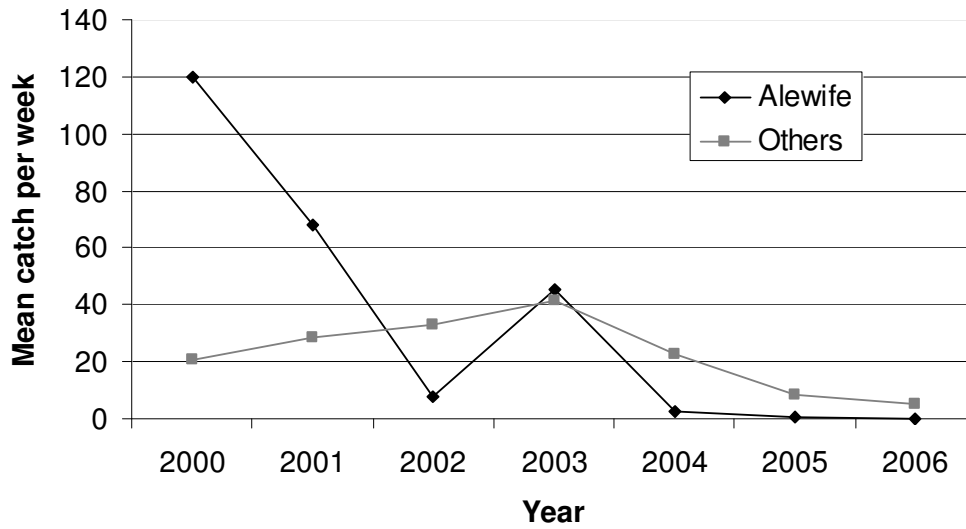


Figure 2. Mean weekly alewife and “other” (non-alewife) catch per unit effort at Rat, summer 2006.

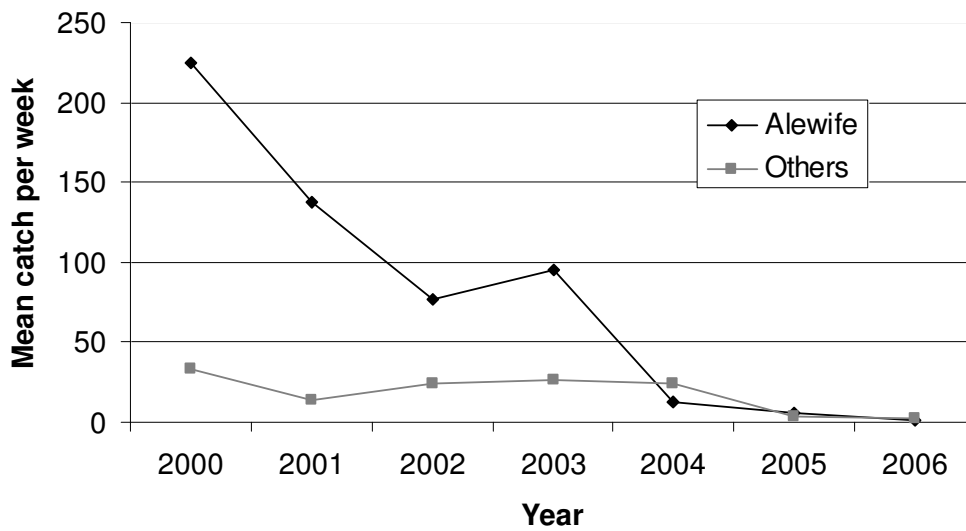


Figure 3. Mean weekly alewife and “other” (non-alewife) catch per unit effort at Brookwood Point, summer 2006.

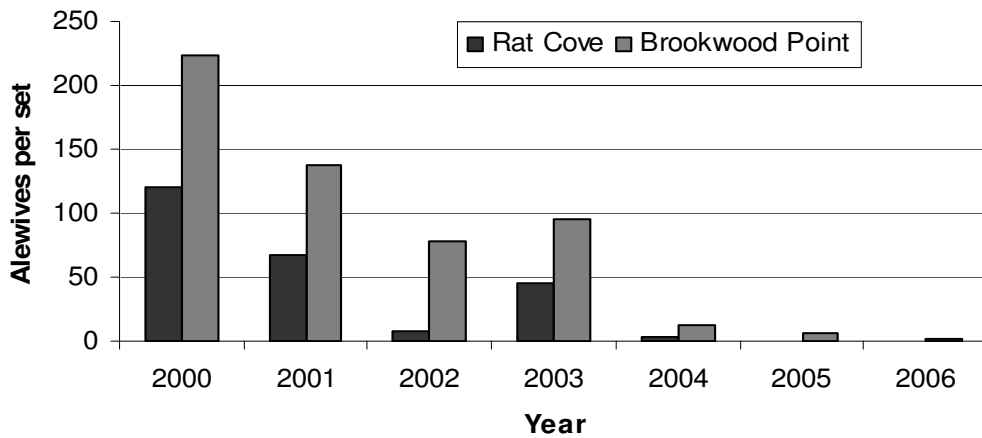


Figure 4. Mean alewife catch per set, 2000-2002 (Gray and Foster 2003), 2003 (Burns 2004), 2004 (Leonard and Cheever 2005), 2005 (Reynolds and Summerville 2006) 2006.

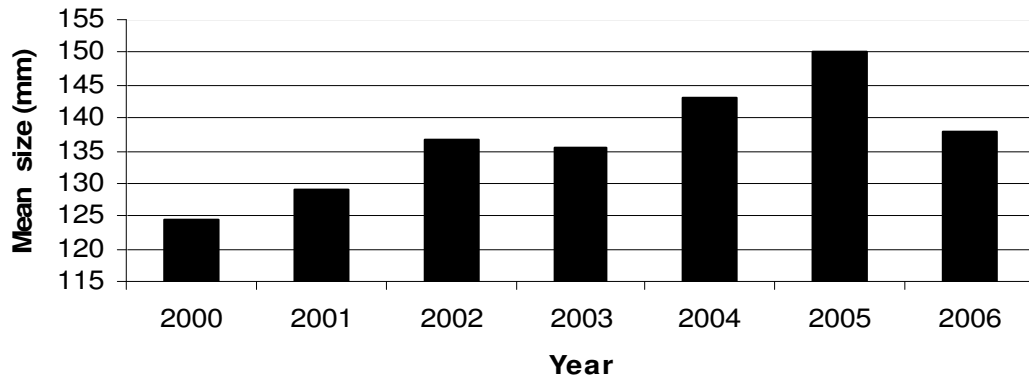


Figure 5. Total mean length of alewife gathered in trap nets during the summer of 2000-2006.

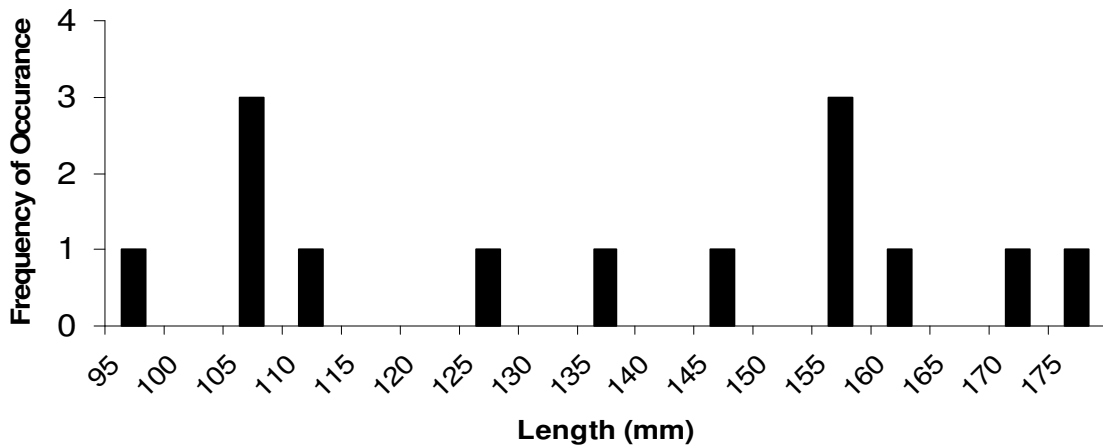


Figure 6. Length Frequency Histogram of Alewife caught from trap nets at Brookwood Point none where caught at Rat Cove.

CONCLUSION

This year's data, in conjunction with those of previous years, suggests a decline in the alewife abundance in Otsego Lake. The size of the alewife, although slightly smaller than last year, was still larger than during years prior to 2003. This suggests that they are not being limited by a lack of resources, though might be controlled by predation. Though outside influences may have attributed to catching a smaller mean length for 2006, the overall trend of larger individual fish and a decrease in alewife abundance continues. Monitoring of both study sites is suggested so that future data can be collected and more concrete conclusions can be made.

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