Summer 2004 trap net monitoring of the fish community in the littoral zone at Brookwood Point and Rat Cove

Paul R. Leonard[1]
Jason Cheever[2]

INTRODUCTION

Trap net data collected in Rat Cove and Brookwood Point over the summer of 2004 was conducted as a continuation of the monitoring that has taken place since 1979 in Rat Cove (MacWatters 1980) and since 1999 at Brookwood Point (Gray 2004). Rat Cove and Brookwood Point are considered littoral zones, meaning light can reach the bottom allowing for abundant plant growth. It is in this area where many species of fish, including the alewife (*Alsoa pseudohargenous*), lay eggs (Closs et al. 2004). Alewives, illegally introduced into the lake in 1986, have diminished zooplankton abundance (Foster 1990). A decreased zooplankton population, comprised of smaller-bodied individuals, coupled with nutrient loading, has led to an increased algal standing crop since the introduction of the alewife (Harman et al. 1997). Since their introduction, trap netting has been used as a mean to track abundances and sizes of alewives in these shallow waters.

In 2000, the New York State Department of Conservation permitted a walleye (*Sander vitreus*) stocking program which has continued through 2004. The stocking not only creates a more diverse fishery for anglers, but also may serve as a method to help control the alewife population. Data gathered before and after the stocking of walleye by means of trap net, haul seine, gill net, and electro-fishing will be used to evaluate the effect of the stocking program on reducing alewife abundance, as well as any resultant trophic changes related to zooplankton communities, algal standing crops and rates of hypolimnetic oxygen depletion.

METHODS AND MATERIALS

A trap net was set each day Monday through Thursday at approximately 0900 hrs in both Rat Cove and Brookwood Point from 27 May to 10 August (Figure 1). Trap nets were set perpendicular to the north shore at Rat Cove and east off of Brookwood Point. The trap nets were then retrieved Tuesday through Friday at 0900 hrs. Fish were taken out of the nets and held in totes where they were taken back to the Biological Field Station dock. Species were then identified, measured in millimeters using a measuring board, weighed in grams using a spring scale, and released, except for alewives, which

---

[1] Rufus J. Thayer Otsego Lake Research Assistant, summer 2004. Present affiliation: Clarkson University.
[2] Robert C. MacWatters internship in aquatic sciences, summer 2004. Present affiliation: Department of Fisheries and Wildlife Technology, SUNY Agriculture and Technical College.

generally don't survive once captured. They were brought up to the Biological Field Station where they were measured and weighed using an electric scale.

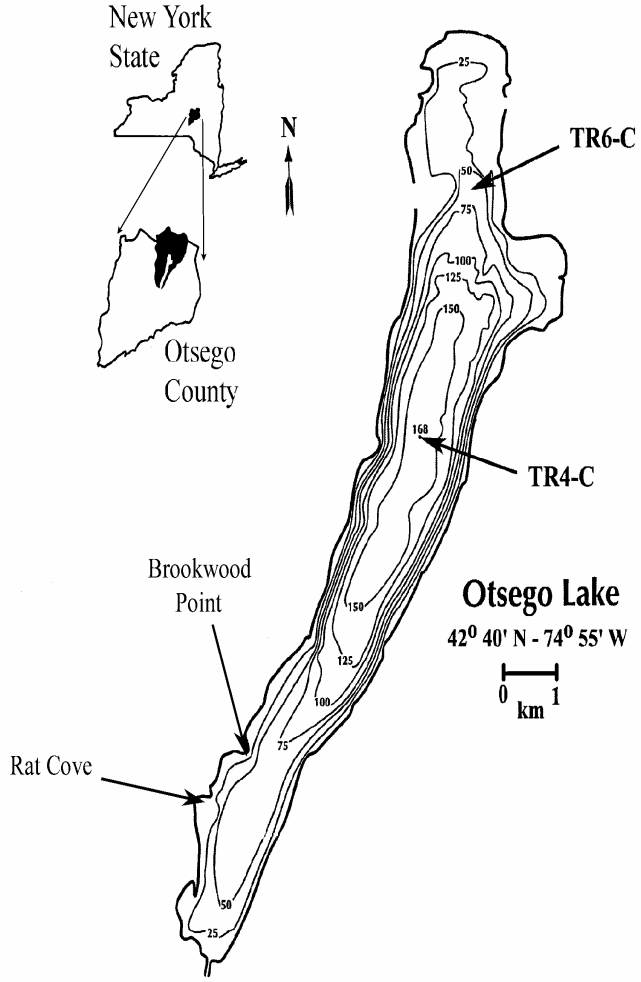

Figure 1. Otsego Lake showing Rat Cove and Brookwood point, the trap netting sites.

RESULTS

The mean catch per week during 2004 was substantially lower than it had been in other years since 2000 (Tables 1 and 2), largely due to a decline in alewife catch. Numbers of other littoral species collected has remained relatively stable. Figure 2 illustrates the declining alewife abundance. In both Rat Cove and Brookwood Point, alewife catch per unit effort (CPUE) has been reduced to a fraction of what it had been in 2000.

Concurrent with alewife decline, there has been an increase in mean length of alewives (Figure 3). Reduced numbers may have alleviated intraspecific competition, resulting in increased resources and subsequent higher growth rates. This is consistent with work conducted by (Albright et al. 2005), which documented that larger bodied zooplankton are more abundant than during any year since the alewife introduction.

Rat Cove	2000	2001	2002	2003	2004
Mean catch per week	141	96	41	87	25
Alewife	120.1	67.8	8.0	45.2	2.4
Golden Shiner	0.6	0.3	0.4	0.7	0.5
European Rudd	0.1	0.0	0.3	0.7	0.2
Pumpkinseed	9.7	20.8	15.1	32.8	12.9
Blue Gill	2.0	2.9	3.7	1.7	1.5
Redbreast Sunfish	0.8	0.6	0.3	0.4	0.3
Rock Bass	1.6	1.5	3.8	1.0	1.8
Large Mouth Bass	0.1	0.6	0.3	0.3	0.1
Chain Pickerel	0.6	0.5	0.1	0.2	0.2
Atlantic Salmon	0.0	0.1	0.0	0.1	0.0
Yellow Perch	2.5	0.5	1.3	0.3	1.2
White Sucker	1.1	0.2	1.1	0.1	1.9
Common Carp	0.3	0.3	0.2	0.5	0.3
Brown Bullhead	1.7	0.1	6.4	2.6	1.6
Spot Tail Shiner	0.0	0.0	0.0	0.1	0.0
Small Mouth Bass	0.0	0.0	0.1	0.0	0.0
Emerald Shiner	0.0	0.0	0.0	0.0	0.4

Table 1. Total mean weekly catch at Rat Cove and the catch contributed by each species, 2000-2004 (modified from Burns 2004).

Brookwood	2000	2001	2002	2003	2004
Mean catch per week	258	151	101	121	37
Alewife	224.2	137.3	77.4	94.7	12.6
Golden Shiner	0.3	0.3	1.1	1.8	1.6
European Rudd	0.0	0.3	0.0	0.1	0.2
Pumpkin Seed	3.1	7.4	12.0	13.1	12.2
Blue Gill	6.5	0.9	0.9	1.0	0.8
Redbreast Sunfish	0.3	0.0	0.9	0.2	0.7
Rock Bass	7.7	3.5	4.0	3.8	3.0
Large Mouth Bass	0.3	0.3	0.7	0.8	0.0
Chain Pickerel	0.3	0.0	0.3	0.2	0.2
Atlantic Salmon	0.0	0.3	0.0	0.0	0.0
Yellow Perch	1.8	0.3	0.2	0.0	0.6
Walleye	0.0	0.0	0.0	0.1	0.0
White Sucker	4.9	0.0	1.7	0.7	0.6
Common Carp	2.1	0.3	0.6	0.1	0.3
Brown Bullhead	6.7	0.0	1.0	3.6	4.2
Bluntnose Minnow	0.3	0.0	0.0	0.0	0.0
Small Mouth Bass	0.0	0.0	0.0	0.6	0.2
Common Chub	0.0	0.0	0.1	0.0	0.0
Eastern Shiner	0.0	0.0	0.1	0.0	0.0
Spot Tail Shiner	0.0	0.6	0.0	0.0	0.0

Table 2. Total mean weekly catch at Brookwood Point and the catch contributed by each species, 2000-2004 (modified from Burns 2004).

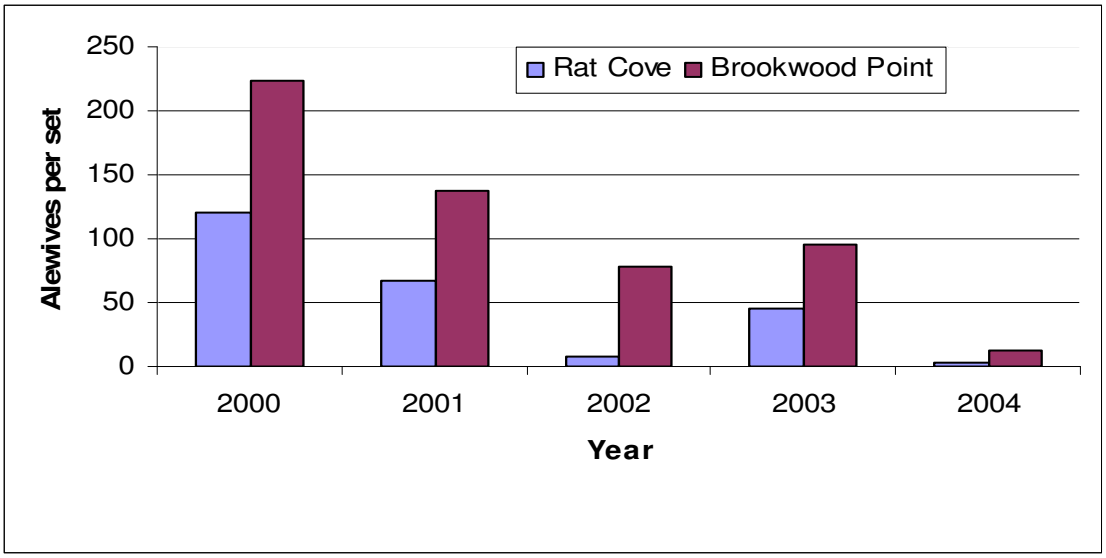

Figure 2. Mean alewife catch per set, 2000-2002 (Gray and Foster 2003), 2003 (Burns 2004) and 2004.

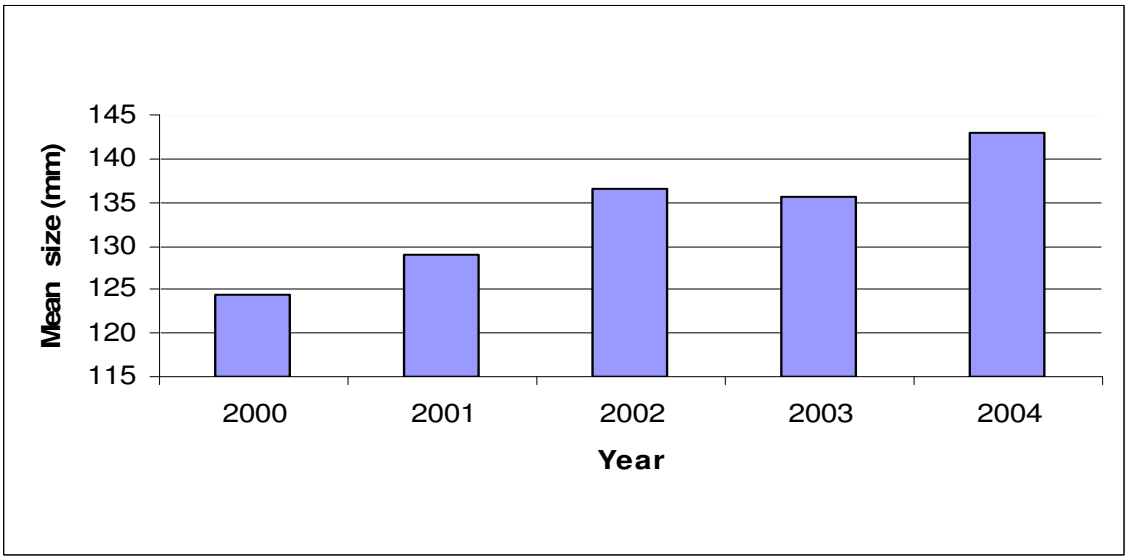

Figure 3. Mean total length of alewives collected in trap nets over the summers of 2000-2004.

Figures 4 and 5 show length histograms of frequency of occurrence for the catch at Rat Cove and Brookwood Point, respectively. Those graphs substantiate an increase in the size structure of the alewife community compared to any post-establishment year (Cornwell in prep.).

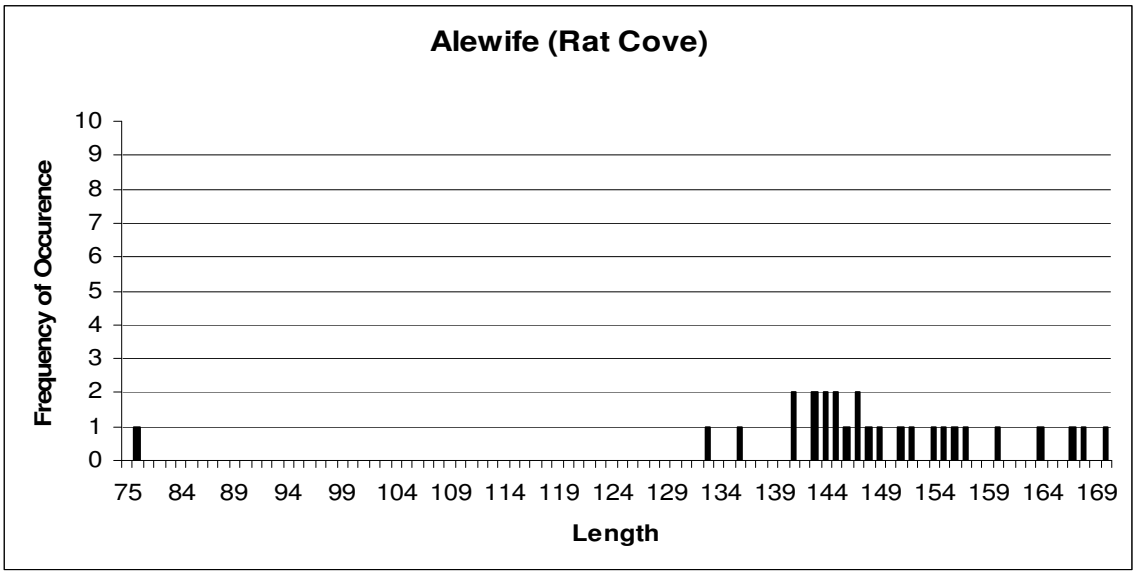

Figure 4. Length frequency histogram of alewife catch at Rat Cove, 2004.

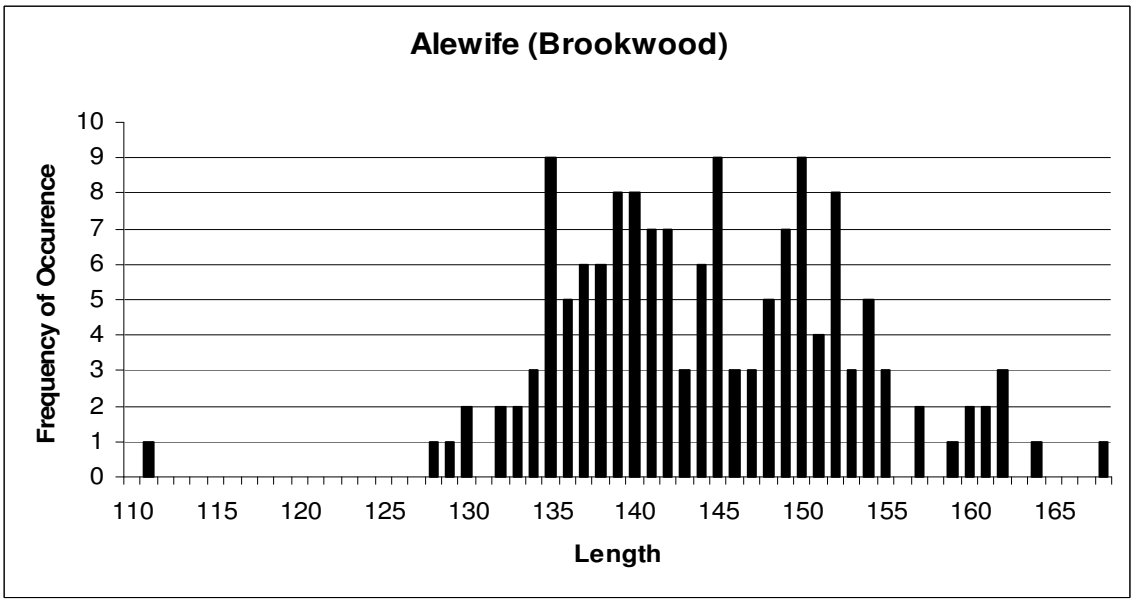

Figure 5. Length frequency histogram of alewife catch at Brookwood Point, 2004.

CONCLUSIONS

To better understand the impacts of the invasive alewife, as well as a means of evaluating of the re-establishment of walleye to reduce the alewife, densities the littoral zone fishes should continue to be studied by the use of trap nets. Burns (2004) stated that alewife populations have yet to be diminished by the walleye stocking. However, summer 2004 data, along with those from previous years, shows a distinct change in the littoral fish community dynamics. Data collected over the next few years will help to better understand possible causes of this change.

REFERENCES

Albright, M.F., L. Hingula and R. Hamway. 2005. A survey of Otsego Lake zooplankton, summer 2004. *In* 37th Ann. Rept. (2004). SUNY Oneonta Bio Fld. Sta., SUNY Oneonta.

Burns, R.E. 2004. Summary of littoral fish trap net catch at Rat Cove and Brookwood Point, Otsego Lake, summer 2003. *In* 36th Ann. Rept. (2003) SUNY Biol. Fld. Sta., SUNY Oneonta.

Closs, G., B. Downs, and A. Boulton. 2004. Freshwater Ecology. Blackwell Publishing Co. Malden, MA.

Foster, J.R. 1990. Introduction of the alewife (*Alsoa pseudoharengus*) in Otsego Lake. *In* 22nd Ann. Rept. (1989) SUNY Biol. Fld. Sta., SUNY Oneonta.

Gray, M.S. and J.R. Foster. 2003. Summary of the trap net alewife (*Alsoa pseudoharengus*) catch in Rat Cove: 1989-2002. *In* 35th Ann. Rept. (2002) SUNY Biol. Fld. Sta., SUNY Oneonta.

Gray, M.S. 2004. Personal Communication. SUNY Oneonta Biol. Fld. Sta. Cooperstown, NY.

Harman, W.N., L.P. Sohacki, M.F. Albright, and D.L. Rosen. 1997. The state of Otsego Lake 1936-1996. Occ. Paper #30. SUNY Oneonta Biol. Fld. Sta., Cooperstown, NY.

MacWatters, R.C. 1980. The Fishes of Otsego Lake. Occas. Pap. #7. SUNY Oneonta Biol. Fld. Sta., SUNY Oneonta.

Meehan, H.A. 2001. Assessment of the Rat Cove fish community, summer 2001. *In* 34th Ann. Rept. (2001) SUNY Biol. Fld. Sta., SUNY Oneonta.