REPORTS:

Monitoring trophic changes following the reintroduction of walleye (*Stizostedion vitreum*) to Otsego Lake: an executive summary

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In June and July 2000, Otsego Lake was stocked with 80,000 Oneida Lake strain pond fingerling walleye (*Stizostedion vitreum*) averaging 48mm in total length (TL) (range= 32-56mm) with the primary goal of re-establishing walleye to the lake. The yearly stocking of this number of walleye will continue to at least 2003. It is expected that walleye will forage primarily upon alewives (*Alosa pseudoharengus*), which are now the dominant planktivore (Warner, 1999) following their introduction to Otsego Lake in 1986 (Foster, 1989). Walleye pond fingerling stocking is preferred over fry as alewives consume walleye fry and small fingerlings (<34mm TL) often on the first strike (Brooking *et al.*, 1998). BFS involvement relates to monitoring to ascertain the potential establishment of the walleye population and for changes that may result from trophic cascade effects (Cooke *et al.*, 1993) brought about by reduced planktivory, leading to increased grazing upon algae, following a reduced alewife population.

Since the irruption of the alewife population since 1986, there has been a decrease in mean summer Secchi transparencies, increases in total phosphorus and chlorophyll *a* concentrations (Harman, 1997), and increased rates of hypolimnetic oxygen consumption (Albright, 2001). These changes are believed to be linked to decreased zooplankton mean size, biomass and grazing rates (Warner, 1999). If a large walleye population is established, sustained by stocking, a reduced alewife population may reverse the aforementioned trends.

The following three papers are part of a three-year study designed to monitor trophic changes that may result from the walleye stocking. This work is are designed to complement long-term studies by the BFS including baseline water chemistry, particularly related to nutrients, hypolimnetic oxygen dynamics, algal and zooplankton biomass and community descriptions, and acoustic studies on the pelagic fish population abundance and structure.

In the first paper in this series, Durie (2001) continues monitoring Otsego Lake chlorophyll *a* concentrations as part of the long-term limnological program in place at the BFS. Increased chlorophyll *a* concentration indicate an increased algal standing crop, which relates directly to decreased Secchi transparency (Warner, 1999) and ultimately to increased rates of hypolimnetic oxygen depletion. Increases in algal standing crop and decreased algal cell size are associated with high abundances of planktivorous fishes such as the alewife (Warner, 1999).

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In the second contribution to this monitoring regime, Morgan (2001) summarizes the condition of the zooplankton community prior to the establishment of walleye. The zooplankton community size, structure, biomass, grazing index (epilimnetic filtering) and phosphorus regeneration rate for summer 2000 are described. Previous to the introduction of alewives in 1986 (Foster, 1989) Otsego Lake maintained a low algal biomass, high transparency and low hypolimnetic oxygen consumption, presumably maintained largely by a zooplankton community dominated by large cladocerans and copepods (Harman et al. 1980).

In the final contribution to this series, Gray (2001) compares the growth of centrarchid fishes from pre- and post-alewife periods by summarizing an electrofishing survey of the entire shoreline of Otsego Lake conducted in June and early July 2000. High abundance of large chain pickerel (Essox niger), smallmouth bass (Micropterus dolomieu), largemouth bass (Micropterus salmoides) and other predators may impact walleye survival and success as stocked fish may be vulnerable to predation (Brooking, pers. comm., 2000). Summer 2000 electrofishing data for the entire lake indicate that smallmouth bass were very abundant (16.03 fish/hr.) as were largemouth bass (14.17 fish/hr). A fall electrofishing survey with the same gear conducted on 14, 25, 31 October yielded five walleye (116-155mm) during 7.6hr of electrofishing effort covering over 2/3 of Otsego Lake’s shoreline for a total of .66 walleye/hr. Compared to other New York State walleye/alewife lakes summarized by Brooking and Rudstam (2000), the catch rate for stocked walleyes is low and the abundance of predators is high.

Walleye stocking and possible trophic changes will be monitored for the next three years. Chlorophyll a, zooplankton community size and structure and predator abundance will be added to data collected on pelagic fish abundance (estimated by hydroacoustics and gill nets), baseline water quality and walleye survival/growth data (determined by fall boat electrofishing) to realize the implication of this reintroduction.

REFERENCES


