Walleye *(Stizostidion vitreum)* reintroduction update: Walleye stocking and electrofishing summary 2000-1

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ABSTRACT

In June and July 2001, Otsego Lake was stocked with 45,000 Oneida Lake strain pond fingerling walleye *(Stizostidion vitreum)* averaging 53.6 mm in total length (range= 41-65 mm). Additionally 8,000 minnow-reared fall fingerlings (ave. TL= 121.5 mm, range=93-160 mm) were stocked in October 2001 with a right pelvic fin clip. The total number of stocked walleye was lower for 2001 (53,000 total) than for 2000 (80,000 total). Fall electrofishing surveys of the entire shoreline in 2001 yielded 14 walleye (ave. TL=159.2) during 9.5 hr of fishing for a catch rate of 1.53 fish/hr, which is higher than the .66 fish/hr observed in 2000 (n=5). The average size of recaptured walleye was greater in 2001 than 2000 (TL=159mm and 144mm, respectively). Predator catch rates for 2001 were higher than in 2000 for chain pickerel (*Esox niger*) (12.31/hr and 3.26/hr, respectively) and rock bass (*Ambloplеites rupestris*) (14.76 and 2.0,respectively). Other walleye predator catch rates, including yellow perch (*Perca flavescens*) and largemouth bass (*Micropterus salmoides*) are slightly lower or have remained relatively constant in 2001.

INTRODUCTION

Between June and July 2000, 80,000 pond fingerling walleye (ave. TL=46.8 mm) were stocked into Otsego Lake along the south west shoreline. In 2001, 45,000 pond fingerlings (ave. TL=53.6 mm) were stocked along the south shoreline and 8,000 fall fingerlings (ave. TL= 121.54 mm) were stocked at the north east end of the Lake. Fall fingerlings were given a right pelvic clip so that they could he differentiated from fish stocked earlier. The primary goal of this re-introduction is to provide additional angling opportunity, as walleye are popular sportfish (Festa, 1987), and to provide additional predation on alewife (*Alosa pseudoharengus*). Alewife have been linked to decreased mean zooplankton size, biomass and grazing rate (Warner, 1999), decreased mean summer Secchi transparencies, increased nutrient cycling rates and chlorophyll *a* concentrations (Harman et al, 1997), and increased rates of hypolimnetic oxygen demand (Albright, 2001). The target number of walleyes to stock is 80,000 per year (20 walleye per acre). This stocking will continue to at least fall 2002.

It is expected that walleye will forage primarily on alewife, which are now the dominant forage fish in Otsego Lake (Warner, 1999; Cornwell, in prep.), since their introduction in 1986 (Foster, 1990). Walleye pond fingerling were chosen over fry because adult alewife will consume walleye fry and fingerlings <34 mm TL (Brooking et al., 1998). Additionally, fall fingerlings stocked in October may be too small to consume young of year alewife, as walleye prefer prey less than 1/3 of their body size (Brooking, 2002). Furthermore, Brooking et al. (2001) state that survival of fall fingerlings over

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pond fingerlings is not as great as expected in other walleye lakes in New York. Therefore, the additional cost of rearing fall fingerlings over pond fingerlings may not be justified.

Success of fry, pond fingerling and fall fingerling walleye stocked in several New York Lakes has been extensively evaluated by the Cornell University Warmwater Fisheries Unit. Brooking (2001) indicates that in study lakes having larger sizes (TL>381mm) of largemouth bass (*Micropterus salmoides*) and chain pickerel (*Esox niger),* survival of stocked walleye appears to be limited. Additional work by Brooking et al. (2001) indicates that there is some evidence that abundant prey fish and panfish may buffer predation on stocked walleye. Initial survival of stocked fingerlings seemingly depends largely on the balance of the pre-existing predator prey community in receiving waters (Brooking et al., 2001). Walleye pond fingerling survival in Otsego Lake is linked strongly to predation as demonstrated in McDonnell and Cornwell (2002). A larger suite of predators (as hypothesized in Brooking et al., 2001), including chain pickerel, largemouth bass, small mouth bass (*Micropterus dolomieui*), rock bass (*Amblopleites rupestris*) and yellow perch (*Perca flavescens*), prey on stocked walleye.

MATERIALS AND METHODS

Three electrofishing surveys were completed. The first, in June 2000, preceded the first walleye stocking but counted all fish present. The second, in October and November 2000, focused primarily upon recapturing walleye that had been stocked that summer. The third, in October and November 2001, evaluated all fish present. Otsego Lake's entire shoreline (36.2 km) was surveyed on the first and third surveys. Due to inclement weather, 22.1 km were surveyed in the fall of 2000. Surveys were conducted at night with a Smith-Root™ boat electrofisher. A 3500-watt generator coupled to a Type VI-A variable voltage pulsator provided power for the electrofisher. During 2000 and 2001 surveys 336-504 DC volts at 6-7.5 amps were used on all collection nights. Two scappers located on each side of the bow captured fish in the field.

Electrofishing surveys were made when littoral water temperatures were 10-18°C, as prescribed in the Percid Sampling Manual (Forney et al., 1994), with alternating game fish (usually 30 min) and all fish (usually 15 min) collections. All fish were measured on a measuring board for total length (TL) in mm and weighed in grams on a spring balance or portable electronic balance. All fish except alewives and several walleye were released at the end of each collection run. Results of game fish and non-game fish are expressed in catch/hr.

RESULTS AND DISCUSSION

The results for 2000-2001 electrofishing are expressed in Table 1. Year 2000 data are adapted from electrofishing catch rates found in Gray (2000) and DEC (unpublished data). Stocked pond fingerlings in 2000 averaged 46.8 mm and in 2001 averaged 53.6 mm. Stocked fall fingerlings in 2001 averaged 121 mm. This is typical with most other New York lakes stocked with walleye, where pond fingerlings are generally 40-47 mm and fall fingerlings 114-130mm (Brooking et al, 2001).

Table 1. Electrofishing catch rates for game and non-game fish for June 2000 (accept walleye: October 2000) and October 2001.

Species	**2000 Catch Rate**	**2001 Catch Rate**
Walleye* (*Stizostidion vitreum*)	0.66/hr*	1.53/hr.
Brown Bullhead (*Ictalurus nebulosus*)	4.5/hr.	1.67/hr.
Bluegill (*Lepomis macrochirus*)	11.0/hr	30.67/hr.
Common Carp (*Cyprinus carpio*)	4.0/hr.	4.0/hr.
Alewife (*Alosa pseudoharengus*)	123/hr.	2.67/hr.
Emerald Shiner (*Notropis artherinoides*)	6.0/hr.	6.67/hr.
Golden Shiner (*Notemigonus crysoleucas*)	3.5/hr.	11.33/hr.
Pumpkinseed (*Lepomis gibbosis*)	31.0/hr.	46/hr.
Redbreasted Sunfish (*Lepomis auritus*)	2.0/hr	14.67/hr.
Spottail Shiner (*Notropis hudsonius*)	3.0/hr	12.67/hr.
Tesselated Darter (*Etheostoma olmstedi*)	1.0/hr.	10.0/hr.
White Sucker (*Catastomas commersoni*)	28/hr	8.67/hr.
Lake Trout (*Salvelinus namaycush*)	N/A	2.84/hr.
Atlantic Salmon (*Salmo salar*)	N/A	.67/hr.
Brown Trout (*Salmo trutta*)	3.5/hr.	.983/hr.
Rockbass (*Ambloplеites rupestris*)	**24.5/hr**	**94/hr.**
Chain Pickerel (*Esox niger*)	**3.26/hr.**	**12.31/hr.**
Largemouth Bass (*Micropterus salmoides*)	**14.17/hr.**	**14.21/hr.**
Smallmouth Bass (*Micropterus dolomieui*)	**16.03/hr.**	**6.12/hr.**
Yellow Perch (*Perca flavescens*)	**26/hr.**	**22/hr.**
Catch rate of important predators/hr	**58.23/hr**	**142.52/hr**
Effort hrs/shoreline km	10.73/36.2	9.5/36.2

* Walleye sampled in October 2000, 7.6h, 22.1 km shoreline fished
Bolded fish are important predators of walleye in Otsego Lake (McDonnell and Cornwell, 2002).

Despite missing our target stocking of 80,000 by 27,000 fish in 2001, we recaptured a larger sample of walleye (n=5 in 2000, n=14 in 2001). Walleye recaptured in 2001 were larger than 2000 fish (159 mm and 144 mm, respectively). Four fish in 2001 had a right pelvic clip indicating they had been stocked that fall.

Overall, predator catch rates for 2001 were substantially higher than in 2001 (142.5/hr vs. 58.2/hr). Most of this difference was due to higher catch rates of chain pickerel (12.31/hr and 3.26/hr, respectively) and rock bass (94/hr and 25.4/hr). Catch rates of smallmouth bass were lower in 2001 when compared to 2000 (6.12/hr and 16.03/hr respectively). Little differences were noted for largemouth bass (14.21/hr and 14.17/hr, respectively) and yellow perch (22/hr and 26/hr, respectively). Based upon finding by McDonnell and Cornwell (2002), yellow perch and rock bass are now considered important predators of walleye pond fingerlings in Otsego Lake. Rock bass and chain pickerel catch rates for 2001 are higher in Otsego than nine of ten other lakes stocked with walleye and monitored by Cornell Warmwater Unit (Brooking et al., 2001), while small mouth and largemouth bass catch rates are low to average compared to those lakes. Otsego Lake's predators, including perch and rock bass, which are more abundant

than either smallmouth or largemouth bass in Otsego Lake, may be limiting stocking success.

Because alewives commonly consume walleye fry (Brooking et al., 2001), recruitment in such lakes tends to be limited. Schoharie Reservoir (60 km south east of Otsego Lake) has had a self-sustaining walleye population for some time. In 1995, that waterbody had a walleye catch rate of 2.0-3.2/hr of age-0 and age-1 fish (McBride, 1998). During that time alewives were the dominant forage fish. However, following a massive alewife die-off, walleye catch rates increased to 64.9 fish/hr in 1997. Current Otsego catch rates (1.5/hr) are comparable to those in Schoharie Reservoir when it was limited by alewife.

Despite a higher total catch rate of all predators in 2001 than 2000 (142.52/hr. and 58.23/hr. respectively) and a lower number of stocked pond fingerlings in 2001, returns of stocked pond fingerlings were higher than in 2000. This may be explained in part by the fact that stocking continued into the fall of 2001. Those fish were larger and the duration between stocking and electrofishing was shorter. These factors would both reduce the chance of predation by gamefish. This is supported by the capture of four fall, fin clipped fingerlings captured in the same location within days after they were stocked. Additionally, walleye captured in fall 2001 likely represented those stocked in both years of the program. More work on Otsego Lake predator-walleye relationships is planned for 2002 with electrofishing surveys in May-June and October-November.

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