SUMMARY OF 2009 WATERPORT RESERVOIR FISHERY SURVEY

Matthew Sanderson
Biologist 1 (Aquatic)

NYSDEC
Bureau of Fisheries
6274 East Avon-Lima Rd
Avon, New York 14414

July 1, 2013

ABSTRACT

Waterport Reservoir, a 335-acre hydroelectric impoundment of Oak Orchard Creek in Orleans County, New York, has been stocked annually with varying numbers of pond-reared walleye (*Sander vitreus*) fingerlings and fry from 1989 to 2009. DEC's Region 8 Fisheries Unit conducted a warm water fisheries survey of the reservoir on September 14, 15, and 16, 2009. The survey included collection of pertinent chemical and physical data and sampling of fish populations by electrofishing and gill netting. Three net sets (49 total hours) and 1.6 hours of electrofishing yielded 19 fish species and a total of 346 fish. Eighty six bluegill sunfish accounted for 29% of the catch. The second and third most commonly caught fish were largemouth bass (74, 25%) and white perch (53, 18%). Six total walleyes were captured, the electrofishing CPUE was 0.64 walleye per hour, and the walleye CPUE by gill netting was 1.7 per 350 ft net night in 2009. If the electrofishing and gill net catch rates were reflective of the density of walleyes in the reservoir, the population increased substantially from 1989 to 1992, remained at about the same level through 1994, and then decreased considerably from 1999 to 2009. Based on age analysis of the 6 walleyes captured in the 2009 survey, all likely resulted from the pond fingerling stocking program. It is interesting that the year classes best represented are those of 2003 and 2001 (2 fish each or 33% of the sample each). The 2003 year class was the largest (17,455 fingerlings stocked) and the 2001 year class was the smallest (1,482 fingerlings stocked). Either survival of this small lot of fish was exceptional or wild fish contributed significantly to that year class. Growth exhibited by Waterport Reservoir walleye compares favorably with the New York average. The mean condition factor and mean relative weight suggest that walleye are underweight at length when compared to most walleyes from other waters. The 2009 CPUE by electrofishing for largemouth *(Micropterus salmoides)*, and smallmouth *(Micropterus dolomieu)* bass combined was 55.8 bass per hour, likely reflecting a moderate density of bass in the reservoir. Size structure indices for largemouth and smallmouth bass are average, suggesting stable populations. Waterport Reservoir largemouth and smallmouth bass exhibited slightly below average growth for New York and are near average weight at length when compared to most bass from other waters. Despite small sample sizes for yellow perch *(Perca flavescens)*, it is known from reliable angler reports that they have contributed significantly to panfish catches during the winter ice fishery. White perch (*Morone americana*) are an important component of the fish community and achieve fair size, but it is unclear if they are of importance to Waterport Reservoir anglers.

INTRODUCTION

Waterport Reservoir (aka Lake Alice, Ont-138-P166), is a 335-acre hydroelectric impoundment of Oak Orchard Creek in Orleans County, New York (Figure 1). Public access to the reservoir is via a paved boat ramp and parking area that is maintained by Orleans County. The reservoir is one of the few suitable locations in the county for the restoration of walleye as a secondary fishery and has been stocked annually with varying numbers of pond-reared walleye (*Sander vitreus*) fingerlings and fry from 1989 to 2005 (Appendix A). The walleye fingerlings were raised by members of the Orleans County Federation of Sportsmen's Clubs as part of a cooperative program involving the New York State Department of Environmental Conservation (NYSDEC), New York Sea Grant Extension, and State University of New York (SUNY) College at Brockport. NYSDEC has provided between 20,000 and 30,000 walleye fry annually, use of a rearing pond (Brackett pond) on its Tonawanda Wildlife Management Area, guidelines for raising and stocking fingerlings, and assessment surveys. Sea Grant Extension has served as coordinator, and SUNY Brockport has provided technical assistance. Since 2007, walleye fry have not been raised to finglerling stage by cooperators, and instead are stocked directly into Waterport Reservoir (Appendix B). Although the hydropower facility is exempt from Federal Energy Regulatory Commission (FERC) regulations, Brookfield Power Corporation has maintained reservoir water levels at relatively consistent elevations.

DEC's Region 8 Fisheries Unit conducted surveys of Waterport Reservoir in October 1989, October 1992, October 1994 (Lane 1995), and October 1999 (Web Pearsall, NYSDEC unreported data). Surveys included collection of pertinent chemical/physical data and sampling of fish populations by electrofishing and gill netting. The purpose of the surveys was to assess the fish community and the contribution of stocked fingerlings to the walleye population of the reservoir. This report describes the findings of a warm water fishery assessment survey conducted from September 14-16, 2009, and compares the results of this survey with those done previously.

METHODS

DEC's Region 8 Fisheries Unit conducted a warm water fisheries assessment survey of Waterport Reservoir on September 14, 15, and 16, 2009 in accordance with DEC's percid and centrarchid sampling manuals (Forney, et al. 1994, Green 1989). The survey included collection of pertinent chemical and physical data and sampling of fish populations by electrofishing and gill netting.

Electrofishing was conducted at night with a Polarcraft shocker boat operating at 530 volts, 120 cycles per second pulsed D.C. and 6 amps. Electrofishing was conducted in depths generally less than 6 feet at various locations along the shoreline between the bridge at Kenyonville to the west and the Waterport Dam to the east (Figure 1). Electrofishing electrode on time totaled 1.56 hours, during which 0.75 hours were spent targeting all fish species and 0.81 hours were spent targeting gamefish and percids (perch, walleyes) only.

The assessment also utilized standard gangs of sinking, multifilament gill nets bottom set overnight, perpendicular or oblique to depth contours. Each net gang consisted of seven 50 ft long panels, 8 ft deep and ranging in size from 1-5 inch stretch mesh. The net consisted of a 25 ft panel of 1 inch mesh on each end, and 50 ft panels of 1.5, 2.0, 2.5, 3.0, 4.0, and 5.0 inch mesh randomly placed between these panels. One 350-ft long multifilament net was set overnight on September 14 and two were set overnight on September 15, 2009. Net locations and depths are given in Table 1 and shown on Figure 1. Chemical and physical data obtained just east of the New York Route 279 bridge at the Hamlet of Waterport in late summer of 1989- 1994 (Lane 1995) and confirmed in 2009, suggests that anoxia occurs at depths greater than 35 feet. Nets were set in mid afternoon at depths where dissolved oxygen was above 5.0 ppm and tended the following morning.

All fish were identified, and measured for total length. Weights and scales for age determination were taken from a sub sample of northern pike *(Esox lucius)*, white perch (*Morone americana*), rock bass *(Ambloplites rupestris)*, pumpkinseed sunfish *(Lepomis gibbosus)*, bluegill sunfish *(Lepomis macrochirus)*, largemouth bass *(Micropterus salmoides)*, smallmouth bass *(Micropterus dolomieu)*, and yellow perch *(Perca flavescens)*. Weights, scales and otoliths were taken from all walleye. Scales were dried and pressed into acetate and otoliths were dried, cracked in half, "toasted" using an alcohol burner, mounted in clay, and a drop of immersion oil added. Ages were determined from magnification of scale impressions and mounted otoliths with a stereomicroscope.

Data were entered into the Bureau of Fisheries Statewide Fisheries Database and downloaded onto a Lotus 1-2-3 spreadsheet. Catch per Unit of Effort (CPUE), mean length at age, age and length structure, and size and condition indices were calculated.

Proportional stock density (PSD) compares, as a percent, the numbers of fish of quality size to those of stock size. Relative stock density (RSD) makes a similar comparison between numbers of preferred size fish to those of stock size. These size categories are quantified in New York as follows (Gablehouse 1984):

	Size category in inches (mm)		
Species	Stock	Quality	Preferred
Largemouth bass	8 (200)	12 (300)	15 (380)
Smallmouth bass	7 (180)	11 (280)	14 (350)
Sunfish	3 (80)	6 (150)	8 (200)
Crappie	5 (130)	8 (200)	10 (250)
Rock bass	4 (100)	7 (180)	9 (230)
Walleye	10 (250)	15 (380)	20 (510)
Yellow perch	5 (130)	8 (200)	10 (250)
Northern pike	14 (350)	21 (530)	28 (710)

PSD and RSD are numerical descriptions of length frequency data and are calculated as:

$$PSD = \frac{\text{Number of fish} \geq \text{min. quality length X 100}}{\text{Number of fish} \geq \text{min. stock length}}$$

$$RSD = \frac{\text{Number of fish greater than or equal to "preferred" size}}{\text{Number of fish greater than or equal to "stock" size x 100}}$$

Values of PSD and RSD range from 1 to 100. Given representative samples of a population, stock density indices can provide insight or predictive ability about population dynamics (Anderson 1980, Gabelhouse 1984, Anderson and Neumann 1996).

Relative weight (Wr) is a refinement of the relative condition concept, given by the equation:

$$Wr = (W/Ws) \text{ X } 100,$$

where W is the weight of an individual and Ws is a length-specific standard weight predicted by a weight-length regression constructed to represent the species. The form of the Ws equation is:

$$\text{Log 10 } (Ws) = a' + b \text{ x } \log10(L),$$

where a' is the intercept value and b is the slope of the log10(weight)-log10(length) regression equation and L is the maximum total length of the fish. Fish with a Wr close to 100 are in balance with their food supply, whereas fish with values below 85 are underweight and may be too abundant for their food supply. On the other end, fish with Wr above 105 are more plump than necessary, reflecting an overabundant food supply. (Flickinger et al. 1999, Anderson and Neumann 1996, Blackwell, et al. 2000).

RESULTS AND DISCUSSION

CPUE estimates for the survey are presented in Table 2. Three net sets (49 total hours) and 1.6 hours of electrofishing yielded 19 fish species and a total of 346 fish. Eighty six bluegill sunfish accounted for 29% of the catch. The second and third most commonly caught fish were largemouth bass (74, 25% of the catch) and white perch (53, 18% of the catch).

Electrofishing catch and CPUE from 1989 – 2009, are shown in Table 3. Largemouth bass (32%), bluegill and pumkinseed sunfish (37%) and shorthead redhorse (9%) were the most commonly caught species in 2009. Electrofishing in 1989, 1992, 1994, and 1999 was accomplished at night with a boat shocker operating at 200 volts, 120 cps pulsed D.C. and 9-12 amps. In 1989, electrofishing electrode on time totaled 1.35 hours, during which 0.52 hours were spent targeting all fish species, 0.52 hours were spent targeting gamefish and 0.31 hours were spent targeting percids (perch, walleyes). In 1992 and 1994, total electrofishing on time was 1 hour and only walleyes were targeted (Lane 1995). In 1999, all fish species were

collected during 1.49 hours of total electrofishing on time (Web Pearsall, NYSDEC unreported data).

Gill net catch and CPUE from 1989 – 2009, are shown in Table 4. White perch (44%), bluegill and pumkinseed sunfish (19%), and shorthead redhorse (*Moxostoma macrolepidotum,* 10%) were the most commonly caught species in 2009. The 1989-1999 surveys employed graded mesh Swedish gill nets, each composed of 6-25 foot panels of 1.5", 2", 2.38", 2.5", 3" and 3.5" (stretch) mesh for a total length of 150 feet per net. Two of these nets were deployed in 1989, and three were used in 1992, 1994, and 1999. One of the 1989 net sites was not re-utilized in 1992 or 1994. However, a site at the mouth of Otter Creek was used in all five surveys. Net sites used in 1992 and 1994 were essentially the same. Nets were set in late afternoon/early evening and tended the next morning.

Walleye. The 2009 survey captured 6 total walleyes. The 1989, 1992, 1994, and 1999 surveys captured 3, 12, 23, and 6 total walleyes respectively. Electrofishing CPUE was 0.64 per hour in 2009 and was 1.5, 7.0, 7.0, and 1.3 per hour in 1989, 1992, 1994, and 1999, respectively (Table 3). Walleye catch per unit effort (CPUE) by gill netting was 1.7 per 350 ft net in 2009, and 0.5, 1.7, 5.3, and 1.33 walleyes per 150 ft net in 1989, 1992, 1994, and 1999, respectively (Table 4). According to DEC's Percid Sampling Manual (Forney et. al. 1994), a catch rate of less than 8 walleyes per hour of electrofishing and a catch rate of less than one walleye per 150 foot net lift might be representative of a marginal walleye population. If the electrofishing and gill net catch rates were reflective of the density of walleyes in the reservoir, the population increased substantially from 1989 to 1992, remained at about the same level through 1994, and then decreased considerably from 1999 to 2009.

It is not possible to conclude with certainty what portion of these fish were recruited from the stocking program versus other potential sources, including natural reproduction in Waterport Reservoir itself or downstream migration from Glenwood Lake and/or the Barge Canal. However, based on age analysis of the six walleyes captured in the 2009 survey, all likely resulted from the Sportsmen's Federation stocking program (Table 5). Circumstantial evidence is therefore strong that stocking has been the main source of recruitment to Waterport Reservoir's walleye population. Lane (1995) likewise concluded that, except for one walleye captured in 1989, all walleye from the 1989 – 1994 surveys were from the Federation stocking program. The 2009 survey captured representatives of most the year classes that were stocked, except the 2002 and 2005 year classes. It is interesting that the year classes best represented are those of 2003 and 2001 (2 fish each or 33% of the sample each). In contrast, the 2003 year class was the largest (17,455 fingerlings stocked) and the 2001 year class was the smallest (1,482 fingerlings stocked). Similarly, the 1996 year class was relatively weak (2,380 fingerlings stocked) and was the best represented year class in the 1999 sample. Either survival of these small lots of fish was exceptional or wild fish contributed significantly to those year classes.

Figure 2 provides a growth rate summary for Waterport Reservoir and a comparison of walleye growth with the New York State average. Growth exhibited by Waterport Reservoir walleye compares favorably with the New York average (Forney, et al. 1994). The mean condition

factor (K) and mean relative weight (Wr) were 0.91 and 85.3, respectively, which suggests that Waterport Reservoir walleye are underweight at length when compared to most walleyes from other waters (Table 6).

Largemouth bass. All largemouth bass were collected by electrofishing and none were captured in gill nets in any of the surveys, a testament to this species' widely recognized ability to avoid that gear type (Tables 2-4). Largemouth bass sampled in 2009 ranged in size from 2.4 inches (61 mm) to 18.0 inches (457 mm). Of these, 57 (77%) were eight inches (203 mm) or more, 33 (36%) were 12 inches (305 mm) or more in length (PSD = 58, Table 6) and nine were 15 inches (381 mm) or more (RSD = 16). Figure 3 illustrates largemouth bass growth in Waterport Reservoir and compares it with growth rates of largemouth bass from many other New York waters (Green 1989). Waterport Reservoir largemouth bass exhibited slightly below average growth for New York. The mean condition factor (K) and mean relative weight (Wr) were 1.4 and 104, respectively, which suggests that Waterport Reservoir Largemouths are near average weight at length when compared to most largemouth bass from other waters and remained consistent over the last 10 years (Table 6).

Smallmouth bass. Smallmouths are somewhat more vulnerable to capture by gill nets than are largemouth. However, of the 14 smallmouth bass collected in 2009, 13 were collected by electrofishing (CPUE 8.3 per hour) and one was collected in gill nets. In 1989 and 1999, 23 and 65 smallmouths were collected by electrofishing, respectively (Table 3). According to Lane (1995) numerous smallmouths were observed during electrofishing in 1994, but not targeted for collection. Five were collected in gill nets in 1994 and none were collected in gill nets in either 1989 or 1992. Of the 14 smallmouth bass collected in 2009, 14 (100 %) were 7 inches (178 mm) or larger in length and 7 (50 %) were 11 inches 279 mm) or larger in length (PSD=50, Table 6). Figure 3 compares growth of Waterport Reservoir smallmouth bass with smallmouth growth from other New York waters as presented in DEC's Centrarchid Sampling Manual (Green 1989). As with largemouth bass, Waterport Reservoir smallmouth bass growth was slightly below average for New York. The mean condition factor (K) and mean relative weight (Wr) were 1.4 and 94, respectively, which suggests that Waterport Reservoir smallmouths are near average weight at length when compared to most smallmouth bass from other waters (Table 6).

The 2009 electrofishing CPUE for largemouth and smallmouth bass combined was 55.8 bass per hour. This CPUE compares very favorably with the average CPUE of 14-15 bass per hour for the statewide New York Bass Study (Green et. al. 1984), likely reflecting a moderate density of bass in the reservoir. Similarly, growth and size structure of both bass species in Waterport Reservoir is acceptable, suggesting stable populations.

Northern pike. Only one northern pike was captured in 2009, a 23 inch (584 mm) fish caught during electrofishing. Of the previous surveys, only a 25-inch (635 mm) specimen was captured by gill net in 1992. Another pike, approximately 10–12 lbs., was observed by the survey crew in 1994 that had just been caught by a shore owner fishing from his dock with live bait (Lane 1995). Pike appear to be at low density in Waterport Reservoir.

Other Species

Representatives of 15 other fish species were captured during the 2009 and the earlier surveys (Tables 3 and 4). Additionally, numerous common carp *(Cyprinus carpio)* and brook silversides *(Labidesthes sicculus)* were observed, but not captured, during electrofishing.

The influence of the Barge Canal on Waterport Reservoir's fish community is readily apparent in its species mix. Channel catfish *(Ictalurus punctatus)*, freshwater drum *(Aplodinotus grunniens)*, gizzard shad *(Dorosoma cepedianum)*, white perch, and most recently, round goby (*Neogobius melanostomus*) are not usually found in New York's smaller inland waters.

Several species, collectively termed "panfish," are of particular interest to anglers and fishery managers because of their sportfishing value and as prey for gamefish. In Waterport Reservoir, four panfish species: bluegill, black crappie *(Pomoxis nigromaculatus)*, pumpkinseeds, and white perch, are most prominent in the fishery. Rock bass and brown bullhead *(Ameiurus nebulosus)* are also present at lower densities and contribute to the panfish catch.

Table 6 illustrates the size distribution and condition indices of black crappie, bluegills, pumpkinseeds, rock bass, yellow perch, and white perch captured in 2009 and the earlier surveys. Since panfish were sampled by electrofishing only in 1989, lack of sampling consistency among the three surveys makes it difficult to draw meaningful conclusions from the data, except to say the PSDs and condition are average for crappies, sunfish, rock bass, and perch.

Sample sizes are small, but 2009, 1999, and 1994 data suggest an excellent growth rate for the sunfishes and rock bass and an average rate for yellow perch and Black crappie (Figure 4).

Despite small sample sizes for yellow perch, it is known from reliable angler reports that they have contributed significantly to panfish catches during the winter ice fishery. White perch are an important component of the Waterport Reservoir fish community and achieve fair size (8 inches (203 mm) mean total length). It is unclear if they are of importance to Waterport Reservoir anglers.

RECOMMENDATIONS

1. Currently, 120,000 walleye fry are annually stocked into Waterport Reservoir because DEC mandated disease testing of the cooperatively raised walleye pond fingerlings prior to stocking is too expensive for the Orleans County Federation of Sportsmen's Clubs. Continue the current annual walleye fry stocking if the capacity for DEC hatchery pond fingerling walleye production doesn't permit additional policies.

2. Because cooperator-raised walleye pond fingerlings successfully established a moderate fishery, annually stock 6,600 DEC raised walleye pond fingerlings for 5 years (2014 – 2018).

3. The DEC Region 8 Fisheries Unit will resurvey Waterport Reservoir in 2019, in accordance with both the post-stocking survey plan of the DEC percid sampling manual and the fish community sampling plan to assess the walleye pond fingerling stocking program and to fully characterize the Waterport Reservoir fishery.

4. Brookfield Power Corporation should continue to coordinate with DEC regarding plans to draw down Waterport Reservoir in order to minimize drawdown impacts on the reservoir's aquatic community.

REFERENCES

Anderson, R.O. 1980. Proportional stock density (PSD) and relative weight (Wr): Interpretive indices for 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 1st annual workshop of the New York Chapter American Fisheries Society.

Anderson, R. O. and R. M. Neumann. 1996. Length, weight, and associated structural indices. Chapter 15 in Murphy, B. R., and D. W. Willis, editors. Fisheries techniques. 2nd edition. American Fisheries Society, Bethesda, Maryland.

Blackwell, B. G., M. L. Brown, and D. W. Willis. 2000. Relative weight (Wr) status and current use in fisheries assessment and management. Reviews in Fisheries Science 8: 1-44.

Flickinger, S. A., F. J. Bulow, and D. W. Willis. 1999. Small impoundments. Chapter 21 in: C. C. Kohler and W. A. Hubert, editors. Inland fisheries management in North America, 2nd edition. American Fisheries Society, Bethesda, Maryland.

Forney, J.L., L.G. Rudstam, and D.M. Green 1994. Percid Sampling Manual. Chapter 3 in: Fish Sampling Manual. New York State Department of Environmental Conservation.

Gabelhouse, D.W., Jr. 1984. A length-categorization system to assess fish stocks. North American J. Fisheries Management 4:273−285.

Green, D.M. 1989. Centrarchid Sampling Manual. Chapter 1 in: Fish Sampling Manual. New York State Department of Environmental Conservation.

Green, D.M., B.J. Schonhoff III, and W.D. Youngs. 1984. Source document: Population dynamics of Largemouth and smallmouth bass in New York waters. New York State Department of Environmental Conservation, Albany, NY. 286 pp.

Lane, G.A. 1995. Summary of 1989, 1992, and 1994 Waterport Reservoir fishery surveys. NYSDEC Bureau of Fisheries, Avon, NY 14414. File report. 15 pp.

Table 1. Location of gill nets set in Waterport Reservoir September 14-16, 2009.

					Net Depth (ft)	
Site #	Date pulled	NYTME	NYTMN	Time fished	Min	Max
1	9/15/2009	237059	4801867	16.5	15	40
5	9/16/2009	234952	4800586	16.5	10	29
6	9/16/2009	236100	4801615	16	16	26
				49	13.7	31.7

Table 2. Catch per unit effort (CPUE) from electrofishing and gill nets in Waterport Reservoir September 14-16, 2009.

Electrofishing CPUE

	Site						CPUE
Species	02	03	04	07	08	Catch	#/hr
Northern pike	0	1	0	0	0	1	0.64
Common carp	12	0	0	0	0	12	7.69
White sucker	0	0	0	0	0	0	0.00
Shorthead redhorse	13	0	5	2	0	20	12.82
Brown bullhead	0	0	0	0	0	0	0.00
Channel catfish	0	0	0	0	0	0	0.00
Brook silverside	1	0	2	0	0	3	1.92
White perch	0	0	1	0	0	1	0.64
Rock bass	5	0	10	0	0	15	9.62
Pumpkinseed	5	0	14	0	0	19	12.18
Bluegill	29	0	32	4	0	65	41.67
Smallmouth bass	3	0	4	1	5	13	8.33
Largemouth bass	14	16	33	3	8	74	47.44
Black crappie	1	2	0	0	0	3	1.92
Yellow perch	0	0	0	0	0	0	0.00
Logperch	1	0	0	0	0	1	0.64
Walleye	0	0	1	0	0	1	0.64
Freshwater drum	0	0	0	0	0	0	0.00
Round goby	0	0	0	0	0	0	0.00
Total	84	19	102	10	13	228	146.15

Table 2. Continued.

Gill net CPUE

	Site				CPUE	Total	
Species	01	05	06	Catch	#/net	Catch	% Catch
Northern pike	0	0	0	0	0.00	1	0.3%
Common carp	0	1	0	1	0.33	13	3.8%
White sucker	0	2	1	3	1.00	3	0.9%
Shorthead redhorse	3	4	5	12	4.00	32	9.2%
Brown bullhead	0	3	3	6	2.00	6	1.7%
Channel catfish	0	3	1	4	1.33	4	1.2%
Brook silverside	0	0	0	0	0.00	3	0.9%
White perch	1	39	12	52	17.33	53	15.3%
Rock bass	0	2	1	3	1.00	18	5.2%
Pumpkinseed	0	0	1	1	0.33	20	5.8%
Bluegill	13	8	0	21	7.00	86	24.9%
Smallmouth bass	0	1	0	1	0.33	14	4.0%
Largemouth bass	0	0	0	0	0.00	74	21.4%
Black crappie	0	0	0	0	0.00	3	0.9%
Yellow perch	0	3	0	3	1.00	3	0.9%
Logperch	0	0	0	0	0.00	1	0.3%
Walleye	0	3	2	5	1.67	6	1.7%
Freshwater drum	0	3	0	3	1.00	3	0.9%
Round goby	0	2	1	3	1.00	3	0.9%
Total	17	74	27	118	39.33	346	100.0%

Table 3. Numbers of fish captured from electrofishing and CPUE (number of fish /hour) from Waterport Reservoir - October 1989, 1992, 1994, 1999, and 2009.

Species	1989[1]	1992[2]	1994[2]	1999[1]	2009[1]
Northern pike (*Esox lucius*)			1 (1.0)		1 (0.6)
Golden shiner (*Noteruigonus crysoleucas*)	4 (3.0)			5 (3.4)	
Common carp (*Cyprinus carpio*)	3 (2.2)				12 (7.7)
White sucker (*Catestomus commersoni*)	5 (3.7)				
Northern hog sucker (*Hypentelium nigricans*)				1 (0.7)	
Silver redhorse (*Moxostoma anisurum*)	5 (3.7)				
Shorthead redhorse (*Moxostoma macrolepidotum*)					20 (12.8)
Brown bullhead (*Ameiurus nebulosus*)	1 (0.7)			1 (0.7)	
Banded killifish (*Fundulus diaphanous*)				11 (7.4)	
Brook silversides (*Labidesthes sicculus*)	5 (3.7)				3 (1.9)
White perch (*Morone americana*)	1 (0.7)			25 (16.8)	1 (0.6)
White bass (*Morone chrysops*)				1 (0.7)	
Rock bass (*Ambloplites rupestris*)	7 (5.2)			15 (10.1)	15 (9.6)
Pumpkinseed (*Lepomis gibbosus*)	22 (16.3)				19 (12.2)
Bluegill (*Lepomis macrochirus*)	49 (36.3)			44 (29.5)	65 (41.7)
Smallmouth bass (*Micropterus dolomieu*)	23 (17.0)			65 (43.6)	13 (8.3)
Largemouth bass (*Micropterus salmoides*)	13 (9.6)			30 (20.1)	74 (47.4)
Black crappie (*Pomoxis nigromaculatus*)	38 (28.2)			10 (6.7)	3 (1.9)
Yellow perch (*Perca flavescens*)	3 (2.2)				
Logperch (*Percina caprodes*)				1 (0.7)	
Walleye (*Sander vitreus*)	2 (1.5)	7 (7.0)	7 (7.0)	2 (1.3)	1 (0.6)

Footnotes: 1. All fish targeted. 2. Only walleyes targeted.

Table 4. Numbers of fish captured in gill nets and CPUE (number of fish /gill net) from Waterport Reservoir - October 1989, 1992, 1994, 1999, and 2009.

Species	1989[1]	1992[1]	1994[1]	1999[1]	2009[2]
Northern pike (*Esox lucius*)		1 (0.3)			
Gizzard shad (*Dorosoma cepedianum*)		4 (1.3)			
Golden shiner (*Noteruigonus crysoleucas*)	5 (2.5)	2 (0.7)	4 (1.3)		
Common carp (*Cyprinus carpio*)					1 (0.3)
White sucker (*Catestomus commersoni*)	22 (11.0)	8 (2.7)	5 (1.7)	3 (1.0)	3 (1.0)
Northern hog sucker (*Hypentelium nigricans*)	1 (0.5)			1 (0.3)	
Silver redhorse (*Moxostoma anisurum*)	1 (0.5)	20 (6.7)	16 (5.3)	33 (11.0)	
Shorthead redhorse (*Moxostoma macrolepidotum*)					12 (4.0)
Brown bullhead (*Ameiurus nebulosus*)		3 (1.0)	1 (0.3)		6 (2.0)
Channel catfish (*Ictalurus punctatus*)		1 (0.3)			4 (1.3)
White perch (*Morone americana*)	12 (6.0)	73 (24.3)	26 (8.7)	49 (16.3)	52 (17.3)
White bass (*Morone chrysops*)					
Rock bass (*Ambloplites rupestris*)		8 (2.7)	12 (4.0)	41 (13.7)	3 (1.0)
Pumpkinseed (*Lepomis gibbosus*)	7 (3.5)	8 (2.7)	6 (2.0)		1 (0.3)
Bluegill (*Lepomis macrochirus*)	1 (0.5)	6 (2.0)	17 (5.7)	6 (2.0)	21 (7.0)
Smallmouth bass (*Micropterus dolomieu*)			5 (1.7)	2 (0.7)	1 (0.3)
Black crappie (*Pomoxis nigromaculatus*)	32 (16)	5 (1.7)	26 (8.7)	6 (2.0)	
Yellow perch (*Perca flavescens*)	2 (1.0)	10 (3.3)	10 (3.3)	4 (1.3)	3 (1.0)
Logperch (*Percina caprodes*)					
Walleye (*Sander vitreus*)	1 (0.5)	5 (1.7)	16 (5.3)	4 (1.3)	5 (1.7)
Freshwater drum (*Aplodinotus grunniens*)			1 (0.3)	1 (0.3)	3 (1.0)
Round goby (*Neogobius melanostomus*)					3 (1.0)

Footnotes: 1. 6 ft X 150 ft nets. 2. 8 ft X 350 ft nets.

Table 5. Number and stage of walleye stocked into Waterport Reservoir and walleye age (years) captured by gill net & electrofishing, September 1999 and 2009.

			Year Sampled					
			1999			2009		
Year stocked	Number stocked	Stage	Age	Frequency	Percent	Age	Frequency	Percent
2009	120,000	fry				0	0	0.0%
2008	30,000	fry				1	0	0.0%
2007	90,000	fry				2	0	0.0%
2006	0					3	1	16.7%
2005	16,298*	fingerling				4	0	0.0%
2004	651*	fingerling				5	1	16.7%
2003	17,455	fingerling				6	2	33.3%
2002	5,966	fingerling				7	0	0.0%
2001	1,482	fingerling				8	2	33.3%
2000	2,544	fingerling				9	0	0.0%
1999	10,588	fingerling	0	0	0.0%	10	0	0.0%
1998	10,378	fingerling	1	1	16.7%			
1997	0	fingerling	2	0	0.0%			
1996	2,380	fingerling	3	4	66.7%			
1995	6,385	fingerling	4	1	16.7%			
1994	4,929	fingerling	5	0	0.0%			
	319,056			6	100.0%		6	100.0%

*Stocked from Glenwood Lake north to Lake Ontario, including Waterport Reservoir

Table 6. Proportional Stock Density (PSD), Fulton Condition factor (K), and Relative Weight (Wr) of select species sampled in Waterport Reservoir from 1989-2009.

PSD

Species	1989	1992	1994	1999	2009
Largemouth bass	44			67	58
Smallmouth bass	21		60	43	50
Black crappie	16	50	45	69	100
Pumpkinseed/bluegill	57	57	52	39	52
Rock bass	50	50	50	36	44
Yellow perch	40	50	50		50

Mean Condition (K)

Species	1989	1992	1994	1999	2009
Largemouth bass				1.3	1.4
Smallmouth bass			1.2	1.2	1.4
Black crappie			1.4	1.4	1.5
Pumpkinseed			2.2		2.2
Bluegill			2.1	1.9	2.1
Rock bass			2	1.6	1.8
Yellow perch			1.2	0.97	1.1
White perch					1.5

Mean Relative Weight (Wr)

Species	1989	1992	1994	1999	2009
Largemouth bass				102	104
Smallmouth bass			84	84	94
Black crappie			105	91	90
Pumpkinseed			100		102
Bluegill			101	94	101
Rock bass			91	74	83
Yellow perch			88	67	86
White perch					97

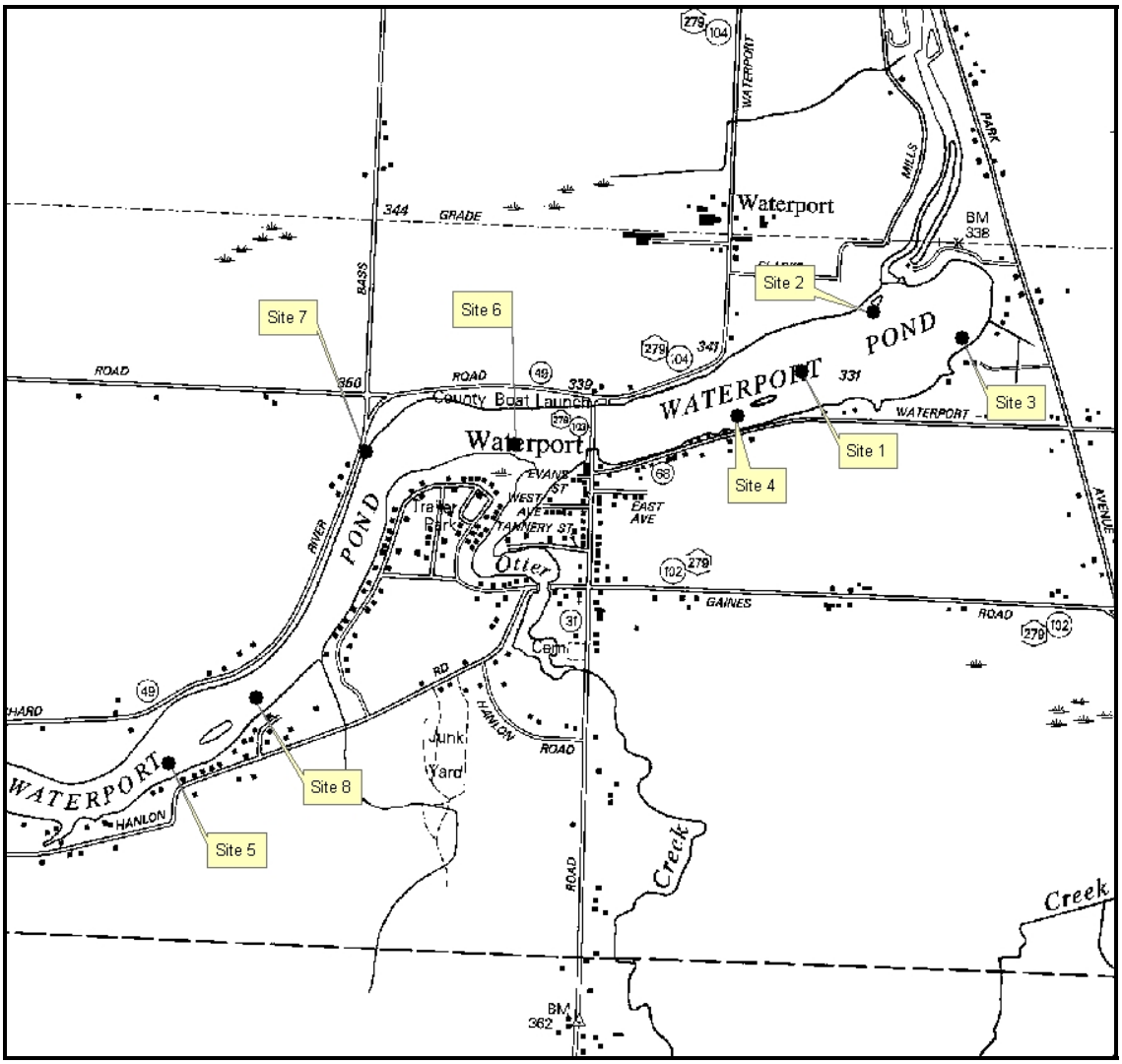

Figure 1. Map of Waterport Reservoir showing September 2009 sampling locations.

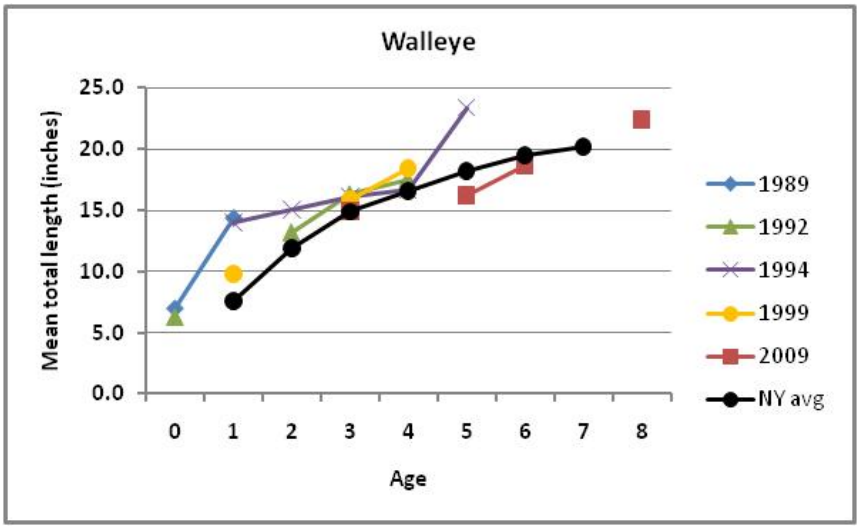

Figure 2. Mean total length at age for walleye sampled in Waterport Reservoir from 1989 to 2009 and the New York State average.

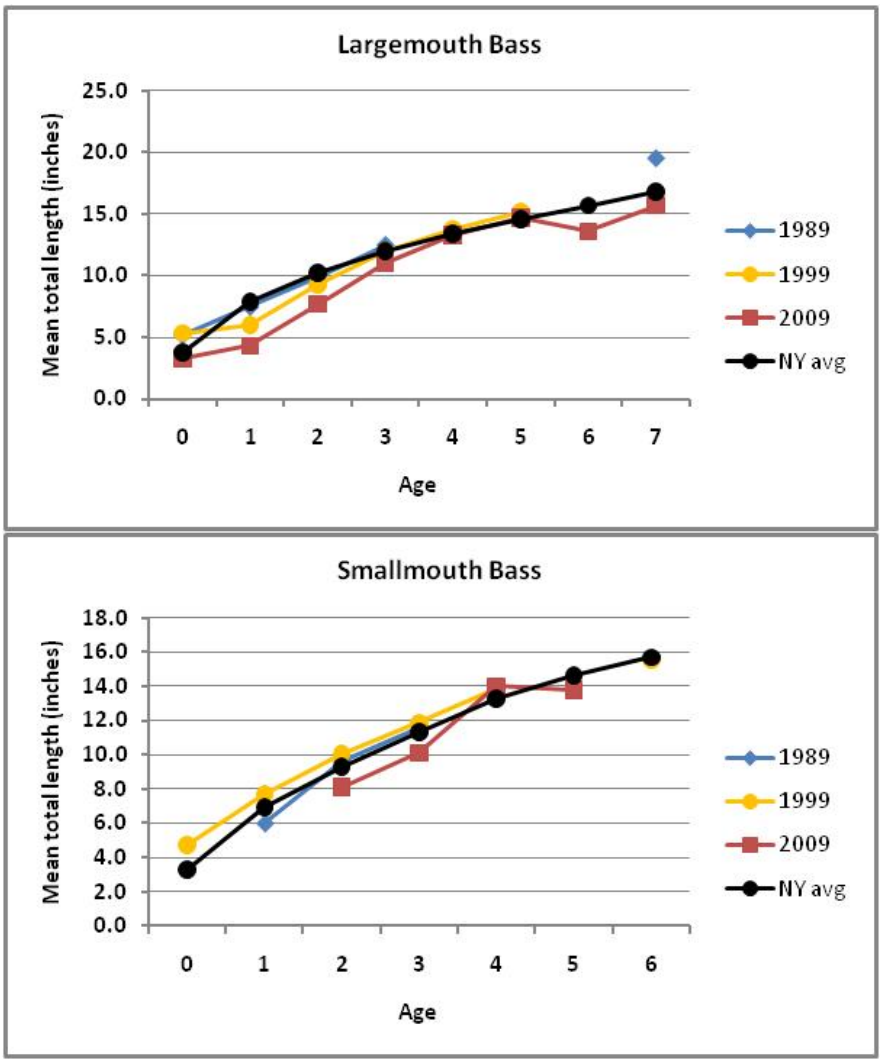

Figure 3. Mean total length at age for largemouth and smallmouth bass sampled in Waterport Reservoir from 1989 to 2009 and the New York State average.

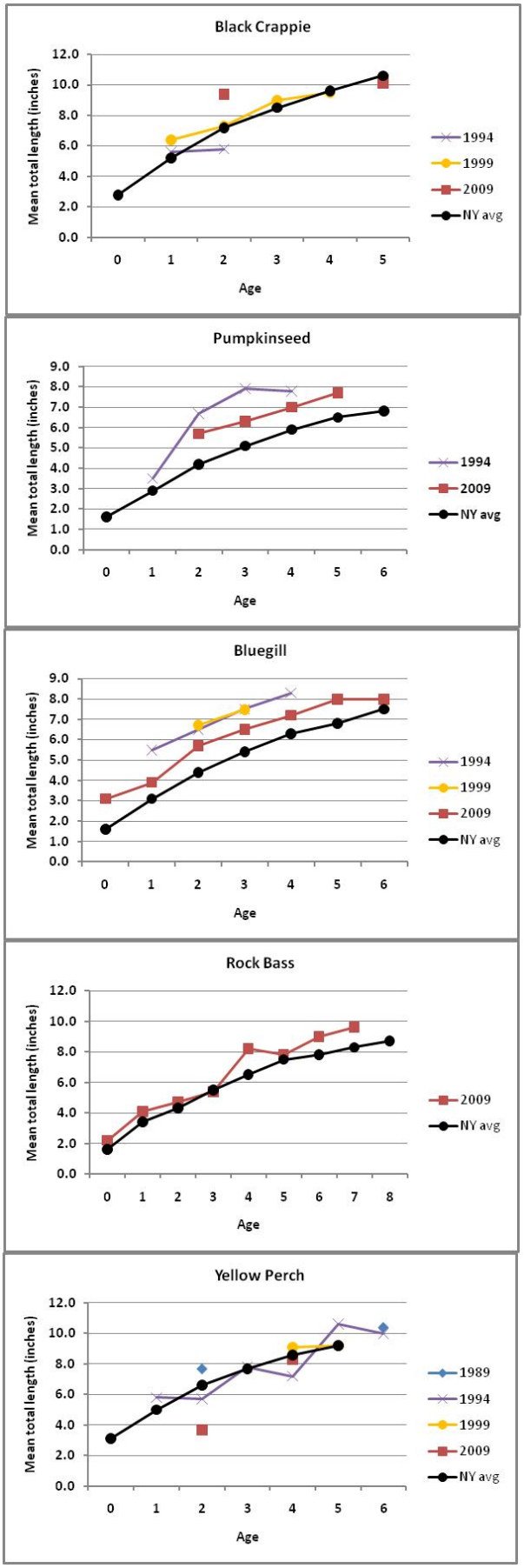

Figure 4. Mean total length at age for selected panfish species sampled in Waterport Reservoir from 1989 to 2009 and the New York State average.

APPENDIX A

Walleye fingerlings produced for stocking from Brackett Pond

Year	Number	Water
1989	11,200	Waterport Reservoir
1990	5,200	Waterport Reservoir
1991	2,684	Waterport Reservoir
1992	20,340	Waterport Reservoir
1993	1,276	Waterport Reservoir
1994	4,929	Waterport Reservoir
1995	12,370	Bridges (Oak Orchard) 6,385
		Pt Breeze (Oak Orchard) 5,985
1996	2,380	Waterport Reservoir
1997	0	Waterport Reservoir
1998	10,378	Waterport Reservoir
1999	10,588	Waterport Reservoir
2000	2,544	Waterport Reservoir
2001	1,482	Waterport Reservoir
2002	5,966	Waterport Reservoir
2003	17,455	Waterport Reservoir
2004	651	Glenwood Lake north to Lake Ontario
2005	16,298	Oak Orchard, North of Glenwood Lake to Waterport Reservoir
2006	11,820	Waterport Reservoir

APPENDIX B

Walleye fry stocked into Waterport Reservoir

Year	Number	Water
2007	90,000 Fry	Waterport Reservoir
2008	0	Waterport Reservoir
2009	120,000 Fry	Waterport Reservoir
2010	120,000 Fry	Waterport Reservoir
2011	120,000 Fry	Waterport Reservoir