

# Diet analysis of predatory fish prior and subsequent to stocking walleye (*Sander vitreus*) in Otsego Lake, 2007

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## INTRODUCTION

Otsego Lake (42° 41'N-70° 53'W) is the headwaters of the glacially-created Susquehanna River Valley within the northern Appalachian Plateau. Harman et al. (1997) classified the lake as oligo-mesotrophic prior to the unauthorized introduction of alewife (*Alosa pseudoharengus*) in 1986 (Foster 1989). This introduction affected the lake, causing the limnology to turn toward a more eutrophic system (Harman et al. 2002). Alewives are effective planktivores and have created a shift in zooplankton populations from larger *Daphnia* to smaller *Bosmina* (Warner 1999). Increased algae populations due to the decrease in large zooplankton have caused the transparency of the lake to decrease. Increased algae levels also cause depressed hypolimnetic oxygen concentrations during summer stratification. Algae decomposing in the hypolimnetic zone consume dissolved oxygen within that strata. Competition with alewife for food can be blamed for the decrease of the Otsego bass (*Coregonus clupeaformis*) and cisco (*C. artedii*) (Linhart 1999).

Otsego Lake has been stocked with walleye since 2000 at a targeted rate of 80,000 per year. The intention for research during summer 2007 was to stock half of the 40,000 during the daytime and half during the night time in order to evaluate differences in short term survival rates of the walleye. This would complement work done in previous years (Cornwell 2001; Cheever 2004). However all 40,000 walleye were stocked during the daytime on 27 and 28 June due to complications with an outside supplier.

Continued research by the Biological Field Station has investigated alewife abundance (Brooking and Cornwell 2005), as well as trophic changes (Albright 2005) that might be related to declining alewife populations resulting from walleye predation.

Alewife use shallow waters in the littoral zone to spawn from late May to August (Smith 1985). The stocking of walleye has been timed to correlate with the spawning alewife. Introduced walleye are expected to feed upon the alewife fry allowing for optimal walleye growth. Stocked walleye must survive heavy predation as they are stocked; this is generally considered the most important variable determining the success of stocked fish (Clapp et al. 1995).

Hoyle and Keast (1987) indicate that bass can consume slender bodied prey (i.e., Walleye) up to 50% of the bass total length, with 35% of their total length being optimal. These

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models suggest that stocked walleye could be vulnerable to predators as small as 100mm and very vulnerable to fish 150mm.

The goal of this study is to determine the survival rates of stocked walleye, identify specific predators by examining stomach contents of seined predatory fish prior to and after stocking, and to determine whether those predators are selecting for walleye over other prey fish present in the community.

## METHODS

This study took place during June 2007. Six sample sites were chosen for predator data collection (Figure 1). The three sites on the west shore included Brookwood Point, Three mile Point, Five Mile Point, and the three sites on the east side included Point Judith, Point Florence, and Gravelly Point. These sites were chosen for their accessibility, ease of seining, and for having similar bathymetrics. Pre-stocking seining was conducted between 1 and 25 June, with each site having been seined a variable amount of times to collect a sufficient number of predators. This work was conducted to characterize the fish community and predation habits prior to the addition of walleye. Additionally, this work provided the opportunity to train the seining team so that work would proceed effectively following the walleye stocking.

Stocking occurred on 27 June on the east side of the lake and 28 June on the west side. The first day of stocking included the west side sites (Five Mile, Three Mile, and Brookwood Points) and was of fingerlings that averaged 44.9 mm in length. The east side sites (Gravelly, Florence, and Judith Points) were stocked on the later date, with fry averaging 33.6 mm in length. A total of 40,000 walleye fry were distributed equally at all six sites. Walleye fingerlings tend to be littoral fish and therefore were not expected to cross the deep basin of Otsego Lake, so any walleye collected at a particular site was assumed to have been stocked in that immediate vicinity.

The Biological Field Station barge, including a 350 gallon holding tank and aerator, was used to transport fingerlings to their point of release. Fish were stocked at 11:00 AM on both dates. Seining embarked two hours following stocking. However, due to severe weather, Three Mile and Gravelly Points were comparably sampled 20 hours subsequent to stocking.

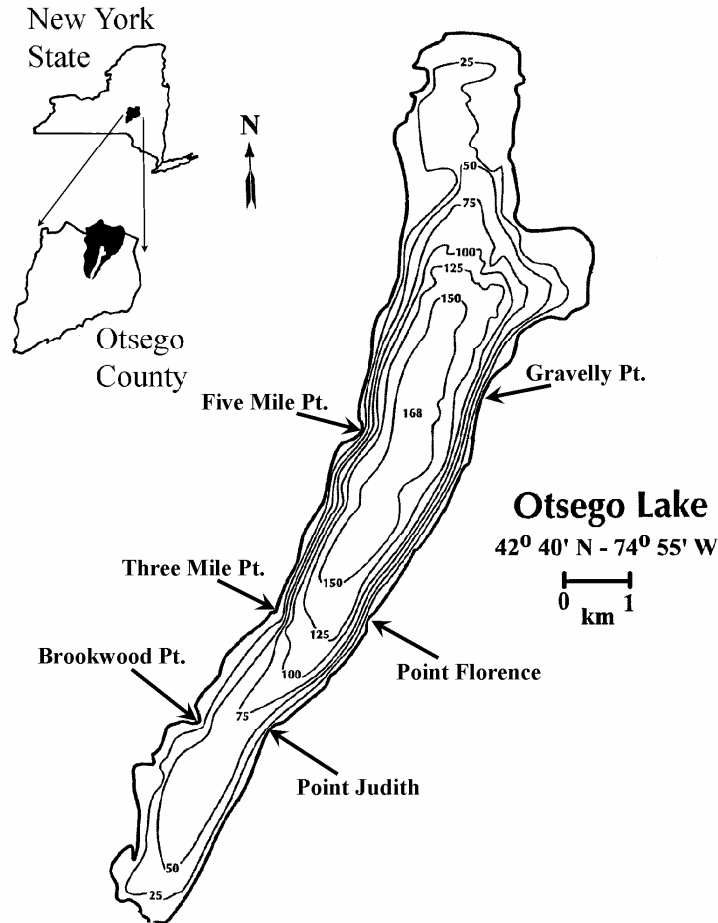


Figure 1. Bathymetric map of Otsego Lake showing sites of stocking and seining efforts.

The collection of fish followed methodologies outlined in Nelson et al. (1983). A 300' haul seine was used. Captured fish were designated into three categories; predator, prey and others. Predators included individuals of the following species which exceeded 100mm: largemouth bass (*Micropterus salmoides*), smallmouth bass (*M. dolomieu*), yellow perch (*Perca flavescens*), chain pickerel (*Esox niger*) and rock bass (*Ambloplites rupestris*). Additional to the aforementioned predators, five adult walleye were captured and lavaged at Three Mile Point on 1 June, however none were captured subsequent to stocking. These walleye were determined to be large enough (323-349 mm) to be potential predators of walleye fry, due to the fact that they are voracious opportunistic feeders and may perform cannibalism (Smith 1985).

The prey community included any species of fish under 100mm in length. These species included bluntnose (*Pimephales notatus*) and fathead minnows (*P. promelas*), spottail (*Notropis hudsonius*) and emerald shiners (*N. atherinoides*), tessellated darters (*Etheostoma olmstedii*), walleye, as well as any centrarchid under 100mm including largemouth bass, smallmouth bass, bluegill (*Lepomis macrochirus*), pumpkinseed (*L. gibbosus*), and redbreast (*L. auritus*). Although most alewife collected were over 100mm in length, they were considered as prey. Fish

too small or young to identify were designated as ichthyoplankton. All fish over 100 mm were measured and recorded, including predators. Stomach contents were taken from all predators over 100mm using pulsed gastric lavage as described by Lagler et al. (1962) and Foster (1977). Stomach contents were collected in Whirl-Pacs<sup>®</sup>, labeled, preserved in 70% ethanol and refrigerated.

Stomach contents were examined at later dates. Contents were described in three ways; frequency of occurrence, percent composition by number, and percent composition by weight. Frequency of occurrence is the proportion of fish that contained one or more of a given food type (Bowen 1996). The percent composition by number expresses the percentage of a given food type of the total items counted (Bowen 1996). Percent composition by weight expresses the percentage of a given food type of the total weight (in grams) of a certain food type. The Strauss index (1979) was used to describe prey selection by predators in this study and is represented by the formula:

$$SI=r_i-p_i$$

SI is the expression of the Strauss index from 1 to -1,  $r_i$  is the relative abundance of prey type in the predator diet and  $p_i$  is the relative abundance of that fish in the environment (Bowen 1996). A Strauss index of 1 indicates perfect selection for a prey item and an index of -1 indicates perfect selection against it (Bowen 1996). A Strauss index of 0 indicates the prey item being selected for at the same proportion to its population within the community.

## RESULTS AND DISCUSSION

Tables 1 through 5 describe the frequency of occurrence (FOO), percent by composition, and percent by weight of stomach contents of the five species of predators collected. A wide diversity of invertebrates and fish were observed among samples collected. Crayfish were the most prominent prey item by proportion for occurrence, number, and weight of all predators, except chain pickerel. Although the sample size of pickerel stomach samples collected was small, they proved to be primarily piscivorous. No walleye were collected from stomachs prior to stocking. Subsequent to stocking, yellow perch, largemouth and smallmouth bass exhibited high frequencies of occurrence of walleye fry in stomach samples.

Table 6 describes the overall prey community collected. The number of each prey item consumed by each predator, both prior and subsequent to stocking, is given, as are the corresponding SI values. Yellow perch and smallmouth bass exhibited strong preference for walleye fry as a food source subsequent to stocking. The Strauss Index for largemouth bass displayed slight selection towards walleye whereas rock bass and chain pickerel exhibited no selection for walleye. Largemouth bass and chain pickerel displayed strong preference for alewife prior to stocking.

## YELLOW PERCH STOMACH ANALYSIS

PREY		West Side Prior			West Side Subsequent			East Side Prior			East Side Subsequent		
		N = 47			N = 33			N = 28			N = 19		
		FOO	% by Number	% by Weight	FOO	% by Number	% by Weight	FOO	% by Number	% by Weight	FOO	% by Number	% by Weight
<b>Fish</b>	<b>Walleye</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.606</b>	<b>44.7</b>	<b>75.2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.053</b>	<b>3.1</b>	<b>1.1</b>
	Alewife	0.022	0.3	12.8	0	0	0	0	0	0	0	0	0
	Centrarchidae	0.044	1.4	4.3	0.030	0.4	0.7	0	0	0	0	0	0
	Largemouth Bass	0	0	0	0.061	0.8	0.4	0	0	0	0.053	9.4	2
	Smallmouth Bass	0	0	0	0.061	1.1	0.5	0	0	0	0.105	15.6	3.5
	Cyprinidae	0.022	0.3	0.4	0	0	0	0.036	0.3	0	0	0	0
	Bluntnose Minnow	0	0	0	0	0	0	0	0	0	0	0	0
	Tessellated Darter	0.067	1.1	11.7	0	0	0	0	0	0	0.053	3.1	6.6
	Ichthyoplankton	0.067	6.6	1.3	0.212	5.7	1.3	0.036	1.8	2.2	0.053	6.3	1.3
<b>Amphibian</b>	Tadpole	0	0	0	0	0	0	0	0	0	0	0	0
<b>Crustacea</b>	Amphipod	0.178	7.7	0	0.03	1.1	0	0.286	17.7	0.2	0	0	0
	Crayfish	0.444	6.6	54.7	0.333	5	18	0.357	4	78.1	0.526	34.4	85
<b>Mollusca</b>	Physidae	0.022	0.9	0.4	0	0	0	0	0	0	0	0	0
	Planorbidae	0.022	0.3	0	0	0	0	0	0	0	0	0	0
<b>Insecta</b>	Anisoptera	0.067	0.9	5.9	0	0	0	0.107	0.9	2.4	0	0	0
	Arachnidae	0.022	0.3	0	0	0	0	0	0	0	0	0	0
	Chironomid	0.133	11.7	0	0.03	0.4	0	0.179	3.1	0	0	0	0
	Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0
	Diptera	0.044	1.1	0	0.03	0.4	0	0.25	5.8	0.7	0	0	0
	Ephemeroptera	0.4	21.7	1.7	0.212	23.3	0.5	0.143	1.8	0	0.105	9.4	0.2
	Gerridae	0.022	2	0.8	0	0	0	0.036	0.3	0	0	0	0
	Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0
	Notonectidae	0.2	4.6	0.3	0.152	8.8	0.2	0.179	2.8	0.2	0.053	3.1	0
	Psephenidae	0	0	0	0	0	0	0	0	0	0	0	0
	Trichoptera	0.289	15.1	0.7	0.03	0.8	0	0.5	52.6	11.3	0	0	0
	Zygoptera	0.178	16.9	4.9	0.394	7.6	3.1	0.357	8.9	4.8	0.053	3.1	0.2
<b>Empty</b>		0.044	0.6	NA	0	0	NA	0	0	NA	0.211	12.5	NA

Table 1. Frequency of occurrence (FOO), percent by number, and percent by weight of stomach samples collected from yellow perch (*Perca flavescens*) prior and subsequent to walleye fingerling stocking in Otsego Lake, June 2007. Data pertaining to stocked walleye are in **bold**.

### LARGEMOUTH BASS STOMACH ANALYSIS

PREY		West Side Prior			West Side Subsequent			East Side Prior			East Side Subsequent		
		N = 3			N = 2			N = 12			N = 6		
		FOO	% by Number	% by Weight	FOO	% by Number	% by Weight	FOO	% by Number	% by Weight	FOO	% by Number	% by Weight
<b>Fish</b>	<b>Walleye</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.333</b>	<b>22.2</b>	<b>2</b>	
	Alewife	0.333	10	62.6	0	0	0	0.167	11.8	70.7	0	0	0
	Centrarchidae	0	0	0	0	0	0	0	0	0	0	0	0
	Largemouth Bass	0	0	0	0	0	0	0	0	0	0	0	0
	Smallmouth Bass	0	0	0	0	0	0	0	0	0	0.167	11.1	3.5
	Cyprinidae	0.333	10	11.6	0	0	0	0.083	5.9	1.1	0	0	0
	Bluntnose Minnow	0	0	0	0	0	0	0	0	0	0	0	0
	Tessellated Darter	0	0	0	0.5	50	42.6	0.25	17.6	21.1	0	0	0
	Ichthyoplankton	0	0	0	0	0	0	0	0	0	0	0	0
<b>Amphibian</b>	Tadpole	0	0	0	0	0	0	0	0	0	0	0	0
<b>Crustacea</b>	Amphipod	0	0	0	0	0	0	0	0	0	0	0	0
	Crayfish	0.333	10	25.9	0.5	33.3	57.5	0.083	5.9	6.8	0.333	33.3	94.6
<b>Mollusca</b>	Physidae	0	0	0	0	0	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0	0	0	0	0	0
<b>Insecta</b>	Anisoptera	0	0	0	0	0	0	0	0	0	0	0	0
	Arachnidae	0	0	0	0	0	0	0	0	0	0	0	0
	Chironomid	0	0	0	0	0	0	0.083	5.9	0	0	0	0
	Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0
	Diptera	0	0	0	0	0	0	0	0	0	0.167	11.1	0
	Ephemeroptera	0.333	40	0	0	0	0	0.167	11.8	0	0	0	0
	Gerridae	0	0	0	0	0	0	0	0	0	0	0	0
	Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0
	Notonectidae	0.333	20	0	0	0	0	0	0	0	0	0	0
	Psephenidae	0	0	0	0	0	0	0	0	0	0	0	0
	Trichoptera	0.333	10	0	0	0	0	0.083	17.6	0	0	0	0
	Zygoptera	0	0	0	0	0	0	0.083	5.9	0.2	0	0	0
<b>Empty</b>		0	0	NA	0.5	16.7	NA	0.25	17.6	NA	0.333	22.2	NA

Table 2. Frequency of occurrence (FOO), percent by number, and percent by weight of stomach samples collected from largemouth bass (*Micropterus salmoides*) prior and subsequent to walleye fingerling stocking in Otsego Lake, June 2007. Data pertaining to stocked walleye are in **bold**.

### SMALLMOUTH BASS STOMACH ANALYSIS

PREY		West Side Prior			West Side Subsequent			East Side Prior			East Side Subsequent		
		N = 25			N = 13			N = 41			N = 18		
		FOO	% by Number	% by Weight	FOO	% by Number	% by Weight	FOO	% by Number	% by Weight	FOO	% by Number	% by Weight
<b>Fish</b>	<b>Walleye</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.385</b>	<b>41</b>	<b>72.3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.444</b>	<b>28.2</b>	<b>47.1</b>
	Alewife	0.04	1	34.1	0	0	0	0.024	0.9	26.6	0	0	0
	Centrarchidae	0.04	1	5.8	0	0	0	0.049	1.7	2.1	0	0	0
	Largemouth Bass	0	0	0	0	0	0	0	0	0	0	0	0
	Smallmouth Bass	0	0	0	0	0	0	0	0	0	0	0	0
	Cyprinidae	0.04	1	0	0	0	0	0.049	1.7	0.9	0.056	0.9	2.4
	Bluntnose Minnow	0.04	1	2.2	0	0	0	0.024	2.6	7.8	0.056	0.9	7
	Tessellated Darter	0.08	2	10.7	0	0	0	0.098	3.4	2.4	0.056	5.5	2.1
	Ichthyoplankton	0.04	5.1	0.2	0.154	17.9	6	0	0	0	0.389	10.9	3.7
<b>Amphibian</b>	Tadpole	0	0	0	0	0	0	0.024	0.9	0	0	0	0
<b>Crustacea</b>	Amphipod	0	0	0	0	0	0	0	0	0	0	0	0
	Crayfish	0.348	10.2	45.3	0.385	15.4	7.8	0.585	20.5	54.1	0.389	14.5	33.2
<b>Mollusca</b>	Physidae	0	0	0	0	0	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0	0	0	0	0	0
<b>Insecta</b>	Anisoptera	0	0	0	0.077	2.6	5.7	0	0	0	0	0	0
	Arachnidae	0.04	1	0	0	0	0	0	0	0	0	0	0
	Chironomid	0	0	0	0	0	0	0	0	0	0	0	0
	Coleoptera	0	0	0	0	0	0	0.024	0.9	0	0	0	0
	Diptera	0.174	14.3	0.2	0.231	7.7	1.1	0.317	29.1	4.2	0.389	10.9	1.3
	Ephemeroptera	0.435	37.8	1.5	0.077	2.6	0	0.268	28.2	1.8	0.278	20.9	0
	Gerridae	0	0	0	0	0	0	0	0	0	0	0	0
	Hemiptera	0.04	1	0	0	0	0	0	0	0	0	0	0
	Notonectidae	0.2	19.4	0	0	0	0	0.073	3.4	0	0	0	0
	Psephenidae	0	0	0	0	0	0	0	0	0	0	0	0
	Trichoptera	0.08	2	0	0.077	2.6	0	0.024	0.9	0	0.056	0.9	0
	Zygoptera	0.08	2	0	0.231	10.3	7.1	0.073	3.4	0.2	0.167	4.5	3.2
<b>Empty</b>		0.04	1	NA	0	0	NA	0.073	2.6	NA	0.111	1.8	NA

Table 3. Frequency of occurrence (FOO), percent by number, and percent by weight of stomach samples collected from smallmouth bass (*Micropterus dolomieu*) prior and subsequent to walleye fingerling stocking in Otsego Lake, June 2007. Data pertaining to stocked walleye are in **bold**.

### ROCK BASS STOMACH ANALYSIS

PREY		West Side Prior			West Side Subsequent			East Side Prior			East Side Subsequent		
		N = 12			N = 21			N = 6			N = 12		
		FOO	% by Number	% by Weight	FOO	% by Number	% by Weight	FOO	% by Number	% by Weight	FOO	% by Number	% by Weight
<b>Fish</b>	<b>Walleye</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.048</b>	<b>4.3</b>	<b>1.8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
	Alewife	0	0	0	0	0	0	0	0	0	0	0	0
	Centrarchidae	0	0	0	0.048	4.3	5	0.167	6.7	3.2	0	0	0
	Largemouth Bass	0	0	0	0	0	0	0	0	0	0	0	0
	Smallmouth Bass	0	0	0	0	0	0	0	0	0	0	0	0
	Cyprinidae	0	0	0	0	0	0	0	0	0	0	0	0
	Bluntnose Minnow	0.083	3.8	65.9	0.095	8.7	26.3	0.833	33.3	62.2	0	0	0
	Tessellated Darter	0	0	0	0	0	0	0	0	0	0	0	0
	Ichthyoplankton	0	0	0	0	0	0	0	0	0	0	0	0
<b>Amphibian</b>	Tadpole	0	0	0	0	0	0	0	0	0	0	0	0
<b>Crustacea</b>	Amphipod	0.083	3.8	0	0.048	4.3	0	0	0	0	0	0	0
	Crayfish	0.429	11.5	34.1	0.238	21.7	66.5	0.167	33.3	34.3	0.583	0.467	91.2
<b>Mollusca</b>	Physidae	0	0	0	0	0	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0.167	6.7	0	0	0	0
<b>Insecta</b>	Anisoptera	0	0	0	0	0	0	0	0	0	0	0	0
	Arachnidae	0	0	0	0	0	0	0	0	0	0	0	0
	Chironomid	0.167	7.7	0	0	0	0	0	0	0	0	0	0
	Coleoptera	0.083	3.8	0	0	0	0	0	0	0	0	0	0
	Diptera	0.167	11.5	0	0	0	0	0.167	6.7	0	0	0	0
	Ephemeroptera	0.083	3.8	0	0	0	0	0.167	6.7	0	0	0	0
	Gerridae	0	0	0	0	0	0	0	0	0	0	0	0
	Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0
	Notonectidae	0	0	0	0	0	0	0	0	0	0	0	0
	Psephenidae	0.083	3.8	0	0	0	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0.048	4.3	0	0	0	0	0	0	0
	Zygotera	0.333	42.3	0	0.095	13	0.4	0.167	6.7	0.2	0.167	26.7	8.8
<b>Empty</b>		0.167	7.7	NA	0.429	39	NA	0	0	NA	0.333	0.267	NA

Table 4. Frequency of occurrence (FOO), percent by number, and percent by weight of stomach samples collected from rock bass (*Ambloplites rupestris*) prior and subsequent to walleye fingerling stocking in Otsego Lake, June 2007. Data pertaining to stocked walleye are in **bold**.

### CHAIN PICKEREL STOMACH ANALYSIS

PREY		West Side Prior			West Side Subsequent			East Side Prior			East Side Subsequent		
		N = 0			N = 1			N = 6			N = 6		
		FOO	% by Number	% by Weight	FOO	% by Number	% by Weight	FOO	% by Number	% by Weight	FOO	% by Number	% by Weight
<b>Fish</b>	<b>Walleye</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>33.3</b>	<b>2.7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
	Alewife	0	0	0	1	66.7	97.3	1	70	100	0.333	0.222	95.2
	Centrarchidae	0	0	0	0	0	0	0.167	10	0	0	0	0
	Largemouth Bass	0	0	0	0	0	0	0	0	0	0.167	0.444	4.8
	Smallmouth Bass	0	0	0	0	0	0	0	0	0	0	0	0
	Cyprinidae	0	0	0	0	0	0	0	0	0	0	0	0
	Bluntnose Minnow	0	0	0	0	0	0	0	0	0	0	0	0
	Tessellated Darter	0	0	0	0	0	0	0	0	0	0	0	0
	Ichthyoplankton	0	0	0	0	0	0	0	0	0	0	0	0
<b>Amphibian</b>	Tadpole	0	0	0	0	0	0	0	0	0	0	0	0
<b>Crustacea</b>	Amphipod	0	0	0	0	0	0	0	0	0	0	0	0
	Crayfish	0	0	0	0	0	0	0	0	0	0	0	0
<b>Mollusca</b>	Physidae	0	0	0	0	0	0	0	0	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0	0	0	0	0	0
<b>Insecta</b>	Anisoptera	0	0	0	0	0	0	0	0	0	0	0	0
	Arachnidae	0	0	0	0	0	0	0	0	0	0	0	0
	Chironomid	0	0	0	0	0	0	0.167	10	0	0	0	0
	Coleoptera	0	0	0	0	0	0	0	0	0	0	0	0
	Diptera	0	0	0	0	0	0	0	0	0	0	0	0
	Ephemeroptera	0	0	0	0	0	0	0	0	0	0	0	0
	Gerridae	0	0	0	0	0	0	0	0	0	0	0	0
	Hemiptera	0	0	0	0	0	0	0	0	0	0	0	0
	Notonectidae	0	0	0	0	0	0	0	0	0	0	0	0
	Psephenidae	0	0	0	0	0	0	0	0	0	0	0	0
	Trichoptera	0	0	0	0	0	0	0.167	10	0	0	0	0
	Zygoptera	0	0	0	0	0	0	0	0	0	0	0	0
<b>Empty</b>		0	0	NA	0	0	NA	0	0	NA	0.5	0.333	NA

Table 5. Frequency of occurrence (FOO), percent by number, and percent by weight of stomach samples collected from chain pickerel (*Esox niger*) prior and subsequent to walleye fingerling stocking in Otsego Lake, June 2007. Data pertaining to stocked walleye are in **bold**.

Predator	Prey	# Netted		# Consumed		Strauss Index	
		Prior	Subsequent	Prior	Subsequent	Prior	Subsequent
Yellow Perch N = 127	Walleye	1	183	0	118	0	<b>0.617</b>
	Alewife	30	0	1	0	0.021	0
	Tessellated Darter	92	42	0	1	-0.032	-0.033
	Ichthyoplankton	0	0	23	17	0.742	0.114
	Largemouth Bass	0	62	0	5	0	-0.025
	Smallmouth Bass	3	40	0	8	-0.001	0.016
	<b>Total Centrarchidae</b>	627	294	5	0	-0.059	-0.281
		630	396	5	13	-0.060	-0.291
	Bluntnose Minnow	1945	368	0	0	-0.682	-0.351
	Emerald Shiner	42	9	0	0	-0.015	-0.009
	Fathead Minnow	27	17	0	0	-0.010	-0.016
	Spottail Shiner	83	33	0	0	-0.029	-0.031
	Unidentified Cyprinidae	0	0	2	0	0.065	0
	<b>Total Cyprinidae</b>	2097	427	2	0	-0.671	-0.407
		Empty			4	4	
<b>Total</b>		2850	1048	31	149		
Largemouth Bass N = 23	Walleye	1	183	0	2	0	0.158
	Alewife	30	0	3	0	0.364	0
	Tessellated Darter	92	42	3	3	0.342	0.460
	Ichthyoplankton	0	0	0	0	0	0
	Largemouth Bass	0	62	0	0	0	-0.059
	Smallmouth Bass	3	40	0	1	-0.001	0.129
	<b>Total Centrarchidae</b>	627	294	0	0	-0.222	-0.281
		630	396	0	1	-0.223	-0.211
	Bluntnose Minnow	1945	368	0	0	-0.690	-0.351
	Emerald Shiner	42	9	0	0	-0.015	-0.009
	Fathead Minnow	27	17	0	0	-0.010	-0.016
	Spottail Shiner	83	33	0	0	-0.029	-0.031
	Unidentified Cyprinidae	0	0	2	0	0.250	0
	<b>Total Cyprinidae</b>	2097	427	2	0	0.250	-0.407
		Empty			3	3	
<b>Total</b>		2850	1048	8	6		
Smallmouth Bass N = 97	Walleye	1	183	0	47	0	<b>0.460</b>
	Alewife	30	0	2	0	0.076	0
	Tessellated Darter	92	42	6	6	0.229	0.041
	Ichthyoplankton	0	0	5	19	0.217	0.257
	Largemouth Bass	0	62	0	0	0	-0.059
	Smallmouth Bass	3	40	0	0	-0.001	-0.038
	<b>Total Centrarchidae</b>	627	294	3	0	-0.090	-0.281
		630	396	3	0	-0.091	-0.378
	Bluntnose Minnow	1945	368	4	1	-0.508	-0.351
	Emerald Shiner	42	9	0	0	-0.015	-0.009
	Fathead Minnow	27	17	0	0	-0.009	-0.016
	Spottail Shiner	83	33	0	0	-0.029	-0.031
	Unidentified Cyprinidae	0	0	3	1	0.130	0.014
	<b>Total Cyprinidae</b>	2097	427	7	2	-0.432	-0.380
		Empty			4	2	
<b>Total</b>		2850	1048	23	74		

Table 6. Number of fish from the prey community netted, number of prey fish consumed, and comparison of Strauss Index for selectivity of each predatory species collected prior and subsequent to walleye fingerling stocking, June 2007. Values in **bold** indicate significant selection towards walleye fry by yellow perch and smallmouth bass.

Predator	Prey	# Netted		# Consumed		Strauss Index	
		Prior	Subsequent	Prior	Subsequent	Prior	Subsequent
Rock Bass N = 51	Walleye	1	183	0	1	0	0.075
	Alewife	30	0	0	0	-0.011	0
	Tessellated Darter	92	42	0	0	-0.032	-0.040
	Ichthyoplankton	0	0	0	0	0	0
	Largemouth Bass	0	62	0	0	0	-0.059
	Smallmouth Bass	3	40	0	0	-0.001	-0.038
	<i>Total Centrarchidae</i>	627	294	1	1	-0.077	-0.030
	Bluntnose Minnow	1945	368	6	2	0.175	0.149
	Emerald Shiner	42	9	0	0	-0.015	-0.009
	Fathead Minnow	27	17	0	0	-0.009	-0.016
	Spottail Shiner	83	33	0	0	-0.029	-0.031
	<i>Total Cyprinidae</i>	2097	427	6	2	0.121	0.093
	Empty				13		
	<b>Total</b>	2850	1048	7	4		
	Chain Pickerel N = 13	Walleye	1	183	0	1	0
Alewife		30	0	7	4	<b>0.864</b>	<b>0.444</b>
Tessellated Darter		92	42	0	0	-0.322	-0.040
Ichthyoplankton		0	0	0	0	0	0
Largemouth Bass		0	62	0	4	0	0.385
Smallmouth Bass		3	40	0	0	-0.001	-0.038
<i>Total Centrarchidae</i>		627	294	1	0	-0.095	-0.281
Bluntnose Minnow		1945	368	0	0	-0.682	-0.351
Emerald Shiner		42	9	0	0	-0.015	-0.009
Fathead Minnow		27	17	0	0	-0.010	-0.016
Spottail Shiner		83	33	0	0	-0.029	-0.031
<i>Total Cyprinidae</i>		2097	427	0	0	-0.736	-0.407
Empty				0	3		
<b>Total</b>		2850	1048	8	9		

Table 6 (cont.). Number of fish from the prey community netted, number of prey fish consumed, and comparison of Strauss Index for selectivity of each predatory species collected prior and subsequent to walleye fingerling stocking, June 2007. Values in **bold** indicate significant selection towards walleye fry by yellow perch and smallmouth bass.

Table 7 summarizes the overall values of predators captured, frequency of occurrence (FOO) of walleye in stomach contents, total walleye consumed, and the Strauss selection index subsequent to stocking. Walleye were collected from all five predatory species, with yellow perch, smallmouth bass and largemouth bass displaying substantial frequencies of occurrence. Yellow perch and smallmouth bass consumed large numbers and indicated a strong preference towards the stocked walleye. Those instances in which walleye occurred in stomach samples for yellow perch and smallmouth bass, the samples contained five walleye on average.

Predator	# Predators Captured	FOO Walleye (%)	Total Walleye Consumed	Strauss Index
Yellow Perch	52	40	118	0.617
Largemouth Bass	8	25	2	0.158
Smallmouth Bass	31	42	47	0.460
Rock Bass	33	5	1	0.075
Chain Pickerel	7	14	1	-0.064

Table 7. Number of predators captured with frequency of occurrence (FOO) of walleye fry in stomach samples, total walleye consumed by the predators, and Strauss' Index for selectivity subsequent to walleye fry stocking in Otsego Lake, June 2007.

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