

Lake Ontario - Eastern Basin Creel Survey, 1998

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Lake Ontario supports the largest sport fishery in New York State (Kretser and Klatt 1981, Connely et al. 1989, 1996). The warmwater component of this fishery is concentrated primarily in the Eastern Basin, adjoining Jefferson County. The Eastern Basin has been known for many years as an extremely productive smallmouth bass (*Micropterus dolomieu*) fishery and an excellent area for warmwater sportfishing in general (Stone et al. 1951).

Warmwater fish stocks, including smallmouth bass, within Lake Ontario's Eastern Basin have been monitored annually since 1976 through a standardized assessment netting program (Eckert 1998). A 1978 creel census reported over 183,000 smallmouth bass harvested from the Eastern Basin (Panek 1981) at a time when the smallmouth bass abundance index, based on assessment netting, was 26.04 bass/net-night (Eckert 1998). In 1984 Eastern Basin smallmouth bass were at a low abundance (index 12.44) and a creel survey reported about 91,000 harvested (NYSDEC 1989a). After recovering in the late 80's and early 90's smallmouth bass in the Eastern Basin were at the lowest abundance ever recorded by 1997, with abundance index of 6.03. Anecdotal information from Environmental Conservation officers, sportsmen and charter operators consistently reported the worst bass fishing quality in memory. Although less dramatic, fishing for some other warmwater species (e.g. yellow perch *Perca flavescens*) also appeared to be poor.

In recent years the Lake Ontario system has been subject to a number of significant impacts including: reduced nutrient loading, invasion and

expansion of dreissenid mussels, invasion of other exotic species such as the zooplankters *Bythotrephes cederstroemi* and *Cercopagis pengoi*, the round goby (*Neogobius melanastomus*), and rapid growth of double-crested cormorant (*Phalacrocorax auritus*) populations. Cormorant predation alone represents a mortality factor for smallmouth bass, negligible at the time of earlier surveys, but likely of the same order of magnitude as the fishery by the mid 1990's (Schneider et al. 1997).

The most recent comprehensive creel survey of the Eastern Basin warmwater fishery took place in 1984, well before the effects of recent system changes became apparent. An updated creel survey was needed to characterize fishery, particularly smallmouth bass catch and harvest rates, under current conditions and better understand the impacts of system changes.

The specific objectives of this creel survey were to:

- Estimate angler effort, catch and harvest in the New York waters of Lake Ontario's Eastern Basin from May 1 through September 30, 1998.
- Characterize angler origins and preferences.
- Determine size structure of the fish harvest.

Methods

The creel survey consisted of two independent samples. Angler interviews were conducted by

direct contact at representative access sites to provide data such as catch and harvest rates, and angler characteristics. Effort data was collected by instantaneous aerial counts of fishing boats. This method was very similar to that regularly used on the open waters of Lake Erie (Einhouse and Eifert 1989, Culligan et al. 1997) which was based on the method described by Schmidt (1975).

The sampling period for this survey extended from May 1, 1998 (opening of walleye season) through September 30, 1998 (bass season opened June 20). The survey area, for both counts and interviews, included U.S. waters of Lake Ontario, including bays, north and east of Stony Point, an area of some 256,000 acres (Figure 1). Interviews were conducted on two weekend days and two randomly selected weekdays per week, between 0900 EDT and one hour after sunset. Two interview routes were employed, covering access points from Henderson Harbor to Cape Vincent (Figure 1). One route included four and the other included five marina or launch ramp sites (Table 1). Interviews were conducted by two agents, each covering one route during the survey day. Interviews collected data concerning: area and time fished, target species, fish harvested or released, and angler residence. Harvested fish were measured (total length) when feasible. Data from anglers returning to these access points but fishing outside the census area (e.g., the St Lawrence River), were not considered in this report.

Aerial counts of fishing boats were conducted on one randomly selected weekday and one randomly selected weekend day per week. A few cancellations occurred due to weather or aircraft problems. Counts were conducted through field glasses from altitudes of about 2000 feet.

Starting times for both interview routes and counts were randomly chosen, as was the starting point for each survey route.

Estimates of fishing effort, catch rates and harvest, along with associated standard errors, were

calculated according to Schmidt 1975 :

Fishing Effort

$$P = \{(\sum C_i)/n\} \times H \times D$$

$$S_c^2 = 1/n(n-1) \times [\sum C_i^2 - \{(\sum C_i)^2 / n\}] \times (HD)^2$$

where:

- P = fishing effort in angler-hours
- C_i = angler count for I-th flight (fishing boats from flight x anglers per boat from interviews)
- n = number of flights
- H = number of daylight hours per day
- D = number of days
- S_c² = standard error square of the mean angler count

Catch and Harvest

$$CR = \{(\sum F_i)/n\} / \{(\sum H_i)/n\} = \sum F_i / \sum H_i$$

$$Y = P \times (CR)$$

where:

- CR = mean catch rate in fish harvested per angler-hour
- H_i = number of angler-hours expended by I-th party
- F_i = number of fish caught by I-th party
- n = number of parties interviewed
- P = fishing effort in angler-hours
- Y = harvest in number for particular species

$$S_{CR}^2 = CR^2 \times [(S_F^2/F^2) + (S_H^2/H^2) - \{2 \text{Cov}(F \times H) / (F \times H)\}]$$

$$S_Y^2 = (S_P^2 \times CR^2) + (S_{CR}^2 \times P^2)$$

$$S_F^2 = \{1/n(n-1)\} \times [\sum F_i^2 - \{(\sum F_i)^2 / n\}]$$

$$S_H^2 = \{1/n(n-1)\} \times [\sum H_i^2 - \{(\sum H_i)^2 / n\}]$$

$$\text{Cov}(F \times H) = \{1/n(n-1)\} \times \{\sum F_i H_i - [\sum F_i \times \sum H_i] / n\}$$

where:

- S_{CR}² = standard error square of the mean catch rate

S_Y^2 = standard error square of estimated harvest

S_F^2 = standard error square of the mean number of fish

S_H^2 = standard error square of mean hours

S_p^2 = standard error square of estimated fishing effort

Cov (F x H) = covariance of fish and hours

F = mean number of fish per party

H = mean number of angler-hours per party

Information concerning the definition of strata is presented in Table 2.

The fishing population surveyed consisted of daylight (sunrise to sunset) boat anglers. The major assumptions underlying effort calculation in this survey were that: 1) fishing boats interviewed at the selected access sites experienced catch rates representative of the entire boat angling population within each survey area and stratum, and 2) all fishing boats, both in the act of fishing, and also traveling, could be distinguished from other pleasure boats.

Results

The Eastern Basin Lake Ontario angler survey in 1998 included 33 sets of aerial observations of fishing boats and 1,010 interviews at access sites. Of these, 864 interviews, involving 2,150 individual angler trips, documented fishing within the limits of the Eastern Basin study area.

Catch and Harvest Smallmouth bass were the most commonly caught and harvested gamefish species in the Eastern Basin Lake Ontario fishery, with 0.69 fish/angler-hour caught, 0.20 fish/angler-hour harvested by anglers targeting bass (Table 3), and total harvest of 35,736 fish (Table 4). The Hardscrabble and Henderson Bay areas produced the greatest harvest (Table 5). The average total length of harvested smallmouth bass was 14.2 in (360.0 mm, Table 6).

Walleye (*Stizostedion vitreum*), which provided no detectable harvest in earlier surveys were the second most harvested game fish, with targeted rates per angler-hour of 0.10 fish caught and 0.09 fish harvested before the opening of bass season, and 0.23 caught and 0.19 harvested during bass season (Table 3). Throughout the survey period over 15,000 walleye were harvested (Table 4), mostly in the Black River Bay and Offshore/Stony & Galloo Islands areas (Table 7). The average total length of harvested walleye was 25.2 in (638.5 mm, Table 6).

Yellow perch were the most commonly harvested pan fish, with over 60,000 fish taken (Table 4). Henderson Bay was by far the most productive area for perch harvest (Table 8). Brown bullhead (*Ameiurus nebulosus*) was another panfish species with significant harvest (Table 4). Among game fish lake trout (*Salvelinus namaycush*) and chinook salmon (*Oncorhynchus tshawytscha*) and were also harvested (Table 4).

Total length distributions of harvested fish are presented in Figure 2.

Angler Effort and Characteristics Total effort for pre-bass season (May 1 through June 19) was greatest in Black River bay which is known for early season walleye fishing. Lowest effort was in the offshore/ Stony and Galloo Islands area, which is the most distant area from Eastern Basin ports and has the longest average trip (Table 9) .

Highest effort during the bass season (sampled June 20 through September 30) occurred in the Chaumont Bay and Hardscrabble areas which are known primarily for smallmouth bass and yellow perch fishing and are easily accessible to small boats (Table 10).

During the pre-bass season, with the walleye and northern pike seasons open, most anglers (63%) said they were targeting walleye, a few (4%) were fishing specifically for northern pike and 14% reported fishing for any warmwater (non-salmonid)

gamefish, apparently a combination of walleye and northern pike. Panfish anglers comprised 9% of those interviewed (Table 11).

During the bass season 48% of anglers reported fishing for smallmouth bass, 15% for walleye and a very few (1%) for other warmwater gamefish (largemouth bass or muskellunge). Anglers targeting chinook salmon comprised 12% of interviewees with another 3% for other, or any, salmonids (Table 11).

Almost 75% of anglers participating in the Eastern Basin fishery in 1998 were New York State residents led by Jefferson County (local) residents with 36 percent of interviewed anglers and Monroe County (Rochester area) residents with 8%. Pennsylvania and New Jersey residents with 13% and 5% of all interviewed anglers respectively, were best represented among non-New York residents from 27 states and provinces (Table 12).

Discussion

Changes in Composition of Fishery The open water fishery of Lake Ontario's Eastern Basin on the New York side has been dominated by smallmouth bass in all earlier studies, extending back to 1966 (Joliff and LeTendre 1966, Panek 1981, NYSDEC 1989a), and remains so in 1998. However some significant changes have occurred over the years. Based on assessment netting (Chrisman and Eckert 1998) smallmouth bass abundance increased dramatically after the most recent previous study (1984) peaking in 1989, then declining to its lowest recorded level. Peak abundance was nearly six times greater than current abundance. It is entirely possible, indeed likely, that success and participation in the Eastern Basin smallmouth bass fishery was much higher when bass were more abundant than in 1984 or 1998. However we are not able to document such a pattern in the fishery.

Walleye were a negligible part of the fishery in New York waters of Lake Ontario's Eastern Basin

at the time of earlier creel surveys (through 1984). By 1990, anecdotal reports of successful walleye fishing began to accumulate. These reports were substantiated in 1991 when the Lake Ontario Fishing Boat Census, though not covering most of the Eastern Basin, detected an increase in walleye harvest at its easternmost sites (Eckert et al. 1992). By 1998 the quality of this fishery (targeted catch rate = 0.10-0.23, harvest rate = 0.09-0.19 walleye/angler-hour) was similar to that of the well known Lake Erie walleye fishery (targeted catch rate = 0.21, targeted harvest rate = 0.19 walleye/angler-hour, Einhouse and Eifert 1989). The magnitude of the fishery remains considerably lower, however, with an estimated harvest of some 15,000 fish compared to 50,000 in New York waters of Lake Erie (Culligan et al.).

In 1978 yellow perch harvest approached 108,000 fish and 14% of angling parties targeted yellow perch (Panek 1981). Only 3-4% of anglers targeted perch in 1998, and harvest declined to 60,500 fish. Although specifically targeted by only 2% of angling parties, rock bass (*Ambloplites rupestris*) contributed significantly to the Eastern Basin fishery in 1978 with a harvest of over 95,000 fish (Panek 1981). In 1998 harvest was negligible, with only 0.3% of parties harvesting any rock bass.

Chinook salmon and other trout and salmon, which were the target of 15% of trips during the 1998 bass season (Table 13) were not present at all during the 1978 or 1966 studies. Anglers targeting northern pike, which were a small but notable part of the fishery in 1966 (Joliff and LeTendre 1966), have been a minor component in subsequent studies.

The rapid expansion of trout and salmon fishing opportunity in Lake Ontario during the 1980's was accompanied by greatly increased publicity for all aspects of the Lake Ontario fishery, including the Eastern Basin. Recent interest in the expanding walleye fishery has resulted in continuing publicity.

An expansion of the charter fishing fleet (not as dramatic for the Eastern Basin as for other parts of

Lake Ontario), and public access facilities, occurred during the same period. These factors have led to increased knowledge of, and easier access to, the Lake Ontario Eastern Basin fishery for non-New York State resident anglers. These anglers now account for over one quarter of all angler trips in this fishery, up from about 5% in 1966 (Table 14).

Comparability of Data Four studies specifically covering Lake Ontario's Eastern basin fishery have been conducted over the last 32 years. All four studies were based on direct contact interviews. In the 1966 survey work, interviews were conducted from a roving boat (Joliff and LeTendre 1966). In 1978 (Panek 1981) interviews were conducted both from a roving boat and at access sites. Access site interviews were the basis of catch and harvest rate, and angler characteristic data in both the 1984 (NYSDEC 1989b) and the current studies. Many of the access sites covered were common to all three more recent studies. Due to the similarity of interview techniques direct comparisons of catch and harvest rates are reasonable.

Each of the Eastern Basin angler surveys used a different technique to estimate angling effort. Joliff and LeTendre (1966) conducted aerial counts but results were not reported and no effort estimates were made. In 1979 (Panek 1981), effort estimation was based on a combination of counts from a roving boat and from vantage points on shore. The 1984 survey (NYSDEC 1989b) employed counts at selected public access points to collect effort information. In the current study, counts of boats from the air formed the basis of angling effort estimation. Due to wide range of estimation techniques used, comparisons among effort estimates must be made with caution.

The aerial count technique is the most comprehensive used to date, in that boats are generally more visible from the air, all areas were examined on each count day, and all fishing boats are counted whether or not they return to a public access point. This would be expected to result in a more complete count, and a higher effort estimate

than other techniques would provide.

All boat count techniques depend on the ability to distinguish between fishing and non-fishing boats. This may or may not be more difficult from the air than from the surface. However, to the extent that mis-identifications occurred it would have resulted in positive bias to the effort estimate, since all boats were counted which were visibly fishing, or were of a fishing type and were not visibly engaged in another activity (such as swimming or skiing).

Catch and Harvest Rates - Lake Ontario Eastern Basin targeted smallmouth bass catch (0.69 fish/angler-hour) and harvest (0.20 fish/angler hour) rates were substantially lower than previous studies (Table 14). The 1998 directed harvest rate was only 34% of the 1966 (lake) rate and 43% of the 1978 level, directed catch was 70% of the 1966 (lake) rate. Overall (targeted and non-targeted) catch and harvest rates were 51% and 45% of 1984, at which time bass were at low abundance, based on assessment netting, though not as low as currently (Chrisman and Eckert 1998). Due to very low catch and harvest rates total smallmouth bass harvest in 1998 was much lower than in earlier years (Table 15).

The 1998 catch rate, though poor for the Eastern Basin, was still relatively good compared to other bass fisheries in New York State: Green (1978) reported an average targeted catch rate for cooperating anglers in other NY waters of 0.10 bass/angler-hour. The highest catch rate for smallmouth bass in 11 non-Great Lakes waters during 1977-1980 was 0.65 fish per angler-hour (Green et al 1981).

Angler effort and characteristics Despite reduced smallmouth bass fishing quality (catch and harvest rates no reduction in angler effort during the bass season was detected in 1998. In fact, effort appeared to have increased relative to 1978 and remained relatively unchanged compared to 1984 (Table 16). However, direct comparisons of total effort estimates among these surveys is suspect

because different effort estimation techniques were used. The 1998 (aerial) technique would be expected to provide higher effort estimates than earlier techniques. Anglers targeting walleye are now a significant part of the fishery (15%) during the bass season. However anglers continued to target bass at the about same rate (48%) as they had in 1978 (Panek 1981). Anglers travel to the Eastern Basin area from a distance (26% non-resident), apparently to a greater extent than they had in earlier surveys (Table 17). Recreational angling effort is generally expected to respond negatively to reductions in angling quality. The Eastern Basin smallmouth bass fishery may have exhibited a higher quality and greater effort between 1984 and 1998 when bass were more abundant (Chrisman and Eckert 1998), but this is not documented.

Angler expenditures were not specifically estimated in this study. Angler expenditures are influenced by many factors and can be estimated in various ways, but total expenditures are always closely related to angler effort and residence. Total expenditures in 1998 would certainly not show a decline from 1984 since no decline in effort was documented. A specific, conservative, angler expenditure estimate for the Eastern Basin fishery in 1998, based on the Connelly et al (1997) cost of an average New York Great Lakes angler trip would be \$1,866,074 (\$21.72/trip) on-site and \$572,194 (\$6.66/trip) en route.

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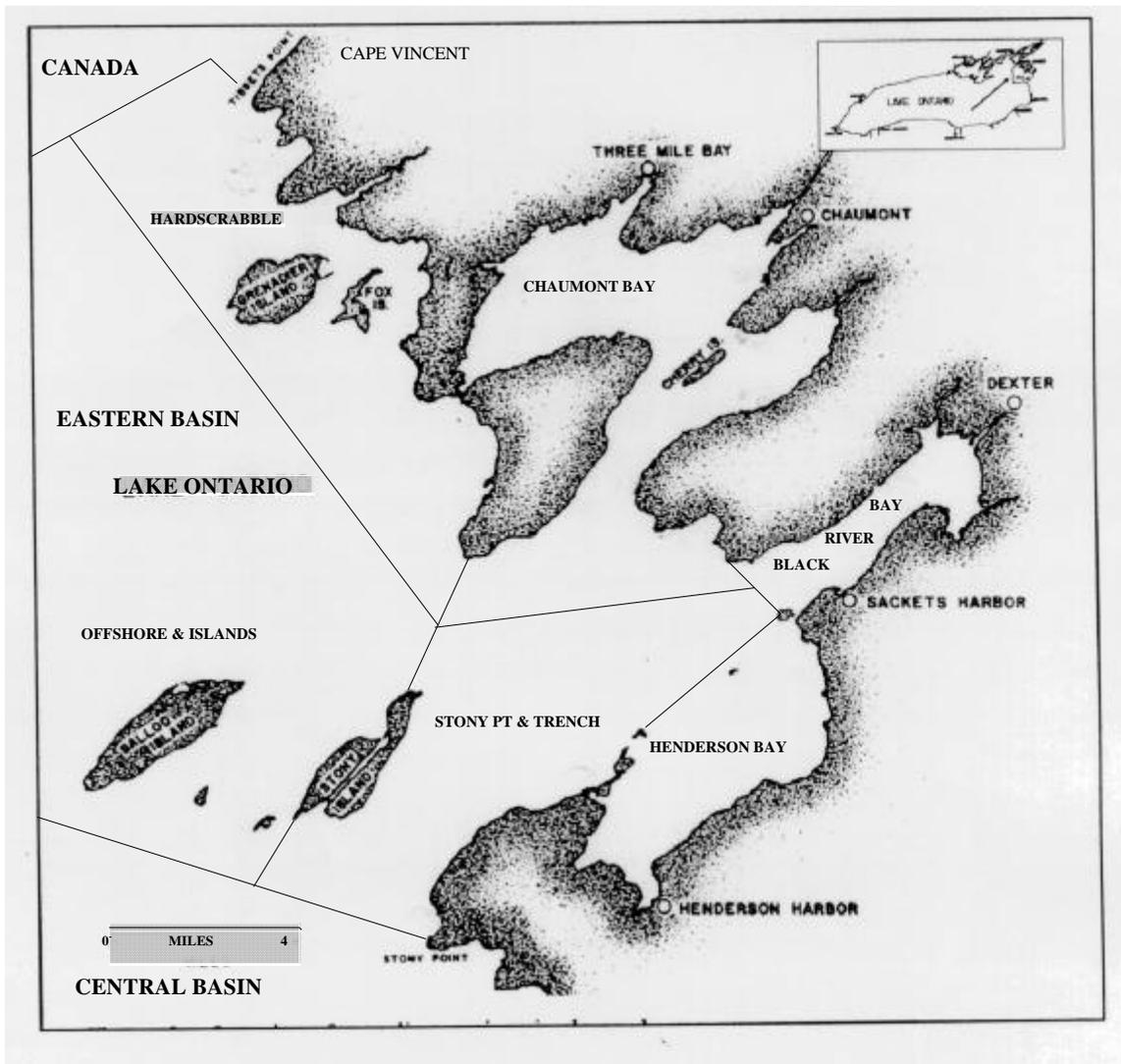


Figure 1. Study area: U.S. waters of Lake Ontario's Eastern Basin.

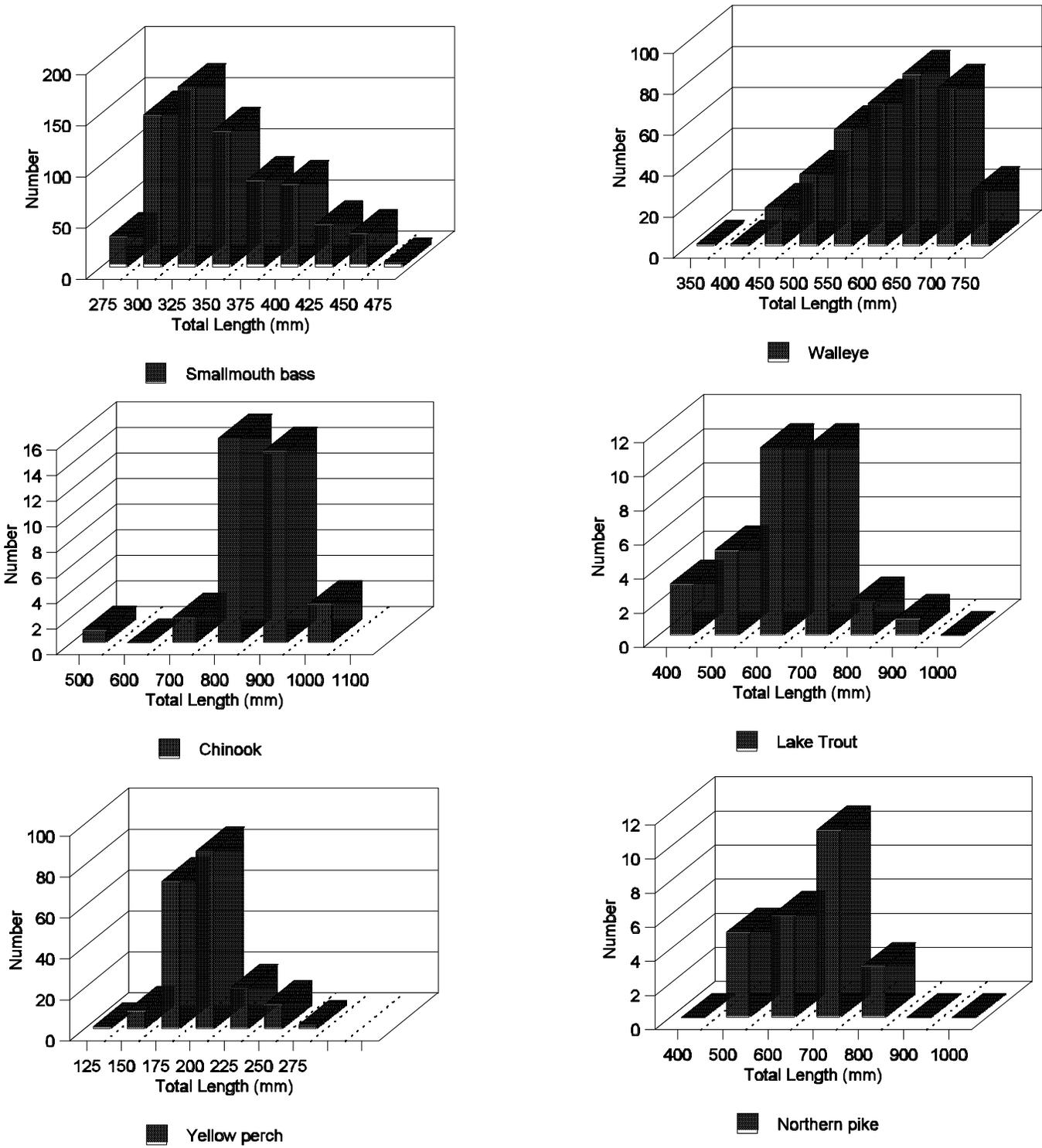


Figure 2. Total length distribution of harvested game fish and yellow perch (N=734 smallmouth

bass, 371 walleye, 37 chinook, 33 lake trout, 203 yellow perch, 25 northern pike).

Table 1. Interview route descriptions.

	South Interview Route	North Interview Route
Access Sites	Lake Ontario Mariners Marina/Harbors End Marina Henderson Town Launch Henchens Marina Dexter Village Launch Sackets Harbor Launch	Cape Vincent Launch Inner Mud Bay Marinas Martins Marina Pier 2 Chaumont Bay Launch
Travel Time	1.5 hours	1.25 hours
Interview Time per Site	1.5 hours	1.9 hours
Data Management Time	1.0 hours	1.0 hours

Table 2. Creel survey effort estimation parameters.

	Pre-Bass Stratum	Bass Season Stratum
Survey Period	2 May 98-19 June 98	20 June 98-30 September 98
Number of Weekend/Holidays	15	31
Number of Weekdays	34	72
Mean Daylength (hours)	14.9	14.0

Table 3 . Harvest (fish kept) and catch (fish released + kept) rates per angler-hour of smallmouth bass and walleye for targeted and overall fisheries.

Species	Fishery	Harvest/Angler-Hour	Catch/Angler-Hour
Smallmouth Bass	Targeted(bass seas)	0.20	0.69
Smallmouth Bass	Overall (bass season)	0.10	0.35
Walleye	Targeted (pre-bass)	0.09	0.10
Walleye	Targeted (bass seas)	0.19	0.23
Walleye	Overall (pre-bass)	0.06	0.07

Species	Fishery	Harvest/Angler-Hour	Catch/Angler-Hour
Walleye	Overall (bass seas)	0.04	0.04

Table 4. Total harvest of major gamefish and panfish.

Species	Harvest	Standard Error	95% Conf. Limits +/-
Smallmouth Bass	35,736	4,674	26% (9,291)
Walleye	15,141	1,761	23% (3,482)
Lake Trout	2,658	715	54% (1,435)
Chinook Salmon	2,435	489	40% (974)
Yellow Perch	60,591	8,634	28% (16,965)
Brown Bullhead	6,281	2,101	67% (4,208)

Table 5. Harvest of smallmouth bass during the bass season.

Area	Bass Season Harvest	Standard Error
Black River Bay	918	322
Chaumont Bay	7,166	1,635
Hardscrabble	12,457	3,645
Offshore/Islands	5,312	1,582
Stony Pt/Trench	2,829	897
Henderson Bay	7,054	1,573
Season Total	35,736	4,674

Table 6. Total lengths of harvested fish.

Species	Number Measured	Mean Total Length mm (inches)	Range mm (inches)
Smallmouth bass	734	360.0 (14.2)	270-491 (10.6-19.3)
Walleye	371	638.5 (25.1)	355-790 (14.0-31.1)

Species	Number Measured	Mean Total Length mm (inches)	Range mm (inches)
Yellow perch	203	205.9 (8.1)	125-289 (4.9-11.4)
Chinook salmon	37	895.0 (35.2)	515-1080 (20.3-42.5)
Lake Trout	33	661.7 (26.1)	458-917 (18.0-36.0)
Northern pike	25	700.2 (27.6)	500-864 (19.7-34.1)

Table 7. Harvest of walleye during the pre-bass and bass seasons.

Area	Pre-Bass Harvest	Standard Error	Bass Season Harvest	Standard Error
Black River Bay	3,709	707	306	109
Chaumont Bay	1,039	280	1,221	538
Hardscrabble	800	263	995	417
Offshore/Islands	86	69	5,995	1,368
Stony Pt/Trench	141	94	849	305
Henderson Bay	0	-	0	-
Season Total	5,775	813	9,366	1,562

Table 8. Harvest of yellow perch during the pre-bass and bass seasons.

Area	Pre-Bass Harvest	Standard Error	Bass Season Harvest	Standard Error
Black River Bay	67	29	109	60
Chaumont Bay	432	294	4,236	1,732
Hardscrabble	716	322	11,155	3,820
Offshore/Islands	0	-	528	263
Stony Pt/Trench	0	-	294	170
Henderson Bay	0	-	43,054	7,527
Season Total	1,215	437	59,376	8,623

Table 9. Fishing effort during the pre-bass season (angler -hours, angler-trips)

Area	Angler-Hours	Std. Error	Mean Hrs/Trip	Angler-Trips
Black River Bay	41,366	6,539	5.6	7,360
Chaumont Bay	28,958	5,423	5.6	5,207
Hardscrabble	20,962	4,646	5.2	4,037
Offshore/Islands	3,755	1,744	8.3	454
Stony Pt/Trench	7,108	2,255	7.0	1,015
Henderson Bay	10,673	3,044	3.6	2,949
Total Pre-Bass	112,822	10,542		21,023
Total Bass & PreBass	475,476*	33,426		85,915

* 95% confidence limit for total bass season and pre-bass season = +/- 14%

Table 10. Fishing effort during the bass season (angler -hours, angler-trips)

Area	Angler-Hours	Std. Error	Mean Hrs/Trip	Angler-Trips
Black River Bay	30,780	3,196	4.8	6,399
Chaumont Bay	87,906	15,068	5.3	16,725
Hardscrabble	88,610	23,347	5.3	16,811
Offshore/Islands	40,173	8,128	7.2	5,551
Stony Pt/Trench	68,474	11,441	6.6	10,337
Henderson Bay	46,711	5,131	5.2	9,068

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Area	Angler-Hours	Std. Error	Mean Hrs/Trip	Angler-Trips
Total Bass Season	362,654	31,720		64,892
Total Bass & PreBass	475,476*	33,426		85,915

* 95% confidence limit for total bass season and pre-bass season effort = +/- 14%

Table 11. Angler preferences - anglers targeting species or types .

Target Species	Pre - Bass Season	(May 1 - June 19)	Bass Season Open	(June 20 - Sept. 30)
	Number of Anglers	Percent*	Number of Anglers	Percent*
Walleye	409	63%	221	15%
Smallmouth Bass	1	trace	716	48%
Northern Pike	25	4%	6	trace
Other non-salmonid gamefish	0	0%	9	1%
Any non-salmonid gamefish	93	14%	68	5%
WARMWATER GAMEFISH TOTAL	528	81%	1020	69%
Yellow Perch	20	3%	60	4%
Other panfish	17	3%	5	trace
Any panfish	24	4%	54	5%
PANFISH TOTAL	61	9%	119	8%
Chinook Salmon	0	0%	179	12%
Other trout or salmon	15	2%	13	1%
Any trout or salmon	3	trace	36	2%
SALMONID TOTAL	18	3%	228	15%

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Target Species	Pre - Bass Season	(May 1 - June 19)	Bass Season Open	(June 20 - Sept. 30)
Anything	42	6%	120	8%

* may not total 100% due to rounding

other non-salmonid gamefish: largemouth bass, muskellunge

other panfish: brown bullhead, channel catfish, rock bass

other trout or salmon: brown trout, lake trout, rainbow/steelhead

Table 12. Residence of interviewed anglers.

Angler Residence	Number of Anglers	Percent
Jefferson County (local)	777	36%
Monroe County	175	8%
Onondaga County	119	6%
Oswego County	110	5%
38 other counties	415	19%
NY RESIDENT TOTAL	1596	74%
Pennsylvania	289	13%
New Jersey	100	5%
23 other states/provinces	165	8%
NON-RESIDENT TOTAL	554	26%

Table 13. Top four angler preferences - percent of parties targeting species or types.

Year	Period	Target	Percent	Source
1966	June 18-Sept.5	<u>Bays:</u>		Jolliff and LeTendre 1966
		Smallmouth bass	72	
		Yellow perch	14	
		Anything	8	
		Northern pike	2	
		<u>Lake:</u>		
		Smallmouth bass	85	
		Yellow perch	11	
Anything	3			
		Northern pike	trace	
1978	June 17-Oct.27	Smallmouth bass	52	Panek 1981
		Anything	19	
		Yellow perch	14	
		Largemouth bass	10	
1984	May through Sept.	Not reported		NYSDEC 1989a

Year	Period	Target	Percent	Source
1998	May 1 - June 19 (Pre-Bass Season)	Walleye	63	Present
		Any non-salmonid gamefish	14	
		Anything	6	
		Any panfish	4	
1998	June 20 - Sept. 30 (Bass Season)	Smallmouth Bass	48	Present
		Walleye	15	
		Chinook Salmon	12	
		Anything	8	

Table 14. Smallmouth bass catch and harvest rates for targeted (shaded) and overall fishery.

Year	Period	Fishery	Harvest/ Angler-Hour	Catch/ Angler-Hour	Source
1966	Jun 18-Sep 5	targeted	bays 0.18 lake 0.59	bays 0.26 lake 0.98	Jolliff and LeTendre 1966
		overall	- -	bays 0.24 lake 0.91	
1978	Jun 17-Oct 27	overall	0.47*	1.25**	Panek 1981
1984	Jun 1- Sep 30	overall	0.22**	0.69**	NYSDEC 1989a

Year	Period	Fishery	Harvest/ Angler-Hour	Catch/ Angler-Hour	Source
1998	Jun 20-Sep 30	targeted	0.20	0.69	Present
		overall	0.10	0.35	

* catch rate of legal size fish by boat anglers

** total SMBcaught or harvested/ total angler -hours in fishery)

Table 15. Smallmouth bass harvest (number of individuals).

Year	Period	Smallmouth Bass Harvest (numbers)	Source
1966	June 18-Sept.5	no estimate	Jolliff and LeTendre 1966
1978	June 17-Sept.30	180,331	Panek 1981
	June 17-Oct.27	183,324	
1984	June through Sept.	84,712	NYSDEC 1989a
	June through Oct.	90,360	
1998	June 20 - Sept. 30	35,736	Present

Table 16. Overall angling effort during the bass season (angler-hours).

Year	Period	Angler-Hours	Source
1966	June 18-Sept.5	no estimate	Jolliff and LeTendre 1966
1978	June 17- Sept. 30	259,153	Panek 1981
1984	June through Sept*.	387,673	NYSDEC 1989a

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Year	Period	Angler-Hours	Source
1998	June 20-Sept. 30	362,654	Present

*includes some pre-bass season

Table 17. Angler residence based on percent of anglers interviewed.

Year	Period	Percent Non-NYS Resident	Source
1966	June 18-Sept.5	Approx. 5	Jolliff and LeTendre 1966
1978	June 17-Oct.27	4*	Panek 1981
1984	May through Sept.	16.7*	NYSDEC 1989a
1998	May through Sept.	26	Present

*calculated as percent of angler-trips