

## STUDY PERFORMANCE REPORT

State: Michigan

Project No.: F-81-R-4

Study No.: 488

Title: Status of the Lake St. Clair fish community and sport fishery

Period Covered: October 1, 2002 to September 30, 2003

**Study Objectives:** The objectives of this study are (1) to measure the abundance of yellow perch, juvenile gamefish, and various forage species in Lake St. Clair, (2) to monitor abundance of adult gamefish species, (3) to document the abundance and distribution of aquatic plants in Lake St. Clair with sidescan sonar and hydroacoustic technology, and (4) to monitor trends in game fish catch rates for the Lake St. Clair fishery.

**Summary:** Fish populations were sampled with 10 m headrope bottom trawls and trap nets during 2002 and 2003. Data entry and analysis for all 2002 trawls are complete. Yellow perch and spottail shiner dominated the trawl catches. Predator fish populations were surveyed with trap nets in Anchor Bay in 2002 and 2003. In 2002 a total of 64 net lifts captured 120 northern pike, 41 muskellunge, 400 smallmouth bass, and 243 walleye. A total of 399 walleye and 272 smallmouth bass were tagged. Anglers reported capturing 27 tagged walleye and 12 tagged smallmouth bass through October 2002. On average, walleye tag recoveries were more widely dispersed from the tag site than smallmouth tag recoveries. Sport fishing catch and effort information was collected with a voluntary angler diary program in 2000 and 2001. Data entry and analysis for all 2001 sport diaries are complete. Catch rates for walleye and muskellunge were the highest since 1996, while catch rates for smallmouth bass and yellow perch remained within the range observed for these species in prior years. Sport diaries were distributed to cooperators in April 2002 for the 2002 fishing season. Yellow perch recruitment in Lake St. Clair is highly variable between years. The 1992, 1997, 1999, and 2000 year classes appeared weak, while the 1993, 1994, 1996, and 1998 year classes were comparatively strong. About six weeks of survey time were devoted to developing effective and efficient aquatic plant survey techniques. Hydroacoustic techniques were used along with intensive plant and sediment sampling at 68 Lake St. Clair stations and one inland lake. These results will provide a basis for describing the Lake St. Clair plant community in 2003 and comparing it to the plant community in 1978. Analysis of the data collected will also aid in developing and improving sampling protocols for monitoring the plant community in other Michigan lakes and rivers.

**Findings:** Jobs 1, 3, 5, 6, 8, 9, 10, and 11 were scheduled for 2002-03, and progress is reported below.

**Job 1. Title: Sample yellow perch and forage with index trawls.**—During 2002, fish were collected at the Anchor Bay index site with a 10 m headrope bottom trawl with 3 tows in June and 13 tows in September. In June, spottail shiner, yellow perch, mimic shiner, troutperch, and rock bass were most abundant. During September spottail shiner, round goby, yellow perch, mimic shiner, and rock bass were most abundant. Some interesting seasonal patterns were revealed by comparing spring and fall densities since 1996 for Anchor Bay (Table 1). Rainbow smelt were abundant in June but decreased to low abundance in September, probably a result of the warmer water conditions found in Lake St. Clair during July and August. Similarly, yellow perch density was consistently higher during June than during the fall sampling period. We suspect that yellow perch

catch rates were low in September due to yellow perch distribution in macrophyte beds, which were abundant by September. Unfortunately, we were unable to effectively trawl in heavily vegetated areas of the lake. Conversely, alewife and smallmouth bass abundances were generally higher in the fall sampling. This increase is likely related to recruitment of age 0 fish to the trawl gear by September.

While few trends in catch rates across the time period 1996-2002 were evident, several species appear to have lower catch rates in recent years. Logperch, troutperch, and johnny darter have all exhibited lower catch rates since 1998. We believe that the observed decline in these three species is evidence that round gobies are negatively impacting the abundance of benthic species in Lake St. Clair.

Sampling has continued on schedule in 2003.

**Job 3. Title: Collect catch and effort data for the sport fishery with angler diaries.**—A voluntary angler diary program was used to collect catch and effort data for recreational fishing on Lake St. Clair. The program was initiated by the Ontario Ministry of Natural Resources (OMNR) in 1985 to monitor trends in the muskellunge catch rate for Lake St. Clair. Five years later the program was expanded to include other species. The Michigan Department of Natural Resources (MDNR) became involved in the program in 1993. Since that time, the program has been a cooperative effort between the OMNR and MDNR. In 2002, the MDNR distributed 74 angler diaries to Michigan resident sport anglers interested in participating in the diary program. A total of 47 diaries were returned by cooperating anglers during fall and early winter.

The Lake St. Clair Angler Diary Program provides annual estimates of catch rates for the major sport fish species in the lake. Ontario and Michigan angler diary data were pooled to produce the 2002 estimates (Table 2). Walleye and muskellunge catch rates in 2002 were at the low end of the range of values observed since 1996. Catch rates for yellow perch and smallmouth bass remained well within the range observed in previous years. Fishing effort for muskellunge was the lowest, while yellow perch effort was the highest recorded since 1996. Effort directed at smallmouth bass and walleye by the diary participants also increased in 2002. Increased angler participation is needed if this program is to continue to provide reasonable estimates of catch rates for sport fish in Lake St. Clair. MDNR creel survey data collected from Lake St. Clair in 2002 will be compared with angler diary program results. In particular, comparison of angler diary catch rates with creel survey catch rate estimates will be most interesting.

New angler diaries were distributed in April 2003 and will be recalled in November 2003. An on-site MDNR creel survey on Lake St. Clair was used to distribute additional diaries to avid anglers in 2003.

**Job 5. Title: Analyze data and estimate growth rates for yellow perch.**—Processing of yellow perch scale samples collected in 2002, and diet samples collected in 2001, was completed. Processing of scale samples collected in 2003 is underway. Although the data set covers only a six year time span, it appears that growth rates, based on mean length at age, have declined and are now below state average (Table 3). The causative factor in this decline is not clear.

Evaluation of catch rates by age indicated the presence of strong and weak year classes in the population (Table 4). The 1992, 1997, 1999, and 2000 year classes appeared weak, while the 1993, 1994, 1996, and 1998 year classes were comparatively strong. Variable recruitment is characteristic of yellow perch populations throughout the Great Lakes. The apparent decline in growth for recent years could be related to higher yellow perch densities due to the strength of the 1993, 1994, 1996, and 1998 year classes.

**Job 6. Title: Prepare annual performance reports.**—In addition to this study performance report, findings of work conducted under this study were summarized in an annual fisheries status report prepared for the Lake Erie Committee of the Great Lakes Fisheries Commission. A poster presentation was also prepared for the PERCIS III meeting in July 2003 based on some of the findings from this study.

**Job 8. Title: Publish report covering sampling through 2001.**—Results covering the first five years of this study are given in the following report. Publication of this report was not completed in 2003 as scheduled. The draft is currently under revision and will be published early 2004.

Thomas, M. V., and R. C. Haas. In press. Status of the Lake St. Clair fish community and sport fishery, 1996-2001. Michigan Department of Natural Resources, Fisheries Research Report, Ann Arbor.

**Job 9. Title: Sample fish community with trap nets and tag predator species.**—Trap nets were fished in Anchor Bay of Lake St. Clair during May 2002 to capture predator fish species and collect biological data on their populations. A total of 64 net lifts captured 120 northern pike, 41 muskellunge, 400 smallmouth bass, 23 largemouth bass, and 243 walleye. The mean total lengths for these species were: 722 mm for northern pike, 1,043 mm for muskellunge, 364 mm for smallmouth bass, 313 mm for largemouth bass, and 497 mm for walleye. The mean weights for these species were: 2.34 kg for northern pike, 7.82 kg for muskellunge, 0.79 kg for smallmouth bass, 0.52 kg for largemouth bass, and 1.16 kg for walleye. All but one of the walleye and 272 of the smallmouth bass were tagged with monel metal jaw tags and released at the site of capture. The age distributions for predator species caught in 2002 are shown in Table 5. For smallmouth bass, the age-4 cohort (1998 year class) accounted for nearly 75% of the total captured in the trap nets.

The total trap net catch rate for smallmouth bass in 2002 (Table 6) was lower than those recorded during the 1970s and early 1980s by Bryant and Smith (1988). Clear water, cold spring water temperatures, or lower smallmouth bass abundance could all be factors in the low total cpue. Age 9 and older fish were particularly well represented in the 2002 trap net catch. This may be an indication that survival rates are high or that a particularly strong year class is present in that age group. Additional years of survey data will help us discern the current status of the Anchor Bay smallmouth bass population.

Trap net sampling in 2003 occurred from May 28 to June 20. A total of 856 smallmouth bass and 176 walleye were captured in the trap nets. Scale samples collected from predator species will be processed by March 2003.

**Job 10. Title: Collect, summarize, and analyze tag recovery data.**—A total of 173 walleye and 830 smallmouth bass were tagged with monel metal jaw tags in 2003. Tagging data on individual walleye and smallmouth bass were added to the MDNR tagging database.

A total of 68 walleye tags and 23 smallmouth bass tags have been recovered by anglers and reported to MDNR. Tag recovery data were collected from anglers and their capture locations were converted to geographic coordinates. These recovery data were combined with appropriate tagging data collected during their original capture. Information letters and shoulder patches were sent to each angler to thank them for their cooperation. All pertinent tag recovery data were placed in the Lake St. Clair tag recovery database.

Maps comparing the geographical distribution of walleye tag recoveries in 2002 with 2003 are presented in Figure 1. On average, recaptured walleyes had traveled 19.0 km from the Anchor Bay tag site in 2003. The biggest difference compared to 2002 was that in 2003 some tagged

walleye in were recovered in the lower Detroit River and Maumee River. These fish were originally tagged in May 2002 in Anchor Bay. Their recapture in spring 2003 in the Maumee and Detroit Rivers suggested that some of the walleye tagged in Anchor Bay during the spring were post-spawn Lake Erie walleye migrating northward.

Maps comparing the geographical distribution of smallmouth bass tag recoveries in 2002 with 2003 are presented in Figure 2. In both years, smallmouth bass recoveries reflected movements of fish from Anchor Bay into the St. Clair River channels and along the western shore of the lake. However, a distinct lack of recoveries from Ontario waters of Lake St. Clair is likely an indication that Anchor Bay smallmouth bass are spatially segregated from Ontario smallmouth bass populations. On average, recaptured smallmouth bass had traveled 8.5 km from their tag site in 2003.

Tagged walleye recovered by anglers were larger in total length at tagging compared to the entire tagged population which is opposite from the 2002 result. This difference suggests that walleye vulnerability to capture varies with size and year. Tagged smallmouth bass recovered by anglers were smaller than the entire tagged population which was also evident in 2002. We suspect this is because large smallmouth bass are less vulnerable to angling than smaller smallmouth bass in Lake St. Clair. The 2002 and 2003 seasonal pattern of tag recoveries differed for the two species (Figure 3). For walleye in 2003, the month of August produced the majority of recaptures with most August fish being taken in Anchor Bay. Most of the smallmouth bass tags were recovered in June and all June fish were recovered along the west shore of Lake St. Clair south of the tag site.

Similar to our observations in 2002, there was a large difference in tag reporting rate between walleye (11.6%) and smallmouth bass (0.6%) (Table 7). We think this is substantial evidence that angler exploitation was significantly higher on walleye. However, it is too early in the tagging portion of the study to evaluate how important variation in angler response was between the two species. We know that catch-and-release fishing prevailed for smallmouth bass which may have accounted for non-reporting of a large number of tags.

**Job 11. Title: Survey aquatic plant community.**—We continued to develop survey techniques to facilitate sampling of submerged vegetation in Lake St. Clair with remote sensing (Biosonics® hydroacoustic) equipment and computer software. One new inland lake (Big Platte Lake, Benzie Co.) was also added to the group selected for initial development of these techniques. This lake was added because it has an ongoing study of the catchment's nutrient budget which offered a unique opportunity to evaluate several aspects of the plant sampling program. Hydroacoustic transect and bathymetry data collected in 2001 and 2002 from Nichols and Clifford lakes were examined and mapped with ArcView®, EchoView®, and Surfer® software. Further analyses of these data will continue in 2003 and 2004.

Lake St. Clair plant sampling data collected in 2002-03 were examined to develop a new sampling protocol which was adopted for the Lake St. Clair study during spring and summer of 2003. We decided upon a modified transect sampling protocol utilizing Biosonics® hydroacoustic equipment in combination with replicated tosses of a hook. The hook was attached to a line and tossed several times to retrieve a representative plant sample. The plant samples were separated to species, weighed, and photographed. A subset of 68 of the 115 Lake St. Clair sites, first sampled for plants in 1978 by Schloesser (1982) and Schloesser and Manny (1982), were selected for our 2003 survey (Figure 4). We chose to overlay a square hectare plot over the 1978 plant stations and run 11 hydroacoustic transects east and west spaced 10 m apart (upper part of Figure 5) through each one. A technique was developed to create the transect route on a laptop computer in the field at the time of sampling. The track was uploaded to the

GPS and followed while the hydroacoustic data was being collected. The bottom part of Figure 5 shows a typical section of hydroacoustic echo trace containing plant information. Plant height and percent cover information has been extracted for these plots by post-processing with plant analysis software. These results will be combined with species and wet weight data to generate plant coverage and biomass estimates for each hectare plot sampled. A comparison will be made with the 1978 data to look for changes. The square hectare sampling protocol was also applied to the work on Big Platte Lake in 2003. The size of Big Platte (over 1,000 acres) was considered too big to effectively sample transects spaced at 50 m shoreline intervals as had been done in 2001 and 2002 on the much smaller Nichols and Clifford lakes.

**Literature cited:**

- Bryant, W. C., and K. D. Smith. 1988. Distribution and population dynamics of smallmouth bass in Anchor Bay, Lake St. Clair. Michigan Department of Natural Resources, Fisheries Research Report 1944, Ann Arbor.
- Schloesser, D. W. 1982. Seasonal Growth of submersed aquatic macrophytes in the St. Clair-Detroit River ecosystem. United States Fish and Wildlife Service, Great Lakes Fishery Laboratory, Administrative Report 82-5, Ann Arbor.
- Schloesser, D. W., and B. A. Manny. 1982. Distribution and relative abundance of submersed aquatic macrophytes in the St. Clair-Detroit River ecosystem. United States Fish and Wildlife Service, Great Lakes Fishery Laboratory, Administrative Report 82-7, Ann Arbor.

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**Date:** September 30, 2003

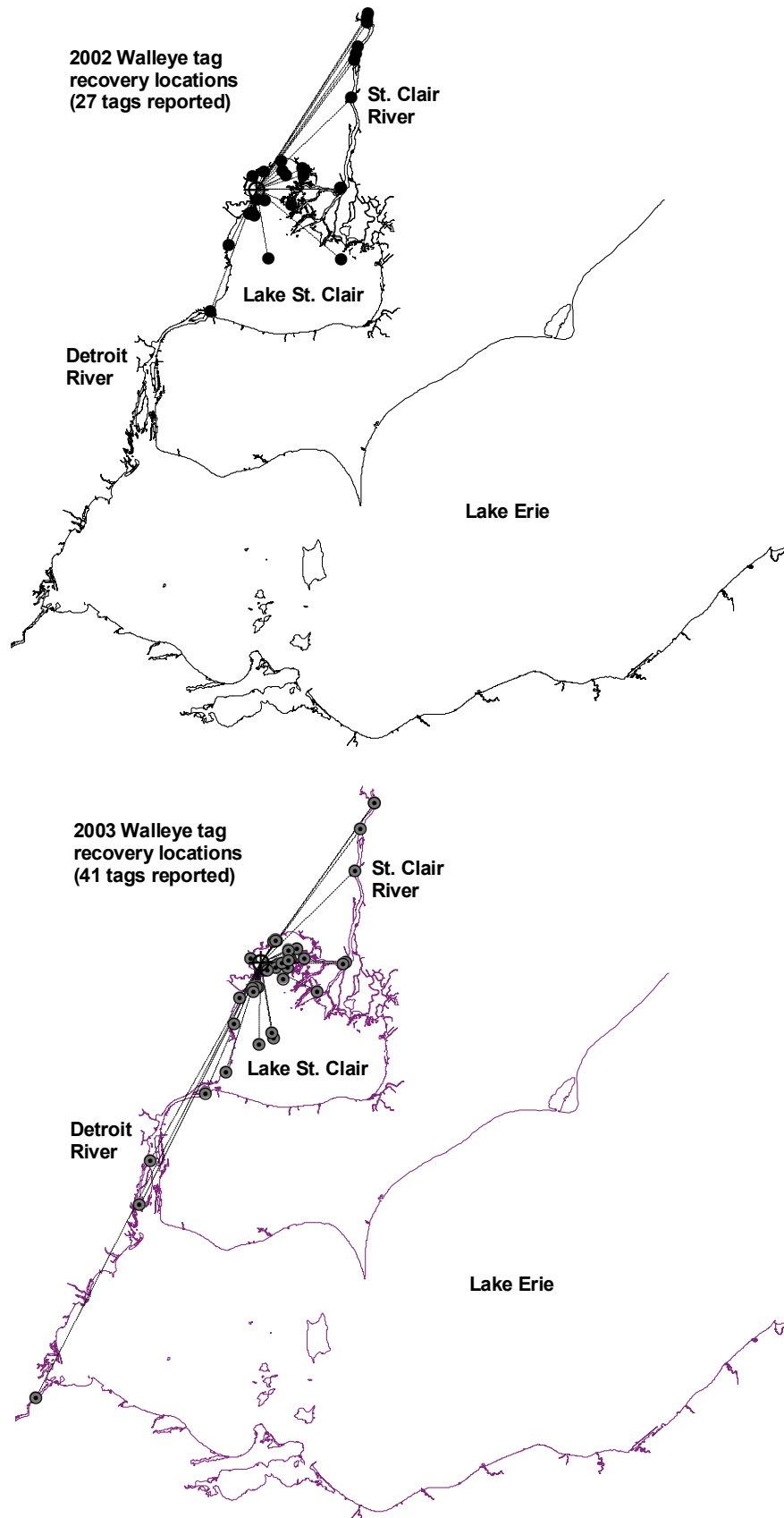
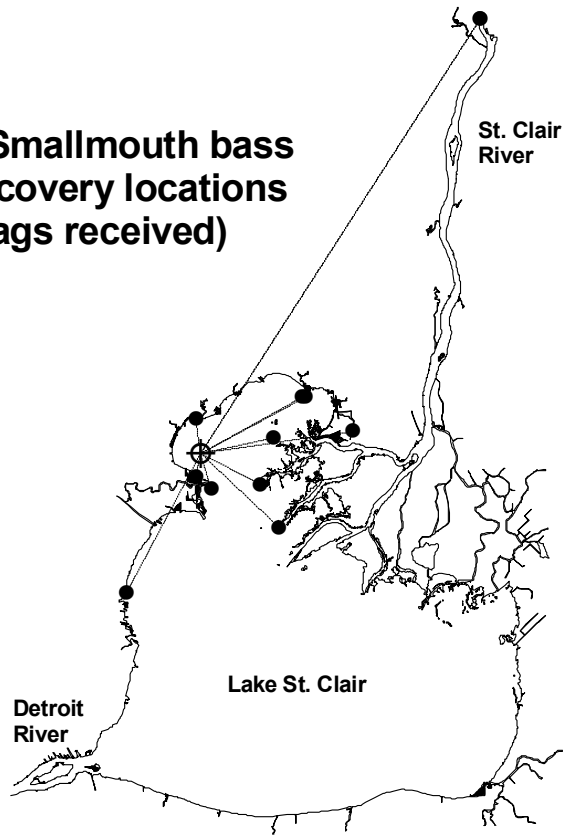


Figure 1.—Maps show distribution of walleye tag recoveries by anglers during the 2002 versus 2003 fishing seasons. The open circle shows the tagging site connected to each tag recovery by a dotted line (spider diagram).

**2002 Smallmouth bass  
tag recovery locations  
(12 tags received)**



**2003 Smallmouth bass  
tag recovery locations  
(11 tags received)**

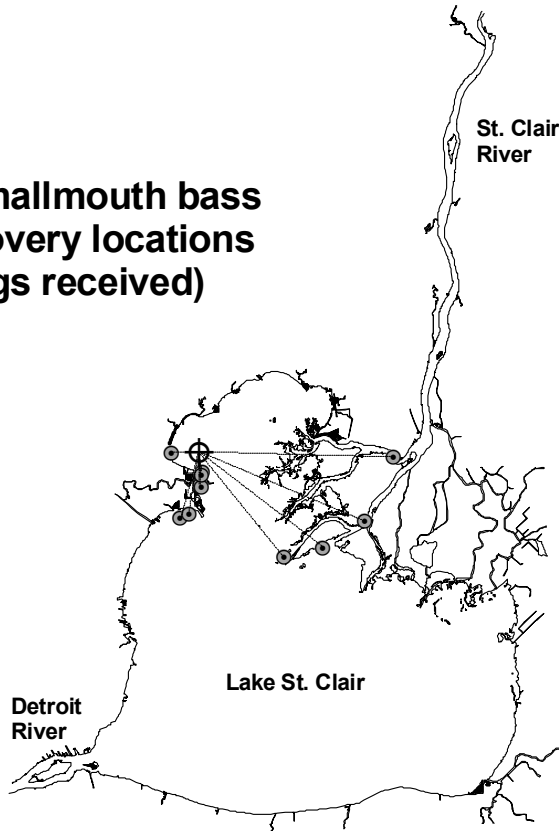


Figure 2.—Maps show distribution of smallmouth bass tag recoveries by anglers during the 2002 versus 2003 fishing seasons. The open circle shows the tagging site connected to each tag recovery by a dotted line (spider diagram).

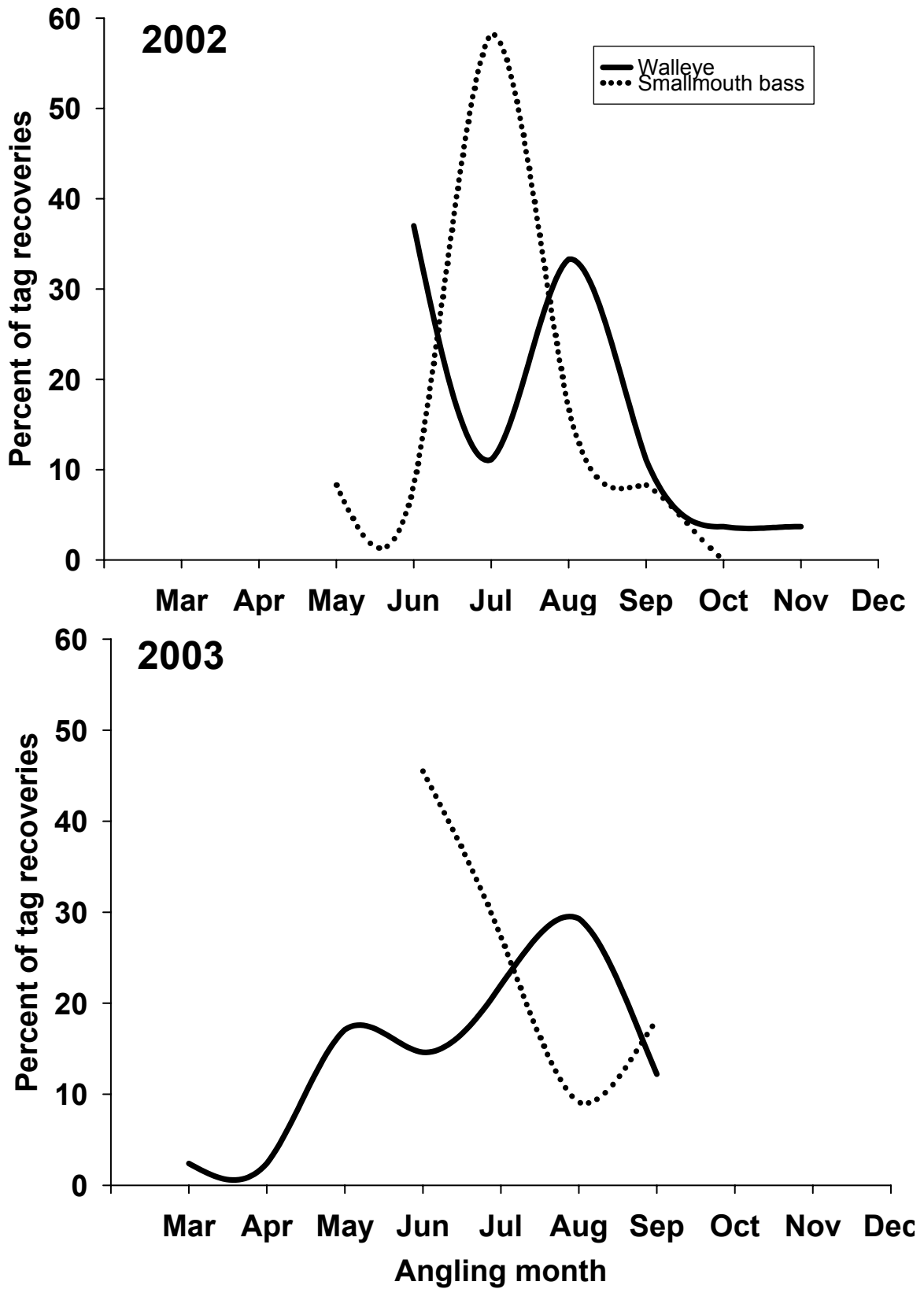


Figure 3.—Monthly distribution of walleye and smallmouth bass tag recoveries by anglers fishing in the Lower Great Lakes during 2002 and 2003. In 2002, 27 walleye and 12 smallmouth bass tags were reported. In 2003, 41 walleye and 11 smallmouth bass were reported.



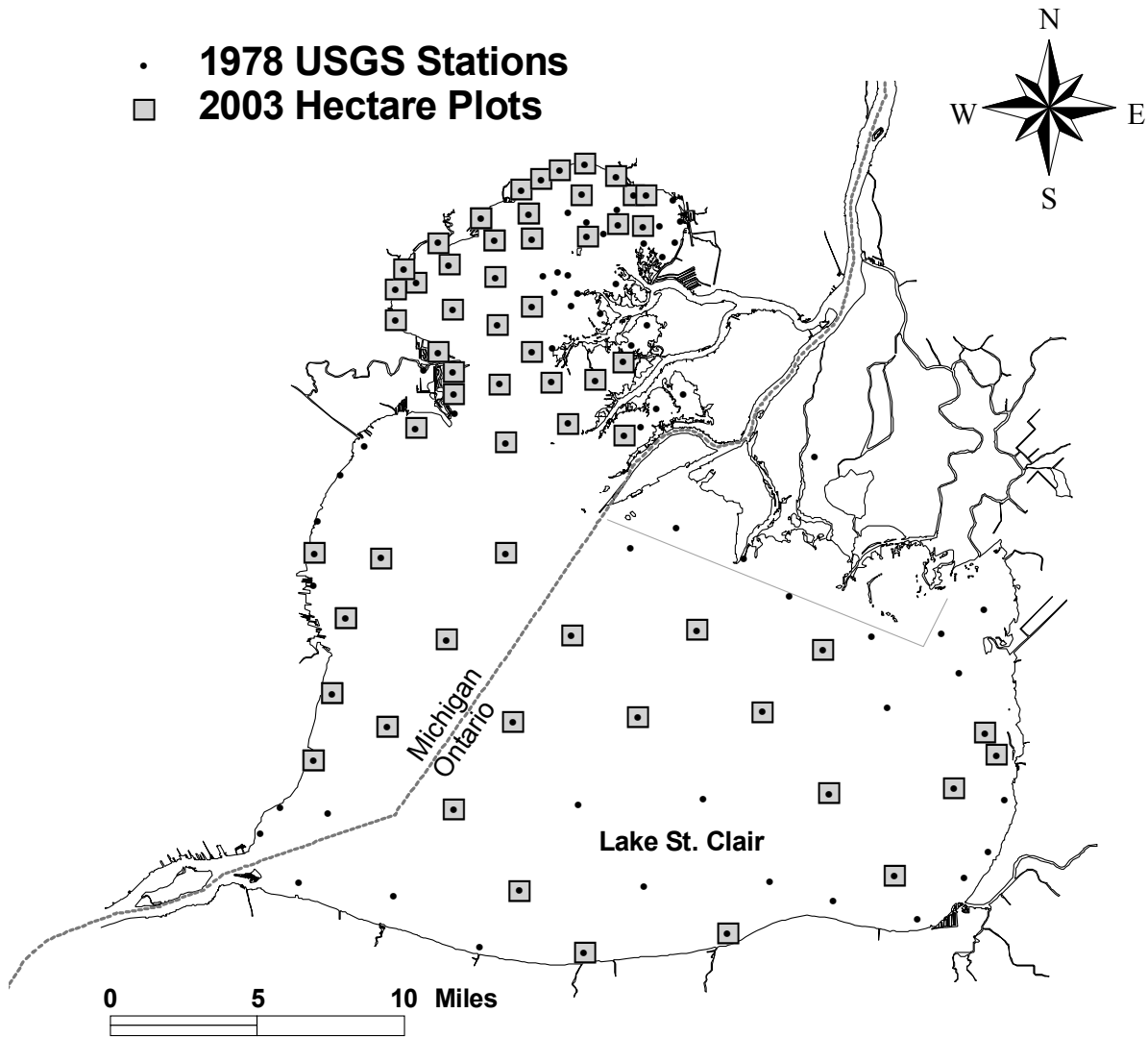


Figure 4.—Map of plant sampling locations. Black dots show 115 USGS sampling stations first visited during summer and fall of 1978. Gray squares show subset of 68 stations revisited in 2003 for square hectare plot sampling with hydroacoustic gear and hook tosses.

# Hectare Plot

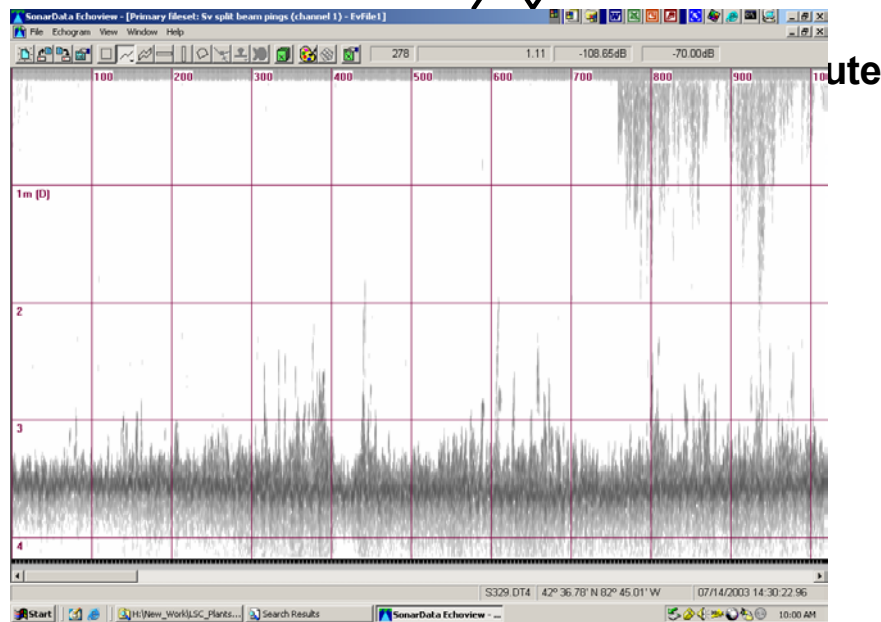
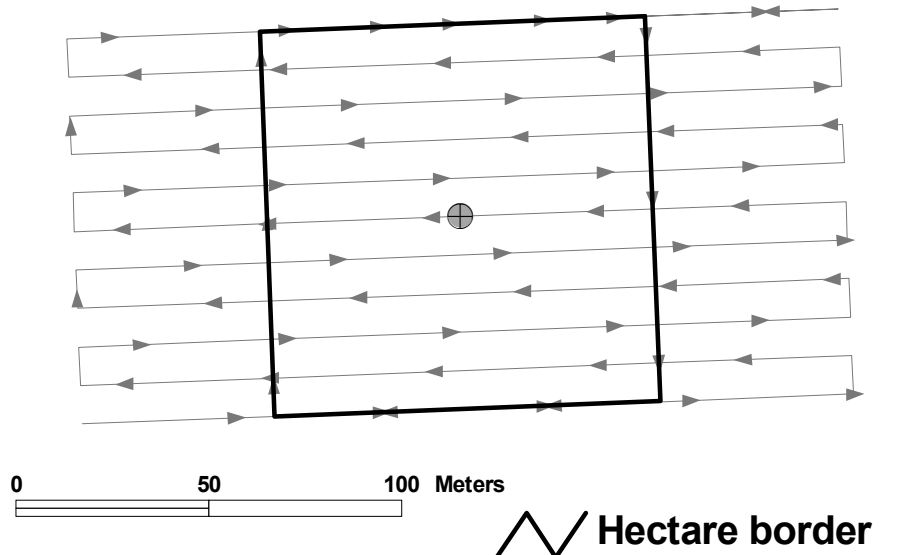
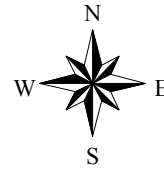


Figure 5.—Map in upper portion shows layout of typical square hectare plant sampling plot centered on a 1978 USGS sampling station. Dark border outlines hectare sample area and lighter gray line shows route of 11 transects at 10-m intervals followed by survey boat during hydroacoustic sampling. Hook tosses were typically made at center of hectare area. Lower portion shows screenshot from EchoView® software with submerged plants clearly visible on lake bottom.

Table 1.—Mean density (number per hectare) for all fish species caught during spring (June) and fall (September or October) with 10 m headrope index trawls in Anchor Bay, Lake St. Clair.

Species	Spring							Fall						
	1996	1997	1998	1999	2000	2001	2002	1996	1997	1998	1999	2000	2001	2002
Alewife	29.2	10.6	2.5	1.9	3.9	2.9	3.0	28.3	30.7	11.5	1.6	2.8	32.3	0.0
Bluntnose minnow	0.7	0.0	0.2	0.0	11.1	10.0	6.8	0.0	33.5	0.2	9.4	14.8	53.8	32.7
Common carp	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.9	0.0	0.1	0.0	1.1	2.1
Emerald shiner	0.7	0.2	0.0	0.0	5.1	0.0	10.6	3.8	1.1	7.5	0.0	0.0	0.0	0.6
Freshwater drum	6.6	12.5	5.0	2.3	0.7	4.5	0.8	1.1	0.6	0.2	1.4	1.0	2.3	0.2
Johnny darter	21.7	2.8	7.0	0.0	0.2	0.3	0.0	17.7	4.0	0.0	0.0	0.10	0.0	0.2
Lake sturgeon	2.3	0.4	0.0	0.1	0.2	0.0	0.8	1.8	0.0	1.4	0.0	0.1	0.0	0.0
Largemouth bass	0.0	0.0	0.0	0.0	0.1	0.6	0.0	0.0	0.0	0.0	3.0	1.8	16.4	35.5
Logperch	8.8	75.6	83.3	7.6	0.2	1.6	7.5	32.4	40.0	20.6	1.3	5.2	17.5	5.9
Mimic shiner	17.2	26.3	1.6	0.0	13.5	20.4	362.3	267.6	1094.9	0.2	29.8	14.8	9.6	44.1
Muskellunge	0.0	0.2	0.0	0.1	0.0	0.6	0.8	0.2	0.2	0.0	0.0	0.1	1.1	0.0
Northern pike	0.0	0.4	0.2	0.0	0.1	1.3	0.0	0.0	0.4	0.0	0.1	0.3	0.6	0.6
North. shorthead redhorse	7.7	6.7	0.7	6.9	2.5	3.6	6.8	0.2	0.4	0.2	0.4	0.7	2.3	0.3
Pumpkinseed	0.0	0.6	0.0	0.0	0.0	1.9	0.0	0.2	4.0	0.0	1.6	0.4	5.1	5.4
Quillback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.1	1.1	0.0	0.7	0.0	1.7
Rainbow smelt	593.0	656.1	4.3	4.0	3.8	61.1	0.0	0.9	16.5	0.2	0.0	1.0	0.0	0.0
Rock bass	43.0	17.5	5.4	1.0	12.8	29.8	38.5	18.3	81.5	0.9	89.0	92.8	39.6	40.8
Round goby	4.8	14.3	28.1	6.0	10.8	1.3	30.2	65.7	9.7	22.2	9.6	10.0	10.2	99.3
Silver lamprey	0.0	0.2	0.0	0.9	0.3	0.0	0.0	0.5	0.0	0.0	0.2	0.0	0.3	0.0
Silver redhorse	0.7	2.3	0.2	0.4	0.9	0.0	2.3	4.5	0.9	0.7	0.0	0.4	1.1	5.7
Smallmouth bass	0.2	3.2	0.5	0.0	0.8	2.9	3.8	13.6	10.6	24.5	10.7	6.1	0.0	51.4
Spottail shiner	178.2	122.6	8.2	68.9	935.4	7.4	5729.6	17.0	487.2	45.3	200.0	50.5	878.5	2406.5
Trout-perch	231.2	345.9	98.5	154.0	34.3	11.0	264.9	775.7	92.3	25.8	2.9	0.2	0.0	9.7
Walleye	4.5	10.4	0.9	1.7	1.2	0.6	0.8	7.2	1.3	2.7	0.9	0.8	0.0	11.3
White perch	1.4	0.7	0.0	0.4	13.3	0.6	0.8	16.1	11.7	7.5	0.1	0.1	0.0	13.2
White sucker	5.4	3.7	3.6	0.0	2.5	1.3	61.1	0.5	2.3	0.0	0.3	1.0	0.6	8.0
Yellow perch	1184.1	560.3	249.7	866.9	157.8	1131.7	724.5	34.2	26.8	68.8	21.7	40.9	113.8	73.3

Table 2.—Angler effort, catch, and catch rates for the Lake St. Clair sport fishing diary program.

Species	Year	Trips seeking	Effort (rod-hours)	Number caught	Number kept	Catch per rod-hour
Walleye	1996	484	6,102	1,906	1,685	0.31
	1997	408	4,681	1,479	1,311	0.32
	1998	510	5,599	2,481	1,947	0.44
	1999	625	5,850	2,610	2,239	0.44
	2000	444	4,672	1,753	1,646	0.37
	2001	342	4,051	1,893	1,681	0.47
	2002	425	4,475	1,357	1,298	0.30
Yellow perch	1996	265	3,462	10,654	5,846	3.08
	1997	252	2,701	9,661	5,773	3.58
	1998	305	3,520	7,134	5,048	2.03
	1999	226	2,087	6,142	3,654	2.94
	2000	235	2,892	10,436	5,660	3.61
	2001	164	2,047	5,862	4,350	2.86
	2002	412	4,658	12,841	9,091	2.87
Smallmouth bass	1996	153	1,537	545	190	0.35
	1997	143	1,375	687	148	0.50
	1998	127	1,248	495	94	0.40
	1999	222	1,841	1,112	204	0.60
	2000	190	1,126	1,484	126	1.22
	2001	74	512	280	48	0.55
	2002	153	1,207	954	110	0.79
Muskellunge	1996	494	15,629	1,458	12	0.093
	1997	425	15,199	1,573	11	0.103
	1998	383	11,336	1,075	8	0.094
	1999	318	9,370	645	5	0.069
	2000	269	8,874	749	16	0.084
	2001	241	7,248	851	2	0.117
	2002	156	3,953	277	4	0.070

Table 3.—Mean length at age (mm) for yellow perch from Lake St. Clair trawls in June. Sample size in parentheses. SWAVg is the Michigan statewide average growth value.

Age	1997	1998	1999	2000	2001	2002	SWAVg
Males							
1	87 (33)	102 (4)	102 (59)	109 (6)	109 (3)	103 (5)	
2	126 (32)	132 (104)	140 (48)	129 (110)	126 (8)	139 (6)	
3	147 (172)	162 (39)	158 (64)	158 (17)	142 (56)	153 (16)	
4	181 (74)	171 (111)	179 (45)	171 (60)	175 (12)	169 (43)	
5	206 (11)	187 (43)	186 (70)	189 (57)	193 (23)	189 (13)	
6	213 (24)	209 (12)	193 (43)	200 (47)	206 (18)	213 (7)	
7	225 (3)	238 (4)	218 (4)	209 (4)	207 (6)	215 (7)	
Females							
1	90 (23)	101 (5)	106 (94)	108 (2)	114 (2)	106 (24)	
2	136 (20)	141 (70)	139 (38)	138 (147)	126 (1)	161 (1)	
3	160 (136)	167 (11)	170 (43)	171 (18)	160 (59)	168 (4)	
4	195 (56)	186 (54)	181 (29)	194 (35)	181 (25)	198 (34)	
5	211 (8)	196 (47)	209 (42)	206 (46)	230 (25)	189 (42)	
6	245 (4)	226 (17)	223 (45)	229 (24)	241 (15)	219 (11)	
7	— —	253 (2)	247 (4)	234 (14)	263 (12)	227 (2)	
Sexes combined							
1	88 (61)	102 (9)	103 (163)	109 (8)	111 (5)	105 (29)	102
2	130 (52)	135 (174)	139 (86)	134 (257)	126 (9)	142 (7)	145
3	152 (308)	163 (50)	163 (107)	164 (35)	151 (115)	156 (20)	173
4	187 (130)	176 (165)	180 (74)	180 (95)	179 (37)	182 (77)	198
5	208 (19)	192 (90)	195 (112)	197 (103)	212 (48)	189 (56)	221
6	218 (28)	219 (29)	208 (88)	210 (71)	221 (33)	219 (11)	246
7	229 (4)	243 (6)	233 (8)	228 (18)	245 (18)	227 (10)	267

Table 4.–Catch rate by age for yellow perch in June index trawl tows on Lake St. Clair.

Year class	Total CPUE	Survey year									
		1993 <sup>1</sup>	1994 <sup>1</sup>	1995 <sup>1</sup>	1996	1997	1998	1999	2000	2001	2002
1984	0.5	0.1	0.1	0.3	–	–	–	–	–	–	–
1985	0.2	0.0	0.2	0.0	–	–	–	–	–	–	–
1986	0.3	0.2	0.1	0.0	–	–	–	–	–	–	–
1987	1.0	0.0	0.6	0.3	0.1	–	–	–	–	–	–
1988	4.1	0.9	1.6	0.9	0.3	0.3	–	–	–	–	–
1989	10.2	2.8	3.7	2.2	1.2	0.3	–	–	–	–	–
1990	30.4	6.1	4.1	13.4	5.2	1.3	0.3	–	–	–	–
1991	164.4	51.3	47.0	32.1	18.7	12.9	1.8	0.6	–	–	–
1992	43.3	1.0	3.4	5.8	11.5	9.6	10.4	1.1	0.1	0.5	–
1993	569.2	–	56.3	125.8	171.4	113.7	43.0	54.3	1.5	3.3	–
1994	936.4	–	–	166.2	293.2	348.2	88.1	20.6	8.3	10.6	1.3
1995	164.5	–	–	–	21.4	40.7	26.4	32.2	12.3	21.1	10.4
1996	235.7	–	–	–	–	33.3	77.1	70.3	11.3	35.3	9.7
1997	157.1	–	–	–	–	–	2.7	37.6	5.5	52.8	61.3
1998	1,198.5	–	–	–	–	–	–	650.2	114.1	347.7	83.7
1999	49.4	–	–	–	–	–	–	–	4.8	25.8	17.6
2000	7.3	–	–	–	–	–	–	–	–	2.7	4.6
2001	131.3	–	–	–	–	–	–	–	–	–	131.3

<sup>1</sup>Data collected during previous studies.

Table 5.—Age distribution for predator species captured in Anchor Bay assessment trap nets in 2002.

Age	Species			
	Muskellunge	Northern pike	Smallmouth bass	Walleye
1	—	1	—	—
2	—	4	—	6
3	—	28	10	80
4	1	44	281	14
5	3	22	35	56
6	6	14	16	44
7	11	6	10	8
8	9	1	11	22
9	9	—	10	7
10	2	—	12	3
11	0	—	6	2
12	0	—	4	—
13	0	—	2	—

Table 6—Age specific catch per net lift for smallmouth bass in Anchor Bay assessment trap net surveys. Total CPUE represents the combined Age 2 through Age 13 catch per net lift values. Age 9+ is the catch per net lift for age groups 9, 10, 11, 12, and 13.

Age	Sample year										
	1974	1975	1977	1978	1979	1980	1981	1983	1984	1985	2002
2	—	0.01	0.07	0.09	0.05	—	0.07	0.04	0.15	0.07	—
3	1.62	0.16	0.48	3.09	4.55	20.64	2.87	3.12	8.16	2.93	0.16
4	3.66	3.21	7.96	7.44	5.89	14.34	24.12	5.19	10.19	16.91	4.42
5	2.64	2.43	1.31	12.76	2.11	5.20	6.80	2.19	4.35	6.33	0.52
6	0.81	0.90	1.85	0.94	3.12	1.71	1.53	3.60	2.00	2.21	0.25
7	0.36	0.42	0.99	0.59	0.49	2.12	0.34	0.68	1.67	0.81	0.16
8	0.06	0.08	0.19	0.24	0.26	0.97	0.37	0.02	0.19	0.59	0.17
9	0.02	0.07	0.13	—	0.18	0.11	0.10	0.07	0.11	0.18	0.16
10	—	0.03	0.03	—	0.02	0.11	—	0.01	0.08	0.11	0.19
11	—	0.02	—	—	—	—	—	—	0.00	—	0.10
12	—	—	—	—	—	—	—	—	0.01	—	0.06
13	—	—	—	—	—	—	—	—	—	—	0.03
9+	0.02	0.12	0.16	0.00	0.20	0.22	0.10	0.08	0.20	0.29	0.54
Total CPUE	9.17	7.33	13.01	25.15	16.67	45.20	36.20	14.92	26.91	30.14	6.23
Mean age	4.44	4.86	4.69	4.56	4.43	4.02	4.27	4.58	4.24	4.47	4.87



Table 7.—Walleye and smallmouth bass tag recoveries from Lake St. Clair during 2002 and 2003.

Year	Number tags applied	Mean length (mm) at tagging	Number recoveries in 2002	2002 Seasonal recovery rate	Mean tag length (mm) at recovery	Number recoveries in 2003	2003 Seasonal recovery rate	Mean tag length (mm) at recovery	Total tags recovered	Percent recovered
Walleye										
2002	241	497.1	27	0.112	475.6	21	0.087	524.5	48	19.9
2003	173	492.7	—	—	—	20	0.116	502.4	20	11.6
Smallmouth Bass										
2002	270	383.8	12	0.044	369.2	6	0.022	353.2	18	6.7
2003	830	388.3	—	—	—	5	0.006	384.6	5	0.6