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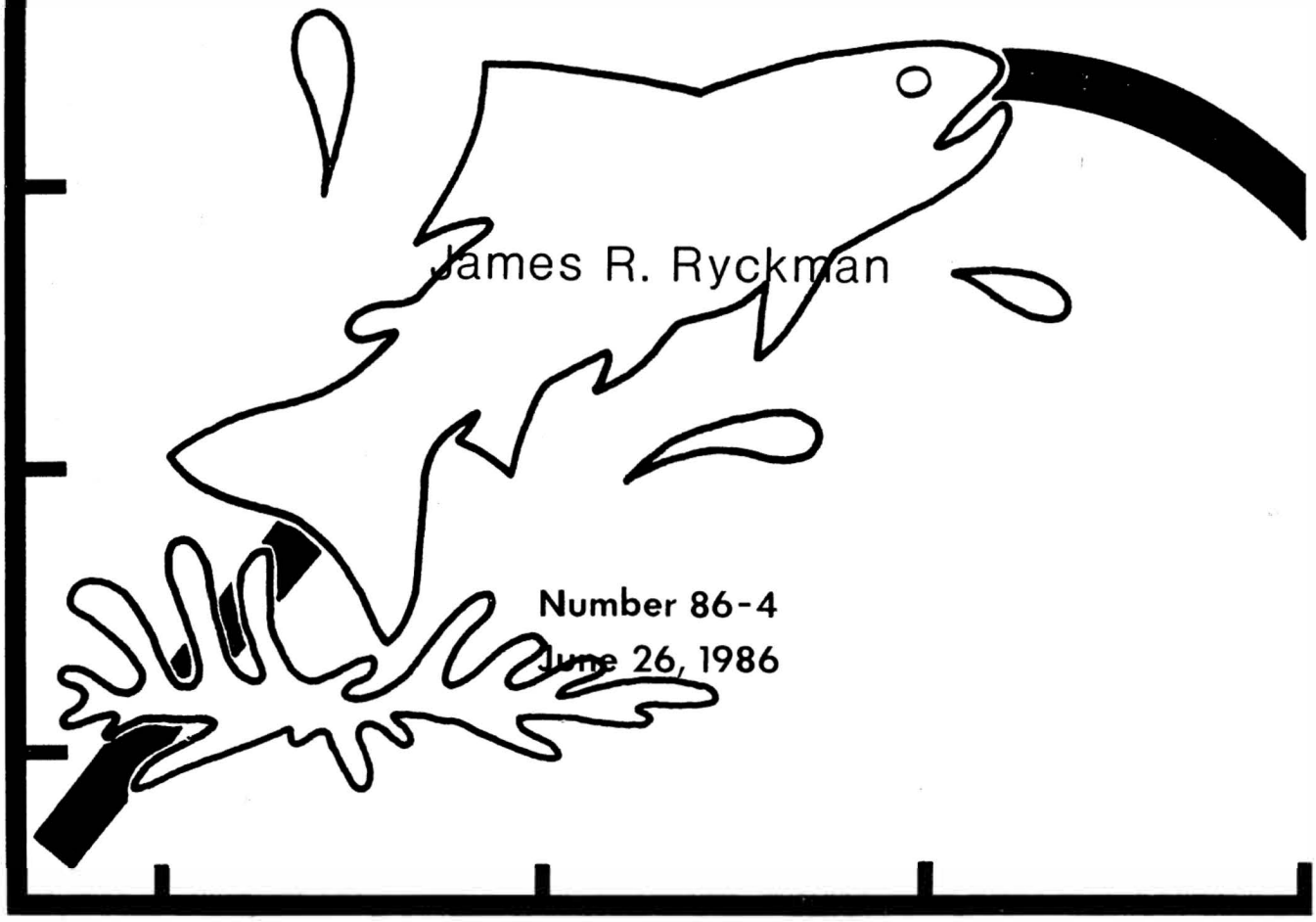
FISHERIES DIVISION

TECHNICAL REPORT

A Creel Survey of Sportfishing in Saginaw Bay, Lake Huron, 1983-84



James R. Ryckman

Number 86-4
June 26, 1986

Michigan Department of
Natural Resources

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Technical Report 86–4

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Another year-to-year comparison could be made with the 1984 data from Arenac and northern Bay counties using similar ice fishing data collected from 1974 to 1978 (Weber 1985). The three statistics compared were the number of perch caught, the hours spent fishing, and the number of fishing trips made by anglers. The 1977–78 ice fishing season had the most perch caught (501,806 ± 43,851); 1983–84 had the highest numbers of angler hours (218,536 ± 36,079) and angler trips (73,173 ± 11,151). The 1975–1976 ice fishing season had the lowest estimated perch catch (41,583 ± 26,988) and the 1976–1977 ice fishing season had the lowest number of angler hours (47,872 ± 16,839) and angler trips (6,539 ± 1,858). These statistics are partly influenced annually again by the year class strength of yellow perch and are strongly influenced by the length of the season or by the length of time ice covers the bay (Ryckman and Lockwood 1985). These data are summarized monthly in Table 13.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
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A CREEL SURVEY OF SPORTFISHING IN SAGINAW BAY, LAKE HURON, 1983–84[1]

James R. Ryckman

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[1]Contribution from Dingell-Johnson Project F-53-R, Michigan

ABSTRACT

A creel survey was conducted in four counties on Saginaw Bay from the spring season of 1983 to the spring season of 1984. During this 13-month period anglers fished an estimated total of 1,720,054 hours. Thirty-nine percent of this fishing effort was expended from May through November 1983. Sixty-one percent of the effort occurred from January through May 1984. Essentially no fishing occurred during the month of December 1983.

Anglers caught an estimated 3,829,868 fish of all species from May 1983 through May 1984. Forty percent of these fish were caught from May through November 1983. The remaining 60% of the catch occurred from January through May 1984. Ninety-four percent of the May through November 1983 catch was yellow perch. This species made up 97% of the total catch from January through May 1984. The catch of yellow perch had an average length of 7.6 inches. Catch rates for this 13-month period were 2.2266 total fish per hour per angler and 2.1347 yellow perch per hour per angler.

A comparison of the months of May 1983 and May 1984 showed much higher fishing pressure, total catch, and yellow perch catch in the latter year than in 1983. Catch rates for May for both years were not significantly different. The month of May 1984 had the highest fishing pressure of any month surveyed. This estimated pressure was 220,931 angler hours. The month of August 1983 had the highest catch of total fish and catch of yellow perch. These estimates were 498,816 and 492,739, respectively.

A comparison of the number of yellow perch caught per month and number of angler hours spent fishing showed a high correlation ($r^2=0.8332$).

INTRODUCTION

Saginaw Bay is located on the eastern side of Michigan's lower peninsula in the Lake Huron watershed. It is approximately 60 miles long and its axis runs in a southwesterly-northeasterly direction. The lower end of the bay is approximately midway between the northern and southern boundaries of Michigan's lower peninsula. The width of the bay varies from 18 to 30 miles. Its major tributary is the Saginaw River, which enters at the southwestern end of the bay at Bay City.

This body of water has long been noted for its sport and commercial fisheries. The primary species caught by anglers and commercial fishermen is the yellow perch. Concern about the health of the yellow perch population stimulated a survey to measure the annual catch and effort for the sport fishery in a four county area.

METHODS

A creel census was begun in the spring of 1983 for the Saginaw Bay waters of Arenac, Bay, Huron, and Tuscola counties. Three of the four counties (Bay, Huron, and Tuscola) were censused from March 1983 to the end of May 1984. The northern-most county, Arenac, was censused from May 1983 through May 1984.

Iosco County also borders the extreme northern end of Saginaw Bay, but it was decided that this area more nearly matched Lake Huron proper and, therefore, was not included in this survey. This survey includes all of the area of Saginaw Bay southwest of a line from the Iosco-Arenac county line to the tip of the thumb of Michigan (Port Austin in Huron County, Fig. 1). Interviews were collected on-site by clerks according to stratified random schedules (Ryckman 1981). Five census clerks collected interviews during the open-water season and four clerks worked during the ice fishing season. The interviews provided catch rates (catch per hour) by species, species sought information, residence of anglers, length of an angler trip, and number of fishing trips taken by each angler each day.

Fishing pressure counts were made once a day by airplane, on 3 weekdays and 2 weekend days per week during the open-water season (March-November 1983 and April-May 1984). The counts from the plane were also made on a stratified random schedule (morning vs afternoon and weekday vs weekend). The direction of the flight of the plane, within a monthly period, was also randomly selected to eliminate any time of day bias in the angler counts. The counting was done by both a clerk accompanying the pilot and the pilot to insure accuracy. Individual shore anglers and fishing boats were counted during the open-water season.

During the ice fishing season (January-March 1984) similar stratified counts were made by the clerks from the ground. This method was possible because the ice fishing occurred in fewer and more localized areas visible from the shore.

The average number of shore anglers per count per time strata during the open-water season and the average number of open-ice fishermen per count per time strata were calculated. These averages were multiplied by a corresponding expansion factor (number of days in a time strata x possible fishing hours in a day in a time strata) to provide estimates of angler hours. Boat hours and shanty hours were estimated similarly with the two following additions. First, estimates of the number of anglers per boat and per ice shanty were determined from interviews collected by the clerks and the appropriate expansion factors were multiplied by the original calculated boat hours and shanty hours to estimate angler hours for each fishery. Second, ice shanties were subsampled 2 or 3 days each, week (stratified by weekdays and weekends) to determine what percentage of them were actually being used for fishing. These percentages were used to adjust the original estimate of shanty fishing hours.

All estimates were stratified by weekend and weekdays, month, fishing type, and county. All estimates and statistics in this report are given with confidence limits of two standard errors.

A list of common and scientific names of fish caught by anglers is given in Appendix 1.

RESULTS

Anglers fished an estimated 676,349 angler hours from May through November 1983 in the four counties censused. They caught 1,516,116 fish, of which 94% (1,427,937) were yellow perch (Table 1). Other important species caught were channel catfish (35,550) and bullheads (19,294) (Table 2). Essentially no sportfishing occurred on Saginaw Bay in December 1983.

Open-ice fishing and shanty fishing occurred from January through mid-March 1984, and shore and boat fishing occurred from mid-March through May 1984, when the census was terminated. For the January through May period, an estimated 1,043,705 angler hours were expended fishing on Saginaw Bay. The estimate of total fish caught was 2,313,752, of which 96.98% (2,243,799) was yellow perch (Tables 1 and 3). The catch of rainbow smelt was of secondary importance. The highest monthly fishing effort, total catch, and yellow perch catch were during January 1984. These estimates were 371,514 angler hours, 802,248 total fish caught, and 785,745 yellow perch caught, respectively. The second highest estimated monthly fishing effort was in May 1984. This estimate was 220, 931 angler hours. The second highest monthly estimates of total fish and yellow perch caught occurred in August 1983. These values were 498,816 total fish and 492,739 yellow perch, respectively (Tables 2 and 3).

For the 13 months of census, May 1983 through May 1984, the total fishing effort for the four counties of Saginaw Bay was 1,720,054$\pm$119,577 angler hours and 526,777$\pm$45,538 angler trips. From those two values the average length of an angler trip within a day was calculated to be 3.3$\pm$0.4 hours. The total number of fish of all species caught by sports anglers was 3,829,868$\pm$493,218. Yellow perch catch was estimated to be 3,671,736$\pm$491,574 or

95.87±17.81% of the total catch. The 13-month average catch rates were 2.2266±0.3259 total fish per angler hour and 2.1347±0.3220 yellow perch per angler hour.

The length-frequency distribution of 3,000 yellow perch taken from all areas fished from March 1983 through May 1984 (Weber 1985) indicates that of the 3,792,008 perch caught during this period 1,008,674 (26.60±0.05%) were in the 6.0-to 6.9-inch group; 1,418,211 (37.40±7.24%) were in the 7.0-to 7.9-inch group; 750,818 (19.80±3.99%) were in the 8.0 to 8.9-inch group; and 329,905 (8.70± 1.93%) were in the 9.0- to 9.9-inch group (Table 4). The average size of all angler caught perch from this sample was 7.63±0.04 inches.

The total number of yellow perch caught each month from May 1983 through May 1984 showed a direct straight-line relationship with the number of angler hours fished each month. This relationship was:

Total yellow perch catch = 1.946 x total number of angler hours fished per month.

This relationship had a correlation coefficient (r) of 0.9128 (Fig. 2).

This relationship was also tested using winter ice fishing data from Arenac County collected from 1974 through 1983 (Weber 1985). The relationship between the number of perch caught and the number of hours spent fishing was not significantly different from the 1983–1984 overall relationship for the entire four-county area surveyed (Fig. 2).

The only month that could be used to compare year-to-year variation in the fishing (1983 vs 1984) for the entire four-county area censused was the month of May because no interviews were collected from Arenac County during March and April 1983. May 1984 had significantly higher fishing pressure, total catch of all species, and total catch of yellow perch than May 1983. The May 1984 catch and fishing pressure divided by the May 1983 values showed the following relationships:

1) May 1984 total catch = (4.95±2.71) x (May 1983 total catch).
2) May 1984 perch catch = (5.63±3.60) x (May 1983 perch catch).
3) May 1984 angler hours = (4.58±1.91) x (May 1983 angler hours).
4) May 1984 angler trips = (5.68±2.79) x (May 1983 angler trips).

The catch rate comparisons for May 1983 to May 1984, for total fish and yellow perch are:

1) May 1984 total fish per angler hour = (1.08±0.74 x May 1983 total fish per angler hour).
2) May 1984 perch per angler hour = (1.23±0.94 x May 1983 perch per angler hour).

Since the confidence limits for the catch rate ratios (1984 catch rate ÷ 1983 catch rate) of total fish and yellow perch caught in May 1983 and May 1984 both overlap the value of 1.00,

neither catch rate could be shown to be significantly different between the 2 years for the month of May. Similar statistics for the fishing pressure (angler hours and angler trips), the estimated total fish caught, and the estimated yellow perch caught (May 1984 ÷ May 1983) all had a ratio value significantly higher than 1.00. Therefore, these statistics were higher in 1984 than 1983. These figures demonstrate the extreme year-to-year variability of certain estimates that can occur within a fishery and the danger of extrapolating any single year's data over several years. This variability is most likely due to year class strength of yellow perch in the fishery.

Another year-to-year comparison could be made with the 1984 Arenac County data using similar ice fishing data collected from 1974 to 1978 (Weber 1985). The three statistics compared were the number of perch caught, the hours spent fishing, and the number of fishing trips made by anglers. The 1977–78 ice fishing season had the most perch caught (501,806±43,851) and the highest numbers of angler hours (161,749±10,708) and angler trips (48,749±4,171). The 1975–1976 ice fishing season had the lowest estimated perch catch (41,583±26,988) and the 1976–1977 ice fishing season had the lowest number of angler hours (47,872±16,839) and angler trips (6,539±1,858). These statistics are partly influenced annually again by the year class strength of yellow perch and are strongly influenced by the length of the season or by the length of time ice covers the bay (Ryckman and Lockwood 1985). These data are summarized monthly in Table 13.

Total fishing pressure, total catch of all fish, and total yellow perch caught appear to be dependent on the number of yellow perch available to the anglers. This most likely is related to year class strength, as reflected in the recruitment of 6- to 8-inch perch in the fishery. These sizes make up 83.8% of the yellow perch caught (Table 4).

Catch rates of total fish and yellow perch appear to be consistent from month to month. This suggests anglers will fish Saginaw Bay as long as yellow perch are available to be caught and will not fish the Bay when yellow perch are not available or catchable.

Fishing pressure estimates for the four-county area surveyed were fairly precise. Two standard errors of the estimated angler hours, divided by the estimate were equal to 6.83%. The same statistic for angler trips was 8.44%. Estimates of catch rates for yellow perch and total fish were not as precise as the pressure estimates. Two standard errors of the catch per hour, divided by the estimate of catch per hour, were 15.09% for yellow perch and 14.63% for total fish. To improve the precision of these estimates more interviews would have to be taken. One problem during this survey was the long time required by the census clerks to travel from their work stations to Saginaw Bay and return. Two to 3 hours of the 8-hour shift were spent traveling and this directly reduced the number of interviews collected in a day.

RECOMMENDATIONS

Future surveys of Saginaw Bay should probably be done for at least 2 and preferably 3 consecutive years to better determine the between-year variation of fishing pressure and catch.

Census clerks working on Saginaw Bay should spend at least 8 hours per work day collecting interviews to improve the estimates of catch rates and catch.

Since there seems to be a strong linear relationship between estimated angler hours per month and the number of yellow perch caught per month (Fig. 2), this relationship should be tested in any future surveys at Saginaw Bay. If this relationship remains fairly constant from year to year, it may be possible to estimate the yellow perch catch more economically by only making angler pressure counts. This method could not be used to make catch estimates of other fish species, however.

ACKNOWLEDGMENTS

I would like to thank the Fisheries field personnel of the Department of Natural Resources, Districts 7, 8, and 11, for collecting data and Roger Lockwood for assisting in the analysis of the data and training of clerks. I would also like to thank James Schneider for editing this report and Amelia Carter who piloted the plane and supervised the angler count routines.

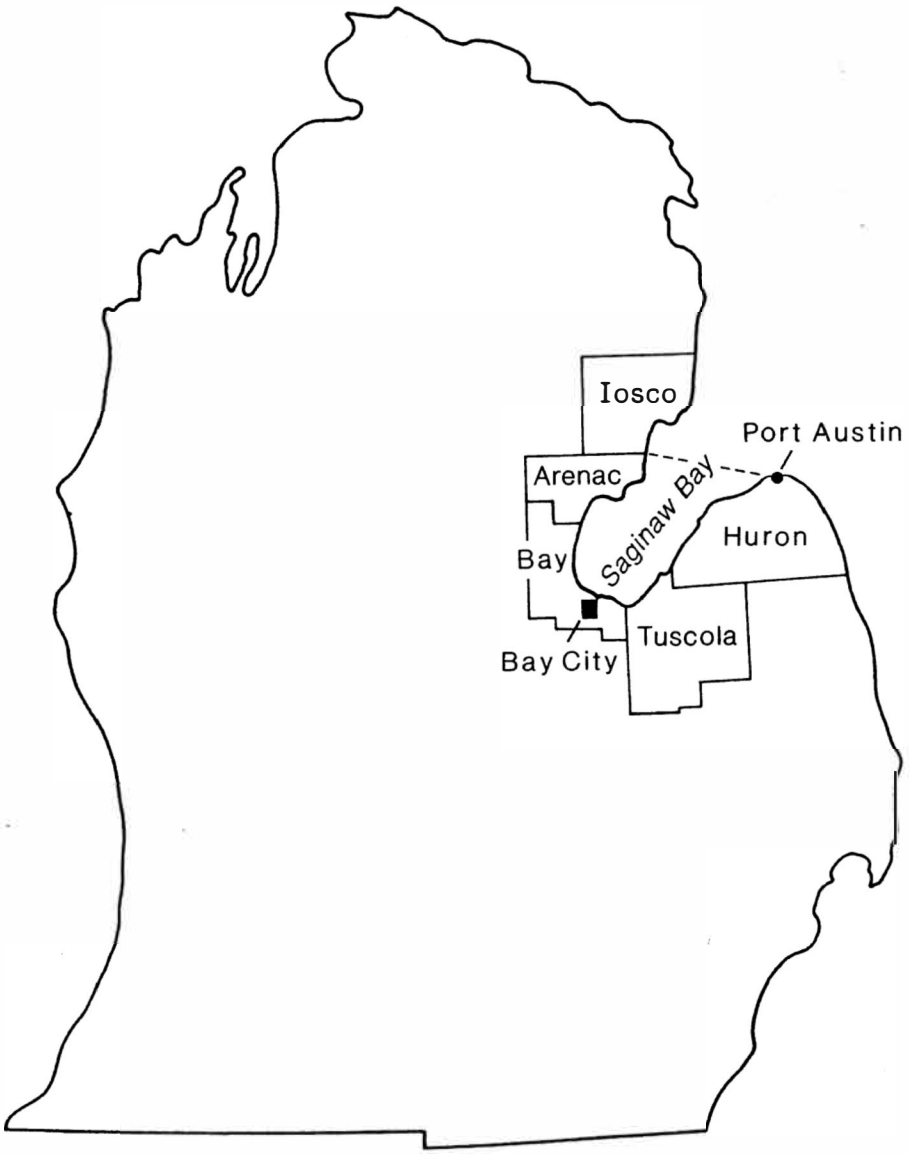

Figure 1. Map of Michigan showing the five counties surrounding Saginaw Bay and the four county areas censused from May 1983 through May 1984 (southwest of the dashed line).

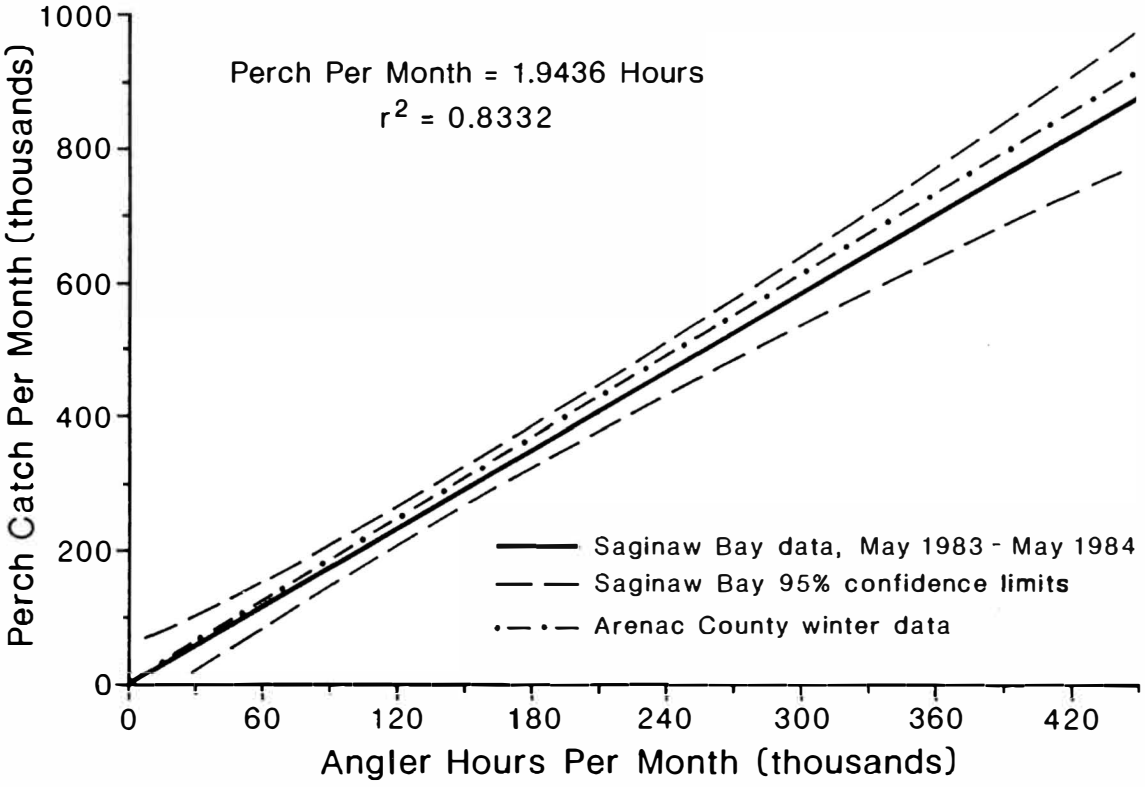

Figure 2. Linear relationship between number of hours fished per month and the number of yellow perch caught per month on Saginaw Bay, May 1983 through May 1984, and the same relationship for the Arenac County winter ice fisheries for the winters of 1974–75 through 1977–78 and 1983–84.

Table 1. Yellow perch catch given as a percentage of the total catch from Saginaw Bay, from May-November 1983 and January-May 1984.

County fished	May-Nov 1983	Jan-May 1984	Total of 13 months
Arenac	96.69 ± 73.47	90.87 ± 37.46	94.24 ± 44.95
Bay	94.50 ± 80.61	95.84 ± 30.67	95.14 ± 44.54
Huron	91.05 ± 31.35	98.42 ± 34.95	97.31 ± 26.66
Tuscola	95.07 ± 35.55	98.90 ± 19.13	98.18 ± 16.90
Total	94.18 ± 36.33	96.98 ± 17.20	95.87 ± 17.81

Table 2. Angler catch by species for the four county total of Saginaw Bay, March-November 1983.

Species	Total catch per hour May-Nov	Month									Mar-Nov total
		Mar[1]	Apr[1]	May	Jun	Jul	Aug	Sep	Oct	Nov	
Rainbow trout	0.0037 (0.0041)	0 (0)	0 (0)	126 (247)	16 (34)	0 (0)	0 (0)	17 (35)	2,343 (3,074)	326 (528)	2,828 (3,129)
Brown trout	<0.0001 (0.0001)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	44 (89)	0 (0)	0 (0)	44 (89)
Lake trout	0.0036 (0.0017)	0 (0)	0 (0)	222 (276)	521 (776)	443 (526)	702 (535)	83 (132)	691 (551)	101 (113)	2,763 (1,255)
Coho salmon	<0.0001 (<0.0001)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	26 (61)	0 (0)	0 (0)	0 (0)	26 (61)
Chinook salmon	0.0114 (0.0077)	0 (0)	0 (0)	58 (91)	56 (116)	1,007 (1,378)	1,019 (750)	6,356 (5,576)	172 (157)	0 (0)	8,668 (5,797)
Smelt	<0.0001 (<0.0001)	0 (0)	0 (0)	2 (6)	0 (0)	0 (0)	0 (0)	0 (0)	32 (69)	0 (0)	34 (69)
Northern pike	0.0009 (0.0012)	0 (0)	0 (0)	104 (146)	3 (7)	9 (18)	37 (37)	535 (927)	0 (0)	0 (0)	688 (939)
Tiger musky	<0.0001 (<0.0001)	0 (0)	0 (0)	11 (24)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	11 (24)
Yellow perch	2.0416 (0.5901)	31,181 (59,693)	89,091 (88,720)	45,306 (26,165)	120,160 (64,157)	267,611 (159,522)	492,739 (320,798)	285,981 (157,852)	158,444 (43,296)	57,696 (24,821)	1,548,209 (414,731)
Walleye	0.0028 (0.0019)	0 (0)	0 (0)	30 (51)	167 (184)	971 (1,190)	712 (758)	248 (273)	0 (0)	0 (0)	2,128 (1,450)
Smallmouth bass	0.0011 (0.0014)	0 (0)	0 (0)	19 (41)	114 (149)	0 (0)	139 (211)	545 (987)	0 (0)	0 (0)	817 (1,021)
Largemouth bass	0.0021 (0.0013)	0 (0)	0 (0)	89 (127)	985 (829)	424 (536)	61 (112)	24 (38)	0 (0)	0 (0)	1,583 (1,002)

Table 2. Continued:

Species	Total catch per hour May-Nov	Month									Mar-Nov total
		Mar[1]	Apr[1]	May	Jun	Jul	Aug	Sep	Oct	Nov	
Bluegill	0.0007 (0.0007)	0 (0)	15 (33)	37 (91)	170 (309)	215 (442)	54 (138)	15 (18)	0 (0)	0 (0)	506 (566)
Rock bass	0.0039 (0.0029)	0 (0)	0 (0)	714 (1,348)	401 (333)	703 (600)	221 (222)	889 (1,506)	16 (32)	8 (18)	2,952 (2,146)
Sunfish	0.0066 (0.0097)	0 (0)	2,735 (7,216)	408 (431)	661 (726)	641 (662)	377 (316)	169 (138)	26 (39)	8 (18)	5,025 (7,304)
Crappie sp.	0.0032 (0.0020)	1 (1)	278 (535)	871 (1,037)	896 (855)	43 (58)	0 (0)	12 (25)	215 (297)	122 (194)	2,438 (1,491)
White bass	0.0011 (0.0008)	0 (0)	0 (0)	62 (134)	353 (384)	35 (43)	212 (304)	90 (186)	118 (228)	0 (0)	870 (588)
Drum	0.0054 0.0029	0 (0)	0 (0)	12 (27)	1,312 (1,459)	1,878 (1,488)	339 (216)	267 (192)	301 (491)	0 (0)	4,109 (2,161)
Carp	0.0011 (0.0008)	0 (0)	188 (418)	216 (198)	252 (309)	47 (72)	4 (5)	24 (31)	75 (109)	0 (0)	806 (572)
Bowfin	<0.0001 (0.0001)	0 (0)	14 (31)	4 (7)	0 (0)	36 (70)	5 (12)	0 (0)	0 (0)	0 (0)	59 (78)
White sucker	0.0001 (0.0002)	0 (0)	86 (156)	25 (42)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	111 (162)
Redhorse sp.	<0.0001 (<0.0001)	0 (0)	0 (0)	0 (0)	12 (24)	0 (0)	10 (20)	5 (9)	0 (0)	0 (0)	27 (33)
Bullhead	0.0264 (0.0162)	0 (0)	725 (1,383)	7,927 (8,645)	6,983 (7,334)	3,756 (3,997)	103 (98)	332 (483)	193 (288)	0 (0)	20,019 (12,114)

Table 2. Continued:

Species	Total catch per hour May-Nov	Month									Mar-Nov total
		Mar[1]	Apr[1]	May	Jun	Jul	Aug	Sep	Oct	Nov	
Channel catfish	0.0469 (0.0218)	0 (0)	0 (0)	1,141 (1,229)	21,793 (14,200)	6,501 (2,993)	2,049 (1,504)	3,847 (6,547)	219 (193)	0 (0)	35,550 (16,040)
Gar sp.	0.0001 (0.0003)	0 (0)	99 (219)	3 (8)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	102 (219)
Other sp.	0.0043 (0.0084)	0 (0)	3,087 (6,372)	0 (0)	58 (119)	0 (0)	6 (15)	0 (0)	78 (158)	0 (0)	3,229 (6,375)
White perch	0.0023 (0.0051)	0 (0)	1,764 (3,879)	11 (18)	0 (0)	2 (5)	1 (2)	0 (0)	0 (0)	0 (0)	1,778 (3,879)
Total catch	2.1697 (0.5963)	31,182 (59,693)	98,082 (89,338)	57,398 (27,643)	154,913 (66,157)	284,322 (159,622)	498,816 (320,804)	299,483 (158,101)	162,923 (43,415)	58,261 (24,828)	1,645,380 (415,424)
Angler hours	— —	14,914 (6,363)	67,065 (28,792)	48,224 (19,654)	126,834 (28,745)	148,621 (41,492)	149,211 (42,544)	116,977 (30,272)	69,341 (14,924)	17,141 (5,147)	758,328 (82,336)
Angler trips	— —	4,069 (2,508)	17,445 (7,948)	14,345 (6,179)	34,594 (7,728)	50,517 (19,261)	38,840 (9,410)	27,408 (6,936)	22,415 (6,877)	8,188 (4,038)	217,821 (27,177)

[1]Does not include March and April Arenac County. There are no counts or interviews from that county for this period.

Table 3. Angler catch by species for the four county total, Saginaw Bay, January-May 1984.

Species	Total catch per hour	Month					Season
		Jan	Feb	Mar	Apr	May	
Rainbow trout	0.0004	0	0	71	310	0	381
	(0.0003)	(0)	(0)	(117)	(328)	(0)	(348)
Brown trout	0.0004	0	0	9	293	74	376
	(0.0004)	(0)	(0)	(18)	(443)	(113)	(458)
Lake trout	0.0001	0	4	0	0	107	111
	(0.0001)	(0)	(9)	(0)	(0)	(144)	(144)
Splake	<0.0001	0	0	18	0	0	18
	(<0.0001)	(0)	(0)	(37)	(0)	(0)	(37)
Coho salmon	<0.0001	0	0	0	1	0	1
	(<0.0001)	(0)	(0)	(0)	(1)	(0)	(1)
Chinook salmon	<0.0001	0	0	0	0	23	23
	(<0.0001)	(0)	(0)	(0)	(0)	(27)	(27)
Rainbow smelt	0.0390	11,921	81	0	10,850	17,859	40,711
	(0.0275)	(2,406)	(166)	(0)	(15,003)	(24,137)	(28,522)
Lake herring	0.0001	0	0	0	141	0	141
	(0.0002)	(0)	(0)	(0)	(187)	(0)	(187)
Northern pike	0.0025	1,004	1,102	0	413	64	2,583
	(0.0021)	(1,329)	(1,562)	(0)	(650)	(84)	(2,153)
Yellow perch	2.1498	785,745	347,648	437,009	418,442	254,955	2,243,799
	(0.3320)	(129,015)	(106,569)	(142,230)	(167,730)	(70,475)	(285,187)
Walleye	0.0044	3,544	937	0	0	123	4,604
	(0.0070)	(7,162)	(1,598)	(0)	(0)	(99)	(7,339)
Largemouth bass	0.0009	0	0	0	104	813	917
	(0.0010)	(0)	(0)	(0)	(217)	(967)	(991)
Bluegill	0.0002	0	0	0	109	102	211
	(0.0002)	(0)	(0)	(0)	(123)	(135)	(183)
Rock bass	0.0004	0	0	0	11	441	452
	(0.0004)	(0)	(0)	(0)	(23)	(443)	(444)
Sunfish sp.	0.0014	34	0	0	666	789	1,489
	(0.0016)	(69)	(0)	(0)	(1,313)	(955)	(1,625)

Table 3. Continued:

Species	Total catch per hour	Month					Season
		Jan	Feb	Mar	Apr	May	
Crappie sp.	0.0059	0	1,474	544	2,614	1,560	6,192
	(0.0032)	(0)	(1,554)	(762)	(2,659)	(1,031)	(3,336)
White sucker	0.0043	0	0	1,112	2,929	466	4,507
	(0.0026)	(0)	(0)	(1,527)	(2,144)	(478)	(2,675)
Longnose sucker	0.0002	0	0	24	77	121	222
	(0.0003)	(0)	(0)	(50)	(122)	(244)	(277)
Bullhead sp.	0.0034	0	0	123	498	2,941	3,562
	(0.0019)	(0)	(0)	(240)	(294)	(1,945)	(1,981)
Channel catfish	0.0021	0	0	2	8	2,162	2,172
	(0.0012)	(0)	(0)	(3)	(1)	(1,226)	(1,226)
White bass	0.0004	0	0	0	0	376	376
	0.0002	(0)	(0)	(0)	(0)	(239)	(239)
Drum	<0.0001	0	0	0	0	64	64
	(<0.0001)	(0)	(0)	(0)	(0)	(92)	(92)
Carp	0.0008	0	0	0	12	828	840
	(0.0005)	(0)	(0)	(0)	(17)	(513)	(513)
Total catch	2.2169	802,248	351,246	438,912	437,478	283,868	2,313,752
	(0.3367)	(129,243)	(106,604)	(142,240)	(168,442)	(74,555)	(286,761)
Angler hours	—	371,514	156,823	111,550	182,887	220,931	1,043,705
	—	(54,334)	(36,008)	(37,464)	(48,221)	(20,285)	(91,591)
Angler trips	—	112,336	41,571	31,197	67,826	81,540	334,470
	—	(16,991)	(9,356)	(7,658)	(24,437)	(19,301)	(37,478)

Table 4. The number of yellow perch (Perca flavescens) by inch group caught in Saginaw Bay, March 1983 through May 1984.

County	Inch group 4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	12.0-12.9	13.0-13.9	Total
Arenac	1,368 ±1,193	21,896 ±8,764	182,010 ±64,058	255,911 ±89,548	135,481 ±48,023	59,529 ±21,809	20,527 ±8,285	4,106 ±2,387	2,053 ±1,542	1,368 ±1,193	684,249[1] ±237,233
Bay	2,048 ±1,775	32,775 ±12,733	272,439 ±92,222	383,055 ±128,859	202,793 ±69,176	89,106 ±31,496	30,726 ±12,044	6,145 ±3,523	3,073 ±2,290	2,048 ±1,775	1,024,208 ±341,115
Huron	2,796 ±2,300	44,737 ±12,403	371,876 ±74,866	522,863 ±103,397	276,810 ±56,934	121,629 ±27,436	41,941 ±11,831	8,388 ±4,233	4,194 ±2,910	2,796 ±2,300	1,398,030 ±268,429
Tuscola	1,371 ±1,112	21,937 ±5,301	182,349 ±11,138	256,384 ±36,821	135,733 ±20,950	59,640 ±10,736	20,566 ±5,199	4,113 ±1,999	2,057 ±1,399	1,371 ±1,112	685,521 ±92,954
Total	7,583 ±6,150	121,345 ±29,127	1,008,674 ±147,147	1,418,211 ±199,850	750,818 ±114,003	329,905 ±58,677	113,760 ±27,942	22,752 ±11,039	11,376 ±7,733	7,584 ±6,150	3,792,008 ±503,322

[1]Does not include March and April 1983 perch catch.

Table 5. Angler catch by species for Arenac County portion of Saginaw Bay, May-November 1983.

Species	Total catch per hour	Month							
		May	Jun	Jul	Aug	Sep	Oct	Nov	Total
Rainbow trout	0.0153 (0.0174)	126 (247)	16 (34)	0 (0)	17 (35)	2,343 (3,074)	326 (528)	0 (0)	2,828 (3,129)
Chinook salmon	0.0137 (0.0195)	0 (0)	0 (0)	0 (0)	0 (0)	2,393 (3,554)	136 (150)	0 (0)	2,529 (3,557)
Northern pike	<0.0001 (0.0001)	0 (0)	0 (0)	0 (0)	8 (21)	0 (0)	0 (0)	0 (0)	8 (21)
Yellow perch	2.1965 (1.3231)	2,636 (3,526)	9,226 (7,476)	150,276 (150,802)	71,654 (62,264)	167,885 (149,969)	526 (785)	3,985 (3,577)	406,188 (221,789)
Walleye	0.0029 (0.0051)	0 (0)	0 0)	431 (904)	108 (242)	0 (0)	0 (0)	0 (0)	539 (936)
Smallmouth bass	0.0030 (0.0054)	19 (41)	41 (84)	0 (0)	26 (69)	463 (981)	0 (0)	0 (0)	549 (988)
Largemouth bass	0.0001 (0.0002)	0 (0)	0 (0)	20 (43)	0 (0)	0 (0)	0 (0)	0 (0)	20 (43)
Bluegill	0.0012 (0.0019)	3 (6)	159 (308)	0 (0)	52 (138)	0 (0)	0 (0)	0 (0)	214 (338)
Rock bass	0.0066 (0.0085)	54 (88)	57 (88)	346 (367)	26 (51)	735 (1,493)	0 (0)	0 (0)	1,218 (1,543)
Sunfish sp.	0.0024 (0.0023)	129 (248)	21 (42)	214 (310)	66 (105)	17 (36)	0 (0)	0 (0)	447 (414)
Drum	0.0015 (0.0015)	0 (0)	73 (154)	134 (154)	78 (153)	0 (0)	0 (0)	0 (0)	285 (266)

Table 5. Continued:

Species	Total catch per hour	Month							
		May	Jun	Jul	Aug	Sep	Oct	Nov	Total
Carp	0.0005 (0.0006)	26 (40)	68 (102)	0 (0)	0 (0)	6 (16)	0 (0)	0 (0)	100 (111)
White sucker	0.0001 (0.0002)	20 (41)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	20 (41)
Redhorse sp.	<0.0001 (0.0001)	0 (0)	12 (24)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	12 (24)
Bullhead sp.	0.0035 (0.0030)	187 (179)	185 (336)	255 (382)	12 (32)	0 (0)	0 (0)	0 (0)	639 (540)
Channel catfish	0.0244 (0.0364)	302 (402)	85 (116)	714 (997)	296 (585)	3,084 (6,523)	30 (63)	0 (0)	4,511 (6,638)
Total catch	2.2718 (1.3321)	3,502 (3,572)	9,943 (7,494)	152,390 (150,810)	72,343 (62,267)	176,926 (150,195)	1,018 (960)	3,985 (3,577)	420,107 (221,950)
Angler hours	— —	10,605 (12,561)	23,103 (10,090)	45,339 (33,369)	35,982 (20,350)	42,099 (18,459)	24,614 (9,112)	3,183 (1,280)	184,925 (47,038)
Angler trips	— —	3,055 (3,565)	7,304 (2,963)	18,605 (18,083)	9,322 (5,256)	10,547 (5,026)	7,749 (3,047)	730 (315)	57,312 (20,267)

Table 6. Angler catch by species for Arenac County portion of Saginaw Bay, January-May 1984.

Species	Total catch per hour	Month					Season
		Jan	Feb	Mar	Apr	May	
Rainbow trout	0.0028 (0.0026)	0 (0)	0 (0)	71 (117)	310 (328)	0 (0)	381 (348)
Coho salmon	<0.0001 (<0.0001)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	1 (1)
Lake herring	0.0010 (0.0014)	0 (0)	0 (0)	0 (0)	141 (187)	0 (0)	141 (187)
Rainbow smelt	0.1636 (0.1118)	11,921 (2,406)	0 (0)	0 (0)	10,850 (15,083)	0 (0)	22,771 (15,274)
Brown trout	0.0028 (0.0034)	0 (0)	0 (0)	9 (18)	293 (443)	74 (113)	376 (458)
Northern pike	0.0019 (0.0039)	0 (0)	0 (0)	0 (0)	253 (537)	0 (0)	253 (537)
Yellow perch	1.9978 (0.6599)	34,329 (41,097)	50,927 (52,853)	17,650 (12,421)	141,884 (43,488)	33,271 (23,694)	278,061 (84,197)
Walleye	0.0002 (0.0003)	0 (0)	0 (0)	0 (0)	0 (0)	24 (38)	24 (38)
Largemouth bass	0.0027 (0.0051)	0 (0)	0 (0)	0 (0)	0 (0)	371 (710)	371 (710)
Bluegill	0.0004 (0.0009)	0 (0)	0 (0)	0 (0)	0 (0)	56 (117)	56 (117)
Rock bass	0.0016 (0.0027)	0 (0)	0 (0)	0 (0)	0 (0)	226 (377)	226 (377)
Carp	0.0022 (0.0004)	0 (0)	0 (0)	0 (0)	0 (0)	305 (38)	305 (38)

Table 6. Continued:

Species	Total catch per hour	Month					Season
		Jan	Feb	Mar	Apr	May	
White sucker	0.0139 (0.0137)	0 (0)	0 (0)	1,024 (1,514)	862 (1,132)	42 (88)	1,928 (1,892)
Longnose sucker	0.0009 (0.0018)	0 (0)	0 (0)	0 (0)	0 (0)	121 (244)	121 (244)
Bullhead	0.0026 (0.0031)	0 (0)	0 (0)	0 (0)	0 (0)	363 (423)	363 (423)
Channel catfish	0.0046 (0.0032)	0 (0)	0 (0)	0 (0)	0 (0)	636 (440)	636 (440)
Total catch	2.1986 (0.6801)	46,250 (41,167)	50,927 (52,853)	18,754 (12,513)	154,594 (46,050)	35,489 (23,717)	306,014 (85,603)
Angler hours	— —	32,182 (9,102)	18,252 (4,957)	12,938 (9,338)	56,747 (11,612)	19,066 (2,881)	139,185 (18,378)
Angler trips	— —	23,917 (6,337)	6,866 (2,255)	3,728 (1,584)	16,439 (3,494)	10,623 (6,113)	61,573 (9,865)

Table 7. Angler catch by species for the Bay County portion of Saginaw Bay, March-November 1983.

Species	Total catch per hour	Month									Season
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
Northern pike	0.0006 (0.0009)	0 (0)	0 (0)	98 (145)	0 (0)	0 (0)	4 (9)	0 (0)	0 (0)	0 (0)	102 (145)
Yellow perch	3.1961 (2.0275)	23,910 (57,428)	9,459 (22,074)	709 (1,049)	27,259 (48,604)	74,204 (46,641)	261,506 (305,813)	56,099 (35,794)	80,588 (34,273)	11,397 (9,436)	545,131 (323,096)
Largemouth bass	0.0042 (0.0039)	0 (0)	0 (0)	0 (0)	256 (336)	404 (534)	61 (112)	0 (0)	0 (0)	0 (0)	721 (641)
Rock bass	0.0052 (0.0084)	0 (0)	0 (0)	559 (1,341)	123 (204)	175 (398)	25 (40)	0 (0)	0 (0)	0 (0)	882 (1,414)
Sunfish sp.	0.0030 (0.0038)	0 (0)	0 (0)	0 (0)	154 (292)	359 (576)	0 (0)	5 (11)	0 (0)	0 (0)	518 (646)
Drum	0.0073 (0.0089)	0 (0)	0 (0)	0 (0)	386 (615)	827 (1,363)	35 (73)	0 (0)	0 (0)	0 (0)	1,248 (1,497)
Carp	0.0011 (0.0018)	0 (0)	0 (0)	0 (0)	134 (289)	0 (0)	0 (0)	0 (0)	47 (94)	0 (0)	181 (304)
Bullhead sp.	0.1037 (0.0743)	0 (0)	0 (0)	7,438 (8,641)	6,489 (7,321)	3,289 (3,975)	52 (89)	287 (480)	140 (283)	0 (0)	17,695 (12,016)
Channel catfish	0.0482 (0.0377)	0 (0)	0 (0)	629 (1,143)	6,176 (5,795)	1,378 (1,747)	0 (0)	0 (0)	32 (69)	0 (0)	8,215 (6,160)
Bluegill	0.0013 (0.0026)	0 (0)	0 (0)	0 (0)	0 (0)	215 (442)	0 (0)	0 (0)	0 (0)	0 (0)	(215) (442)
Bowfin	<0.0001 (<0.0001)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5 (12)	0 (0)	0 (0)	0 (0)	5 (12)

Table 7. Continued:

Species	Total catch per hour	Month									Season
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
Chinook salmon	<0.0001	0	0	0	0	0	0	2	0	0	2
	(0.0003)	(0)	(0)	(0)	(0)	(0)	(0)	(5)	(0)	(0)	(5)
Smelt	0.0002	0	0	0	0	0	0	0	32	0	32
	(0.0004)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(69)	(0)	(69)
Total catch	3.3709	23,910	9,459	9,433	40,977	80,851	261,688	56,393	80,839	11,397	574,947
	(2.0435)	(57,428)	(22,074)	(8,882)	(49,501)	(46,873)	(305,814)	(35,798)	(34,274)	(9,436)	(323,387)
Angler hours	—	2,184	3,848	10,967	24,991	47,684	27,870	30,628	17,760	4,631	170,563
	—	(2,192)	(2,673)	(11,656)	(11,369)	(17,936)	(23,404)	(17,175)	(6,617)	(1,576)	(38,571)
Angler trips	—	1,119	1,844	4,530	8,673	19,387	8,582	5,515	6,500	582	56,732
	—	(1,997)	(2,976)	(4,343)	(4,210)	(5,606)	(5,597)	(2,667)	(5,278)	(351)	(12,135)

Table 8. Angler catch by species for the Bay County portion of Saginaw Bay, January-May 1984.

Species	Total catch per hour	Month					
		Jan	Feb	Mar	Apr	May	Season
Rainbow smelt	0.0500 (0.0677)	0 (0)	81 (166)	0 (0)	0 (0)	17,859 (24,137)	17,940 (24,138)
Northern pike	<0.0001 (<0.0001)	0 (0)	0 (0)	0 (0)	0 (0)	12 (26)	12 (26)
Yellow perch	1.3343 (0.3836)	164,301 (66,687)	84,081 (42,859)	107,285 (59,816)	23,319 (8,240)	100,091 (45,157)	479,077 (109,401)
Bluegill	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	46 (69)	46 (69)
Sunfish sp.	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	8 (14)	37 (65)	45 (66)
Crappie	0.0001 (0.0001)	0 (0)	0 (0)	0 (0)	0 (0)	32 (52)	32 (52)
White bass	0.0002 (0.0004)	0 (0)	0 (0)	0 (0)	0 (0)	83 (158)	83 (158)
Carp	0.0002 (0.0004)	0 (0)	0 (0)	0 (0)	0 (0)	80 (157)	80 (157)
Drum	<0.0001 (<0.0001)	0 (0)	0 (0)	0 (0)	0 (0)	8 (16)	8 (16)
White sucker	<0.0001 (<0.0001)	0 (0)	0 (0)	0 (0)	0 (0)	3 (5)	3 (5)
Bullhead	0.0066 (0.0053)	0 (0)	0 (0)	0 (0)	104 (96)	2,276 (1,870)	2,380 (1,872)

Table 8. Continued:

Species	Total catch per hour	Month					Season
		Jan	Feb	Mar	Apr	May	
Channel catfish	0.0005 (0.0009)	0 (0)	0 (0)	0 (0)	0 (0)	181 (337)	181 (337)
Total catch	1.3923 (0.3956)	164,301 (66,687)	84,162 (42,860)	107,285 (59,816)	23,431 (8,240)	120,708 (51,239)	499,887 (112,051)
Angler hours	— —	111,484 (24,954)	50,406 (21,691)	32,681 (15,624)	54,338 (22,852)	110,131 (45,541)	359,040 (62,718)
Angler trips	— —	28,279 (6,934)	12,762 (5,453)	6,873 (3,347)	21,382 (9,002)	41,997 (16,726)	111,293 (21,209)

Table 9. Angler catch by species for the Huron County portion of Saginaw Bay, March-November 1983.

Species	Total catch per hour	Month									Season
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
Brown trout	0.0001	0	0	0	0	0	0	44	0	0	44
	(0.0003)	(0)	(0)	(0)	(0)	(0)	(0)	(89)	(0)	(0)	(89)
Lake trout	0.0084	0	0	222	521	443	702	83	691	101	2,763
	(0.0040)	(0)	(0)	(276)	(776)	(526)	(535)	(132)	(551)	(113)	(1,255)
Coho salmon	0.0001	0	0	0	0	0	26	0	0	0	26
	(0.0002)	(0)	(0)	(0)	(0)	(0)	(61)	(0)	(0)	(0)	(61)
Chinook salmon	0.0186	0	0	58	56	1,007	1,019	3,961	36	0	6,137
	(0.0142)	(0)	(0)	(91)	(116)	(1,378)	(750)	(4,297)	(45)	(0)	(4,577)
Smelt	<0.0001	0	0	2	0	0	0	0	0	0	2
	(<0.0001)	(0)	(0)	(6)	(0)	(0)	(0)	(0)	(0)	(0)	(6)
Northern pike	0.0017	0	0	6	0	9	25	533	0	0	573
	(0.0028)	(0)	(0)	(13)	(0)	(18)	(36)	(927)	(0)	(0)	(928)
Tiger musky	<0.0001	0	0	11	0	0	0	0	0	0	11
	(<0.0001)	(0)	(0)	(24)	(0)	(0)	(0)	(0)	(0)	(0)	(24)
Yellow perch	1.3883	7,066	61,960	39,746	83,011	34,365	132,159	46,294	39,072	13,778	457,451
	(0.4353)	(16,227)	(73,781)	(25,823)	(41,201)	(22,129)	(72,363)	(32,722)	(20,350)	(10,561)	(124,078)
Walleye	0.0039	0	0	0	0	529	524	243	0	0	1,296
	(0.0034)	(0)	(0)	(0)	(0)	(774)	(710)	(273)	(0)	(0)	(1,085)
Smallmouth bass	0.0008	0	0	0	73	0	113	82	0	0	268
	(0.0008)	(0)	(0)	(0)	(123)	(0)	(199)	(109)	(0)	(0)	(258)
Largemouth bass	0.0026	0	0	89	729	0	0	24	0	0	842
	(0.0024)	(0)	(0)	(127)	(758)	(0)	(0)	(38)	(0)	(0)	(770)
Bluegill	<0.0001	0	0	0	0	0	2	5	0	0	7
	(<0.0001)	(0)	(0)	(0)	(0)	(0)	(5)	(9)	(0)	(0)	(10)
Rock bass	0.0025	0	0	98	214	173	159	141	16	8	809
	(0.0015)	(0)	(0)	(108)	(248)	(258)	(211)	(194)	(32)	(18)	(472)
Sunfish sp.	0.0039	0	0	273	486	66	300	144	16	8	1,293
	(0.0026)	(0)	(0)	(353)	(663)	(102)	(297)	(133)	(32)	(18)	(826)
Crappie sp.	0.0049	0	0	581	864	40	0	12	85	34	1,616
	(0.0035)	(0)	(0)	(731)	(854)	(58)	(0)	(25)	(128)	(55)	(1,134)

Table 9. Continued:

Species	Total catch per hour	Month									Season
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
White perch	0.0054	0	1,764	11	0	0	0	0	0	0	1,775
	(0.0118)	(0)	(3,879)	(18)	(0)	(0)	(0)	(0)	(0)	(0)	(3,879)
Drum	0.0062	0	0	2	721	859	226	243	0	0	2,051
	(0.0045)	(0)	(0)	(4)	(1,310)	(576)	(134)	(190)	(0)	(0)	(1,450)
Carp	0.0006	0	0	159	0	44	4	5	0	0	212
	(0.0006)	(0)	(0)	(190)	(0)	(72)	(5)	(9)	(0)	(0)	(203)
Bowfin	0.0001	0	0	4	0	36	0	0	0	0	40
	(0.0002)	(0)	(0)	(7)	(0)	(70)	(0)	(0)	(0)	(0)	(70)
White sucker	0.0002	0	48	4	0	0	0	0	0	0	52
	(0.0004)	(0)	(131)	(8)	(0)	(0)	(0)	(0)	(0)	(0)	(131)
Redhorse sp.	<0.0001	0	0	0	0	0	10	5	0	0	15
	(<0.0001)	(0)	(0)	(0)	(0)	(0)	(20)	(9)	(0)	(0)	(22)
Bullhead sp.	0.0019	0	0	155	201	133	36	45	53	0	623
	(0.0010)	(0)	(0)	(122)	(257)	(132)	(25)	(58)	(55)	(0)	(325)
Channel catfish	0.0588	0	0	121	14,469	3,403	727	594	70	0	19,384
	(0.0411)	(0)	(0)	(138)	(12,946)	(2,114)	(1,172)	(542)	(111)	(0)	(13,182)
Other	0.0098	0	3,087	0	58	0	6	0	78	0	3,229
	(0.0194)	(0)	(6,372)	(0)	(119)	(0)	(15)	(0)	(158)	(0)	(6,375)
Total catch	1.5191	7,066	66,859	41,542	101,403	41,107	136,038	52,458	40,117	13,929	500,519
	(0.4487)	(16,277)	(74,157)	(25,839)	(43,236)	(22,302)	(72,384)	(33,024)	(20,358)	(10,562)	(125,118)
Angler hours	—	10,386	47,719	21,046	70,305	49,104	73,928	39,666	15,065	2,275	329,494
	—	(5,685)	(24,282)	(8,317)	(24,173)	(16,537)	(28,419)	(16,637)	(7,120)	(1,552)	(51,831)
Angler trips	—	2,388	10,986	5,093	16,786	11,082	14,837	10,334	4,052	1,094	76,652
	—	(1,490)	(6,029)	(1,863)	(5,720)	(3,456)	(5,318)	(3,944)	(1,917)	(810)	(11,614)

Table 10. Angler catch by species for the Huron County portion of Saginaw Bay, January-May 1984.

Species	Total catch per hour	Month					Season
		Jan	Feb	Mar	Apr	May	
Lake trout	0.0003 (0.0004)	0 (0)	4 (9)	0 (0)	0 (0)	107 (144)	111 (144)
Splake	<0.0001 (0.0001)	0 (0)	0 (0)	18 (37)	0 (0)	0 (0)	18 (37)
Chinook salmon	<0.0001 (<0.0001)	0 (0)	0 (0)	0 (0)	0 (0)	23 (27)	23 (27)
Northern pike	0.0061 (0.0056)	1,004 (1,329)	1,102 (1,562)	0 (0)	160 (367)	39 (75)	2,305 (2,085)
Yellow perch	2.4873 (0.7953)	222,420 (82,859)	155,859 (76,210)	275,518 (127,452)	216,042 (161,409)	70,740 (41,085)	940,579 (238,031)
Walleye	<0.0001 (<0.0001)	0 (0)	14 (28)	0 (0)	0 (0)	0 (0)	14 (28)
Largemouth bass	0.0014 (0.0018)	0 (0)	0 (0)	0 (0)	104 (217)	442 (656)	546 (691)
Bluegill	<0.0001 (0.0001)	0 (0)	0 (0)	0 (0)	22 (44)	0 (0)	22 (44)
Rock bass	0.0006 (0.0006)	0 (0)	0 (0)	0 (0)	0 (0)	215 (233)	215 (233)
Sunfish	0.0037 (0.0044)	34 (69)	0 (0)	0 (0)	646 (1,313)	734 (952)	1,414 (1,623)
Crappie sp.	0.0160 (0.0094)	0 (0)	1,474 (1,554)	536 (762)	2,569 (2,659)	1,471 (1,023)	6,050 (3,334)
Drum	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	44 (89)	44 (89)

Table 10. Continued:

Species	Total catch per hour	Month					Season
		Jan	Feb	Mar	Apr	May	
Carp	0.0002 (0.0003)	0 (0)	0 (0)	0 (0)	0 (0)	69 (113)	69 (113)
White sucker	0.0066 (0.0051)	0 (0)	0 (0)	88 (197)	1,991 (1,815)	421 (470)	2,500 (1,885)
Longnose sucker	0.0001 (0.0003)	0 (0)	0 (0)	0 (0)	48 (115)	0 (0)	48 (115)
Bullhead	0.0013 (0.0010)	0 (0)	0 (0)	123 (240)	377 (277)	0 (0)	500 (367)
Channel catfish	0.0032 (0.0029)	0 (0)	0 (0)	0 (0)	0 (0)	1,210 (1,084)	1,210 (1,084)
Total catch	2.5272 (0.8002)	223,458 (82,870)	158,453 (76,242)	276,283 (127,455)	221,959 (161,447)	75,515 (41,135)	955,668 (238,080)
Angler hours	— —	135,135 (42,220)	61,520 (25,278)	57,106 (32,648)	56,515 (40,592)	67,880 (18,056)	378,156 (73,899)
Angler trips	— —	37,055 (12,925)	14,981 (6,334)	18,092 (6,625)	24,861 (15,605)	19,291 (6,825)	114,280 (23,263)

Table 11. Angler catch by species for the Tuscola County portion of Saginaw Bay, March-November 1983.

Species	Total catch per hour	Month									Season
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
Northern pike	<0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	3 (7)	0 (0)	0 (0)	2 (4)	0 (0)	0 (0)	5 (9)
Yellow perch	1.9011 (0.9088)	205 (565)	17,672 (44,050)	2,215 (2,064)	664 (515)	8,766 (6,396)	27,420 (16,616)	15,703 (8,638)	38,258 (16,888)	28,536 (20,068)	139,439 (54,999)
Walleye	0.0040 (0.0032)	0 (0)	0 (0)	30 (51)	167 (184)	11 (25)	80 (110)	5 (12)	0 (0)	0 (0)	293 (222)
Bluegill	0.0010 (0.0014)	0 (0)	15 (33)	34 (91)	11 (20)	0 (0)	0 (0)	10 (16)	0 (0)	0 (0)	70 (100)
Rock bass	0.0006 (0.0006)	0 (0)	0 (0)	3 (7)	7 (15)	9 (21)	11 (24)	13 (20)	0 (0)	0 (0)	43 (41)
Sunfish sp.	0.0004 (0.0005)	0 (0)	1 (2)	6 (11)	2 (4)	11 (20)	3 (8)	10 (22)	0 (0)	0 (0)	33 (33)
Crappie sp.	0.0079 (0.0113)	1 (1)	34 (134)	290 (735)	32 (42)	3 (6)	0 (0)	0 (0)	130 (268)	88 (186)	578 (816)
White bass	0.0119 (0.0086)	0 (0)	0 (0)	62 (134)	353 (384)	35 (43)	212 (304)	90 (186)	118 (228)	0 (0)	870 (588)
White perch	<0.0001 (<0.0001)	0 (0)	0 (0)	0 (0)	0 (0)	2 (5)	1 (2)	0 (0)	0 (0)	0 (0)	3 (6)
Drum	0.0072 (0.0071)	0 (0)	0 (0)	10 (27)	132 (85)	58 (44)	0 (0)	24 (29)	301 (491)	0 (0)	525 (502)
Carp	0.0043 (0.0059)	0 (0)	188 (418)	31 (37)	50 (40)	3 (4)	0 (0)	13 (24)	28 (56)	0 (0)	313 (426)
Bowfin	0.0002 (0.0004)	0 (0)	14 (31)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	14 (31)

Table 11. Continued:

Species	Total catch per hour	Month									Season
		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
White sucker	0.0005	0	38	1	0	0	0	0	0	0	39
	(0.0012)	(0)	(84)	(3)	(0)	(0)	(0)	(0)	(0)	(0)	(84)
Bullhead sp.	0.0134	0	616	147	108	109	3	0	0	0	983
	(0.0191)	(0)	(1,355)	(182)	(75)	(82)	(6)	(0)	(0)	(0)	(1,372)
Channel catfish	0.0470	0	0	92	1,063	1,006	1,026	169	87	0	3,443
	(0.0210)	(0)	(0)	(153)	(670)	(666)	(738)	(138)	(127)	(0)	(1,223)
Gar	0.0014	0	99	3	0	0	0	0	0	0	102
	(0.0030)	(0)	(219)	(8)	(0)	(0)	(0)	(0)	(0)	(0)	(220)
Total catch	2.0008	206	18,677	2,924	2,592	10,013	28,756	16,039	38,922	28,624	146,753
	(0.9248)	(565)	(44,074)	(2,211)	(955)	(6,434)	(16,636)	(8,643)	(16,901)	(20,071)	(55,044)
Angler hours	—	2,344	15,498	5,606	8,435	6,494	11,431	4,584	11,902	7,052	73,346
	—	(1,836)	(15,239)	(4,844)	(3,303)	(3,596)	(6,359)	(1,978)	(6,726)	(4,467)	(19,810)
Angler trips	—	562	4,615	1,667	1,831	1,443	2,099	1,012	4,114	5,782	23,125
	—	(289)	(4,238)	(1,772)	(715)	(785)	(1,154)	(426)	(2,546)	(3,928)	(6,763)

Table 12. Angler catch by species for the Tuscola County portion of Saginaw Bay, January-May 1984.

Species	Total catch per hour	Month					Season
		Jan	Feb	Mar	Apr	May	
Northern pike	<0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	13 (28)	13 (28)
Yellow perch	3.2636 (0.7102)	364,695 (60,366)	56,781 (30,310)	36,556 (15,910)	37,197 (11,020)	50,853 (26,042)	546,082 (74,937)
Walleye	0.0273 (0.0441)	3,544 (7,162)	923 (1,598)	0 (0)	0 (0)	99 (91)	4,566 (7,339)
Bluegill	0.0005 (0.0007)	0 (0)	0 (0)	0 (0)	87 (115)	0 (0)	87 (115)
Rock bass	<0.0001 (0.0001)	0 (0)	0 (0)	0 (0)	11 (23)	0 (0)	11 (23)
Sunfish	0.0002 (0.0003)	0 (0)	0 (0)	0 (0)	12 (23)	18 (38)	30 (44)
Crappie sp.	0.0007 (0.0007)	0 (0)	0 (0)	8 (17)	45 (40)	57 (115)	110 (123)
White bass	0.0018 (0.0011)	0 (0)	0 (0)	0 (0)	0 (0)	293 (180)	293 (180)
Drum	<0.0001 (0.0001)	0 (0)	0 (0)	0 (0)	0 (0)	12 (17)	12 (17)
Carp	0.0023 (0.0029)	0 (0)	0 (0)	0 (0)	12 (17)	374 (474)	386 (474)
White sucker	0.0005 (0.0008)	0 (0)	0 (0)	0 (0)	76 (137)	0 (0)	76 (137)
Longnose sucker	0.0003 (0.0004)	0 (0)	0 (0)	24 (50)	29 (41)	0 (0)	53 (65)

Table 12. Continued:

Species	Total catch per hour	Month					Season
		Jan	Feb	Mar	Apr	May	
Bullhead	0.0019 (0.0020)	0 (0)	0 (0)	0 (0)	17 (23)	302 (321)	319 (322)
Channel catfish	0.0009 (0.0009)	0 (0)	0 (0)	2 (3)	8 (1)	135 (147)	145 (147)
Total catch	3.3001 (0.7163)	368,239 (60,760)	57,704 (30,352)	36,590 (15,910)	37,494 (11,021)	52,156 (26,050)	552,183 (75,274)
Angler hours	— —	92,713 (23,386)	26,645 (12,744)	8,825 (3,534)	15,287 (4,528)	23,854 (7,514)	167,324 (28,262)
Angler trips	— —	23,085 (5,788)	6,962 (3,549)	2,504 (1,019)	5,144 (1,543)	9,629 (2,967)	47,324 (7,637)

Table 13. Yellow perch catch and the fishing pressure for the ice fishing seasons in Arenac and northern Bay counties on Saginaw Bay, December 1974 through April 1978 and January through March 1984.

Date and species	Total catch per hour	Month					
		Dec	Jan	Feb	Mar	Apr	Total
1974–75							
Yellow perch	1.5597	—	—	83,524	59,554	7,266	150,344
	±0.4172	—	—	±30,049	±16,956	±6,200	±35,056
Angler hours		—	—	56,056	36,990	3,348	96,394
		—	—	±10,771	±6,299	±2,023	±12,641
Angler trips		—	—	7,817	4,586	336	12,739
		—	—	±1,502	±781	±203	±1,705
1975–76							
Yellow perch	0.7998	2,460	6,266	26,166	6,701	—	41,583
	±0.5476	±3,590	±6,662	±25,156	±2,887	—	±26,888
Angler hours		1,980	26,262	17,780	5,922	—	51,994
		±2,094	±9,892	±4,855	±3,351	—	±11,706
Angler trips		462	3,272	2,883	1,748	—	8,365
		±532	±1,202	±797	±1,546	—	±2,180
1976–77							
Yellow perch	1.0921	9,622	21,442	21,218	—	—	52,282
	±0.7333	±16,896	±19,382	±15,260	—	—	±29,900
Angler hours		3,048	20,647	24,184	—	—	47,872
		±3,647	±14,515	±7,717	—	—	±16,839
Angler trips		443	3,160	2,936	—	—	6,539
		±468	±1,598	±825	—	—	±1,858
1977–78							
Yellow perch	3.1024	82,908	233,937	171,332	13,971	—	501,806
	±0.3401	±23,341	±25,355	±26,352	±6,390	—	±43,851
Angler hours		24,930	87,325	47,056	2,438	—	161,749
		±3,612	±8,543	±5,339	±349	—	±10,708
Angler trips		7,800	25,182	14,984	783	—	48,749
		±1,194	±3,325	±2,211	±154	—	±4,171
1983–84							
Yellow perch	1.6778	—	178,679	124,798	63,191	—	366,668
	±0.5488	—	±74,372	±65,716	±29,518	—	±103,543
Angler hours		—	130,128	62,537	25,871	—	218,536
		—	±27,424	±20,646	±11,107	—	±36,079
Angler trips		—	48,762	18,078	6,333	—	73,173
		—	±9,455	±5,523	±2,110	—	±11,151

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Report approved by W. C. Latta

Typed by G. M. Zurek

Appendix 1. List of angler caught fish in Saginaw Bay, 1983–84.

Common name	Scientific name
Rainbow trout	Salmo gairdneri
Brown trout	Salmo trutta
Lake trout	Salvelinus namaycush
Splake	Salvelinus namaycush x Salvelinus fontinalis
Coho salmon	Oncorhynchus kisutch
Chinook salmon	Oncorhynchus tshawytscha
Rainbow smelt	Osmerus mordax
Northern pike	Esox lucius
Tiger musky	Esox masquinongy x Esox lucius
Yellow perch	Perca flavescens
Walleye	Stizostedion vitreum
Smallmouth bass	Micropterus dolomieui
Largemouth bass	Micropterus salmoides
Bluegill	Lepomis macrochirus
Rock bass	Ambloplites rupestris
Sunfish	Lepomis sp.
Crappie	Pomoxis sp.
White bass	Morone chrysops
White perch	Morone americana
Freshwater drum	Aplodinotus grunniens
Carp	Cyprinus carpio
Bowfin	Amia calva
White sucker	Catostomus commersoni
Longnose sucker	Catostomus catostomus
Redhorse sucker	Moxostoma sp.
Bullhead	Ictalurus sp.
Channel catfish	Ictalurus punctatus
Gar	Lepisosteus sp.
Lake herring	Coregonus artedii