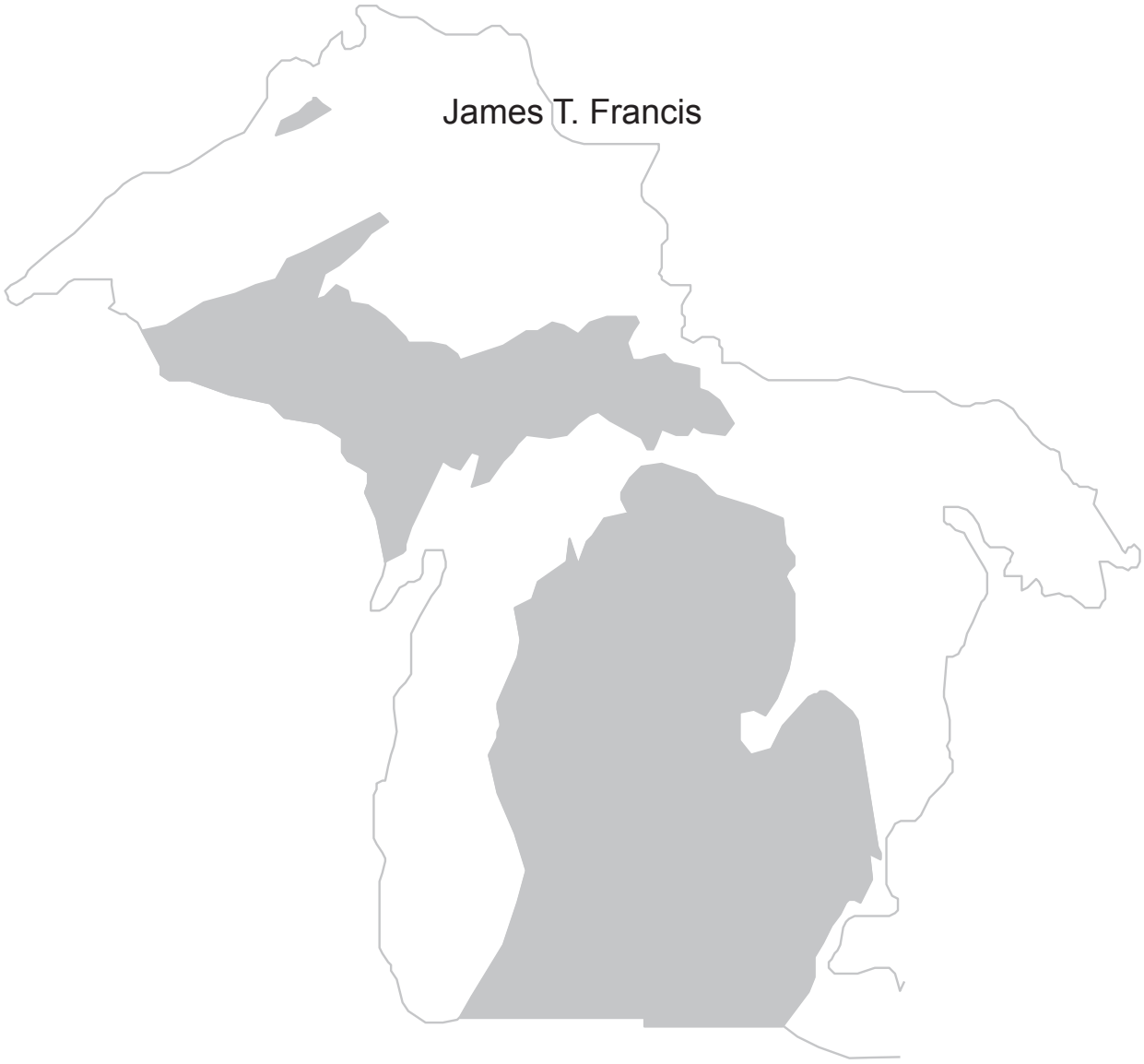
STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Number 2005-1 May 2005

The Walleye Fishery of the Detroit River, Spring 2000

James T. Francis



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FISHERIES DIVISION
TECHNICAL REPORT

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
FISHERIES DIVISION

Fisheries Technical Report 2005-1
May 2005

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For information or assistance on this publication, contact the Michigan Department of Natural Resources, Fisheries Division, Box 30446, Lansing, MI 48909, or call 517-373-1280.

This publication is available in alternative formats.

Printed under authority of Michigan Department of Natural Resources
Total number of copies printed 160 — Total cost $238.52 — Cost per copy $1.49

Suggested Citation Format

Francis, J. T. 2005. The walleye fishery of the Detroit River, Spring 2000. Michigan Department of Natural Resources, Fisheries Technical Report 2005-1, Ann Arbor.

Michigan Department of Natural Resources
Fisheries Technical Report 2005-1, 2005

The Walleye Fishery of the Detroit River, Spring 2000

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Abstract.–The objective of this study was to evaluate the spring walleye fishery on the Detroit River and compare results to historical catch survey data. In spring 2000, a progressive-access catch survey was conducted on the trailer boat fishery on the U.S. side of the Detroit River. A total of 1,114 interviews were conducted during the 9-week survey from March 11 to May 16, 2000. The estimated harvest was 97,292 walleyes from 344,741 angler hours, with 73% of the effort and 63% of the harvest taking place in the lower half of the river. This is a significant increase in both total effort and harvest compared to earlier surveys. The development of an intense spring fishery for walleye is likely the result of an increased walleye population in Lake Erie, publicity about the fishery, and improvements in boating and fishing equipment.

Introduction

Walleyes *Sander vitreus* support an important commercial and sport fishery in Lake Erie, with most of the harvest taking place in the productive western basin. From 1990 to 2002, the walleye harvest in the western basin averaged 3.4 million fish per year, compared to 1.6 million walleyes for the rest of the lake (Lake Erie Walleye Task Group 2003). In addition to supporting a fishery in Lake Erie, a significant number of walleyes migrate annually up the Detroit River into Lake St. Clair and Lake Huron. Recovery patterns for walleyes tagged in Lake Erie during the spring clearly illustrate this northward migration during April and May (Thomas and Haas 2003). These migrating walleyes support an intense seasonal fishery on the Detroit River. The objective of this study was to document harvest and effort by the trailer boat fishery in Michigan waters of the Detroit River during the spring walleye run.

The Detroit River is a 52-km long connecting waterway between Lake St. Clair and Lake Erie. The discharge of the river averages 5,200 m^3/s and flow velocities range from 0.30 to 0.88 m/s (Derecki 1984). The river is bisected by the international boundary with Canada.

Methods

A progressive-access catch survey was conducted from March 11, 2000 until May 16, 2000 along the U.S. side of the Detroit River. Nine public boating access sites were identified along the U.S. side of the Detroit River and all were included in the survey (Figure 1). The daylight hours were divided into two intervals. The first shift began at daylight and ended in the afternoon; the second shift began in the morning and ended at sunset. Shift hours varied by month due to varying length of daylight among months (Table 1). No effort was made to survey shore anglers or moored boats.

The creel clerk was scheduled for four, 10-hour shifts each week, including both weekend

days and two randomly selected weekdays. Work shift, starting site, direction of travel (up or downstream), and time to begin a trailer count were all selected randomly. At the beginning of a shift, the clerk proceeded to the predetermined starting site and began conducting interviews. Of the nine sites covered in the survey, four had less activity than the five primary sites (Figure 1). The five primary sites were identified as "interview sites." The clerk allocated the workday so that approximately equal amounts of interview time were spent at each interview site. At a predetermined time, the clerk visited each site (both interview and non-interview sites) to record the number of trailers parked in the lot. Following the trailer count, the clerk continued conducting interviews through the end of the shift.

The clerk interviewed each boat that returned to the access site during the scheduled shift. A standard angler party interview form on a scantron sheet was used to record data. Date, time, and interview site were recorded for all interviews. If the boater did not fish, that was recorded on the form as a non-angler and the interview was ended. If fishing did take place, the angler was asked to provide their zip code, number of anglers in the party, fishing mode, target species, time fishing started and ended, and species and number of fish harvested and released. If fishing took place on the Canadian side of the river or outside of the river (Lake St. Clair or Lake Erie), the data were recorded, but these interviews were excluded from analysis.

Fishing effort was determined through counts of boat trailers at all nine public boating access sites. Angler interviews provided the number of anglers per boat, length of fishing trip, and catch rates. The proportion of boaters who indicated they were not fishing was used to adjust the trailer counts for non-fishing effort.

Catch and effort estimates were made for each site by month. Because sampling did not occur over the entire month in March and May, estimates were calculated only for the period surveyed. Monthly site estimates were summed for an approximate total river estimate. Expansion values (F in Lockwood et al. 1999) are given in Table 1. Standard mathematical formulas for creel census (Lockwood et al. 1999) were used to calculate estimates of number of fish harvested. Estimates of fish released were not computed, but inspection of the interview slips indicates very few legal walleyes were released. Three measures of fishing effort were estimated: angler hours, angler trips, and angler days. An angler trip was considered to be one completed fishing excursion. An angler day was defined as one or more fishing excursions during a 24-hour period. Error bounds for all catch and effort estimates in this report are defined as two standard errors of the estimate.

Results

A total of 1,114 interviews were conducted during the survey. Only 46 of the total interviews were from boats that were not fishing. Most of the anglers interviewed (92%) were targeting walleye and most (93%) were fishing in the Detroit River (Tables 2 and 3).

Walleyes comprised the bulk of the catch, but white bass *Morone chrysops*, yellow perch *Perca flavescens*, and a variety of other species were taken (Table 4). At all sites combined, the estimated harvest was 97,292 walleyes from 344,741 angler hours, for an average harvest rate of 0.2822 walleye per hour. However, walleye harvest rate ranged from 0.1760 per hour at Lake Erie Metropark to 0.4553 per hour at Belanger Park (Table 5). Most effort (73%) and catch (63%) were recorded from the three most downriver sites. The month of April, which was sampled from start to finish, accounted for most of the fishing pressure and harvest. Sixteen days in May produced an estimate of effort roughly three times higher than 21 days surveyed in March.

Anglers reported traveling from 332 postal zip codes. Most anglers were Michigan residents (97%), but anglers from Illinois, Indiana, Iowa, Maryland, North Carolina, Ohio, Pennsylvania, Wisconsin, and Oklahoma were represented (Table 6). Most of the Michigan anglers resided in Wayne (41%), Oakland (15%), and Macomb (13%) counties (Table 7).

Discussion

Fishing effort has increased dramatically on the Detroit River. This may be deduced from

annual trends in survey data which, although not strictly comparable due to differences in methods used and months sampled, represent the bulk of the fishery. The first catch surveys on the Detroit River were conducted in 1942 and 1943 (Krumholz and Carbine 1943, 1945). From mid-May through October 1942, boat anglers fished 135,029 hours and harvested a total of 62,855 fish (Table 8). Most of the harvest was walleye (45%), followed by yellow perch (35%), suckers (5%), rock bass *Ambloplites rupestris* (5%), freshwater drum *Aplodinotus grunniens* (4%), and white bass (3%). During the 1943 season, both fishing effort and harvest were down. From the end of May through September 1943, boat anglers fished 62,730 hours and harvested 19,321 fish (Table 8). Walleye (79%) and yellow perch (7%) again accounted for most of the catch. Extensive shore fishing was observed but estimates of fishing effort were not made.

The next catch survey was conducted on the Detroit River during the 1980 and 1981 fishing seasons (Bryant 1984). Fishing effort had increased substantially compared to the earlier survey. Boat anglers averaged 425,592 angler hours annually from May through November 1980 and May through September 1981 (Table 8). Total catch ranged from 233,356 fish in 1981 to 499,068 fish in 1980, and walleye harvest averaged 89,781 fish per year. Walleye, yellow perch, and white bass were the primary species harvested. The study by Bryant (1984) was the first study to estimate effort and catch by shore anglers on the Detroit River. Shore angler effort exceeded boat angler effort during both years (Table 8). Shore anglers averaged 246,335 fish per year, primarily yellow perch, freshwater drum, rock bass, and white bass.

During the short time period before the next survey was conducted, in 1983 and 1984, effort and harvest had increased dramatically for both boat (trailered and moored) and shore anglers (Haas et al. 1985). Boat angler effort increased to an average of 681,602 angler hours for April through November 1983 and 1984 (Table 8). Anglers harvested an average of 915,153 fish per year, of which walleye accounted for 142,245 fish per year. Shore angler effort increased to 714,958 angler hours and harvest to 502,690 fish.

Lake Erie is highly regarded for its walleye fishing opportunities. For comparison purposes, 205,215 walleyes were harvested in Michigan waters of Lake Erie by 712,742 angler hours in 7 months, April to October 2000 (Thomas and Haas 2001). This compares to 97,292 walleyes harvested from the Detroit River by 344,741 angler hours during a 9-week period in the same year. Although this current survey focused on the most intense part of the walleye fishery on the Detroit River, there is a walleye fishery year around, whenever ice is not present. Therefore, based on effort and harvest patterns for the summer and fall months from earlier Detroit River catch surveys, total fishing effort and walleye harvest on the Detroit River may be similar to that on Lake Erie.

It appears that the specialized spring walleye fishery has developed since the mid-1980s when the last catch survey was conducted on the Detroit River. April is the only month for which estimates are available for the entire month in the current survey. In April 2000, anglers fished 256,151 angler hours and harvested 78,836 walleyes. In comparison, an average effort of 16,571 angler hours and an average catch of 1,308 walleyes were estimated for April 1983 and 1984 (Haas et al. 1985). The effort estimate for April 2000 is comparable to the month of highest effort in 1983 and 1984, which was June (265,407 and 204,746 angler hours, respectively). The month of highest walleye catches in 1983 and 1984 were July and June, respectively.

The development of this early spring fishery in the Detroit River is likely the result of a combination of factors. One is an increase in walleye abundance (Figure 2). The adult walleye population increased dramatically in 1984 (due to a very large 1982 year class) and remained high during the late 1980s. In the 1990s the walleye population declined but was still 40% higher than in the early 1980s. Walleye population levels in Lake Erie are important because tagging studies have shown that a substantial migration occurs in which walleyes move from spawning locations in Lake Erie, up the Detroit River, and even into Lake St. Clair and the St. Clair River (Haas et al. 1988; Thomas and Haas 2003). These migrating fish contribute to the harvest throughout the connecting waters and even in southern Lake

Huron (McParland 1999) and Saginaw Bay (Fielder et al. 2000). Tagging studies confirm that the majority of the Detroit River walleye harvest comes from the Lake Erie population (Haas et al. 1988). Thus, the increased walleye population on Lake Erie likely has resulted in increased numbers of walleyes moving through the Detroit River and contributing to this fishery.

Another factor is publicity from numerous television shows, fishing magazines, and newspaper articles promoting the fishery in the late 1980s and early 1990s and stimulating increased interest. Increased interest is supported by the fact that walleye anglers now come from a wider area. In contrast, in 1942 and 1943 all interviewed anglers except two were from Wayne County (Krumholz and Carbine 1943, 1945). However, other factors, most notably improvements in travel, presumably also contributed to this shift in participants. Another factor in the increase in fishing pressure following the 1942 and 1943 surveys was the end of WWII. Other catch surveys documented an increase in fishing pressure after the war (Schneider and Lockwood 1979).

Additionally, improvements in boating and fishing equipment likely encouraged increased fishing. Boats and motors are more reliable today than during previous survey periods. This is especially important when fishing on the Detroit River in March and April when weather conditions can be harsh. In addition to providing safer access to the fishery, fishing techniques have improved. For example, the development of electric trolling motors allows for improved boat control. Most anglers that target walleye in the spring fishery use a technique called vertical jigging. Jigs are tipped with night crawlers, large shiners, artificial plastic baits, or a combination of artificial and live baits. Boat control is critical to ensure that the lure is presented in a vertical position despite strong currents.

The other popular fishing technique for walleye on the Detroit River is “handlining.” Body baits or spoons are fished from leaders connected to a wire line that runs to a spring loaded, self-winding reel. A 1- to 2-pound weight is used to take the baits to the bottom. This appears to be the same technique used by anglers during the 1940s survey (Krumholz and Carbine 1943). Based on personal observations, vertical jigging is much more prevalent during the day and handlining is used exclusively at night or when water clarity is poor.

Although the 1983–84 survey was conducted throughout the year and this 2000 survey only included a short time period in spring, both surveys found most of the catch and effort were recorded for sites on the lower half of the river. Boat anglers in 1983 and 1984 directed 80% of the fishing effort and caught 80% of the fish from Wyandotte downstream (Haas et al. 1985). In 2000, 73% of the effort and 63% of the catch came from this same area.

Effort and harvest estimates in this study are for the trailer boat fishery in spring 2000, during daylight hours, on the U.S. side of the Detroit River. There are boats that launch from the U.S. side, but fish on the Canadian side of the river that were not included in the survey. Likewise, there are anglers who do not trailer their boats, but keep them moored along the river. There is also an established night fishery. Additionally, there are numerous locations along the river where anglers fish from shore. All of these account for additional fishing effort and harvest that were not addressed in the current survey. Thus, fishing estimates derived from this study should be considered a conservative estimate of the entire fishery.

This survey successfully completed the objectives of documenting effort and harvest during the early season fishery on the Detroit River. Due to budget and personnel restrictions, a more comprehensive survey was not possible. However, it is recommended that a complete survey be planned for the Detroit River fishery. This should include the entire boat fishery, not just the trailer boat fishery, as well as estimates of shore effort and harvest.

Acknowledgments

Many Fisheries Division personnel assisted in planning and conducting this study. Gary Towns provided the idea to conduct the survey and made the decisive, and sometimes controversial, personnel allocations needed to complete the work. Roger Lockwood assisted in the planning stages and developed the creel schedules. Scott Zajac conducted the survey and

provided valuable feed-back throughout the survey. Jerry Rakoczy and Donna Wesander processed the data sheets and generated effort and harvest estimates. Todd Somers assisted in the planning stages, supervised the creel clerk, and assisted with logistics during the survey. Jeff Braunscheidel provided input during the planning stages and provided comments on draft manuscripts. Comments from Mike Thomas and Jim Schneider on draft manuscripts greatly improved the final product. Thanks to all.

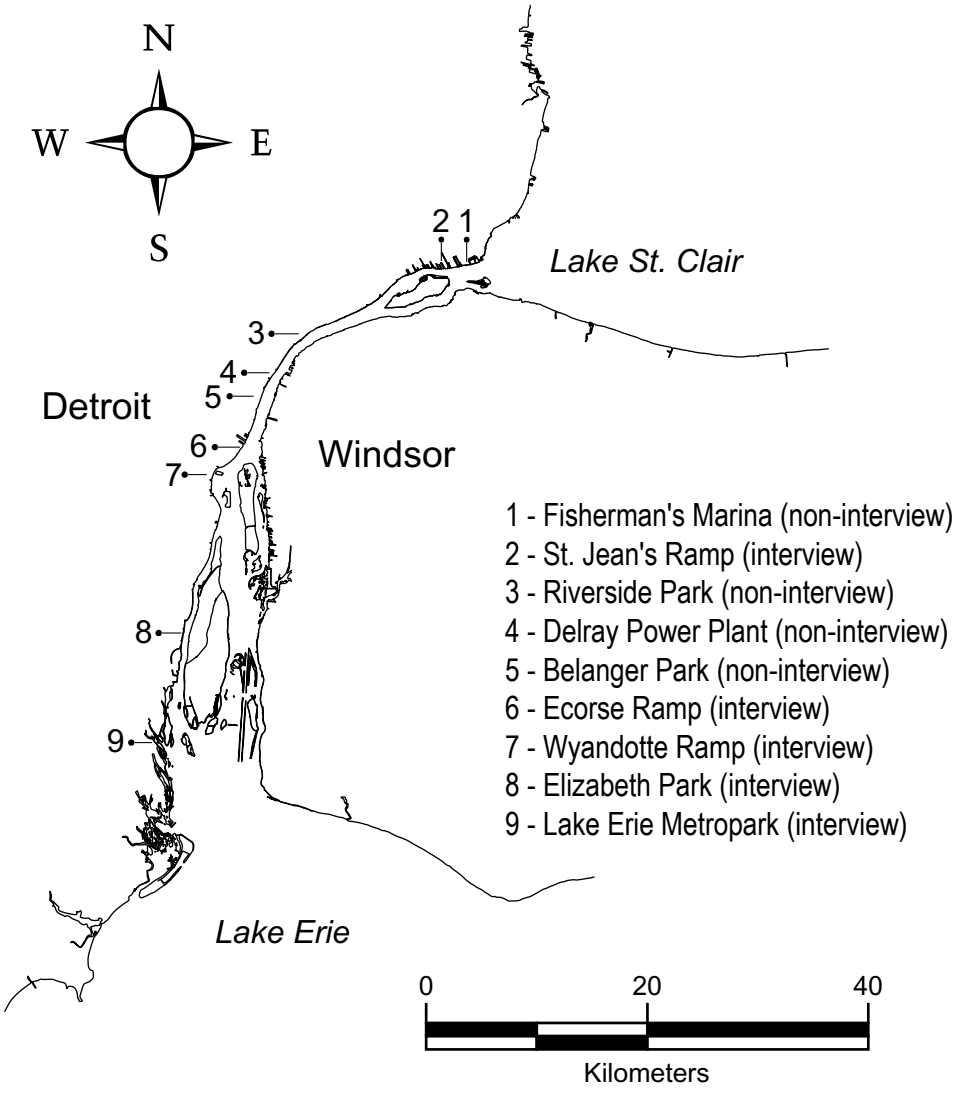

Figure 1.−Map of the Detroit River showing interview and trailer count site locations for the 2000 creel survey.

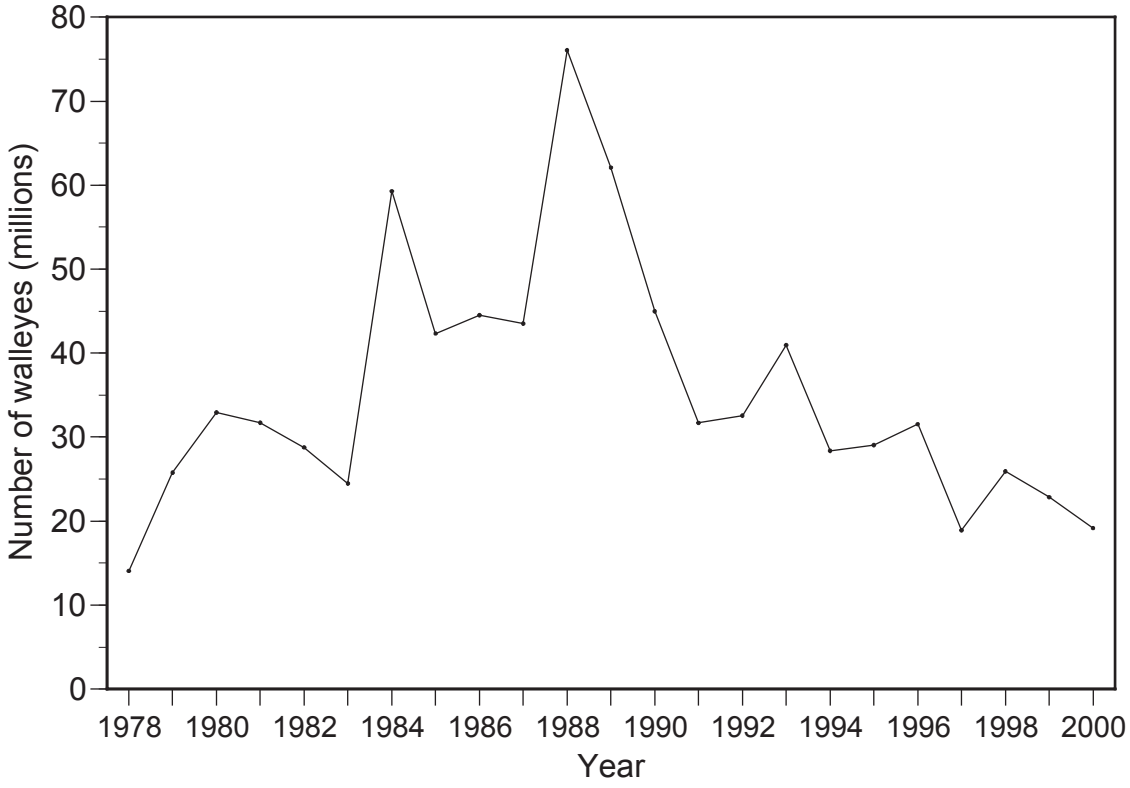

Figure 2.−Estimated abundance of age-2 and older walleye in Lake Erie (Lake Erie Walleye Task Group 2003).

Table 1.–Creel clerk work shifts for the Detroit River catch survey, 2000.

Month	Shift A	Shift B	Expansion values (F)
March	6 am – 4:30 pm	8 am – 6:30 pm	13
April	6 am – 4:30 pm	10 am – 8:30 pm	15
May	6 am – 4:30 pm	10 am – 8:30 pm	16

Table 2.–Frequency of targeted species for anglers interviewed at nine Michigan public boating access sites on the Detroit River, 2000.

Species Targeted	Number of interviews (%)
Walleye	984 (92%)
Anything	47 (4%)
Yellow perch	17 (2%)
Northern pike	10 (1%)
Smallmouth bass	5 (<1%)
Panfish	5 (<1%)

Table 3.–Frequency of area fished by anglers interviewed at nine Michigan public boating access sites on the Detroit River, 2000.

Area Fished	Number of Interviews
Detroit River	988
Canada	54
Lake Erie	14
Lake St. Clair	12
Total	1,068

Table 4.–Estimated fish harvest per hour, number harvested, and effort (angler hours, trips, and days) for the Detroit River trailer boat fishery, 2000 (two standard errors in parentheses).

Species	Harvest per hour	Month			Total
		March 11–31	April 1–30	May 1–16	
Walleye *Sander vitreus*	0.2822 (0.0148)	6,180 (1,369)	78,836 (3,323)	12,276 (1,850)	97,292 (4,042)
White bass *Morone chrysops*	0.0368 (0.0062)	0 (0)	210 (36)	12,479 (2,092)	12,689 (2,092)
Yellow perch *Perca flavescens*	0.0208 (0.0034)	1,860 (410)	2,627 (294)	2,697 (1,013)	7,184 (1,132)
White perch *Morone americana*	0.0099 (0.0020)	0 (0)	107 (24)	3,313 (690)	3,420 (690)
Bluegill *Lepomis macrochirus*	0.0076 (0.0008)	211 (40)	2,425 (253)	0 (0)	2,636 (256)
Rock bass *Ambloplites rupestris*	0.0038 (0.0004)	0 (0)	393 (63)	921 (111)	1,314 (127)
Black crappie *Pomoxis nigromaculatus*	0.0012 (0.0002)	262 (50)	145 (19)	0 (0)	407 (53)
Northern pike *Esox lucius*	0.0002 (0.0000)	0 (0)	84 (11)	0 (0)	84 (11)
Channel catfish *Ictalurus punctatus*	0.0002 (0.0000)	0 (0)	78 (11)	0 (0)	78 (11)
Freshwater drum *Aplodinotus grunniens*	0.0000 (0.0000)	0 (0)	0 (0)	14 (10)	14 (10)
Angler Hours		21,189 (3,279)	256,151 (7,898)	67,401 (7,030)	344,741 (11,070)
Angler Trips		4,877 (1,047)	49,540 (2,904)	13,377 (1,877)	67,794 (3,613)
Angler Days		4,877 (1,047)	49,221 (2,920)	13,377 (1,877)	67,475 (3,626)

Table 5.–Estimated effort (angler hours) and number of walleyes harvested by anglers launching at nine Michigan public boating access sites on the Detroit River, 2000.

Site	Hours (%)	Walleye harvested			Total (%)	Harvest per hour
		March	April	May		
Fisherman's	6,236 (2)	0	1,479	551	2,030 (2)	0.3255
St. Jean's	31,912 (9)	0	8,176	3,392	11,568 (12)	0.3625
Riverside Park	2,239 (1)	0	317	425	742 (1)	0.3314
Delray P. P.	6,460 (2)	0	1,653	0	1,653 (2)	0.2559
Belanger Park	23,889 (7)	695	9,389	792	10,876 (11)	0.4553
Ecorse	23,224 (7)	0	8,657	0	8,657 (9)	0.3728
Wyandotte	67,018 (20)	4,987	16,459	2,329	23,775 (24)	0.3548
Elizabeth Park	97,983 (28)	0	19,291	3,605	22,896 (24)	0.2337
Erie Metro P.	85,780 (25)	498	13,413	1,183	15,094 (15)	0.1760

Table 6.–State of residence of anglers interviewed during the 2000 Detroit River catch survey.

State	Interviews	
	Number	Percent
Illinois	10	0.9
Indiana	4	0.4
Iowa	3	0.3
Michigan	1,026	96.9
Maryland	1	0.1
North Carolina	2	0.2
Ohio	5	0.5
Pennsylvania	1	0.1
Oklahoma	1	0.1
Wisconsin	6	0.6
Total	1059	100.0

Table 7–County of residence of Michigan anglers interviewed during the 2000 Detroit River catch survey.

County	Interviews	County	Interviews
Allegan	3	Lenawee	7
Arenac	1	Livingston	16
Bay	1	Macomb	133
Berrien	1	Midland	1
Branch	1	Monroe	47
Calhoun	4	Montcalm	1
Cass	2	Muskegon	10
Charlevoix	1	Oakland	155
Clinton	6	Oceana	1
Eaton	14	Ogemaw	1
Genesee	19	Ottawa	11
Gladwin	1	Oscoda	1
Grand Traverse	1	Presque Isle	2
Gratiot	4	Roscommon	1
Hillsdale	3	Saginaw	3
Ingham	15	Sanilac	1
Ionia	10	Shiawassee	1
Isabella	1	St. Clair	11
Jackson	27	St. Joseph	1
Kalamazoo	5	Van Buren	4
Kent	21	Washtenaw	39
Lapeer	5	Wayne	432
		Wexford	1

Table 8.–Estimated effort and harvest from previous Detroit River fishery surveys.

		Boat Ffishery			Shore fishery		
Year	Sampling period	Effort (angler hours)	Total harvest	Walleye harvest	Effort (angler hours)	Total harvest	Walleye harvest
1942	May 17–Nov. 1	135,029	62,855	28,033	–	–	–
1943	May 27–Sept. 27	62,730	19,321	15,263	–	–	–
1980	May 1–Nov. 30	459,892	499,068	90,109	545,026[a]	237,281[a]	12,683[a]
1981	May 1–Sept. 30	391,291	233,356	89,453	598,211	255,390	5,046
1983	April 1–Nov. 30	792,258	1,213,848	111,245	762,963	568,962	7,282
1984	April 1–Nov. 30	570,945	616,458	172,891	666,952	436,418	35,883
2000	Mar. 11–May 16	344,741	125,118	97,292	–	–	–

[a] The survey of the shore fishery began on June 1 in 1980.

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