

Charter Boat Effort and Fish Harvest from the Michigan Waters of the Great Lakes, 2009

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Introduction

The charter fishing industry provides Michigan with significant economic benefits. Michigan's charter boat industry increased from 250 operations in 1979 to nearly 900 in 1989. During the 1990s and through the early 2000s, the number of charter boats used for sport fishing excursions on Michigan's Great Lakes waters declined to approximately 500 operators. During the 2009 fishing season, there were 580 operators; a number similar to the 582 operators reporting in 2008.

Reporting of sport harvest and fishing effort by the charter fishing industry is required under Public Act 451 (Part 445) of 1994. Similar legislation was first enacted during 1989 (Act 22, Public Acts of 1989) and was supported by the Michigan Charter Boat Association (MCBA) and the Michigan Department of Natural Resources (MDNR). The law stipulates that charter operators keep an up-to-date daily log of their fishing activity onboard their vessel at all times.

The objective of the catch reporting system is to obtain a continuous annual record of (1) charter fishing effort and (2) number, type, and location of fish harvested by charter anglers. These data assist MDNR's Great Lakes fishery management efforts because they are used to track changes in fishing harvest and harvest rates over time. These changes in harvest help MDNR evaluate the status of fish stocks. Annual reports also provide a measure of the health and welfare of the charter industry.

Methods

In 1989, a committee of two members each from MDNR and MCBA developed the Michigan Charter Boat Daily Catch Report form (MDNR form PR8206). This form was revised slightly in January 2006 when the following changes were made: 1) a "total number of anglers" column replaced the "resident and non-resident" angler columns, 2) recording columns for smallmouth bass and muskellunge harvest were added. In March of each year, all known charter operators are mailed a packet of

information which includes an instructional letter, an annual supply of catch report forms, and copies of Great Lakes grid maps (for use in identifying fishing location).

In recent years, some charter operators expressed an interest in submitting their monthly reports using the internet. MDNR Fisheries Division and Michigan Department of Information Technology developed a program for online charter reporting; the prototype was completed in early summer 2007. In the late summer of 2007, seven charter operators were selected to test the prototype reporting system in preparation for having the online system available starting in 2008. The online reporting system is an option for charter operators to use, but is not mandatory. During the 2008 reporting season, 77 operators (13%) were either using or had recently signed up to use the online system. By the end of the 2009 reporting season, 105 operators (18%) were using the online system.

Charter operators are identified from (1) a list of operators who submitted catch reports the previous year, (2) review of MDNR Law Enforcement Division's list of individuals who applied for and received a certificate of inspection for a fishing vessel, and (3) review of the list of individuals who applied for and received a Sport Trolling License. It is up to new charter operators to inform Fisheries Division they are now an active charter fishing operation.

Charter operators are required by law to complete the paper version of the catch report form each time they fish, or to use the alternate online reporting method. Regardless of method used, the completed monthly form is to be submitted to the MDNR Charlevoix Fisheries Research Station by the tenth of each month following the month of fishing. If a charter operator owns more than one boat, or fishes in multiple Great Lakes, he/she must fill out a monthly report for each boat and each lake fished. The report form requires the following information, regardless of fishing success or method used to submit data (paper forms or online version): a MDNR assigned reporting identification number for each boat, lake fished, date fished, port of origin, grid where a majority of the fishing occurred on that excursion, hours

fished (dock to dock), total number of anglers (resident + non-resident anglers), catch (number harvested) of major species, and number of sea lamprey seen attached to Chinook salmon and lake trout. Space is provided at the bottom of the form for comments and observations. For those chartering in major rivers, river fished is used in lieu of lake fished, and grid fished is omitted.

Charlevoix Fisheries Research Station personnel organize and review forms as they are received. Incomplete forms are returned to the charter operator with an explanation of why the report was returned and a request that the operator correct/complete the report. Data is then entered into a database and summarized to describe port-specific and lake-wide trends in fishing effort and harvest of major sport fish.

The majority of charter businesses operate during late spring through early fall. If MDNR personnel do not receive a report for a given month, it is assumed an operator is delinquent, because one cannot distinguish those operators who did not fish from those who failed to submit a report. For months June through November, MDNR issues postcard notices to charter operators who do not file a catch report from the previous month. Prior to 2005, two notices were sent each month, the first after an operator was delinquent for 10 days and the second after 30 days. Starting with 2005, the frequency of the monthly postcard notices changed due to budget and staffing constraints; the first monthly (after 10 days) reminder was omitted. Another change was made in 2006; the postcard notice now informed the operator of all months currently delinquent for the reporting year to date. Late in the year, those operators who do not file reports for one or more months during the period April through October are sent a final postcard to notify them of all missing reports. If reports are not received, those operators with one delinquent report are sent one final letter via first class mail and those with two or more delinquent reports are sent letters via certified mail. These letters inform the operator that he or she is receiving the final request to submit their reports. If the recipient does not respond by the date indicated, his or her name may be submitted to MDNR Law Enforcement Division,

recommending non-issuance of an inspection certificate for the following season.

Charter data are used to summarize three types of fishing effort: angler hours, angler trips, and charter excursions. Angler hours are the total number of hours fished by all anglers in an excursion, dock to dock. An angler trip is one completed fishing outing by one individual (angler) on the boat. A charter excursion is one completed boat trip. For example, if a charter operator took four anglers out for a six hour fishing trip, total fishing effort is 24 angler hours (4 anglers each fishing 6 hours), 4 angler trips, and one charter excursion.

Charter data are also used to summarize the harvest and harvest rate of those sport-fish listed on the form. Harvest is the number of fish caught and kept by an angler. Harvest rate is the number of fish harvested in a given amount of time (e.g., number/hour). It is possible to separate fishing effort between "groups" of fish - such as salmonine (salmon and trout species) effort from percid plus other species (walleye, perch, smallmouth bass, muskellunge, and undefined) effort - since fishing trips usually target one or the other group. However, it is usually not possible to separate fishing effort between species within these groups (i.e., fishing trips often target more than one species within a group). Starting with 2004 reporting, an improved method to calculate targeted harvest rates was implemented; this method separates salmonine effort from percid effort and uses one of these two efforts to calculate the harvest rates of individual species within each group. In 2005, effort for the 'other' category was combined with percid effort. The improved methodology had the greatest effect on percid harvest rates when effort for "percids + other" was a small percent of the total effort. For Lakes Michigan, Huron, and Superior, a majority of the effort is targeted at salmonines, not percids + other; if this total effort is used to calculate the harvest rate of percids + other, the actual rates will in most cases be greatly underestimated. Both total and targeted harvest rate data are contained in this report.

Charter operators also record the number of sea lamprey observed attached on lake trout and

Chinook salmon. These data (number of lamprey attached per 100 fish) are collected by request of the U.S. Fish and Wildlife Service's (USFWS) Sea Lamprey Control Station in Marquette, Michigan, and used with other data sets as an index of sea lamprey abundance in the Great Lakes.

Results

Compliance

During the 2009 fishing season, rate of compliance varied each month; when averaged over all reporting months, 75% of all charter boat operators complied with the law by submitting their catch reports within 30 days of the due date. Overall monthly rate of compliance in 2009 was unchanged from 2008, increased 11% compared to 2007 and was 1% less than in 2006. In December 2009, at the time of sending final notification letters for one or more delinquent reports, 80% of the operators were in compliance; this compliance rate was 5% less than in 2008 and 2007, and 8% less than in 2006. By January 2010, 93% of all charter operators had complied with the law; this rate of compliance is 2% less than that observed in 2008 and 2007, and 1% greater than the 2006 rate.

Reporting of results

Starting with the 2004 charter fishing harvest and effort data, results are inclusive of any month of the year for which charter trips were reported. For reports prior to 2004, only fishing trips conducted in months April-October were included in results. Tables, graphs, and comparisons in this report include fishing harvest and effort from the Great Lakes, inclusive of tributaries.

Fishing effort

In 2009, charter anglers participated in 12,578 charter excursions on the Michigan waters of Lakes Michigan, Huron, Erie, Superior, and the St. Clair system, including major tributaries (Tables 1-6). From 2008 to 2009, there was a 12% decrease in the number of total excursions; the number of excursions

decreased on lakes Michigan, Erie, and the St. Clair System (Table 6). Excursions on Lake Erie decreased 21%, from 870 (2008) to 689 (2009). Lake Michigan saw a decrease of 14%, from 11,326 (2008) to 9,750 (2009), and the St. Clair System decreased 3%, from 440 (2008) to 425 (2009). Excursions on Lake Huron increased 9%, 1,470 (2009) from 1,345 (2008) while Lake Superior excursions were essentially unchanged. The distribution of charter fishing excursions in 2009 by lake was: 78% Lake Michigan, 12% Lake Huron, 5% Lake Erie, 3% St. Clair System, and 2% Lake Superior. Comparing the distribution of effort to 2008, there was a 3% increase in the proportion of excursions on Lake Huron, a 2% decrease in on Lake Michigan, and 1% decrease on Lake Erie.

A total of 291,919 hours were spent fishing by 51,568 charter anglers in Michigan's waters and tributaries of the Great Lakes (Tables 1-5, Figures 1-2b). Angler hours and total number of charter anglers decreased about 13% compared to 2008, corresponding with the 12% decrease in excursions for 2009. While high unemployment and the struggling economy remained factors, inclement weather was another major factor explaining the decline in effort in 2009. Charter operators throughout Michigan's Great Lakes lost numerous trips due to windy conditions; many such trips were on weekends. 2008 also experienced a 12% decrease in effort (compared to 2007); factors included high gasoline prices for consumers (over \$4.00 per gallon for some of the year), in conjunction with high unemployment rates and a struggling economy in the state of Michigan. The two consecutive years of declining charter effort resulted in a 22% decrease in excursions from 2009 (12,578) to 2007 (16,132) (Table 6).

Starting in 2006, charter operators are no longer asked to record anglers in the categories resident and non-resident of Michigan; total anglers (resident + non-resident) are now recorded. Data collected over several years showed the overall percentage of non-resident anglers remained at 25-30%; Lake Superior charter operators consistently had the greatest percentage of non-resident clients.

Harvest

Charter operators reported a total of 134,535 fish harvested from the Michigan waters of the Great Lakes and its major tributaries in 2009 (Tables 1-5); this is a 11% decrease compared to 2008 total harvest (151,612). Most of these fish were harvested from Lake Michigan (67%), followed by Lake Erie (15%), Lake Huron (11%), the St. Clair system (5%), and Lake Superior (2%). In comparison to 2008, total harvest decreased on Lakes Michigan (14%), Superior (3%), and the St. Clair system (32%), and increased on Lakes Erie (4%) and Huron (3%).

Historically, the most abundant species in the charter harvest has been yellow perch; however over the last several years, the number of Chinook salmon harvested increased as harvest of yellow perch decreased. Since 2003, Chinook salmon has been the most abundant species in the harvest. In 2009, Chinook salmon accounted for 41% of the total harvest. Percent of total harvest for other species were as follows: walleye 17%, lake trout 15%, yellow perch 13%, rainbow trout 6%, coho salmon 5%, and brown trout <1%. The "other" species category accounted for 2% of the harvest. The species composition of this category is not fully known because MDNR does not require it to be identified; it includes smallmouth bass and muskellunge, in addition to other species not defined on the report form.

Charter anglers harvested 55,528 Chinook salmon in 2009, which is a 19% decrease relative to 2008 (68,906). Total harvest (all lakes combined) in 2009 increased for coho salmon, rainbow trout, and yellow perch; harvest of all other species recorded decreased. Harvest numbers for these species in 2009 were: 22,969 walleye, 20,079 lake trout, 17,757 yellow perch, 8,142 rainbow trout, 7,017 coho salmon, and 387 brown trout (Tables 1-5).

The St. Clair system has the highest number of "other" species in the charter harvest. In general, species categorized as "other" are not differentiated. However, starting with 2006, two species targeted in the St. Clair system, smallmouth bass and muskellunge, are now listed individually on the charter form. Due to

low harvest of these two species, compiled harvest results group these species into the "other" fish category as in past years. While harvest of smallmouth bass and muskellunge is small in number, the St. Clair system supports a popular "catch and release" fishery for these species. Released fish of any species are not reported by charter operators.

The total number of salmonines (Chinook salmon, coho salmon, lake trout, rainbow trout, and brown trout) harvested from Michigan's Great Lakes waters in 2009 was 91,153, which is a 14% decrease (15,494 fish) from 2008 harvest (106,647).

Harvest rates

In 2009, charter anglers harvested 0.46 fish (all species from all lakes combined) per hour; almost the same as for 2008 (0.45 fish). Total harvest rates (Tables 1-5) are lake-specific rates per hour and per excursion for all species in the charter harvest based on total fishing effort in that lake, regardless of species targeted. The following discussion will focus on targeted harvest rates (Tables 7-11 and Figures 3-11).

Most charter excursions that took place on Michigan's Great Lakes waters during 2009 targeted the various species of salmonines. Comparing targeted harvest rates (fish per 5 angler hours) to 2008 data, Lake Michigan angler harvest rates increased for coho salmon, rainbow trout, and yellow perch. Brown trout harvest rates remained unchanged, while lake trout and Chinook salmon harvest rates decreased slightly (Figures 3-7). The targeted harvest rate reported in 2009 for Chinook salmon in Lake Michigan (1.22 fish per 5 hours of angler fishing) is similar to 2008; the harvest rate remains high in relation to the average for the 1990-2009 data series (Figure 3).

Targeted harvest rates (fish per 5 angler hours) for Lake Huron in 2009 increased compared to 2008 for lake trout, rainbow trout, and brown trout while rates decreased for Chinook salmon, coho salmon, yellow perch, and walleye (Figures 3-7 and Figure 9). Although the harvest rate for walleye (3.00 fish per 5 angler hours) decreased to the rate observed in 2007, the harvest rate remains high

in relation to the 1990-2009 data series for Lake Huron (Figure 9).

Lake trout continues to be the most important salmonine in the charter harvest from Lake Superior. Compared to 2008, targeted harvest rates for lake trout increased (Figure 4) while coho salmon harvest rates decreased (Figure 5). Coho harvest rates were comparable to those observed for other species (e.g. Chinook salmon, rainbow trout, and brown trout) in 2009; even when combined, these salmonines make up a minor portion of the Lake Superior charter harvest (Table 10).

Walleye and yellow perch play an important role in charter fisheries on Lake Erie and the St. Clair system. Lake-wide management objectives led to a change in the walleye harvest season for Lake Erie in 2004 and 2005; walleye harvest was not permitted during the months of April and May. Regulation changes in 2006 allowed for walleye harvest for the entire year in Lake Erie; this regulation remained in place through 2009. Targeted harvest rates for walleye (3.04 fish per 5 angler hours) and yellow perch (2.96 fish per 5 angler hours) increased (Figure 10), while fishing effort (3,162 anglers; Figure 2b) decreased in Lake Erie for 2009, in comparison to 2008. Targeted harvest rates for walleye (2.07 fish per 5 angler hours) increased, while yellow perch (0.86 fish per 5 angler hours) decreased on the St. Clair system in 2009, compared to 2008 (Figure 11).

Sea Lamprey Incidence

For 2009, sea lamprey incidence on Chinook salmon increased in Lake Michigan, compared to 2008 levels. Lake Huron's incidence of 6.3 lampreys attached per 100 chinook is a decrease compared to rates from recent years (Figure 12).

Sea lamprey incidence on lake trout increased on Lake Michigan but decreased on Lake Huron. The occurrence of lamprey on lake trout in Lake Superior (1.1 lamprey/100 fish) was unchanged compared to 2008 (Figure 13).

Online Information

Previous annual reports and information on charter fishing effort and harvest at individual fishing ports can be found on the MDNR

website <http://www.michigan.gov/dnr>. Click on the following links to find the data: 'Fishing' link, then 'Angler Information' link, then 'Charter Fishing'.

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Table 1.—Total harvest per hour, harvest per excursion, number of fish harvested, and fishing effort (angler hours, anglers, and charter excursions) for charter boats fishing Michigan waters of Lake Michigan, 2009. Other species= smallmouth bass, musky, and unknown species.

Species	Total harvest per hour	Total harvest per excursion	Month												Season
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Coho salmon	0.030	0.710	0	0	0	850	996	577	621	2,402	1,435	26	16	0	6,923
Chinook salmon	0.239	5.609	0	0	0	51	4,661	3,228	11,262	26,477	8,817	164	26	0	54,686
Rainbow trout	0.034	0.797	7	103	188	190	584	1,082	1,724	1,001	2,038	252	482	118	7,769
Brown trout	0.002	0.038	0	0	2	34	89	45	91	59	42	5	1	1	369
Lake trout	0.057	1.341	1	0	0	11	1,146	2,628	4,599	3,162	1,487	22	6	9	13,071
Yellow perch	0.025	0.592	0	0	0	135	225	786	1,686	1,968	974	0	0	0	5,774
Walleye	0.004	0.101	6	21	10	58	94	137	33	167	265	99	53	46	989
Other	0.001	0.023	0	0	0	0	4	17	137	41	21	2	0	0	222
Lamprey on:															
Chinook salmon			0	0	0	2	59	27	120	292	53	1	0	0	554
Lake trout			0	0	0	0	35	50	40	64	32	1	0	0	222
Angler hours			133	719	956	2,811	16,790	21,090	55,151	86,861	39,483	2,381	2,058	769	229,202
Anglers			19	99	133	453	2,877	3,655	9,926	15,542	6,970	385	307	106	40,472
Charter excursions			6	32	41	129	675	862	2,367	3,684	1,698	126	99	31	9,750

Table 2.—Total harvest per hour, harvest per excursion, number of fish harvested, and fishing effort (angler hours, anglers, and charter excursions) for charter boats fishing Michigan waters of Lake Huron, 2009. Other species= smallmouth bass, musky, and unknown species.

Species	Total harvest per hour	Total harvest per excursion	Month												Season
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Coho salmon	0.002	0.040	0	0	0	4	3	17	17	12	6	0	0	0	59
Chinook salmon	0.029	0.565	0	0	0	1	22	80	171	329	225	3	0	0	831
Rainbow trout	0.012	0.237	0	0	0	39	16	39	114	88	50	3	0	0	349
Brown trout	0.001	0.011	0	0	0	3	7	0	2	1	2	1	0	0	16
Lake trout	0.168	3.272	0	0	0	0	295	1,090	1,592	1,311	522	0	0	0	4,810
Yellow perch	0.016	0.319	0	0	0	0	236	21	40	59	99	14	0	0	469
Walleye	0.277	5.395	0	0	0	29	1,078	2,897	2,508	1,192	179	42	5	0	7,930
Other	0.018	0.356	0	0	0	0	154	102	169	62	23	13	0	0	523
Lamprey on:															
Chinook salmon			0	0	0	0	4	9	13	18	15	0	0	0	59
Lake trout			0	0	0	0	4	17	21	18	3	0	0	0	63
Angler hours			0	0	0	307	2,854	7,198	8,813	6,863	2,479	88	6	0	28,608
Anglers			0	0	0	49	495	1,348	1,656	1,285	451	18	1	0	5,303
Charter excursions			0	0	0	19	147	360	439	356	138	10	1	0	1,470

Table 3.— Total harvest per hour, harvest per excursion, number of fish harvested, and fishing effort (angler hours, anglers, and charter excursions) for charter boats fishing Michigan waters of Lake Erie (Grids 500, 702, 703, 801, 802), 2009. Other species= smallmouth bass, musky, and unknown species.

Species	Total harvest per hour	Total harvest per excursion	Month												Season
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Coho salmon	0.000	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Chinook salmon	0.000	0.001	0	0	0	0	0	1	0	0	0	0	0	0	1
Rainbow trout	0.000	0.004	0	0	0	0	0	2	1	0	0	0	0	0	3
Brown trout	0.000	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Lake trout	0.000	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow perch	0.591	14.498	0	0	0	0	88	369	263	4,587	3,594	1,088	0	0	9,989
Walleye	0.607	14.888	0	0	0	90	1,554	3,954	4,387	260	12	1	0	0	10,258
Other	0.029	0.704	0	0	0	0	230	163	82	10	0	0	0	0	485
Lamprey on:															
Chinook salmon			0	0	0	0	0	0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	0	0	0	0	0	0	0	0	0
Angler hours			0	0	0	162	2,502	5,899	5,320	1,727	1,049	240	0	0	16,899
Anglers			0	0	0	27	449	1,089	1,038	321	190	48	0	0	3,162
Charter excursions			0	0	0	8	103	230	224	72	42	10	0	0	689

Table 4.—Total harvest per hour, harvest per excursion, number of fish harvested, and fishing effort (angler hours, anglers, and charter excursions) for charter boats fishing Michigan waters of Lake Superior, 2009. Other species= smallmouth bass, musky, and unknown species.

Species	Total harvest per hour	Total harvest per excursion	Month												Season
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Coho salmon	0.004	0.139	0	0	0	0	0	7	23	1	3	0	0	0	34
Chinook salmon	0.001	0.041	0	0	0	0	0	1	4	3	2	0	0	0	10
Rainbow trout	0.003	0.086	0	0	0	0	0	17	4	0	0	0	0	0	21
Brown trout	0.000	0.008	0	0	0	0	0	1	1	0	0	0	0	0	2
Lake trout	0.273	9.008	0	0	0	0	24	554	831	589	200	0	0	0	2,198
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Walleye	0.001	0.041	0	0	0	0	0	0	1	9	0	0	0	0	10
Other	0.028	0.939	0	0	0	0	0	41	183	5	0	0	0	0	229
Lamprey on:															
Chinook salmon			0	0	0	0	0	0	1	0	0	0	0	0	1
Lake trout			0	0	0	0	0	7	5	7	5	0	0	0	24
Angler hours			0	0	0	0	64	2,619	2,892	1,698	779	4	0	0	8,056
Anglers			0	0	0	0	8	313	412	259	98	1	0	0	1,091
Charter excursions			0	0	0	0	1	66	98	59	19	1	0	0	244

Table 5.—Total harvest per hour, harvest per excursion, number of fish harvested, and fishing effort (angler hours, anglers, and charter excursions) for charter boats fishing Michigan waters of St. Clair System (Lake St. Clair, St. Clair River, and Detroit River), 2009. Other species= smallmouth bass, musky, and unknown species.

Species	Total harvest per hour	Total harvest per excursion	Month												Season
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Coho salmon	0.000	0.002	0	0	0	0	1	0	0	0	0	0	0	0	1
Chinook salmon	0.000	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Rainbow trout	0.000	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Brown trout	0.000	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Lake trout	0.000	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow perch	0.167	3.588	0	0	0	1	0	288	357	424	344	77	34	0	1,525
Walleye	0.413	8.899	0	0	1	1,328	1,419	142	224	298	104	129	137	0	3,782
Other	0.131	2.816	0	0	0	0	0	301	414	350	122	10	0	0	1,197
Lamprey on:															
Chinook salmon			0	0	0	0	0	0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	0	0	0	0	0	0	0	0	0
Angler hours			0	0	12	2,839	2,161	863	1,164	1,180	489	280	166	0	9,154
Anglers			0	0	2	483	407	135	181	182	81	45	24	0	1,540
Charter excursions			0	0	1	137	111	37	49	49	22	11	8	0	425

Table 6.—Number of charter excursions on the Michigan waters of the Great Lakes (including tributaries); April – October for years 1990-2003 and January – December for years 2004-2009.

Lake	Year									
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Michigan	13,467	13,604	10,995	10,298	10,116	9,996	10,344	10,627	12,333	11,382
Huron	4,010	3,442	2,521	2,307	2,182	2,599	2,592	2,684	3,210	3,123
Erie	1,684	1,445	1,679	1,881	1,661	1,781	1,775	1,727	1,679	2,380
Superior	755	791	743	618	455	515	524	497	517	607
St. Clair	779	643	509	414	299	336	407	394	432	389
Total	20,695	19,925	16,447	15,518	14,713	15,227	15,642	15,929	18,171	17,881

Table 6 (continued)

Lake	Year									
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Michigan	11,714	11,224	11,924	12,094	11,966	12,526	12,064	12,704	11,326	9,750
Huron	2,760	2,867	2,874	2,771	2,622	2,085	1,765	1,537	1,345	1,470
Erie	1,836	1,947	1,870	1,695	718	694	1,554	1,039	870	689
Superior	482	477	430	505	455	479	398	359	245	244
St. Clair	348	433	246	466	339	319	366	493	440	425
Total	17,140	16,948	17,344	17,531	16,100	16,103	16,147	16,132	14,226	12,578

Table 7.—Targeted harvest per hour, harvest per excursion and number fish harvested by species with total fishing effort (angler hours, anglers, and charter excursions) for charter boats fishing Michigan waters of Lake Michigan and its tributaries, 2009. Targeted harvest based on total salmonine effort (salmon and trout species) or total percid + other effort (perch, walleye, plus other= smallmouth bass, musky, and unknown species).

Species	Targeted harvest per hour	Targeted harvest per excursion	Month												Season
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Coho salmon	0.031	0.730	0	0	0	850	996	577	621	2,398	1,434	26	16	0	6,918
Chinook salmon	0.243	5.772	0	0	0	51	4,661	3,228	11,262	26,475	8,810	164	26	0	54,677
Rainbow trout	0.035	0.819	7	102	183	190	584	1,082	1,724	1,000	2,036	251	482	114	7,755
Brown trout	0.002	0.039	0	0	2	34	89	45	91	59	42	5	1	1	369
Lake trout	0.058	1.379	1	0	0	11	1,146	2,628	4,599	3,161	1,483	20	6	6	13,061
Yellow perch	1.158	18.628	0	0	0	135	225	780	1,620	1,690	710	0	0	0	5,160
Walleye	0.210	3.379	5	16	5	58	74	137	33	164	265	93	52	34	936
Other	0.033	0.523	0	0	0	0	0	0	122	23	0	0	0	0	145
Lamprey on:															
Chinook salmon			0	0	0	2	59	27	120	292	53	1	0	0	554
Lake trout			0	0	0	0	35	50	40	64	32	1	0	0	222
Angler hours			133	719	956	2,811	16,790	21,090	55,151	86,861	39,483	2,381	2,058	769	229,202
Anglers			19	99	133	453	2,877	3,655	9,926	15,542	6,970	385	307	106	40,472
Charter excursions			6	32	41	129	675	862	2,367	3,684	1,698	126	99	31	9,750

Table 8.—Targeted harvest per hour, harvest per excursion and number fish harvested by species with total fishing effort (angler hours, anglers, and charter excursions) for charter boats fishing Michigan waters of Lake Huron and its tributaries, 2009. Targeted harvest based on total salmonine effort (salmon and trout species) or total percid + other effort (perch, walleye, plus other= smallmouth bass, musky, and unknown species).

Species	Targeted harvest per hour	Targeted harvest per excursion	Month												Season
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Coho salmon	0.004	0.069	0	0	0	4	3	17	17	12	6	0	0	0	59
Chinook salmon	0.053	0.964	0	0	0	1	21	80	171	329	224	3	0	0	829
Rainbow trout	0.022	0.399	0	0	0	39	15	39	109	88	50	3	0	0	343
Brown trout	0.001	0.016	0	0	0	3	7	0	1	1	2	0	0	0	14
Lake trout	0.307	5.573	0	0	0	0	295	1,090	1,575	1,311	522	0	0	0	4,793
Yellow perch	0.036	0.769	0	0	0	0	236	21	40	59	99	14	0	0	469
Walleye	0.599	12.779	0	0	0	29	1,077	2,887	2,457	1,140	160	40	5	0	7,795
Other	0.031	0.656	0	0	0	0	130	71	135	44	11	9	0	0	400
Lamprey on:															
Chinook salmon			0	0	0	0	4	9	13	18	15	0	0	0	59
Lake trout			0	0	0	0	4	17	21	18	3	0	0	0	63
Angler hours			0	0	0	307	2,854	7,198	8,813	6,863	2,479	88	6	0	28,608
Anglers			0	0	0	49	495	1,348	1,656	1,285	451	18	1	0	5,303
Charter excursions			0	0	0	19	147	360	439	356	138	10	1	0	1,470

Table 9.—Targeted harvest per hour, harvest per excursion and number fish harvested by species with total fishing effort (angler hours, anglers, and charter excursions) for charter boats fishing Michigan waters of Lake Erie (Grids 500, 702, 703, 801, 802), 2009. Targeted harvest based on total salmonine effort (salmon and trout species) or total percid + other effort (perch, walleye, plus other= smallmouth bass, musky, and unknown species).

Species	Targeted harvest per hour	Targeted harvest per excursion	Month												Season
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Coho salmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chinook salmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rainbow trout	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brown trout	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lake trout	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow perch	0.591	14.498	0	0	0	0	88	369	263	4,587	3,594	1,088	0	0	9,989
Walleye	0.607	14.888	0	0	0	90	1,554	3,954	4,387	260	12	1	0	0	10,258
Other	0.029	0.704	0	0	0	0	230	163	82	10	0	0	0	0	485
Lamprey on:															
Chinook salmon			0	0	0	0	0	0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	0	0	0	0	0	0	0	0	0
Angler hours			0	0	0	162	2,502	5,899	5,320	1,727	1,049	240	0	0	16,899
Anglers			0	0	0	27	449	1,089	1,038	321	190	48	0	0	3,162
Charter excursions			0	0	0	8	103	230	224	72	42	10	0	0	689

Table 10.—Targeted harvest per hour, harvest per excursion and number fish harvested by species with total fishing effort (angler hours, anglers, and charter excursions) for charter boats fishing Michigan waters of Lake Superior and its tributaries, 2009. Targeted harvest based on total salmonine effort (salmon and trout species) or total percid + other effort (perch, walleye, plus other= smallmouth bass, musky, and unknown species).

Species	Targeted harvest per hour	Targeted harvest per excursion	Month												Season
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Coho salmon	0.004	0.155	0	0	0	0	0	7	23	1	3	0	0	0	34
Chinook salmon	0.001	0.046	0	0	0	0	0	1	4	3	2	0	0	0	10
Rainbow trout	0.003	0.096	0	0	0	0	0	17	4	0	0	0	0	0	21
Brown trout	0.000	0.009	0	0	0	0	0	1	1	0	0	0	0	0	2
Lake trout	0.288	10.037	0	0	0	0	24	554	831	589	200	0	0	0	2,198
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Walleye	0.024	0.400	0	0	0	0	0	0	1	9	0	0	0	0	10
Other	0.507	8.440	0	0	0	0	0	27	182	2	0	0	0	0	211
Lamprey on:															
Chinook salmon			0	0	0	0	0	0	1	0	0	0	0	0	1
Lake trout			0	0	0	0	0	7	5	7	5	0	0	0	24
Angler hours			0	0	0	0	64	2,619	2,892	1,698	779	4	0	0	8,056
Anglers			0	0	0	0	8	313	412	259	98	1	0	0	1,091
Charter excursions			0	0	0	0	1	66	98	59	19	1	0	0	244

Table 11.—Targeted harvest per hour, harvest per excursion and number fish harvested by species with total fishing effort (angler hours, anglers, and charter excursions) for charter boats fishing Michigan waters of the St. Clair System (Lake St. Clair, St. Clair River, and Detroit River), 2009. Targeted harvest based on total salmonine effort (salmon and trout species) or total percid + other effort (perch, walleye, plus other= smallmouth bass, musky, and unknown species).

Species	Targeted harvest per hour	Targeted harvest per excursion	Month												Season
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Coho salmon	0.000	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Chinook salmon	0.000	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Rainbow trout	0.000	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Brown trout	0.000	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Lake trout	0.000	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow perch	0.167	3.588	0	0	0	1	0	288	357	424	344	77	34	0	1,525
Walleye	0.413	8.899	0	0	1	1,328	1,419	142	224	298	104	129	137	0	3,782
Other	0.131	2.816	0	0	0	0	0	301	414	350	122	10	0	0	1,197
Lamprey on:															
Chinook salmon			0	0	0	0	0	0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	0	0	0	0	0	0	0	0	0
Angler hours			0	0	12	2,839	2,161	863	1,164	1,180	489	280	166	0	9,154
Anglers			0	0	2	483	407	135	181	182	81	45	24	0	1,540
Charter excursions			0	0	1	137	111	37	49	49	22	11	8	0	425

Figure 1.—Total number of charter anglers (trips) on the Michigan waters of the Great Lakes (including tributaries), 1990-2009.

Year	Number of anglers (trips)
1990	85,079
1991	85,902
1992	68,545
1993	67,615
1994	66,047
1995	72,427
1996	74,864
1997	74,431
1998	83,862
1999	82,181
2000	81,940
2001	79,083
2002	76,352
2003	76,151
2004	66,845
2005	67,224
2006	68,572
2007	67,513
2008	59,840
2009	51,568

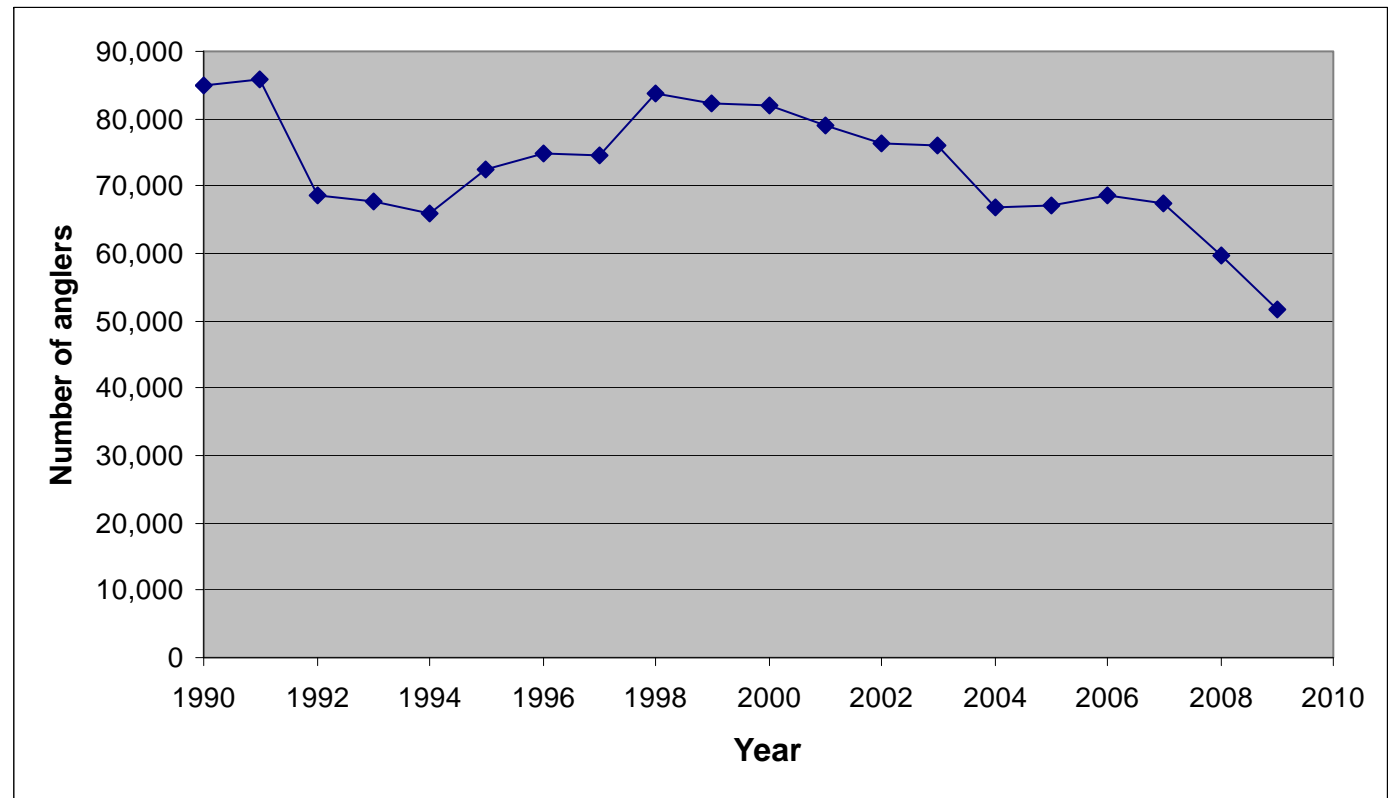


Figure 2(a).—Total number of charter anglers (trips) on the Michigan waters of Lake Michigan and Lake Huron (including tributaries), 1990-2009.

Year	Lake Michigan	Lake Huron
1990	57,140	14,604
1991	62,578	12,012
1992	47,145	8,965
1993	46,510	8,069
1994	46,759	7,613
1995	51,515	9,432
1996	52,527	9,612
1997	52,805	9,684
1998	60,250	11,913
1999	55,578	11,861
2000	57,006	11,009
2001	53,645	11,555
2002	53,213	10,742
2003	52,972	10,318
2004	49,959	9,947
2005	52,665	7,812
2006	50,903	6,521
2007	53,337	5,635
2008	47,977	4,951
2009	40,472	5,303

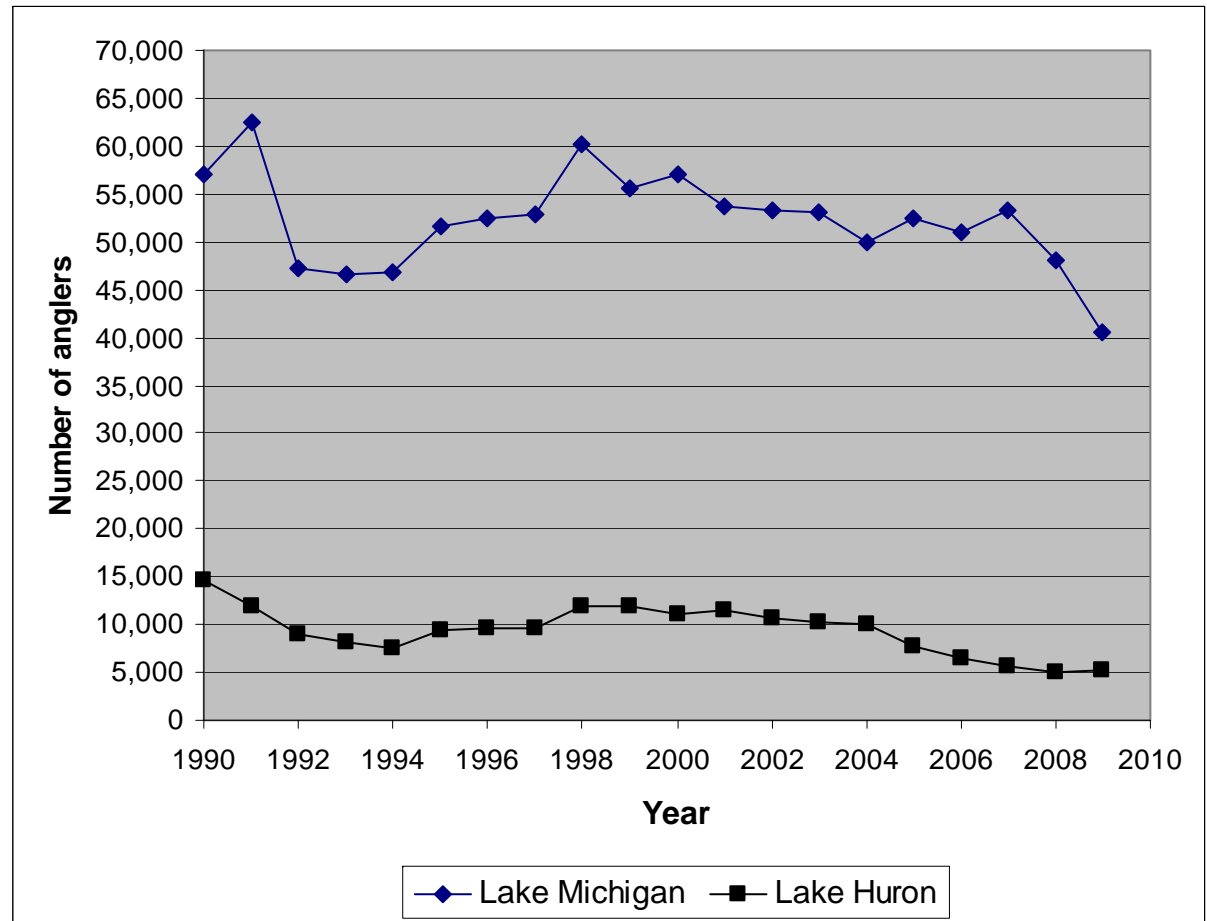


Figure 2 (b).—Total number of charter anglers (trips) on the Michigan waters of Lakes Erie, Superior, and the St. Clair System (including tributaries), 1990-2009.

Year	Lake Erie	Lake Superior	St. Clair System
1990	8,073	3,337	1,925
1991	6,139	3,588	1,585
1992	7,202	3,399	1,834
1993	8,829	2,858	1,349
1994	7,564	3,053	1,058
1995	8,144	2,411	925
1996	8,873	2,569	1,283
1997	8,280	2,481	1,181
1998	8,148	2,303	1,248
1999	10,645	2,869	1,228
2000	10,153	2,335	1,437
2001	10,226	2,222	1,435
2002	9,232	2,104	1,061
2003	8,514	2,446	1,901
2004	3,603	2,044	1,292
2005	3,392	2,171	1,184
2006	7,807	1,836	1,505
2007	5,031	1,630	1,880
2008	4,063	1,191	1,658
2009	3,162	1,091	1,540

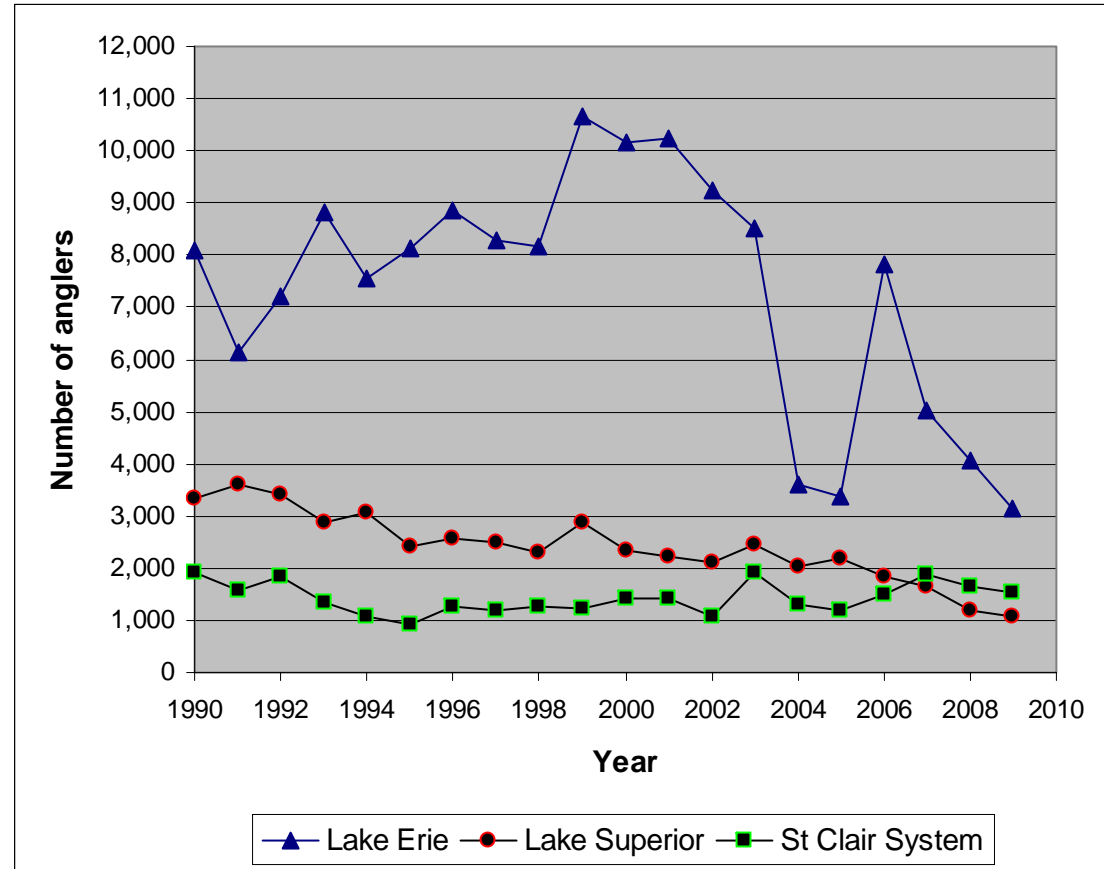


Figure 3. - Charter angler targeted harvest rates (fish per 5 angler hours) for Chinook salmon on Lake Michigan and Lake Huron, 1990-2009.

Year	Lake Michigan	Lake Huron
1990	0.37	0.35
1991	0.39	0.40
1992	0.27	0.41
1993	0.21	0.45
1994	0.22	0.50
1995	0.29	0.72
1996	0.50	0.71
1997	0.53	1.04
1998	0.44	0.93
1999	0.48	0.96
2000	0.67	0.75
2001	0.62	0.75
2002	0.84	1.04
2003	0.97	0.86
2004	1.23	0.63
2005	1.39	0.32
2006	1.47	0.37
2007	1.47	0.40
2008	1.23	0.37
2009	1.22	0.27

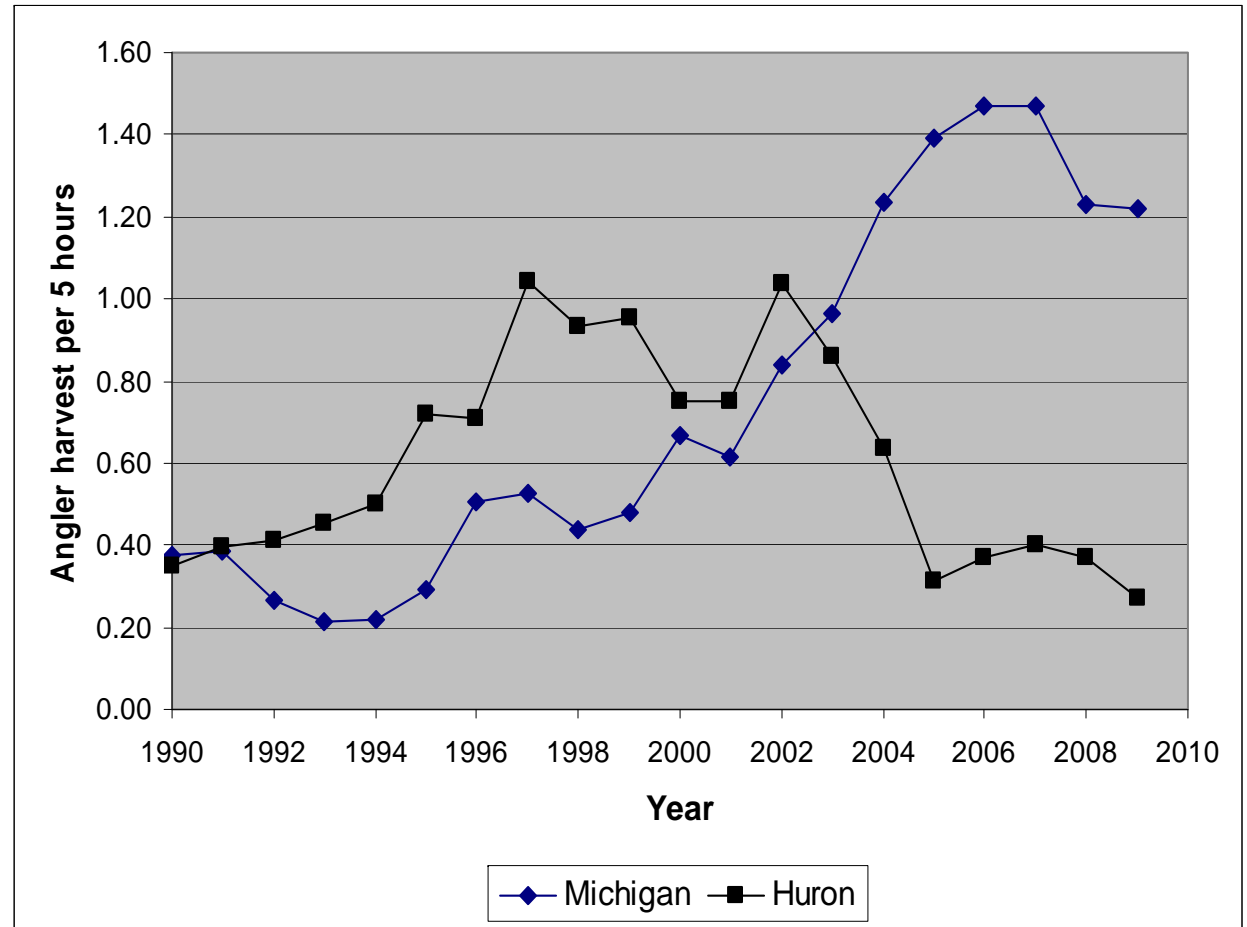


Figure 4.—Charter angler targeted harvest rates (fish per 5 angler hours) for lake trout on Lakes Michigan, Huron, and Superior, 1990-2009.

Year	Lake Michigan	Lake Huron	Lake Superior
1990	0.42	0.60	1.42
1991	0.48	0.53	1.40
1992	0.41	0.43	1.33
1993	0.52	0.26	1.44
1994	0.57	0.39	1.33
1995	0.61	0.41	1.31
1996	0.42	0.57	1.43
1997	0.39	0.56	1.34
1998	0.50	0.75	1.27
1999	0.34	0.71	1.32
2000	0.32	0.80	1.36
2001	0.26	0.65	1.51
2002	0.17	0.71	1.38
2003	0.14	1.08	1.36
2004	0.10	1.49	1.49
2005	0.11	1.52	1.50
2006	0.15	1.54	1.45
2007	0.19	1.38	1.47
2008	0.31	1.29	1.40
2009	0.29	1.54	1.44

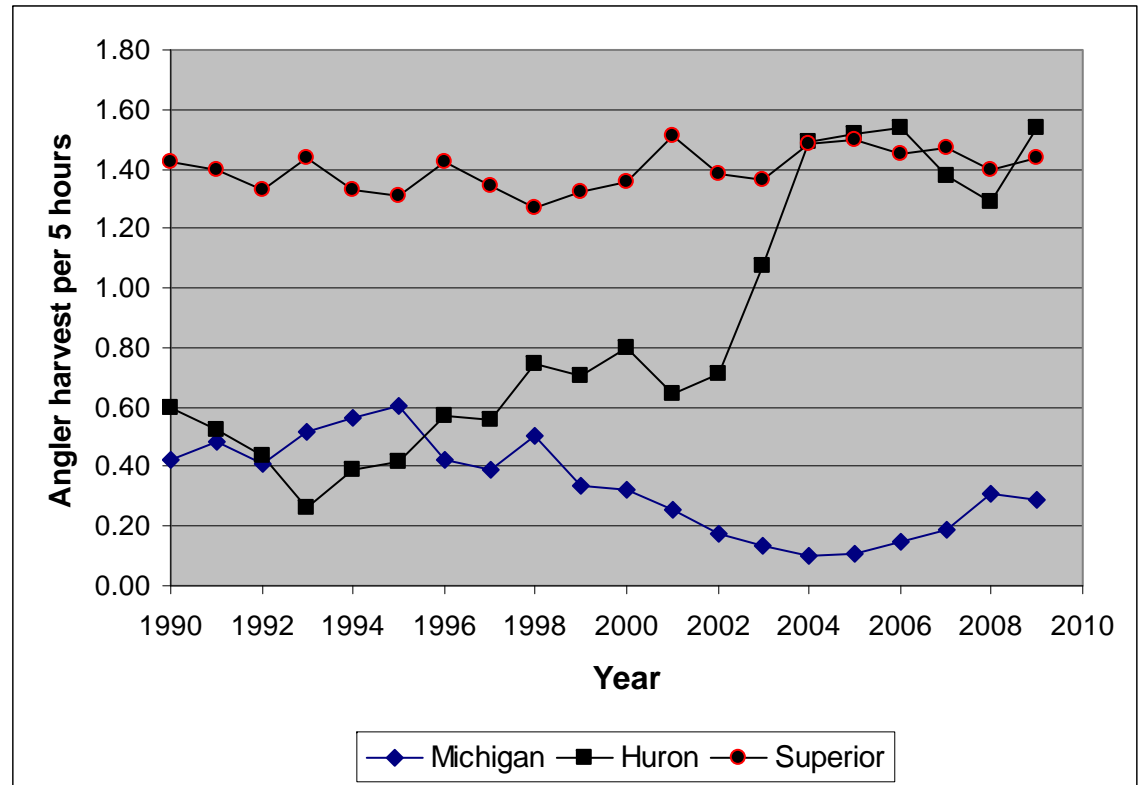


Figure 5.—Charter angler targeted harvest rates (fish per 5 angler hours) for coho salmon on Lakes Michigan, Huron, and Superior, 1990-2009.

Year	Lake Michigan	Lake Huron	Lake Superior
1990	0.20	0.01	0.06
1991	0.16	0.02	0.16
1992	0.18	0.01	0.06
1993	0.24	0.02	0.05
1994	0.14	0.02	0.07
1995	0.13	0.01	0.08
1996	0.17	0.02	0.09
1997	0.21	0.01	0.06
1998	0.26	0.02	0.04
1999	0.18	0.06	0.12
2000	0.31	0.04	0.05
2001	0.19	0.03	0.09
2002	0.26	0.12	0.11
2003	0.18	0.03	0.03
2004	0.17	0.02	0.07
2005	0.09	0.02	0.06
2006	0.11	0.03	0.05
2007	0.18	0.02	0.07
2008	0.12	0.04	0.10
2009	0.16	0.02	0.02

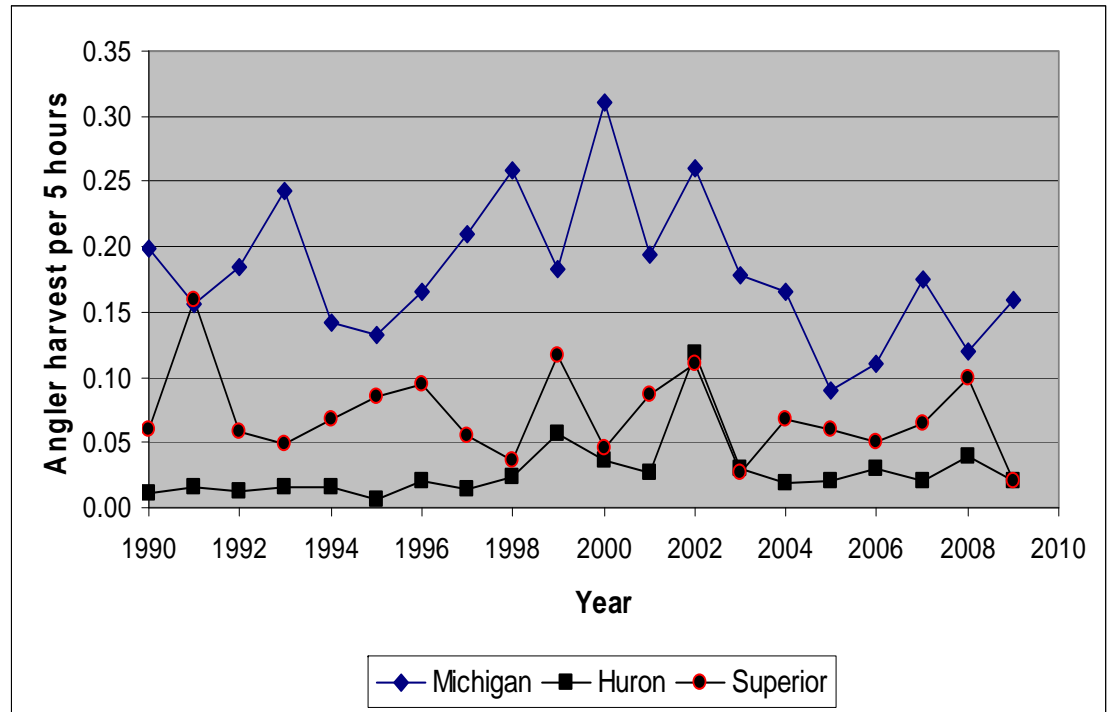


Figure 6.—Charter angler targeted harvest rates (fish per 5 angler hours) for rainbow trout (steelhead) on Lake Michigan and Lake Huron, 1990-2009.

Year	Lake Michigan	Lake Huron
1990	0.22	0.02
1991	0.42	0.04
1992	0.37	0.05
1993	0.28	0.09
1994	0.29	0.08
1995	0.19	0.16
1996	0.39	0.17
1997	0.29	0.12
1998	0.24	0.08
1999	0.22	0.08
2000	0.18	0.08
2001	0.26	0.10
2002	0.19	0.09
2003	0.18	0.04
2004	0.12	0.05
2005	0.15	0.06
2006	0.14	0.07
2007	0.13	0.06
2008	0.14	0.09
2009	0.18	0.11

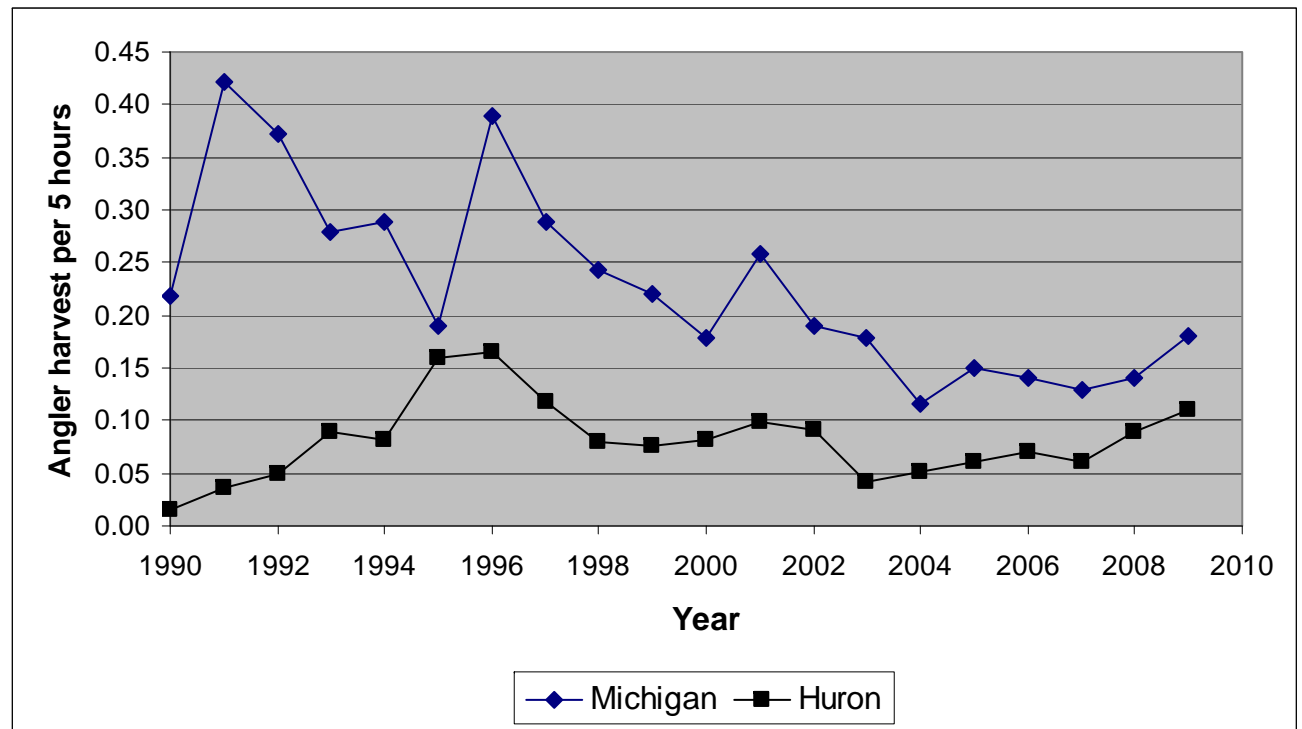


Figure 7.—Charter angler targeted harvest rates (fish per 5 angler hours) for brown trout on Lake Michigan and Lake Huron, 1990-2009.

Year	Lake Michigan	Lake Huron
1990	0.03	0.01
1991	0.05	0.01
1992	0.02	0.04
1993	0.04	0.10
1994	0.06	0.12
1995	0.05	0.11
1996	0.06	0.05
1997	0.08	0.02
1998	0.04	0.03
1999	0.04	0.01
2000	0.07	0.01
2001	0.03	0.01
2002	0.04	0.02
2003	0.02	0.03
2004	0.01	0.02
2005	0.02	0.01
2006	0.01	0.00
2007	0.01	0.01
2008	0.01	0.00
2009	0.01	0.08

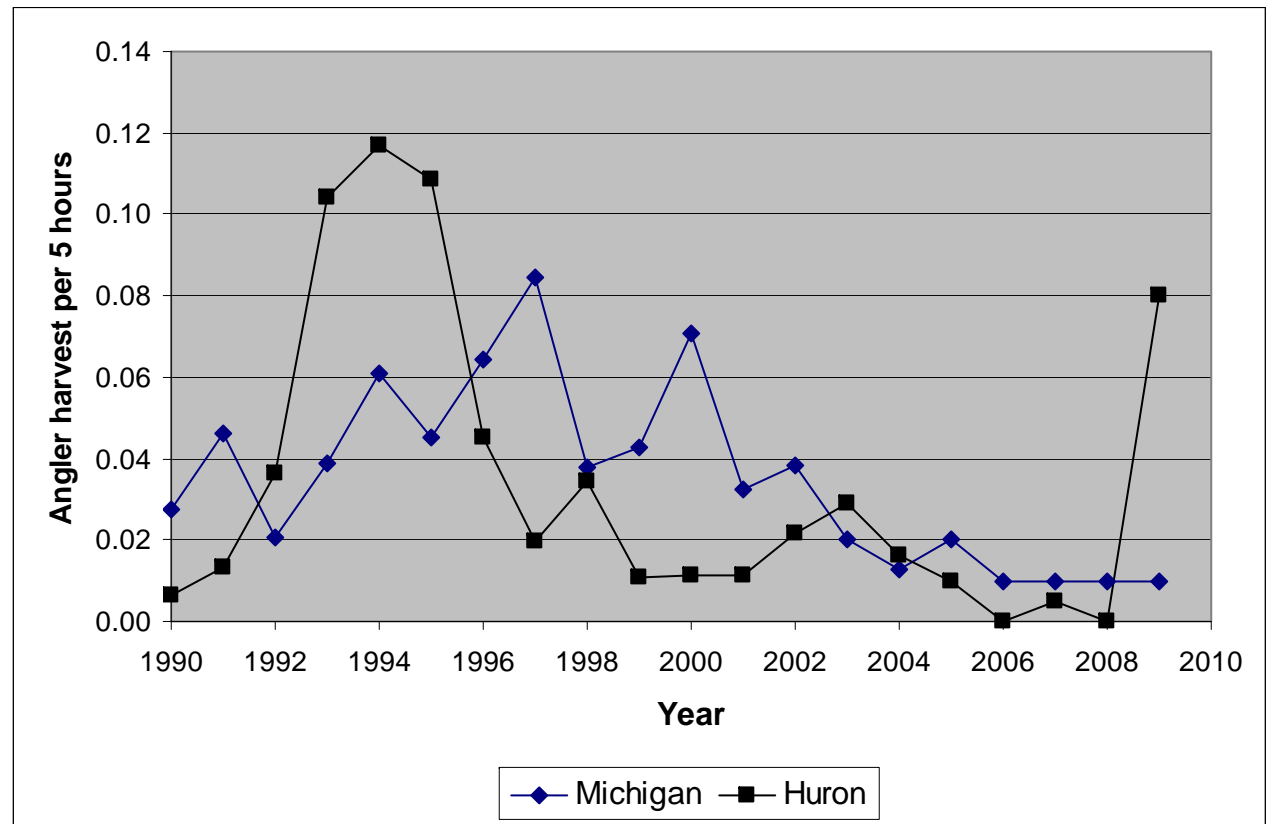


Figure 8.—Charter angler targeted harvest rates (fish per 5 angler hours) for yellow perch on Lake Michigan, 1990-2009.

Year	Yellow Perch
1990	24.49
1991	8.42
1992	12.28
1993	14.66
1994	12.38
1995	9.01
1996	4.23
1997	5.93
1998	3.35
1999	5.43
2000	3.44
2001	2.25
2002	2.54
2003	4.14
2004	2.16
2005	2.91
2006	4.97
2007	5.00
2008	4.26
2009	5.79

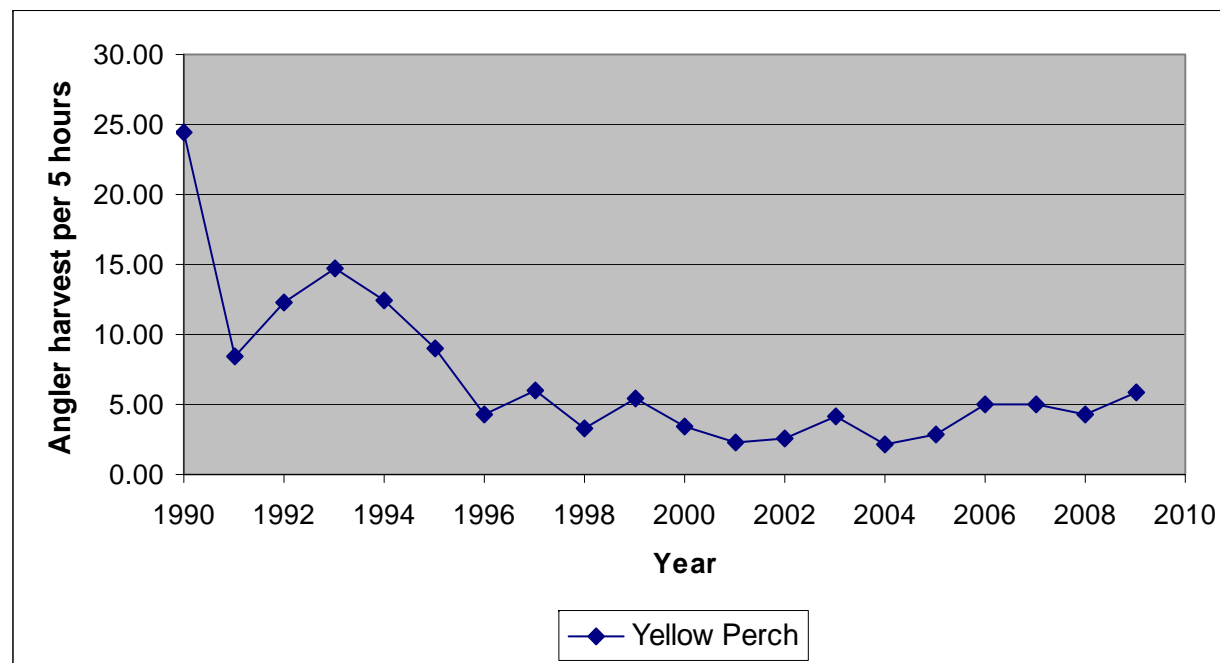


Figure 9.—Charter angler targeted harvest rates (fish per 5 angler hours) for yellow perch and walleye on Lake Huron, 1990-2009.

Year	Yellow perch	Walleye
1990	3.28	1.57
1991	1.72	1.47
1992	1.57	1.56
1993	0.91	1.62
1994	1.42	1.77
1995	1.19	0.87
1996	0.90	1.06
1997	0.69	1.22
1998	0.92	1.28
1999	2.61	0.98
2000	1.13	1.21
2001	0.90	1.13
2002	0.39	0.98
2003	0.42	1.20
2004	0.11	1.18
2005	0.15	1.42
2006	0.41	2.42
2007	0.27	3.01
2008	0.65	3.28
2009	0.18	3.00

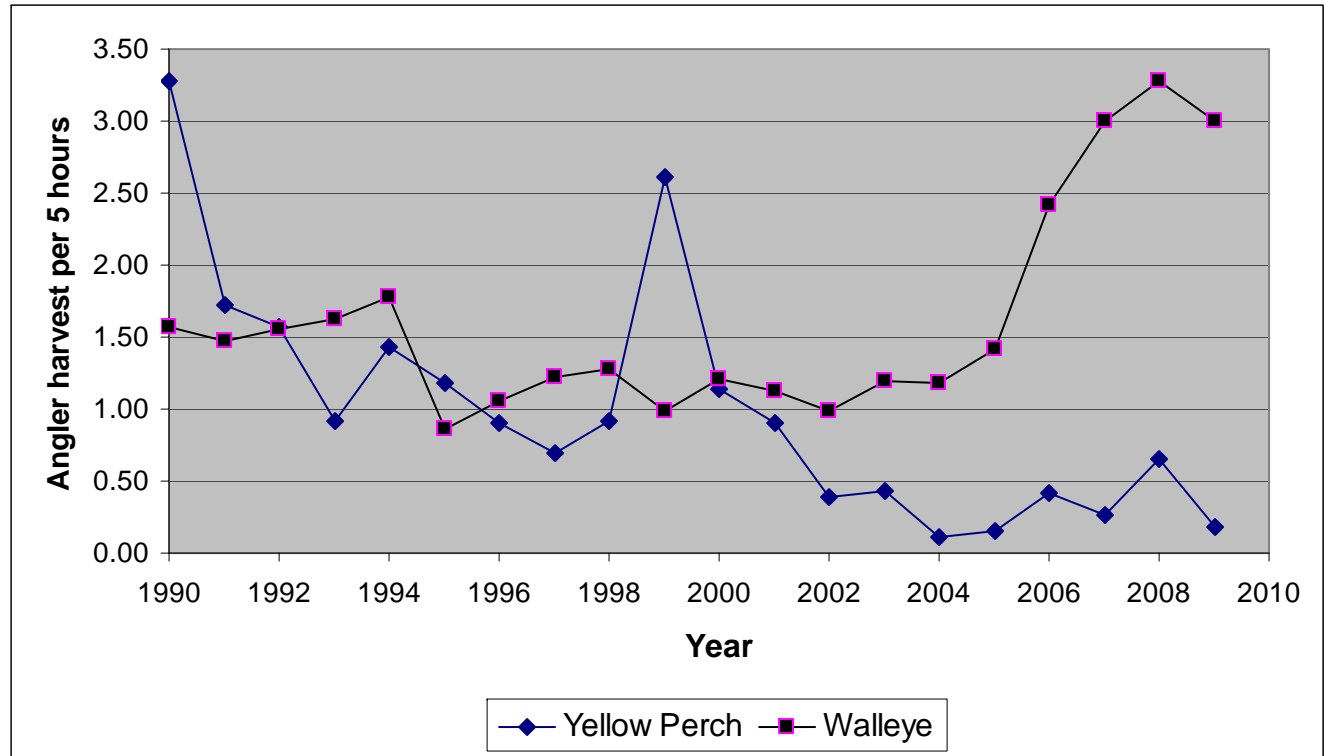


Figure 10.—Charter angler targeted harvest rates (fish per 5 angler hours) for yellow perch and walleye on Lake Erie, 1990-2009.

Year	Yellow perch	Walleye
1990	1.52	3.77
1991	1.99	3.21
1992	2.51	4.21
1993	2.30	4.05
1994	1.70	3.48
1995	2.59	4.17
1996	3.95	4.12
1997	3.77	4.21
1998	3.52	5.37
1999	3.72	4.22
2000	3.34	3.89
2001	2.85	4.27
2002	5.01	3.71
2003	3.13	4.30
2004	2.19	3.00
2005	3.85	1.57
2006	1.59	4.56
2007	1.91	3.81
2008	1.61	2.89
2009	2.96	3.04

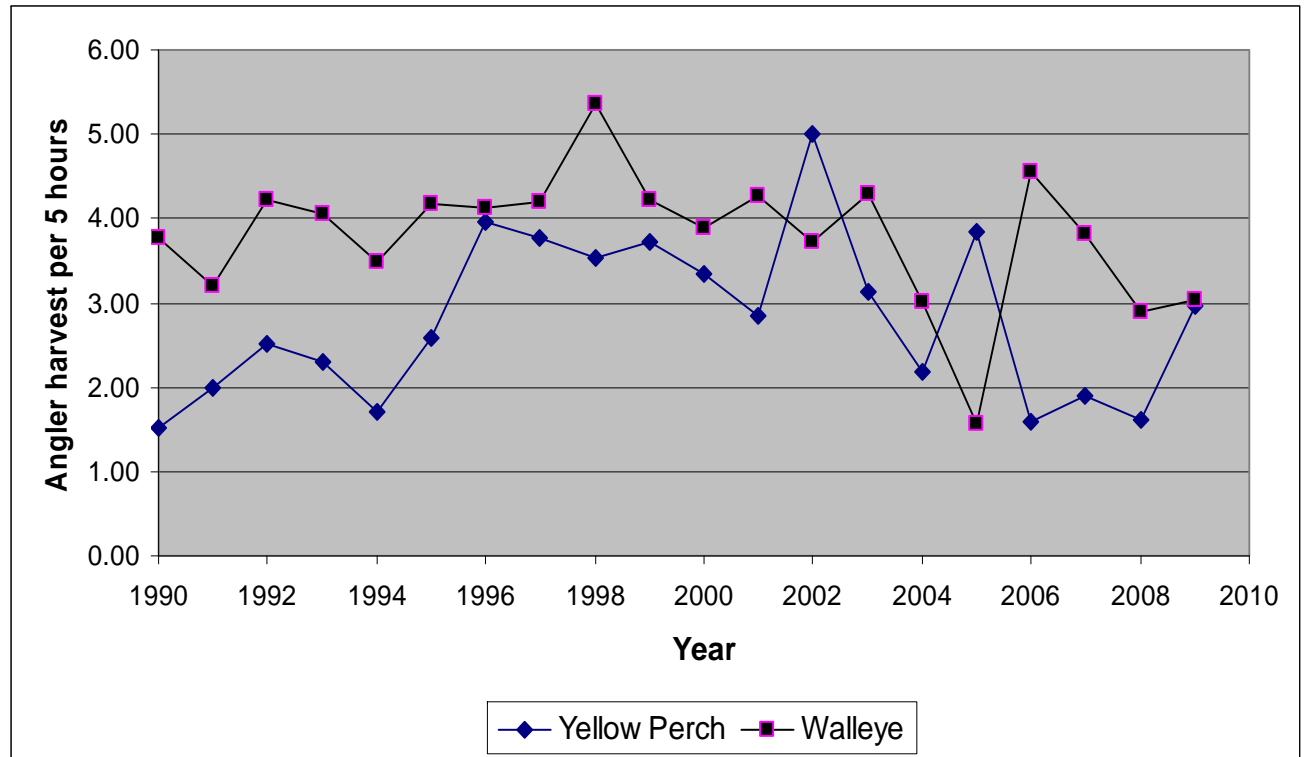


Figure 11.—Charter angler targeted harvest rates (fish per 5 angler hours) for yellow perch and walleye on the St. Clair system, 1990-2009.

Year	Yellow perch	Walleye
1990	1.25	1.42
1991	1.52	0.88
1992	0.93	0.79
1993	1.39	1.13
1994	3.79	0.59
1995	3.39	1.07
1996	5.06	0.81
1997	3.86	0.95
1998	2.28	1.03
1999	2.40	0.99
2000	2.54	1.01
2001	3.43	1.35
2002	6.12	0.76
2003	2.44	1.24
2004	2.13	1.29
2005	2.85	1.98
2006	3.80	1.68
2007	4.90	2.19
2008	1.96	1.10
2009	0.86	2.07

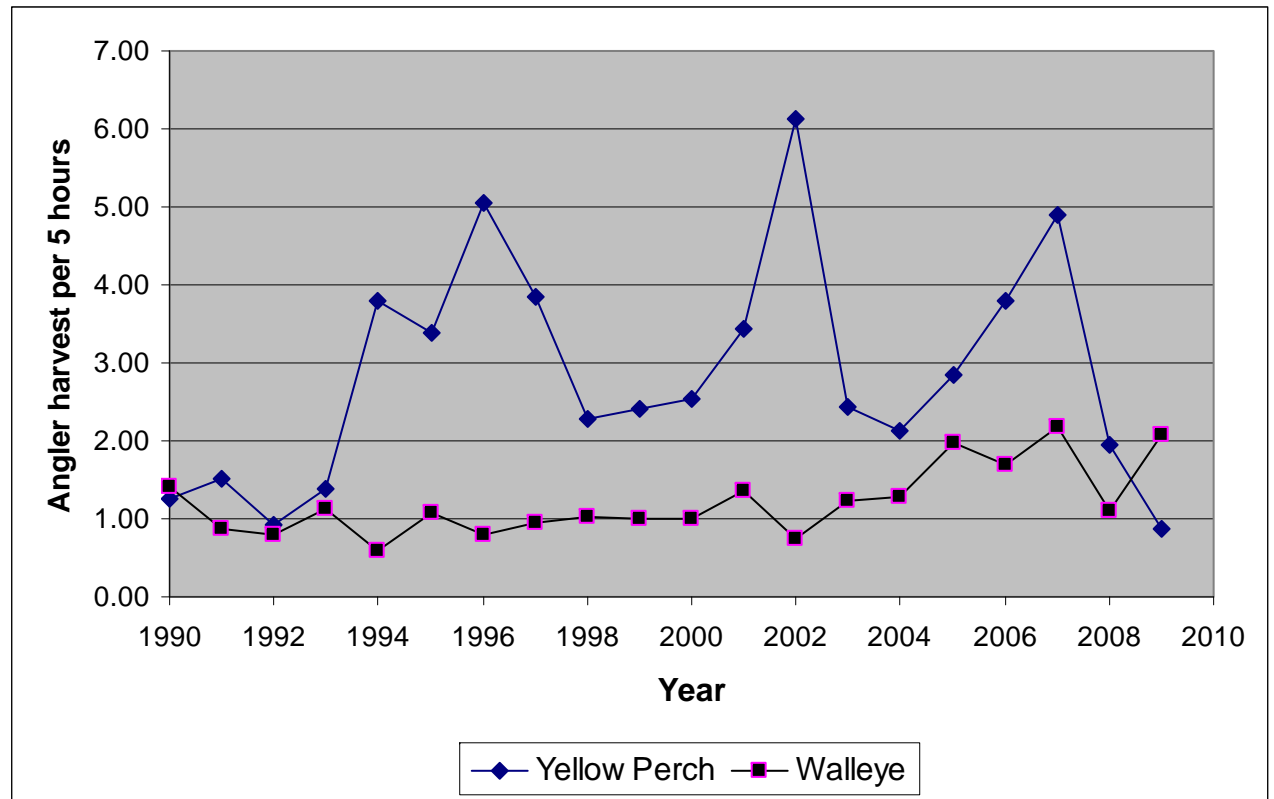


Figure 12.—Sea lamprey incidence (number attached per 100 fish) on Chinook salmon harvested by charter anglers on Lake Michigan and Lake Huron, 1990-2009.

Year	Lake Michigan	Lake Huron
1990	0.5	18.6
1991	0.3	13.9
1992	0.2	13.6
1993	0.1	7.6
1994	0.3	7.1
1995	0.3	6.2
1996	0.1	3.9
1997	0.2	4.7
1998	0.4	5.2
1999	0.2	4.6
2000	0.4	7.3
2001	0.5	4.6
2002	0.8	4.2
2003	1.2	6.0
2004	1.0	5.8
2005	1.3	6.4
2006	1.3	12.5
2007	1.4	9.3
2008	0.8	9.6
2009	1.0	6.3

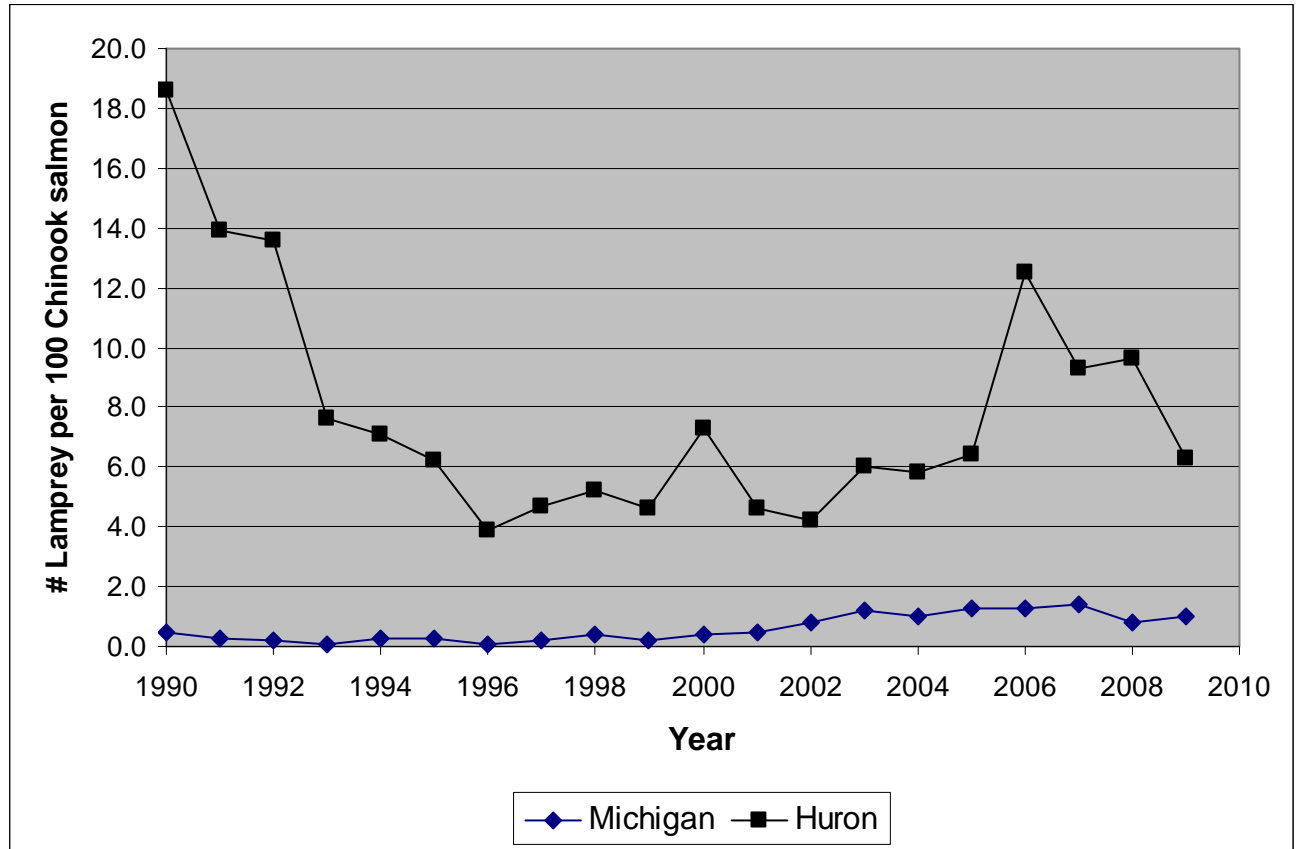


Figure 13.—Sea lamprey incidence (number attached per 100 fish) on lake trout harvested by charter anglers on Lakes Michigan, Huron, and Superior, 1990-2009.

Year	Lake Michigan	Lake Huron	Lake Superior
1990	1.8	6.6	1.8
1991	1.2	5.7	1.6
1992	0.8	4.6	0.8
1993	0.6	2.1	0.5
1994	0.6	3.3	1.1
1995	1.0	2.7	0.7
1996	0.7	1.9	1.0
1997	1.1	3.0	0.6
1998	1.1	2.1	0.5
1999	1.2	1.8	0.5
2000	1.3	2.2	0.4
2001	1.3	2.0	0.7
2002	2.2	1.5	0.4
2003	2.4	1.3	0.7
2004	2.6	1.4	0.8
2005	2.8	1.1	1.2
2006	2.7	1.8	3.0
2007	2.3	1.9	1.6
2008	1.2	2.0	1.1
2009	1.7	1.3	1.1

