

Charter Boat Catch and Effort from the Michigan Waters of the Great Lakes, 2013

Donna L. Wesander
and
David F. Clapp



Tightlines for Troops, Manistee Michigan, May 17, 2014 (photo by Mindy Sedelmaier)



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Introduction

The charter fishing industry provides Michigan with significant economic benefits. Economic impacts of charter fishing to coastal communities in Michigan included gross sales of at least \$14.9 million and 343,845 labor hours in 2009 (O'Keefe and Miller 2011). 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. During a charter fishing season, new charter boats may enter into the charter business while some others will depart. At the end of the 2013 charter fishing year, there were 552 boats operated by 502 businesses; a number similar to the 555 charter boats and 509 businesses reporting by the end of 2012.

Reporting of sport catch 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 (DNR). 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 caught by charter anglers. These data assist the DNR's Great Lakes fishery management efforts because they are used to track changes in fishing catch and catch rates over time. These changes in catch help the DNR 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 consisting of two members each from DNR and MCBA developed the Michigan Charter Boat Daily Catch Report

form (DNR form PR8206). Charter businesses have used this form to report their monthly charter fishing activity since 1990. The form was revised in January 2006 when the following changes were made: 1) a "total number of anglers" column replaced the "resident and non-resident" angler columns, and 2) recording columns for smallmouth bass and muskellunge harvest were added. Further revision in February 2010 included additions of: 1) a second line for each trip to record released fish by species, and 2) the designation of trip target species, or species group. In March of each year, all known charter operators reporting via mail are sent 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).

Charter operators are identified from (1) a list of operators who submitted catch reports the previous year, (2) review of DNR 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.

In the early to mid 2000s, some charter operators expressed an interest in submitting their monthly reports using the internet. DNR 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. Improvements to the trip entry pages of the online reporting system were implemented in December 2013. The online reporting system is an option for charter operators to use, but is not mandatory. The number of businesses using the online reporting system has increased each year. During the initial reporting season in 2008, 14% of the operators were either using or had recently signed up to use the online system. By the end

of the 2013 reporting season, 35% of the operators (174) reporting for 197 boats were using the online system.

Charter operators are required by law to complete the paper version of the catch report form for each month they fish, or to use the alternate online reporting method. Regardless of method used, the completed monthly form is to be submitted to the DNR 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, they 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 DNR 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 and number released) of major species, fish specie(s) targeted, 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 catch of major sport-fish.

The majority of charter businesses operate during late spring through early fall. If DNR 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, DNR 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, their name may be submitted to DNR Law Enforcement Division for enforcement actions which can include 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 (anglers), and one charter excursion.

Charter data are also used to summarize the harvest, catch, harvest rate, and catch rate of those sport-fish listed on the form. Catch is the number of fish caught by an angler. Catch rate is the number of fish caught in a given amount of time (e.g., number/hour). Harvest is the number of fish caught and kept by an angler and harvest rate is the number of fish harvested in a given amount of time (e.g., number/hour). For most charter trips, it is possible to separate fishing effort between "groups" of fish - such as

a salmonine group (salmon and trout species) or a percid plus other species group (walleye, perch, smallmouth bass, muskellunge, and other) - since fishing trips usually target one or the other group. However, it is usually not possible to separate fishing effort between species within the salmonine group (i.e., fishing trips often target more than one species within the group). From 1990-2003, charter effort was reported as total fishing effort, regardless of target group or species. Starting with 2004 reporting, an improved method to calculate targeted harvest rates was implemented; this method separated salmonine effort from percid effort and used 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 total effort is used to calculate the harvest rate of percids + other, the actual rates will in most cases be greatly underestimated. Starting in 2010, reporting requirements again improved by requiring the recording of more specific target species for each fishing trip. Fishing target and effort is still reported for the salmonines as a group, while trips for the other recorded species is target and effort specific. 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

Charter operator compliance with the reporting requirement varies throughout the

year. Percent of compliance varies each month but in general is lowest during the early season fishing months, increases by mid-season, with greatest compliance in months at the end of the fishing season (65-80% compliance). During the 2013 fishing season, when averaged over all reporting months, 69% 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 2013 was 2% less than in 2012. In December 2013, at the time of sending final notification letters for one or more delinquent reports, 80% of the operators/boats were in compliance; this compliance rate was 3% greater than in 2012.

The percent of delinquent reporters at the time of final notification had been consistently greater than 20 percent for numerous years. In January 2013 and January 2014, Charlevoix Fisheries Research Station personnel coordinated with DNR Law Enforcement Division to identify reasons for noncompliance and provided DNR Law Enforcement Division a list of delinquent reporters. Each operator on the list had not responded to the certified letter notification and had multiple months of reports missing for the reporting year. LED contacted each delinquent reporter on the list in person or via phone. While these actions took additional time to complete, the result was increased compliance for reporting. By March 2014, 99% of all charter operators had complied with the law; the same as in 2012. In comparison, final compliance for the 2011 season in which there had been no additional contact after the final certified mailing, was 93%.

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, catch, and effort from the Great Lakes, inclusive of tributaries.

Fishing effort

In 2013, charter anglers participated in 15,647 charter excursions on the Michigan waters of Lakes Michigan, Huron, Erie, Superior, and the St. Clair system, including major tributaries (Tables 1-6). From 2012 to 2013, there was a 2% decrease in the number of total excursions. Excursions on Lake Michigan decreased 3%, from 12,236 (2012) to 11,925 (2013); excursions on Lake Huron decreased 4%, from 1,594 (2012) to 1,533 (2013); Lake Superior excursions increased 3%, from 411 (2012) to 422 (2013); Lake Erie excursions decreased 14%, from 813 (2012) to 696 (2013); and excursions on the St. Clair system increased 24%, from 867 (2012) to 1,071 (2013). The distribution of charter fishing excursions in 2013 by lake was: 76% Lake Michigan, 10% Lake Huron, 7% St. Clair System, 4% Lake Erie, and 3% Lake Superior; Lakes Michigan and Erie each decreased 1%, lakes Huron and Superior remained the same, and the St. Clair System increased 2% in comparison to 2012. Reported excursions on the St. Clair system increased starting in 2010 compared to years prior due to the addition of catch-and-release charter fishing data collection.

A total of 359,365 hours were spent fishing by 62,873 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 1% and 3% respectively compared to 2012, corresponding with the 2% decrease in excursions for 2013. Starting in 2008, some businesses have been influenced by high gasoline prices for consumers (over \$4.00 per gallon for some months of 2008) and prices remained in the mid to high \$3 per gallon range through 2013. Based on charter operator's comments, windy weather continued to be reported as a reason for canceled excursions in 2013, similar to 2012 through 2010. Comments regarding decreases in the number of Chinook salmon being caught became more pronounced, including the comment that the Chinook salmon caught were larger size in comparison to 2012. The charter industry continued its trend of recovery from the 2009 charter fishing season, when a 22% decrease in effort (compared to the stable 2004-

2007 data series) and the lowest reported excursions in the entire data series (Table 6) were recorded.

Harvest

Both total and targeted harvest numbers by species are included in this report. Charter operators reported a total of 145,575 fish harvested from the Michigan waters of the Great Lakes and its major tributaries in 2013 (Tables 1-5); this is a 23% decrease compared to 2012 total harvest (189,237). Most of these fish were harvested from Lake Michigan (63%), followed by Lake Erie (16%), Lake Huron (11%), the St. Clair system (8%), and Lake Superior (3%). In comparison to 2012, total harvest increased on Lake Huron (1%), Lake Superior (1%), and the St. Clair system (3%); was unchanged on Lake Erie; and decreased 4% on Lake Michigan.

Historically, the most abundant species in the charter harvest had been yellow perch; however over the years of this data series (1990-current day), 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 2013, Chinook salmon continued to dominate the species harvest and accounted for 26% of the total harvest (a 21% decrease compared to 47% in 2012). The decrease in Chinook salmon harvest resulted in increased targeting of lake trout and coho salmon in locations where more than one salmonine can be the target species for the excursion. Lake trout accounted for 20% of total harvest in 2013, an increase of 10% compared to 2012 (10%). Percent of total harvest for other species were as follows: walleye 18%, yellow perch 17%, coho salmon 11%, rainbow trout 6%, smallmouth bass 1%, and brown trout <1%. The "other" species category accounted for about 2% of the harvest. The species composition of this 'other' category is not fully known because DNR does not require it to be identified. Some operators provide comments on 'other' species they have caught. Some species listed included white bass, lake whitefish, Atlantic salmon, pink salmon, splake, carp, and freshwater drum. Changes to the reporting form in 2010 allow for smallmouth

bass and muskellunge to be recorded and reported on separately so they are no longer included in the 'other' category.

Charter anglers harvested 37,664 Chinook salmon in 2013, which is a 58% decrease relative to 2012 (88,943). Total harvest (all lakes combined) in 2013 increased for lake trout, coho salmon, and brown trout; rainbow trout, yellow perch, walleye, and smallmouth bass harvest decreased. Total harvest numbers in 2013 for species other than Chinook salmon were: 28,736 lake trout, 25,426 walleye, 23,953 yellow perch, 15,363 coho salmon, 9,125 rainbow trout, 1,964 smallmouth bass, and 613 brown trout (Tables 1-5).

The total number of salmonines (Chinook salmon, coho salmon, lake trout, rainbow trout, and brown trout) harvested from Michigan's Great Lakes waters in 2013 was 91,501 fish, which is a 31% decrease (41,666 fish) from 2012 harvest (133,167).

In general, species categorized as "other" are not differentiated in the charter reporting data. Starting with 2006, two species, smallmouth bass and muskellunge, were listed individually on the charter form. However, due to low harvest of these two species, compiled harvest results continued to group these species into the "other" fish category. While harvest of smallmouth bass and muskellunge can be small in number, there is a popular "catch-and-release" fishery for these species. Changes to reporting in 2010 made it possible for operators to report on the catch-and-release fishery for these species. Consequently smallmouth bass and muskellunge were removed from the 'other' category and recorded separately. In 2013, charter anglers caught 20,591 smallmouth bass of which they released 18,627 (90%) and harvested 1,964; this is a 29% increase from the 2012 catch of 15,973 fish. Catch of muskellunge was 1,137 and all but 4 were released. This is an 11% decrease in comparison to the 1,281 muskellunge caught in 2012. 8,826 total 'other' fish were caught, 2,727 were harvested and 6,099 released (Tables 1-5).

Harvest rates

In 2013, charter anglers harvested 0.41 fish (all species from all lakes combined) per hour; a 21% decrease compared to 2012 (0.52 fish). Total harvest rates 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. Targeted harvest rates per hour and per excursion are based on targeted effort for an individual species or fish group in that lake. The following discussion will focus on targeted harvest rates (Tables 1-5 and Figures 3-10).

Most charter excursions that took place on Michigan's Great Lakes waters during 2013 targeted the various species of salmonines. Comparing targeted harvest rates (fish per 5 angler hours) to 2012 data, Lake Michigan angler harvest rates increased for coho salmon and lake trout. Brown trout harvest rates remained unchanged, while Chinook salmon and rainbow trout (steelhead) harvest rates decreased (Figures 3-7). The targeted harvest rate reported in 2013 for Chinook salmon in Lake Michigan (0.66 fish per 5 hours of angler fishing) is a 59% decrease compared to the 2012 rate of 1.6 fish per 5 hours of angler fishing (the highest rate in the 1990-2013 data series); a rate similar to 0.66 fish was last recorded in years 2000-2001 (Figure 3). Fishing effort for the 5 salmonines reported is combined into one target group. The decreased harvest rate of Chinook salmon on Lake Michigan had charter captains targeting lake trout; this is reflected in the increased lake trout harvest rate of 0.4 fish per 5 angler hours, a 82% increase from the 2012 rate of 0.22 fish per 5 angler hours (Figure 4).

Targeted harvest rates (fish per 5 angler hours) on Lake Huron in 2013 increased compared to 2012 for Chinook salmon and walleye; harvest rates decreased for coho salmon, lake trout, rainbow trout, and brown trout (Figures 3-8). The harvest rate for Chinook salmon increased to 0.62 fish per 5 angler hours; a rate not seen for Lake Huron since 2004 (Figure 3). The harvest rate for walleye increased (3.13 fish per 5 angler hours) and is the second highest rate in the 1990-2013 data series for Lake Huron (Figure 8).

Lake trout continues to be the most important salmonine in the charter harvest from Lake Superior. Compared to 2012, the targeted harvest rate for lake trout decreased from 1.61 to 1.57 fish per 5 hours. Lake trout harvest rates in the last three years (2011-2013) are the highest in the 24 year data series (Figure 4). The four remaining salmonids (Chinook salmon, coho salmon, rainbow trout, and brown trout) combined, make up a small portion (14%) of the total Lake Superior salmonine harvest (4,159 fish) (Table 5).

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 from Lake Erie; this regulation remained in place through 2013. Targeted harvest rates for walleye (4.02 fish per 5 angler hours) increased slightly (Figure 9) on Lake Erie for 2013, in comparison to 2012. Targeted harvest rates decreased slightly for walleye (2.56 fish per 5 angler hours) on the St. Clair system in 2013, compared to 2012 (2.58 fish per 5 angler hours) (Figure 10). Changes in 2010 reporting requirements included recording the target species (or fish group) for each fishing trip, allowing for more accurate reporting of harvest rates for walleye and yellow perch. The affect this has on targeted harvest rates is most evident in yellow perch harvest rates. Targeted harvest rates for yellow perch are greatly increased starting with 2010 in relation to the 1990-2009 data series for Lake Erie; the targeted harvest rate was 21.47 fish per 5 angler hours in 2013 (Figure 9). A similar increase is evident for the St. Clair System starting in 2010; the targeted harvest rate was 14.85 fish per 5 angler hours in 2013 (Figure 10).

Catch and Catch rates

Catch is the number of fish caught by an angler regardless of whether the fish is harvested or released back to the water. Catch rate is the number of fish caught in a given amount of time

(e.g., number/hour). Beginning in 2010, targeted catch per hour, targeted catch per excursion, targeted released number of fish per year, and total released number of fish per year, by species, are reported (Tables 1-5). Smallmouth bass and muskellunge (“musky”) are popular species caught but not harvested. In 2013, catch rates on the St. Clair system for smallmouth bass and musky were 36.6 and 5.3 fish per excursion, respectively (Table 4). Targeted catch rate for smallmouth bass per excursion was 21.0 fish on Lake Michigan (Table 1).

Sea Lamprey Incidence

For 2013, sea lamprey incidence on Chinook salmon increased for Lake Huron and remained the same for Lake Michigan, compared to 2012 levels. Lake Huron incidence was 10.5 lampreys attached per 100 Chinook salmon and Lake Michigan incidence was 0.7 lampreys attached per 100 Chinook salmon (Figure 11).

Sea lamprey incidence on lake trout decreased for lakes Michigan and Superior. The occurrence of lamprey on lake trout in Lake Huron (1.8 lamprey/100 lake trout) increased compared to 1.2 lamprey/100 lake trout in 2012 (Figure 12).

Online Information

Previous annual reports and information on charter fishing effort and harvest at individual fishing ports can be found on the DNR website <http://www.michigan.gov/dnr>. Click on the following links to find the data: ‘Fishing’ link, then ‘Managing Michigan’s Fisheries’, then the ‘Charter Fishing’ link.

Acknowledgments

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References

O'Keefe, D. M., and S. R. Miller. 2011. 2009 Michigan Charter Fishing Study. Michigan Sea Grant MICHU-11. Available: <http://www.miseagrant.umich.edu/downloads/fisheseries/11-200-Michigan-Charter-Fishing-Study.pdf> (October 2014)

Table 1.—Targeted harvest & catch rates per hour, per excursion, and number of fish harvested or released by species for charter boats fishing Michigan waters of Lake Michigan and select tributaries, 2013. Targeted harvest & catch of any salmon or trout is based on total salmonine effort; other species are trip-target specific. Catch Rates = harvested (kept) fish + released fish. Bottom lines show total fishing effort (angler hours, anglers, and charter excursions).

Targeted Harvest/hr Catch/hr	Targeted Harvest/excur Catch/excur	SPECIES Harvest= Line 1 Released = Line 2	Month												TARGETED	TOTAL
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Harvest/year released/year	(target+non-target) Harvest/year released/year
0.056	1.316	Coho salmon	0	0	0	324	2,580	2,038	3,319	5,773	916	51	1	0	15,002	15,006
0.056	1.324	released	0	0	0	2	20	3	12	48	7	0	0	0	92	92
0.132	3.112	Chinook salmon	0	0	0	49	2,633	1,935	6,792	19,740	4,173	145	0	0	35,467	35,487
0.135	3.192	released	0	0	0	0	40	28	125	183	253	275	0	0	904	904
0.032	0.749	Rainbow trout	34	101	425	181	534	572	2,590	2,238	519	518	684	136	8,532	8,596
0.037	0.864	released	51	40	124	184	13	6	24	22	2	587	203	57	1,313	1,315
0.002	0.046	Brown trout	0	0	5	79	132	36	81	153	35	1	1	1	524	530
0.002	0.054	released	0	2	8	9	2	37	10	15	1	0	1	2	87	90
0.081	1.903	Lake trout	0	0	1	731	1,161	3,086	8,411	6,847	1,410	38	0	0	21,685	21,712
0.095	2.246	released	0	0	0	22	97	738	1,673	1,120	251	13	0	0	3,914	3,933
3.681	60.925	Yellow perch	0	0	0	0	0	1,003	3,171	3,620	300	70	0	0	8,164	8,316
3.781	62.582	released	0	0	0	0	0	88	29	39	15	51	0	0	222	351
0.247	4.432	Walleye	23	11	11	24	44	108	73	137	192	134	56	29	842	877
0.403	7.226	released	33	12	34	0	35	135	106	95	32	20	20	9	531	553
0.000	0.007	Smallmouth Bass	0	0	0	0	0	1	0	0	0	0	0	0	1	36
1.291	21.028	released	0	0	0	0	96	735	992	698	391	115	0	0	3,027	3,374
		Musky	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		released	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0.124	1.721	Other	0	0	0	0	17	54	0	21	13	0	0	0	105	497
0.382	5.279	released	0	0	0	0	0	54	46	64	42	11	0	0	217	466
		Lamprey on:														
		Chinook salmon	0	0	0	1	19	15	49	148	17	0	0	0	249	249
		Lake trout	0	0	0	2	8	41	85	77	10	0	0	0	223	223
		Total angler hours	417	838	2,218	4,386	19,513	27,741	67,818	115,565	27,799	5,720	4,214	1,066		277,295
		Total anglers	57	115	299	707	3,301	4,896	12,366	20,516	4,970	850	608	148		48,833
		Total excursions	19	40	104	191	760	1,187	2,905	4,854	1,275	320	213	57		11,925

Table 2.—Targeted harvest & catch rates per hour, per excursion, and number of fish harvested or released by species for charter boats fishing Michigan waters of Lake Huron and select tributaries, 2013. Targeted harvest & catch of any salmon or trout is based on total salmonine effort; other species are trip- target specific. Catch Rates = harvested (kept) fish + released fish. Bottom lines show total fishing effort (angler hours, anglers, and charter excursions).

Targeted Harvest/hr Catch/hr	Targeted Harvest/excur Catch/excur	SPECIES Harvest= Line 1 Released = Line 2	Month												TARGETED	TOTAL
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Harvest/year released/year	(target+non-target) Harvest/year released/year
0.004	0.066	Coho salmon	0	0	0	13	9	10	5	9	11	1	0	0	58	58
0.004	0.069	released	0	0	0	0	1	1	0	0	0	0	0	0	2	2
0.123	2.271	Chinook salmon	0	0	0	6	39	245	667	786	230	10	0	0	1,983	1,986
0.123	2.277	released	0	0	0	0	0	3	1	1	0	0	0	0	5	5
0.030	0.548	Rainbow trout	0	0	0	23	32	115	208	76	21	3	0	0	478	485
0.031	0.570	released	0	0	0	0	0	11	9	0	0	0	0	0	20	20
0.002	0.044	Brown trout	0	0	0	1	4	8	19	6	0	0	0	0	38	44
0.002	0.044	released	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.212	3.927	Lake trout	0	0	0	0	352	907	979	920	270	0	0	0	3,428	3,437
0.231	4.282	released	0	0	0	0	74	89	79	46	17	5	0	0	310	310
0.582	13.688	Yellow perch	0	0	0	0	31	31	65	49	43	0	0	0	219	378
1.125	26.438	released	0	0	0	0	0	0	40	114	50	0	0	0	204	220
0.625	14.246	Walleye	0	0	0	0	610	3,967	3,428	837	126	26	109	0	9,103	9,243
0.980	22.338	released	0	0	0	0	418	2,889	1,415	378	24	5	42	0	5,171	5,171
0.000	0.000	Smallmouth Bass	0	0	0	0	0	0	0	0	0	0	0	0	0	62
0.000	0.000	released	0	0	0	0	0	0	0	0	0	0	0	0	0	89
0.000	0.000	Musky	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.000	0.000	released	0	0	0	0	0	0	0	0	0	0	0	0	0	2
1.000	10.000	Other	0	0	0	0	26	10	0	0	14	0	0	0	50	556
1.320	13.200	released	0	0	0	0	6	0	0	0	10	0	0	0	16	695
		Lamprey on:														
		Chinook salmon	0	0	0	1	12	37	125	33	5	0	0	0	213	213
		Lake trout	0	0	0	0	7	18	21	15	3	0	0	0	64	64
		Total angler hours	0	0	0	189	2,249	9,086	10,595	7,070	1,707	122	132	0		31,150
		Total anglers	0	0	0	29	410	1,662	1,978	1,283	330	21	26	0		5,739
		Total excursions	0	0	0	10	121	421	516	351	101	6	7	0		1,533

Table 3.—Targeted harvest & catch rates per hour, per excursion, and number of fish harvested or released by species for charter boats fishing Michigan waters of Lake Erie, 2013. Targeted harvest & catch of any salmon or trout is based on total salmonine effort; other species are trip-target specific. Catch Rates = harvested (kept) fish + released fish. Bottom lines show total fishing effort (angler hours, anglers, and charter excursions).

Targeted Harvest/hr Catch/hr	Targeted Harvest/excur Catch/excur	SPECIES Harvest= Line 1 Released = Line 2	Month												TARGETED	TOTAL	
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Harvest/year released/year	(target+non-target) Harvest/year released/year	
		Coho salmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
		Chinook salmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
		Rainbow trout	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	
		Brown trout	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	
		Lake trout	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	
4.293	95.926	Yellow perch	0	0	0	283	1,086	873	318	1,017	3,675	3,108	0	0	10,360	11,399	
4.529	101.185	<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>80</i>	<i>0</i>	<i>32</i>	<i>0</i>	<i>52</i>	<i>272</i>	<i>132</i>	<i>0</i>	<i>0</i>	<i>568</i>	<i>657</i>	
0.803	18.089	Walleye	0	0	3	575	793	6,171	2,623	385	68	0	0	10,618	10,668		
0.865	19.467	<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>33</i>	<i>88</i>	<i>478</i>	<i>154</i>	<i>48</i>	<i>8</i>	<i>0</i>	<i>0</i>	<i>809</i>	<i>811</i>		
0.000	0.000	Smallmouth Bass	0	0	0	0	0	0	0	0	0	0	0	0	0	67	
0.583	7.000	<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>7</i>	<i>0</i>	<i>7</i>	<i>70</i>	
0.000	0.000	Musky	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0.000	0.000	<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>3</i>	
0.000	0.000	Other	0	0	0	0	0	0	0	0	0	0	0	0	0	564	
0.000	0.000	<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>3,146</i>	
		Lamprey on:															
		Chinook salmon	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	
		Total angler hours	0	0	18	852	1,415	7,473	3,051	1,231	1,010	579	12	0		15,641	
		Total anglers	0	0	3	148	262	1,457	592	223	198	108	2	0		2,993	
		Total excursions	0	0	1	45	69	317	140	51	45	27	1	0		696	

Table 4.—Targeted harvest & catch rates per hour, per excursion, and number of fish harvested or released by species for charter boats fishing Michigan waters the St. Clair System (Lake St. Clair, St. Clair River, and Detroit River), 2013. Targeted harvest & catch of any salmon or trout is based on total salmonine effort; other species are trip-target specific. Catch Rates = harvested (kept) fish + released fish. Bottom lines show total fishing effort (angler hours, anglers, and charter excursions).

Targeted Harvest/hr Catch/hr	Targeted Harvest/excur Catch/excur	SPECIES Harvest= Line 1 Released = Line 2	Month												TARGETED	TOTAL			
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Harvest/year released/year	(target+non-target) Harvest/year released/year			
		Coho salmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	
		Chinook salmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>1</i>	
		Rainbow trout	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	
		Brown trout	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	
		Lake trout	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	
2.969	67.471	Yellow perch	0	0	0	0	0	119	25	86	1,353	1,408	450	0	3,441	3,860			
3.594	81.667	<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>4</i>	<i>0</i>	<i>394</i>	<i>326</i>	<i>0</i>	<i>0</i>	<i>724</i>	<i>746</i>			
0.512	11.676	Walleye	0	0	0	2,156	1,245	440	415	100	91	60	0	0	4,507	4,638			
0.561	12.793	<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>282</i>	<i>140</i>	<i>0</i>	<i>9</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>431</i>	<i>442</i>			
0.169	3.283	Smallmouth Bass	0	0	0	0	12	181	407	638	167	0	0	0	1,405	1,799			
1.880	36.607	<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>78</i>	<i>3,817</i>	<i>4,297</i>	<i>2,124</i>	<i>2,204</i>	<i>956</i>	<i>733</i>	<i>54</i>	<i>0</i>	<i>14,263</i>	<i>15,094</i>			
0.000	0.005	Musky	0	0	0	0	0	0	0	1	0	0	0	0	1	4			
0.205	5.261	<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>324</i>	<i>194</i>	<i>174</i>	<i>153</i>	<i>161</i>	<i>36</i>	<i>4</i>	<i>1,046</i>	<i>1,127</i>			
3.449	106.429	Other	0	0	0	0	0	745	0	0	0	0	0	0	745	1,097			
3.458	106.714	<i>released</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>2</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>2</i>	<i>1,371</i>			
		Lamprey on:																	
		Chinook salmon	0	0	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	0	0
		Total angler hours	0	0	0	4,209	3,692	4,836	3,394	3,265	2,359	1,622	224	16				23,617	
		Total anglers	0	0	0	649	582	741	528	508	362	254	35	2				3,661	
		Total excursions	0	0	0	174	182	217	158	146	103	77	13	1				1,071	

Table 5.—Targeted harvest & catch rates per hour, per excursion, and number of fish harvested or released by species for charter boats fishing Michigan waters of Lake Superior and its tributaries, 2013. Targeted harvest & catch of any salmon or trout is based on total salmonine effort; other species are trip-target specific. Catch Rates = harvested (kept) fish + released fish. Bottom lines show total fishing effort (angler hours, anglers, and charter excursions).

Targeted Harvest/hr Catch/hr	Targeted Harvest/excur Catch/excur	SPECIES Harvest= Line 1 Released = Line 2	Month												TARGETED	TOTAL
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Harvest/year released/year	(target+non-target) Harvest/year released/year
0.026	0.731	Coho salmon	0	0	0	0	49	97	59	82	11	1	0	0	299	299
0.027	0.751	released	0	0	0	0	0	0	0	2	5	1	0	0	8	8
0.017	0.467	Chinook salmon	0	0	0	0	34	93	50	10	4	0	0	0	191	191
0.017	0.484	released	0	0	0	0	2	1	0	0	3	1	0	0	7	7
0.004	0.105	Rainbow trout	0	0	0	0	0	7	16	20	0	0	0	0	43	43
0.006	0.161	released	0	0	0	4	0	8	0	1	0	10	0	0	23	23
0.003	0.095	Brown trout	0	0	0	0	7	26	4	2	0	0	0	0	39	39
0.003	0.095	released	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0.314	8.770	Lake trout	0	0	0	0	67	530	1,310	1,362	300	18	0	0	3,587	3,587
0.357	9.985	released	0	0	0	0	79	26	173	143	73	3	0	0	497	497
		Yellow perch	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		released	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Walleye	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		released	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Smallmouth Bass	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		released	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Musky	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		released	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.034	0.615	Other	0	0	0	0	0	8	0	0	0	0	0	0	8	13
1.137	20.462	released	0	0	0	0	0	0	0	0	0	258	0	0	258	421
		Lamprey on:														
		Chinook salmon	0	0	0	0	1	2	0	0	0	0	0	0	3	3
		Lake trout	0	0	0	0	0	1	6	21	6	0	0	0	34	34
		Total angler hours	0	0	0	64	405	2,423	3,847	3,702	815	406	0	0		11,662
		Total anglers	0	0	0	8	65	334	524	526	133	57	0	0		1,647
		Total excursions	0	0	0	3	18	82	123	128	44	24	0	0		422

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 2004-2013.

Lake	Year											
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Michigan	13,467	13,604	10,995	10,298	10,116	9,996	10,344	10,627	12,333	11,382	11,714	11,224
Huron	4,010	3,442	2,521	2,307	2,182	2,599	2,592	2,684	3,210	3,123	2,760	2,867
Erie	1,684	1,445	1,679	1,881	1,661	1,781	1,775	1,727	1,679	2,380	1,836	1,947
St. Clair System	779	643	509	414	299	336	407	394	432	389	348	433
Superior	755	791	743	618	455	515	524	497	517	607	482	477
Total	20,695	19,925	16,447	15,518	14,713	15,227	15,642	15,929	18,171	17,881	17,140	16,948

Table 6 (continued)

Lake	Year											
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Michigan	11,924	12,094	11,966	12,526	12,064	12,704	11,326	9,750	10,204	10,834	12,236	11,925
Huron	2,874	2,771	2,622	2,085	1,765	1,537	1,345	1,470	1,446	1,399	1,594	1,533
Erie	1,870	1,695	718	694	1,554	1,039	870	689	738	698	813	696
St. Clair System	246	466	339	319	366	493	440	425	719	831	867	1,071
Superior	430	505	455	479	398	359	245	244	374	382	411	422
Total	17,344	17,531	16,100	16,103	16,147	16,132	14,226	12,578	13,481	14,144	15,921	15,647

Figure 1.—Total number of charter anglers (trips) on the Michigan waters of the Great Lakes (including tributaries), 1990-2013.

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	76,353
2003	76,151
2004	66,845
2005	67,224
2006	68,572
2007	67,513
2008	59,840
2009	51,568
2010	55,273
2011	57,432
2012	64,567
2013	62,873

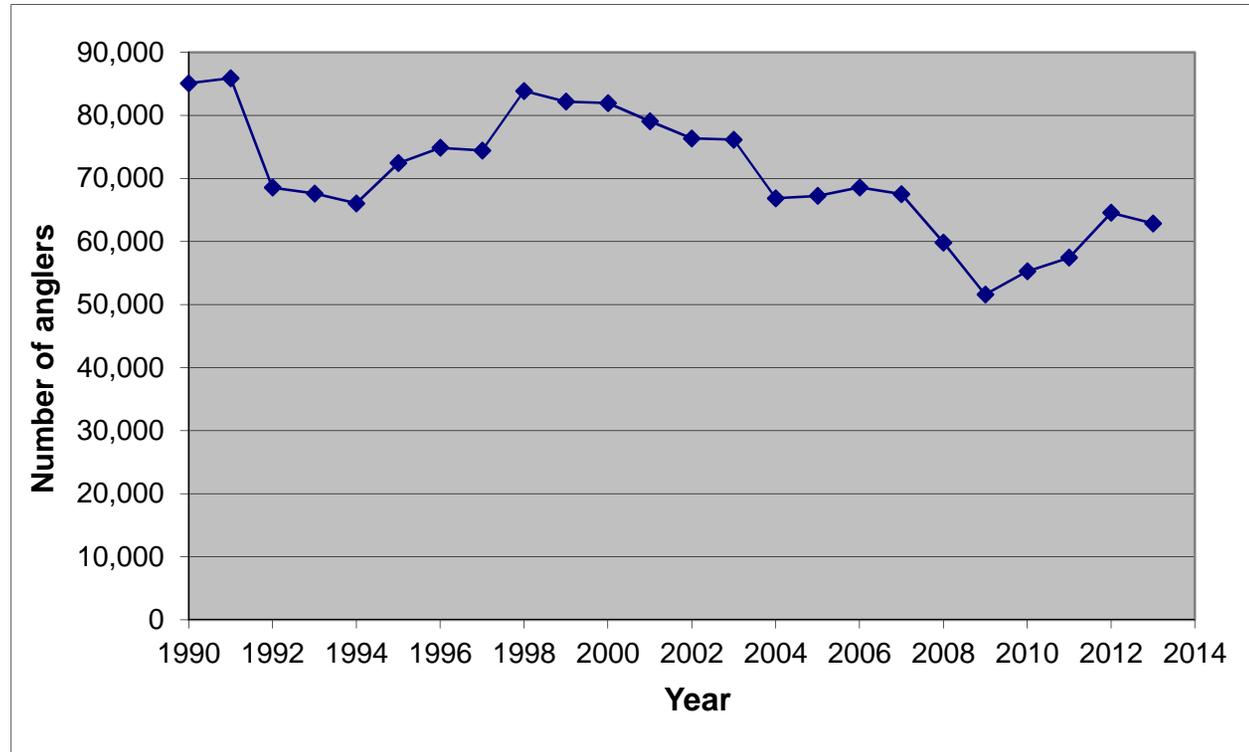


Figure 2(a).—Total number of charter anglers (trips) on the Michigan waters of Lake Michigan and Lake Huron (including tributaries), 1990-2013.

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	10,743
2003	52,972	10,318
2004	49,959	9,947
2005	52,478	7,812
2006	50,903	6,521
2007	53,337	5,635
2008	47,977	4,951
2009	40,472	5,303
2010	42,635	5,148
2011	44,612	5,170
2012	50,384	5,697
2013	48,833	5,739

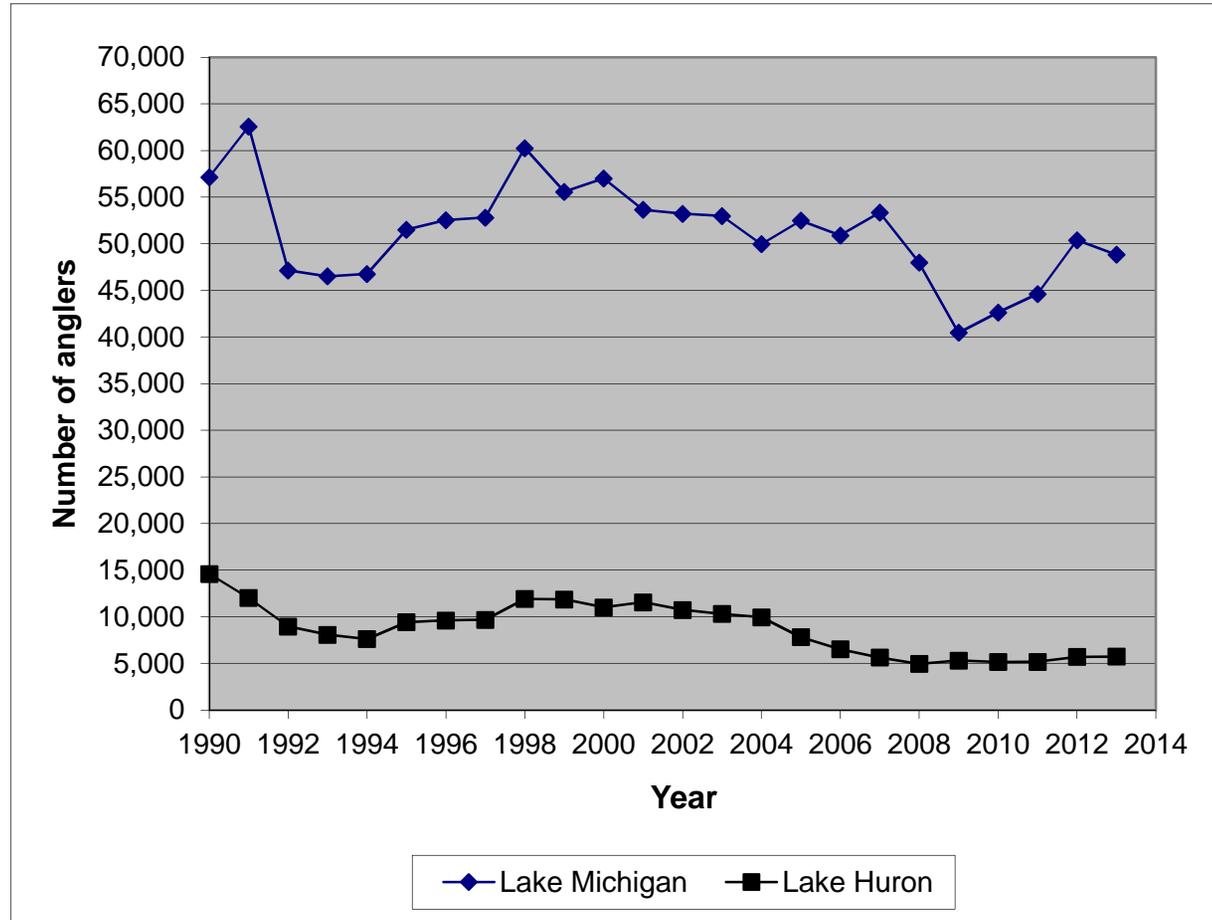


Figure 2 (b).—Total number of charter anglers (trips) on the Michigan waters of Lake Erie, Lake Superior, and the St. Clair System (including tributaries), 1990-2013.

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
2010	3,322	1,527	2,641
2011	3,113	1,639	2,898
2012	3,640	1,766	3,080
2013	2,993	1,647	3,661

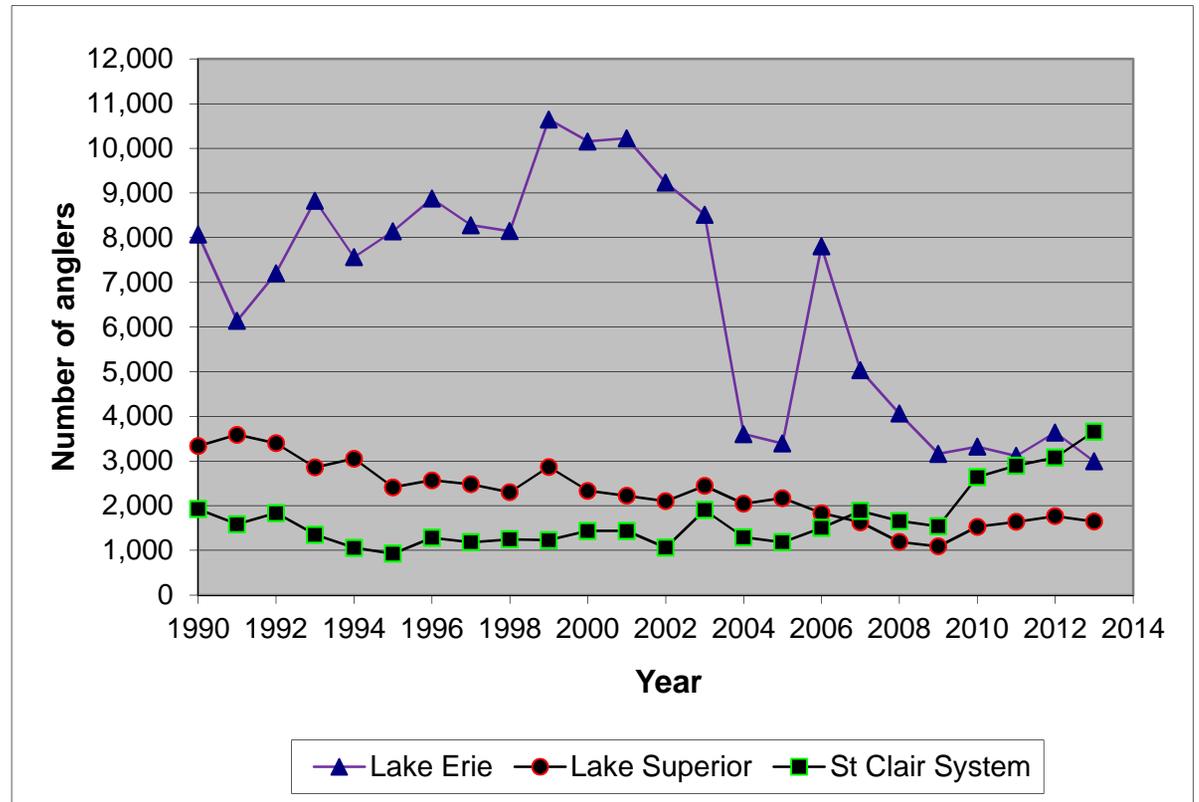


Figure 3. - Charter angler targeted harvest rates (fish per 5 angler hours) for Chinook salmon on Lake Michigan and Lake Huron, 1990-2013.

Year	Lake Michigan	Lake Huron
1990	0.37	0.35
1991	0.39	0.40
1992	0.27	0.41
1993	0.21	0.41
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
2010	1.23	0.22
2011	1.12	0.31
2012	1.60	0.46
2013	0.66	0.62

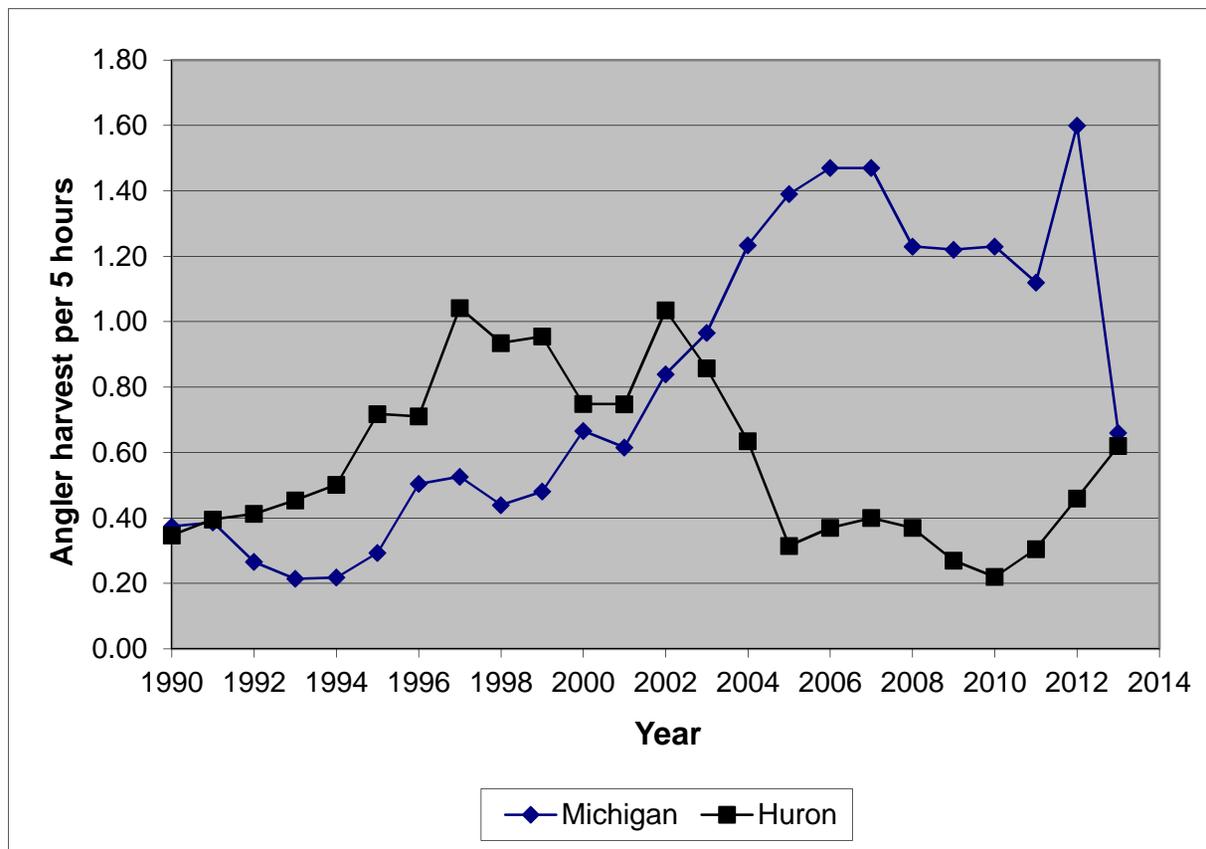


Figure 4.—Charter angler targeted harvest rates (fish per 5 angler hours) for lake trout on lakes Michigan, Huron, and Superior, 1990-2013.

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
2010	0.33	1.45	1.45
2011	0.40	1.16	1.65
2012	0.22	1.21	1.61
2013	0.40	1.01	1.57

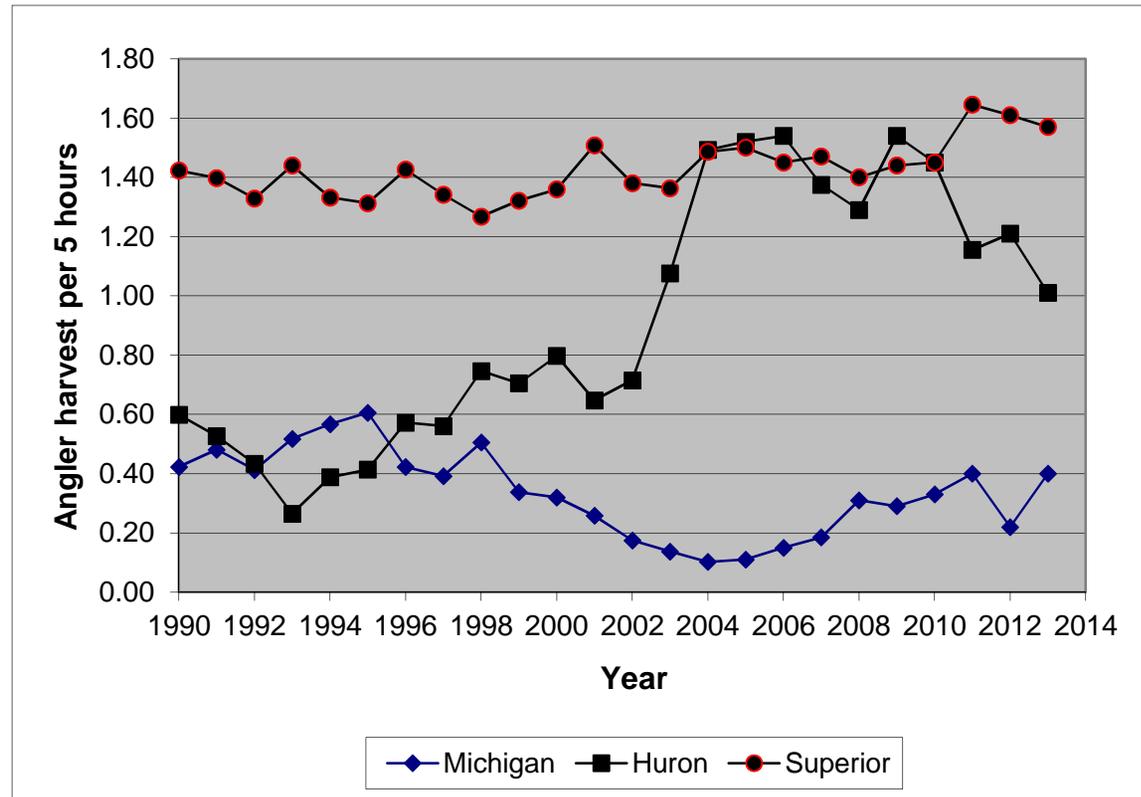


Figure 5.—Charter angler targeted harvest rates (fish per 5 angler hours) for coho salmon on lakes Michigan, Huron, and Superior, 1990-2013.

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
2010	0.12	0.02	0.15
2011	0.17	0.02	0.08
2012	0.21	0.06	0.10
2013	0.28	0.02	0.13

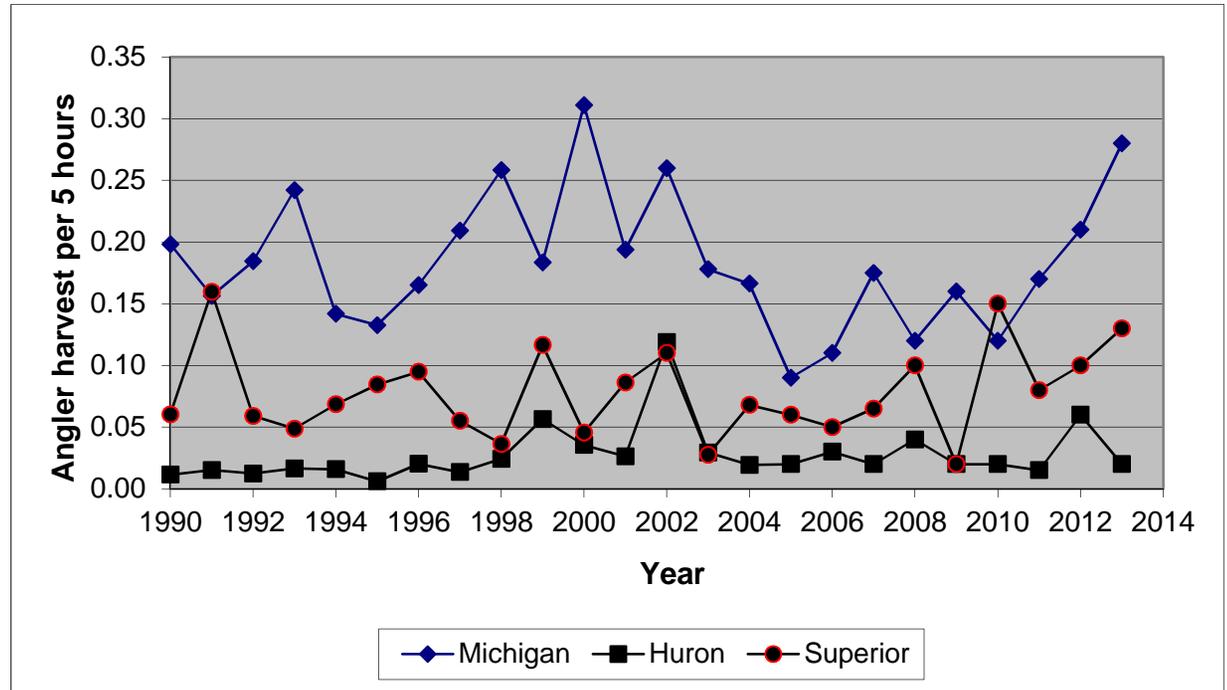


Figure 6.—Charter angler targeted harvest rates (fish per 5 angler hours) for rainbow trout (steelhead) on Lake Michigan and Lake Huron, 1990-2013.

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
2010	0.11	0.16
2011	0.19	0.16
2012	0.20	0.29
2013	0.16	0.15

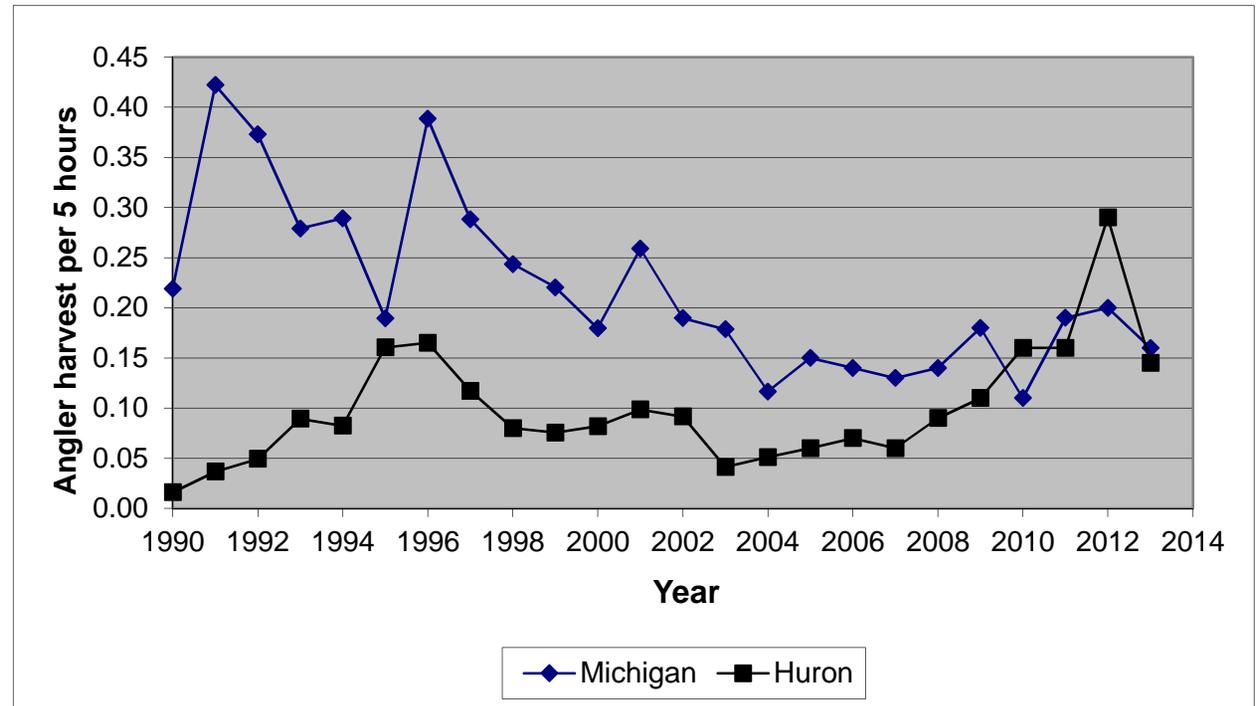


Figure 7.—Charter angler targeted harvest rates (fish per 5 angler hours) for brown trout on Lake Michigan and Lake Huron, 1990-2013.

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
2010	0.01	0.02
2011	0.01	0.02
2012	0.01	0.02
2013	0.01	0.01

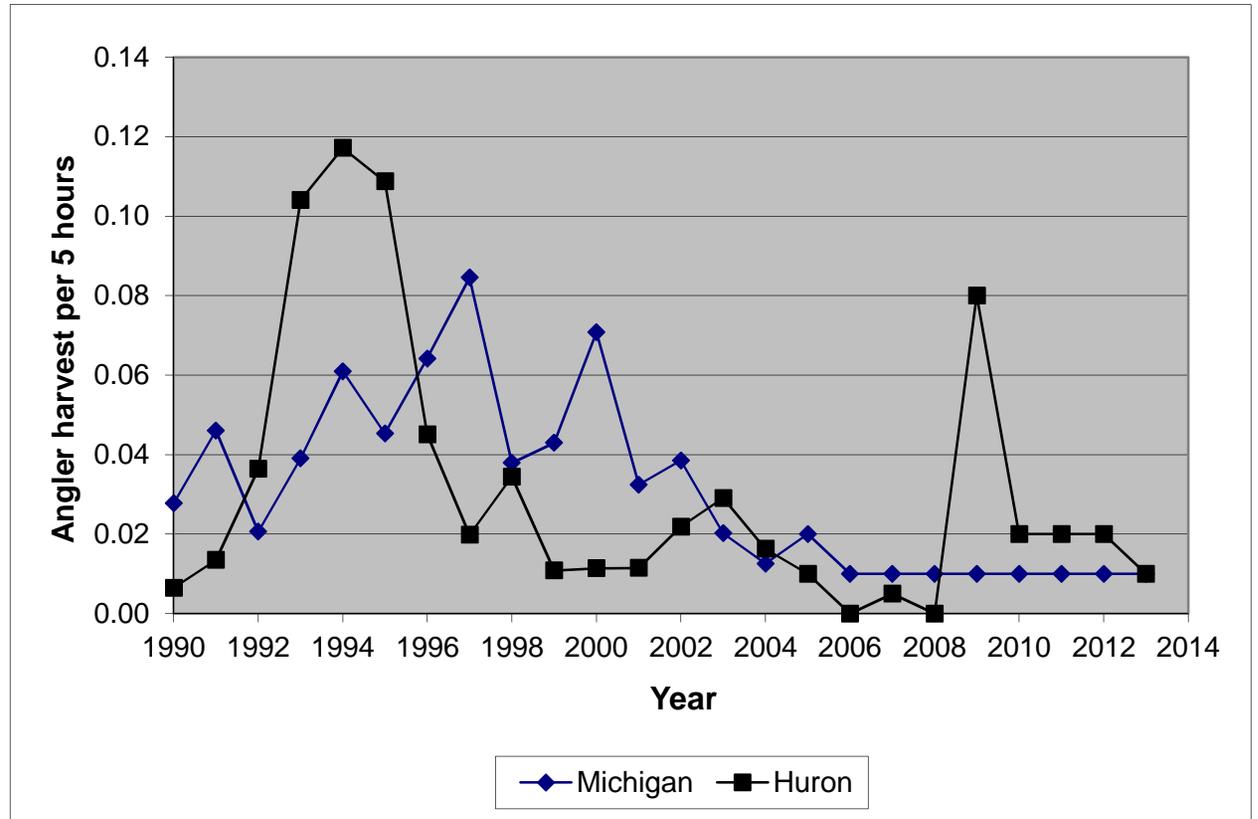


Figure 8.—Charter angler targeted harvest rates (fish per 5 angler hours) for walleye on Lake Huron, 1990-2013.

Year	Walleye
1990	1.57
1991	1.47
1992	1.56
1993	1.62
1994	1.77
1995	0.87
1996	1.06
1997	1.22
1998	1.28
1999	0.98
2000	1.21
2001	1.13
2002	0.98
2003	1.20
2004	1.18
2005	1.42
2006	2.42
2007	3.01
2008	3.28
2009	3.00
2010	2.20
2011	2.36
2012	2.87
2013	3.13

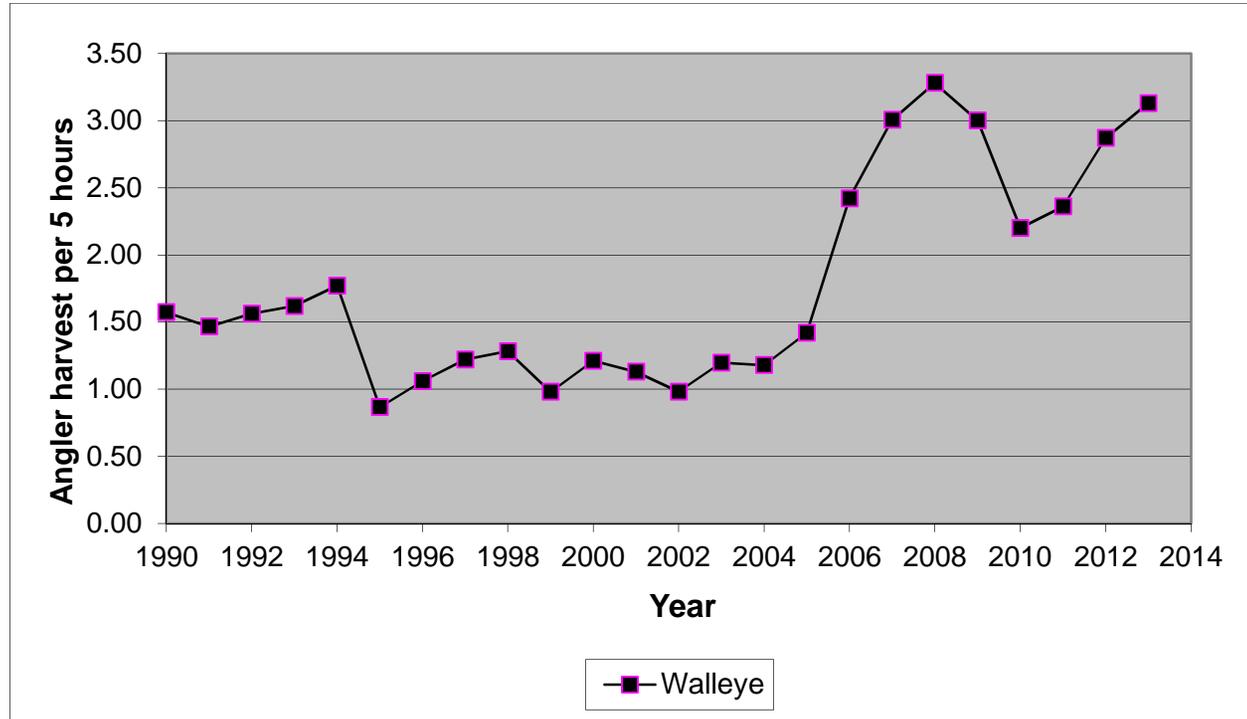


Figure 9.—Charter angler targeted harvest rates (fish per 5 angler hours) for yellow perch and walleye on Lake Erie, 1990-2013.

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
2010	26.08	3.46
2011	22.90	3.29
2012	23.10	4.01
2013	21.47	4.02

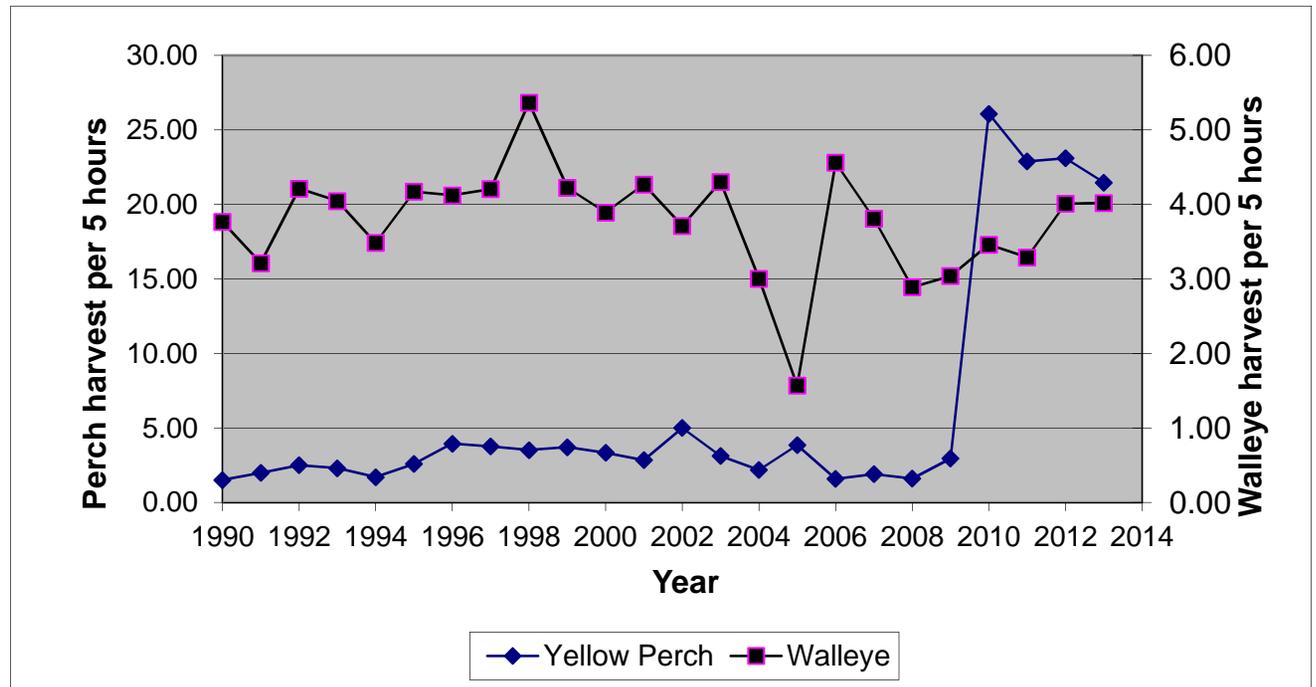


Figure 10.—Charter angler targeted harvest rates (fish per 5 angler hours) for yellow perch and walleye on the St. Clair system, 1990-2013.

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
2010	15.90	2.23
2011	11.88	2.20
2012	15.06	2.58
2013	14.85	2.56

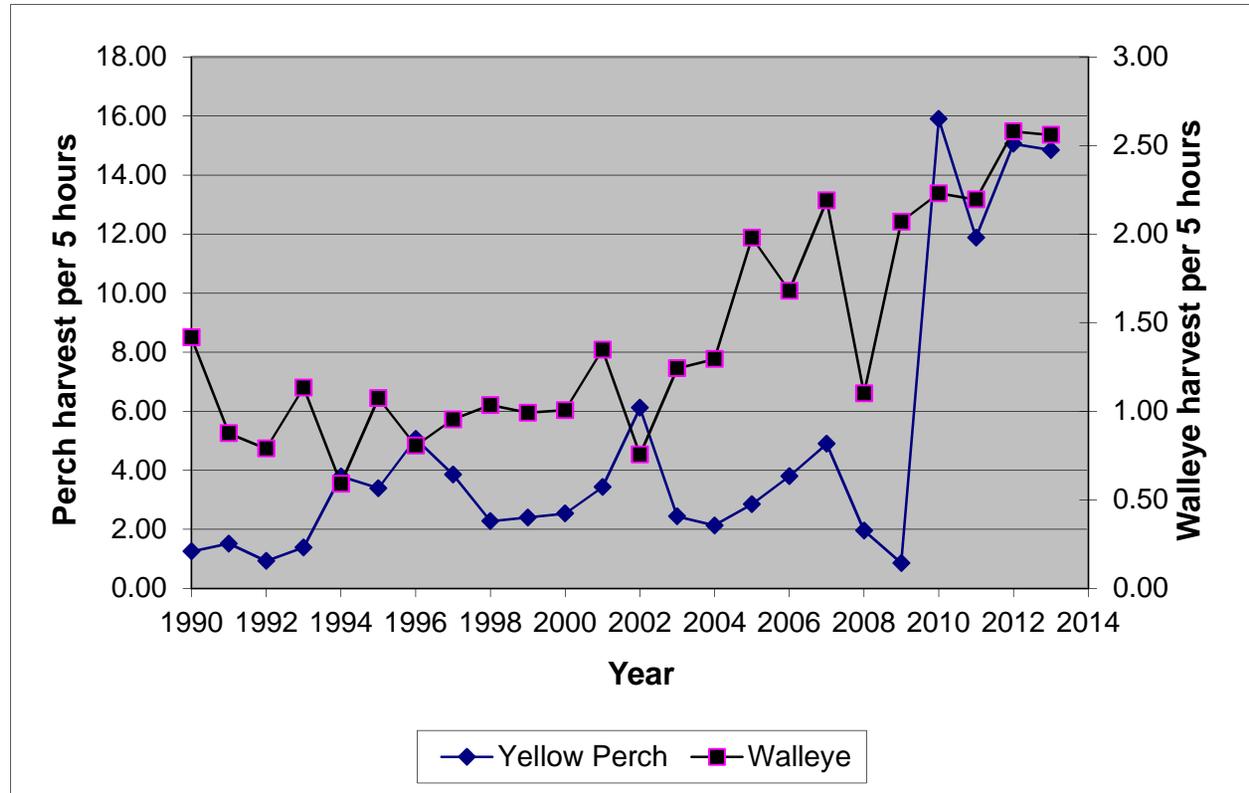


Figure 11.—Sea lamprey incidence (number attached per 100 fish) on Chinook salmon harvested by charter anglers on Lake Michigan and Lake Huron, 1990-2013.

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
2010	0.7	4.5
2011	0.7	5.8
2012	0.7	5.1
2013	0.7	10.5

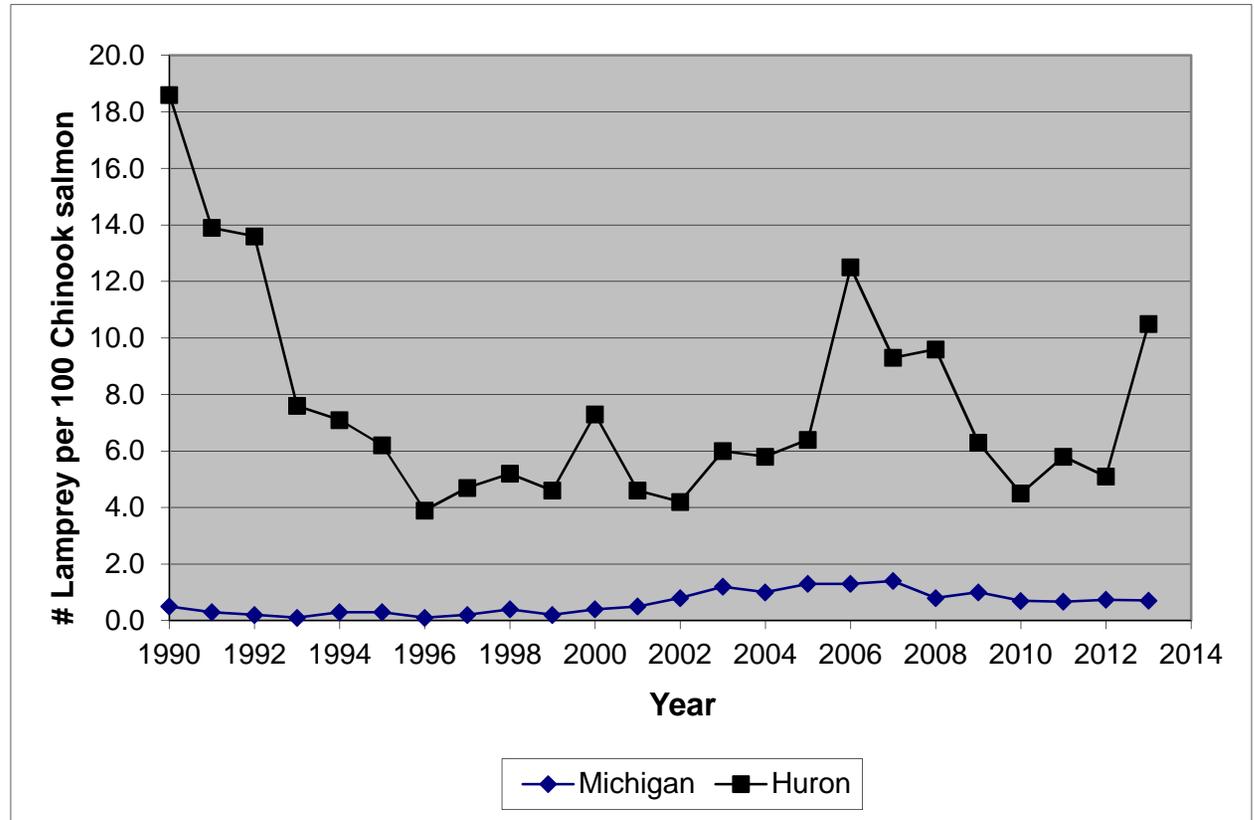


Figure 12.—Sea lamprey incidence (number attached per 100 fish) on lake trout harvested by charter anglers on lakes Michigan, Huron, and Superior, 1990-2013

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
2010	1.3	1.6	0.9
2011	1.1	2.4	1.0
2012	1.6	1.2	1.6
2013	1.0	1.8	1.0

