Charter Boat Catch and Effort from the Michigan Waters of the Great Lakes, 2014

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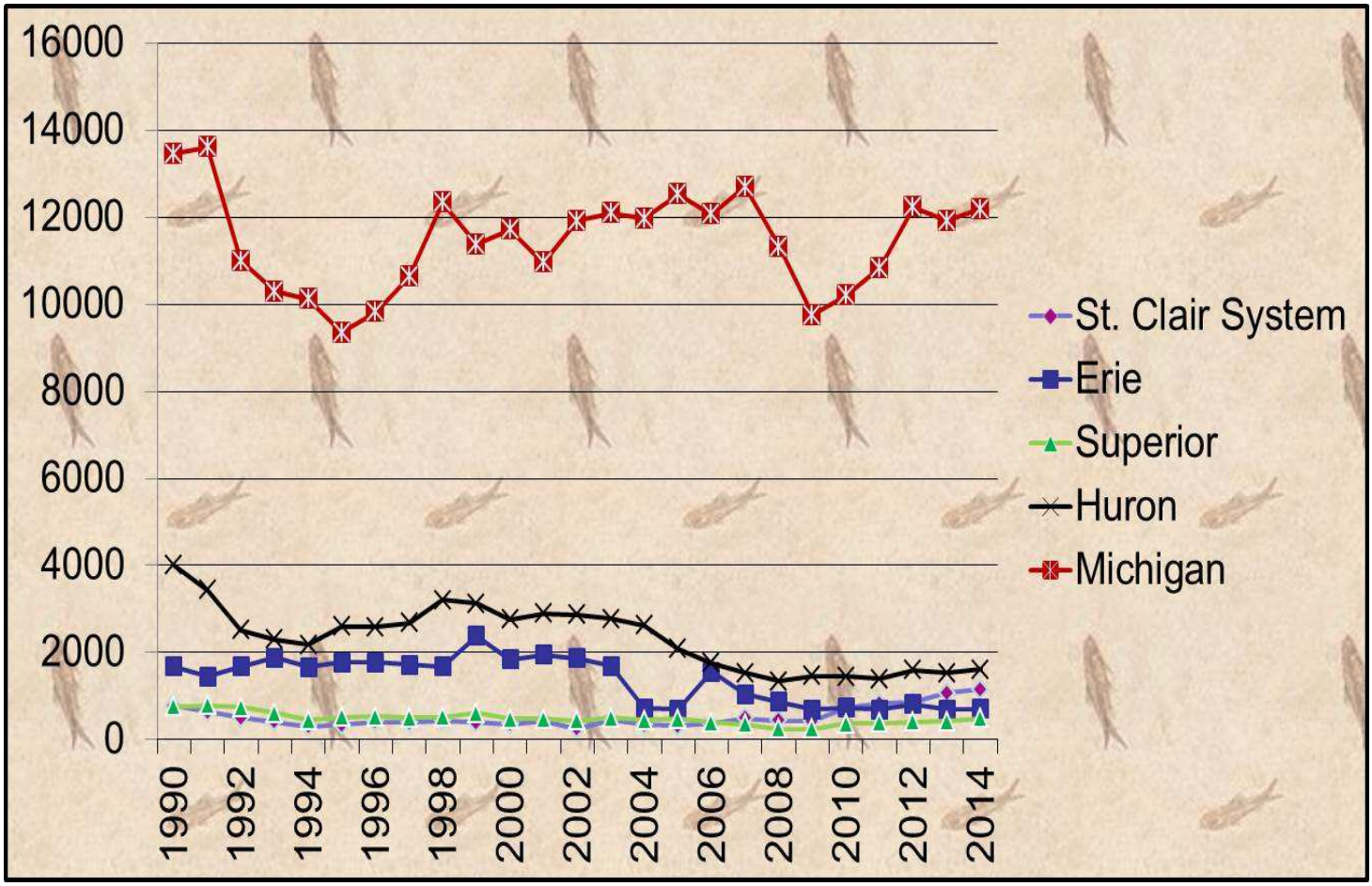

Charter Fishing Excursions by Great Lake – includes select tributaries

(Within State of Michigan Waters)

Michigan Department of Natural Resources
Fisheries Division
Charlevoix Fisheries Research Station
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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 2014 charter fishing year, there were 566 boats operated by 508 businesses; a number similar to the 552 charter boats and 502 businesses reporting by the end of 2013.

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 shall submit a monthly fishing activity report and 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 and December 2014. 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 2014 reporting season, 38% of the operators (194) reporting for 241 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(s). 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. These changes 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 was further modified by requiring the recording of more specific target species for each fishing trip. Fishing target and effort are still reported for the salmonines as a group, while trips for the other recorded species are target and effort specific to the species. 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 (40-83% compliance). During the 2014 fishing season, when averaged over all reporting months, 65% 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 2014 was 4% less than in 2013. In December 2014, at the time of sending final notification letters for one or more delinquent reports, 81% of the operators/boats were in compliance; this compliance rate was 1% greater than in 2013.

The percent of delinquent operators at the time of final notification had been consistently greater than 20 percent for numerous years. Starting with January 2013 and each subsequent January, 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 operators. 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 operator 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 2015, 99% of all charter operators had complied with the law; the same as in 2012 and 2013. In comparison, final compliance for the 2011 season in which there had been minimal additional contact after the final certified mailing, was 93%.

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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 select tributaries.

Fishing effort

In 2014, charter anglers participated in 16,150 charter excursions on the Michigan waters of Lakes Michigan, Huron, Erie, Superior, and the St. Clair system, including major tributaries (Tables 1-6). From 2013 (15,647 excursions) to 2014, there was a 3% increase in the number of total excursions. Excursions on Lake Michigan increased 2%, from 11,925 (2013) to 12,193 (2014); excursions on Lake Huron increased 5%, from 1,533 (2013) to 1,610 (2014); Lake Superior excursions increased 17%, from 422 (2013) to 493 (2014); Lake Erie excursions increased about 1%, from 696 (2013) to 702 (2014); and excursions on the St. Clair system increased 8%, from 1,071 (2013) to 1,152 (2014). The distribution of charter fishing excursions in 2014 by lake was: 76% Lake Michigan, 10% Lake Huron, 7% St. Clair System, 4% Lake Erie, and 3% Lake Superior; there was no change for any lake in comparison to 2013. 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 366,612 hours were spent fishing by 64,956 charter anglers in Michigan's waters and select tributaries of the Great Lakes (Tables 1-5, Figures 1-2b). Angler hours and total number of charter anglers increased 2% and 3% respectively compared to 2013. Starting in 2008, some businesses had been influenced by high gasoline prices for consumers (over $4.00 per gallon for some months of 2008). Gasoline prices remained in the mid $3 per gallon range through most of 2014 but was dropping below $3 per gallon in early fall. Based on charter operator's comments, bad and windy weather continued to be reported as a reason for canceled excursions in 2014, similar to 2013 through 2010. There were widespread comments regarding ice and cold water temperatures in the late spring to early summer months. Operators on Lake Michigan relayed their opinion on a lack of bait fish, decreases in the number of Chinook salmon being caught; some indicating it was their worst salmon season of all time. Lake Huron captains commented on seeing more cormorants, catching Atlantic salmon, and good walleye fishing in Saginaw bay but no yellow perch. Positive comments came from Lake Erie in respect to yellow perch fishing while Lake St. Clair captains indicated slow fishing for yellow perch and walleye. 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 152,254 fish harvested from the Michigan waters of the Great Lakes and its major tributaries in 2014 (Tables 1-5); this is a 5% increase compared to 2013 total harvest (145,575). Most of these fish were harvested from Lake Michigan (61%), followed by Lake Erie (17%), Lake Huron (12%), the St. Clair system (7%), and Lake Superior (4%). In comparison to 2013, total harvest increased on Lake Huron (1%), Lake Superior (1%), and Lake Erie (1%) while there was a decreased fish harvest on Lake Michigan (2%) and the St. Clair System (1%).

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 2014, Chinook salmon continued to be the most abundant of the species harvest, accounting for 25% (38,118 fish) of the total harvest (a 1% decrease compared to 26% in 2013). The decrease in Chinook salmon harvest in 2013-2014 resulted in increased targeting of lake trout in locations where more than one salmonine can be the target species for the excursion. Lake trout also accounted for 25% (37,687) of total harvest in 2014, an increase of 5% compared to 2013 (20%) and an increase of 15% when compared to 2012 (10%). Percent of total

harvest for other species were as follows: walleye 17%, yellow perch 14%, rainbow trout 9%, coho salmon 6%, smallmouth bass 2%, and brown trout <1%. The "other" species category accounted for about 3% 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 38,118 Chinook salmon in 2014, which is a 1% increase relative to 2013 (37,664). Total harvest (all lakes combined) in 2014 increased for lake trout, walleye, rainbow trout, brown trout, and smallmouth bass; coho salmon and yellow perch harvest decreased. Total harvest numbers in 2014 for species other than Chinook salmon were: 37,687 lake trout, 25,642 walleye, 20,746 yellow perch, 13,961 rainbow trout, 8,679 coho salmon, 2,412 smallmouth bass, and 894 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 2014 was 99,339 fish, which is a 9% increase (7,838 fish) from 2013 harvest (91,501). The increase came predominantly from lake trout and rainbow trout harvest.

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 2014, charter anglers caught 20,885 smallmouth bass of which they released 18,473 (88%) and harvested 2,412; this is a 1% increase from the 2013 catch of 20,591 fish. Catch of muskellunge was 1,333 and all were released. This is an 17% increase in comparison to the 1,137 muskellunge caught in 2013. 11,326 total 'other' fish were caught, 4,115 were harvested and 7,211 released (Tables 1-5).

Harvest rates

In 2014, charter anglers harvested 0.42 fish (all species from all lakes combined) per hour; almost the same compared to 2013 (0.41 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 2014 targeted the various species of salmonines. Comparing targeted harvest rates (fish per 5 angler hours) to 2013 data, Lake Michigan angler harvest rates increased for Chinook salmon, lake trout, rainbow trout (steelhead), and brown trout, while coho salmon harvest rates decreased (Figures 3-7). The targeted harvest rate reported in 2014 for Chinook salmon in Lake Michigan (0.69 fish per 5 hours of angler fishing) is a 5% increase compared to the 2013 rate of 0.66 fish per 5 hours of angler fishing; these rates are similar to those recorded in 2000-2001 (Figure 3). The decreased harvest of Chinook salmon on Lake Michigan had charter captains targeting lake trout; this is reflected in the increased lake trout harvest rate of 0.5 fish per 5 angler hours, a 25% increase from the 2013 rate of 0.40 fish per 5 angler hours (Figure 4).

Targeted harvest rates (fish per 5 angler hours) on Lake Huron in 2014 increased

compared to 2013 for lake trout and walleye, remained unchanged for coho salmon and brown trout, and decreased for Chinook salmon and rainbow trout (Figures 3-8). The harvest rate for Chinook salmon decreased to 0.20 fish per 5 angler hours which is the lowest rate over the years of this data series (1990-2014) (Figure 3). The decline in the alewife population in Lake Huron gave rise to favorable conditions for the increase of the walleye population in Saginaw Bay. The harvest rate for walleye increased (3.64 fish per 5 angler hours) and is the highest rate in the 1990-2014 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 2013, the targeted harvest rate for lake trout increased from 1.57 to 1.91 fish per 5 hours, the highest in the 25 year data series (Figure 4). The four remaining salmonids (Chinook salmon, coho salmon, rainbow trout, and brown trout) combined, make up a small portion (6%) of the total Lake Superior salmonine harvest (5,157 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 2014. Targeted harvest rates for walleye (4.11 fish per 5 angler hours) increased (Figure 9) on Lake Erie for 2014, in comparison to 2013 (4.02 fish per 5 angler hours). Targeted harvest rates increased for walleye (2.82 fish per 5 angler hours) on the St. Clair system in 2014, compared to 2013 (2.56 fish per 5 angler hours), and is the highest harvest rate in the data series (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 26.01 fish per 5 angler hours in 2014 (Figure 9), an increase of 21% compared to 2013 (21.47 fish per 5 angler hours) and similar to 2010 (26.08 fish per 5 angler hours). A similar increase is evident for the St. Clair System starting in 2010; the targeted harvest rate was 9.30 fish per 5 angler hours in 2014, a decrease of 37% compared to 2013 (14.85 fish per 5 angler hours) (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 2014, catch rates on the St. Clair system for smallmouth bass and musky were 34.0 and 4.5 fish per excursion, respectively (Table 4). Targeted catch rate for smallmouth bass per excursion was 24.1 fish on Lake Michigan (Table 1).

Sea Lamprey Incidence

For 2014, sea lamprey incidence on Chinook salmon decreased on lakes Huron and Michigan, compared to 2013 levels. Lake Huron incidence was 2.8 lampreys attached per 100 Chinook salmon, the lowest in the 25 year data series; Lake Michigan incidence was 0.6 lampreys attached per 100 Chinook salmon (Figure 11).

The occurrence of lamprey on lake trout in Lake Superior (1.9 lamprey/100 lake trout) increased compared to 1.0 lamprey/100 lake trout in 2013. Sea lamprey incidence on lake trout decreased for lakes Michigan and Huron. The occurrence of lamprey on lake trout in Lake Michigan (0.5 lamprey/100 lake trout) decreased compared to 1.0 lamprey/100 lake trout in 2013 and is the lowest level reported in the 25 years of collecting the data. The occurrence of

lamprey on lake trout in Lake Huron (1.4 lamprey/100 lake trout) decreased compared to 1.8 lamprey/100 lake trout in 2013 (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/fisheries/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, 2014. 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 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TARGETED Harvest/year *released/year*	TOTAL (target+non-target) Harvest/year *released/year*
0.031	0.726	Coho salmon	0	0	2	775	981	848	1,271	3,604	936	42	2	1	8,462	8,462
0.031	0.733	*released*	*0*	*0*	*0*	*32*	*13*	*3*	*8*	*10*	*12*	*8*	*0*	*0*	*86*	*86*
0.138	3.207	Chinook salmon	0	0	0	30	4,585	4,621	6,653	17,654	3,568	271	4	0	37,386	37,395
0.141	3.284	*released*	*0*	*0*	*0*	*6*	*110*	*237*	*119*	*56*	*125*	*221*	*13*	*0*	*887*	*890*
0.050	1.157	Rainbow trout	19	91	287	161	1,226	1,721	3,828	4,191	921	394	423	220	13,482	13,520
0.053	1.242	*released*	*4*	*45*	*165*	*106*	*86*	*40*	*55*	*17*	*44*	*277*	*93*	*60*	*992*	*994*
0.003	0.071	Brown trout	0	0	3	129	331	44	118	165	30	0	3	8	831	832
0.008	0.192	*released*	*0*	*1*	*7*	*16*	*199*	*174*	*76*	*348*	*220*	*278*	*74*	*11*	*1,404*	*1,407*
0.100	2.332	Lake trout	0	0	1	227	2,250	5,047	9,549	8,021	2,061	30	0	0	27,186	27,192
0.117	2.734	*released*	*0*	*0*	*0*	*4*	*72*	*831*	*2,028*	*1,309*	*385*	*56*	*0*	*0*	*4,685*	*4,697*
2.184	37.108	Yellow perch	0	0	0	0	142	100	2,060	1,205	278	0	0	0	3,785	3,830
2.192	37.235	*released*	*0*	*0*	*0*	*0*	*0*	*0*	*12*	*0*	*1*	*0*	*0*	*0*	*13*	*99*
0.208	3.903	Walleye	12	17	49	12	52	209	48	68	162	43	36	18	726	756
0.343	6.441	*released*	*3*	*1*	*8*	*0*	*39*	*113*	*63*	*82*	*19*	*10*	*18*	*116*	*472*	*497*
0.011	0.172	Smallmouth Bass	0	0	0	0	0	4	17	5	0	0	0	0	26	52
1.590	24.166	*released*	*0*	*0*	*0*	*0*	*27*	*690*	*1,078*	*1,328*	*389*	*111*	*0*	*0*	*3,623*	*3,870*
		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*
0.081	1.235	Other	0	0	0	0	7	15	50	47	0	2	0	0	121	334
0.534	8.184	*released*	*0*	*0*	*0*	*0*	*14*	*264*	*156*	*199*	*48*	*0*	*0*	*0*	*681*	*1,140*
		Lamprey on:														
		Chinook salmon	0	0	0	1	29	16	42	121	23	0	0	0	232	232
		Lake trout	0	0	0	0	8	21	48	45	15	0	0	0	137	137
		Total angler hours	140	547	1,952	3,320	24,261	33,916	67,282	112,205	26,424	5,201	3,550	1,742		280,540
		Total anglers	21	80	285	558	4,063	6,090	12,333	20,213	4,855	779	499	241		50,017
		Total excursions	10	29	104	167	946	1,465	2,888	4,746	1,269	292	186	91		12,193

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, 2014. 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 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TARGETED Harvest/year *released/year*	TOTAL (target+non-target) Harvest/year *released/year*
0.003	0.057	Coho salmon	0	0	0	3	5	19	9	13	1	1	0	0	51	54
0.003	0.060	*released*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*3*	*3*
0.039	0.766	Chinook salmon	0	0	0	1	19	52	269	266	74	5	0	0	686	688
0.040	0.778	*released*	*0*	*0*	*0*	*0*	*2*	*3*	*2*	*1*	*2*	*0*	*0*	*0*	*10*	*10*
0.021	0.419	Rainbow trout	0	0	0	14	14	53	108	118	59	9	0	0	375	377
0.024	0.475	*released*	*0*	*0*	*0*	*0*	*0*	*17*	*18*	*1*	*2*	*12*	*0*	*0*	*50*	*50*
0.001	0.029	Brown trout	0	0	0	1	2	1	8	8	3	3	0	0	26	31
0.002	0.030	*released*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*1*
0.319	6.251	Lake trout	0	0	0	0	338	1,250	1,919	1,661	424	3	0	0	5,595	5,629
0.354	6.920	*released*	*0*	*0*	*0*	*0*	*34*	*228*	*212*	*76*	*38*	*10*	*0*	*0*	*598*	*598*
1.193	37.143	Yellow perch	0	0	0	0	0	0	0	12	248	0	0	0	260	461
1.394	43.429	*released*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*44*	*0*	*0*	*0*	*44*	*74*
0.728	14.835	Walleye	0	0	0	29	927	4,411	3,747	1,069	74	83	0	0	10,340	10,489
0.981	19.991	*released*	*0*	*0*	*0*	*0*	*332*	*1,896*	*1,077*	*250*	*12*	*27*	*0*	*0*	*3,594*	*3,594*
0.000	0.000	Smallmouth Bass	0	0	0	0	0	0	0	0	0	0	0	0	0	109
1.520	25.333	*released*	*0*	*0*	*0*	*0*	*55*	*50*	*0*	*0*	*0*	*47*	*0*	*0*	*152*	*247*
		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*	*10*
0.163	2.600	Other	0	0	0	0	0	0	9	0	0	4	0	0	13	795
0.550	8.800	*released*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*31*	*0*	*0*	*31*	*1,448*
		Lamprey on:														
		Chinook salmon	0	0	0	0	4	4	6	5	1	0	0	0	20	20
		Lake trout	0	0	0	0	3	17	36	21	4	0	0	0	81	81
		Total angler hours	0	0	0	106	2,348	8,558	11,643	7,286	1,694	483	0	0		32,118
		Total anglers	0	0	0	19	416	1,640	2,126	1,366	302	75	0	0		5,944
		Total excursions	0	0	0	10	117	437	556	363	92	35	0	0		1,610

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, 2014. 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 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TARGETED Harvest/year *released/year*	TOTAL (target+non-target) Harvest/year *released/year*
		Coho salmon	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*
		Chinook salmon	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*
		Rainbow trout	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		released	*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
		released	*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
		released	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
5.201	119.991	Yellow perch	0	0	0	0	0	0	75	828	8,019	4,277	0	0	13,199	13,366
5.750	132.664	*released*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*178*	*748*	*468*	*0*	*0*	*1,394*	*1,401*
0.821	17.814	Walleye	0	0	0	657	2,285	5,221	2,007	251	0	0	0	0	10,421	10,428
0.857	18.600	*released*	*0*	*0*	*0*	*32*	*48*	*317*	*52*	*11*	*0*	*0*	*0*	*0*	*460*	*464*
0.000	0.000	Smallmouth Bass	0	0	0	0	0	0	0	0	0	0	0	0	0	35
1.778	44.714	*released*	*0*	*0*	*0*	*0*	*295*	*0*	*18*	*0*	*0*	*0*	*0*	*0*	*313*	*350*
		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*	*4*
0.000	0.000	Other	0	0	0	0	0	0	0	0	0	0	0	0	0	1,872
0.000	0.000	*released*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3,513*
		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	0	702	3,118	6,370	2,372	640	1,445	765	0	0		15,412
		Total anglers	0	0	0	137	583	1,226	472	122	275	147	0	0		2,962
		Total excursions	0	0	0	43	148	274	112	30	63	32	0	0		702

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), 2014. 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 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TARGETED Harvest/year *released/year*	TOTAL (target+non-target) Harvest/year *released/year*
		Coho salmon	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*
		Chinook salmon	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*
		Rainbow trout	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*
		Brown trout	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*
		Lake trout	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*
1.860	44.931	Yellow perch	0	0	0	0	50	145	186	401	773	1,051	0	0	2,606	2,898
2.499	60.362	*released*	*0*	*0*	*0*	*0*	*0*	*0*	*158*	*160*	*255*	*322*	*0*	*0*	*895*	*953*
0.563	11.945	Walleye	0	0	0	2,093	1,385	299	37	48	0	20	0	0	3,882	3,963
0.630	13.348	*released*	*0*	*0*	*0*	*437*	*19*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*456*	*469*
0.203	4.358	Smallmouth Bass	0	0	0	0	0	204	617	824	308	21	0	0	1,974	2,207
1.586	33.985	*released*	*0*	*0*	*0*	*41*	*2,857*	*4,637*	*1,880*	*1,943*	*999*	*1,064*	*0*	*0*	*13,421*	*13,996*
0.000	0.000	Musky	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.184	4.477	*released*	*0*	*0*	*0*	*0*	*0*	*299*	*280*	*230*	*156*	*111*	*108*	*92*	*1,276*	*1,318*
0.707	11.290	Other	0	0	0	0	58	292	0	0	0	0	0	0	350	1,089
0.828	13.226	*released*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*24*	*36*	*0*	*0*	*60*	*794*
		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	0	3,456	3,530	4,644	3,725	3,989	2,692	2,016	789	573		25,414
		Total anglers	0	0	0	628	616	686	565	616	418	317	94	65		4,005
		Total excursions	0	0	0	164	172	210	159	174	113	93	40	27		1,152

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, 2014. 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 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TARGETED Harvest/year *released/year*	TOTAL (target+non-target) Harvest/year *released/year*
0.013	0.345	Coho salmon	0	0	0	0	5	43	58	48	9	0	0	0	163	163
0.014	0.374	*released*	*0*	*0*	*0*	*0*	*14*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*14*	*14*
0.003	0.074	Chinook salmon	0	0	0	0	2	15	5	11	2	0	0	0	35	35
0.003	0.080	*released*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*	*3*
0.005	0.131	Rainbow trout	0	0	0	0	0	16	29	11	6	0	0	0	62	62
0.005	0.135	*released*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*1*	*0*	*0*	*0*	*2*	*2*
0.002	0.066	Brown trout	0	0	0	0	6	10	5	6	4	0	0	0	31	31
0.003	0.072	*released*	*0*	*0*	*0*	*0*	*2*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*3*	*3*
0.381	10.288	Lake trout	0	0	0	0	41	880	1,734	1,830	381	0	0	0	4,866	4,866
0.453	12.214	*released*	*0*	*0*	*0*	*0*	*5*	*119*	*429*	*332*	*26*	*0*	*0*	*0*	*911*	*911*
1.990	31.833	Yellow perch	0	0	0	0	0	0	0	191	0	0	0	0	191	191
3.083	49.333	*released*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*105*	*0*	*0*	*0*	*0*	*105*	*105*
0.333	6.000	Walleye	0	0	0	0	0	0	0	0	6	0	0	0	6	6
0.333	6.000	*released*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*4*
0.281	3.000	Smallmouth Bass	0	0	0	0	0	0	7	2	0	0	0	0	9	10
0.531	5.667	*released*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*6*	*0*	*0*	*0*	*0*	*8*	*9*
		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*
0.111	2.400	Other	0	0	0	0	0	18	6	0	0	0	0	0	24	25
0.440	9.500	*released*	*0*	*0*	*0*	*0*	*0*	*3*	*4*	*0*	*0*	*64*	*0*	*0*	*71*	*316*
		Lamprey on:														
		Chinook salmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Lake trout	0	0	0	0	3	12	48	25	3	0	0	0	91	91
		Total angler hours	0	0	0	0	380	2,365	4,879	4,472	880	152	0	0		13,128
		Total anglers	0	0	0	0	66	358	755	684	145	20	0	0		2,028
		Total excursions	0	0	0	0	21	83	178	166	40	5	0	0		493

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 2004-2014.

	Year											
Lake	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)

	Year												
Lake	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
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	12,193
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	1,610
Erie	1,870	1,695	718	694	1,554	1,039	870	689	738	698	813	696	702
St. Clair System	246	466	339	319	366	493	440	425	719	831	867	1,071	1,152
Superior	430	505	455	479	398	359	245	244	374	382	411	422	493
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	16,150

Figure 1.–Total number of charter anglers (trips) on the Michigan waters of the Great Lakes (including tributaries), 1990-2014.

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
2014	64,956

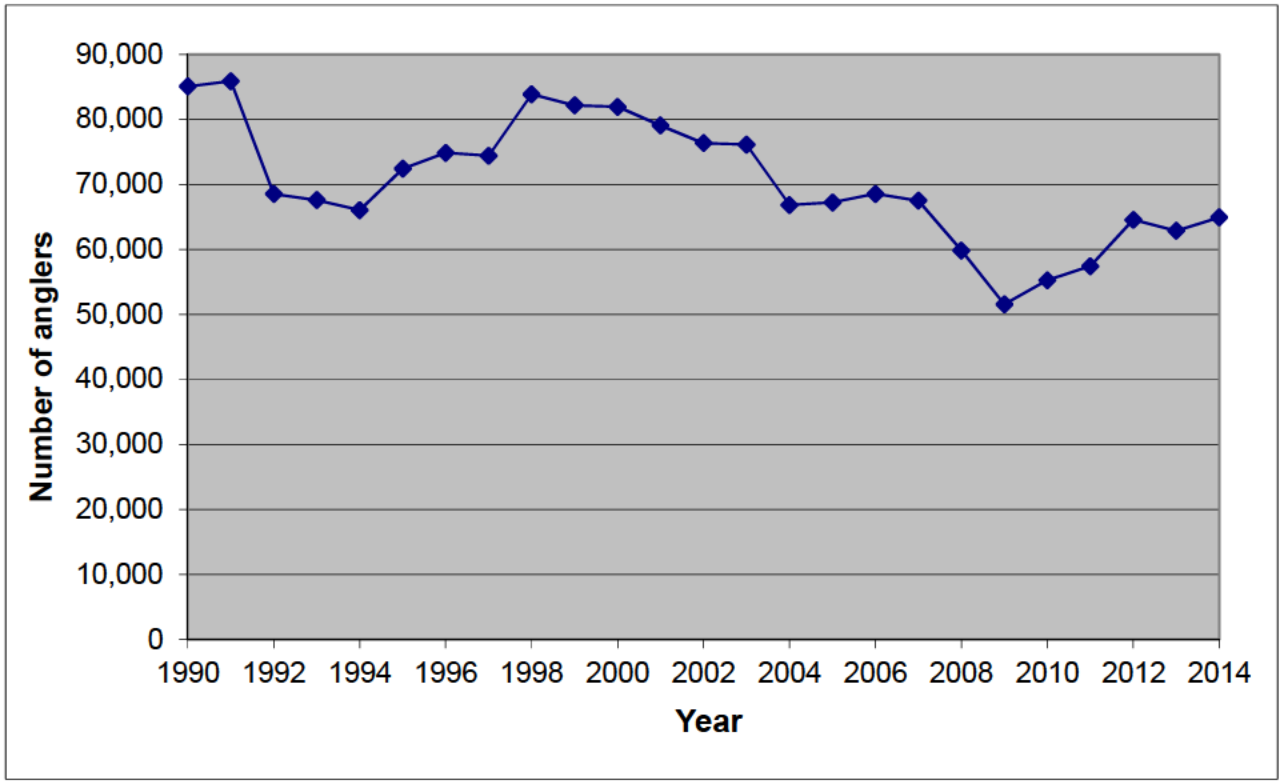

Figure 2(a).–Total number of charter anglers (trips) on the Michigan waters of Lake Michigan and Lake Huron (including tributaries), 1990-2014.

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
2014	50,017	5,944

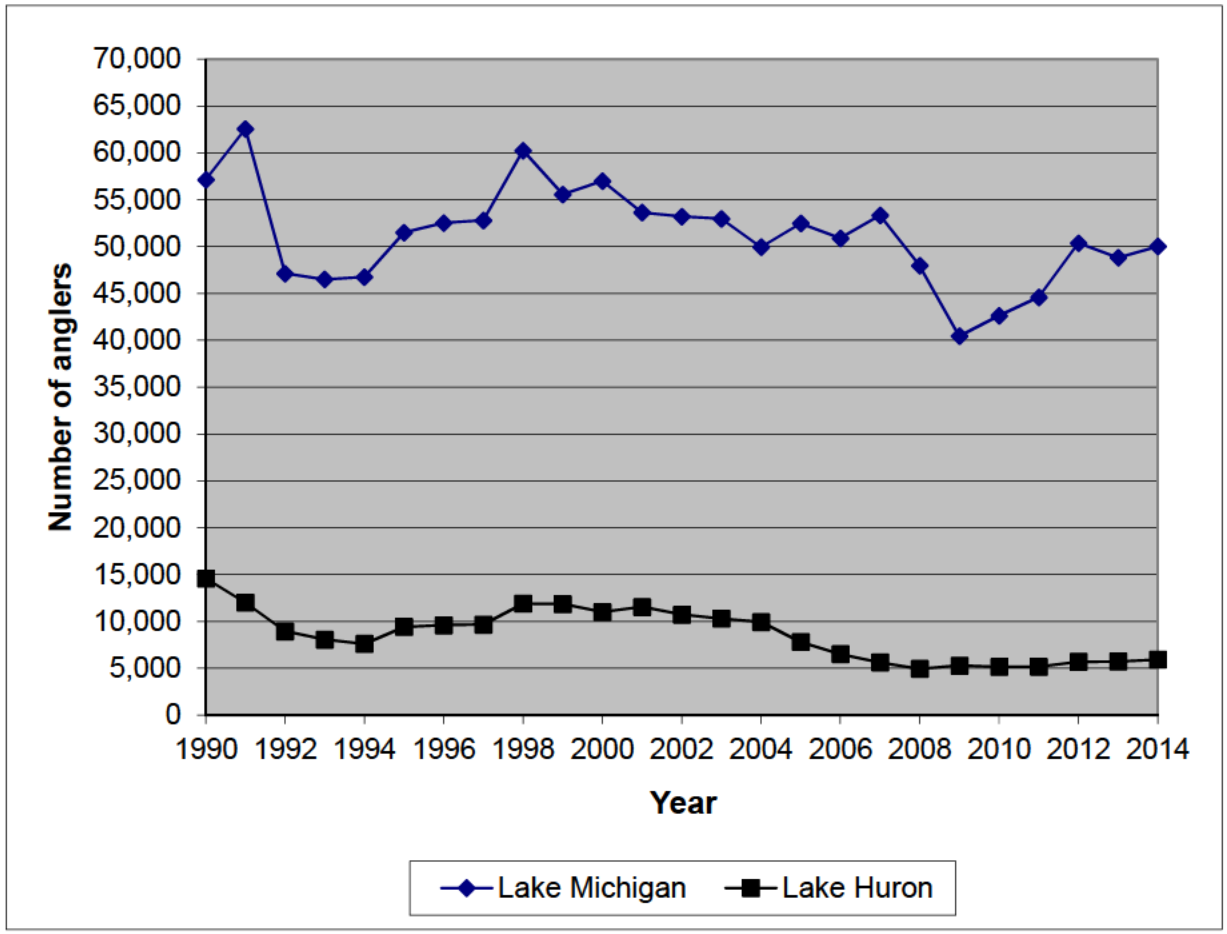

Figure 2 (b).–Total number of charter anglers (trips) on the Michigan waters of Lake Erie, Lake Superior, and the St. Clair System (including tributaries), 1990-2014.

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
2014	2,962	2.028	4,005

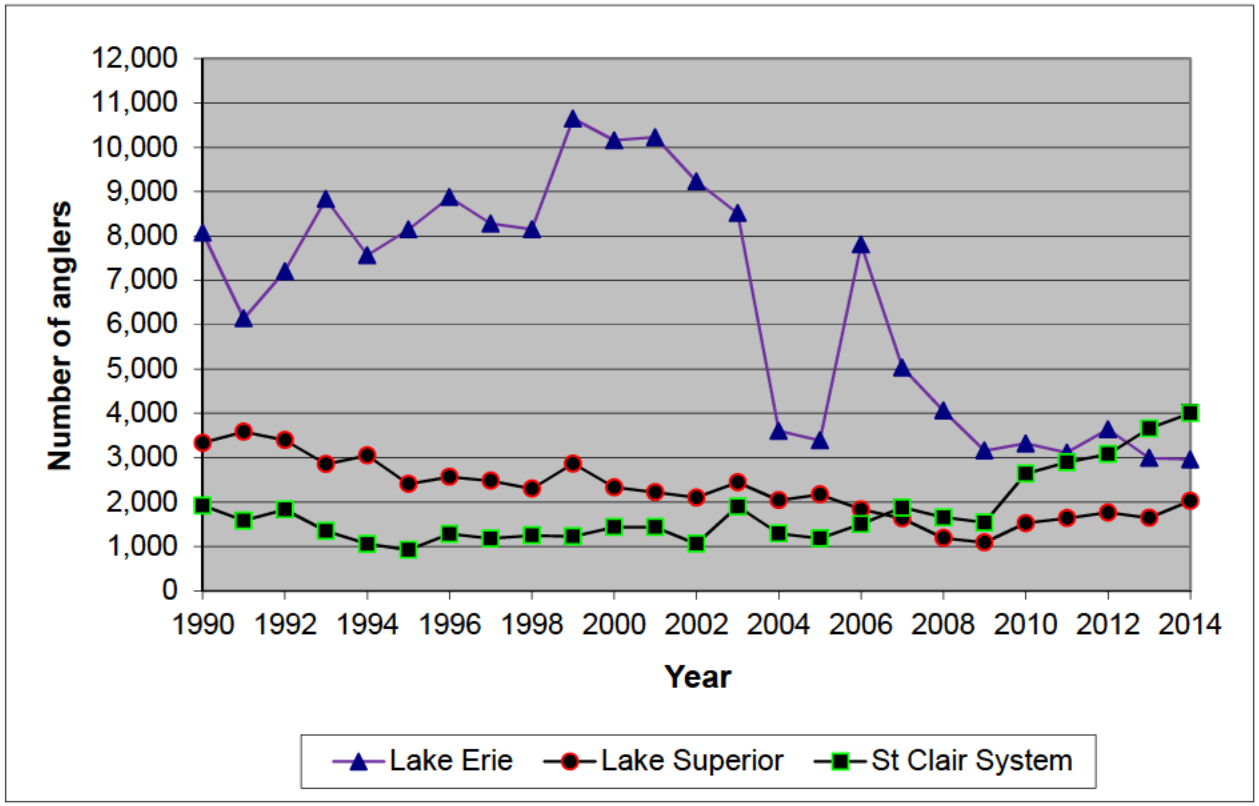

Figure 3. - Charter angler targeted harvest rates (fish per 5 angler hours) for Chinook salmon on Lake Michigan and Lake Huron, 1990-2014.

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
2010	1.23	0.22
2011	1.12	0.31
2012	1.60	0.46
2013	0.66	0.62
2014	0.69	0.20

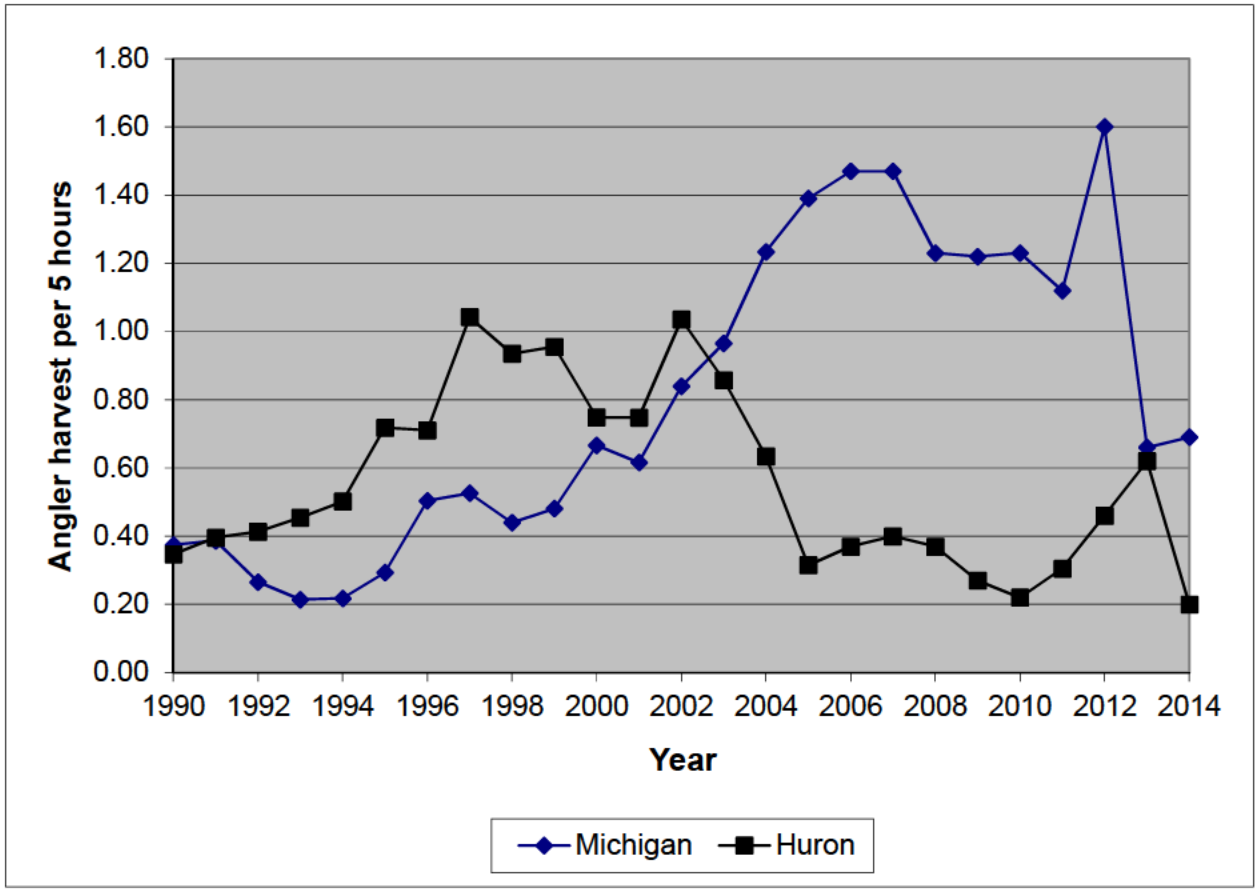

Figure 4.—Charter angler targeted harvest rates (fish per 5 angler hours) for lake trout on lakes Michigan, Huron, and Superior, 1990-2014.

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
2014	0.50	1.60	1.91

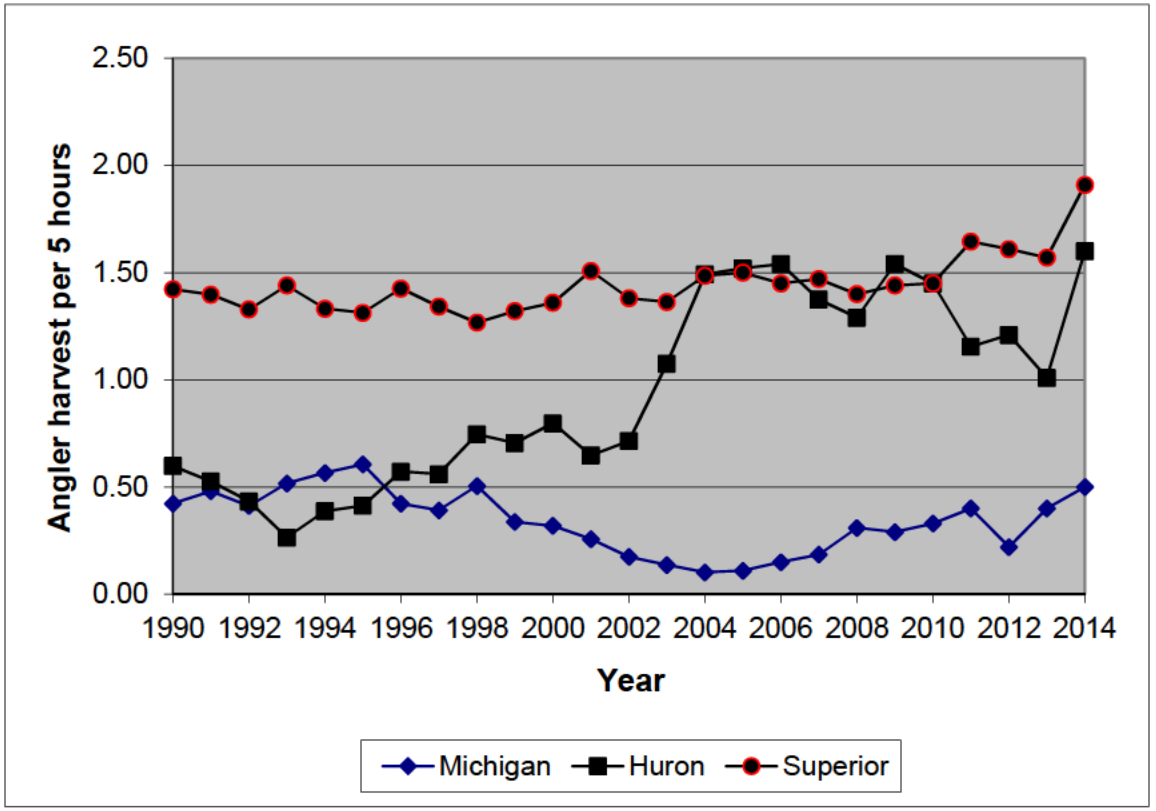

Figure 5.—Charter angler targeted harvest rates (fish per 5 angler hours) for coho salmon on lakes Michigan, Huron, and Superior, 1990-2014.

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
2014	0.16	0.02	0.07

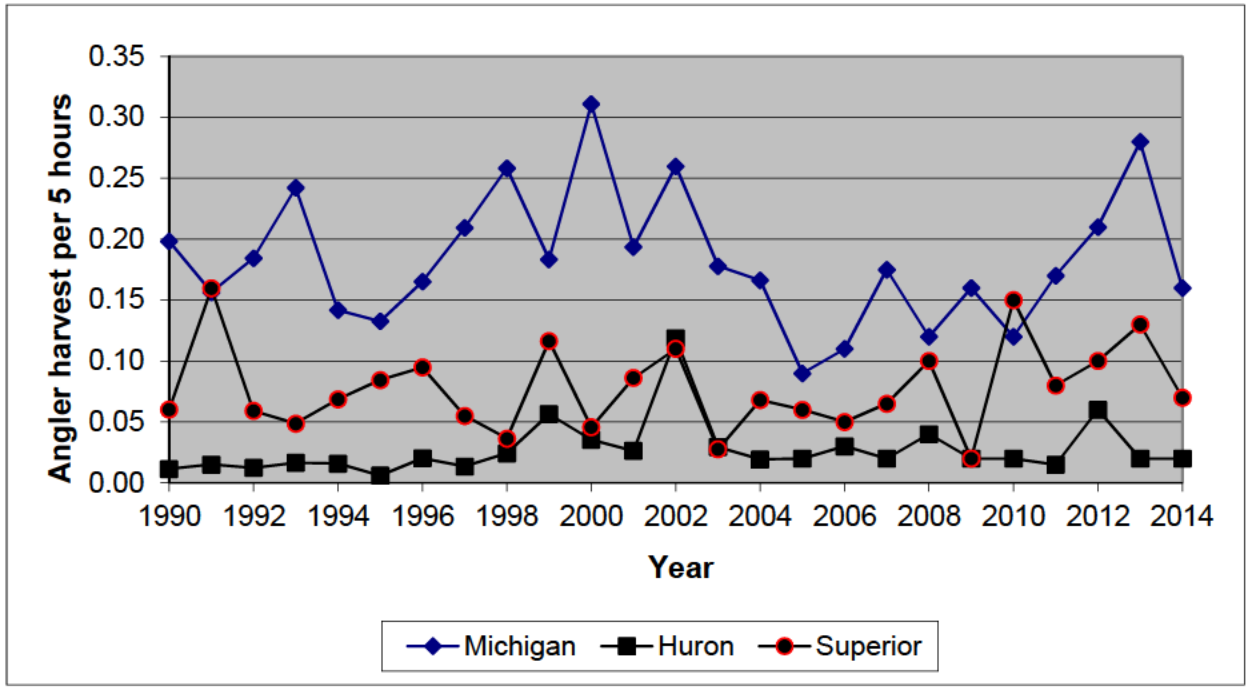

Figure 6.—Charter angler targeted harvest rates (fish per 5 angler hours) for rainbow trout (steelhead) on Lake Michigan and Lake Huron, 1990-2014.

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
2014	0.25	0.11

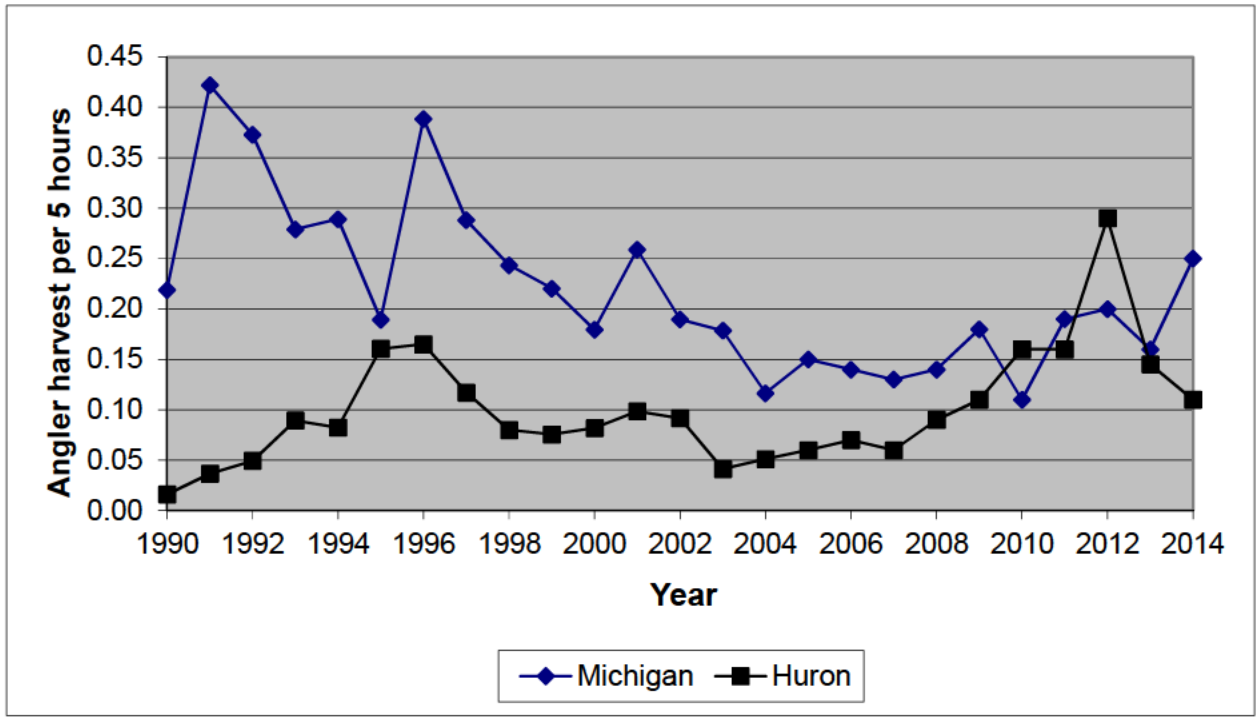

Figure 7.—Charter angler targeted harvest rates (fish per 5 angler hours) for brown trout on Lake Michigan and Lake Huron, 1990-2014.

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
2014	0.02	0.01

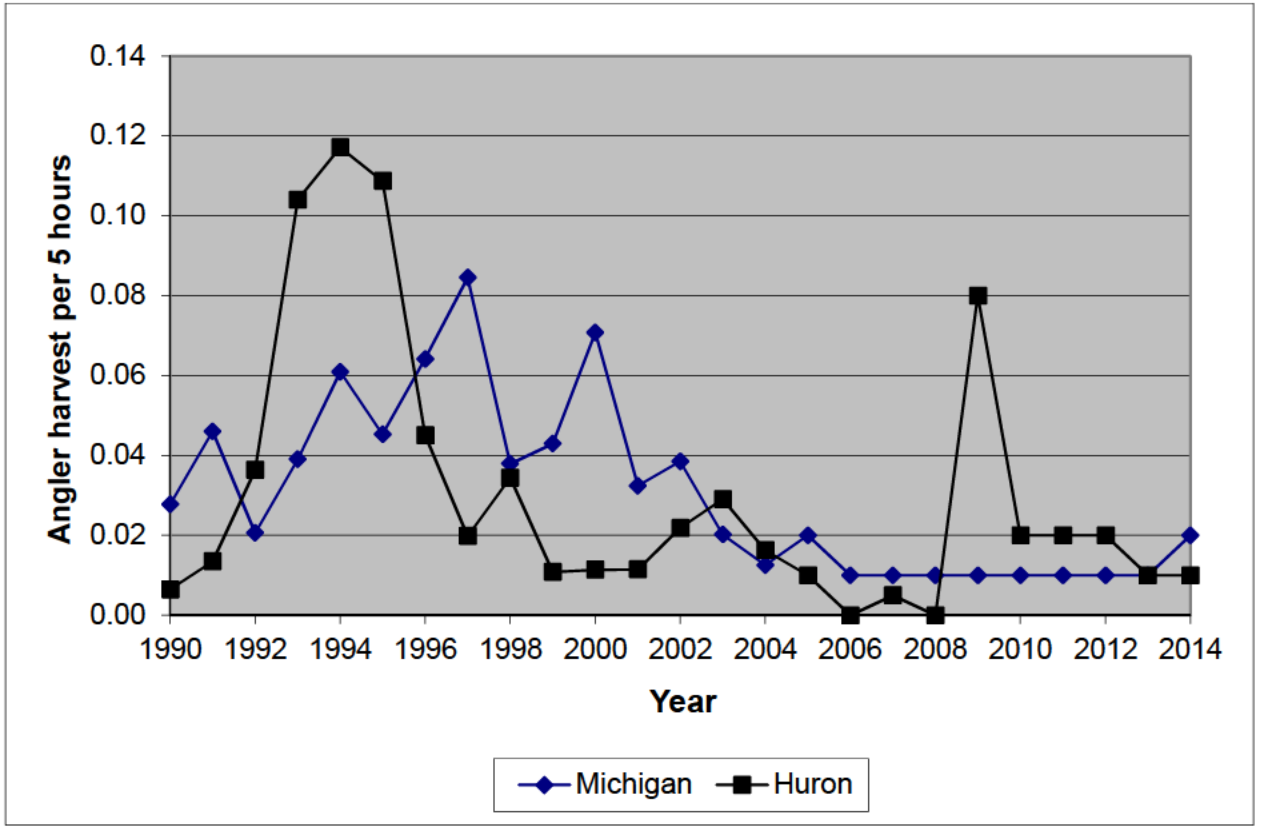

Figure 8.—Charter angler targeted harvest rates (fish per 5 angler hours) for walleye on Lake Huron, 1990-2014.

Year	Lake Huron
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
2014	3.64

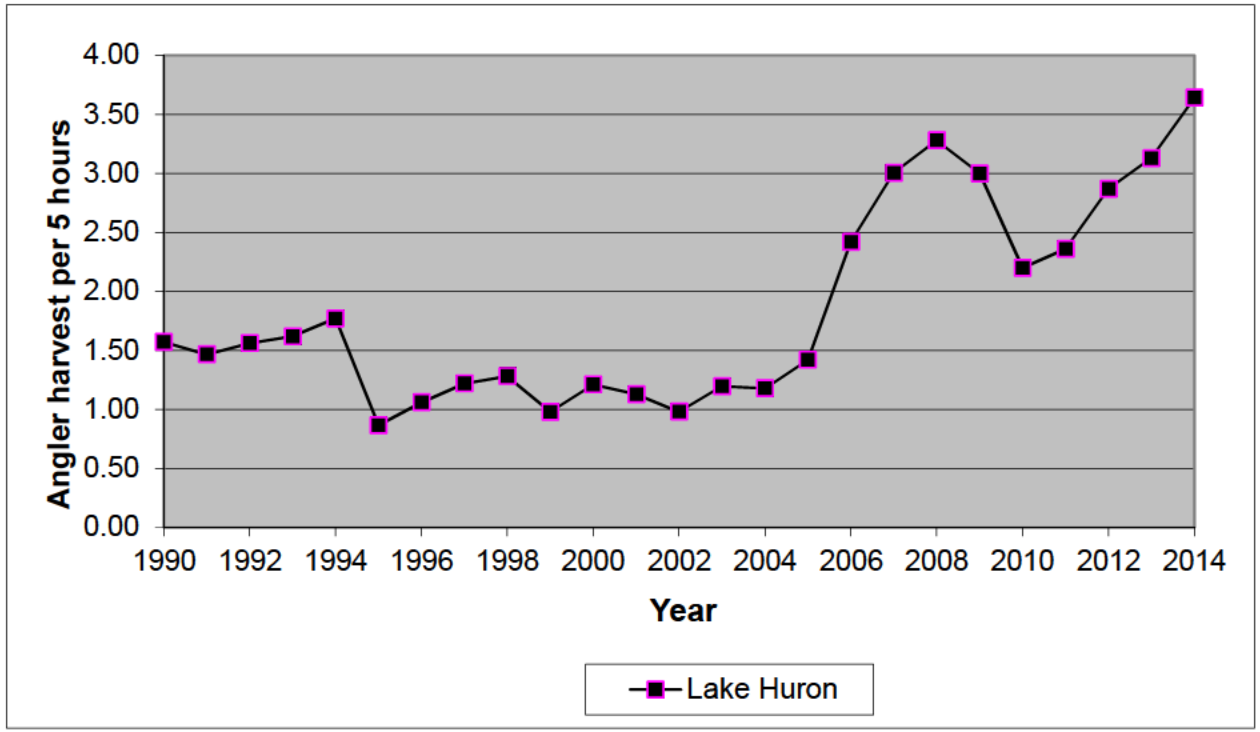

Figure 9.—Charter angler targeted harvest rates (fish per 5 angler hours) for yellow perch and walleye on Lake Erie, 1990-2014.

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
2014	26.01	4.11

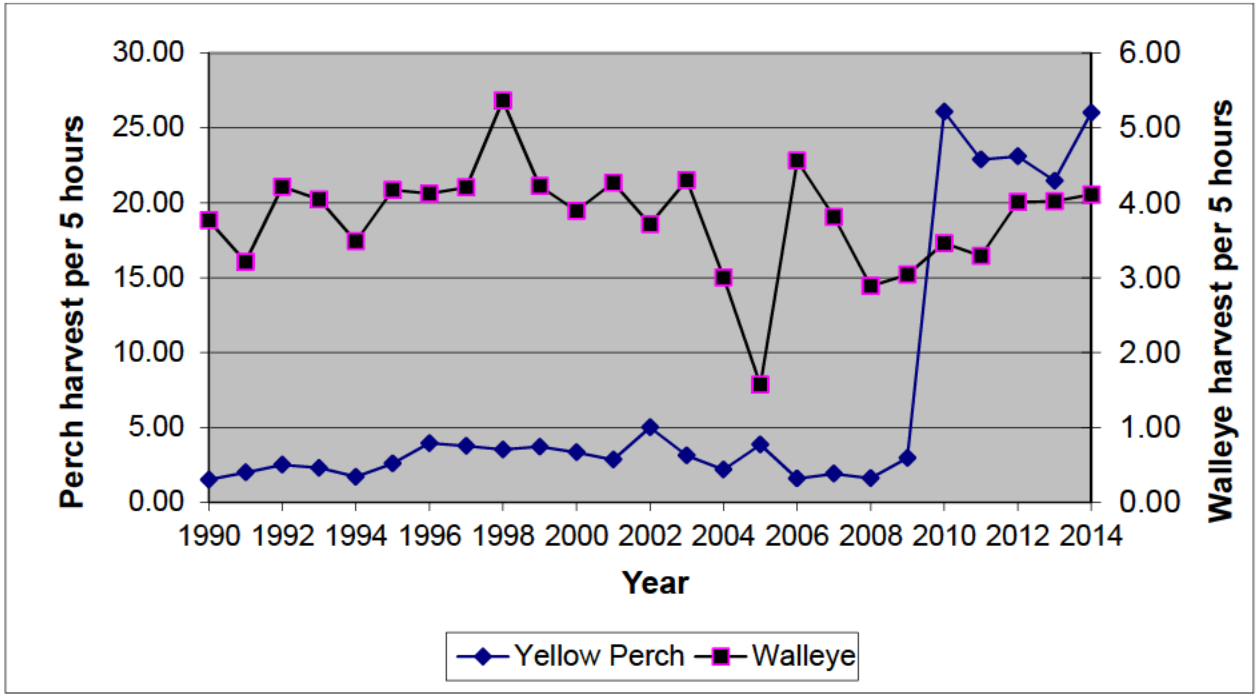

Figure 10.—Charter angler targeted harvest rates (fish per 5 angler hours) for yellow perch and walleye on the St. Clair System, 1990-2014.

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
2014	9.30	2.82

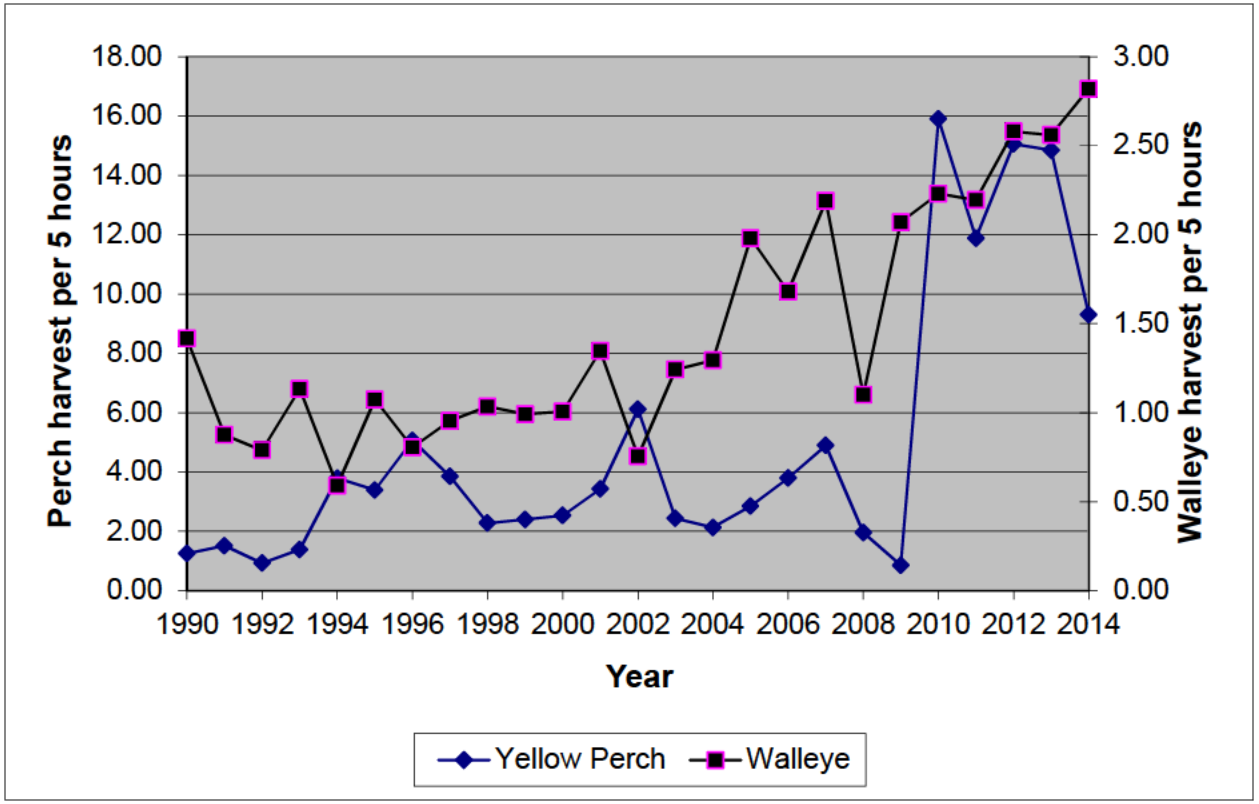

Figure 11.—Sea lamprey incidence (number attached per 100 fish) on Chinook salmon harvested by charter anglers on Lake Michigan and Lake Huron, 1990-2014.

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
2014	0.6	2.8

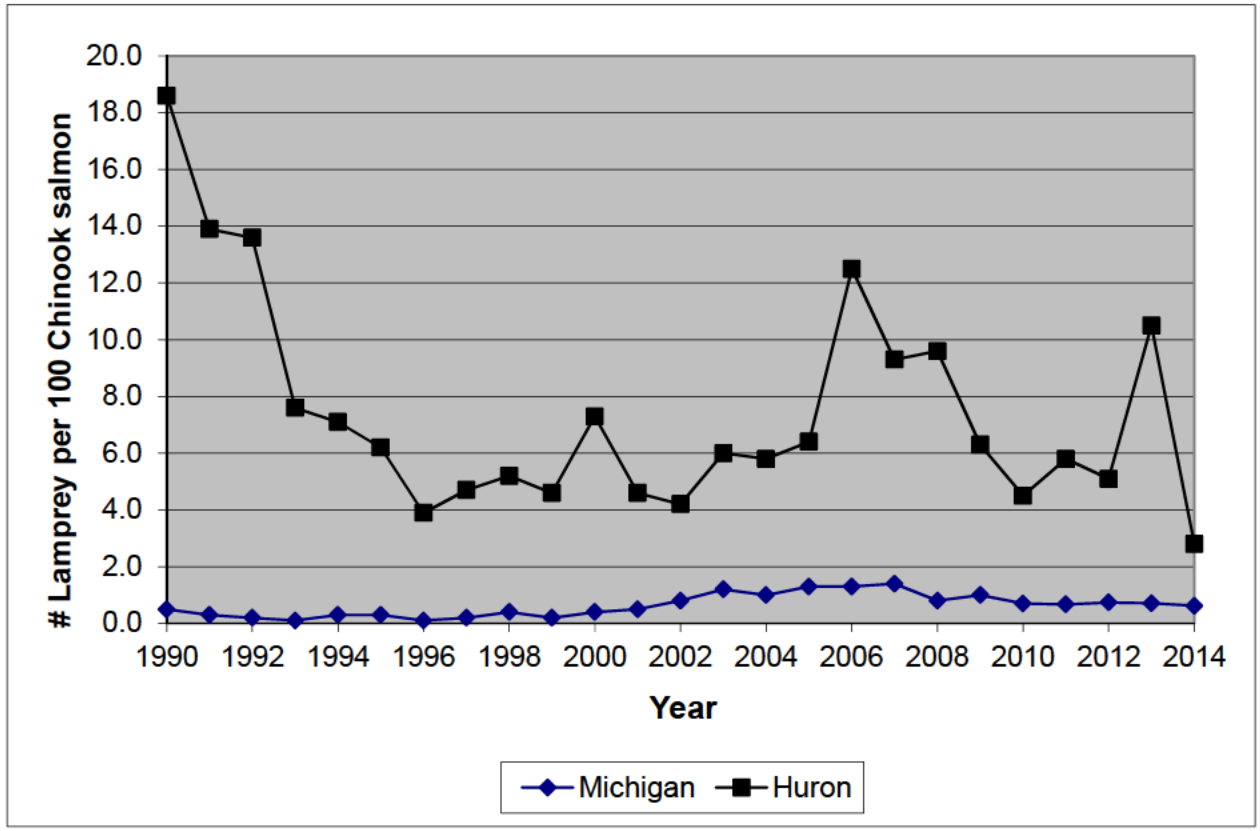

Figure 12.—Sea lamprey incidence (number attached per 100 fish) on lake trout harvested by charter anglers on lakes Michigan, Huron, and Superior, 1990-2014

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
2014	0.5	1.4	1.9