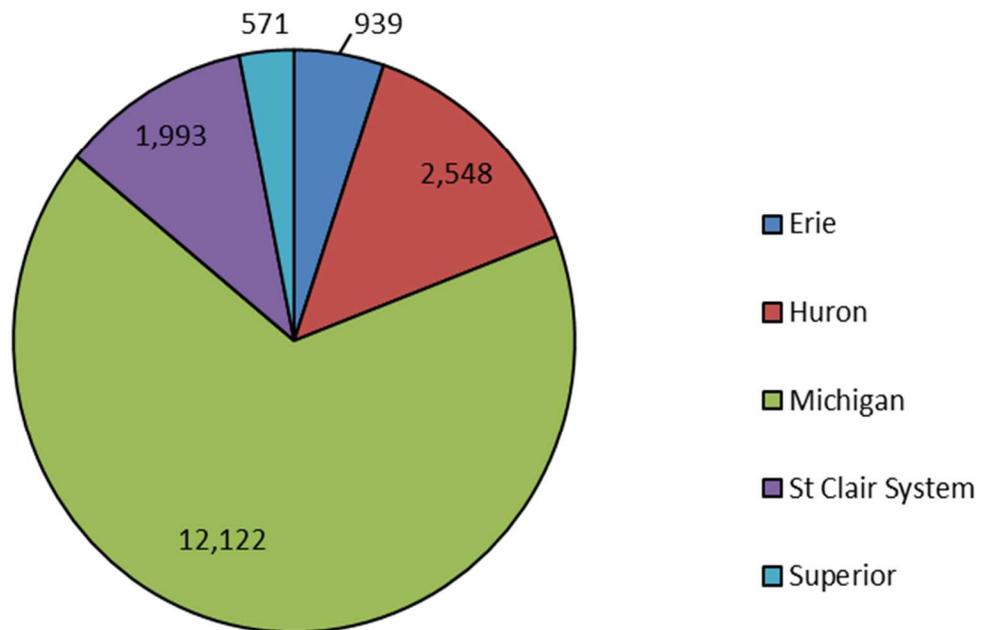


# Charter Boat Catch and Effort from the Michigan Waters of the Great Lakes, 2017

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## 2017 Charter Excursions by Lake - Total 18,173



Michigan Department of Natural Resources  
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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 any charter fishing season, it is common for new charter boats and operators to enter into the charter business while some others will depart. Michigan Department of Natural Resources (DNR) Charlevoix Fisheries Research Station personnel coordinate with DNR Law Enforcement Division (LED) district personnel to acquire charter boat inspection renewals and new charter boat applicant information. Charlevoix Fisheries Research Station personnel review the current completed applications to identify and add operators who were absent from the prior year's charter reporting database. At the end of the 2017 charter fishing year, there were 611 boats (operated by 538 businesses) in the charter reporting database. While this is a decrease of 16 boats and 13 businesses for the 2017 year, the numbers of boats and businesses are similar the 613 charter boats and 537 businesses reporting at the end of 2015.

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 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 or April 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 LED'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. In 2016 Charlevoix Fisheries Research Station personnel coordinated with Michigan Department of Technology, Management, and Budget (DTMB) to implement two modifications to the password functions of the online reporting system: 1) password criteria were modified to make end user password selection more intuitive and allow for more diverse password selection, and 2) a reset function was added to allow end users to reset their own password. These changes were implemented in May 2016. 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 2017 reporting season, 51% of the operators (272) reporting for 309 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 or

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.

Most 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 this reason, operators must submit a report – whether they had completed fishing trips for the month. 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 notices 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 current year 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 LED 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., charter 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 or groups of species for each fishing trip. Fishing target and effort are still summarized for the salmonines as a group, while trips which target all other reported species are specific to the species, i.e. the percids + group is now separated so charter operators can record targeted fishing for walleye, yellow perch, smallmouth bass, musky, and other category. 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 is generally lowest during the early season fishing months, increases by mid-season, with greatest compliance in months at the end of the fishing season. In 2016, Charlevoix Fisheries Research Station personnel initiated a new process which involved coordinating with DNR LED; the goal was to increase compliance during the fishing season. Each month (June through September), Charlevoix Fisheries Research Station personnel provided DNR LED a current listing of charter operators who were delinquent on reports. DNR LED district conservation officers and support staff contacted the charter operators in person or via phone and requested the operator submit monthly reports. The added interaction between DNR LED and charter operators increased monthly reporting compliance during the summer months to the end of 2016; this process was again used in 2017 and resulted in increased compliance for the 2017 reporting year. During the 2017 fishing season, when averaged over all

reporting months, 84% 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 2017 was 5% greater than in 2016. In December 2017, at the time of sending final notification letters for one or more delinquent reports, 94% of the operators/boats were in compliance; this compliance rate was 5% greater than in 2016.

The percent of delinquent operators at the time of final notification had been consistently 20 percent or greater for numerous years. Starting with January 2013 and each subsequent January, Charlevoix Fisheries Research Station personnel coordinated with DNR LED to identify reasons for noncompliance and provided DNR LED a final 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 reporting compliance. By mid-January 2018, 100% of all charter operators had complied with the law. In comparison, final compliance for the 2011 season (for example), in which there had been minimal 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 select tributaries.

#### *Fishing effort*

In 2017, charter anglers participated in 18,173 charter excursions on the Michigan waters of Lakes Michigan, Huron, Erie, Superior, and the St. Clair system, including major tributaries (Tables 1-6). When compared to 2016, there were 806 more excursions (5%

increase). Excursions on Lake Michigan increased 3%, from 11,791 (2016) to 12,122 (2017); excursions on Lake Huron increased 18%, from 2,154 (2016) to 2,548 (2017); Lake Superior excursions decreased 7%, from 616 (2016) to 571 (2017); Lake Erie excursions decreased 5%, from 987 (2016) to 939 (2017); and excursions on the St. Clair system increased 10%, from 1,819 (2016) to 1,993 (2017).

The distribution of charter fishing excursions in 2017 by lake was: 67% Lake Michigan, 14% Lake Huron, 11% St. Clair System, 5% Lake Erie, and 3% Lake Superior. Lake Michigan excursions decreased 1%; excursions on Lake Huron increased 2% and excursions on the St. Clair System increased 1%; excursions on Lake Superior and Lake Erie each decreased 1% in comparison to 2016. Reported excursions on the St. Clair system increased starting in 2010 (compared to years prior) primarily due to the addition of catch-and-release charter fishing data collection.

A total of 400,450 hours was spent fishing by 71,951 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 each increased 2% compared to 2016 even though there were thirteen fewer charter businesses reporting by the end of the 2017 season (538 in 2017 vs 551 in 2016). Based on charter operators' comments, bad and windy weather during some months continued to be a reason for some canceled excursions in 2017, as in 2016 through 2010. Charter businesses on Lake Superior submitted comments that the new fishing access in the Porcupine Mountain State Park was getting use, and some captains would prefer a Lake trout bag limit of 3 instead of the current bag limit of 5 for the area around Shelter Bay. Operators on Lake Michigan submitted comments that they were seeing bait fish, they were catching lots of Coho in various ports, many captains indicated they were still relying mostly on lake trout, many commented on the continued decreases in the number of Chinook salmon being caught but those that were caught were healthy and of good size. Lake Huron captains commented on how a few times during

the year the wind and water temps adversely affected walleye fishing in Saginaw Bay. There were more captains commenting on catching Atlantic salmon in various ports, operators were still releasing small walleye in Saginaw Bay, and a Yellow perch fishery was starting back up in Saginaw Bay.

Comments from captains fishing Lake Erie indicated walleye fishing in the Detroit River and Lake Erie was very good during the spring and early summer with lots of undersized walleye being released and that there was a yellow perch fishery. St. Clair System captains commented on a decrease in both smallmouth bass and musky catches, some operators were catching Atlantic salmon, and those chartering for lake sturgeon were successful.

Even with the numerous reasons some charter operators provided as to why they weren't catching fish or taking customers out fishing in 2017, the charter industry remained stable and is fully recovered from the 2009 charter fishing season (when a 22% decrease in effort and the lowest reported excursions in the entire data series were recorded) (Table 6).

### *Harvest*

Both total and targeted harvest numbers by species are included in this report. Charter operators reported a total of 218,581 fish harvested from the Michigan waters of the Great Lakes and its major tributaries in 2017 (Tables 1-5); this is a 22% increase compared to the 2016 total harvest (179,538). Most of these fish were harvested from Lake Michigan (46%), followed by Lake Erie (24%), Lake Huron (17%), the St. Clair system (10%), and Lake Superior (2%). In comparison to 2016 percent total harvest per lake, total harvest increased on Lake Huron (1%) and the St. Clair System (2%), while Lake Erie harvest decreased (1%), Lake Michigan and Lake Superior had less than 1% decrease in fish harvest.

Historically, the most abundant species in the charter harvest had been yellow perch; however, over the years of this data series (1990-present), the number of Chinook salmon harvested increased as harvest of yellow perch decreased. In the years 2003-2014, Chinook

salmon was the most abundant species in the harvest, but that ended with the 2015 charter fishing season when lake trout was the most abundant species harvested. In 2017, for the third year in a row, lake trout was again the most harvested species, accounting for 25% (55,363 fish) of the total harvest (a 6% decrease compared to 31% in 2016). The decrease in Chinook salmon harvest over the period 2013-2016 resulted in increased targeting of lake trout and other salmonines in locations where more than one salmonine can be the target species for the excursion. Chinook salmon accounted for 12% (25,268 fish) of total harvest in 2017, a decrease of 1% compared to 2016 (13%) and decrease of 35% when compared to 2012 (47%) percent total harvest, when Chinook salmon harvest (88,943 fish) was greatest for this data series. However, even though the percent of Chinook salmon in the 2017 harvest decreased, the actual number of Chinook salmon harvest increased by 2,804 fish (25,268 fish in 2017 vs 22,464 fish in 2016). There was another factor affecting the percent of harvested Chinook salmon and lake trout in 2017 - coho salmon. Coho salmon is a desirable sport fish and they were caught in good numbers at various ports in Lake Michigan. Percent of total harvest of coho salmon was 11% in 2017, a 6% increase when compared to 2016. Percent of total harvest for other species were as follows: walleye 24%, yellow perch 23%, rainbow trout 3%, 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, lake herring (cisco), Atlantic salmon, pink salmon, splake, carp, and freshwater drum.

Total harvest numbers of fish (all lakes combined) in 2017 increased for coho salmon, Chinook salmon, yellow perch, and walleye, and; lake trout, brown trout, rainbow trout, and smallmouth bass harvest decreased. Total fish harvest numbers in 2017 were: 55,363 lake trout, 51,547 walleye, 50,768 yellow perch, 25,268

Chinook salmon, 23,202 coho salmon, 6,926 rainbow trout, 780 smallmouth bass, and 373 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 2017 was 111,132 fish, which is a 17% increase (16,154 fish) from 2016 harvest (94,978). The increase was predominantly due to increased coho salmon harvest.

In general, species categorized as "other" are not differentiated in the charter reporting data. In 2006, harvest for 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. Additional 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. In 2017, charter anglers caught 21,768 smallmouth bass of which they released 20,988 (96%) and harvested 780; this is a 4% increase from the 2016 catch of 20,878 fish. Catch of muskellunge in 2017 was 874 fish and all but 7 fish were released. This is a 39% decrease in comparison to the 1,429 muskellunge caught in 2016. 15,628 total 'other' fish were caught in 2017; 4,347 were harvested and 11,281 released (Tables 1-5).

#### *Harvest rates*

In 2017, charter anglers harvested 0.55 fish (all species from all lakes combined) per hour; an increase in comparison to 2016 (0.46 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 2017 targeted the various species of salmonines (13,446 excursions which is 74%). Comparing targeted harvest rates (fish per angler hour) to 2016 data, Lake Michigan angler harvest rates increased for coho salmon and Chinook salmon, harvest rates were stable for lake trout and brown trout, and harvest rates decreased for rainbow trout (steelhead) (Figures 3-7). The targeted harvest rate reported in 2017 for Chinook salmon in Lake Michigan (0.09 fish per angler hour) is a 12.5% increase compared to the 2016 rate of 0.8 fish per angler hour. The decreased harvest of Chinook salmon on Lake Michigan in recent years has charter captains continuing to harvest other salmonine species including coho salmon and lake trout. Coho salmon were obtainable in Lake Michigan in 2017 which resulted in a 158% increase in the targeted harvest rate; from 0.033 per angler hour in 2016 to 0.085 per angler hour in 2017. The targeted harvest rate for lake trout in 2017 was 0.16 fish per angler hour, which is unchanged from 2016 thus extending the highest harvest rate reported in the data series (1990-2017) (Figure 4).

Targeted harvest rates (fish per angler hour) on Lake Huron in 2017 when compared to 2016 increased for coho salmon (0.006 fish per angler hour), walleye (0.889 fish per angler hour), and yellow perch (2.45 fish per angler hour); rates were unchanged for Chinook salmon (0.03 fish per angler hour) and lake trout (0.36 fish per angler hour) while the harvest rates decreased for rainbow trout (0.019 fish per angler hour) and brown trout fishing was insignificant (Figures 3-8).

The decline in the alewife population in Lake Huron in the early 2000s gave rise to favorable conditions for the increase of the walleye population in Saginaw Bay. New walleye harvest regulations were implemented in late 2015 for Saginaw Bay; the daily possession limit increased from 5 to 8 fish per day, while the minimum size limit decreased from 15 inches to 13 inches; the regulations remained in

effect for 2017. The harvest rate for walleye increased by 32% for 2017 (0.89 fish per angler hour) when compared to 2016 (0.67 fish per angler hour) and is up 45% when compared to 2015 (0.61 fish per angler hour) (Figure 8). One anticipated effect of the increased walleye bag limit is to promote the yellow perch population in Saginaw Bay. 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 effect 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 a lake. For Lake Huron, the targeted harvest rate for yellow perch increased for the fourth consecutive year to 2.15 fish per angler hour in 2017, a 5% increase in comparison to the 2016 rate of 2.05 fish per angler hour (Figure 8).

Lake trout continues to be the most important salmonine in the charter harvest from Lake Superior. Compared to 2017, the targeted harvest rate for lake trout decreased 2.5% from 0.36 to 0.35 fish per angler hour (Figure 4). The four remaining salmonids (Chinook salmon, coho salmon, rainbow trout, and brown trout), combined, make up a small portion (12%) of the total targeted Lake Superior salmonine harvest (5,259 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 2017. Targeted harvest rates for walleye on Lake Erie decreased for the first time in the last three years; 0.83 fish per angler hour for 2017 in comparison to 0.86 fish per angler hour in 2016 (Figure 9). In 2017, targeted harvest rates increased 44% for walleye in the St. Clair system (0.77 fish per angler hour), in comparison to 2016 (0.53 fish per angler hour)

(Figure 10). The changes enacted in 2010 to the reporting requirements to record the target species (or fish group) for each fishing trip, is again evident in yellow perch harvest rates for Lake Erie and the St. Clair System. The targeted harvest rate for yellow perch for Lake Erie was 6.28 fish per angler hour in 2017, a 14% decrease from the 2016 rate of 7.32 fish per angler hour, but still the second highest rate reported in the 28 years of collecting data (Figure 9). For the St. Clair System, the targeted harvest rate for yellow perch was 2.2 fish per angler hour in 2017, a decrease of 10% compared to 2016 (2.45 fish per angler hour) (Figure 10). One factor affecting species harvest rates in a waterbody such as the St. Clair System can be the availability of another desired fish species during the excursion; anglers are sometimes able to fish for more than one fish species in the same excursion. While this factor could have affected the yellow perch angler harvest rate in 2017, a more likely reason is that angler hours per excursion increased in comparison to 2016.

#### *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 generally not harvested. Catch rates on the St. Clair system for smallmouth bass decreased by 3% in 2017 (25.9 fish per excursion) compared to 2016 (26.8 fish per excursion); catch rates for musky declined 24% (2.7 fish per excursion) compared to 2016 (3.5 fish per excursion) (Table 4). Targeted catch rate for smallmouth bass per excursion was 20.2 fish on Lake Michigan (Table 1), an increase of 20% in comparison to 2016 (16.9 fish per excursion).

### *Sea Lamprey Incidence*

For 2017, sea lamprey incidence on Chinook salmon increased in Lake Michigan and Lake Huron, compared to 2016 levels. Lake Michigan incidence was 0.5 lampreys attached per 100 Chinook salmon. Lake Huron incidence was 5.8 lampreys attached per 100 Chinook salmon (Figure 11).

The occurrence of lamprey on lake trout in Lake Superior (0.9 lamprey/100 lake trout) decreased compared to 2016 (1.1 lamprey/100 lake trout). In 2017, as with Chinook salmon, the occurrence of lamprey increased on lake trout in Lake Michigan and Lake Huron. Lake Michigan incidence was 0.19 lampreys attached per 100 lake trout compared to 0.15 lamprey/100 lake trout in 2016; but this is still the second lowest level reported in the 28 years of collecting data. The occurrence of lamprey on lake trout in Lake Huron (1.03 lamprey/100 lake trout) increased compared to 0.81 lamprey/100 lake trout in 2016 and, like the rates for lampreys in Lake Michigan, is the second lowest level reported in the data series (1990-2017) (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: 'I will Be - Fishing' link, then under the "Where to Fish" section' click the 'Charter Fishing' link. Links to individual reports and port data will be found in the section titled, "How is the data used?".

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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, 2017. 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 Harvest/year released/year	TOTAL (target+non-target) Harvest/year released/year
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
0.085	1.951	Coho salmon	0	0	284	1,753	6,226	3,614	3,733	5,406	1,555	34	0	0	22,605	22,607
0.086	1.966	released	0	0	3	33	85	12	10	16	10	5	0	0	174	174
0.093	2.124	Chinook salmon	0	0	66	68	3,376	1,362	5,833	12,122	1,656	119	0	0	24,602	24,603
0.095	2.178	released	0	0	0	14	191	69	46	43	45	219	0	0	627	629
0.024	0.547	Rainbow trout	89	230	485	137	299	659	2,092	989	172	344	536	306	6,338	6,369
0.027	0.625	released	14	36	121	233	68	30	13	8	5	92	181	104	905	909
0.001	0.027	Brown trout	1	7	34	34	41	41	71	67	15	0	3	3	317	317
0.003	0.070	released	0	1	20	149	63	91	25	87	6	32	23	1	498	500
0.157	3.597	Lake trout	0	0	36	1,173	2,787	6,276	14,955	10,786	5,458	180	11	0	41,662	41,684
0.165	3.759	released	0	0	0	16	170	422	680	482	84	26	0	0	1,880	1,900
1.364	85.786	Yellow perch	0	0	0	318	0	0	260	1,687	105	32	0	0	2,402	2,490
1.428	89.786	released	0	0	0	21	0	0	37	54	0	0	0	0	112	217
0.205	3.667	Walleye	17	26	3	1	71	76	68	170	154	18	41	37	682	719
0.412	7.355	released	18	63	9	1	67	104	128	119	69	24	45	39	686	755
0.002	0.021	Smallmouth Bass	0	0	0	0	0	0	0	0	0	5	0	0	5	20
1.527	20.218	released	0	0	0	0	163	1,220	1,658	1,063	402	220	0	0	4,726	5,136
		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
0.177	2.311	Other	0	0	0	0	127	25	38	0	8	10	0	0	208	1,622
0.363	4.733	released	0	0	0	0	23	64	46	60	0	25	0	0	218	574
		Lamprey on:														
		Chinook salmon	0	0	0	1	17	3	30	65	4	0	0	0	120	120
		Lake trout	0	0	0	0	2	9	25	30	13	0	0	0	79	79
		Total angler hours	507	1,418	3,342	6,120	23,644	30,970	72,922	90,933	32,689	4,625	4,578	2,130		273,878
		Total anglers	70	197	491	1,118	4,191	5,712	13,548	16,615	6,038	702	648	318		49,648
		Total excursions	26	73	185	291	995	1,395	3,177	3,874	1,478	259	254	115		12,122

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, 2017. 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 Harvest/year released/year	TOTAL (target+non-target) Harvest/year released/year
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
0.006	0.106	Coho salmon	0	0	0	6	7	15	49	29	24	7	0	0	137	138
0.006	0.113	released	0	0	0	1	0	8	0	0	0	0	0	0	9	10
0.025	0.475	Chinook salmon	0	0	0	3	14	81	316	127	62	8	1	0	612	617
0.025	0.476	released	0	0	0	0	0	0	0	0	0	1	0	0	1	1
0.019	0.366	Rainbow trout	0	0	18	27	16	67	167	103	55	16	3	0	472	486
0.024	0.465	released	0	0	0	1	0	69	26	3	0	29	0	0	128	131
0.000	0.009	Brown trout	0	0	0	0	1	5	5	0	0	0	0	0	11	13
0.001	0.024	released	0	0	0	0	1	1	2	0	0	6	10	0	20	20
0.364	6.964	Lake trout	0	0	0	92	869	1,662	2,768	2,279	1,306	0	0	0	8,976	9,032
0.386	7.377	released	0	0	0	0	63	210	25	98	53	71	13	0	533	539
2.450	50.037	Yellow perch	0	0	0	157	18	31	540	330	440	1,186	0	0	2,702	3,470
3.257	66.519	released	0	0	0	0	87	0	10	21	151	621	0	0	890	947
0.889	18.728	Walleye	0	0	0	22	1,475	8,167	9,021	2,485	614	130	256	116	22,286	22,862
1.192	25.125	released	0	0	0	0	546	3,877	2,171	401	59	14	225	320	7,613	7,634
0.034	0.625	Smallmouth Bass	0	0	0	0	5	0	0	0	0	0	0	0	5	52
0.966	17.625	released	0	0	0	0	105	31	0	0	0	0	0	0	136	325
0.000	0.000	Musky	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.057	2.000	released	0	0	0	0	0	0	0	0	0	2	0	0	2	2
0.383	7.667	Other	0	0	0	0	0	0	46	0	0	0	0	0	46	775
0.742	14.833	released	0	0	0	0	6	17	7	0	10	3	0	0	43	2,003
		Lamprey on:														
		Chinook salmon	0	0	0	0	2	0	21	9	4	0	0	0	36	36
		Lake trout	0	0	0	0	8	10	27	37	9	2	0	0	93	93
		Total angler hours	0	0	84	622	4,281	13,466	18,014	9,531	3,720	1,042	267	106		51,133
		Total anglers	0	0	12	117	768	2,450	3,275	1,757	704	173	46	18		9,320
		Total excursions	0	0	6	39	219	672	864	468	201	60	14	5		2,548

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, 2017. 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 Harvest/year released/year	TOTAL (target+non-target) Harvest/year released/year	
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
		Coho salmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		released	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Chinook salmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		released	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Rainbow trout	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		released	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Brown trout	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		released	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
		released	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.279	149.163	Yellow perch	0	0	0	0	0	224	2,298	7,950	20,958	8,710	134	0	40,274	41,569	
6.505	154.537	released	0	0	0	0	0	15	97	322	582	435	0	1,451	1,662		
0.825	17.701	Walleye	0	0	0	1,122	2,310	6,075	1,961	162	5	0	30	0	11,665	11,698	
1.735	37.243	released	0	0	0	1,138	2,819	6,745	2,096	79	0	0	1	12,878	13,459		
0.000	0.000	Smallmouth Bass	0	0	0	0	0	0	0	0	0	0	0	0	0	25	
1.857	40.857	released	0	0	0	0	0	267	0	0	19	0	0	286	352		
		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	15	
0.556	10.000	Other	0	0	0	0	6	24	0	0	0	0	0	30	91		
2.944	53.000	released	0	0	0	50	29	50	0	0	0	0	0	129	3,142		
		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	1,582	2,893	7,114	2,917	1,846	3,233	1,125	57	0		20,767	
		Total anglers	0	0	0	273	518	1,381	555	340	602	216	9	0		3,894	
		Total excursions	0	0	0	82	132	324	138	74	139	47	3	0		939	

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 of the St. Clair System (Lake St. Clair, St. Clair River, and Detroit River), 2017. 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 Harvest/year released/year	TOTAL (target+non-target) Harvest/year released/year	
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
		Coho salmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
		released	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.042	0.333	Chinook salmon	0	0	0	0	0	2	0	0	0	0	0	0	2	4	
0.042	0.333	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	
2.203	49.315	Yellow perch	0	0	0	0	114	0	134	267	1,183	965	0	0	2,663	3,227	
3.497	78.296	released	0	0	0	0	0	0	98	111	620	736	0	0	1,565	1,908	
0.766	15.883	Walleye	0	0	0	7,344	4,765	2,125	756	534	221	179	70	0	15,994	16,268	
1.116	23.120	released	0	0	0	2,790	2,936	914	480	124	23	14	7	0	7,288	7,445	
0.027	0.549	Smallmouth Bass	0	0	0	0	26	5	109	122	48	0	0	0	310	683	
1.281	25.929	released	0	0	0	275	2,915	3,793	2,905	2,168	1,166	1,082	36	0	14,340	15,170	
0.001	0.024	Musky	0	0	0	0	0	0	0	7	0	0	0	0	7	7	
0.116	2.653	released	0	0	0	0	0	150	165	160	119	101	70	0	765	850	
1.210	19.500	Other	0	0	0	0	890	475	0	0	0	0	0	0	1,365	1,829	
4.015	64.700	released	0	0	0	0	2,359	675	4	17	74	35	0	0	3,164	5,407	
		Lamprey on:															
		Chinook salmon	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
		Lake trout	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
		Total angler hours	0	0	0	10,697	8,081	6,620	4,706	4,560	3,357	2,432	894	24		41,371	
		Total anglers	0	0	0	1,914	1,455	1,070	734	655	522	380	113	3		6,846	
		Total excursions	0	0	0	479	417	333	235	202	166	119	41	1		1,993	

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, 2017. 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 Harvest/year released/year	TOTAL (target+non-target) Harvest/year released/year
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
0.034	0.802	Coho salmon	0	0	0	0	64	86	114	145	46	0	0	0	455	455
0.036	0.848	released	0	0	0	0	3	0	5	18	0	0	0	0	26	26
0.003	0.078	Chinook salmon	0	0	0	0	2	12	9	16	5	0	0	0	44	44
0.003	0.078	released	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.005	0.123	Rainbow trout	0	0	0	0	4	31	17	13	4	1	0	0	70	70
0.006	0.150	released	0	0	0	1	9	2	0	3	0	0	0	0	15	15
0.003	0.076	Brown trout	0	0	0	0	1	26	11	4	1	0	0	0	43	43
0.004	0.104	released	0	0	0	0	6	2	3	3	2	0	0	0	16	16
0.352	8.196	Lake trout	0	0	0	0	112	1,217	1,529	1,342	433	14	0	0	4,647	4,647
0.451	10.510	released	0	0	0	72	96	294	413	320	102	15	0	0	1,312	1,312
		Yellow perch	0	0	0	0	0	0	0	0	0	0	0	0	0	12
		released	0	0	0	0	0	0	0	0	0	0	0	0	0	4
		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
0.000	0.000	Smallmouth Bass	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.208	5.000	released	0	0	0	0	0	0	5	0	0	0	0	0	5	5
		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
0.106	2.333	Other	0	0	0	0	0	0	0	0	0	7	0	0	7	30
0.364	8.000	released	0	0	0	0	0	0	0	0	0	17	0	0	17	155
		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	10	11	20	0	1	0	0	42	42
		Total angler hours	0	0	0	152	633	3,183	4,295	3,608	1,246	184	0	0		13,301
		Total anglers	0	0	0	19	108	516	734	595	238	33	0	0		2,243
		Total excursions	0	0	0	8	35	119	185	148	66	10	0	0		571

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 2004-2017.

Year	Lake					Total Excursions
	Michigan	Huron	Erie	St. Clair System	Superior	
1990	13,467	4,010	1,684	779	755	20,695
1991	13,604	3,442	1,445	643	791	19,925
1992	10,995	2,521	1,679	509	743	16,447
1993	10,298	2,307	1,881	414	618	15,518
1994	10,116	2,182	1,661	299	455	14,713
1995	9,996	2,599	1,781	336	515	15,227
1996	10,344	2,592	1,775	407	524	15,642
1997	10,627	2,684	1,727	394	497	15,929
1998	12,333	3,210	1,679	432	517	18,171
1999	11,382	3,123	2,380	389	607	17,881
2000	11,714	2,760	1,836	348	482	17,140
2001	11,224	2,867	1,947	433	477	16,948
2002	11,924	2,874	1,870	246	430	17,344
2003	12,094	2,771	1,695	466	505	17,531
2004	11,966	2,622	718	339	455	16,100
2005	12,526	2,085	694	319	479	16,103
2006	12,064	1,765	1,554	366	398	16,147
2007	12,704	1,537	1,039	493	359	16,132
2008	11,326	1,345	870	440	245	14,226
2009	9,750	1,470	689	425	244	12,578
2010	10,204	1,446	738	719	374	13,481
2011	10,834	1,399	698	831	382	14,144
2012	12,236	1,594	813	867	411	15,921
2013	11,925	1,533	696	1,071	422	15,647
2014	12,193	1,610	702	1,152	493	16,150
2015	12,758	1,756	638	1,460	633	17,245
2016	11,791	2,154	987	1,819	616	17,367
2017	12,122	2,548	939	1,993	571	18,173

Figure 1.—Total number of charter anglers (trips) on the Michigan waters of the Great Lakes (including tributaries), 1990-2017.

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
2015	68,856
2016	70,235
2017	71,951

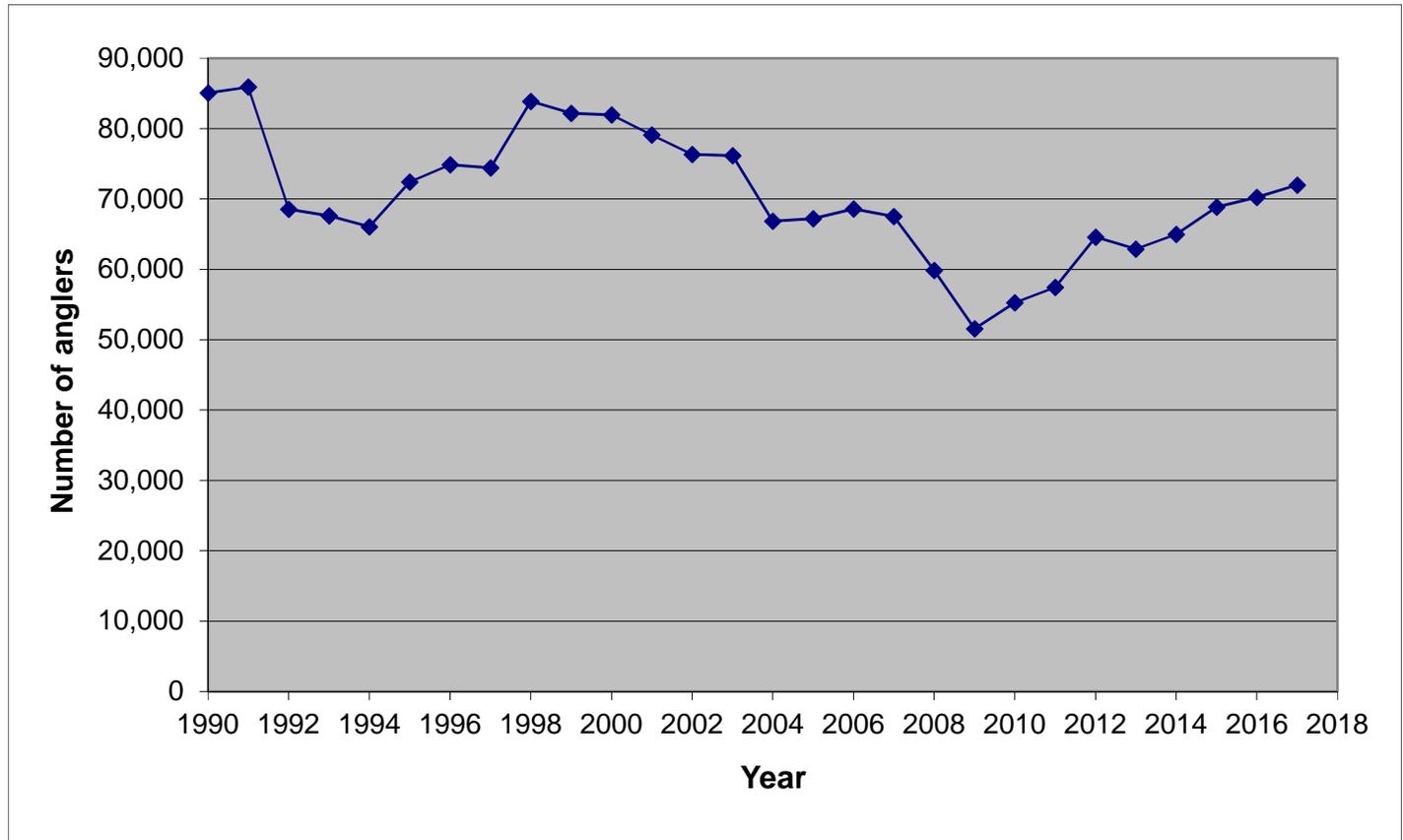


Figure 2(a).—Total number of charter anglers (trips) on the Michigan waters of Lake Michigan and Lake Huron (including tributaries), 1990-2017.

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
2015	52,133	6,486
2016	49,480	8,070
2017	49,648	9,320

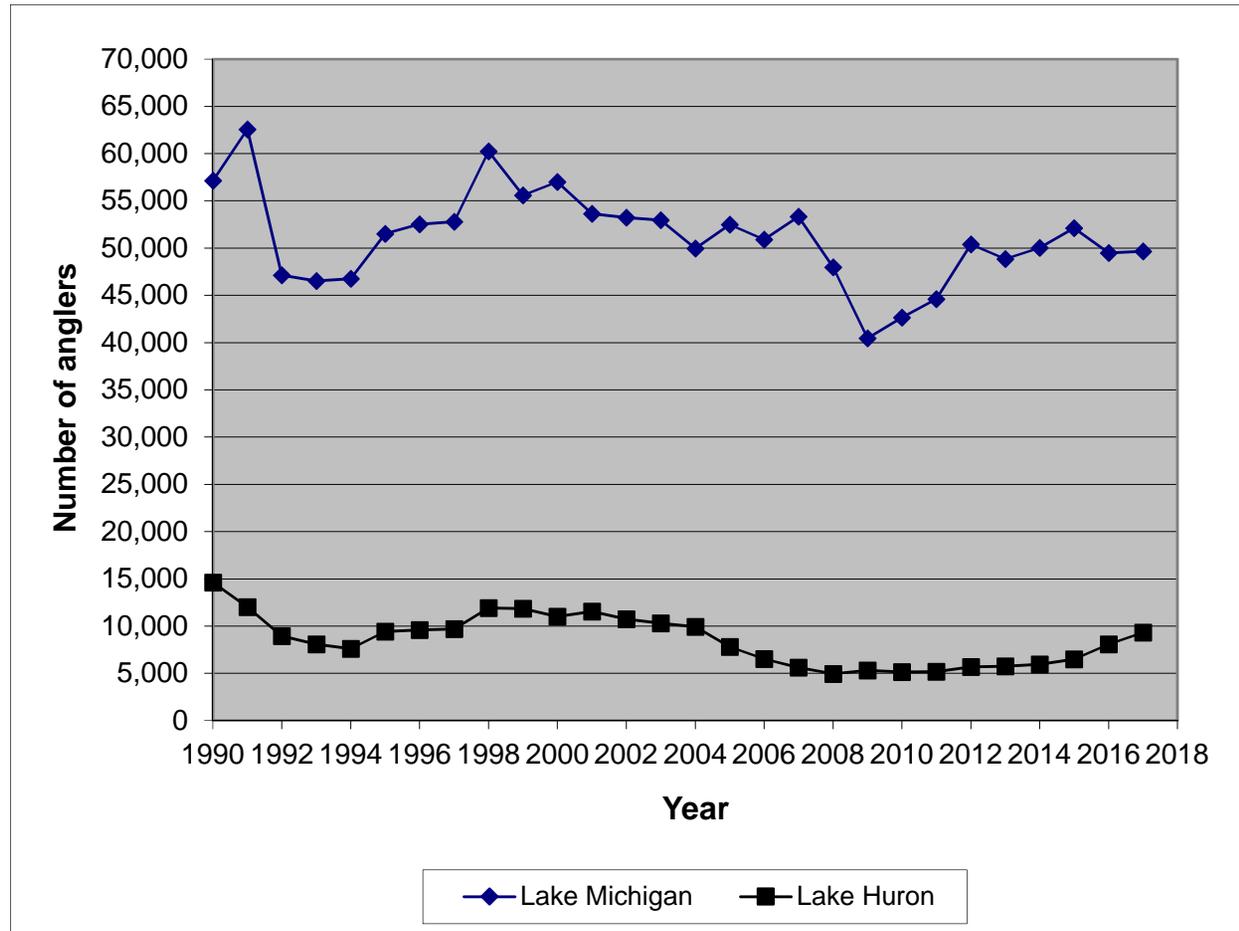


Figure 2 (b).—Total number of charter anglers (trips) on the Michigan waters of Lake Erie, Lake Superior, and the St. Clair System, 1990-2017.

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
2015	2,623	2,562	5,052
2016	4,178	2,410	6,097
2017	3,894	2,243	6,846

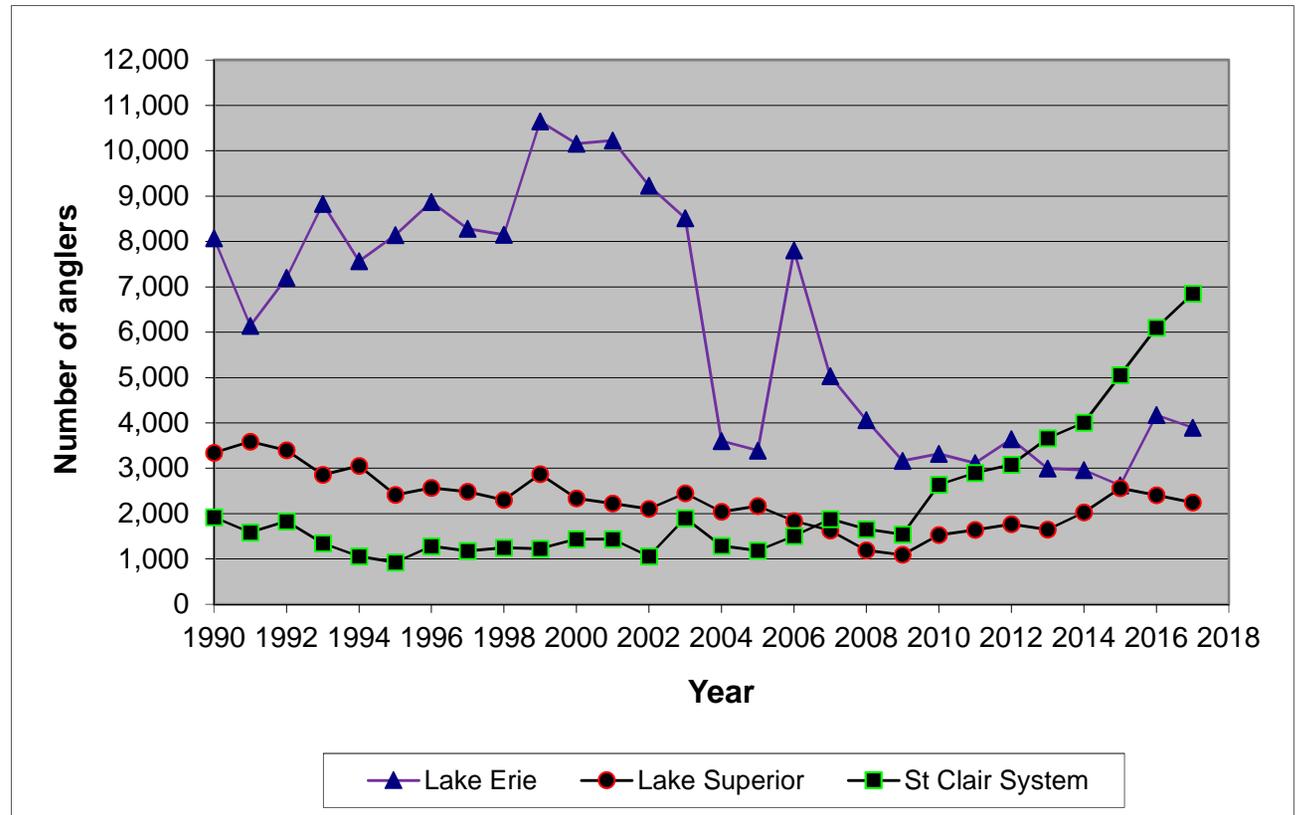


Figure 3. - Charter angler targeted harvest rates (fish per angler hour) for Chinook salmon (CHS) on Lake Michigan and Lake Huron, 1990-2017.

Year	Lake Michigan	Lake Huron
1990	0.07	0.07
1991	0.08	0.08
1992	0.05	0.08
1993	0.04	0.09
1994	0.04	0.10
1995	0.06	0.14
1996	0.10	0.14
1997	0.11	0.21
1998	0.09	0.19
1999	0.10	0.19
2000	0.13	0.15
2001	0.12	0.15
2002	0.17	0.21
2003	0.19	0.17
2004	0.25	0.13
2005	0.28	0.06
2006	0.29	0.07
2007	0.29	0.08
2008	0.25	0.07
2009	0.24	0.05
2010	0.25	0.04
2011	0.22	0.06
2012	0.32	0.09
2013	0.13	0.12
2014	0.14	0.04
2015	0.10	0.01
2016	0.08	0.03
2017	0.09	0.03

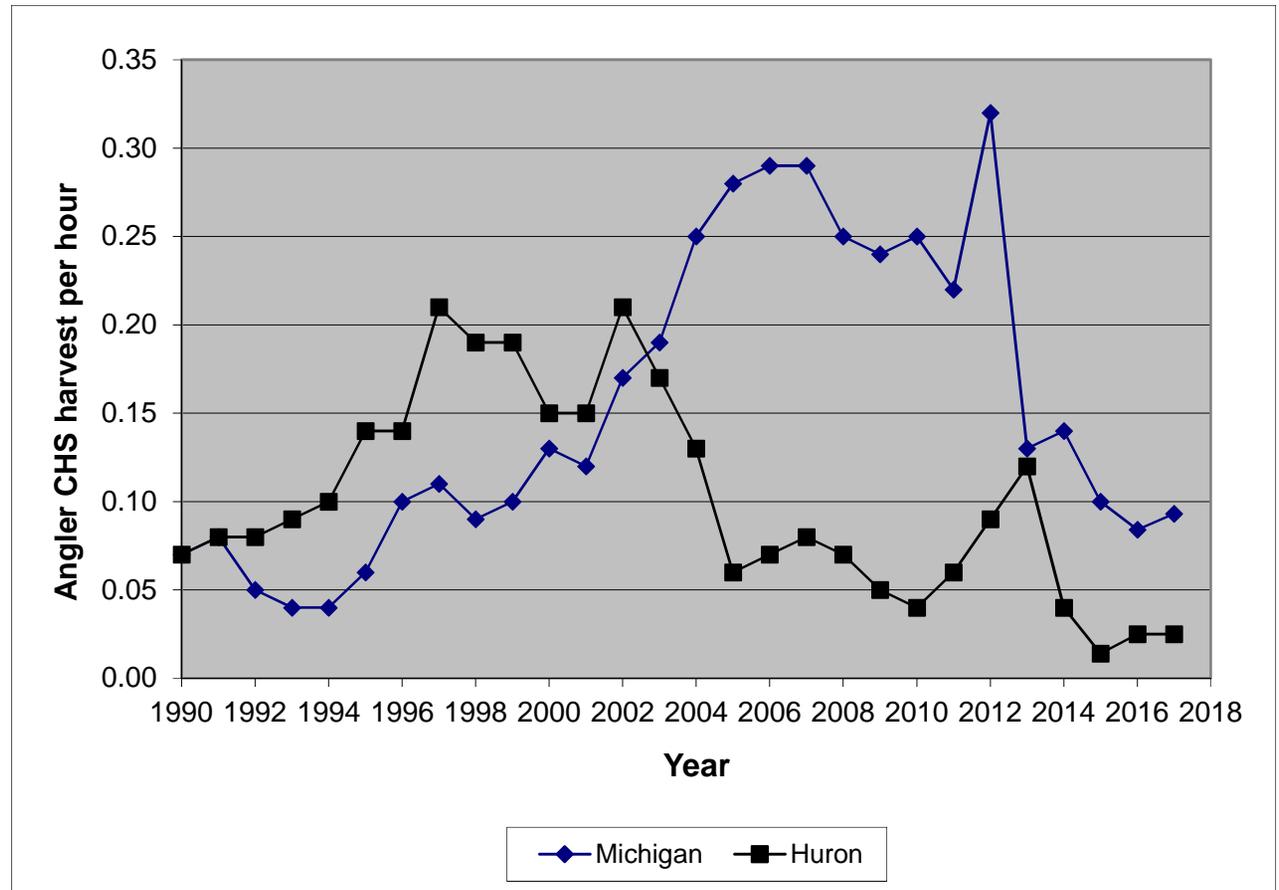


Figure 4. - Charter angler targeted harvest rates (fish per angler hour) for lake trout (LAT) on lakes Michigan, Huron, and Superior, 1990-2017

Year	Lake Michigan	Lake Huron	Lake Superior
1990	0.08	0.12	0.28
1991	0.10	0.11	0.28
1992	0.08	0.09	0.27
1993	0.10	0.05	0.29
1994	0.11	0.08	0.27
1995	0.12	0.08	0.26
1996	0.08	0.11	0.29
1997	0.08	0.11	0.27
1998	0.10	0.15	0.25
1999	0.07	0.14	0.26
2000	0.06	0.16	0.27
2001	0.05	0.13	0.30
2002	0.03	0.14	0.28
2003	0.03	0.22	0.27
2004	0.02	0.30	0.30
2005	0.02	0.30	0.30
2006	0.03	0.31	0.29
2007	0.04	0.28	0.29
2008	0.06	0.26	0.28
2009	0.06	0.31	0.29
2010	0.07	0.29	0.29
2011	0.08	0.23	0.33
2012	0.04	0.24	0.32
2013	0.08	0.20	0.31
2014	0.10	0.32	0.38
2015	0.15	0.43	0.34
2016	0.16	0.36	0.36
2017	0.16	0.36	0.35

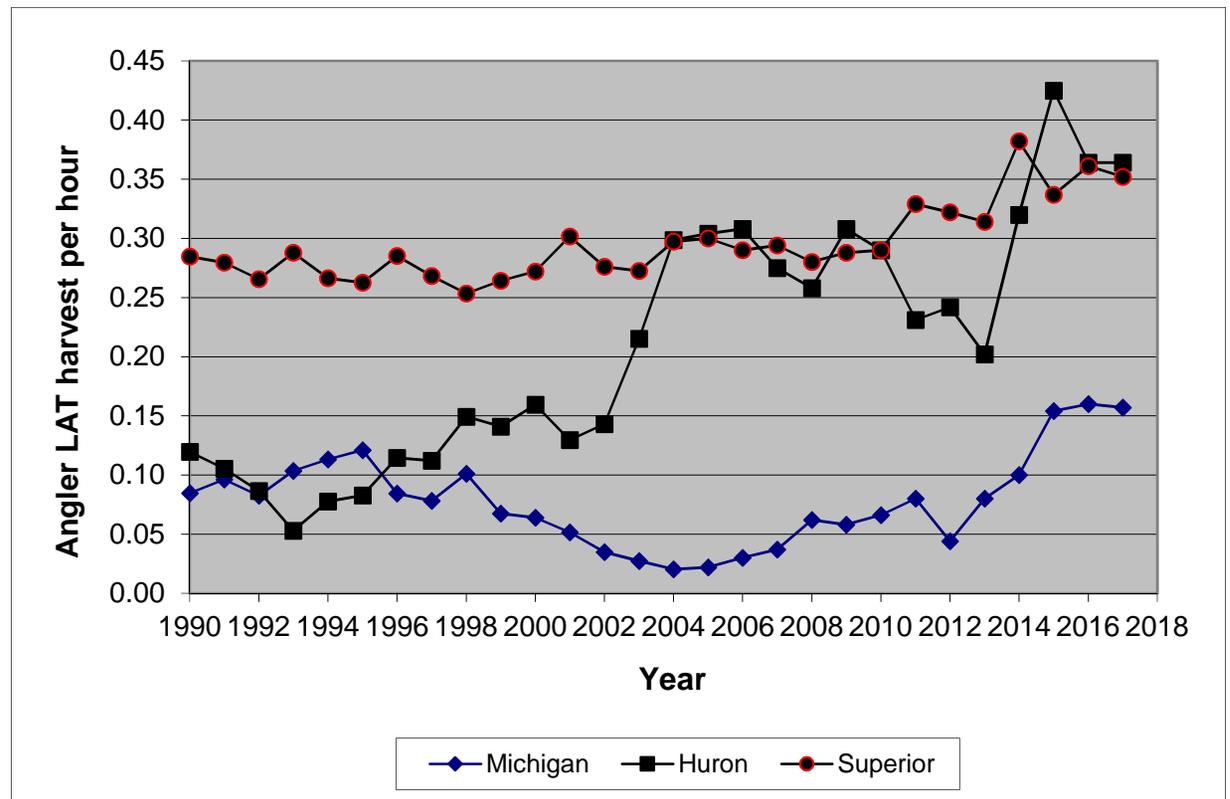


Figure 5.—Charter angler targeted harvest rates (fish per angler hour) for coho salmon (COS) on lakes Michigan, Huron, and Superior, 1990-2017.

Year	Lake Michigan	Lake Huron	Lake Superior
1990	0.04	0.00	0.01
1991	0.03	0.00	0.03
1992	0.04	0.00	0.01
1993	0.05	0.00	0.01
1994	0.03	0.00	0.01
1995	0.03	0.00	0.02
1996	0.03	0.00	0.02
1997	0.04	0.00	0.01
1998	0.05	0.00	0.01
1999	0.04	0.01	0.02
2000	0.06	0.01	0.01
2001	0.04	0.01	0.02
2002	0.05	0.02	0.02
2003	0.04	0.01	0.01
2004	0.03	0.00	0.01
2005	0.02	0.00	0.01
2006	0.02	0.01	0.01
2007	0.04	0.00	0.01
2008	0.02	0.01	0.02
2009	0.03	0.00	0.00
2010	0.02	0.00	0.03
2011	0.03	0.00	0.02
2012	0.04	0.01	0.02
2013	0.06	0.00	0.03
2014	0.03	0.00	0.01
2015	0.02	0.01	0.02
2016	0.03	0.00	0.03
2017	0.09	0.01	0.03

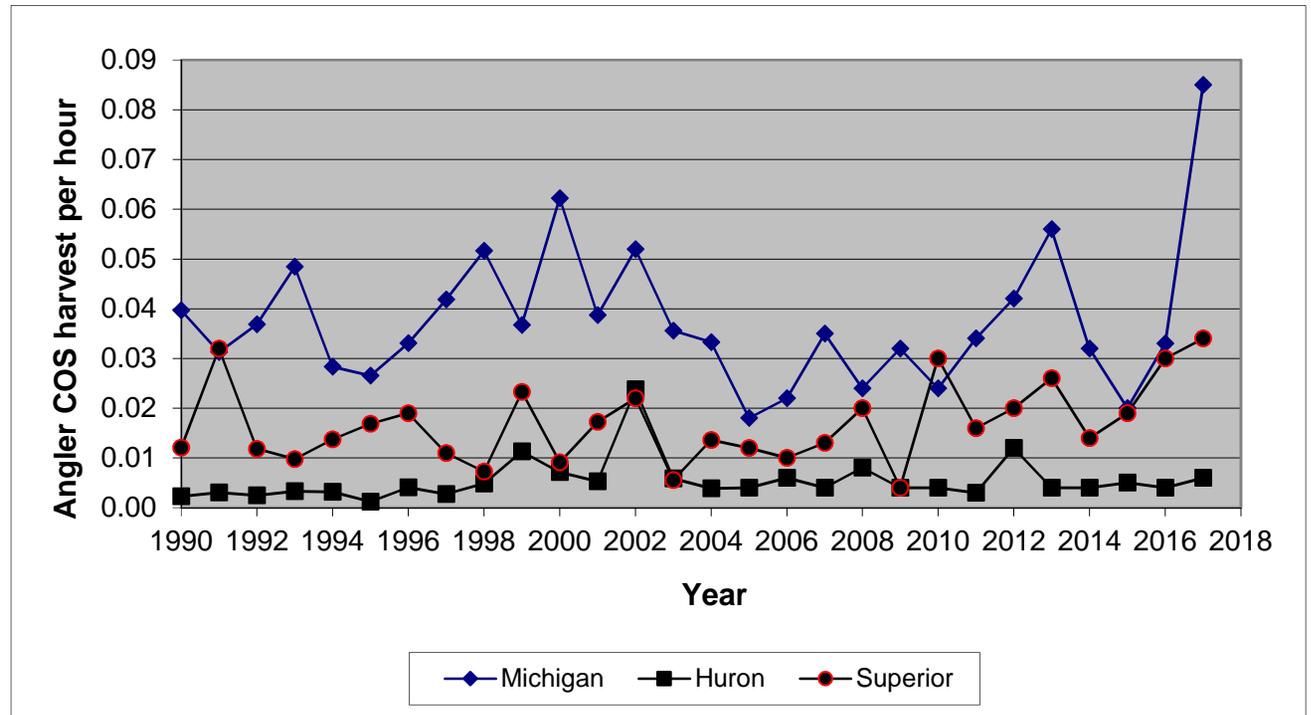


Figure 6.—Charter angler targeted harvest rates (fish per angler hour) for rainbow trout (steelhead) (RBT) on Lake Michigan and Lake Huron, 1990-2017.

Year	Lake Michigan	Lake Huron
1990	0.04	0.00
1991	0.08	0.01
1992	0.07	0.01
1993	0.06	0.02
1994	0.06	0.02
1995	0.04	0.03
1996	0.08	0.03
1997	0.06	0.02
1998	0.05	0.02
1999	0.04	0.02
2000	0.04	0.02
2001	0.05	0.02
2002	0.04	0.02
2003	0.04	0.01
2004	0.02	0.01
2005	0.03	0.01
2006	0.03	0.01
2007	0.03	0.01
2008	0.03	0.02
2009	0.04	0.02
2010	0.02	0.03
2011	0.04	0.03
2012	0.04	0.06
2013	0.03	0.03
2014	0.05	0.02
2015	0.03	0.02
2016	0.03	0.03
2017	0.02	0.02

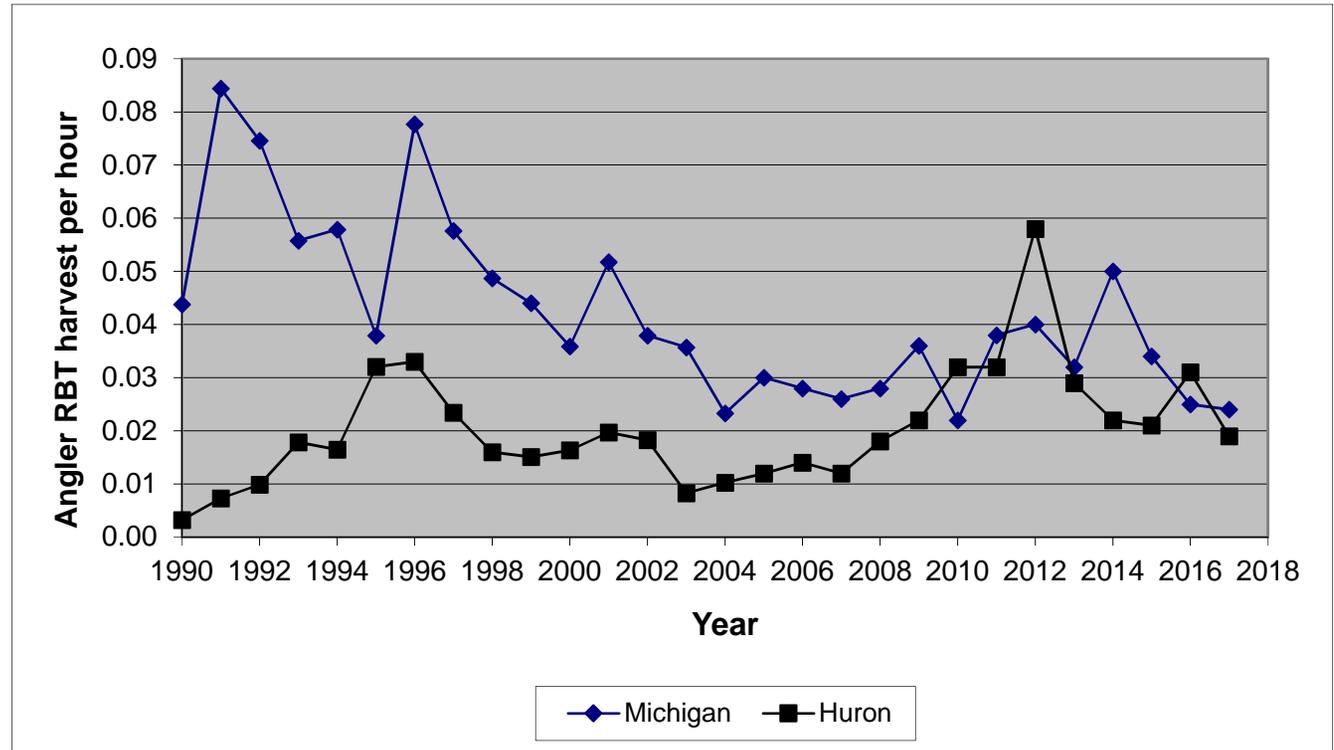


Figure 7.—Charter angler targeted harvest rates (fish per angler hour) for brown trout (BNT) on Lake Michigan and Lake Huron, 1990-2017.

Year	Lake Michigan	Lake Huron
1990	0.006	0.001
1991	0.009	0.003
1992	0.004	0.007
1993	0.008	0.021
1994	0.012	0.023
1995	0.009	0.022
1996	0.013	0.009
1997	0.017	0.004
1998	0.008	0.007
1999	0.009	0.002
2000	0.014	0.002
2001	0.006	0.002
2002	0.008	0.004
2003	0.004	0.006
2004	0.003	0.003
2005	0.004	0.002
2006	0.002	0.000
2007	0.002	0.001
2008	0.002	0.000
2009	0.002	0.016
2010	0.002	0.004
2011	0.002	0.004
2012	0.002	0.004
2013	0.002	0.002
2014	0.003	0.001
2015	0.004	0.000
2016	0.001	0.001
2017	0.001	0.000

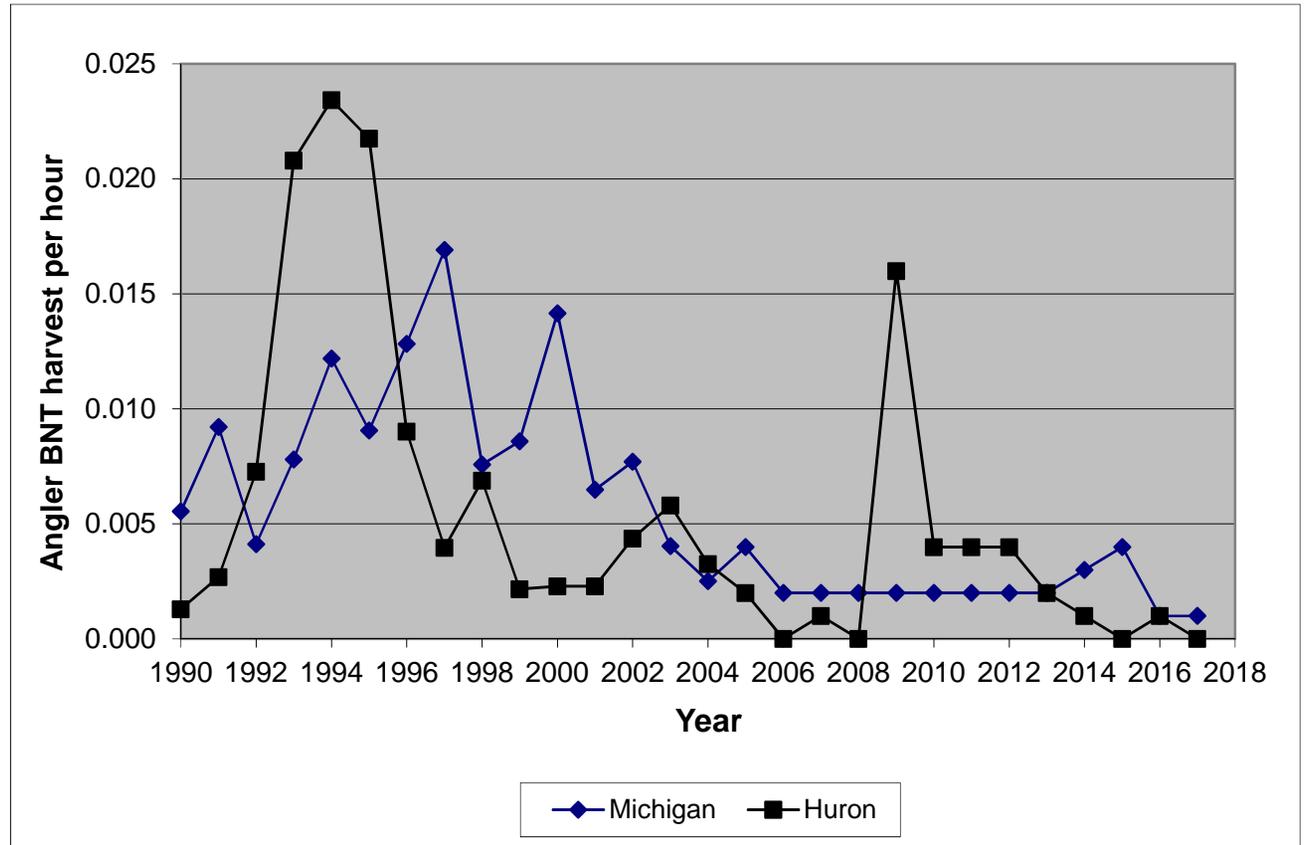


Figure 8.—Charter angler targeted harvest rates (fish per angler hour) for yellow perch (YEP) and walleye (WAE) on Lake Huron, 1990-2017.

Year	Yellow perch	Walleye
1990	0.66	0.31
1991	0.34	0.29
1992	0.31	0.31
1993	0.18	0.32
1994	0.28	0.35
1995	0.24	0.17
1996	0.18	0.21
1997	0.14	0.24
1998	0.18	0.26
1999	0.52	0.20
2000	0.23	0.24
2001	0.18	0.23
2002	0.08	0.20
2003	0.08	0.24
2004	0.02	0.24
2005	0.03	0.28
2006	0.08	0.48
2007	0.05	0.60
2008	0.13	0.66
2009	0.04	0.60
2010	1.77	0.44
2011	2.53	0.47
2012	1.67	0.57
2013	0.58	0.63
2014	1.19	0.73
2015	2.04	0.61
2016	2.05	0.67
2017	2.15	0.89

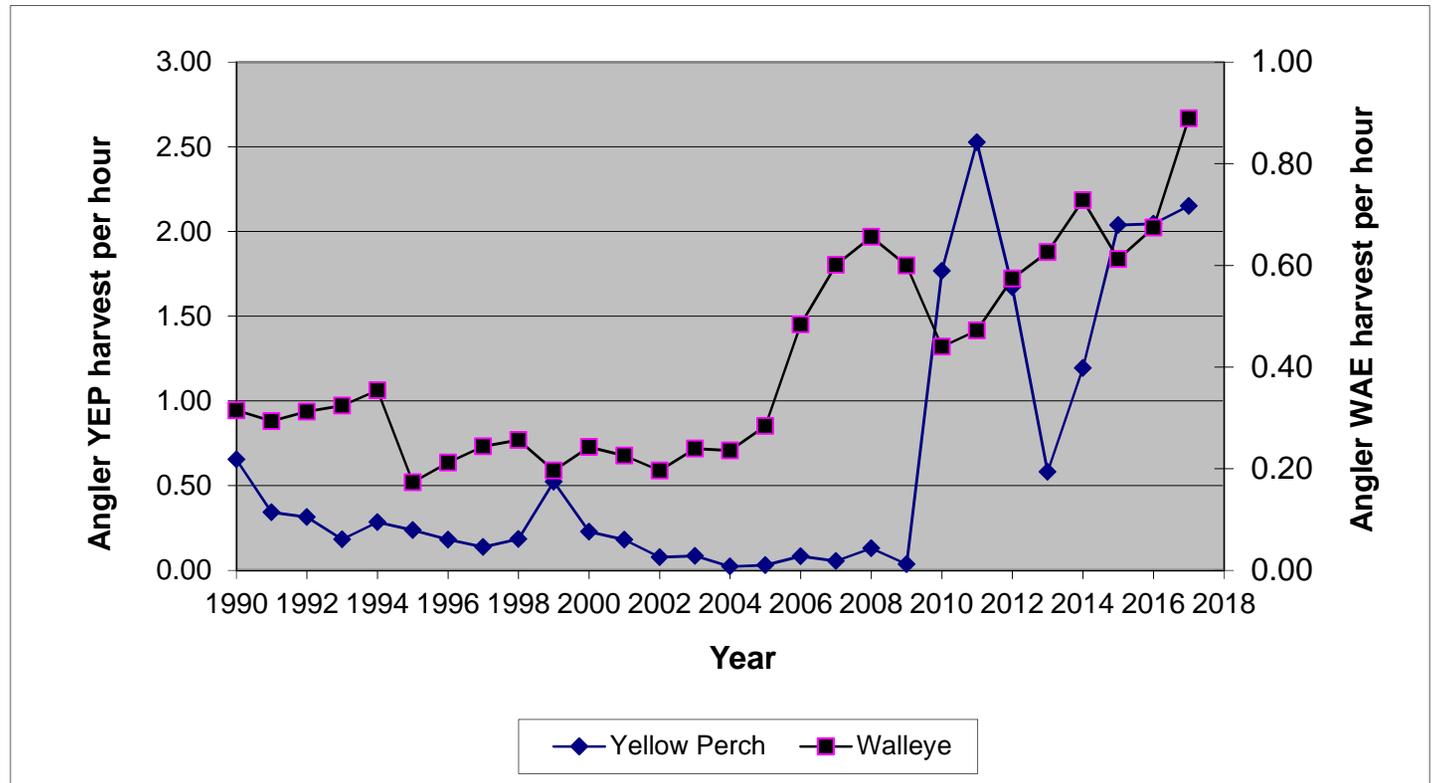


Figure 9.—Charter angler targeted harvest rates (fish per angler hour) for yellow perch (YEP) and walleye (WAE) on Lake Erie, 1990-2017.

Year	Yellow perch	Walleye
1990	0.30	0.75
1991	0.40	0.64
1992	0.50	0.84
1993	0.46	0.81
1994	0.34	0.70
1995	0.52	0.83
1996	0.79	0.82
1997	0.75	0.84
1998	0.70	1.07
1999	0.74	0.84
2000	0.67	0.78
2001	0.57	0.85
2002	1.00	0.74
2003	0.63	0.86
2004	0.44	0.60
2005	0.77	0.31
2006	0.32	0.91
2007	0.38	0.76
2008	0.32	0.58
2009	0.59	0.61
2010	5.22	0.69
2011	4.58	0.66
2012	4.62	0.80
2013	4.29	0.80
2014	5.20	0.82
2015	5.20	0.85
2016	7.32	0.86
2017	6.28	0.83

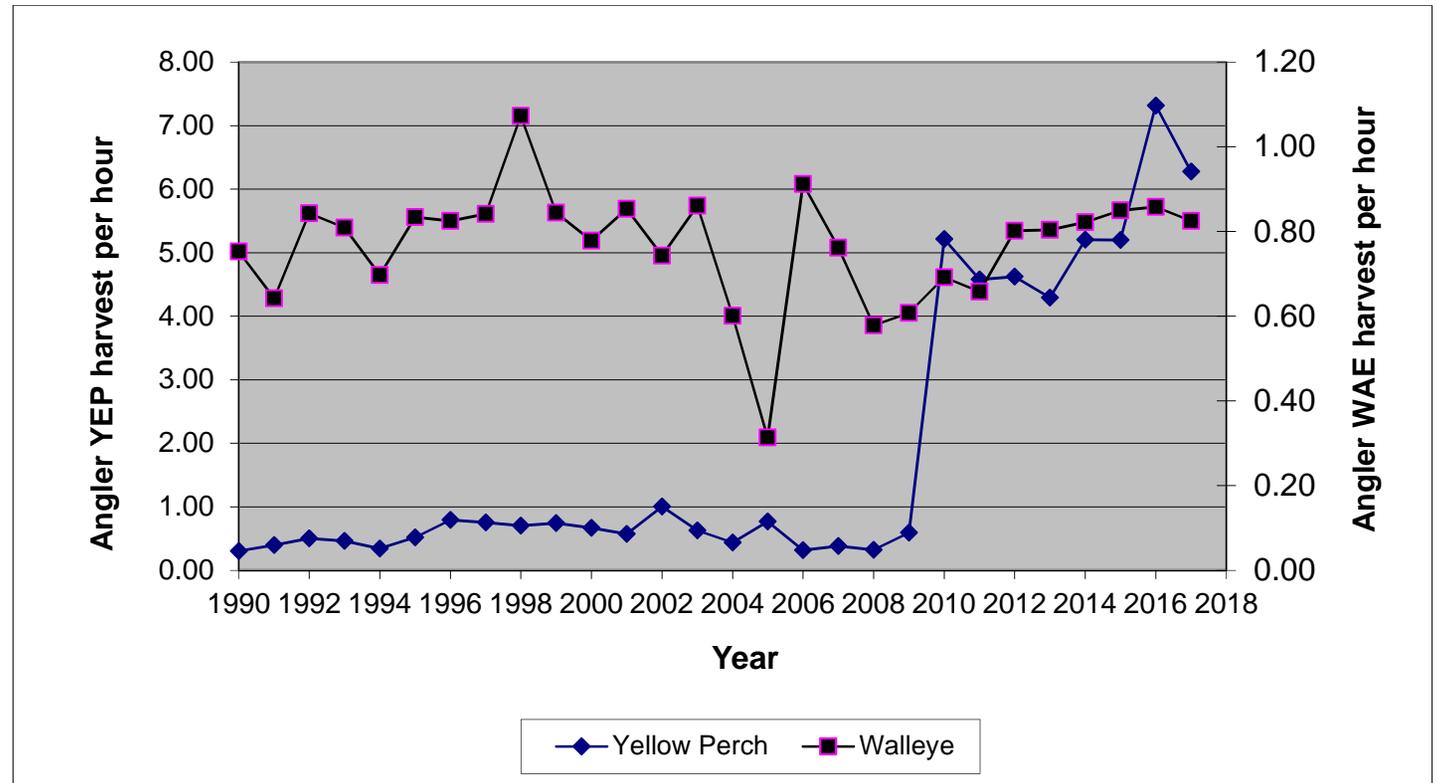


Figure 10.—Charter angler targeted harvest rates (fish per angler hour) for yellow perch (YEP) and walleye (WAE) on the St. Clair System, 1990-2017.

Year	Yellow perch	Walleye
1990	0.25	0.28
1991	0.30	0.18
1992	0.19	0.16
1993	0.28	0.23
1994	0.76	0.12
1995	0.68	0.21
1996	1.01	0.16
1997	0.77	0.19
1998	0.46	0.21
1999	0.48	0.20
2000	0.51	0.20
2001	0.69	0.27
2002	1.22	0.15
2003	0.49	0.25
2004	0.43	0.26
2005	0.57	0.40
2006	0.76	0.34
2007	0.98	0.44
2008	0.39	0.22
2009	0.17	0.41
2010	3.18	0.45
2011	2.38	0.44
2012	3.01	0.52
2013	2.97	0.51
2014	1.86	0.56
2015	1.21	0.53
2016	2.45	0.53
2017	2.20	0.77

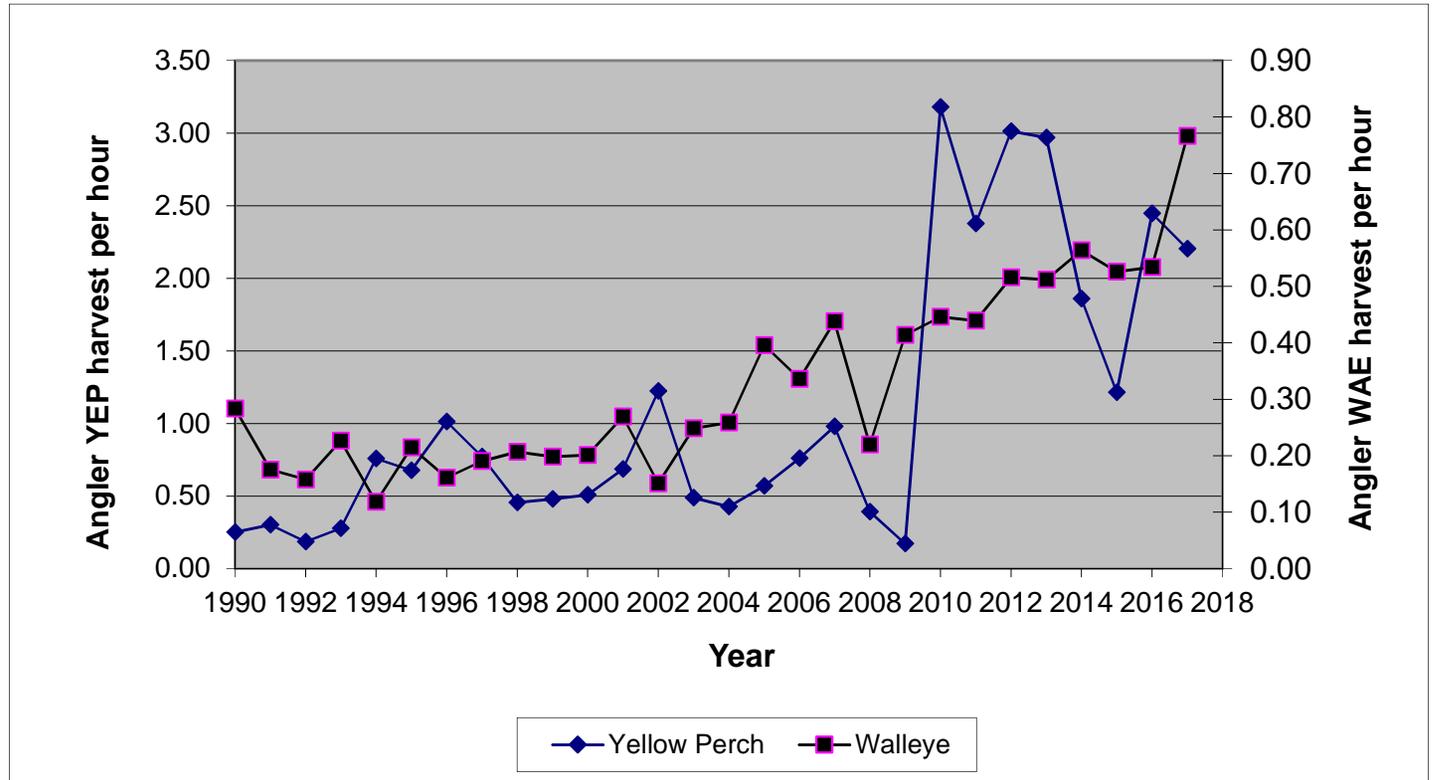


Figure 11.- Sea lamprey incidence (number attached per 100 fish) on Chinook salmon harvested by charter anglers on Lake Michigan and Lake Huron, 1990-2017.

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
2015	0.4	3.4
2016	0.3	0.8
2017	0.5	5.8

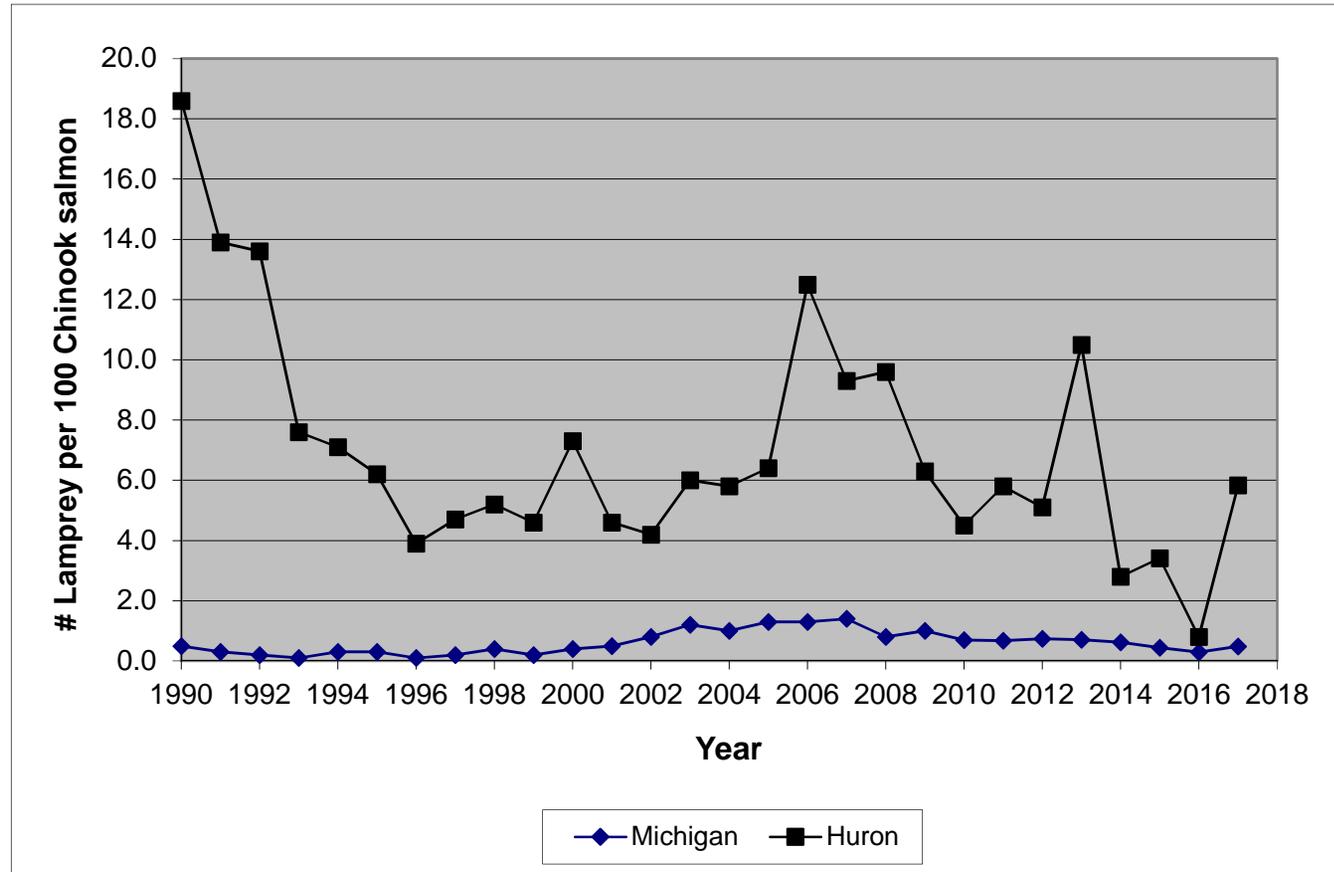


Figure 12.—Sea lamprey incidence (number attached per 100 fish) on lake trout harvested by charter anglers on lakes Michigan, Huron, and Superior, 1990-2017.

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
2015	0.3	1.6	1.9
2016	0.2	0.8	1.1
2017	0.2	1.0	0.9

