

2009 Charter Boat Operator Report  
with emphasis on Catch and Effort  
within Indiana Waters of Lake Michigan

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## EXECUTIVE SUMMARY

- Eighty charter licenses were issued to fish Indiana waters during 2009. Forty-three operators guided exclusively on Lake Michigan and 37 guided exclusively on other inland bodies of water including: Barbee Lake, Brookville Reservoir, Eel River, Geist Reservoir, James Lake, Monroe Reservoir, Ohio River, Patoka Lake, Pike Lake, Raccoon Lake, Sugar Creek, St. Joseph River, Tippecanoe Lake, Tippecanoe River, Upper Long Lake, Webster Lake, and White River.
- Overall, 100% of the mandated reports were received, with 16% failing to meet time frame requirements.
- Operators submitted reports on 1,097 trips in Indiana waters; 552 in Indiana waters of Lake Michigan and 545 on inland waters. Lake Michigan trips accounted for the majority of the charter angler effort, followed by the Webster Lake area, Brookville Reservoir, Monroe Reservoir, White River, Tippecanoe River, Patoka Lake, and Raccoon Lake.
- Salmonine species were the primary target for Lake Michigan operators; however, 82 fishing trips were conducted for yellow perch by 6 operators and 23 fishing trips were conducted for smallmouth bass by 1 operator. One charter operator exclusively chartered for yellow perch. Inland charter operators targeted species based on fish populations within the body of water (s) fished (i.e. black bass at Monroe, Patoka, and White River; muskellunge at Webster, Barbee and Tippecanoe; temperate bass at Brookville, Monroe, Raccoon; walleye at Brookville, etc.). Sunfish species (bluegill/redear, crappie), bass (smallmouth and largemouth), walleye, temperate bass (hybrid striped bass, striped bass, and white bass) and muskellunge comprised the bulk of the inland catch.
- A total of 12,259 hours were spent pursuing trout and salmon by 2,138 chartered Lake Michigan anglers. This was a 26% increase in angler hours and a 23% increase in anglers compared to the 2008 fishing season. A total of 2,077 hours were spent fishing for perch by 455 Lake Michigan chartered anglers. This was a 4% increase in effort and a 7% increase in anglers compared to the 2008 season.
- The Lake Michigan salmonine catch totaled 7,039 fish. The most abundant species in the catch was coho salmon, comprising 83% of the total. The 2009 trout and salmon catch increased 63% compared to the 2008 catch of 4,316 salmonines. The Lake Michigan yellow perch catch also increased 84% relative to the 2008 perch catch.
- Lake Michigan charter fishing success for all salmonine species was 57.4 fish per 100 hours, one of the highest rates observed in Lake Michigan during the 2000-2009 timeframe. The 2009 charter catch rates increased for coho salmon and Chinook salmon while steelhead trout, brown trout, and lake trout catch rates declined. Comparing 2009 catch rates with their long-term average, coho salmon, Chinook salmon and lake trout had rates that were equal or exceeded their ten-year mean. Steelhead trout and brown trout catch rates were 48% and 59% below their ten-year mean.

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## INTRODUCTION

As a trout and salmon fishery developed within Indiana's waters of Lake Michigan in the mid 1960's, a sport and charter boat industry also developed and prospered. By the mid 1970's, Indiana Department of Natural Resources (IDNR) biologists believed that charter boat operators were harvesting a large number of salmonines each year (Braun and Hudson 1988). As the number of operators increased, information about their fishing effort and catch was important in understanding fishing quality and the impact they had on the Lake Michigan fishery. In 1976, a pilot program was established with reporting forms distributed to ten charter boat operators known to be fishing from Indiana ports. These operators expressed an interest in providing information about their fishing trips to supplement the IDNR creel survey data; however, the degree of cooperation varied from full to no cooperation (Braun and Hudson 1988). To obtain a continuous annual record of charter fishing effort and the numbers and species of fish harvested by charter boat anglers in Indiana, legislation was introduced, and passed in 1987, that required reporting of sport catch and effort by the charter fishing industry.

Indiana Administrative Code 312 I.A.C. 9-7-17, charter fishing boat operator's license, regulates sport fishing for hire within waters of the State, including Lake Michigan. An individual may not take another individual sport fishing for hire on Indiana waters, waters containing state-owned fish, or state boundary waters without a charter fishing boat operator's license issued by the director under Indiana Code (IC) 14-22-15-4 pursuant to I.A.C. 9-7-17. Initially enacted to assist biologists with understanding the Lake Michigan fishery, 312 I.A.C. 9-7-17 also provides fishery information on other bodies of water as a continuous record of charter fishing effort and numbers and species of fish harvested and released by charter boat anglers throughout the state.

Data from the charter industry are used to assist with fishery management efforts by providing valuable trend information concerning charter harvest and catch rates and provides an overview of the status of stocked fish (e.g. salmonine species).

## METHODS

Catch and effort information were submitted by charter boat operators through the mandatory catch reporting system. Licensees provided catch information on a per trip basis for all paid trips for which all or part of the trip was conducted in Indiana waters. Reports were required to be submitted before the fifteenth day of the following month, as outlined in Administrative Code 312 I.A.C. 9-7-17 (Appendix I). The administration of the charter reporting program and compilation of the charter fishing catch and effort was part of the Division of Fish and Wildlife's Project/Grant 300FW1F10D42504. This project focuses on sport fish monitoring in Lake Michigan and its tributaries.

The information obtained from each report included: reporting period (month), name of licensee, name of body of water fished, license number, date of fishing trip, total number of anglers, total hours fished, and numbers of fish harvested and released (Appendix II). Space was also provided on the form for comments or observations. Per I.A.C. 9-7-17, only paid trips conducted wholly or partially in Indiana waters needed to be reported. Reports were required monthly, even if no fishing activity occurred as long as the license was active. If IDNR personnel did not receive a report for a given month, the operator was delinquent since one cannot distinguish those operators that did not fish from those that failed to submit a report.

Delinquencies were directly addressed by the Lake Michigan Fisheries office and the IDNR Law Enforcement Division in Michigan City. Operators who were missing required reports were either telephoned or sent a written notice requesting immediate report submission. If more than three notices were sent to an operator within the fishing season, the operator's name was submitted to Law Enforcement for enforcement action. A person who fails to keep accurate records of each day's catch of fish and other related information or fails to report monthly before the fifteenth day of each month commits a Class C infraction (312 I.A.C. 9-7-17; Authority I.C. 14-22-2-6, I.C. 14-22-15). One written warning and one citation were issued during the 2009 charter fishing season.

The Lake Michigan office received all charter boat operator reports from licensed operators throughout the State of Indiana. Reports were organized and reviewed as

they were received. Incomplete forms were returned to the charter boat operator with an explanation of why the report was returned and a request that the operator correct and/or complete the report. Reports were entered into a database and summarized to describe fishing effort and catch of major sport fish. Brief summaries of inland fishing effort, harvest, and catch can be found within this report; however, emphasis of this report is the Lake Michigan fishery since the majority of charter licenses issued to operate within Indiana waters are for individuals targeting Lake Michigan waters. All estimates provided were based on unverified reports.

Charter data are used to summarize fishing effort, harvest, catch, and catch rates of sport fish listed on the charter boat form. Effort, or angler hours, is the total number of hours fished by all anglers. Harvest is the total number of fish caught and kept by an angler. Catch is the total number of fish caught and harvested or released by an angler. Catch rates are the total number of fish caught within a given amount of time. Relative yearly comparisons of catch, independent of the magnitude of effort, are possible by expressing the catch on a per-unit-of-effort basis, known as catch rates. With this measure, the long-term trend of fishing success by species can be presented for comparisons. Fishing effort was separated between groups of fish including salmonine (trout and salmon), percids (yellow perch), and other species (smallmouth bass) since fishing trips generally target one group. The catch rates provided are targeted, in that only the Lake Michigan trout and salmon catch and effort were utilized for the salmonine catch rates and only yellow perch catch and effort were utilized for the yellow perch catch rates. With the exception of yellow perch and smallmouth bass, all catch rates presented were standardized to 100 angler-hours because rates are significantly less than one fish caught for every hour spent angling.

## RESULTS

### Charter licenses

A total of 80 charter licenses were issued to fish Indiana waters during 2009. Forty-three operators guided exclusively on Lake Michigan and 37 operators guided exclusively on other inland bodies of water including: Barbee Lake, Brookville

Reservoir, Eel River, Geist Reservoir, James Lake, Monroe Reservoir, Ohio River, Patoka Lake, Pike Lake, Raccoon Lake, Sugar Creek, St. Joseph River, Tippecanoe Lake, Tippecanoe River, Upper Long Lake, Webster Lake, and White River (Table 1). The majority of inland licenses issued were for operators targeting the Webster Lake area (including lakes located in the Tippecanoe River Watershed such as the Barbee Chain, and Lakes' James and Tippecanoe), Monroe Reservoir, Patoka Lake, St. Joseph River and White River.

The number of inland charter licenses issued continues to expand while the number of Lake Michigan charter licenses issued continues to drop (Table 1).

### Compliance

Overall, 100% of the mandated reports were received, with 16% failing to meet time frame requirements (based upon the post-mark date on the mailing envelope or the hand-delivery date). Lake Michigan operators submitted 14% of their reports late, while 19% of the inland operators submitted their reports past the legal required time frame. Both Lake Michigan and inland charter operators' overall rate of compliance in 2009 was lower compared to the 2008 fishing season.

### Charter effort and catch

Operators submitted reports on 1,097 trips in Indiana waters; 552 in Indiana waters of Lake Michigan and 545 on inland waters (Table 2). Lake Michigan trips accounted for the majority of the charter angler effort at 14,743 hours or 59% of the effort, followed by the Webster Lake area at 5,257 hours or 21% of the effort, Brookville Reservoir at 1,220 hours (5%), Monroe Reservoir at 1,148 hours (5%), White River at 986 hours (4%), Tippecanoe River at 606 hours (2%), Patoka Lake at 469 hours (2%), and Raccoon Lake at 456 hours (2%, Figure 1).

From 2008 to 2009, the total number of chartered-trips increased slightly (+3%). Lake Michigan had the largest positive percent change in total trips (+21.5%), increasing to 552 trips from 454. The number of inland fishing trips decreased (-11%) from 612 trips to 545 in 2009.

Charter operators reported a total of 25,915 fish caught from Indiana waters in 2009 (Table 2); a 31% increase compared to 2008 total catch (19,774). Most of these fish were caught from Lake Michigan (59%), followed by Monroe Reservoir (14%), Patoka Reservoir (9%), White River (6%), Brookville Reservoir (5%), Tippecanoe River (3%), and the Webster Lake area (1%).

For Lake Michigan operators, trout and salmon were the primary target; however, 82 fishing trips were conducted for yellow perch by 6 operators and 23 fishing trips were conducted for smallmouth bass by 1 operator. One charter boat operator exclusively chartered for yellow perch.

Inland charter operators targeted species based on fish populations within the body of water (s) fished (i.e. black bass at Monroe, Patoka, and White River; muskellunge at Webster, Barbee and Tippecanoe; temperate bass at Brookville, Monroe, Raccoon; walleye at Brookville, etc.). Sunfish species (bluegill/redear, crappie), bass (smallmouth and largemouth), walleye, temperate bass (hybrid striped bass, striped bass, and white bass) and muskellunge comprised the bulk of the catch (Table 2).

#### Lake Michigan trout and salmon

Charter boat operators fishing Indiana waters of Lake Michigan reported 2,138 chartered anglers that fished 12,259 hours for trout and salmon (Table 3). Anglers and angler hours each increased 23% and 26%, respectively, compared to 2008.

A total of 6,803 salmonines were harvested by chartered anglers during the 2009 season; a 61% increase compared to the 2008 harvest of 4,261. Coho salmon dominated the salmonine harvest, comprising 5,780 fish or 85% of the total (Table 3, Figure 2). Percent of total harvest for other trout and salmon species was as follows: Chinook salmon 9%, lake trout 3%, steelhead trout 2%, and brown trout 1%. Harvest and effort were greatest during the months of April and May (Table 3).

In 2009, total harvest and catch (total number of salmonines harvested and released) increased for coho salmon and Chinook salmon, whereas steelhead trout and brown trout decreased (Tables 3 and 4). Lake trout harvest decreased but the total catch increased from 2008 to 2009. This was the direct result of lake trout fishing

trips that occurred during November, when the majority of lake trout caught were released (Table 5).

The overall salmonine charter catch rate was 57.4 fish caught for every 100 hours spent trout and salmon angling (Figure 3). This was an increase over the 2008 salmonine charter catch rate (44.4 fish per 100 hours) and ten-year mean (46.5 fish per 100 hours). The 2009 salmonine catch rate increased to one of the highest rates observed in Indiana waters of Lake Michigan during the 2000-2009 timeframe. Comparing targeted trout and salmon catch rates to 2008 data, catch rates increased for coho salmon and Chinook salmon while steelhead trout, brown trout, and lake trout catch rates declined (Figures 4-8). Steelhead trout catch rates declined to 1.1 fish per 100 hours, which is one of the lowest observed during the 2000-2009 time series (Figure 6). Brown trout catch rates declined to 0.7 fish per 100 hours, the lowest catch rate observed during the 2000-2009 time series (Figure 7). Although the lake trout catch rate fell compared to 2008 (2.9 fish per 100 hr to 2.5 fish per 100 hr), this rate was still the third highest reported from the ten-year data series (Figure 8).

Comparing 2009 catch rates with their long-term average, coho salmon, Chinook salmon and lake trout had rates that were equal or exceeded their ten-year mean (Figures 4, 5 and 8). Steelhead trout and brown trout catch rates were 48% and 59% below their ten-year mean, respectively (Figures 6-7). Overall, brown trout were a minor portion of the Lake Michigan charter catch during 2009.

A relatively low number of trout and salmon were released by chartered anglers, totaling 234 fish (Table 5). Lake trout, followed by coho salmon and Chinook salmon were released most often. Most releases occurred during November and May.

#### Lake Michigan yellow perch

A total of 2,077 hours, representing 82 trips, were spent fishing for perch by 455 chartered anglers (Table 6). This was a 4% increase in effort and a 7% increase in anglers compared to the 2008 fishing season when 1,998 hours, or 75 trips, were fished exclusively for yellow perch by 424 chartered anglers (Palla 2009). A total of 7,995 perch were caught during 2009, which is an 84% increase relative to 2008 (4,339 fish). Largest yellow perch catches occurred during the month of November,

followed by July then April. Yellow perch angler effort was greatest during July, June and November (Table 6).

Targeted catch rates for yellow perch (3.8 fish per angler hour) increased in 2009 to the highest rate observed in the 2002-2009 data series (Figure 9). This was a 73% increase over the observed 2008 perch catch rate (2.2 fish per hour) and a 36% increase over the long-term average (2.8 fish per hour).

A total of 3,479 perch were released, representing 44% of the total catch (Table 6). Perch were released most often during November, followed by July then April.

#### Lake Michigan smallmouth bass

Black bass species play an important role in the diverse fish community found within Lake Michigan. One Lake Michigan charter operator took advantage of this diversity by offering smallmouth bass trips during the 2009 fishing season. While the harvest of smallmouth bass is small in number, Lake Michigan supports a popular “catch and release” fishery (Palla 2009). In 2009, chartered anglers caught a total of 301 smallmouth bass; all bass were released. Largest smallmouth catches occurred between April and June.

The targeted charter smallmouth catch rate was 0.7 fish per angler hour which was slightly above the boat fishery black bass catch rate from the 2009 Lake Michigan creel survey (0.61 fish per angler hour).

## DISCUSSION

Fluctuations in the total catch from year to year are due to a number of factors including total angler effort, lake-wide stocking levels, forage levels and other environmental variables (i.e. weather, water temperatures).

Although the total number of chartered anglers and total angler hours spent pursuing Lake Michigan species increased relative to 2008, these increases were disproportionate compared to the overall salmonine and yellow perch catch. For instance, yellow perch anglers and angler hours increased 7% and 4%; total catch increased 84%. Trout and salmon anglers and angler hours increased 23% and 26%; total catch increased 61%.

The high overall 2009 charter catch can be attributed to significant catch increases observed for Chinook salmon (+97%), yellow perch (+84%), and coho salmon (+79%) compared to the 2008 fishing season. Coho salmon and yellow perch dominated the charter catch within Indiana waters of Lake Michigan.

The salmonine catch rate increased to one of the highest rates observed during the 2000-2009 timeframe. Since 2007, charter catch rates have steadily climbed to near all-time levels. The above-average coho, Chinook and lake trout catch rates directly influenced the overall success of the 2009 season. Although brown trout and steelhead trout catch rates were the lowest observed from the ten-year period, their influence on the charter fishing season was relatively minor.

The increases in salmonine catch could be due, in part, to declines in Chinook salmon abundance in Lake Michigan and increases in the total lake-wide prey fish biomass (estimates from acoustic and bottom-trawl surveys). Chinook salmon stocking rates were adjusted in 1999 and 2006 in an effort to better align stocking with prey fish abundance (Claramunt et al. 2010). In addition to stocking reductions, wild Chinook salmon smolt production has dropped resulting in the lowest value of total Chinook smolt production (estimates of natural reproduction and hatchery stocking combined) since 1985 (Claramunt et al. 2010). The reduction in abundance of Chinook salmon, the largest consumers of forage, likely reduced the overall demand on the prey fish population resulting in better survival of older salmonine age classes.

Estimates of lake-wide forage fish biomass from the 2009 cooperative Lake Michigan bottom trawl and acoustic surveys reported mean total prey fish biomass increased between 52% (bottom trawl) to 1.4 times higher (acoustic) compared to 2008 estimates (Madenjian et al. 2010, Warner et al. 2010). For alewife, the lake-wide biomass bottom trawl estimate from the U.S. Geological Survey Great Lakes Science Center (GLSC) was 13.03 kilotonnes (kt) (1 kt = 1000 metric tons), more than double the 2008 estimate (Madenjian et al. 2010). The lake-wide alewife biomass estimate from the GLSC and Michigan Department of Natural Resources and Environment (MDNRE) acoustic survey was 99.2 kilotonnes, 1.7 times the 2008 acoustic estimate (Warner et al. 2010). Although differences exist between the trawl

and acoustic surveys (acoustic survey is more efficient at sampling younger ages of alewife; trawl survey is more efficient at sampling larger, older alewife), both surveys document the recent increase in alewife biomass. The increase in biomass suggests that Chinook salmon predation pressure has declined (Warner et al. 2010). One measure that supports the observations of increased alewife biomass is growth of predators including Chinook and coho salmon. From the 2009 Indiana Lake Michigan creel survey, biological data collected on angler-caught salmon show higher mean lengths and weights compared to the prior fishing season and long-term average. Coho salmon average length was 6% above the ten-year length average; weight was 25% above. Chinook salmon average length was 2% above the ten-year length average; weight was 6% above. Other tools used to assess growth including the evaluation of Chinook salmon weight-at-age 2 from the MDNRE creel survey (both sexes combined), Chinook weight-at-age 3 from Wisconsin's Strawberry Creek weir returns (only females), and Chinook standard weight index from Strawberry Creek weir) also indicate that weight-at-age improved in 2009. These indices are used by the Salmonid Working Group (SWG) of the Lake Michigan Technical Committee, a group established to assess overall status of Lake Michigan pelagic salmonines and their prey (Claramunt et al. 2010). MDNRE creel survey weight-at-age for age-2 Chinook salmon and Strawberry Creek weir weight of age-3 Chinook both increased from 2008. Long-term averages from Strawberry Creek weir returns, however, show that 2009 weight data were still below the average for their 1985-2009 time series.

Although Lake Michigan prey fish biomass estimates were favorable in 2009, levels remain much lower than levels found in the 1990s (Warner et al. 2010). Additionally, acoustic survey results indicated that the abundance of young alewives (age 0) in 2009 was the lowest of any acoustic survey which may negatively influence future survival of all salmonines. Warner et al. (2010) predict relatively poor survival of the 2009 Chinook salmon year class and the potential for continued declines in salmon abundance.

The below-average charter season for brown trout and steelhead trout may be explained by the availability of other species (i.e. Chinook and coho salmon) rather

than fish abundance. The 2009 brown trout and steelhead trout charter catch rates were the lowest observed from the prior ten-year period.

Since 2003, brown trout charter catch rates steadily increased, due in part to near shore stocking of brown trout in Indiana waters of Lake Michigan (Table 7). On average, 36,000 brown trout have been stocked annually since 2002. The number of brown trout stocked, however, is relatively small compared to stocking levels of other salmonine species within Indiana waters. Historically, brown trout have not contributed significantly to the overall charter catch.

For steelhead, the charter data continues to show similar trends observed lake-wide. Lake-wide sport harvest of steelhead trout was highest from the 1990s through 2002, but dropped substantially through 2008. The steelhead trout sport harvest has remained below 1 million pounds for the last 6 consecutive seasons, with the 2008 harvest of 420,000 pounds being the lowest level observed in the 1985 to 2008 time period (Breidert et al. 2009). From the 2009 Indiana Lake Michigan creel survey, both boat and shore steelhead catch declined compared to the 2008 fishing season (-59% and -14%, respectively); however, the stream steelhead catch more than doubled from 2,228 to 5,471 fish. The stream steelhead catch rate (7.1 fish per 100 hours) was the highest catch rate observed from the 2000-2009 period. Recent steelhead trout stocking changes in 2006 and 2007 by the IDNR may have contributed to the higher 2009 stream steelhead returns.

Due to the shutdown and rehabilitation of Mixsawbah State Fish Hatchery in 2006, spring release Skamania steelhead were stocked in the fall of 2005 and 2006 as fingerlings. The '05 and '06 spring release Skamania steelhead, typically stocked at a size of 7.5 in, were smaller at the time of release (3.8 to 5.4 in). Decreases in the size at stocking may have impacted fish migration. Due to their small size, fish may not have out-migrated until the following year after release, delaying their return for an additional season.

Within the stream fishery, the largest catch of steelhead occurred in July, September, and October. Based upon time of capture, the majority of fish caught were Skamania strain steelhead. Although fishing effort also climbed during this same period, total catch and total fishing effort increases were not proportional. For

example, July angler effort doubled between the 2008 and 2009 fishing season; the catch estimate was 4 times higher in 2009. September angler effort more than doubled between 2008 and 2009; the catch estimate was nearly 7 times higher than in 2008. Overall, the 2009 stream steelhead catch was 2.5 times higher than the 2008 estimate; angler effort was 1.7 times higher.

Typically, up to 50,000 fall fingerling Skamania steelhead are stocked within the East Branch of the Little Calumet River and Trail Creek. In 2005, 381,560 fall fingerling Skamania steelhead were stocked. In 2006, 257,206 fall fingerling Skamania steelhead were stocked. Although the boat steelhead catch rate was below-average, above average stream steelhead catch rates suggest a larger number of steelhead returned to northwest Indiana tributaries for the 2009 fishing season.

Yellow perch fishing was also above average which is reflected in the charter yellow perch catch rate of 3.8 fish per hour. This was the highest rate observed from the 2002-2009 data series. Although yellow perch assessments throughout the lake continue to show a long-term decline in adult yellow perch abundance, recent increases in catch-per-unit-effort during 2009 sampling was evident from all jurisdictions with the exception of Bays de Noc in Michigan and Wisconsin waters of Green Bay (Makauskas and Clapp 2010). The majority of the adult yellow perch population within Illinois, Indiana, and Michigan waters was comprised of the 1998, 2002, 2003, and 2005 year classes. The 2005 year class comprised 25-60% of the adult population from surveys within the various state waters (Makauskas and Clapp 2010). The 1998 year class is still present, albeit in very low numbers from data collected in Illinois and Wisconsin. Overall, however, 2009 sampling did not provide evidence that the Lake Michigan yellow perch population abundance has changed.

Catch of age-0 perch increased slightly in some areas of southern Lake Michigan; however, recruitment in 2009 was still relatively low in most areas of the lake in comparison to long-term averages (Makauskas and Clapp 2010). The 2009 GLSC bottom trawl surveys corroborate the increase in catch of age 0-perch in southern Lake Michigan with nearly all of the perch caught from the Saugatuck transect (Madenjian et al. 2010).

While recruitment in 2009 was higher, it was still well-below the long-term average. Weak year classes will likely contribute to lower yellow perch abundance into the future. Poor yellow perch recruitment in the 1990s and early 2000s can be linked to a combination of factors, including poor weather conditions and low abundance of female spawners (Makauskas and Clapp 2000).

Salmonine species and yellow perch continue to be important components of the Lake Michigan sport fish community. Trout and salmon, originally planted to utilize an overabundant population of non-native alewives, provide sport fishing opportunities for lake and tributary anglers. Stocking levels have been adjusted in an attempt to minimize the risk of a prey fish population crash and its impacts to the fishery. In 2009, nearly 12 million trout and salmon were stocked into Lake Michigan (Figure 10). This level is consistent with the Fish Community Objective (FCO) for Lake Michigan salmonines to maintain a community that has abundant levels of Chinook salmon sufficient to suppress alewife but not beyond levels where predator consumption would threaten food web integrity (Claramunt et al. 2010).

Variables such as lake-wide stocking levels, forage levels and environmental variables (i.e. weather, water temperatures) will continue to influence fishing success within Lake Michigan. Indiana waters are unique and diverse, with a shallow basin and the presence of coldwater fish species (i.e. trout and salmon), coolwater fish species (i.e. yellow perch), and warmwater fish species (i.e. smallmouth bass). This diversity within the fish community continues to provide valuable fishing opportunities for the charter community.

## RECOMMENDATIONS

No recommendations at this time.

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Table 1. Number of charter licenses issued by Indiana Department of Natural Resources from 2000 through 2009.

| <u>Year</u> | <u>Inland Licenses</u> | <u>Lake Michigan Licenses</u> | <u>Total Licenses</u> |
|-------------|------------------------|-------------------------------|-----------------------|
| 2000        | 20                     | 39                            | 59                    |
| 2001        | 23                     | 41                            | 64                    |
| 2002        | 28                     | 47                            | 75                    |
| 2003        | 21                     | 53                            | 74                    |
| 2004        | 21                     | 54                            | 75                    |
| 2005        | 20                     | 55                            | 75                    |
| 2006        | 29                     | 55                            | 84                    |
| 2007        | 29                     | 50                            | 79                    |
| 2008        | 35                     | 45                            | 80                    |
| 2009        | 37                     | 43                            | 80                    |

Table 2. Fishing effort and catch reported by charter boat operators fishing Indiana waters during 2009, by body of water fished.

|                      | <u>Anglers</u> | <u>Hours</u>  | <u>Trips</u> | <u>Black Bass</u> | <u>Bowfin</u> | <u>Catfish</u> | <u>Musky</u> | <u>Yellow Perch</u> | <u>Trout &amp; Salmon</u> | <u>Sunfish</u> | <u>Temperate Bass</u> | <u>Walleye</u> |
|----------------------|----------------|---------------|--------------|-------------------|---------------|----------------|--------------|---------------------|---------------------------|----------------|-----------------------|----------------|
| Brookville Reservoir | 192            | 1,220         | 73           | 55                | 0             | 71             | 0            | 0                   | 0                         | 0              | 430                   | 740            |
| Eel River            | 3              | 26            | 2            | 13                | 0             | 0              | 0            | 0                   | 0                         | 0              | 0                     | 0              |
| Geist Reservoir      | 26             | 119           | 7            | 6                 | 0             | 48             | 0            | 0                   | 0                         | 108            | 0                     | 0              |
| Lake Michigan        | 2,647          | 14,743        | 552          | 301               | 0             | 0              | 0            | 7,995               | 7,039                     | 0              | 0                     | 0              |
| Monroe Reservoir     | 187            | 1,148         | 69           | 77                | 0             | 99             | 0            | 0                   | 0                         | 3,320          | 125                   | 5              |
| Ohio River           | 5              | 25            | 1            | 0                 | 0             | 5              | 0            | 0                   | 0                         | 0              | 0                     | 0              |
| Patoka Lake          | 79             | 469           | 38           | 178               | 1             | 26             | 0            | 0                   | 0                         | 2,211          | 5                     | 5              |
| Pike Lake            | 3              | 15            | 1            | 0                 | 0             | 0              | 0            | 0                   | 0                         | 0              | 0                     | 6              |
| Raccoon Lake         | 58             | 456           | 18           | 0                 | 0             | 0              | 0            | 0                   | 0                         | 0              | 119                   | 0              |
| Sugar Creek          | 10             | 94            | 6            | 76                | 0             | 0              | 0            | 0                   | 0                         | 2              | 0                     | 0              |
| St. Joseph River     | 26             | 175           | 8            | 28                | 0             | 0              | 0            | 0                   | 31                        | 30             | 0                     | 1              |
| Tippecanoe River     | 61             | 606           | 32           | 842               | 0             | 0              | 0            | 0                   | 0                         | 0              | 0                     | 13             |
| Webster Lake Area    | 710            | 5,257         | 246          | 26                | 0             | 0              | 336          | 0                   | 0                         | 4              | 0                     | 0              |
| White River          | 127            | 986           | 44           | 1,400             | 0             | 2              | 0            | 0                   | 0                         | 80             | 46                    | 10             |
| <b>TOTAL</b>         | <b>4,134</b>   | <b>25,339</b> | <b>1,097</b> | <b>3,002</b>      | <b>1</b>      | <b>251</b>     | <b>336</b>   | <b>7,995</b>        | <b>7,070</b>              | <b>5,755</b>   | <b>725</b>            | <b>780</b>     |

Table 3. Trout and salmon harvest and fishing effort reported by charter boat operators fishing Indiana waters of Lake Michigan during 2009.

|                | MONTH       |              |              |            |             |             |             |              |             |             |        |
|----------------|-------------|--------------|--------------|------------|-------------|-------------|-------------|--------------|-------------|-------------|--------|
|                | <u>FEB.</u> | <u>MARCH</u> | <u>APRIL</u> | <u>MAY</u> | <u>JUNE</u> | <u>JULY</u> | <u>AUG.</u> | <u>SEPT.</u> | <u>OCT.</u> | <u>NOV.</u> | TOTAL  |
| <u>HARVEST</u> |             |              |              |            |             |             |             |              |             |             |        |
| Coho           | 0           | 209          | 2,443        | 2,162      | 816         | 119         | 11          | 20           | 0           | 0           | 5,780  |
| Chinook        | 0           | 0            | 215          | 313        | 14          | 43          | 34          | 22           | 0           | 0           | 641    |
| Steelhead      | 0           | 2            | 15           | 87         | 11          | 19          | 2           | 1            | 0           | 0           | 137    |
| Brown Trout    | 0           | 4            | 42           | 23         | 1           | 0           | 0           | 2            | 0           | 0           | 72     |
| Lake Trout     | 0           | 0            | 31           | 84         | 23          | 15          | 8           | 0            | 0           | 12          | 173    |
| TOTAL          | 0           | 215          | 2,746        | 2,669      | 865         | 196         | 55          | 45           | 0           | 12          | 6,803  |
| Angler-Hours   | 24          | 385          | 3,581        | 4,932      | 2,105       | 551         | 148         | 263          | 36          | 234         | 12,259 |
| Anglers        | 3           | 66           | 719          | 795        | 341         | 95          | 23          | 51           | 6           | 39          | 2,138  |
| Trips          | 1           | 16           | 141          | 167        | 71          | 19          | 5           | 13           | 2           | 12          | 447    |

Table 4. Trout and salmon catch and fishing effort reported by charter boat operators fishing Indiana waters of Lake Michigan from 2000 through 2009.

| <u>Year</u>                         | <u>Coho</u> | <u>Chinook</u> | <u>Steel-head</u> | <u>Brown Trout</u> | <u>Lake Trout</u> | <u>Angler Hours</u> | <u>No. Anglers</u> | <u>Trips</u> |
|-------------------------------------|-------------|----------------|-------------------|--------------------|-------------------|---------------------|--------------------|--------------|
| 2000                                | 6,707       | 432            | 178               | 394                | 149               | 13,953              | 2,815              | 571          |
| 2001                                | 10,129      | 675            | 305               | 272                | 192               | 19,295              | 3,576              | 744          |
| 2002                                | 8,518       | 1,420          | 713               | 349                | 177               | 21,164              | 3,946              | 841          |
| 2003                                | 8,777       | 818            | 889               | 176                | 63                | 22,201              | 4,000              | 862          |
| 2004                                | 6,946       | 2,354          | 449               | 276                | 85                | 25,852              | 4,535              | 990          |
| 2005                                | 3,697       | 1,371          | 453               | 286                | 68                | 18,449              | 3,229              | 703          |
| 2006                                | 3,474       | 444            | 115               | 207                | 118               | 10,300              | 1,916              | 407          |
| 2007                                | 2,196       | 476            | 245               | 287                | 434               | 11,143              | 2,019              | 415          |
| 2008                                | 3,267       | 338            | 196               | 235                | 280               | 9,712               | 1,738              | 379          |
| 2009                                | 5,845       | 666            | 141               | 81                 | 306               | 12,259              | 2,138              | 447          |
| Five-year<br>Average<br>(‘04 - ‘08) | 3,696       | 659            | 230               | 219                | 241               | 12,373              | 2,208              | 470          |
| Ten-year<br>Average                 | 5,956       | 899            | 368               | 256                | 187               | 16,433              | 2,991              | 636          |

Table 5. The number of trout and salmon released as reported by charter boat operators fishing Indiana waters of Lake Michigan during 2009.

|                | MONTH       |              |              |            |             |             |             |              |             |             | TOTAL      |
|----------------|-------------|--------------|--------------|------------|-------------|-------------|-------------|--------------|-------------|-------------|------------|
|                | <u>FEB.</u> | <u>MARCH</u> | <u>APRIL</u> | <u>MAY</u> | <u>JUNE</u> | <u>JULY</u> | <u>AUG.</u> | <u>SEPT.</u> | <u>OCT.</u> | <u>NOV.</u> |            |
| <u>SPECIES</u> |             |              |              |            |             |             |             |              |             |             |            |
| Coho           | 6           | 0            | 17           | 40         | 0           | 0           | 0           | 0            | 0           | 0           | 63         |
| Chinook        | 1           | 0            | 5            | 14         | 1           | 0           | 0           | 0            | 4           | 0           | 25         |
| Steelhead      | 0           | 0            | 0            | 2          | 0           | 0           | 0           | 0            | 0           | 2           | 4          |
| Brown<br>Trout | 6           | 1            | 1            | 0          | 0           | 1           | 0           | 0            | 0           | 0           | 9          |
| Lake Trout     | 12          | 0            | 5            | 0          | 0           | 0           | 0           | 0            | 12          | 104         | 133        |
| <b>TOTAL</b>   | <b>25</b>   | <b>1</b>     | <b>28</b>    | <b>56</b>  | <b>1</b>    | <b>1</b>    | <b>0</b>    | <b>0</b>     | <b>16</b>   | <b>106</b>  | <b>234</b> |

Table 6. Yellow perch harvest, number of yellow perch releases, and fishing effort reported by charter boat operators fishing Indiana waters of Lake Michigan during 2009.

|                     | MONTH       |              |            |             |             |             |              |             |             |       |
|---------------------|-------------|--------------|------------|-------------|-------------|-------------|--------------|-------------|-------------|-------|
|                     | <u>MAR.</u> | <u>APRIL</u> | <u>MAY</u> | <u>JUNE</u> | <u>JULY</u> | <u>AUG.</u> | <u>SEPT.</u> | <u>OCT.</u> | <u>NOV.</u> | TOTAL |
| <u>Yellow Perch</u> |             |              |            |             |             |             |              |             |             |       |
| No. Harvested       | 281         | 813          | 398        | 332         | 1,561       | 93          | 0            | 5           | 1,033       | 4,516 |
| No. Released        | 200         | 565          | 280        | 202         | 732         | 0           | 0            | 5           | 1,495       | 3,479 |
| TOTAL               | 481         | 1,378        | 678        | 534         | 2,293       | 93          | 0            | 10          | 2,528       | 7,995 |
| <hr/>               |             |              |            |             |             |             |              |             |             |       |
| Angler-<br>Hours    | 73          | 251          | 130        | 350         | 885         | 55          | 0            | 24          | 309         | 2,077 |
| Anglers             | 20          | 59           | 35         | 69          | 185         | 10          | 0            | 4           | 73          | 455   |
| Trips               | 4           | 10           | 7          | 12          | 32          | 2           | 0            | 1           | 14          | 82    |

Table 7. Number of trout and salmon stocked in Lake Michigan by Indiana Department of Natural Resources, 1997 through 2009.

| Year              | LAKE MICHIGAN     |                  |                    |                | ST. JOSEPH RIVER  |                |                    |
|-------------------|-------------------|------------------|--------------------|----------------|-------------------|----------------|--------------------|
|                   | Chinook<br>Salmon | Coho<br>Salmon   | Steelhead<br>Trout | Brown<br>Trout | Chinook<br>Salmon | Coho<br>Salmon | Steelhead<br>Trout |
| 1997              | 279,297           | 80,817           | 340,010            | 0              | 143,262           | 0              | 287,174            |
| 1998              | 386,525           | 148,320          | 183,715            | 0              | 206,987           | 0              | 299,869            |
| 1999              | 264,608           | 146,882          | 319,082            | 0              | 150,811           | 0              | 252,491            |
| 2000              | 267,865           | 157,208          | 174,136            | 0              | 149,911           | 0              | 220,439            |
| 2001              | 297,195           | 157,048          | 297,971            | 0              | 153,520           | 0              | 293,475            |
| 2002              | 253,000           | 224,797          | 298,884            | 35,000         | 0                 | 0              | 306,297            |
| 2003              | 232,395           | 233,248          | 309,134            | 40,400         | 0                 | 0              | 282,857            |
| 2004              | 237,052           | 236,026          | 334,968            | 46,238         | 0                 | 0              | 278,109            |
| 2005              | 251,281           | 237,009          | 645,576            | 36,371         | 0                 | 0              | 287,471            |
| 2006 <sup>1</sup> | 225,000           | 79,018           | 257,206            | 42,900         | 0                 | 0              | 234,211            |
| 2007 <sup>2</sup> | 217,389           | 231,342          | 349,497            | 41,110         | 0                 | 0              | 279,255            |
| 2008              | 215,770           | 248,667          | 295,489            | 22,446         | 0                 | 0              | 276,511            |
| 2009              | 206,714           | 239,846          | 314,177            | 23,039         | 0                 | 0              | 288,268            |
| <b>Totals</b>     | <b>3,334,091</b>  | <b>2,420,228</b> | <b>4,119,845</b>   | <b>287,504</b> | <b>804,491</b>    | <b>0</b>       | <b>3,586,427</b>   |

<sup>1</sup>Due to the shut-down and rehabilitation of Mixsawbah State Fish Hatchery in 2006, the coho salmon plantings were reduced by 60%; the spring release skamania steelhead were stocked in the fall of 2005 as fingerlings, Michigan steelhead (winter-run) were stocked in 2007 as yearlings instead of December 2006 as fingerlings; and the St. Joseph River fall steelhead plantings were reduced by approximately 40,000 fish to offset changes to the Trail Creek and Little Calumet steelhead stockings.

<sup>2</sup>Due to the shut-down and rehabilitation of Mixsawbah State Fish Hatchery in 2006, the spring release skamania steelhead were stocked in the fall of 2006 as fingerlings.

Lake Michigan (LM)  
Webster Lake area (WEB)  
Brookville Reservoir (BR)  
Monroe Reservoir (MON)  
White River (WR)  
Tippecanoe River (TPR)  
Patoka Lake (PA)  
Raccoon Lake (RAC)

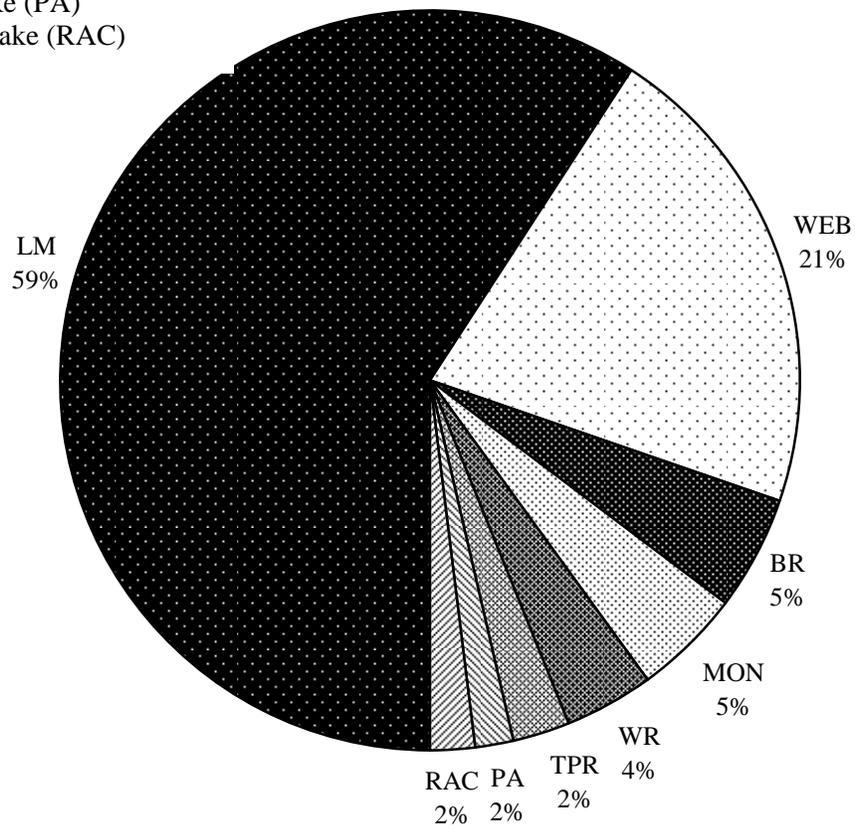
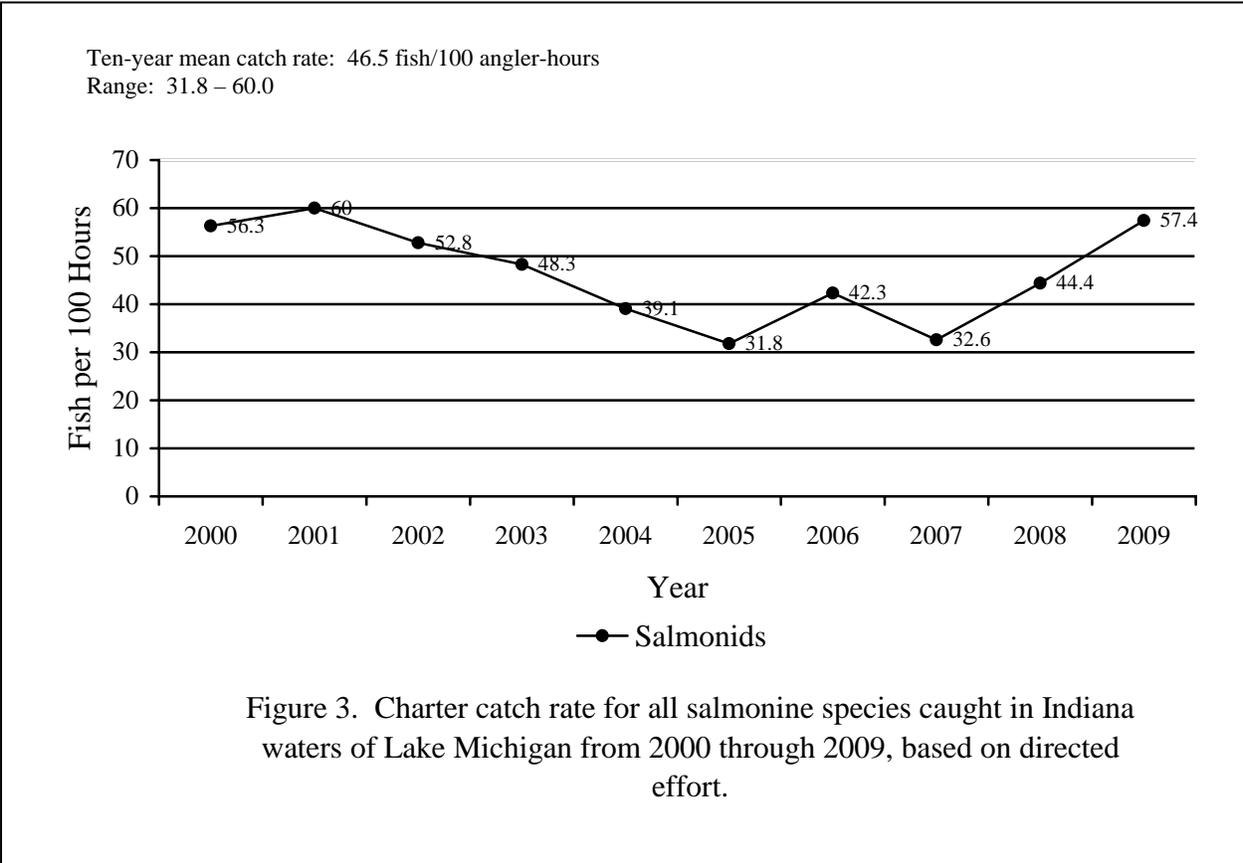
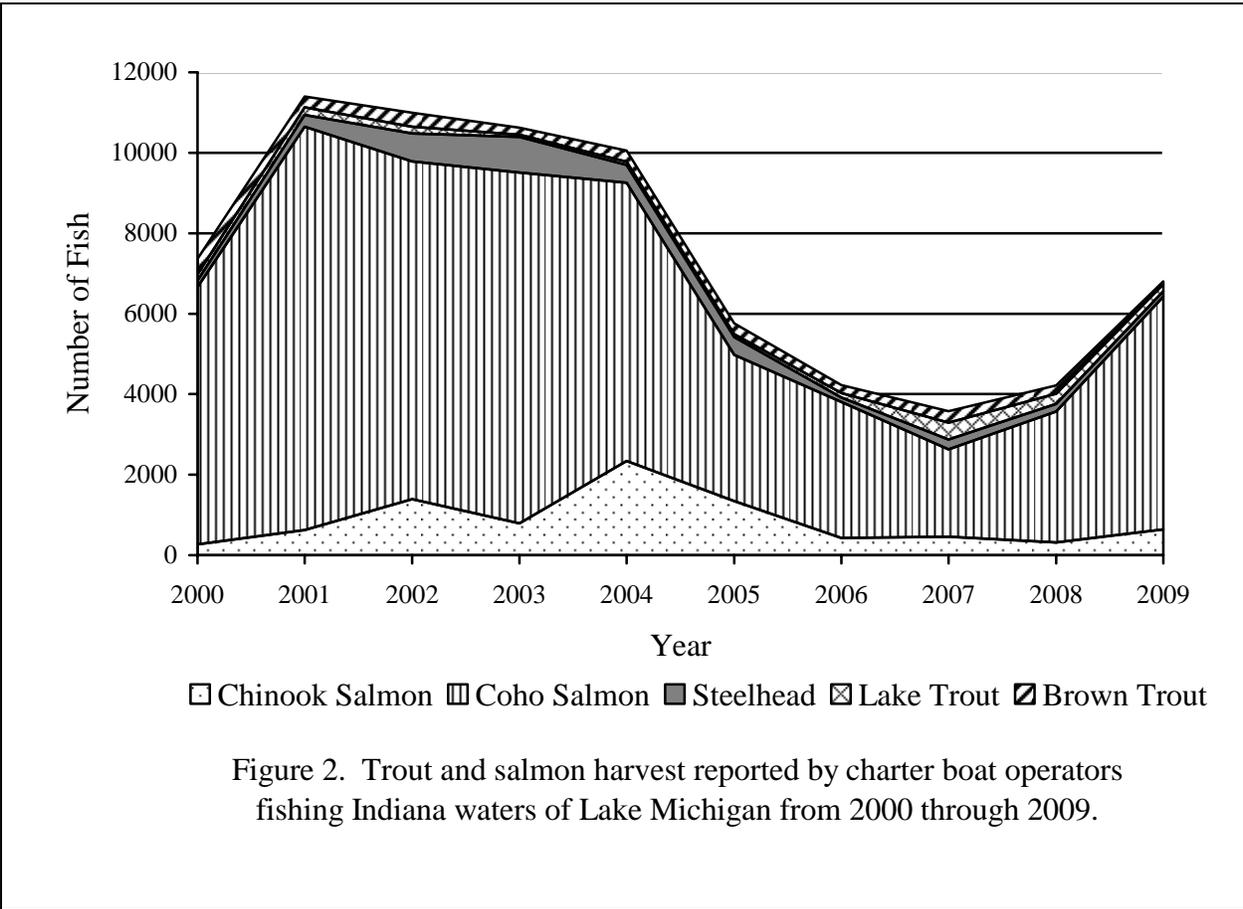


Figure 1. Total number of angler hours fished as reported by charter boat operators fishing Indiana State waters during 2009.



Ten-year mean catch rate: 36.2 fish/100 angler-hours  
Range: 19.7 – 52.5

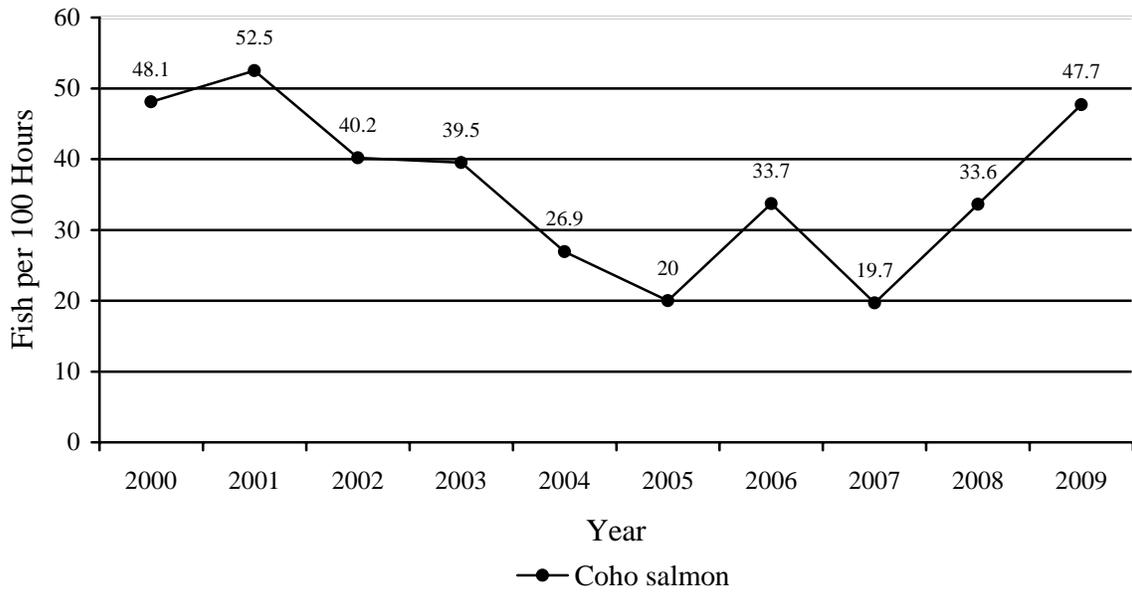


Figure 4. Charter catch rate for coho salmon in Indiana waters of Lake Michigan from 2000 through 2009, based on directed effort.

Ten-year mean catch rate: 5.1 fish/100 angler-hours  
Range: 3.1 – 9.1

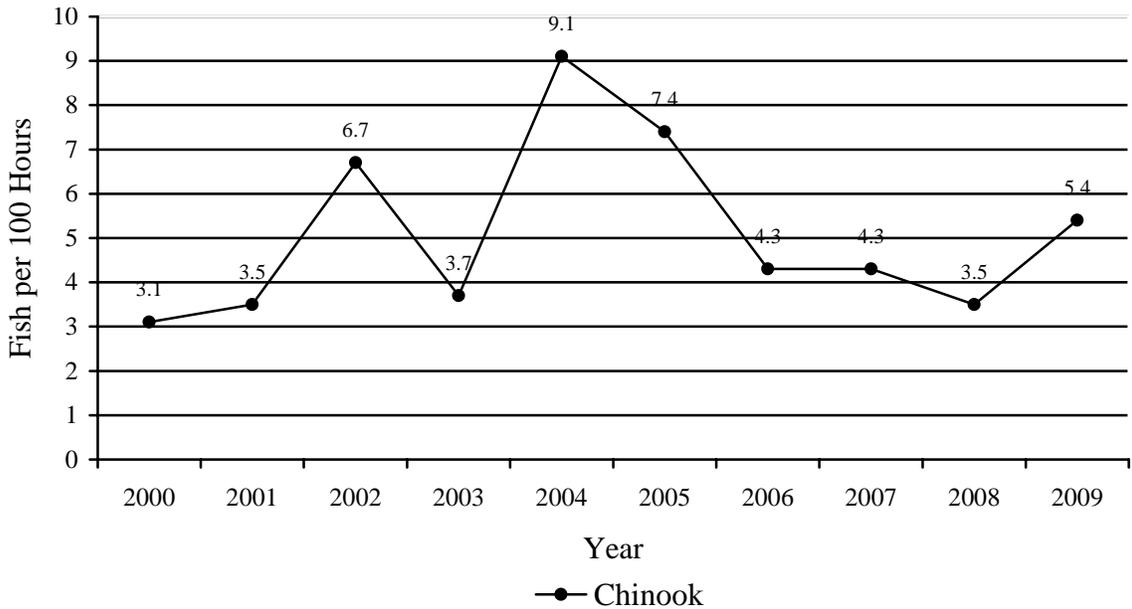


Figure 5. Charter catch rate for Chinook salmon in Indiana waters of Lake Michigan from 2000 through 2009, based on directed effort.

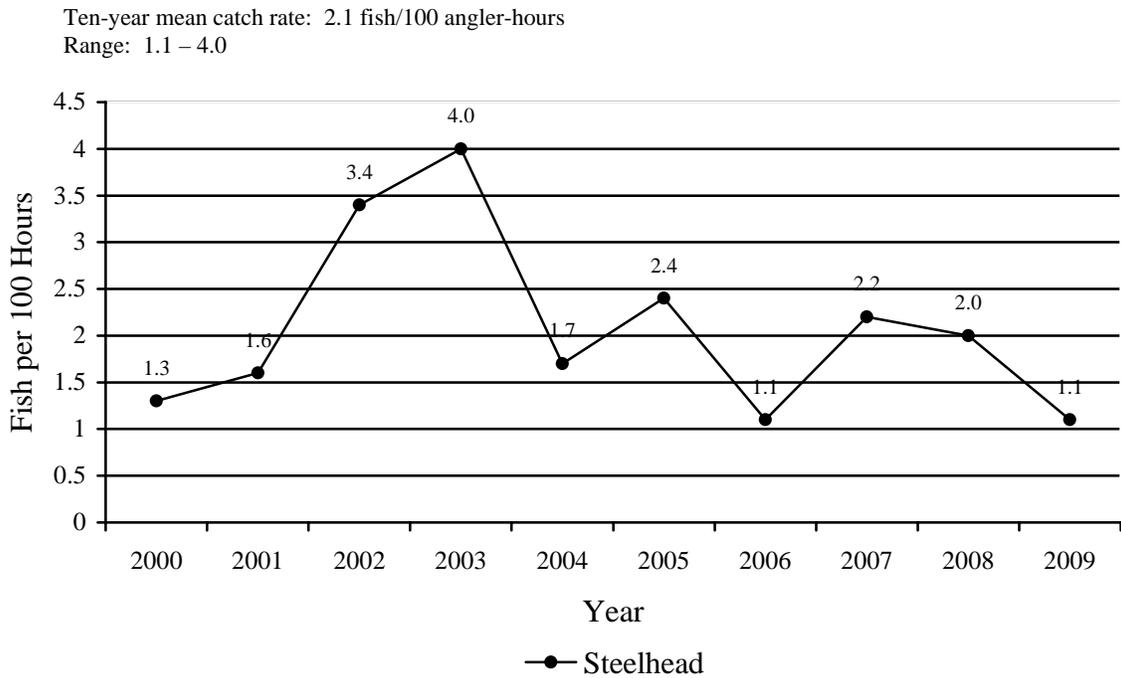


Figure 6. Charter catch rate for steelhead in Indiana waters of Lake Michigan from 2000 through 2009, based on directed effort.

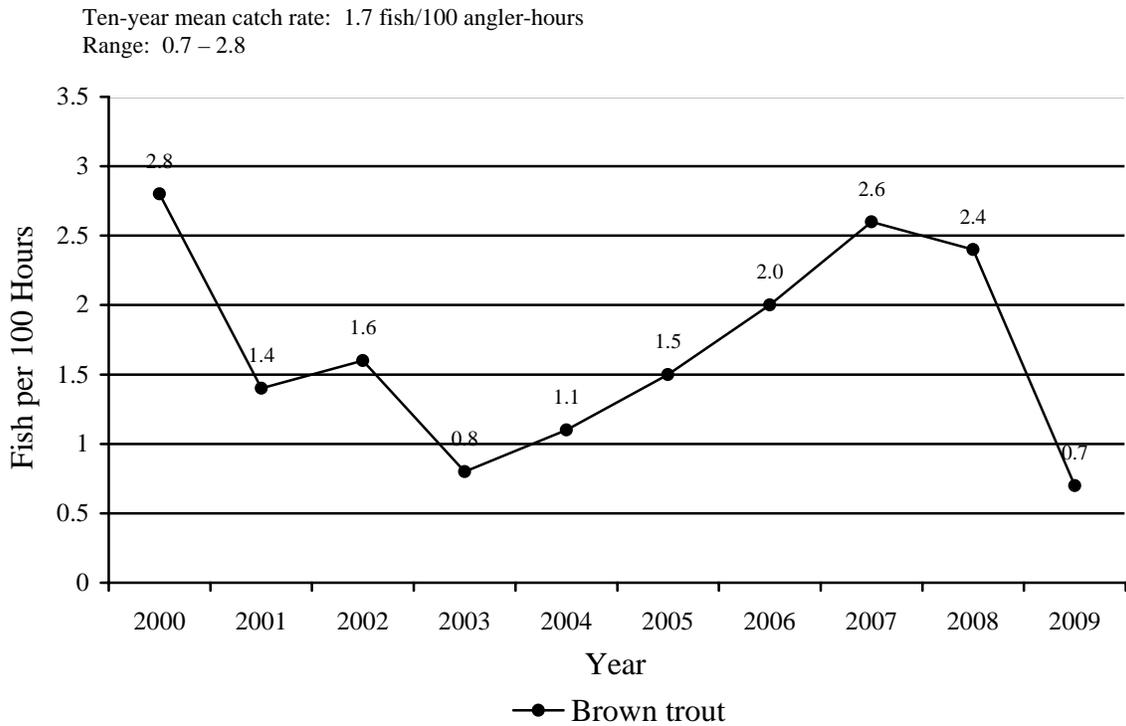


Figure 7. Charter catch rate for brown trout in Indiana waters of Lake Michigan from 2000 through 2009, based on directed effort.

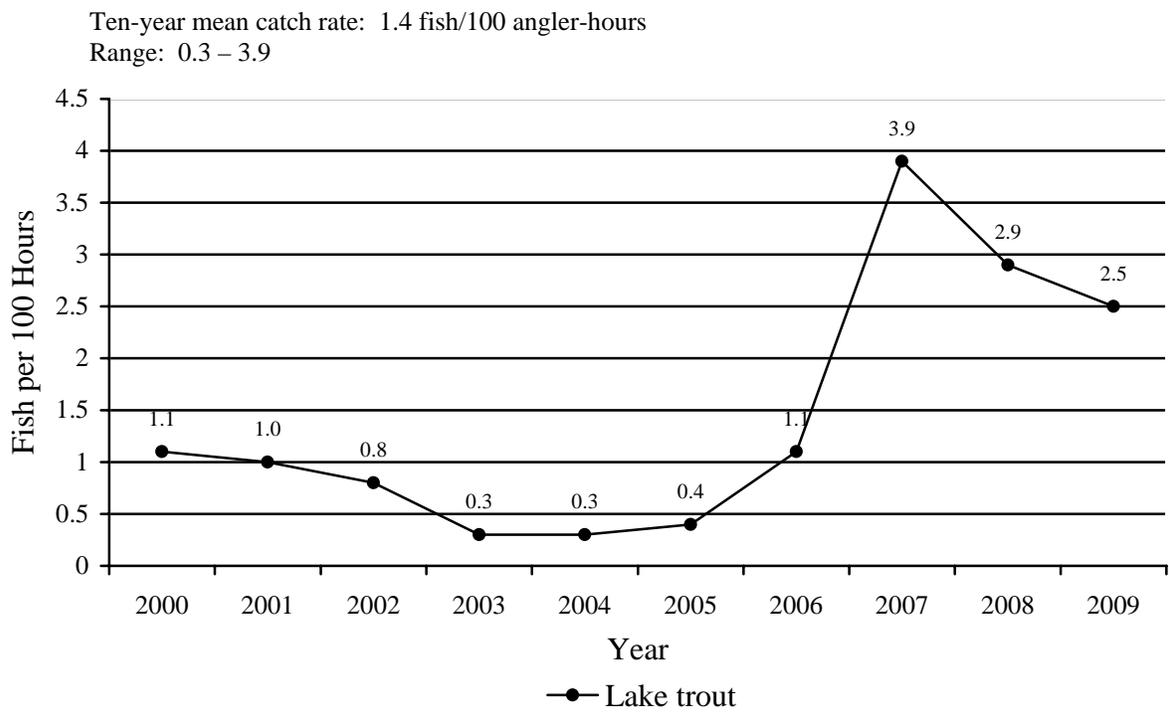


Figure 8. Charter catch rate for lake trout in Indiana waters of Lake Michigan from 2000 through 2009, based on directed effort.

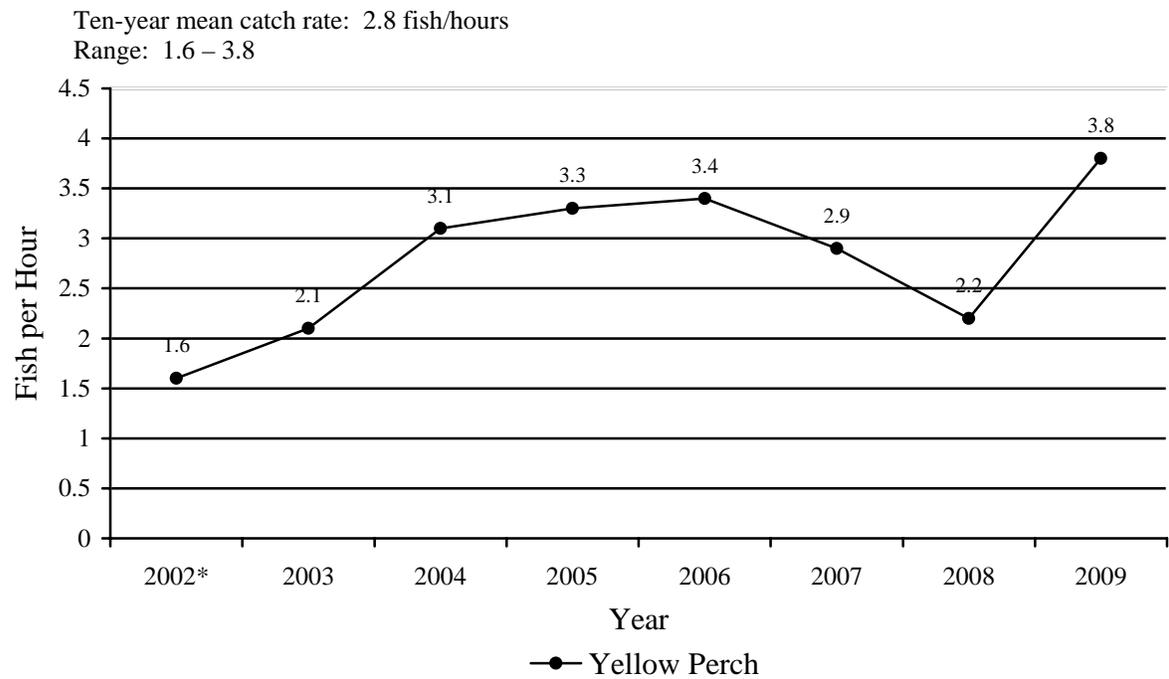


Figure 9. Charter catch rate for yellow perch in Indiana waters of Lake Michigan from 2002 through 2009, based on directed effort.

\* Yellow perch charter catch rate data not available prior to 2002.

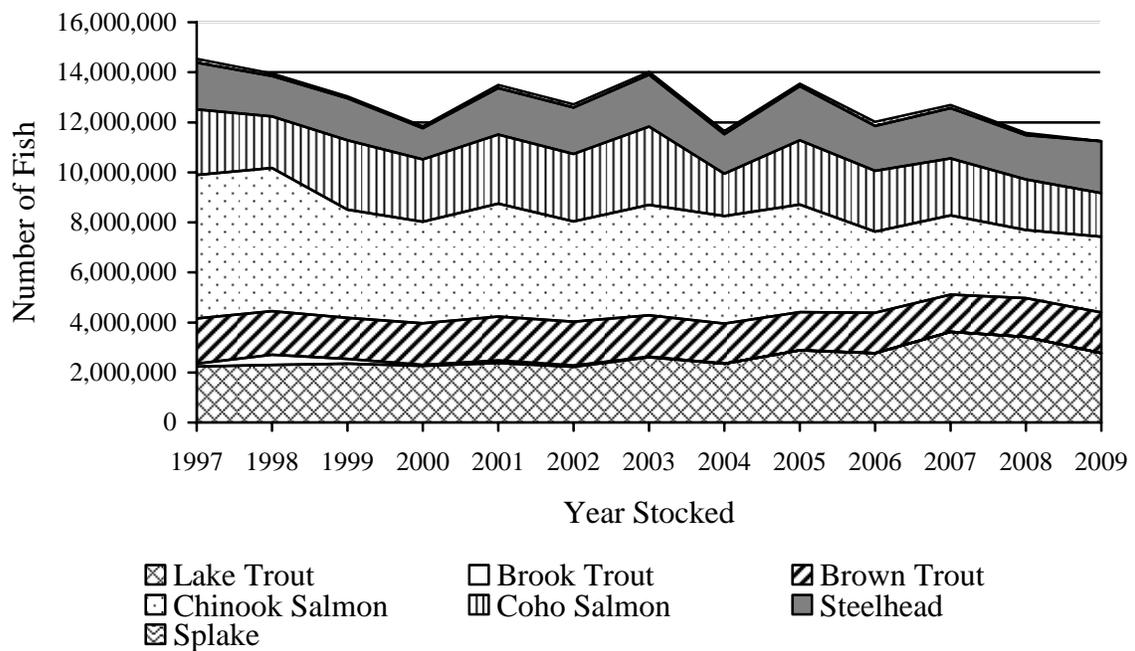


Figure 10. Number of trout and salmon stocked in Lake Michigan each year, 1997 through 2009.

## APPENDIX I

312 I.A.C. 9-7-17 Charter fishing boat operator's license

Authority: IC 14-22-2-6; IC 14-22-15

Affected: IC 14-22-15-4

Sec. 17. (a) An individual may not take another individual sport fishing for hire on:

- (1) Indiana waters;
- (2) waters containing state-owned fish; or
- (3) state boundary waters;

without a charter fishing boat operator's license issued by the director under IC 14-22-15-4 and this section.

(b) A license holder under this section shall, on a departmental form, keep legible and accurate daily fishing records of the:

- (1) species;
- (2) numbers, locations, and dates of fish taken; and
- (3) number of fishermen and hours fished;

while engaged in charter fishing. These daily records shall be recorded before the licensed fishing person departs the boat at the conclusion of the fishing trip.

(c) A license holder under this section shall, on a departmental form, prepare a monthly report of the information maintained on the daily fishing records. The monthly report shall be submitted to the director or the director's representative before the fifteenth day of each month following the month covered. The report shall be submitted each month regardless of whether charter fishing activity occurs in the month covered unless the license holder has submitted an Inactive License Form to signify that no fishing activity will take place for the remainder of the calendar year. The Inactive License Form shall be submitted to the director or the director's representative before the fifteenth day of the month following the month the license is deemed inactive.

(d) The director or the director's representative may, at any reasonable time, inspect the daily fishing records required under subsection (b) or IC 14-22-15-4. (*Natural Resources Commission; 312 IAC 9-7-17; filed May 12, 1997, 10:00 a.m.: 20 IR 2721; filed May 28, 1998, 5:14 p.m.: 21 IR 3723; filed Dec 26, 2001, 2:40 p.m.: 25 IR 1540; readopted filed Jul 28, 2003, 12:00 p.m.: 27 IR 286*)



**INSTRUCTIONS FOR COMPLETING FORM**  
(numbers correspond to numbers on the reverse side)

1. TRIP DATE. Daily fishing trips shall be recorded before the licensed fishing person departs the boat at the conclusion of the charter boat fishing trip (see *administrative rule* 312 AC 9-7-17). Only trips for which all or part of the trip was conducted in **Indiana** waters need to be accounted for. Record the day of the month the fishing activity occurred. If more than one charter boat fishing trip occurs per day, record each trip on a separate line using the same trip date. For example, if you had 3 trips on April 17th, April 17th will occupy three separate lines.
2. NUMBER OF ANGLERS. Daily records shall include the number of anglers fishing in the chartered party. If the captain or first mate's license is used to fish additional poles for the trip or if their license is used for bag limits to count toward the catch, these should be included in the total number of anglers fishing on the boat.
3. LENGTH OF TRIP. Record the number of hours fished in **Indiana** waters. If only a portion of the total trip was conducted in Indiana waters, estimate the total hours that were actually fished in Indiana waters.
4. TOTAL HOURS FISHED. The total hours fished is arrived at by multiplying the number anglers times the hours fished in Indiana waters. For example, if 4 anglers fished 6 hours, the total hours fished is 24.
5. NUMBER OF FISH HARVESTED. Record only fish harvested while fishing in Indiana jurisdictional waters. Use "OTHER" columns for species not listed. **Indicate** what those species are and the **number** harvested in the appropriate boxes. Use the fish abbreviation codes listed. If a code is **not** listed, use the comments box to define the species. For example, if 2 smallmouth bass, 3 largemouth bass and 5 channel catfish were harvested, the fish would be recorded as 2SMB/3LMB in the black bass harvested column and 5CHC in the catfish harvested column.

Black Bass:      smallmouth bass (SMB)  
                         largemouth bass (LMB)

Northern Pike / Muskellunge:      northern pike (NOP)  
   muskie (MUE)

Temperate Bass:      white bass (WHB)  
                                 striped bass (STB)  
                                 hybrid striped bass or wiper (HSB)

Walleye / Sauger:      walleye (WAE)  
                                 sauger (SAE)

OTHER:      carp (CAP)  
                         freshwater drum (FWD)  
                         sunfish family (SUN): includes bluegill, crappie, green sunfish, longear sunfish, pumpkinseed, redear, rock bass, warmouth, etc.

6. NUMBER OF FISH RELEASED. Record only fish that were landed but then released while fishing in Indiana jurisdictional waters. Use "OTHER" columns for species not listed. **Indicate** WHAT those species are and the **number** released in the appropriate box. Use the fish abbreviation codes listed above. If a code is **not** listed, use the comments box to define the species. For example, if 3 walleye, 10 crappie and 2 bluegill were released, the fish would be recorded as 3WAE in the walleye/sauger released column and 12SUN in the other released column.
7. SIGNATURE OF CHARTER OPERATOR. Sign and date the form. Forms must be submitted monthly, even if no fishing activity occurred. Reports are due in the Fish and Wildlife's Michigan City office on or before the 15th of the month following the report month.

NOTE: Return the original copy (*white*) to the Michigan City address displayed below. This report is due in the Division's Michigan City office on or before the 15th of the month following the report month. At any time you may place your license into inactive status by completing an Inactive Report form. Once your license becomes inactive it may not be used for the remainder of the year.

Return to:  
Lake Michigan HQT  
100 West Water Street  
Michigan City, IN 46360-1310

