



**ILLINOIS NATURAL  
HISTORY SURVEY**  
PRAIRIE RESEARCH INSTITUTE

**A Survey of Sport Fishing in the Illinois Portion of Lake Michigan  
March through September 2011**

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**A SURVEY OF SPORT FISHING IN THE ILLINOIS PORTION OF LAKE MICHIGAN**

**March through September, 2011**

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University of Illinois  
Prairie Research Institute  
Illinois Natural History Survey

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Table 1. Common and scientific names of fishes appearing in this report of the survey of sport fishing in the Illinois portion of Lake Michigan. Only common names will be used in the following text.

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Common Name	Scientific Name
Black crappie	<i>Pomoxis nigromaculatus</i>
Bluegill sunfish	<i>Lepomis macrochirus</i>
Brown trout	<i>Salmo trutta</i>
Burbot	<i>Lota lota</i>
Chinook salmon	<i>Oncorhynchus tshawytscha</i>
Coho salmon	<i>Oncorhynchus kisutch</i>
Common carp	<i>Cyprinus carpio</i>
Freshwater drum	<i>Aplodinotus grunniens</i>
Lake trout	<i>Salvelinus namaycush</i>
Largemouth bass	<i>Micropterus salmoides</i>
Northern pike	<i>Esox lucius</i>
Rainbow smelt	<i>Osmerus mordax</i>
Rainbow trout	<i>Oncorhynchus mykiss</i>
Rock bass	<i>Ambloplites rupestris</i>
Round goby	<i>Apollonia melanostoma</i>
Sea lamprey	<i>Petromyzon marinus</i>
Smallmouth bass	<i>Micropterus dolomieu</i>
Yellow perch	<i>Perca flavescens</i>

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**EXECUTIVE SUMMARY**

The purpose of this study was to provide estimates of the non-charter sport fishing effort, harvest and expenditures of anglers fishing the Illinois portion of Lake Michigan. The information provided from this study is important to the management of the sport fisheries in the Illinois waters of Lake Michigan. A contact creel survey was used to collect data concerning the daily effort, harvest and expenditures on randomly selected days over a six month period (4/1 - 9/30). The data were summarized and extrapolated over the six month period to achieve estimates for specific locations as well as for the Illinois waters of the lake. The creel period was stratified by time period (segment = three week blocks) and type of day (weekday vs. weekend/holiday). Also, a March survey was conducted at selected sites along the Lake Michigan shoreline. That survey was stratified in a similar fashion as the main survey except that the segment is one month long instead of three weeks. All data are presented by month.

**Conclusions:**

1. 2011 saw a decrease in angler effort (30.2% compared to 2010). Pedestrian effort decreased 26.6% and boat effort decreased 33.0%.
2. The number of yellow perch harvested decreased 71.9% compared to 2010. The total harvest was nearly 56,800 fish. Mean length increased to 27.2 cm (10.7 in) and mean weight increased to 278 g (0.61 lb), a 4.6% increase and 21.9% increase respectively compared to 2010.
3. Coho salmon was the largest portion of the salmonid harvest in the Illinois waters of Lake Michigan and decreased 4.0% compared to 2010. The total harvest was 29,600 fish. The average size coho in 2011 weighed 1,605 g (3.54 lb.), and measured 54.5 cm (21.5 in) in length, an increase of 1.3% in weight and no change in length.
4. Chinook salmon harvest decreased 28.2% compared to 2010 with a harvest of 5,900 fish. The average size Chinook increased compared to 2010 with length 69.1 cm (27.2 in) and weight 3,852 g (8.49 lb.), an increase of 2.5% and 16.4% respectively.
5. The rainbow trout harvest increased by 4.6% compared to 2010, with a harvest of over 3,100 fish. Rainbow trout length and weight increased compared to 2010 with length increasing 1.6% to 65.0 cm (25.6 in) and an increase in weight of 10.9% to 2,761 g (6.08 lb.).
6. The lake trout harvest increased by 214% compared to 2010 to over 3,000 fish. The average size of lake trout harvested in 2010 decreased compared to 2010 with a decrease in length of 5.1% to 65.0 cm (25.6 in) and a decrease of 21.0% in weight to 2,767 g (6.10 lb.).

7. The brown trout harvest decreased by 57.8% compared to 2010 to 1,100 fish. Average length decreased by 2.9% to 53.6 cm (21.1 in) and average weight decreased by 13.0% to 1,952 g (4.30 lb.).

8. Total expenditures in 2011 were \$3.2 million, 76.7% below 2010.

9. The 2011 March survey saw decreases in angler effort, yellow perch, brown trout, rainbow trout and lake trout harvest; and increases in coho salmon harvest compared to 2010. Total effort was 8,081 angler hours, a 58.7% decrease compared to 2010. Harvest of yellow perch (28), brown trout (87) and rainbow trout (75) decreased 99.8% for yellow perch, 91.3% for brown trout and 22.7% for rainbow trout. Coho salmon (1,201) increased 575%. Lake trout were absent in the March harvest compared to 206 caught in 2010.

### **ABSTRACT**

A survey of sport fishing in the Illinois portion of Lake Michigan was conducted from April 1 to September 30, 2011. The survey covered all legal sport fishing during that period excluding fishing from chartered boats and smelt fishing. It included angling by pedestrians and fishing from boats. The intent of the survey was to provide reliable estimates of sport fishing activity, sport fish harvest, expenditures for sport fishing, and the quality and distribution of sport fishing. Estimated total fishing effort for pedestrians and boaters was 366,600 angler-hours. Estimated total harvest included 56,800 yellow perch, 1,100 brown trout, 3,100 rainbow trout, 3,000 lake trout, 29,600 coho salmon, and 5,900 Chinook salmon. Estimated expenditures for boats, motors, trailers, fishing gear, and automobile gas were over \$3.2 million. The yield value of the sport fishing harvest was approximately \$1.13 million.

One additional special survey was conducted. From March 1 to March 31 an early season survey was conducted at Waukegan Harbor, Montrose Harbor and Calumet Park for pedestrian anglers and Waukegan Harbor and Calumet Park for launched-boat anglers. Anglers from both groups fished a total of 8,100 hours and harvested 30 yellow perch, 90 brown trout, 75 rainbow trout and 1,200 coho salmon. Estimated expenditures for boats, motors, trailers, fishing gear, and automobile gas were over \$1.61 million.

## INTRODUCTION

This report summarizes a survey of sport fishing in the Illinois portion of Lake Michigan from April 1 to September 30, 2011. The survey covered all types of legal sport fishing during that period, with the exceptions of charter-boat fishing and smelt fishing. In addition, a supplemental survey of the early spring fishery from March 1 to March 31 was conducted. The intent of the project was to provide reliable estimates of sport fishing activity, sport fish harvest, expenditures for sport fishing, and quality of sport fishing. Biological data concerning length, weight, sea lamprey wounding and scarring and markings (fin clips and external tags) were also collected for individual fish. Results from the first twenty-four years of this series of annual surveys were reported elsewhere and were summarized by Brofka and Czesny (2010). Prior to these reports, the most recent creel survey of this type in Illinois was conducted in 1979 by Muench (Muench 1981).

### **Geographic setting**

The geographic setting of this survey was the 63 mile Illinois shoreline of Lake Michigan (Figure 1). This area is highly developed and heavily industrialized. Chicago covers roughly one-third of the shoreline, and a series of smaller cities cover almost all of the remainder. This section of Lake Michigan lacks significant tributary streams. The slope of the near-shore lake bottom becomes progressively steeper as one moves from south to north, a geographic feature that influences the distribution and success of sport fishing. This progression means that boaters from Chicago must go considerably farther from shore to reach good salmon waters than boaters departing from North Point Marina.



Figure 1. The Illinois shoreline of Lake Michigan.



## METHODS

The following groups were considered separately: (1) Pedestrian and launched-boat anglers. These anglers were studied directly through personal interviews and direct head counts conducted between 1 April and 30 September. (2) Anglers using moored boats. The data presented here are based entirely on extrapolations from estimates for anglers using launched boats.

### **Pedestrians and launched-boat anglers**

Estimates of effort and harvest by pedestrian and launched-boat anglers were made for selected primary fishing areas, and those estimates were extrapolated to less heavily fished areas. For each primary fishing area, a modified stratified random sampling design similar to that suggested by Malvestuto (1996) was used. The fishing day was the primary sampling unit. Daily estimates of variables of interest (total harvest by species, expenditures by category, etc.) for each primary site were combined to form seasonal estimates using the formula for stratified random samples given by Cochran (1977).

### **Use of primary fishing areas**

The primary fishing areas for pedestrian anglers were North Point Marina, Waukegan Harbor, Montrose Harbor, Belmont Harbor, Jackson Park, and Calumet Park. The primary fishing areas for launched boats were North Point Marina, Waukegan Harbor, Diversey Harbor, and Calumet Park. For each day of work, a creel clerk was assigned to visit three areas, two pedestrian areas and one launch area, in a prescribed order. The three areas were always one of three groups: (1) Waukegan Harbor (pedestrians), North Point Marina (pedestrians), North Point Marina (launched boats); (2) Montrose Harbor (pedestrians), Belmont Harbor (pedestrians), Diversey Harbor (launched boats); and (3) Jackson Park (pedestrians), Calumet Park (pedestrians), Calumet Park (launched boats). The launch ramps at Waukegan Harbor were added in 2006 and were surveyed in the same manner as the launch ramp sites in the three groups. Estimates obtained for the primary fishing areas were extrapolated to all other areas based on the distribution of pedestrian anglers and boat trailers. These distributions were obtained by helicopter flights that were conducted on four weekends during the spring and summer. During each flight, pedestrian anglers were counted and recorded on a form divided by site and the type of pedestrian site: structure (piers and breakwalls), shore (shoreline) and harbor (inside enclosed harbors). Pedestrian anglers who were not at a recognized site were counted and listed in the vicinity of the closest recognized site; the sum of these became the total for "other areas" on the form. Boat trailers with a vehicle attached were counted in the parking lots of launch ramps and were listed on the form at the appropriate site. All of the data collected were combined for the season and averaged, and converted to percentages (Table 2).

## Distribution of fishing

### *Pedestrians and launched boats*

The survey recognized 23 fishing areas (Table 2). Helicopter flights in 1985-90 and 1992-2011 were used to determine the distribution of fishing. In 2011 the 23 areas accounted for 97.3% of the pedestrian anglers observed in the aerial surveys and 100% of the boat trailers parked near launch areas. Boats launched from the Calumet Yacht Club (25 to 50 launches per week in midsummer) were not included in this survey. In this survey, interviews were conducted at six pedestrian fishing areas and four launch areas. The pedestrian areas (North Point Marina, Waukegan Harbor, Montrose Harbor, Belmont Harbor, Jackson Park, and Calumet Park) accounted for 74.4% of the pedestrian anglers observed during the helicopter flights. The four launch areas (North Point Marina, Waukegan Harbor, Diversey Harbor, and Calumet Park) accounted for 73.5% of the boat trailers observed near launch areas.

Table 2. Distribution of pedestrian anglers and boat trailers along the Illinois shoreline of Lake Michigan, determined by helicopter flights in 2011.

Area	Pedestrian anglers (%)	Boat trailers (%)
1. IL Beach State Park & North Point Marina	1.1	38.1
2. Waukegan Harbor and breakwalls	8.1	22.4
3. Great Lakes Naval Training Station	0.0	0.0
4. Forest Park	0.0	0.5
5. Central Park	0.1	1.6
6. Winnetka (Lloyd and Tower Parks)	0.1	4.9
7. Wilmette Harbor	1.6	NA
8. Northwestern Univ. and Dawes Park	0.0	5.4
9. Farwell Avenue pier	1.4	NA
10. Hollywood Avenue pier	0.5	NA
11. Foster Avenue pier	0.1	NA
12. Montrose Harbor and breakwalls	53.5	NA
13. Belmont Harbor	5.5	NA
14. Diversey Harbor and breakwalls	1.1	8.4
15. North Avenue pier	0.0	NA
16. Navy Pier	0.0	NA
17. Monroe Street breakwalls	0.0	NA
18. Burnham Harbor and vicinity	14.7	13.8
19. McCormick Place seawall	1.8	NA
20. 50th Street access area	0.0	NA
21. 59th Street Harbor	1.4	NA
22. Jackson Park Harbor and breakwall	6.1	0.3
23. Calumet Park	0.1	4.6
24. other areas	2.7	0.0

### *Moored boats*

The principal boat mooring areas are North Point Marina, Waukegan Harbor, Great Lakes Naval Training Station, Wilmette Harbor, and the Chicago Park District harbors. This survey did not include boats kept on land (lift service) or at moorings in the Calumet or Chicago river systems. We used the number of power boats kept at moorings as an

index of fishing activity from moored non-charter power boats (Table 3). Although some fishing occurs from sail boats, we assumed that it was a negligible portion of all fishing. Both private lift services, referred to as I/O service in Table 3, were included in the survey (Larsen Marine, at Waukegan Harbor and Skipper Bud's at North Point Marina).

Table 3. Mooring locations along the Illinois shoreline of Lake Michigan and numbers of non-charter power boats moored at each location, as determined by the marinas and port authorities. Total number of power boats per port in bold.

Mooring area	Number of power boats
North Point Marina	<b>1,065</b>
Public Moorings	995
Skipper Bud's I/O service	70
Waukegan Harbor	<b>746</b>
Public Moorings	626
Larsen Marine I/O service	120
Great Lakes Naval Training Station	<b>30</b>
Wilmette Harbor	<b>65</b>
Chicago Park District	<b>3,977</b>
Diversey	700
Burnham	824
other harbor moorings	2,453

### Early spring survey

Only two site groups were surveyed in March. The Lake County group consisted of Waukegan Harbor (pedestrians) and Waukegan Harbor (launched boats). The Chicago group consisted of Montrose Harbor (pedestrians), Calumet Park (pedestrians), and Calumet Park (launched boats). These sites included virtually all the open boat ramps and the areas of heaviest concentrations of open water pedestrian anglers this early in the season (based on personal observations and previous surveys). No attempt was made to estimate moored boat effort, harvest or expenditures in the March survey because very few boats are at moorings at that time.

### Selection of dates in a stratified random sample

The core fishing season (1 April through 30 September 2011) was stratified by segment and type of day. Each date fell within one segment and was either a week day (non holiday Monday through Friday) or a weekend day (weekends and holidays). The following 18 strata were formed:

- |                         |                            |
|-------------------------|----------------------------|
| 1. week days 4/1 - 4/17 | 2. weekend days 4/1 - 4/17 |
| 3. week days 4/18 - 5/8 | 4. weekend days 4/18 - 5/8 |
| 5. week days 5/9 - 5/29 | 6. weekend days 5/9 - 5/29 |
| 7. week days 5/30- 6/19 | 8. weekend days 5/30- 6/19 |

- |                           |                              |
|---------------------------|------------------------------|
| 9. week days 6/20 - 7/10  | 10. weekend days 6/20 - 7/10 |
| 11. week days 7/11 - 7/31 | 12. weekend days 7/11 - 7/31 |
| 13. week days 8/1 - 8/21  | 14. weekend days 8/1 - 8/21  |
| 15. week days 8/22 - 9/11 | 16. weekend days 8/22 - 9/11 |
| 17. week days 9/12 - 9/30 | 18. weekend days 9/12 - 9/30 |

Within each stratum, dates were selected at random with the restriction that all three groups of sites were sampled at least one week day (Monday through Friday) and each weekend. This sampling process was conducted separately for each of the three groups of three areas. Four dates were selected from each stratum except 1, 2, 17 and 18; in those strata, which were several days shorter than the others, fewer than four dates were selected for each group of areas. All three areas in each group were visited on the dates selected for that group.

The early spring survey (1 March through March 31) was treated in a similar fashion to the core survey except that the segment was one month.

- |                         |                            |
|-------------------------|----------------------------|
| 1. week days 3/1 - 3/31 | 2. weekend days 3/1 - 3/31 |
|-------------------------|----------------------------|

### **Data collection**

Data collection at pedestrian fishing areas consisted of counting all pedestrian anglers at the start and finish of a two-hour interview period and interviewing a representative sample of anglers during the two hours. At the eight primary pedestrian areas the interview period was always 0600 to 0800 or 0830 to 1030. Each interview was designed for one angling party (i.e., one or more anglers fishing together) rather than for one individual angler. By interviewing parties instead of all individuals in a party more interviews can be conducted in a given time frame, redundant information can be avoided, and annoyance to the party is minimized. At launch ramps, all trailers with vehicles attached (except personal watercraft trailers) were counted in the parking lot at the beginning and end of the sampling period (between 1100 and 1300) and a representative sample of all returning fishing parties was interviewed.

The interviewers (referred to as creel clerks) gathered information related to effort (number of angler-hours, number of angler-trips), expenditures for the present fishing trip (by category: major = boat, motor, or trailer; minor = fishing gear; other = auto gas @ 10 cents per mile), species sought, and harvest (by species). Clerks also weighed and measured fish in possession of the anglers, noted clipped fins, and noted sea lamprey wounds and scars. The data form and instructions to creel clerks are in (Brofka and Czesny, 2008).

### **Variables measured for each date**

The data collected in the interviews on one date at one area were reduced to a set of variables describing daily fishing activity: (1) Harvest per angler-hour was determined for each species as the number of fish harvested by all parties interviewed divided by the number of hours of fishing by individuals in those parties. (2) Expenditures per

angler-trip were determined in each of three categories (major, minor, and other). For all expenditures, total expenditures by all anglers interviewed were divided by the number of anglers interviewed. (3) Angler-hours (i.e., total time spent fishing by all anglers) and (4) angler-trips (i.e., total number of anglers who fished) were determined differently for pedestrians and boaters. For pedestrians, angler-hours was the average number of anglers (at start and finish of interviews) multiplied by the number of hours in the day (from 0.75 hour before sunrise to 0.75 hour after sunset), and angler-trips was angler-hours divided by the average duration of a pedestrian fishing trip (4.14 hours for all interviews with conventional pedestrian anglers from 2002 - 2011 surveys). The number of fishing boats launched for the day was estimated by multiplying the number of fishing boats landing during the two-hour interview period by the estimated average ratio of the number of all boats returning in a day to the number returning between 11:00 and 13:00. That ratio was estimated to be 2.84 by monitoring all boat traffic at North Point Marina on 4 days in 2011. Angler-trips were then estimated as the total number of boats launched for the day multiplied by the average number of anglers per boat (2.45, based on data from 2002 - 2011). Angler-hours were taken as angler-trips multiplied by the yearly average number of hours per angling trip by boaters (5.38, based on data from 2002 - 2011). (5) Harvest was determined for each species as harvest per angler-hour multiplied by angler-hours, and (6) expenditures were determined for each category as expenditures per angler-trip multiplied by angler-trips.

### **Expansion of daily estimates**

The formula given by Cochran (1977) for stratified random samples was employed to expand the daily estimates to form seasonal area-specific estimates of effort, harvest, and expenditures.

Seasonal averages of harvest per angler-hour were obtained for each primary fishing area by taking unweighted averages of daily values. In these calculations, seasonal averages for yellow perch included only data from anglers who were fishing for perch, and seasonal averages for salmonids included only data from anglers who were fishing for salmonids. Anglers who did not specify what they were fishing for were excluded from these calculations.

### **Extrapolation to other areas**

Extrapolations of seasonal estimates from primary fishing areas to other areas were based on the distributions of pedestrian anglers and boat trailers (Table 2). The distribution of boat trailers was assumed to reflect the distribution of launched-boat anglers. In the extrapolations, harvest, effort, and expenditures at areas not visited were estimated by extension of estimates for the nearest primary fishing areas. Thus, for pedestrian anglers, estimates for Waukegan Harbor were extended to all other areas (except North Point Marina) north of and including Wilmette Harbor; estimates for Montrose Harbor were extended to all remaining areas north of Belmont Harbor; estimates for Belmont Harbor were extended to all remaining areas north of the Monroe Street breakwalls; estimates for Jackson Park were extended to all areas south of Monroe Street except for Calumet Park. For launched boats, estimates for Waukegan Harbor were extended to all launch ramps north of Wilmette (including the "other" areas listed in Table 2); estimates for Diversey were extended to Dawes Park; and results for Calumet Park were extended to the ramps at Jackson Park and Burnham Harbor.

**Moored boats**

Estimates of effort, harvest, and expenditures by anglers using moored boats were extrapolated from calculations for launched boats. First, the ratios of moored fishing boats to launched fishing boats for North Point Marina, and Diversey Harbor were estimated. On four dates during the spring and summer of 2011 counts were made of the numbers of fishing boats returning to moorings while simultaneous counts were made of the number of fishing boats returning to the launch ramp. Charter boats were excluded from the counts. The ratio of moored to launched boats was 0.89 in North Point Marina and 0.91 in Diversey Harbor. Using these figures, seasonal estimates of effort, harvest, and expenditures by anglers using launched boats at North Point and Diversey harbors were extrapolated to moored boats. Thus, for example, the moored boat harvest at North Point Marina for a given segment was estimated to be the launched boat harvest for that segment multiplied by 0.89. Values so derived for North Point and Diversey harbors were then extrapolated to other moored boats based on the distribution of moored power boats. Estimates for North Point Marina were extrapolated to boats moored in Waukegan Harbor, Wilmette Harbor, and Great Lakes Naval Training Station, and the estimates for Diversey Harbor were extrapolated to all other boats moored in Chicago.

**Changes in creel survey methods**

Creel survey methods have varied during the past twenty-six years of the creel survey, so comparisons should be made with caution, especially where estimates for anglers using moored boats are concerned.

**Confidence intervals and bias**

Estimates of harvest, effort, and expenditures are presented without confidence intervals. Confidence intervals presented without estimates of bias are meaningful only if bias is assumed to be negligible, an assumption that we are not willing to make. Although we have collected and will continue to collect data with which to partially assess biases, we are presently unable to make such assessments.

**Yield values**

Here the term yield value means the hypothetical market price of the sport fish harvest. The market prices of fillets were used. The estimated harvest for each species was multiplied by the average individual weight of fish weighed in our survey. That estimated harvested round weight was then multiplied by a factor to estimate the harvested market weight. For fillets, the factor was 0.40 because approximately 60% of the fish is wasted in the filleting process. Total harvested marketable weight was then multiplied by approximate market prices (prices observed on the Internet by W.A. Brofka).

**Missing data**

On some dates creel clerks were unable to complete their assigned interviews. When data were missing from some but not all of the assigned dates in a stratum, estimates for the stratum were based only on data from the completed

dates. In these cases, the sample size was smaller than for strata where all interview sets were completed and the estimates were not as precise as estimates derived from full data sets.

### **Alternate sites/ altered sites**

Sometimes, because of unforeseen circumstances (i.e. construction) a primary site may be closed or less accessible during part or all of a sampling season. The launch ramp at Waukegan was closed until the fourth week in April for major repairs. The fishing pier at North Point Marina was not put in place until the beginning of May.

## **RESULTS**

All estimates derived in this survey are given here without qualification; for simplicity of expression, the word "approximately" is not repeated with each estimated value. Estimates are rounded in the following paragraphs.

Total fishing effort in the Illinois portion of Lake Michigan during the study period was 366,600 angler-hours. Anglers harvested 56,800 yellow perch, 29,600 coho salmon, 5,900 Chinook salmon, 3,100 rainbow trout, 3,000 lake trout and 1,100 brown trout. Expenditures for boats, motors, trailers, fishing gear, and automobile gas used on Lake Michigan fishing trips during the study period were over \$3.2 million. The yield value of the Illinois sport fishing harvest was nearly \$1.13 million.

Detailed results for 2011 are presented in Tables 4 - 10. Tables 4 and 5 list seasonal harvest and effort (angler hours) estimates for anglers. Tables 6 and 7 present effort and harvest for each month. Table 8 provides yield values. Table 9 lists fin clip abbreviations; fin clips observed by our creel clerks are listed in Table 10, with the number of occurrences of each clip or clip combination listed by species. Table 10 can assist in determining the contributions of different stockings of fish to the sport fishery in the Illinois portion of Lake Michigan.

Tables 11 and 12 report angler trips and expenditures among angler types and among years. Tables 13 and 14 compare angler hours and harvest by fish species between angler types and for each year. Table 15 compare minor fish species harvest for each year.

### **Pedestrian fishing**

From April 1 - September 30, 2011, pedestrian anglers made nearly 41,000 trips to Lake Michigan (Table 11) and spent nearly 170,000 hours fishing (Table 4). Yellow perch was the predominant species in the harvest, with a harvest of over 33,000 fish (Table 4). Coho salmon were the next most important species for pedestrian anglers, with a harvest of over 4,700 (Table 4). Pedestrian anglers spent \$163,000 (\$4.00 per trip) for fishing gear and \$73,000 (\$1.79 per trip) for automobile gas (Table 11).



**Boat fishing**

Anglers who used boats made over 37,000 trips to Lake Michigan (Table 11) and spent nearly 197,000 hours fishing (Table 4). The most abundant species in their harvest were coho salmon (24,900), yellow perch (23,700), Chinook salmon (4,700), lake trout (3,000) and rainbow trout (2,800; Table 4). For salmonids, North Point Marina was the most productive of the four primary boat areas, accounting for 53% of the lake trout, brown trout, rainbow trout, Chinook salmon, and coho salmon taken by anglers who used boats (Table 4). Waukegan Harbor accounted for 29% of the yellow perch harvested by boat anglers (Table 4). Expenditures by anglers using boats were \$2,975,000 (\$80 per trip), with 78% of that amount going for boats, motors, and trailers (Table 11).

**Yield values**

The estimated yield values of the three most commonly harvested sport species were \$512,000 for coho salmon, \$455,000 for Chinook salmon, and \$451,000 for yellow perch (Table 8). Currently, none of the species listed in Table 8 are commercially available from Lake Michigan except yellow perch from the Wisconsin portion of Green Bay. The values of all species are derived from the retail prices of those species commercially harvested or raised in other waters.

**Comparisons with preceding years**

Total angler fishing effort in 2011 decreased by 30.2% compared to 2010 (Table 13). Pedestrian effort decreased by 26.6%, boat effort decreased by 33.0% compared to 2010 (Table 13). Angler success for salmonids (number of fish per angler hour) increased compared to 2010 (Figure 2a). Angler success for yellow perch decreased compared to 2010 (Figure 2b).

The yellow perch harvest of 57,000 represented a decrease of 71.9% compared to the 2010 harvest (Table 13 and Figure 4). The average weight of yellow perch kept by anglers increased to 277g (0.61 lb.) (Table 8). The average length increased to 272 mm (Figure 5). Perch fishing off Waukegan was poor for boat anglers in April and May and nonexistent June through September. Boat and pedestrian anglers in Chicago did poor in both June and August (Tables 6 and 7, Figure 6).

The 2011 harvest of coho salmon decreased by 4.0% compared to 2010 (Table 13 and Figure 7). Weight 1,607 g (3.54 lb.) of creel coho salmon increased 2.0% and length (545 mm) decreased 0.2% compared 2010 (Table 8 and Figure 8). 38% of the harvest occurred in June (Tables 6 and 7).

The Chinook salmon harvest was 5,902 fish for 2011, a decrease of 28.2% compared to 2010 (Table 13 and Figure 9). Average length was 691 mm, an increase of 2.5% compared to 2010 and the average weight increased 16.3% compared to 2010 at 3,854 g (8.49 lb.), (Table 8 and Figure 10). 76.9% of Chinook salmon harvest occurred in July, August and September (Tables 6 and 7).

The 2011 harvest of lake trout was 3,008, an increase of 214% compared to 2010, (Table 13). The average weight decreased by 21.6% and average length decreased by 5.0% compared to 2010 (Table 8). 44.9% of the harvest occurred in April (Tables 6 and 7).

The 2011 brown trout harvest (1,098) decreased 57.8% compared to 2010 (Table 13). The average length (536 mm) decreased by 2.9% compared to 2010 and the average weight of 1,952g (4.30 lb.) decreased by 12.4% (Table 8). The peak of the harvest (72.8%) occurred in April (Tables 6 and 7).

The 2011 rainbow trout harvest (3,112) increased by 4.6% compared to 2010 (Table 13). The average length (650mm) and weight 2,760 g (6.08 lb.) increased 0.6% and 10.1% respectively compared to creel rainbow trout from 2010 (Table 8).

Estimated expenditures for boats, motors, and trailers decreased by 80.9% compared to 2010 (Table 11). Minor expenditures decreased by 50.3% and other expenditures decreased by 30.0%.

The 2011 early spring survey saw decreases in all categories except coho salmon compared to 2010. Coho salmon harvest increased by 575% while angler effort decreased 58.7%, lake trout harvest decreased 100%, yellow perch harvest decreased 99.8%, brown trout decreased 91.3% and rainbow trout decreased 29.3%. (Table 14).

### **Minor species**

In addition to the species for which results are presented in detail in Tables 4 - 14, creel clerks reported several other species of fish in possession of anglers (Table 15). For some species, an estimate has been made of the total number of fish harvested and numbers caught (numbers in parentheses). For other species, because so few fish were observed just the actual number observed is reported. Most of the minor species were harvested in or near the harbors. **Rock bass**, 575 (4,302); **bluegill sunfish**, 309 (486); **common carp**, 238 (547); **freshwater drum**, 2,946 (3,951); **smallmouth bass**, 0 (1,631); **largemouth bass**, 4 (243); **burbot**, 1 fish observed, **northern pike**, 1 fish observed, **black crappie**, 2 fish observed; anglers also harvested **alewives** for use as bait and caught **round gobies** (some were retained for food, most were not retained).

## **DISCUSSION**

### **Changes in the fishery and the creel survey in 2011**

The closure for repairs of the launch ramp in Waukegan until the end of April had a negative impact on the fishery as a whole. In March, 2010 there were 3,608 hours of effort and the harvest of 225 yellow perch and 205 brown trout. In April, 2010 there was 27,493 hours of effort and the harvest of 27,246 yellow perch, 3,031 coho salmon and 66

Chinook salmon. In 2011 there was no effort or harvest in March and only 1,676 hours of effort, 762 yellow perch and 162 coho salmon in April.

### **Angler effort**

Total angler fishing effort in 2011 decreased for both pedestrian and boat anglers compared to 2010. Effort decreased 33.0% for boats and 26.6% for pedestrians. Effort has been declining since this survey began in 1986 with periods of stability interspersed. This latest drop could be part of the long term trend or just a short term blip as the weather probably affected to some degree, both angler and fish behavior.

### **Yellow perch**

Annual yellow perch harvests in Illinois were well over one million fish each year from 1986 through 1993 with the exception of 1989. Beginning in 1994 however, harvest fell to fewer than 600,000 and by 1997 fell to well under 60,000 (Brofka and Dettmers, 1997). 2001 saw increased harvest (169,967) due to the combination of the repeal of the slot limit and moving the month closure to July. The annual harvests from 2002 through 2009 saw a general increasing trend to around 300,000. The 2002-2011 average harvest was 229,500. 2011 saw a decrease in both effort and harvest for both boat and pedestrian anglers. Harvest fell 64.8% for pedestrian anglers and 78.0% for boat anglers. Overall effort directed at yellow perch decreased 53.4% and HPE (harvest per angler effort expressed in fish per angler hour) decreased 39.6% to 0.51 yellow perch per angler hour.

### **Coho salmon**

Coho salmon have been the main component of both the boat and pedestrian salmonid fishery. In the boat fishery, coho salmon make up 60 to 70% of the salmonids harvested in a typical year. 2011 was a typical year with coho salmon accounting for 69% of salmonids harvested by the non-charter fishery. The 2011 harvest of over 29,600 coho salmon was a 4% decrease compared to 2010. Mean weight of harvested coho salmon during 2011 was 1,607 g which was 6% heavier than the twenty-six year mean.

### **Other salmonids**

Coho salmon harvest has traditionally been concentrated in the spring and early to mid-summer. Other salmonids, especially lake trout and Chinook salmon, make up the majority of the harvest from mid-summer through the fall. The lake trout harvest was stable from 1991 through 1997 with the exception of 1996. The lake trout harvest in 1998 was exceptional, the highest that this survey has ever seen at 12,000. 1999 and 2000 saw harvest return to the low level recorded in 1996. The past ten years has seen an average harvest of 1,600 fish. The harvest in 2006 (653) was the lowest ever observed by this survey. In 2011 the harvest increased to 3,008 fish, the highest number since 2002.

The Chinook fishery before 1988 was the mainstay of the summer/fall salmonid fishery. Chinook salmon are highly prized because they can attain a very large size and are extremely powerful fighters. Bacterial kidney disease (BKD)

was blamed for die offs of Chinook salmon beginning in 1988. The harvest bottomed out in 1994 with 2,900 Chinook taken. Chinook salmon are now closely monitored in the hatchery and in the wild for BKD (Clark, 1996). The ten year average harvest (2002-2011) of Chinook salmon has been around 10,550 fish. Harvest in 2011 decreased by 28% (5,902) compared to 2010. Mean weight increased 16% to 3,854g (8.49 lbs.) compared to 2010.

Brown trout are an important component of the spring salmonid fishery with a ten year average harvest (2002-2011) of 2,500 fish annually. Pedestrian angling normally accounts for 70% of those fish. The 2011 harvest of 1,098 browns was a decrease of 58% from the 2010 harvest. The mean weight decreased to 1,952 g (4.30 lbs.).

Rainbow trout are a component of the spring and summer fishery. Some mature fish are caught in the spring by pedestrian anglers, but the majority of the fish are caught by the boat fishery. The average annual harvest for the past ten years has been 2,900. 2011 saw an increase of nearly 5% compared to 2010 with a harvest of over 3,100 fish. The mean weight increased to 2,760 g (6.08 lbs.) in 2011.

### **Minor species**

Certain species that have been present in the areas surveyed since the survey began have grown in prominence. Black bass (smallmouth and largemouth bass) inhabiting the harbors and shoreline of the Illinois portion of Lake Michigan have increasingly been the focus of bass anglers nationwide, as indicated by the national B.A.S.S. tournament based at Burnham Harbor July 19 - 23, 2000. Common carp and freshwater drum are being targeted both by anglers fishing for food and catch and release anglers using European carp tournament fishing techniques. Panfish other than yellow perch are being targeted or kept incidentally by pedestrian anglers, with rock bass being the most numerous; the average harvest for the past ten years has been 3% of the average annual yellow perch harvest. 4% of total angling effort was directed at minor species in 2011.

### **Expenditures**

All categories of expenditures in 2011 decreased compared to 2010 expenditures. Major expenditures (boat, motor and trailers) decreased 81%. Minor expenditures (tackle, bait, downriggers, etc.) decreased 50% and other expenditures (mileage) decreased 30%.

### **Early spring (March) survey**

The March survey is heavily influenced by the weather in March and the severity of the winter preceding March. 2000 saw a very mild winter and a relatively calm March. During 2003 the shore line and harbors were locked in ice for the first three weeks. 2004 was a marked improvement over 2003 with increases in all categories except lake trout and Chinook salmon (which remained the same at zero harvested). 2005 saw a decline in all categories. 2006 was similar to 2005. 2007 saw the harbors still frozen at the beginning of March. 2008 survey was similar to 2007 except that the harbors remained frozen longer. Ice again was a problem in 2009, especially at the Lake County group but the ice had cleared earlier from the Calumet ramp allowing boat access to the Calumet River where

excellent yellow perch fishing occurred. Both ramps were clear at the beginning of the 2010 survey though there was some ice early at Montrose Harbor and drifting ice on the lake occasionally caused problems. 2011 saw some ice early in March in Waukegan Harbor which later revealed extensive winter storm damage to the launch ramps, closing them for repair. Of the last ten years of March surveys, 2011 would rank second for coho salmon, sixth for rainbow trout and tenth for effort, yellow perch and brown trout.

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Table 4. Effort (anglers-hours) and harvest (by species) by non-charter anglers in the Illinois portion of Lake Michigan during April-September, 2011. Wau. = Waukegan , Peds = Pedestrian

Type of angler	Area	Effort		Harvest						
		Total hours	Target perch	Target salmon	Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
<b>Peds</b>	North Point	1,558	0	93	0	0	0	0	0	0
	Wau. Harbor	15,775	2,580	10,803	57	177	35	0	475	196
	Montrose	95,417	46,545	35,556	20,740	184	212	0	2,063	515
	Belmont	8,625	5,292	2,253	6,303	15	0	0	228	131
	Jackson	11,156	3,691	6,010	1,486	45	13	0	514	69
	Calumet	1,967	223	1,435	0	76	0	0	46	0
	others	35,226	11,632	19,348	4,486	165	52	0	1,432	243
	<b>TOTALS</b>	<b>169,723</b>	<b>69,963</b>	<b>75,498</b>	<b>33,071</b>	<b>664</b>	<b>312</b>	<b>0</b>	<b>4,759</b>	<b>1,155</b>
<b>Boat</b>	North Point	65,895	4,790	63,695	4,192	244	1,254	981	14,356	2,351
	Wau. Harbor	53,724	7,465	42,621	6,806	49	1,035	465	7,464	1,774
	Diversey	13,133	4,737	7,449	2,130	0	81	391	253	64
	Calumet	8,842	5,535	930	1,734	68	0	0	309	15
	others	55,254	19,379	28,637	8,862	73	430	1,172	2,477	544
	<b>TOTALS</b>	<b>196,848</b>	<b>41,906</b>	<b>143,332</b>	<b>23,725</b>	<b>434</b>	<b>2,800</b>	<b>3,008</b>	<b>24,859</b>	<b>4,747</b>
<b>Summer</b>	<b>TOTALS</b>	<b>366,571</b>	<b>111,869</b>	<b>218,830</b>	<b>56,796</b>	<b>1,098</b>	<b>3,112</b>	<b>3,008</b>	<b>29,618</b>	<b>5,902</b>

Table 5. Effort (anglers-hours) and harvest (by species) by non-charter anglers at selected sites along the Illinois portion of Lake Michigan during March, 2011. Wau. = Waukegan, Cal. = Calumet, Peds = Pedestrian

Location	Effort		Harvest						
	Total hours	Target perch	Target salmon	Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
Wau. Harbor	1,254	0	1,254	0	15	27	0	0	0
Wau. Ramp	0	0	0	0	0	0	0	0	0
Montrose	5,389	0	5,389	28	0	48	0	205	0
Cal. Park Peds	294	0	294	0	0	0	0	87	0
Cal. Park Ramp	1,144	0	1,144	0	72	0	0	909	0
<b>Total</b>	<b>8,081</b>	<b>0</b>	<b>8,081</b>	<b>28</b>	<b>87</b>	<b>75</b>	<b>0</b>	<b>1,201</b>	<b>0</b>

Table 6. Effort and harvest for each month by pedestrian anglers of the Illinois portion of Lake Michigan during April-September, 2011. Wau. = Waukegan

Time Period	Area	Effort		Harvest						
		Total hours	Target perch	Target salmon	Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
April	North Point	0	0	0	0	0	0	0	0	0
	Wau. Harbor	3,056	0	3,056	0	155	0	0	314	0
	Montrose	12,938	1,044	11,773	295	184	0	0	800	0
	Belmont	682	0	682	0	15	0	0	30	0
	Jackson	2,128	0	2,128	0	22	13	0	472	0
	Calumet	1,144	0	1,134	0	76	0	0	36	0
	others	6,470	70	6,392	15	106	31	0	1,224	0
May	North Point	85	0	35	0	0	0	0	0	0
	Wau. Harbor	1,253	0	1,219	0	0	0	0	0	0
	Montrose	11,921	1,021	10,182	115	0	68	0	1,116	287
	Belmont	767	110	657	0	0	0	0	198	0
	Jackson	1,515	49	1,303	0	0	0	0	0	0
	Calumet	322	0	249	0	0	0	0	0	0
	others	4,468	171	3,872	6	0	3	0	56	14
June	North Point	158	0	0	0	0	0	0	0	0
	Wau. Harbor	2,175	825	1,287	0	0	0	0	153	0
	Montrose	29,089	28,134	46	14,492	0	110	0	0	0
	Belmont	4,683	4,421	0	5,971	0	0	0	0	0
	Jackson	2,059	1,939	22	576	0	0	0	0	0
	Calumet	131	131	0	0	0	0	0	0	0
	others	6,858	6,139	428	2,056	0	5	0	46	0
July	North Point	438	0	0	0	0	0	0	0	0
	Wau. Harbor	982	376	139	13	0	0	0	0	0
	Montrose	11,236	3,953	317	1,730	0	0	0	0	0
	Belmont	518	336	42	187	0	0	0	0	0
	Jackson	1,103	404	23	144	0	0	0	0	0
	Calumet	174	32	0	0	0	0	0	0	0
	others	3,401	1,243	116	424	0	0	0	0	0
August	North Point	651	0	0	0	0	0	0	0	0
	Wau. Harbor	1,885	1,134	519	7	0	0	0	0	0
	Montrose	15,775	12,223	452	4,108	0	0	0	0	0
	Belmont	963	425	73	146	0	0	0	0	0
	Jackson	1,228	1,188	0	765	0	0	0	0	0
	Calumet	104	60	0	0	0	0	0	0	0
	others	4,185	3,668	211	1,975	0	0	0	0	0
September	North Point	226	0	58	0	0	0	0	0	0
	Wau. Harbor	6,424	245	6,163	37	22	35	0	7	196
	Montrose	14,457	169	12,785	0	0	34	0	147	228
	Belmont	1,013	0	799	0	0	0	0	0	131
	Jackson	3,123	111	2,534	0	23	0	0	42	69
	Calumet	93	0	52	0	0	0	0	0	0
	others	9,844	340	8,329	11	60	12	0	107	229

Table 7. Effort and harvest by anglers using boats of the Illinois portion of Lake Michigan during April-September, 2011.

Time period	Area	Effort		Harvest						
		Total hours	Target perch	Target salmon	Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
April	North Point	7,439	2,098	8,002	44	176	0	0	927	0
	Waukegan	1,676	847	829	762	0	0	0	162	18
	Diversey	2,115	0	2,115	0	0	0	359	0	0
	Calumet	775	0	775	0	33	0	0	309	15
	others	6,900	258	3,981	152	31	0	991	321	18
May	North Point	11,647	2,502	9,146	4,127	52	64	11	4,436	144
	Waukegan	10,390	4,498	5,892	6,044	0	123	78	1,498	47
	Diversey	2,891	0	2,891	0	0	0	0	49	0
	Calumet	2,990	2,849	0	0	34	0	0	0	0
	others	12,855	3,161	9,599	1,206	32	25	16	433	9
June	North Point	14,738	51	14,687	21	0	263	249	5,886	477
	Waukegan	13,516	437	12,880	0	29	20	83	4,068	278
	Diversey	3,455	2,124	810	1,767	0	18	0	77	0
	Calumet	1,797	881	0	423	0	0	0	0	0
	others	13,917	6,632	4,965	5,273	6	55	17	1,024	55
July	North Point	14,502	0	14,502	0	7	376	402	2,407	610
	Waukegan	10,226	0	10,226	0	0	461	83	1,125	487
	Diversey	1,357	121	811	45	0	31	0	32	0
	Calumet	1,144	382	0	145	0	0	0	0	0
	others	6,859	512	4,804	259	0	177	17	312	97
August	North Point	12,864	140	12,724	0	0	435	284	438	797
	Waukegan	8,172	720	7,249	0	20	200	92	185	141
	Diversey	3,314	2,492	822	319	0	32	32	96	64
	Calumet	1,637	1,423	0	1,166	0	0	0	0	0
	others	12,312	8,620	3,366	1,973	4	128	106	301	204
September	North Point	4,704	0	4,634	0	9	117	35	262	324
	Waukegan	9,744	964	5,544	0	0	231	128	428	803
	Diversey	0	0	0	0	0	0	0	0	0
	Calumet	498	0	154	0	0	0	0	0	0
	others	2,411	197	1,922	0	0	46	26	85	160

Table 8. Yield values of fish harvested by non-charter sport anglers in the Illinois waters of Lake Michigan during April - September 2011. All fish are assumed to be prepared as fillets with 60% waste. Prices for all except brown trout (used lake trout value) are those current in national markets in February, 2012.

Species	Total harvest	Av. wt. (lbs.)	Round wt. (lbs.)	Market wt. (lbs.)	Price per pound	Yield value
Yellow perch	56,796	0.61	34,646	21,134	\$5.49	\$116,026
Brown trout	1,098	4.30	4,721	1,888	\$7.50	\$14,160
Rainbow trout	3,112	6.08	18,921	7,568	\$7.99	\$60,468
Lake trout	3,008	6.10	18,349	7,340	\$7.50	\$55,050
Coho salmon	29,618	3.54	104,848	41,939	\$11.95	\$501,171
Chinook salmon	5,902	8.49	50,108	20,043	\$18.95	\$379,815

Combined yield value of all species: \$1,126,690



Table 9. Fin clip abbreviations.

Name of fin or bone	Abbreviation
Adipose fin	ad
Dorsal fin	do
Left maxillary bone	lm
Right maxillary bone	rm
Left pectoral fin	lp
Right pectoral fin	rp
Left ventral fin	lv
Right ventral fin	rv

Table 10. Fin clip summary for salmonids harvested by non-charter anglers in the Illinois waters of Lake Michigan during 2011. Typically, only a portion of the salmonids stocked each year are marked. However, all lake trout stocked are clipped. Lake trout examined by clerks which exhibit no fin clips are one of four possibilities: 1. the lake trout is naturally produced (wild). 2. the lake trout failed to receive a fin clip in the hatchery. 3. the lake trout regenerated the missing fin or fins. 4. the clerk did not examine the lake trout thoroughly enough and missed the clip or clips.

Clip	Species				
	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
ad	0	0	2	1	0
ad,lp	1	0	0	0	0
do	0	1	0	0	0
lp	0	1	6	0	2
rp	0	4	4	0	0
lv	0	0	2	1	0
no	24	49	16	305	81

Table 11. Estimated number of angler trips and expenditures by non-charter anglers in the Illinois portion of Lake Michigan, during 2002 - 2011. NA = not applicable.

Type of angler	Year	Effort	Expenditures		
		(angler-trips)	Major (boat)	Minor (gear)	Other (travel)
Pedestrians	2002	63,690	NA	\$624,000	\$107,000
	2003	69,578	NA	\$747,000	\$117,000
	2004	79,062	NA	\$882,000	\$136,000
	2005	85,449	NA	\$574,000	\$153,000
	2006	74,719	NA	\$973,000	\$124,000
	2007	75,041	NA	\$477,000	\$129,000
	2008	83,841	NA	\$1,128,000	\$144,000
	2009	90,555	NA	\$900,000	\$165,000
	2010	61,303	NA	\$502,000	\$104,000
	2011	40,781	NA	\$163,000	\$73,000
Boats	2002	45,745	\$5,270,000	\$734,000	\$173,000
	2003	50,306	\$6,550,000	\$828,000	\$197,000
	2004	42,205	\$11,663,000	\$1,140,000	\$156,000
	2005	37,582	\$7,386,000	\$636,000	\$139,000
	2006	52,277	\$12,293,000	\$2,116,000	\$174,000
	2007	42,034	\$6,914,000	\$600,000	\$104,000
	2008	47,636	\$2,949,000	\$1,469,000	\$136,000
	2009	41,349	\$7,584,000	\$624,000	\$123,000
	2010	55,701	\$12,171,000	\$895,000	\$176,000
	2011	37,061	\$2,320,000	\$532,000	\$123,000
Season Totals	2002	109,435	\$5,270,000	\$1,358,000	\$280,000
	2003	119,884	\$6,550,000	\$1,576,000	\$313,000
	2004	121,267	\$11,633,000	\$2,022,000	\$292,000
	2005	123,031	\$7,386,000	\$1,210,000	\$292,000
	2006	126,996	\$12,293,000	\$3,089,000	\$298,000
	2007	117,075	\$6,914,000	\$1,077,000	\$233,000
	2008	131,477	\$2,949,000	\$2,597,000	\$280,000
	2009	131,904	\$7,584,000	\$1,524,000	\$288,000
	2010	117,004	\$12,171,000	\$1,397,000	\$280,000
	2011	77,842	\$2,320,000	\$695,000	\$196,000

Table 12. March fishing effort and expenditures by non-charter anglers at selected sites in the Illinois portion of Lake Michigan, during 2000 and 2003 - 2011. NA = not applicable

Type of angler	Year	Effort	Expenditures		
		(angler-trips)	Major (boat)	Minor (gear)	Other (travel)
Pedestrians	2000	7,538	NA	\$90,000	\$20,000
	2003	1,987	NA	\$24,000	\$4,000
	2004	4,231	NA	\$94,000	\$8,000
	2005	2,652	NA	\$49,000	\$6,000
	2006	3,378	NA	\$38,000	\$7,000
	2007	2,812	NA	\$26,000	\$5,000
	2008	1,656	NA	\$33,000	\$3,000
	2009	1,750	NA	\$42,500	\$4,000
	2010	2,292	NA	\$51,400	\$5,100
	2011	1,667	NA	\$5,300	\$2,700
Launched Boats	2000	745	\$313,000	\$48,000	\$2,000
	2003	356	\$0	\$1,000	\$700
	2004	787	\$0	\$36,000	\$2,000
	2005	566	\$0	\$19,000	\$1,300
	2006	594	\$0	\$33,000	\$1,200
	2007	835	\$0	\$36,000	\$800
	2008	605	\$0	\$37,000	\$900
	2009	1,925	\$514,000	\$61,000	\$5,000
	2010	2,067	\$993,000	\$83,000	\$5,500
	2011	215	\$1,599,000	\$400	\$300
March Totals	2000	8,283	\$313,000	\$138,000	\$22,000
	2003	2,343	\$0	\$25,000	\$5,000
	2004	5,017	\$0	\$130,000	\$10,000
	2005	3,218	\$0	\$68,000	\$7,600
	2006	3,972	\$0	\$71,000	\$8,200
	2007	3,647	\$0	\$62,000	\$5,800
	2008	2,261	\$0	\$70,000	\$3,700
	2009	3,675	\$514,000	\$103,000	\$9,000
	2010	4,359	\$993,000	\$135,000	\$10,600
	2011	1,882	\$1,599,000	\$5,700	\$3,000

Table 13. Fishing effort and harvest by non-charter anglers in the Illinois portion of Lake Michigan, in 2002 - 2011. Peds = Pedestrian anglers, Boat = Boat anglers.

Angler type	Year	Effort	Harvest					
		(angler-hours)	Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
Peds	2002	232,392	142,218	4,016	171	0	10,565	713
	2003	251,773	139,234	1,181	309	0	4,713	1,122
	2004	287,683	169,212	1,474	436	16	4,301	2,790
	2005	307,076	275,632	1,294	250	0	2,211	2,459
	2006	276,536	188,535	692	304	0	348	2,734
	2007	251,912	216,437	1,110	311	34	491	2,543
	2008	284,555	144,144	1,854	395	0	2,179	2,313
	2009	325,802	147,941	745	507	0	2,366	2,922
	2010	231,121	93,986	630	384	0	4,712	1,755
	2011	169,723	33,071	664	312	0	4,759	1,155
	Boat	2002	228,909	22,734	804	3,920	3,034	43,749
2003		246,897	31,822	223	2,931	1,969	24,836	10,047
2004		210,989	42,536	663	2,420	1,628	23,906	10,792
2005		188,564	27,412	1,095	3,000	1,286	19,035	11,856
2006		260,217	128,173	2,203	2,651	663	18,286	11,984
2007		221,692	71,166	638	2,145	849	29,808	8,617
2008		261,825	173,285	2,594	1,895	1,662	13,799	8,637
2009		217,193	115,601	854	1,206	689	15,361	3,985
2010		293,884	107,928	1,973	2,591	958	26,143	6,467
2011		196,848	23,725	434	2,800	3,008	24,859	4,747
Season		2002	461,301	164,952	4,820	4,091	3,034	54,314
	2003	498,670	171,056	1,404	3,240	1,969	29,549	11,169
	2004	498,672	211,748	2,137	2,856	1,644	28,207	13,582
	2005	495,640	303,044	2,389	3,250	1,286	21,246	14,315
	2006	536,753	316,708	2,895	2,955	663	18,634	14,718
	2007	473,604	287,603	1,748	2,456	883	30,299	11,159
	2008	546,380	317,429	4,447	2,289	1,660	15,979	10,950
	2009	542,995	263,542	1,599	1,713	689	17,727	6,907
	2010	525,005	201,914	2,603	2,975	958	30,855	8,222
	2011	366,571	56,796	1,098	3,112	3,008	29,618	5,902

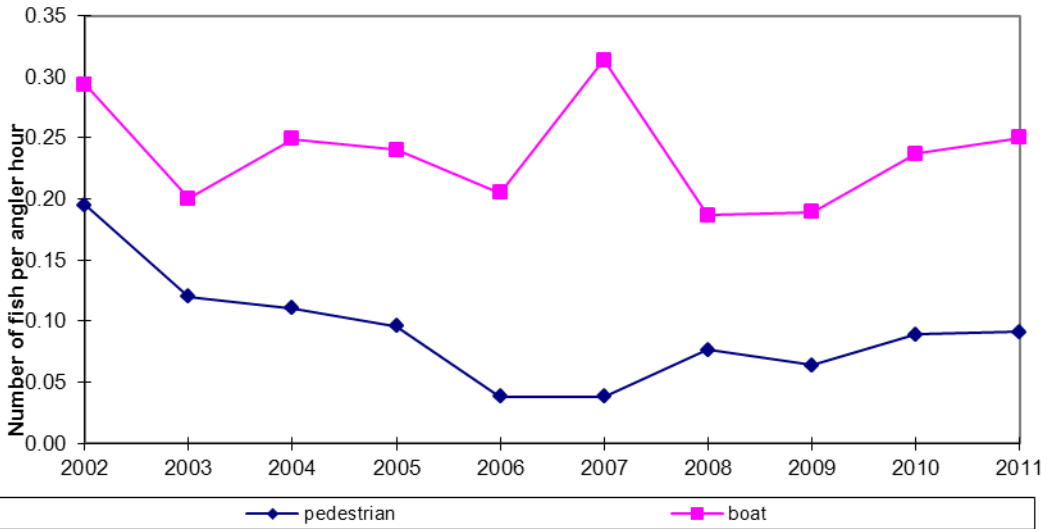
Table 14. March fishing effort and harvest by non-charter anglers at selected sites in the Illinois portion of Lake Michigan, in 2000 and 2003 - 2011. Peds = Pedestrian, Lau'd = Launched boat anglers

Angler type	Year	Effort	Harvest					Chinook salmon
		(angler-hours)	Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	
Peds	2000	34,366	364	3,712	375	0	8,036	0
	2003	9,136	0	175	22	0	15	0
	2004	18,848	170	1,396	360	0	469	0
	2005	11,244	492	762	85	0	173	0
	2006	11,560	0	1,467	65	0	259	0
	2007	9,819	373	764	0	0	386	0
	2008	5,940	261	347	52	0	797	0
	2009	6,296	108	160	85	0	84	0
	2010	8,642	0	549	97	0	65	0
	2011	6,937	28	15	75	0	292	0
	Lau'd	2000	3,699	412	376	42	0	2,242
2003		1,780	4,145	10	0	0	0	0
2004		3,935	9,464	198	9	0	88	0
2005		2,830	5,308	346	0	0	111	0
2006		3,199	4,456	478	0	0	182	0
2007		4,199	10,165	382	9	0	98	0
2008		3,117	1,024	81	0	0	0	0
2009		10,109	19,214	10	0	0	37	0
2010		10,907	16,928	451	0	206	113	0
2011		1,144	0	72	0	0	909	0
March Totals		2000	38,065	776	4,088	417	0	10,278
	2003	10,916	4,145	185	22	0	15	0
	2004	22,783	9,634	1,594	369	0	557	0
	2005	14,074	5,800	1,108	85	0	284	0
	2006	14,759	4,456	1,945	65	0	441	0
	2007	14,018	10,538	1,146	9	0	484	0
	2008	9,057	1,285	428	52	0	797	0
	2009	16,405	19,322	170	85	0	121	0
	2010	19,549	16,928	1,000	97	206	178	0
	2011	8,081	28	87	75	0	1,201	0

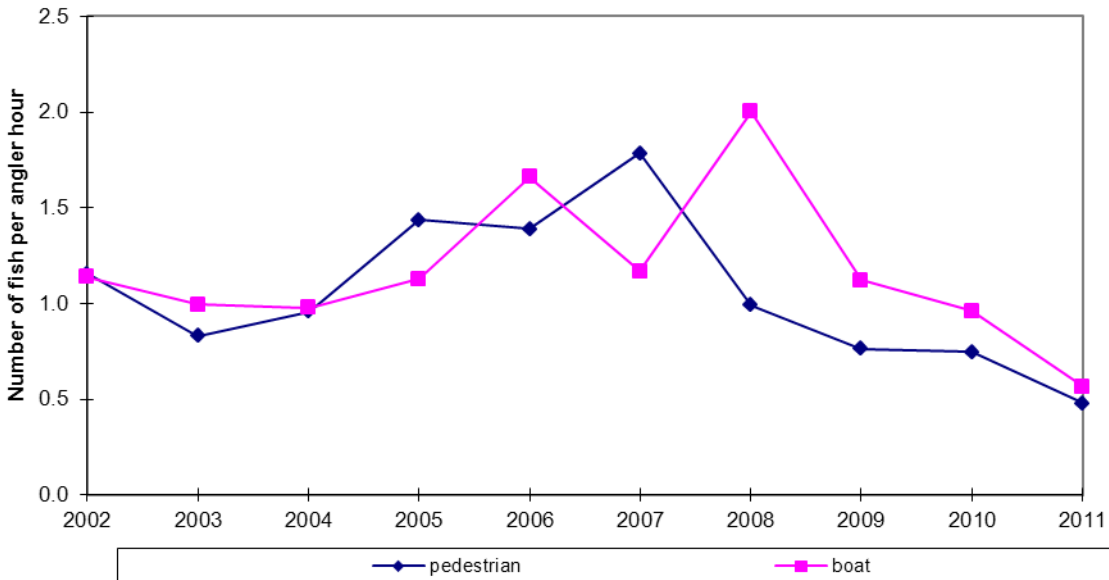
Table 15. Minor species harvest by non-charter anglers in the Illinois portion of Lake Michigan, in 2002 - 2011.

Year	Smallmouth bass	Largemouth bass	Rock bass	Bluegill sunfish	Pumpkinseed sunfish	Common carp	Freshwater drum
2002	0	0	10,507	1,230	220	480	1,066
2003	283	0	7,067	514	1,046	193	3,195
2004	0	0	11,003	3,634	1,143	85	1,160
2005	124	18	9,512	848	601	268	3,921
2006	46	97	6,697	550	28	147	2,990
2007	252	49	10,650	269	20	154	1,965
2008	80	45	7,561	405	0	43	2,033
2009	76	0	3,934	298	0	240	1,482
2010	51	0	1,938	402	9	8	1,768
2011	0	4	575	309	0	238	2,946

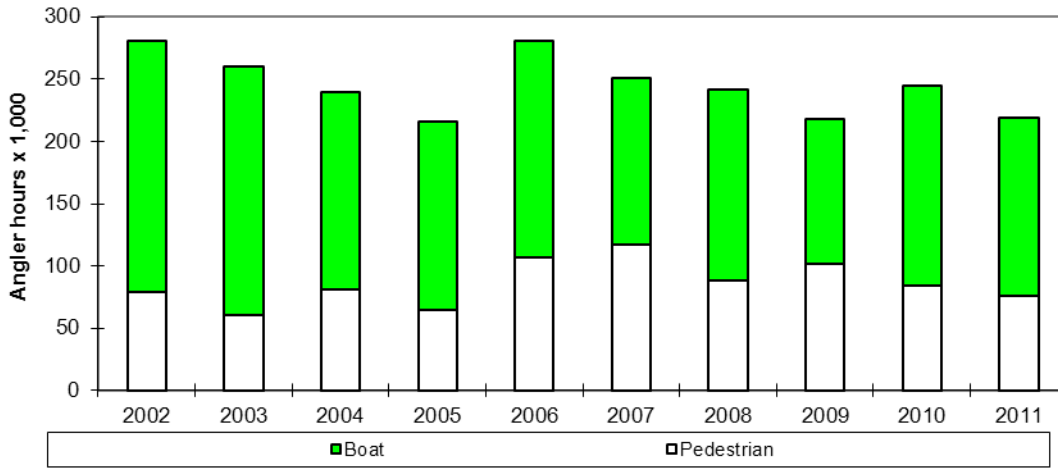
**Figure 2 (a). Salmonid harvest per unit effort, derived from the Illinois sport fishing surveys of Lake Michigan, 2002-2011**



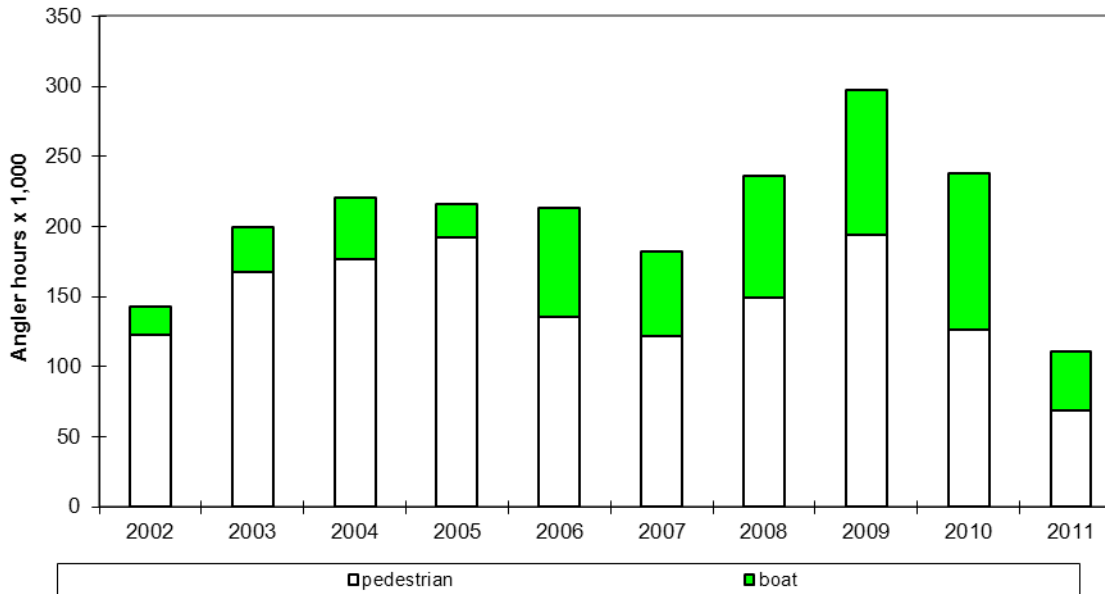
**Figure 2 (b). Yellow perch harvest per unit effort, derived from Illinois sport fishing surveys of Lake Michigan, 2002-2011**



**Figure 3 (a). Directed angler effort for salmonids in the Illinois portion of Lake Michigan, 2002-2011**

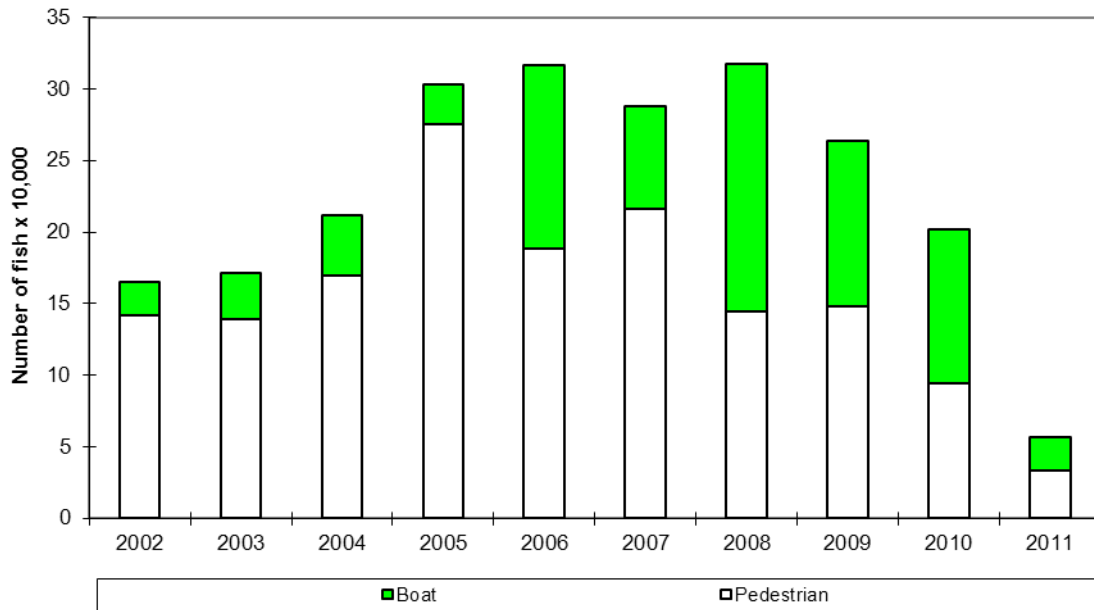


**Figure 3 (b). Directed angler effort for yellow perch in the Illinois portion of Lake Michigan, 2002-2011**

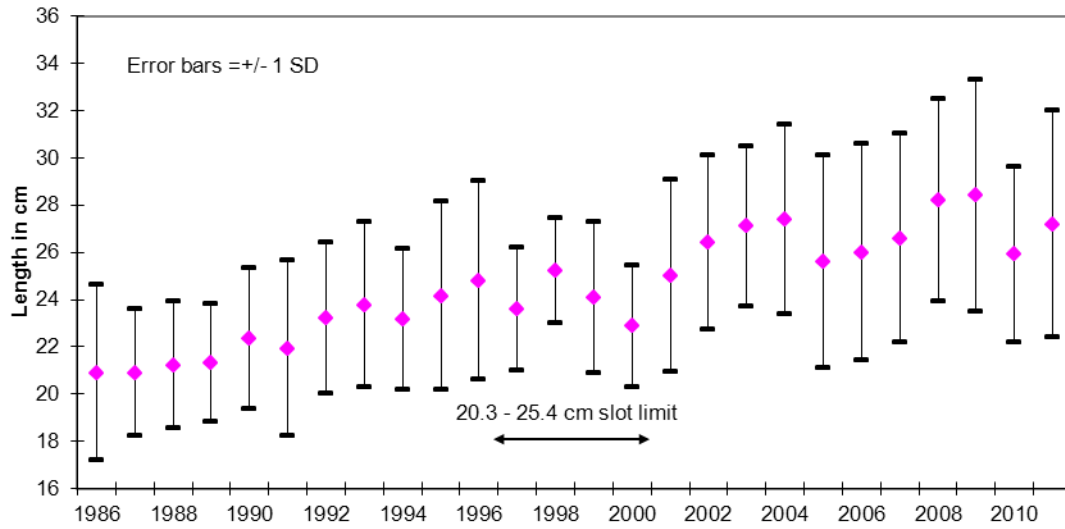




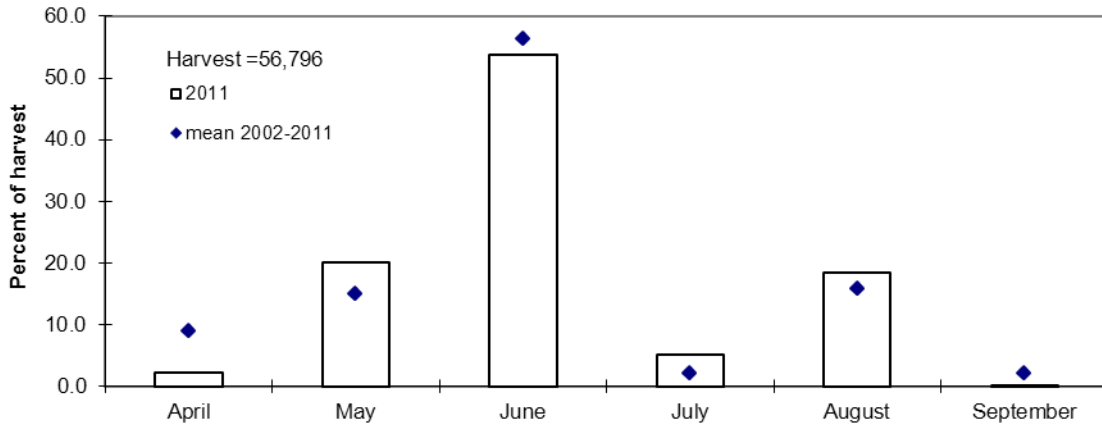
**Figure 4. Total yellow perch non-charter sport harvest in the Illinois waters of Lake Michigan, 2002-2011**



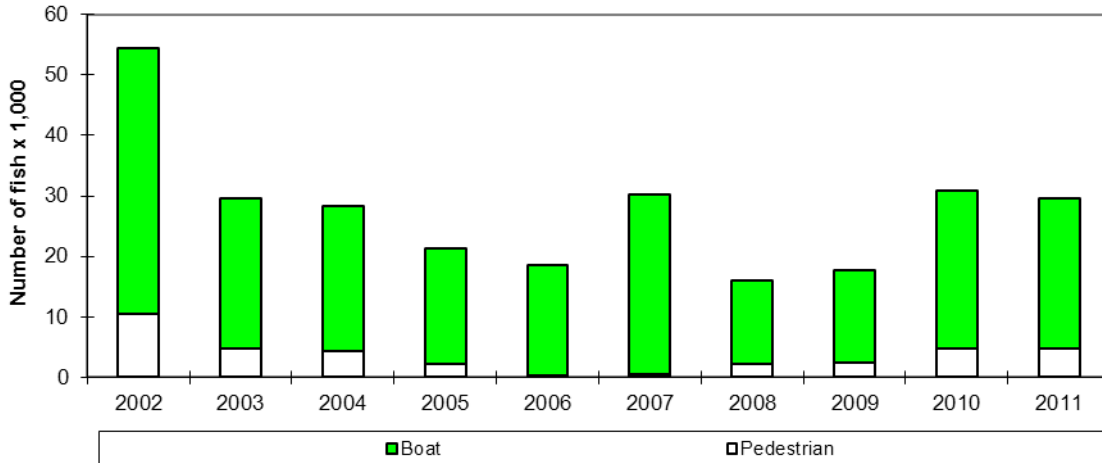
**Figure 5. Average lengths of creel yellow perch from the Illinois waters of Lake Michigan, 1986 - 2011**



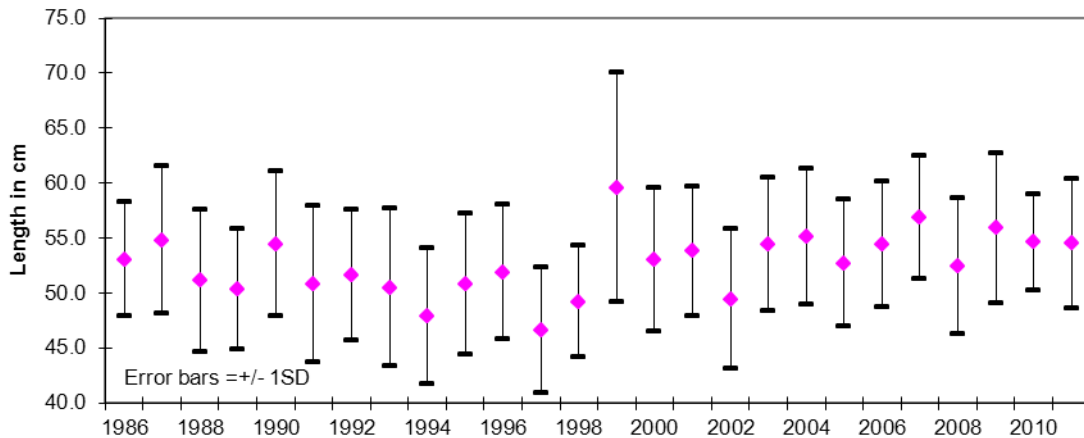
**Figure 6. 2011 yellow perch sport harvest from the Illinois waters of Lake Michigan, per month**



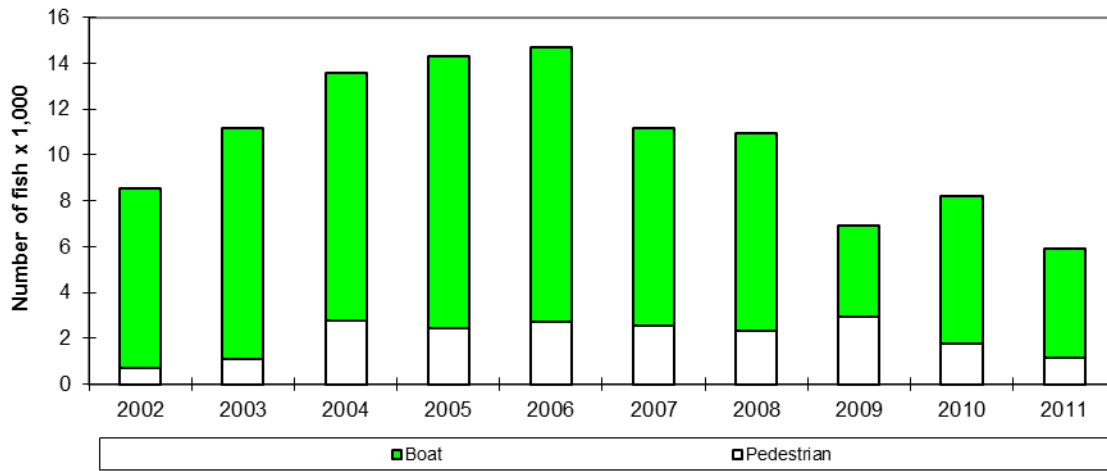
**Figure 7. Total non-charter coho salmon sport harvest in the Illinois waters of Lake Michigan, 2002-2011**



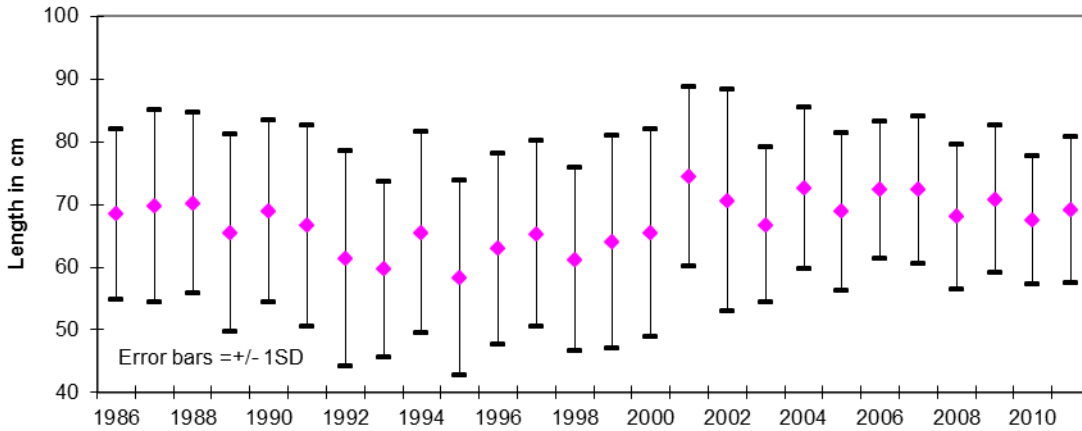
**Figure 8. Average lengths of creel coho salmon from the Illinois waters of Lake Michigan, 1986 - 2011**



**Figure 9. Total non-charter Chinook salmon sport harvest in the Illinois waters of Lake Michigan, 2002-2011**



**Figure 10. Average lengths of creel Chinook salmon from the Illinois waters of Lake Michigan, 1986 - 2011**



**APPENDIX A - COMPARISON OF THE CHARTER AND NON - CHARTER SALMONID BOAT FISHERY**

A comparison was done to see if the charter and non - charter boat salmonid fisheries were targeting the same species (Tables A1 and A2). In general they have with similar percents of total harvest for both groups. A comparison of harvest per unit effort is also presented (Figure A1). As can be imagined the charter fishery generally outperformed the non - charter boat fishery in all years at a factor of 2 or 3 per angler hour. The combined harvest of both charter and non - charter anglers (boats and pedestrians) for 2002 - 2011 is presented (Figure A2). Harvest from early spring surveys are not included in the total.

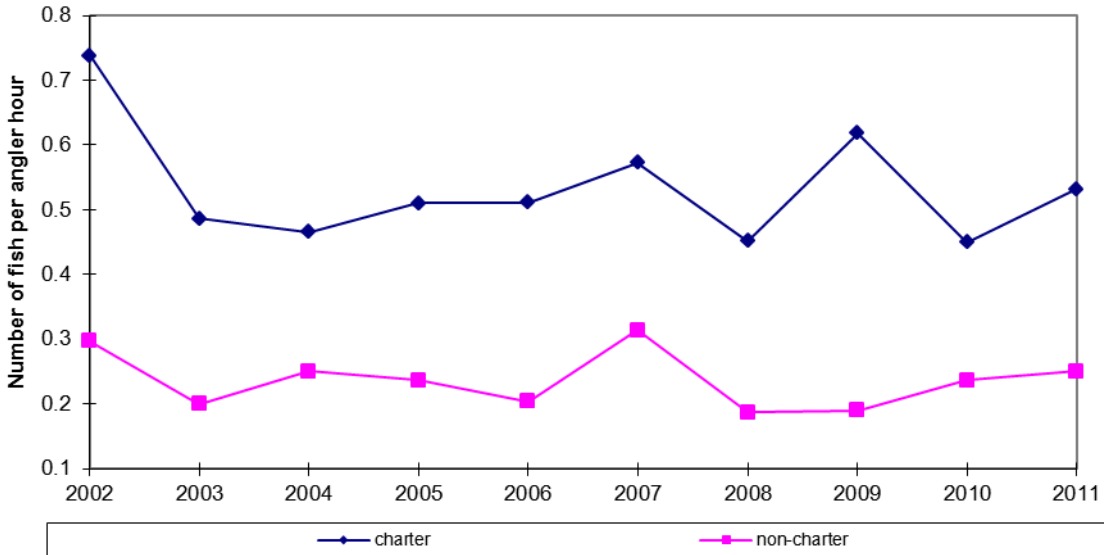
Table A1. Non-charter boat harvest composition (boats only) April – September 2002 - 2011.

Year	Effort	Percent of total harvest					Total salmonids
	(angler-hours)	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon	
2002	201,605	1.40	6.60	5.10	73.70	13.20	59,343
2003	199,369	0.60	7.30	4.90	62.10	25.10	40,006
2004	158,290	1.70	6.10	4.10	60.70	27.40	39,409
2005	151,010	3.00	8.30	3.50	52.50	32.70	36,272
2006	174,621	6.20	7.40	1.90	51.10	33.50	35,787
2007	133,974	1.50	5.10	2.00	70.90	20.50	42,057
2008	153,169	9.10	6.60	5.80	48.30	30.20	28,587
2009	116,514	3.90	5.50	3.10	69.50	18.00	22,095
2010	160,945	5.20	6.80	2.50	68.60	17.00	38,132
2011	143,331	1.20	7.80	8.40	69.30	13.20	35,848

Table A2. Charter boat harvest composition April – September 2002 - 2011.

Year	Effort	Percent of total harvest					
	(angler-hours)	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon	Total salmonids
2002	117,381	1.50	3.70	4.40	80.50	9.90	86,635
2003	112,068	1.00	4.20	5.00	69.60	20.30	54,471
2004	110,284	1.70	3.30	4.30	62.30	28.40	51,359
2005	114,599	2.40	8.60	4.00	51.20	33.70	58,473
2006	99,698	1.20	5.50	2.50	54.00	36.70	51,753
2007	87,763	2.90	3.20	2.90	66.50	24.60	50,218
2008	91,756	2.90	5.20	4.60	59.40	28.00	41,499
2009	88,221	2.00	6.70	5.30	59.10	26.90	34,349
2010	94,406	1.10	13.90	6.00	53.10	26.00	43,883
2011	91,235	0.50	8.60	7.00	67.60	16.30	48,585

**Figure A1. Comparison of charter and non-charter boat salmonid harvest rates for the Illinois portion of Lake Michigan, 2002-2011**



**Figure A2. Illinois Lake Michigan sportfishing harvest (charter & regular combined) 2002 - 2011**

