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ILLINOIS NATURAL HISTORY SURVEY

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

E-52-R12

Annual Report

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Illinois Department of Natural Resources

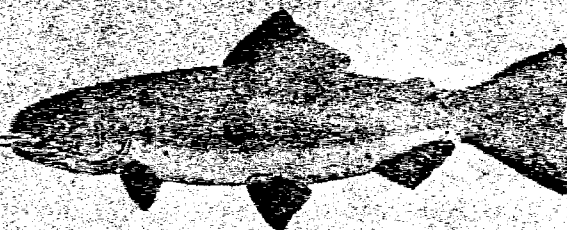
Center for Aquatic Ecology

Wayne A. Brofka and John M. Dettmers

Illinois Natural History Survey
Lake Michigan Biological Station
400 17th Street
Zion, Illinois 60099

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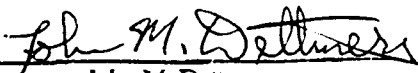
A SURVEY OF SPORT FISHING IN THE ILLINOIS PORTION OF LAKE MICHIGAN


March through September, 1997

Wayne A. Brofska and John M. Dettmers

**Lake Michigan Biological Station
Center for Aquatic Ecology, Illinois Natural History Survey**

**Submitted to
Division of Fisheries, Illinois Department of Natural Resources
in fulfillment of the reporting requirements of
Federal Aid Project F-52-R12**


John M. Dettmers
Principal Investigator


David Philipp, Director
Center for Aquatic Ecology

May 1998

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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.

Common Name	Scientific Name
Alewife	<i>Alosa pseudoharengus</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Bluegill sunfish	<i>Lepomis macrochirus</i>
Brook trout	<i>Salvelinus fontinalis</i>
Brown trout	<i>Salmo trutta</i>
Carp	<i>Cyprinus carpio</i>
Channel catfish	<i>Ictalurus punctatus</i>
Chinook salmon	<i>Oncorhynchus tshawytscha</i>
Coho salmon	<i>Oncorhynchus kisutch</i>
Freshwater drum	<i>Aplodinotus grunniens</i>
Gizzard shad	<i>Dorosoma cepedianum</i>
Lake trout	<i>Salvelinus namaycush</i>
Largemouth bass	<i>Micropterus salmoides</i>
Pumpkinseed sunfish	<i>Lepomis gibbosus</i>
Rainbow smelt	<i>Osmerus mordax</i>
Rainbow trout	<i>Oncorhynchus mykiss</i>
Rock bass	<i>Ambloplites rupestris</i>
Round goby	<i>Neogobius melanostomus</i>
Sea lamprey	<i>Petromyzon marinus</i>
Smallmouth bass	<i>Micropterus dolomieu</i>
White bass	<i>Morone chrysops</i>
White perch	<i>Morone americana</i>
White sucker	<i>Catostomus commersoni</i>
Yellow bullhead	<i>Ameiurus natalis</i>
Yellow perch	<i>Perca flavescens</i>

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 (workday vs. non-work day). 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.

Conclusions:

1. 1997 saw another substantial drop in angler effort (down 25.4% compared to 1996). Pedestrian effort dropped 28.9% because yellow perch fishing was very poor, although the pedestrian coho fishing was excellent in the spring.
2. The number of yellow perch harvested decreased 84.8% compared to 1996. The total harvest was 59,000 fish. The average weight and length of yellow perch in the survey decreased, likely because of the new yellow perch regulations (slot size limit 203 - 254mm could be kept, perch shorter or longer had to be released). The bag limit was reduced to 15 as compared to a 25 fish bag limit in 1995 - 96.
3. Coho salmon dominated the salmonid harvest in the Illinois waters of Lake Michigan, with an increase of 66.4% from 1996. The total harvest was nearly 83,200 fish. The increase in harvest may have resulted in part from the discontinuation of the 5-3-2 bag limit rule in April.
4. Lake trout were numerically the second most important salmonid species. Nearly 5,900 lake trout were harvested, an increase of 123% compared to 1996.
5. The rainbow trout harvest decreased by 39.7% to 3,200 compared to 1996.
6. The brown trout harvest increased by 93.4% to 5,100 compared to 1996. In the past eleven years, the majority of the brown trout were harvested during the first six weeks of the survey, with the majority of the fish appearing to be two years of age. The number of fish stocked lake wide and the severity of the early spring weather strongly influences the size of the brown trout harvest.
7. The chinook salmon harvest decreased by 31.4% to 4,900 compared to 1996.
8. Total expenditures in 1997 were \$9.4 million which were 3.3% above 1996.
9. Weather data were collected throughout the creel season in 1997. Poor weather had a negative effect on launched and moored boat effort (angler hours) during segments 1 and 2 (April 1 - May 12). In segment 2 the weekday effort was more severely impacted than the weekend effort.
10. The March survey saw large increases compared to the 1996 March survey. Anglers at these sites fished for 59,100 hours (an increase of 304% compared to 1996), and harvested 4,154 brown trout (an increase of 327% compared to 1996), 344 rainbow trout (an increase of 54.3% compared to 1996) and 9,530 coho salmon (an increase of 8,486% compared to 1996).

ABSTRACT

A survey of sport fishing in the Illinois portion of Lake Michigan was conducted from April 1 to September 30, 1997. 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 551,000 angler-hours. Estimated total harvest included 59,100 yellow perch, 5,100 brown trout, 3,200 rainbow trout, 5,900 lake trout, 83,200 coho salmon, and 4,900 chinook salmon. Estimated expenditures for boats, motors, trailers, fishing gear, and automobile gas were \$9.4 million. The yield value of the sport fishing harvest was approximately \$1.2 million.

One additional special survey was conducted. From March 1 to March 31 an early season survey was conducted at Waukegan Power Plant, 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 59,100 hours and harvested 9,500 coho salmon, 4,200 brown trout, 300 rainbow trout, 30 lake trout and 30 chinook salmon. Estimated expenditures for boats, motors, trailers, fishing gear, and automobile gas were \$0.86 million.

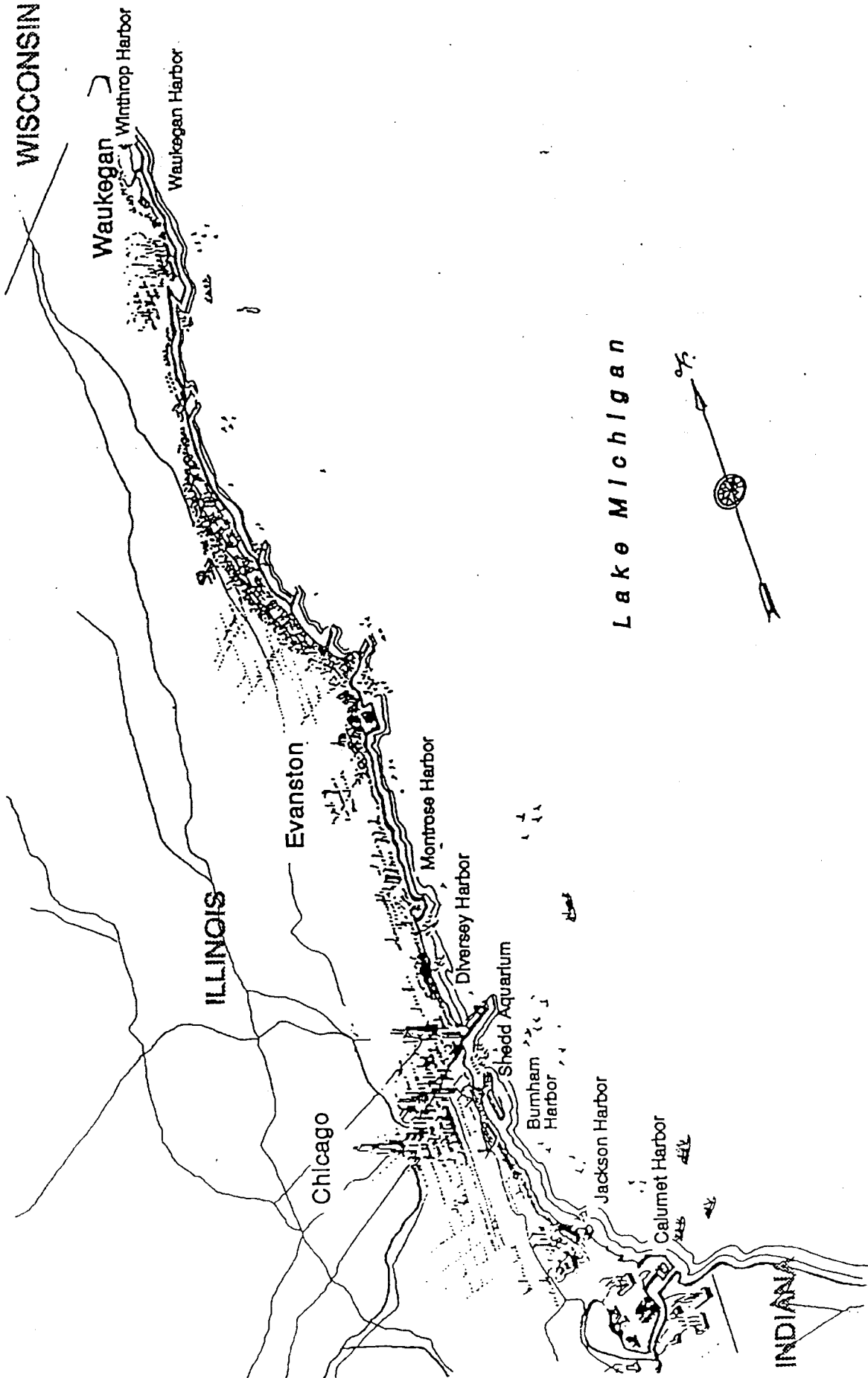
INTRODUCTION

This report summarizes a survey of sport fishing in the Illinois portion of Lake Michigan from April 1 to September 30, 1997. 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 eleven years of this series of annual surveys were reported elsewhere and were summarized by Brofka and Marsden (1997). 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 miles 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 (1983) 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 Waukegan Power Plant, Waukegan Harbor, Montrose Harbor, Diversey Harbor, Burnham Harbor, McCormick Place, Jackson Park, and Calumet Park. The primary fishing areas for launched boats were North Point Marina, Diversey Harbor, Burnham Harbor (west ramp), 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 four groups: (1) Waukegan Harbor (pedestrians), Waukegan Power Plant (pedestrians), North Point Marina (launched boats); (2) Montrose Harbor (pedestrians), Diversey Harbor (pedestrians), Diversey Harbor (launched boats); (3) Burnham Harbor (pedestrians), McCormick Place (pedestrians), Burnham Harbor west ramp, (launched boats); and (4) Jackson Park (pedestrians), Calumet Park (pedestrians), Calumet Park (launched boats). The primary fishing areas accounted for 78% of pedestrian fishing and 60.1% of fishing from launched boats (Table 2). 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 weekends four times during the 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 27 fishing areas (Table 2). Helicopter flights in 1985-90 and 1992-97 were used to determine the distribution of fishing. In 1997 the 27 areas accounted for 98.3% 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 mid summer) were not included in this survey. In this survey, interviews were conducted at eight pedestrian fishing areas and four launch areas. The pedestrian areas (Waukegan Power Plant, Waukegan Harbor, Montrose Harbor, Diversey Harbor, Burnham Harbor, McCormick Place, Jackson Park, and Calumet Park) accounted for 78% of the pedestrian anglers observed during the helicopter flights. The four launch areas (North Point Marina, Diversey Harbor, Burnham Harbor west ramp, and Calumet Park) accounted for 60.1% 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 1997.

Area	Pedestrian anglers (%)	Boat trailers (%)
1. IL. Beach State Park & North Point Marina	3.0	34.2
2. Waukegan Power Plant discharge and pier	8.4	0.0
3. Waukegan Harbor and breakwalls	6.9	18.9
4. Great Lakes Naval Training Station	1.4	2.0
5. Forest Park	0.0	1.1
6. Central Park	0.1	3.1
7. Winnetka (Lloyd and Tower Parks)	1.4	1.1
8. Wilmette Harbor	2.1	0.0
9. Northwestern Univ. and Dawes Park	0.1	10.1
10. Farwell Avenue pier	0.6	0.0
11. Hollywood Avenue pier	2.3	0.0
12. Foster Avenue pier	0.4	0.0
13. Wilson Avenue ramp	0.0	0.5
14. Montrose Harbor and breakwalls	48.1	0.0
15. Belmont Harbor	6.6	0.0
16. Diversey Harbor and breakwalls	4.2	8.6
17. North Avenue pier	0.7	0.0
18. Navy Pier	0.0	0.0
19. Monroe Street breakwalls	0.0	0.0
20. Burnham Harbor and vicinity	1.7	(E) 2.6 (W) 11.7
21. McCormick Place seawall	1.1	0.0
22. 31st Street pier	1.2	0.0
23. 50th Street access area	0.0	0.0
24. 59th Street Harbor	0.0	0.0
25. Jackson Park Harbor and breakwall	5.3	0.5
26. Rainbow Park	0.3	0.0
27. Calumet Park	2.3	5.6
28. other areas	1.8	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 at moorings or on land (lift service) 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.

<u>Mooring area</u>	<u>Number of power boats</u>
North Point Marina	763
Public Moorings	693
Skipper Bud's	70
Waukegan Harbor	609
Public Moorings	489
Larsen Marine I/O service	120
Great Lakes Naval Training Station	96
Wilmette Harbor	85
Chicago Park District	2,063
Diversey	601
Burnham	512
other harbor moorings	950

Early spring survey

Only two site groups were surveyed in March. The Lake County group consisted of Waukegan Harbor (pedestrians), Waukegan Power Plant (pedestrians) and Waukegan Harbor (launched boats). The Chicago group consisted of Montrose Harbor (pedestrians), Calumet Park (pedestrians), and Calumet Park (launched boats). These sites include 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 1997) was stratified by segment and type of day. Each date fell within one segment and was either a working day or a non-working day (weekends and holidays). The following 18 strata were formed:

- | | |
|------------------------------|----------------------------------|
| 1. working days 4/1 - 4/20 | 2. non-working days 4/1 - 4/20 |
| 3. working days 4/21 - 5/11 | 4. non-working days 4/21 - 5/11 |
| 5. working days 5/12 - 6/1 | 6. non-working days 5/12 - 6/1 |
| 7. working days 6/2 - 6/22 | 8. non-working days 6/2 - 6/22 |
| 9. working days 6/23 - 7/13 | 10. non-working days 6/23 - 7/13 |
| 11. working days 7/14 - 8/3 | 12. non-working days 7/14 - 8/3 |
| 13. working days 8/4 - 8/24 | 14. non-working days 8/4 - 8/24 |
| 15. working days 8/25 - 9/14 | 16. non-working days 8/25 - 9/14 |
| 17. working days 9/15 - 9/30 | 18. non-working days 9/15 - 9/30 |

Within each stratum, dates were selected at random with the restriction that all four groups of sites were sampled each work week and each weekend. This sampling process was conducted separately for each of the four groups of three areas. Three dates were selected from each stratum except 17 and 18; in those strata, which were several days shorter than the others, fewer than three 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. working days 3/1 - 3/31
2. non-working 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 jet ski 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 lamprey eel wounds and scars. The data form (Figure A1) and instructions to creel clerks are reproduced in Appendix A.

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 0.5 hour before sunrise to 0.5 hour after sunset), and angler-trips was angler-hours divided by the average duration of a pedestrian fishing trip (3.65 hours for all interviews with conventional pedestrian anglers from 1987 - 1997 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 3.10 by monitoring all boat traffic at North Point Marina on 9 days in 1997. Angler-trips were then estimated as the total number of boats launched for the day multiplied by the average number of anglers per boat (2.58, based on data from 1987 - 1997). Angler-hours were taken as angler-trips multiplied by the yearly average number of hours per angling trip by boaters (5.00, based on data from 1987 - 1997). (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 Waukegan Power Plant) north of and including Wilmette Harbor; estimates for Montrose Harbor were extended to all remaining areas north of Diversey Harbor; estimates for Diversey Harbor were extended to all remaining areas north of the Monroe Street breakwalls; estimates for Burnham Harbor were extended to all remaining areas north of McCormick Place; estimates for McCormick Place were extended to all remaining areas north of 31st Street; estimates from Jackson Park were extended to all remaining areas north of Rainbow Park; and estimates from Calumet Park were extended to all remaining areas south of (and including) Rainbow Park. For launched boats, estimates for North Point Marina 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 the Wilson Avenue ramps; results for Burnham Harbor west ramp were extended to Burnham Harbor east ramp; and results for Calumet Park were extended to the ramp at Jackson Park.

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, Diversey Harbor, and Burnham Harbor (west ramp) were estimated. On fourteen dates during the spring and summer of 1997 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 0.62 in North Point Marina, 1.91 in Diversey Harbor, and 0.33 in Burnham Harbor (west ramp). Using these figures, seasonal estimates of effort, harvest, and expenditures by anglers using launched boats at North Point, Diversey, and Burnham 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 0.62. Values so derived for North Point, Diversey, and Burnham harbors were then extrapolated to other moored boats based on the distribution of moored power boats (Table 3). Estimates for North Point Marina were extrapolated to boats moored in Waukegan Harbor, Wilmette Harbor, and Great Lakes Naval Training Station, and the combined estimates for Diversey Harbor and Burnham Harbor were extrapolated to all other boats moored in Chicago.

Changes in creel survey methods

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

The most important changes in the methods of collecting and analyzing data used in the twelve years of the creel survey are as follows: (1) In 1986 six pedestrian areas and three launch areas were visited for interviews; in 1987 through 1997 eight pedestrian areas and four launch areas were visited. Thus higher proportions of total harvest, effort, and expenditures were estimated directly in 1987 through 1997 than in 1986, and lower proportions were estimated by extrapolation to areas that were not visited. (2) Several parameters used in deriving estimates are themselves estimated, and the estimated values varied during the twelve years. Table 4 lists the values of these parameters used each year. (3) The inputs to the formulae for extrapolating harvest, effort, and expenditures by anglers using launched boats to estimate harvest, effort and expenditures for anglers using moored boats were quite different in the twelve years. This modification of inputs occurred because the estimated ratios of moored boat traffic to launched boat traffic for North Point Marina, Waukegan Harbor, Diversey Harbor and Burnham Harbor changed greatly among 1986, 1988, 1995 - 1997 (Table 4) as new data became available. (4) Average expenditures per angler-trip for "minor" and "other" expenditures were not estimated independently from 1989 to 1993, but were derived from previous creel surveys.

Changes in the average length of pedestrian and boat angler trips and the average number of anglers per boat each year were modified, based on data collected from 1987 through 1997 (Table 5).

Table 4. Parameters used in deriving estimates.

Parameter	1985	1986	1987 - 1994	1995	1996	1997
Duration of fishing trip (hours)						
summer pedestrians	4.27	4.31	4.31	3.71	3.68	3.65
launched boats	5.44	5.25	5.25	5.02	5.02	5.00
Number of anglers per launched boat	2.91	2.77	2.77	2.61	2.58	2.58
Ratio of number of launched boats returning in a day to the number returning during 1100 to 1300.	3.125	2.94	3.13	3.13	3.02	3.10
Ratio of number of moored boats used for fishing on any day to number of launched boats used for fishing.						
North Point Marina	no est.	no est.	no est.	0.63	0.59	0.62
Waukegan Harbor	0.82	0.83	0.83	no est.	no est.	no est.
Diversey Harbor	2.39	1.54	0.92	1.50	2.50	1.91
Burnham Harbor (East, West in 1995-97)	no est.	0.34	1.38	0.43	0.42	0.33
Distributions of pedestrian anglers, launched boats, and moored boats (Tables 1 and 2).	Differences between years were slight, except that North Point Marina has become the major port for launching boats.					

Table 5. Average angler trip lengths and number of anglers per boat, 1987- 1997

Year	Pedestrian angler trip length (hours)	Boat angler trip length (hours)	Anglers per boat
1987	4.31	5.25	2.77
1988	3.80	5.04	2.73
1989	3.15	5.28	2.69
1990	3.60	5.06	2.72
1991	3.73	4.89	2.45
1992	3.82	4.91	2.46
1993	3.92	4.91	2.55
1994	3.37	4.85	2.50
1995	3.46	5.01	2.47
1996	3.68	5.01	2.48
1997	3.37	4.83	2.56
Mean \pm SE	3.65 \pm 0.10	5.00 \pm 0.04	2.58 \pm 0.04

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. Table 4 lists the parameters used in our estimation procedures. Those parameters, to the extent that they are incorrect, introduce bias into the estimation process. Other sources of bias in this survey include the assumption that fishing effort and harvest rates during the times of our interview sets (0600 to 0800 or 0830 to 1030 for pedestrians; 1100 to 1300 for launched boat anglers) are, on average, representative of the entire day.

Yield values

Here the term yield value means the hypothetical market price of the sport fish harvest. For salmonids, approximate market prices of whole fish, headed and gutted were used. For yellow perch, 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 salmonids, the factor was 0.75 because approximately 25% of the weight of a salmonid is in the head and viscera. For yellow perch 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 at local markets 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 maybe closed or less accessible during part or all of a sampling season. In 1997 major construction work occurred along Chicago's shoreline and harbors. New docks were installed at both Diversey and Burnham harbors. Diversey ramp and the west ramp at Burnham were closed until May 15. Clerks monitored launched boat activity at Wilson (for Diversey) and the east ramp at Burnham until the ramps at Diversey and Burnham west were reopened. Shoreline improvement work limited pedestrian angler access at Burnham, McCormick Place and Jackson Park.

Weather

Weather data were collected during the course of the creel survey using a combination of on site observations at the Lake Michigan Biological Station (LMBS) and the daily Lake Michigan forecasts and observations broadcast by the National Weather Service for Illinois and Indiana waters. Variables recorded each day were: wind speed, wind direction, wave height, air temperature, percent of cloud cover and precipitation. In the analysis each variable was subjectively assigned a point value based on expected effect (based on personal observation and experience) on angler effort, and a composite score was produced for each day (Table 6). The possible range of scores was from 7 to 29 with higher scores reflecting better weather.

Table 6. Weather variables and possible scores used in determining the mean daily weather conditions by three week segment in 1997.

<u>Wind speed</u>		<u>Wave height</u>		<u>Air temperature</u>		<u>Precipitation</u>	
Knots	Points	Feet	Points	Degrees F	Points	Yes	Points
0 - 15	5	0 - 2	5	below 20	1	Yes	0
10 - 20	4	1 - 3	4	20 - 39	2	No	5
15 - 25	3	2 - 4	3	40 - 59	3		
20 - 30	2	3 - 5	2	60 - 80	4		
25+	1	4+	1	80+	3		

<u>Wind direction</u>		<u>Cloud cover</u>		<u>Composite</u>	<u>Ratings</u>
Direction	Points		Points	Scores	
N	1	Cloudy	3	26 - 29	Perfect to nearly perfect
NE	1	Clear	5	23 - 25	Good
E	1			20 - 22	Fair
SE	2			17 - 19	Mediocre
S	2			11 - 16	Poor
SW	4			7 - 10	Atrocious
W	4				
NW	3				

(If wind speed is under 10 - 20 score is always 5 for wind direction)

Note: This rating system gauges the effect of weather on angler effort, not angler success. Sometimes outstanding angler success occurs under inclement weather conditions. However, inclement weather conditions generally cause angler effort to be light.

RESULTS

All estimates derived in this survey are often 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 551,000 angler-hours. Anglers harvested 59,000 yellow perch, 83,200 coho salmon, 3,200 rainbow trout, 5,900 lake trout, 4,900 chinook salmon and 5,100 brown trout. Expenditures for boats, motors, trailers, fishing gear, and automobile gas used on Lake Michigan fishing trips during the study period were \$9.4 million. The yield value of the Illinois sport fishing harvest was \$1.2 million.

Detailed results for 1997 are presented in Tables 7 - 14. Table 7 summarizes all expenditure and angler trip estimates for April - September, 1997. Table 8 does the same for the March, 1997 survey. Table 9 summarizes harvest and effort (angler hours) for April - September, 1997. Table 10 does the same for the March, 1997 survey. Tables 11 and 12 list seasonal harvest and effort (angler hours) estimates for pedestrians and anglers using launched boats. Tables 13 and 14 present harvest rates for pedestrians and launched boaters. Table 15 provides yield values. Table 16 presents average weights of the six most important species, with separate average weights given for the harvest of boaters and pedestrians. Table 17 lists fin clip abbreviations, and fin clips observed by our creel clerks are listed in Table 18, with the number of occurrences of each clip or clip combination listed by species, season and angler type. Table 18 can assist in determining the contributions of different stockings of fish to the sport fishery in the Illinois portion of Lake Michigan.

Tables 4 and 5 and 19 - 22 describe comparisons of the 1997 data with data from previous years. Tables 4 and 5 describe parameters used in deriving estimates concerning length of fishing trips, anglers per boat, ratios of moored

to launched fishing boats and the ratio of fishing boats returning during 1100 to 1300 compared to the rest of the day. Table 19 reports angler trips and expenditures between angler types and between years. Table 20 reports angler trips and expenditures across angler types and among years for the March survey. Table 21 compares angler hours and harvest by fish species between angler types and for each year. Table 22 compares angler hours and harvest by fish species between angler types and for each year for the March survey.

Tables C1 and C2 concern a comparison between charter and non - charter boat harvest species composition. Table C1 describes the percent species composition and directed angler hours for the non - charter boat salmonid harvest (boats only) between years. Table C2 describes the percent species composition and angler hours for the charter boat harvest between years.

Pedestrian fishing

From April 1 - September 30 1997, pedestrian anglers made nearly 77,000 trips to Lake Michigan and spent over 283,000 hours fishing (Table 7). Yellow perch was the predominant species in the harvest, with a harvest of over 50,000 fish (Table 9). Coho salmon and brown trout were the next most important species for pedestrian anglers, with a harvest of 16,000 coho salmon and 3,600 brown trout (Table 9). Pedestrian anglers spent nearly \$587,000 (\$7.62 per trip) for fishing gear and over \$120,000 (\$1.57 per trip) for automobile gas (Table 7).

Fishing by boaters using launched boats

Anglers who used launched boats made over 33,000 trips to Lake Michigan and spent 160,000 hours fishing (Table 7). The most abundant species in their harvest were coho salmon (39,500), yellow perch (6,600), lake trout (3,500), chinook salmon (2,400) and rainbow trout (1,900) (Table 9). For salmonids, North Point Marina was the most productive of the four primary launch areas, accounting for 45% of the coho salmon, 49% of the chinook salmon, and 53% of the lake trout taken by anglers who used launched boats (Table 9). Expenditures by anglers using launched boats exceeded \$4,582,000 (\$138 per trip), with 88% of that amount going for boats, motors, and trailers (Table 6).

Fishing by boaters using moored boats

Our estimates for boaters using boats kept at moorings were derived by extrapolation from estimates for boaters using launched boats. This group of anglers harvested 2,400 yellow perch, 27,700 coho salmon, 1,200 rainbow trout, 1,600 chinook salmon and 2,400 lake trout (Table 9), and spent over \$4.1 million for boats, motors, trailers, fishing gear, and automobile gas (Table 7) (we do not include mooring costs here).

Yield values

The estimated yield values of the three most commonly harvested sport species were \$780,000 for coho salmon, \$74,000 for yellow perch, and \$95,000 for lake trout (Table 15). Yellow perch is the only sport species currently commercially fished on Lake Michigan (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 1997 decreased by 25.9% compared to 1996 (Table 21). Launched boat effort fell by 22.2% compared to 1996, and pedestrian effort fell by 28.9% (Table 21 and Figure 2). Angler success (number of fish per angler hour) increased for both boat and pedestrian anglers for salmonids compared to 1996 (Figure 3a). Angler success for yellow perch declined in both categories compared to 1996 (Figure 3b). Directed angler effort for salmonids fell slightly compared to 1996 (Figure 4a) and directed angler effort for yellow perch fell substantially compared to 1996 (Figure 4b). Moored boat effort fell compared to 1996 by 22.5% (Table 21).

Total fish biomass harvested in 1997 saw a major decrease in yellow perch and a slight decrease in salmonid biomass compared to 1996 (Figure 5).

The yellow perch harvest decreased to 59,103, representing a decrease of over 84.8% compared to the 1996 harvest (Table 21 and Figures 5 and 6). The average weight of yellow perch kept by anglers decreased to 0.35 lb. (Table

15). The average length also decreased to 236 mm (Figure 8) largely because most fish harvested were in the 203-254mm slot length limit (Figure 7). Perch fishing was slow in the spring, closed in June, and was poor at all sites for the rest of the year (Tables 11 and 12, Figure 9).

The 1997 harvest of coho salmon increased by over 66% compared to 1996 (Table 21 and Figure 10). The average size of creel coho salmon in 1997 was 38% lighter and 10.2% shorter than 1996 (Table 15, Figures 11 and 12). The bulk of the harvest occurred from mid May through the middle of July (Tables 11 and 12, Figure 13).

The chinook salmon harvest decreased to 4,888 fish for 1997 (Table 21 and Figure 14). Average length was 653mm, an increase of 3.8% compared to 1996 and the average weight decreased to 3,368 g., a decrease of 0.1% compared to 1996 (Table 15, and Figures 15 and 16). The distribution of the chinook harvest was similar to the eleven year mean except that a large percent of the harvest was in segment 5 (June 23 - July 13) (Tables 11 and 12, Figure 17).

The 1997 harvest of lake trout was 5,872, an increase of 123% compared to 1996 (Table 21 and Figure 18). The average weight decreased by 4.2% and the average length increased by 1.3% compared to 1996 (Table 15, Figures 19 and 20). The pattern of harvest over the season was qualitatively similar to previous years (Tables 11 and 12, Figure 21).

The 1997 brown trout harvest (5,114) increased 93.4% compared to 1996 (Table 21, Figure 22). The average length decreased by 1.7% compared to 1996 and the average weight decreased by 17.2% (Table 15 and Figures 23 and 24). The peak of the 1997 harvest was during segment one, the same as the eleven year average (Tables 11 and 12, Figure 25).

The 1997 rainbow trout harvest (3,249) decreased by 39.7% compared to 1996 (Table 21 and Figure 26). The average length of creel rainbow trout increased by 1.0% but the weight decreased by 11.5% compared to 1996 (Table 15 and Figures 27 and 28). Segments 3 and 4 saw higher than normal harvests compared to the eleven year mean (Tables 11 and 12, Figure 29).

Estimated expenditures for boats, motors, and trailers increased by 1.1% compared 1996 (Table 19). Minor expenditures increased by 31.2% but other expenditures decreased by 19.5%.

Weather data were collected throughout the creel season in 1996. Poor weather (Figure 30) had a negative effect on launched and moored boat effort (angler hours) during segments 1 and 2 (April 1 - May 12). The weather stayed fairly constant for most of the summer. However, the closure and reopening of the yellow perch fishery affected the amount of daily effort in segments 4 and 5 in spite of the weather conditions (Figures 31 and 32). The closure artificially reduced effort in segment 4 and the opening of yellow perch fishing artificially increased effort. Ongoing collection of weather data during the creel survey will permit evaluation of how significantly weather affects fishing in relation to other factors.

The early spring survey conducted in 1997 saw a substantial increase in harvest and effort compared to 1996 (Table 22). March saw the beginning of one of the best coho seasons that this survey has ever witnessed with high harvest rates. Because of the shutdown of the Zion nuclear power plant the Waukegan power plant was operating constantly and the warm water discharge brought in large numbers of brown trout.

A comparison of the percentage of different species in the charter and non - charter boat salmonid fishery was made (Appendix C). The differences in species composition between the two groups varied by no more than 0.5% in 1997 (Tables C1 and C2). Harvest per unit effort between charter and non- charter boat anglers were compared and not surprisingly charter boats are more productive by a factor of two to three across all years of the comparison (Figure C1). Salmonid charter and non - charter harvest were combined for a total salmonid harvest by all angler types from 1986 - 1997 (Figure C2).

Minor species

In addition to the species for which results are presented in detail in Tables 9 - 16, creel clerks reported several other species of fish in possession of anglers. For some species, an estimate has been made of the total number of fish harvested (numbers in parentheses) along with actual numbers observed. Most of the minor species were harvested in or near the harbors in Chicago. However, most of the carp, white suckers, channel catfish and some of the freshwater drum were harvested in the outflow of the Waukegan Power Plant. **Rock bass**, 242 fish observed, the bulk of which were seen at Diversey and Burnham harbors (13,457); **pumpkinseed sunfish**, 19 fish observed, (2,455); **bluegill sunfish**, 16 fish observed, (2,079); **common carp**, 59 fish observed, (2,001); **smallmouth bass**, 12 fish observed, (1,061); **largemouth bass**, 12 fish observed, (849); **white sucker**, 4 fish observed; **freshwater drum**, 41 fish observed (1,574); **yellow bullhead**, 1 fish observed; **channel catfish**, 8 fish observed, (270); **gizzard shad**, 3 fish observed; **brook trout**, 2 fish observed, **black crappie**, 2 fish observed; **white bass**, 1 fish observed; anglers also harvested alewives for use as bait.

DISCUSSION

Changes in the fishery and the creel survey in 1997

Several variables changed in 1997 in comparison with previous years of the survey:

The four states bordering Lake Michigan made a united effort to conserve the adult yellow perch population in 1995. The impact on sport angling on the Illinois waters of Lake Michigan was the implementation of a 25 fish daily bag limit and the closure of all fishing for yellow perch in Lake Michigan during the month of June. Beginning on April 1, 1997 further conservation measures were deemed necessary: the daily bag limit was cut to 15 and a slot limit was imposed where yellow perch between 203mm - 254mm could be kept, those fish above and below in total length were to be released. The month of June remained closed.

The 5-3-2 rule for possession of salmonids was rescinded (5 salmon and trout total of which only three could be of one species except lake trout which could only be two). The possession limit in 1997 became 5 salmon and trout in aggregate of which only two could be lake trout.

Waukegan Power Plant was heavily shoaled with sand, making the area surrounding the pier very shallow. The yellow perch fishery there was practically non-existent because of the shallow water. Because of the shutdown of the Zion Electrical Generating Station (nuclear powered), the Waukegan plant (coal powered) operated continuously, the warm water discharge enhancing the pedestrian spring brown trout fishery. Because of the Zion plant shutdown the good to excellent yellow perch fishing for boat anglers (interviewed at North Point Marina) in the Zion plant warm water discharge did not occur during the summer (Segment 6 harvest rates of 3.338 to 4.301 perch per angler hour 1994 - 1996 as compared to 0.945 perch per angler hour 1997).

Angler effort

Total angler fishing effort in 1997 decreased compared to 1996 continuing a long term pattern evident since 1986. Angler success however with salmonids increased for both pedestrian and boat anglers. Much of this increase is attributable to an excellent coho salmon season, especially for pedestrian anglers. Since 1990 directed effort for salmonids has been stable with only minor fluctuations. Directed effort for yellow perch has not been stable and has been in steady decline since 1993. The pedestrian portion of this effort declined more rapidly than the boat effort until 1996 as harvest per angler hour remained fairly high for boat anglers.

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 under 600,000 and later in 1997 fell to well under 60,000. The reason for the decline in yellow perch harvest is a lack of recruitment of new year classes (Marsden et al. 1993, Robillard et al. 1995). The fishery now is supported by the last strong year class produced, the 1988 year class. With little new recruitment the yellow perch available to the fishery are old and large (Robillard et al. 1995). Since it takes Lake Michigan yellow perch at least three years to reach a size where they would become acceptable in

the 1988 year class. With little new recruitment the yellow perch available to the fishery are old and large (Robillard et al. 1995). Since it takes Lake Michigan yellow perch at least three years to reach a size where they would become acceptable in the sport fishery and 1997 did not produce a strong year class (Hess and Makauskas, 1997) the sport fishery will continue to decline until at least the year 2001. Restrictive regulations have exacerbated the decline both in directed effort and harvest. Harvest per unit effort was fairly stable in 1995 and 1996, the first two years of the June closure, 25 fish bag limit. When the 203 to 254mm slot limit was imposed in 1997 the harvest per unit effort declined by more than 50%.

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. 1997 however, was an exceptional year with the second highest harvest seen by this survey of 83,000 and coho salmon making up over 80% of the salmonid harvest. The 1997 coho salmon fishery occurred from the third highest lake wide planting of coho salmon of over 3 million fish (Holey, 1997). However, the average length of coho salmon in 1997 was the lowest seen by this survey. Concern had been voiced by different state agencies (Horns, 1997) that the lake is being over stocked with salmonids reducing the forage base (specifically alewife) to a detrimental level. A reduction in mean length of coho salmon may be evidence that this is true. The rescinding of the 5-3-2 bag limit for salmonids may have enhanced the coho harvest in 1997. By returning the bag limit to 5 salmonids total this would allow an individual angler to harvest 40% more coho per trip.

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 in mid summer through the fall. The lake trout harvest has been stable from 1991 through 1997 with the exception of 1996. Harvest of lake trout often is more of a function of availability of other species than abundance of lake trout. Lake trout are reliable in that they occupy the same areas of the lake at the same times every year, are relatively easy to catch and reach a large size. However, caught from deep water on heavy tackle they put up a lackluster fight. Because lake trout have a high fat content and are long lived, they are in the highest risk group in fish consumption advisories. 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) is blamed for die offs of chinook salmon beginning in 1988. Since 1987 the mean harvest of chinook salmon has been around 8,000 fish. The harvest bottomed out in 1994 with 2,900 chinook taken (Table 22). Chinook salmon are now closely monitored in the hatchery and in the wild for BKD (Clark, 1996). Brown trout are an important component of the spring salmonid fishery with an average harvest of 5,000 fish annually. Pedestrian angling accounts for 63% of those fish. Wisconsin stocks most of the brown trout in Lake Michigan (Holey, 1997) and through identifying fin clips Illinois harvests some of those fish. 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 annual mean harvest has been 4,900. Since 1991 the annual harvest has been higher than the mean except for 1997. Stocking levels lake wide have been relatively stable (Holey, 1997) but a number of different strains of rainbows have been stocked since the late 1980's and some of these strains appear to be performing better than the strains stocked earlier. All states have seen an increase in the annual harvest of rainbow trout (Francis, 1997).

Early spring (March) survey

The March survey is heavily influenced by the current weather in March and the severity of the winter preceding March. In 1995, the first year of the survey, the entire shoreline and harbors were free of ice and no severe lake storms occurred (storms with sustained high winds of an easterly direction generating high seas, damage and erosion to the shoreline). Fishing was good for both coho salmon and brown trout. In 1996 the shoreline and harbors were locked in ice for the first three weeks of March (Brofka and Marsden, 1997). A severe lake storm occurred in the third week. Effort was only 35% of what it had been in 1995 with almost half the effort concentrated at the power plant discharge in Waukegan (Brofka and Marsden, 1997). Harvest of brown trout and coho salmon were much lower than 1995. In 1997 the shoreline and harbors were free of ice and the shoreline did not suffer from any severe storms. March, 1997 saw high harvests of both coho salmon and brown trout and angler effort was four times higher than in 1996.

Expenditures

Since 1995, there appears to be an increase in the amount spent for major expenditures (boats, motors and trailers) compared to the six previous years. This may be a function of our growing national economy and affluence or the increasing population in the general area of the Illinois shoreline. Minor expenditures (tackle, bait, downriggers, etc.) have been increasing at the same time. However, angler trips have been decreasing since 1995 because of the declining yellow perch fishery.

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Table 8. Fishing effort (angler-trips) and expenditures (major, minor, and other) by non-charter anglers in the Illinois portion of Lake Michigan during April-September, 1997. NA = not applicable, Wau. = Waukegan

Type of effort	Area	Angler trips	Expenditures		
			Major (boat etc.)	Minor (gear)	Other (travel)
Pedestrians	Wau.Power	6,459	NA	\$49,016	\$18,718
	Wau.Harbor	8,113	NA	\$54,189	\$18,136
	Montrose	31,346	NA	\$217,454	\$43,278
	Diversey	4,229	NA	\$35,503	\$4,082
	Burnham	3,509	NA	\$34,435	\$5,456
	McCormick	878	NA	\$11,476	\$1,615
	Jackson	3,282	NA	\$27,323	\$2,409
	Calumet	2,086	NA	\$24,156	\$3,437
	other	17,035	NA	\$133,059	\$23,344
	TOTALS	76,937	NA	\$586,611	\$120,475
Launched boats	North Point	12,933	\$1,170,329	\$139,867	\$60,438
	Diversey	1,653	\$602,548	\$11,992	\$1,478
	Burnham	2,033	\$328,485	\$54,182	\$4,273
	Calumet	3,088	\$220,483	\$54,035	\$6,017
	others	13,426	\$1,722,397	\$151,066	\$54,244
		TOTALS	33,134	\$4,044,252	\$411,143
Moored Boats	TOTALS	23,322	\$3,786,272	\$251,298	\$83,896
Season Totals (rounded)		133,000	\$7,831,000	\$1,249,000	\$331,000

Table 9. Fishing effort (angler-trips) and expenditures (major, minor, and other) by non-charter anglers at selected sites along the Illinois portion of Lake Michigan during March, 1997. NA = not applicable, Wau. = Waukegan, Cal. = Calumet, Peds = Pedestrian

Location	Effort (angler- trips)	Expenditures		
		Major (boat)	Minor (gear)	Other (travel)
Wau. Power	3,180	NA	\$57,334	\$11,174
Wau. Harbor	1,214	NA	\$14,866	\$3,660
Wau. Ramp	189	\$170,756	\$1,440	\$217
Montrose	3,939	NA	\$45,713	\$7,871
Cal. Park Peds	3,390	NA	\$15,824	\$7,454
Cal. Park Ramp	945	\$512,982	\$12,610	\$1,699
Total	12,857	\$683,738	\$147,786	\$32,075

Table 10. Effort (anglers-hours) and harvest (by species) by non-charter anglers in the Illinois portion of Lake Michigan during April-September, 1997. Wau. = Waukegan, N. Point = North Point, Peds = Pedestrian, Lau'd = Launched boat

Type of angler	Area	Effort (hours)	Harvest					Chinook salmon
			Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	
Peds	Wau. Power	24,387	0	2,047	0	0	47	7
	Wau. Harbor	29,858	3,650	522	33	0	3,952	164
	Montrose	115,069	20,015	600	110	0	8,035	20
	Diversey	15,564	3,160	0	0	0	53	182
	Burnham	12,912	1,792	24	11	0	331	0
	McCormick	3,230	620	0	0	0	79	180
	Jackson	12,078	5,419	17	12	0	79	58
	Calumet	7,678	2,063	10	0	0	191	0
	other	62,634	13,406	332	46	0	3,290	302
	TOTALS	283,410	50,125	3,552	213	0	16,057	913
Lau'd	N.Point.	64,922	463	309	834	1,836	17,855	1,157
	Diversey	5,356	242	27	28	24	1,249	20
	Burnham	10,207	1,560	77	61	25	1,327	117
	Calumet	15,506	3,028	291	170	0	2,145	41
	others	64,405	1,299	327	760	1,579	16,887	1,040
		TOTALS	160,396	6,592	1,031	1,853	3,464	39,463
Moored	TOTALS	106,766	2,386	531	1,183	2,408	27,671	1,600
Summer Totals		550,572	59,103	5,114	3,249	5,872	83,191	4,888

Table 11. Effort (anglers-hours) and harvest (by species) by non-charter anglers at selected sites along the Illinois portion of Lake Michigan during March, 1997. Wau. = Waukegan, Cal. = Calumet, Peds = Pedestrian

Location	Effort (angler-hours)	Harvest					Chinook salmon
		Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	
Wau. Power	14,492	0	2,540	194	32	113	27
Wau. Harbor	5,533	0	743	62	0	565	0
Wau. Ramp	980	0	93	0	0	53	0
Montrose	17,949	0	87	88	0	1,491	0
Cal. Park Peds	15,446	0	496	0	0	5,196	0
Cal. Park Ramp	4,742	0	288	0	0	2,113	0
Total	59,143	0	4,154	344	32	9,530	27

Table 12. Effort and harvest for each segment by pedestrian anglers of the Illinois portion of Lake Michigan during April-September, 1997. Wau. = Waukegan

Time Period	Area	Effort (angler-hours)	Harvest					Coho salmon	Chinook salmon
			Yellow perch	Brown trout	Rainbow trout	Lake trout			
4/1-	Wau. Power	6,295	0	1,153	0	0	0	7	
4/20	Wau. Harbor	2,335	0	23	0	0	161	0	
	Montrose	9,446	0	224	12	0	576	0	
	Diversey	391	0	0	0	0	0	0	
	Burnham	1,532	0	18	0	0	190	0	
	McCormick	145	0	0	0	0	30	0	
	Jackson	966	0	17	0	0	55	0	
	Calumet	2,844	0	11	0	0	169	0	
	others	5,005	0	72	2	0	325	0	
	4/21-	Wau. Power	3,494	0	772	0	0	47	0
5/11	Wau. Harbor	4,114	0	252	0	0	1,232	21	
	Montrose	16,298	1,089	159	0	0	3,367	0	
	Diversey	399	0	0	0	0	0	0	
	Burnham	491	0	0	0	0	49	0	
	McCormick	30	0	0	0	0	0	0	
	Jackson	259	0	0	12	0	24	47	
	Calumet	355	0	0	0	0	22	0	
	others	5,459	211	123	9	0	1,145	38	
	5/12-	Wau. Power	1,501	0	21	0	0	0	0
6/1	Wau. Harbor	5,316	0	130	22	0	2,171	0	
	Montrose	19,322	4,391	88	0	0	3,811	0	
	Diversey	880	685	0	0	0	0	0	
	Burnham	616	17	6	11	0	0	0	
	McCormick	19	0	0	0	0	0	0	
	Jackson	335	0	0	0	0	0	0	
	Calumet	94	0	0	0	0	0	0	
	others	6,920	1,422	67	12	0	1,536	0	
	6/2-	Wau. Power	1,982	0	101	0	0	0	0
6/22	Wau. Harbor	2,980	0	56	0	0	161	0	
	Montrose	5,977	0	0	0	0	40	0	
	Diversey	1,966	0	0	0	0	0	0	
	Burnham	560	0	0	0	0	0	0	
	McCormick	41	0	0	0	0	0	0	
	Jackson	797	0	0	0	0	0	0	
	Calumet	1,534	0	0	0	0	0	0	
	others	5,077	0	20	0	0	67	0	
	6/23-	Wau. Power	2,689	0	0	0	0	0	0
7/13	Wau. Harbor	3,944	1,330	47	0	0	48	0	
	Montrose	26,535	4,020	63	0	0	0	0	
	Diversey	5,979	1,806	0	0	0	0	0	
	Burnham	4,743	1,399	0	0	0	0	0	
	McCormick	707	325	0	0	0	0	0	
	Jackson	4,260	2,633	0	0	0	0	0	
	Calumet	1,184	1,639	0	0	0	0	0	
	others	16,946	5,799	30	0	0	18	0	

Table 12 continued.

Time Period	Area	Effort (angler- hours)	Harvest					
			Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
7/14-	Wau. Power	2,145	0	0	0	0	0	0
8/3	Wau. Harbor	3,277	2,257	14	0	0	0	0
	Montrose	19,899	10,129	0	0	0	0	0
	Diversey	2,549	669	0	0	0	0	0
	Burnham	1,938	392	0	0	0	0	0
	McCormick	637	240	0	0	0	8	0
	Jackson	3,212	2,785	0	0	0	0	0
	Calumet	979	411	0	0	0	0	0
	others	10,760	5,861	5	0	0	2	0
	8/4-	Wau. Power	2,971	0	0	0	0	0
8/24	Wau. Harbor	1,674	62	0	0	0	0	0
	Montrose	6,022	386	0	0	0	0	0
	Diversey	658	0	0	0	0	0	0
	Burnham	664	0	0	0	0	0	0
	McCormick	179	55	0	0	0	0	0
	Jackson	373	0	0	0	0	0	0
	Calumet	246	0	0	0	0	0	0
	others	2,943	111	0	0	0	0	0
	8/25-	Wau. Power	2,142	0	0	0	0	0
9/14	Wau. Harbor	2,735	0	0	11	0	67	84
	Montrose	5,667	0	47	47	0	0	0
	Diversey	1,632	0	0	0	0	0	31
	Burnham	1,293	0	0	0	0	0	0
	McCormick	756	0	0	0	0	0	103
	Jackson	952	0	0	0	0	0	0
	Calumet	362	0	0	0	0	0	0
	others	4,903	0	9	13	0	25	80
	9/15-	Wau. Power	1,168	0	0	0	0	0
9/30	Wau. Harbor	3,483	0	0	0	0	112	58
	Montrose	5,903	0	20	52	0	242	20
	Diversey	1,110	0	0	0	0	53	150
	Burnham	1,075	0	0	0	0	92	0
	McCormick	717	0	0	0	0	41	77
	Jackson	924	0	0	0	0	0	11
	Calumet	80	0	0	0	0	0	0
	others	4,621	0	4	10	0	172	176

Table 13. Effort and harvest by anglers using launched boats of the Illinois portion of Lake Michigan during April-September, 1997.

Time Period	Area	Effort (angler-hours)	Harvest					
			Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
4/1 -	North Point	969	0	59	0	8	43	0
4/20	Wilson	79	0	0	0	0	0	0
	Burnham	655	0	4	0	0	127	4
	Calumet	4,165	0	242	152	0	1,348	41
	others	1,301	0	61	7	6	138	3
4/21 -	North Point	5,510	0	46	7	82	1,602	52
5/11	Wilson	130	0	0	0	0	96	0
	Burnham	810	0	31	0	0	225	0
	Calumet	1,621	0	10	10	0	211	0
	others	5,130	0	50	6	69	1,536	44
5/12 -	North Point	12,855	0	37	280	240	7,138	95
6/1	Diversey	756	0	11	0	0	446	0
	Burnham	567	0	0	0	0	159	0
	Calumet	662	0	39	0	0	301	0
	others	11,844	0	44	236	203	6,546	80
6/2 -	North Point	14,195	0	17	275	310	5,633	147
6/22	Diversey	478	0	0	0	6	222	0
	Burnham	718	0	0	0	0	233	0
	Calumet	1,595	0	0	8	0	232	0
	others	12,784	0	14	233	267	5,071	124
6/23 -	North Point	9,625	0	21	82	307	2,060	301
7/13	Diversey	1,018	0	10	18	18	285	16
	Burnham	2,129	721	18	26	0	248	58
	Calumet	2,129	1,939	0	0	0	28	0
	others	9,979	329	35	96	277	2,115	290
7/14 -	North Point	6,053	463	30	117	468	775	117
8/3	Diversey	1,473	242	6	10	0	171	4
	Burnham	2,190	578	0	21	0	251	5
	Calumet	1,912	1,057	0	0	0	25	0
	others	7,438	880	31	116	395	897	105
8/4 -	North Point	6,975	0	45	47	273	450	258
8/24	Diversey	81	0	0	0	0	22	0
	Burnham	568	261	0	14	14	14	0
	Calumet	649	31	0	0	0	0	0
	others	6,193	90	38	45	235	407	218
8/25 -	North Point	6,176	0	16	25	117	174	164
9/14	Diversey	286	0	0	0	0	7	0
	Burnham	2,002	0	24	0	11	61	50
	Calumet	1,621	0	0	0	0	0	0
	others	6,257	0	22	21	102	175	156
9/15 -	North Point	2,564	0	38	0	30	0	24
9/30	Diversey	1,055	0	0	0	0	0	0
	Burnham	568	0	0	0	0	9	0
	Calumet	1,152	0	0	0	0	0	0
	others	3,481	0	32	0	25	3	20

Table 14. Harvest rates by pedestrian anglers of the Illinois portion of Lake Michigan during April - September, 1997. For yellow perch, only data from anglers fishing for yellow perch were used. For the five salmonid species, only data from anglers fishing for salmonids were used. Asterisks represent instances when creel clerks found no anglers fishing for the species in question. Wau. = Waukegan.

Time Period	Area	Harvest per angler-hour					Chinook salmon
		Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	
4/1-4/20	Wau. Power	*	0.204	0.000	0.000	0.000	0.001
	Wau. Harbor	*	0.007	0.006	0.000	0.052	0.000
	Montrose	0.000	0.024	0.002	0.000	0.062	0.000
	Diversey	*	0.000	0.000	0.000	0.000	0.000
	Burnham	*	0.010	0.000	0.000	0.096	0.000
	McCormick	*	0.000	0.000	0.000	0.231	0.000
	Jackson	*	0.167	0.000	0.000	0.035	0.000
	Calumet	*	0.005	0.000	0.000	0.042	0.000
4/21-5/11	Wau. Power	*	0.184	0.000	0.000	0.008	0.000
	Wau. Harbor	*	0.058	0.000	0.000	0.336	0.004
	Montrose	0.194	0.004	0.000	0.000	0.352	0.000
	Diversey	0.000	0.000	0.000	0.000	0.000	0.000
	Burnham	0.000	0.000	0.000	0.000	0.250	0.000
	McCormick	*	0.000	0.000	0.000	0.000	0.000
	Jackson	*	0.000	0.044	0.000	0.087	0.174
	Calumet	0.000	0.000	0.000	0.000	0.036	0.000
5/12-6/1	Wau. Power	*	0.000	0.000	0.000	0.000	0.000
	Wau. Harbor	0.000	0.027	0.004	0.000	0.423	0.000
	Montrose	0.645	0.005	0.000	0.000	0.306	0.000
	Diversey	0.525	0.000	0.000	0.000	0.000	0.000
	Burnham	0.000	0.034	0.019	0.000	0.000	0.000
	McCormick	*	0.000	0.000	0.000	0.000	0.000
	Jackson	0.000	*	*	*	*	*
	Calumet	*	0.000	0.000	0.000	0.000	0.000
6/2-6/22	Wau. Power	*	0.197	0.000	0.000	0.000	0.000
	Wau. Harbor	*	0.021	0.000	0.000	0.043	0.000
	Montrose	0.000	0.000	0.000	0.000	0.021	0.000
	Diversey	0.000	0.000	0.000	0.000	0.000	0.000
	Burnham	*	0.000	0.000	0.000	0.000	0.000
	McCormick	*	0.000	0.000	0.000	0.000	0.000
	Jackson	*	0.000	0.000	0.000	0.000	0.000
	Calumet	*	*	*	*	*	*
6/23-7/13	Wau. Power	0.000	0.000	0.000	0.000	0.000	0.000
	Wau. Harbor	0.497	0.000	0.000	0.000	0.000	0.000
	Montrose	0.098	0.000	0.000	0.000	0.000	0.000
	Diversey	0.447	0.000	0.000	0.000	0.000	0.000
	Burnham	0.376	*	*	*	*	*
	McCormick	0.761	*	*	*	*	*
	Jackson	0.736	*	*	*	*	*
	Calumet	1.228	*	*	*	*	*

Table 14 continued.

Time Period	Area	Harvest per angler-hour					
		Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
7/14- 8/3	Wau. Power	0.000	0.000	0.000	0.000	0.000	0.000
	Wau. Harbor	0.908	0.000	0.000	0.000	0.000	0.000
	Montrose	0.661	0.000	0.000	0.000	0.000	0.000
	Diversey	0.264	*	*	*	*	*
	Burnham	0.279	0.000	0.000	0.000	0.000	0.000
	McCormick	0.559	*	*	*	*	*
	Jackson	0.685	*	*	*	*	*
	Calumet	0.711	*	*	*	*	*
8/4- 8/24	Wau. Power	*	0.000	0.000	0.000	0.000	0.000
	Wau. Harbor	0.167	0.000	0.000	0.000	0.000	0.000
	Montrose	0.232	0.000	0.000	0.000	0.000	0.000
	Diversey	0.000	*	*	*	*	*
	Burnham	0.000	0.000	0.000	0.000	0.000	0.000
	McCormick	1.290	0.000	0.000	0.000	0.000	0.000
	Jackson	0.000	0.000	0.000	0.000	0.000	0.000
	Calumet	0.000	*	*	*	*	*
8/25- 9/14	Wau. Power	*	0.000	0.000	0.000	0.000	0.000
	Wau. Harbor	0.000	0.000	0.002	0.000	0.018	0.023
	Montrose	0.000	0.132	0.132	0.000	0.000	0.000
	Diversey	0.000	0.000	0.000	0.000	0.000	0.021
	Burnham	0.000	0.000	0.000	0.000	0.000	0.000
	McCormick	0.000	0.000	0.000	0.000	0.000	0.134
	Jackson	*	0.000	0.000	0.000	0.000	0.000
	Calumet	0.000	0.000	0.000	0.000	0.000	0.000
9/15- 9/30	Wau. Power	*	0.000	0.000	0.000	0.000	0.000
	Wau. Harbor	*	0.000	0.000	0.000	0.028	0.020
	Montrose	0.000	0.003	0.008	0.000	0.047	0.003
	Diversey	*	0.000	0.009	0.000	0.046	0.130
	Burnham	*	0.000	0.000	0.000	0.082	0.000
	McCormick	*	0.000	0.000	0.000	0.044	0.090
	Jackson	*	0.000	0.000	0.000	0.000	0.022
	Calumet	*	0.000	0.000	0.000	0.000	0.000

Table 15. Harvest rates by anglers using launched boats of the Illinois portion of Lake Michigan during April - September, 1997. For yellow perch, only data from anglers fishing for yellow perch were used. For the five salmonid species, only data from anglers fishing for salmonids were used. Asterisks represent instances when creel clerks found no anglers fishing for the species in question.

Time Period	Area	Harvest per angler-hour					
		Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
4/1- 4/20	North Point	*	0.080	0.000	0.005	0.070	0.000
	Wilson	*	0.000	0.000	0.000	0.000	0.000
	Burnham	*	0.009	0.000	0.000	0.201	0.009
	Calumet	*	0.080	0.052	0.000	0.403	0.026
4/21- 5/11	North Point	*	0.007	0.002	0.012	0.346	0.009
	Wilson	*	0.000	0.000	0.000	0.741	0.000
	Burnham	*	0.037	0.000	0.000	0.297	0.000
	Calumet	*	0.004	0.004	0.000	0.180	0.000
5/12- 6/1	North Point	*	0.004	0.019	0.015	0.502	0.007
	Diversey	*	0.012	0.000	0.000	0.601	0.000
	Burnham	0.000	0.000	0.000	0.000	0.351	0.000
	Calumet	*	0.073	0.000	0.000	0.325	0.000
6/2- 6/22	North Point	*	0.001	0.024	0.023	0.406	0.012
	Diversey	*	0.000	0.000	0.018	0.642	0.000
	Burnham	*	0.000	0.000	0.000	0.466	0.000
	Calumet	0.000	0.000	0.016	0.000	0.280	0.000
6/23- 7/13	North Point	0.000	0.005	0.005	0.023	0.246	0.043
	Diversey	*	0.012	0.018	0.018	0.275	0.015
	Burnham	1.015	0.011	0.024	0.000	0.280	0.057
	Calumet	1.121	0.000	0.000	0.000	0.201	0.000
7/14- 8/3	North Point	0.945	0.003	0.017	0.073	0.111	0.018
	Diversey	0.755	0.009	0.000	0.000	0.249	0.008
	Burnham	0.606	0.000	0.053	0.000	0.386	0.003
	Calumet	0.867	0.000	0.000	0.000	0.109	0.000
8/4- 8/24	North Point	0.000	0.006	0.007	0.049	0.098	0.043
	Diversey	*	0.000	0.000	0.000	0.274	0.000
	Burnham	1.609	0.000	0.070	0.070	0.070	0.000
	Calumet	0.037	*	*	*	*	*
8/25- 9/14	North Point	*	0.002	0.002	0.023	0.043	0.028
	Diversey	0.000	0.000	0.000	0.000	0.038	0.000
	Burnham	0.000	0.008	0.000	0.012	0.031	0.019
	Calumet	0.000	0.000	0.000	0.000	0.000	0.000
9/15- 9/30	North Point	*	0.013	0.000	0.010	0.000	0.009
	Diversey	*	0.000	0.000	0.000	0.000	0.000
	Burnham	*	0.000	0.000	0.000	0.012	0.000
	Calumet	*	0.000	0.000	0.000	0.000	0.000

Table 16. Yield values of fish harvested by non-charter sport anglers in the Illinois waters of Lake Michigan during April - September 1997. Yellow perch are assumed to be prepared as fillets with 60% waste and salmonids as whole gutted fish with 25% waste. Prices for all except brown trout (used rainbow trout value) are those current in local markets in March, 1998.

Species	Total harvest	Av. wt (lbs)	Round wt (lbs)	Market wt (lbs)	Price per pound	Yield value
Yellow perch	59,103	0.35	20,686	8,274	\$8.99	\$74,387
Brown trout	5,114	3.17	16,211	12,158	\$3.88	\$47,173
Rainbow trout	3,249	5.64	18,324	13,743	\$3.88	\$53,324
Lake trout	5,872	6.58	38,638	28,978	\$3.28	\$95,048
Coho salmon	83,191	2.09	173,869	130,402	\$5.98	\$779,804
Chinook salmon	4,888	7.52	36,758	27,568	\$5.98	\$164,857

Combined yield value of all species: \$1,214,593

Table 17. Average weights of fish harvested in the Illinois waters of Lake Michigan during 1997. Weights are in grams. n = number of fish weighed. Seasons are defined by the following dates: early spring = 3/1-3/31, spring = 4/1-5/11, early summer = 5/12-6/22, midsummer = 6/23-8/3, late summer = 8/4-9/14, early fall = 9/15-9/30.

* Asterisks represent situations where no fish were weighed.

Species	Angler type		---Spring---		-----Summer-----			----Fall----
			early	mid-late	early	mid	late	early
Coho salmon	boaters	av.	591	708	932	1,353	1,917	820
		n	50	211	481	213	69	1
	pedestrians	av.	538	690	824	1,156	1,017	954
		n	120	132	80	5	3	13
Chinook salmon	boaters	av.	*	3,539	2,787	2,701	2,818	3,530
		n	0	10	10	35	43	3
	pedestrians	av.	3,947	3,718	*	*	5,770	6,353
		n	2	6	0	0	6	11
Rainbow trout	boaters	av.	*	1,501	2,706	2,661	3,490	*
		n	0	12	29	23	8	0
	pedestrians	av.	2,804	1,913	1,626	*	1,622	2,370
		n	9	2	3	0	2	3
Lake trout	boaters	av.	*	2,607	2,580	3,073	3,203	4,341
		n	0	17	22	26	44	1
	pedestrians	av.	1,133	*	*	*	*	*
		n	1	0	0	0	0	0
Brown trout	boaters	av.	1,124	1,272	1,626	2,280	2,433	1,900
		n	10	32	10	6	12	2
	pedestrians	av.	1,322	1,295	2,106	1,559	1,008	1,044
		n	88	56	6	2	1	1
Yellow perch	boaters	av.	*	*	*	161	161	*
		n	0	0	0	109	6	0
	pedestrians	av.	*	130	161	152	139	*
		n	0	13	55	313	11	0

Table 18. 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 19. Fin clip summary for salmonids harvested by non-charter anglers in the Illinois waters of Lake Michigan during 1997. Seasons are defined by the following dates: early spring = 3/1-3/31, spring = 4/1-5/11, early summer = 5/12-6/22, midsummer = 6/23-8/3, late summer = 8/4-9/14, early fall = 9/15-9/30. Occurrences of clips are shown separately for two types of anglers: boaters (b), and pedestrians (p). 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 finclip 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.

Species	Clip	----- SPRING -----				-----SUMMER-----						----- FALL -----		
		early		mid-late		early		mid		late		early		
		b	p	b	p	b	p	b	p	b	p	b	p	
Coho	ad	0	3	4	1	8	1	7	0	1	0	0	1	
salmon	ad,lm	0	0	0	1	0	0	0	0	0	0	0	0	
	ad,lp	0	0	0	0	0	0	1	0	0	0	0	0	
	ad,lv	1	1	4	1	4	0	0	0	1	1	0	5	
	ad,rp	0	0	0	0	1	0	1	0	0	0	0	0	
	ad,rv	0	2	5	2	3	0	5	0	1	0	0	0	
	do	0	1	0	0	0	0	0	0	0	0	0	0	
	lm	0	1	0	0	0	0	2	0	0	0	0	0	
	lm,lv	0	0	0	0	1	0	0	0	0	0	0	0	
	lm,rv	0	2	2	0	0	0	0	0	0	0	0	0	
	lp	0	0	1	2	3	1	2	0	1	0	0	1	
	lv	0	1	3	3	8	1	2	0	1	0	0	0	
	rm	1	0	0	0	1	0	1	0	0	0	0	0	
	rm,lv	0	1	2	0	4	0	0	0	0	0	0	0	
	rm,rp	0	0	0	0	1	0	0	0	0	0	0	0	
	rm,rv	0	2	8	0	14	0	6	0	2	0	0	0	
	rp	0	1	0	2	4	0	5	0	0	0	0	0	
	rv	0	2	2	2	9	0	6	0	1	0	0	2	
	no clips		79	157	244	138	596	86	232	5	67	2	1	11

Table 19, continued

Species	Clip	----- SPRING -----				-----SUMMER-----						-----FALL		
		early		mid-late		early		mid		late		early		
		b	p	b	p	b	p	b	p	b	p	b	p	
Chinook salmon	ad	0	0	0	1	0	0	1	0	0	0	0	0	0
	ad,lv,rv	0	0	0	0	1	0	0	0	0	0	0	0	1
	ad,rp	0	0	0	0	0	0	0	0	0	0	0	0	1
	do	0	0	0	0	0	0	0	0	0	0	0	0	1
	do,rp	0	0	0	0	0	0	0	0	0	1	0	0	0
	lv	0	0	0	0	0	0	0	0	0	1	1	0	0
	lv,rv	0	0	0	0	0	0	0	0	0	0	1	0	0
	rp	0	0	0	0	0	0	0	0	0	0	0	0	1
	rv	0	0	0	0	0	0	1	0	0	0	0	0	1
	no clips	0	2	10	6	12	0	43	0	45	4	3	7	
Rainbow trout	ad	0	1	3	0	1	0	2	0	0	0	0	1	
	ad,do	0	0	0	0	1	0	0	0	0	0	0	0	
	ad,do,lp	0	0	0	0	1	0	0	0	0	0	0	0	
	ad,lp	0	1	0	0	0	0	0	0	0	0	0	0	
	ad,lv	0	0	1	0	0	0	0	0	0	0	0	1	
	ad,rp	0	0	0	0	1	0	0	0	0	0	0	0	
	ad,rv	0	1	0	0	0	0	0	0	0	0	0	0	
	do	0	0	0	0	3	0	0	0	0	0	0	0	
	do,rv	0	0	0	0	1	0	0	0	0	0	0	0	
	lm	0	2	0	0	1	0	0	0	0	0	0	0	
	lp	0	1	0	0	0	1	0	0	0	2	0	0	
	lv	0	1	0	0	3	0	0	0	0	0	0	0	
	lv,rv	0	0	0	0	0	0	0	1	0	0	0	0	
	rm	0	0	0	1	0	0	1	0	0	0	0	0	
	rp	0	0	0	1	4	0	7	1	0	0	0	0	
rp,lv	0	0	0	0	2	0	0	0	0	0	0	0		
rv	0	0	0	0	1	0	0	0	0	0	0	0		
no clips	0	4	7	1	17	2	17	0	6	0	0	1		

Table 19, continued

Species	Clip	----- SPRING -----				-----SUMMER-----						-----FALL	
		early		mid-late		early		mid		late		early	
		b	p	b	p	b	p	b	p	b	p	b	p
Brown trout	ad	1	0	0	0	0	0	0	0	0	0	0	0
	ad,do	0	0	0	0	0	1	0	0	0	0	0	0
	ad,rm	0	2	2	1	0	0	0	0	1	0	0	0
	ad,lv	0	0	0	2	0	0	1	0	0	0	0	0
	ad,rp	0	0	0	0	0	0	0	0	1	0	0	0
	ad,rv	4	3	4	6	1	0	0	0	6	0	0	0
	lm	0	1	0	3	0	0	0	0	0	0	1	0
	lm,rm	0	1	0	0	0	0	0	0	0	0	0	0
	lp	0	1	1	1	0	0	0	0	0	0	0	0
	lp,rp	0	1	0	0	0	0	0	0	0	0	0	0
	rp	0	2	1	0	0	0	0	0	0	0	0	0
	no clips	9	153	33	74	10	6	5	2	5	1	1	1
	Lake trout	ad	0	1	8	0	13	0	19	0	25	0	1
ad,lp		0	0	0	0	0	0	2	0	3	0	0	0
ad,lv		0	0	6	0	6	0	3	0	3	0	0	0
ad,lv,rv		0	0	0	0	0	0	0	0	1	0	0	0
ad,rp		0	0	0	0	0	0	0	0	2	0	0	0
ad,rv		0	0	0	0	1	0	3	0	5	0	0	0
do		0	0	0	0	0	0	0	0	1	0	0	0
lp		0	0	1	0	1	0	1	0	0	0	0	0
lv		0	0	1	0	0	0	1	0	0	0	0	0
rp		0	0	0	0	1	0	1	0	1	0	0	0
rv		0	0	1	0	0	0	3	0	3	0	0	0
no clips		0	0	1	0	1	0	1	0	3	0	0	0

Table 20. Estimated number of angler trips and expenditures by non-charter anglers in the Illinois portion of Lake Michigan, during 1986 - 1997. NA = not applicable.

Type of angler	Year	Effort (angler- trips)	Expenditures		
			Major (boat)	Minor (gear)	Other (travel)
Pedestrians	1986	299,454	NA	\$844,000	\$397,000
	1987	275,187	NA	\$1,568,000	\$439,000
	1988	239,668	NA	\$1,100,000	\$387,000
	1989	159,870	NA	\$724,000	\$267,000
	1990	178,547	NA	\$809,000	\$298,000
	1991	191,427	NA	\$868,000	\$315,000
	1992	158,969	NA	\$721,000	\$266,000
	1993	171,578	NA	\$778,000	\$286,000
	1994	110,132	NA	\$264,000	\$155,000
	1995	120,522	NA	\$333,000	\$193,000
	1996	107,510	NA	\$524,000	\$188,000
1997	76,937	NA	\$587,000	\$120,000	
Launched Boats	1986	71,009	\$2,079,000	\$1,598,000	\$131,000
	1987	54,043	\$2,427,000	\$618,000	\$119,000
	1988	58,009	\$8,061,000	\$614,000	\$123,000
	1989	40,261	\$3,229,000	\$426,000	\$85,000
	1990	45,394	\$2,115,000	\$481,000	\$99,000
	1991	37,693	\$2,196,000	\$391,000	\$85,000
	1992	45,155	\$4,122,000	\$514,000	\$104,000
	1993	44,651	\$634,000	\$471,000	\$97,000
	1994	40,888	\$659,000	\$67,000	\$91,000
	1995	41,654	\$5,152,000	\$77,000	\$111,000
	1996	41,055	\$4,998,000	\$271,000	\$135,000
1997	33,134	\$4,044,000	\$411,000	\$126,000	
Moored Boats	1986	74,307	\$2,022,000	\$2,395,000	\$138,000
	1987	28,911	\$996,000	\$363,000	\$60,000
	1988	34,321	\$5,251,000	\$373,000	\$73,000
	1989	23,084	\$1,449,000	\$244,000	\$49,000
	1990	24,752	\$803,000	\$262,000	\$54,000
	1991	32,004	\$1,786,000	\$331,000	\$72,000
	1992	36,602	\$2,372,000	\$396,000	\$82,000
	1993	41,118	\$849,000	\$435,000	\$90,000
	1994	36,750	\$438,000	\$54,000	\$85,000
	1995	27,156	\$2,640,000	\$46,000	\$72,000
	1996	26,605	\$2,747,000	\$152,000	\$88,000
1997	23,322	\$3,786,000	\$251,000	\$84,000	

Table 20. Continued.

Type of angler	Year	Effort (angler- trips)	Expenditures		
			Major (boat)	Minor (gear)	Other (travel)
Season Totals	1986	444,770	\$4,101,000	\$4,837,000	\$666,000
	1987	358,141	\$3,423,000	\$2,549,000	\$618,000
	1988	333,839	\$13,312,000	\$2,087,000	\$583,000
	1989	223,215	\$4,678,000	\$1,394,000	\$401,000
	1990	248,693	\$2,919,000	\$1,552,000	\$452,000
	1991	263,721	\$3,982,000	\$1,590,000	\$476,000
	1992	240,725	\$6,494,000	\$1,632,000	\$452,000
	1993	257,347	\$1,483,000	\$1,684,000	\$473,000
	1994	187,770	\$1,097,000	\$385,000	\$331,000
	1995	189,332	\$7,792,000	\$456,000	\$376,000
1996	175,170	\$7,744,000	\$947,000	\$411,000	
1997	133,393	\$7,831,000	\$1,249,000	\$331,000	

Table 21. March fishing effort and expenditures by non-charter anglers at selected sites in the Illinois portion of Lake Michigan, during 1995 - 1997. NA = not applicable

Type of angler	Year	Effort (angler- trips)	Expenditures		
			Major (boat)	Minor (gear)	Other (travel)
Pedestrians	1995	4,818	NA	\$16,000	\$17,000
	1996	3,129	NA	\$110,000	\$8,000
	1997	11,723	NA	\$134,000	\$30,000
Launched Boats	1995	1,428	\$0	\$11,000	\$2,000
	1996	228	\$2,000	\$2,000	\$400
	1997	1,133	\$684,000	\$14,000	\$2,000
March Totals	1995	8,802	\$0	\$27,000	\$19,000
	1996	3,357	\$2,000	\$112,000	\$8,400
	1997	12,856	\$684,000	\$148,000	\$32,000

Table 22. Fishing effort and harvest by non-charter anglers in the Illinois portion of Lake Michigan, in 1986 - 1997.
 Peds = Pedestrian, Lau'd = Launched boat anglers, Moo'd = Moored boat anglers.

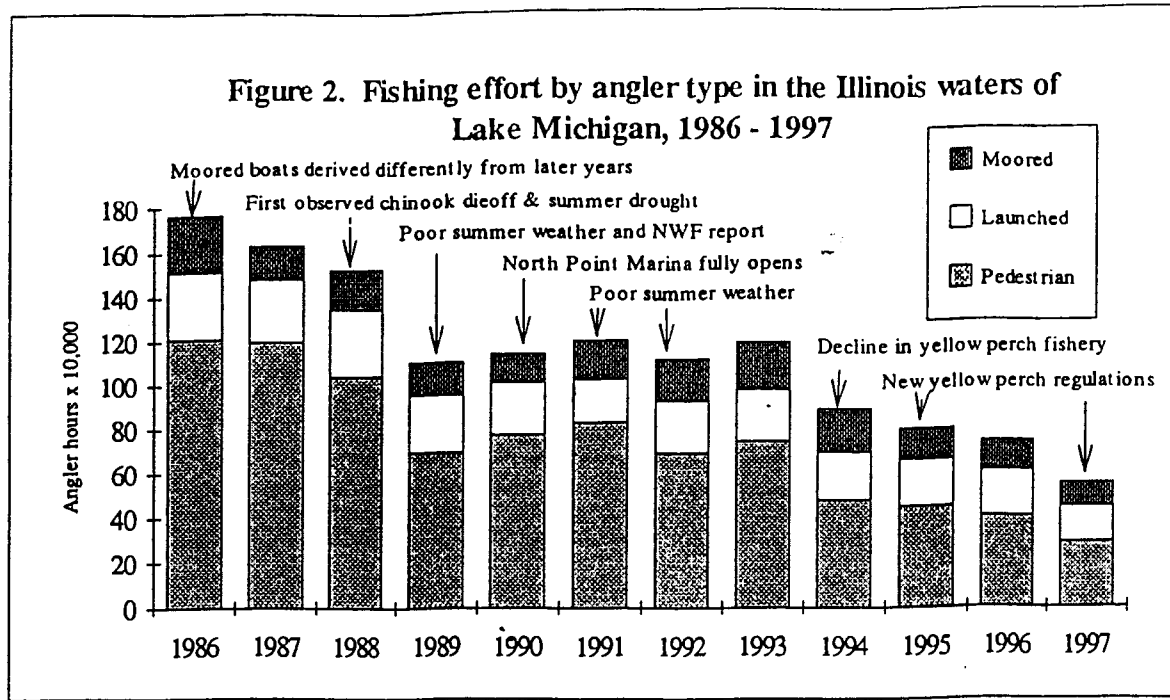
Angler type	Year	Effort (angler- hours)	Harvest					
			Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
Peds	1986	1,206,205	1,447,791	6,146	2,639	215	18,094	4,769
	1987	1,191,607	1,664,726	8,315	2,029	28	12,721	8,823
	1988	1,032,203	1,594,107	3,033	1,851	17	16,582	3,665
	1989	689,037	809,983	2,230	1,792	0	12,832	3,474
	1990	769,538	1,377,356	2,280	982	0	8,424	4,207
	1991	825,049	1,059,222	3,019	312	29	4,381	2,644
	1992	686,533	802,059	1,968	2,002	0	4,826	1,859
	1993	739,839	921,269	2,478	2,199	0	4,965	877
	1994	474,630	307,012	1,496	844	0	7,410	273
	1995	447,031	413,590	2,022	625	0	1,615	760
	1996	398,867	273,248	1,142	989	0	8,312	1,619
	1997	283,410	50,125	3,552	212	0	16,057	913
	Lau'd	1986	304,119	46,078	1,201	1,330	776	22,481
1987		285,076	84,172	690	811	2,299	14,861	8,266
1988		304,547	73,999	836	1,545	2,188	32,016	3,556
1989		262,223	43,132	2,363	1,595	2,544	48,246	4,454
1990		238,317	97,771	1,168	1,659	1,483	30,833	4,060
1991		195,676	152,403	1,092	1,111	2,803	7,708	5,333
1992		235,257	148,197	693	1,783	2,742	29,267	3,173
1993		232,344	163,945	1,098	2,945	3,212	22,375	2,414
1994		216,893	112,873	576	2,925	3,222	26,958	1,399
1995		210,979	94,332	1,674	3,643	2,973	15,734	3,074
1996		206,097	64,983	932	2,735	1,627	25,581	3,250
1997		160,396	6,592	1,031	1,853	3,464	39,463	2,375
Moo'd		1986	254,912	17,669	926	1,271	557	20,047
	1987	151,770	20,964	330	444	1,286	8,855	4,057
	1988	180,186	34,980	485	868	1,446	20,530	2,107
	1989	148,570	21,405	1,272	950	1,537	25,098	2,643
	1990	129,944	40,682	621	1,023	852	18,094	2,468
	1991	179,583	92,457	1,192	1,123	3,172	8,179	6,280
	1992	190,374	116,036	457	1,478	2,712	22,183	2,942
	1993	213,980	133,140	998	2,928	3,234	22,699	2,361
	1994	195,152	104,460	379	2,598	3,142	25,011	1,191
	1995	137,703	57,747	1,002	2,660	2,057	10,804	2,103
	1996	133,560	51,146	570	1,666	1,006	16,098	2,255
	1997	106,766	2,386	531	1,183	2,408	27,671	1,600

Table 22. Continued.

Angler type	Year	Effort (angler- hours)	Harvest					
			Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
Season	1986	1,765,236	1,511,538	8,274	5,240	1,548	60,622	19,216
Totals	1987	1,628,453	1,769,862	9,335	3,294	3,613	36,437	21,146
	1988	1,526,597	1,704,149	4,390	4,318	3,720	69,128	9,457
	1989	1,099,830	874,520	5,864	4,336	4,081	86,176	10,570
	1990	1,137,798	1,515,809	4,069	3,664	2,336	57,351	10,735
	1991	1,200,308	1,304,081	5,303	2,546	6,003	20,268	14,257
	1992	1,112,165	1,066,291	3,118	5,263	5,454	56,273	7,974
	1993	1,186,163	1,218,354	4,574	8,072	6,447	50,039	5,652
	1994	886,675	524,345	2,451	6,367	6,364	59,379	2,863
	1995	795,713	565,669	4,698	6,928	5,030	28,153	5,937
	1996	738,524	389,377	2,644	5,390	2,633	49,991	7,124
	1997	550,572	59,103	5,114	3,249	5,872	83,191	4,888

Table 23. March fishing effort and harvest by non-charter anglers at selected sites in the Illinois portion of Lake Michigan, in 1995 - 1997. Peds = Pedestrian, Lau'd = Launched boat anglers

Angler type	Year	Effort (angler- hours)	Harvest					
			Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
Peds	1995	35,501	0	1,692	566	0	2,459	26
	1996	13,495	0	756	223	0	81	0
	1997	53,420	0	3,866	344	32	7,365	27
Lau'd	1995	6,694	0	241	14	0	1,175	0
	1996	1,146	0	217	0	0	30	0
	1997	5,722	0	288	0	0	2,165	0
March	1995	42,047	0	1,841	580	0	3,634	26
Totals	1996	14,641	0	973	223	0	111	0
	1997	59,143	0	4,154	344	32	9,530	27



The report referred to in this and successive figures was a report issued by the National Wildlife Federation in the summer of 1989. The report dealt with the health risks involved in eating fish from Lake Michigan using a different methodology than the states bordering Lake Michigan measured the risks. The report was widely cited by the news media and had a negative impact on the recreational and commercial fisheries of Lake Michigan. Poor summer weather refers to the negative impact on fishing effort that unsettled weather can have on the fishery during the traditional season of peak effort.

Figure 3 (a). Salmonid harvest per unit effort, derived from Illinois sportfishing surveys of Lake Michigan, 1986 - 1997

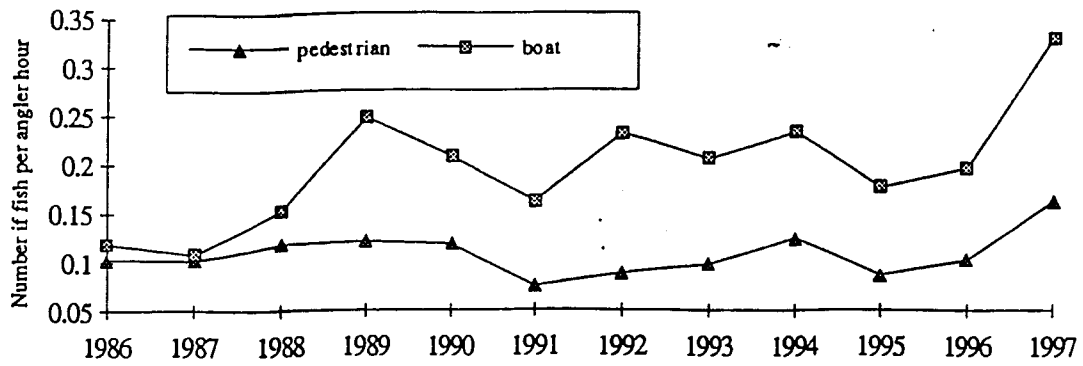


Figure 3 (b). Yellow perch harvest per unit effort, derived from Illinois sport fishing surveys of Lake Michigan, 1986 - 1997

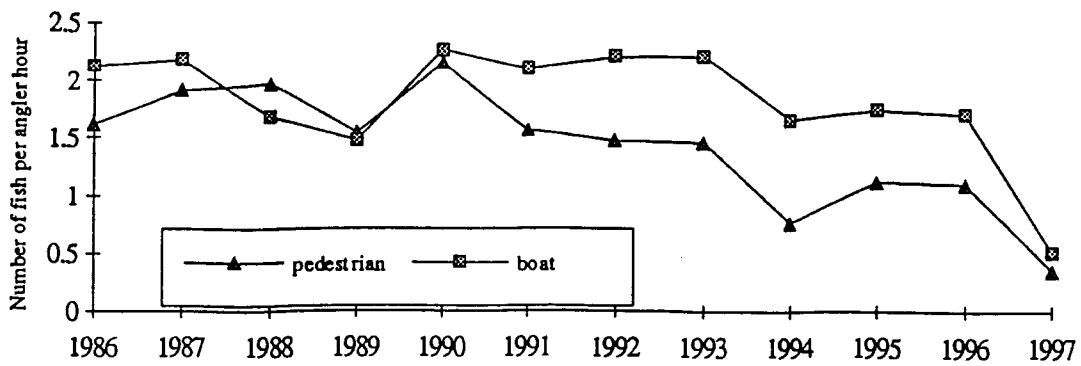


Figure 4a. Directed angler effort for salmonids in the Illinois portion of Lake Michigan, 1986 - 1997

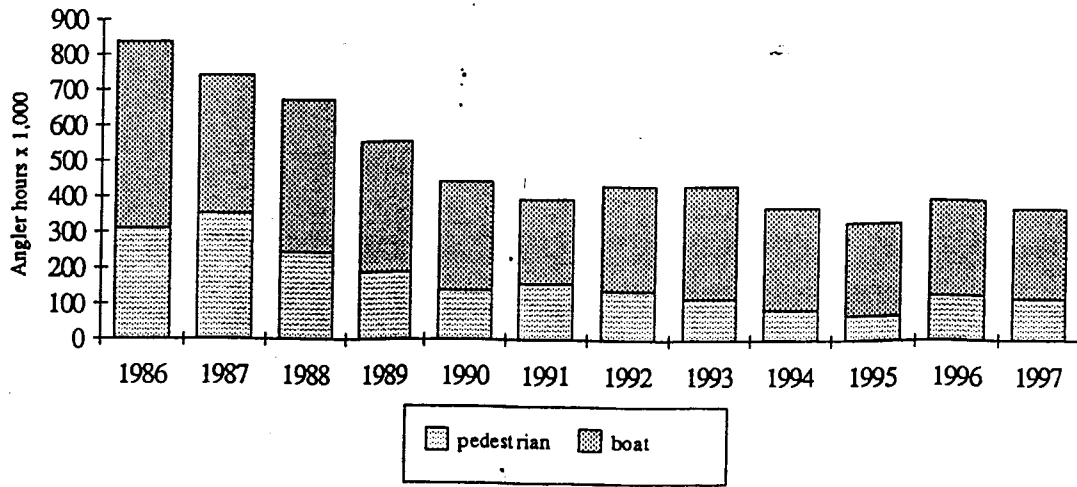


Figure 4b. Directed angler effort for yellow perch in the Illinois portion of Lake Michigan, 1986 - 1997

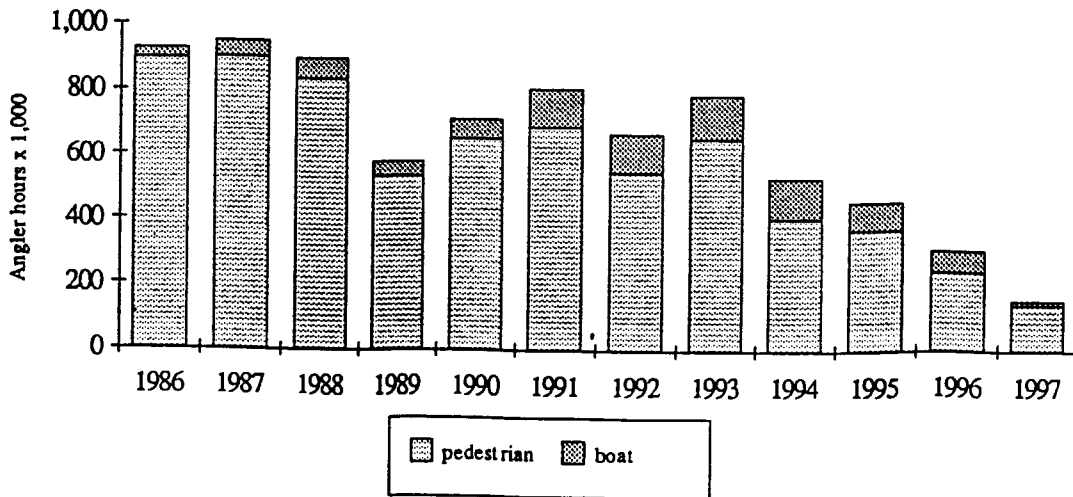


Figure 5. Comparison of fish biomass harvested in the Illinois waters of Lake Michigan, 1986 - 1997

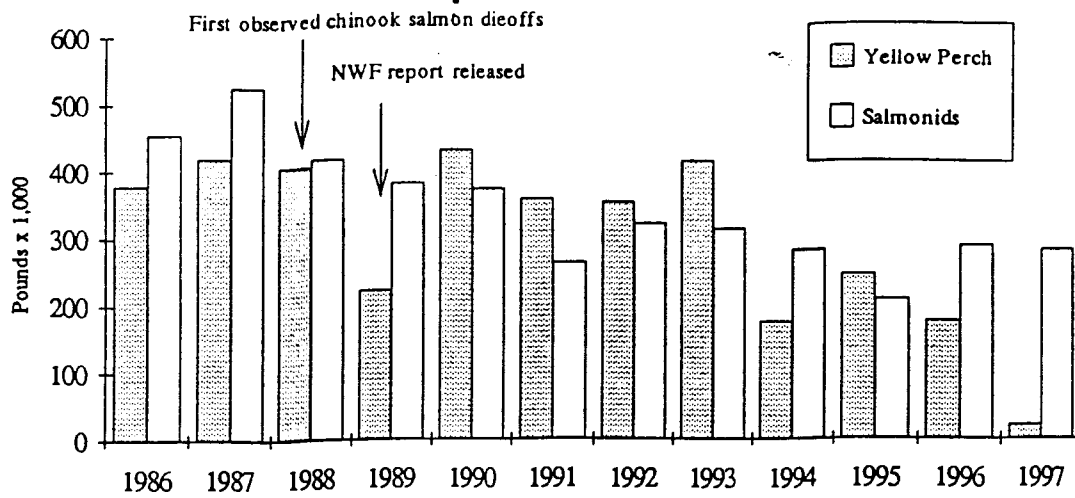


Figure 6. Total yellow perch non - charter sport harvest in the Illinois waters of Lake Michigan, 1986 - 1997

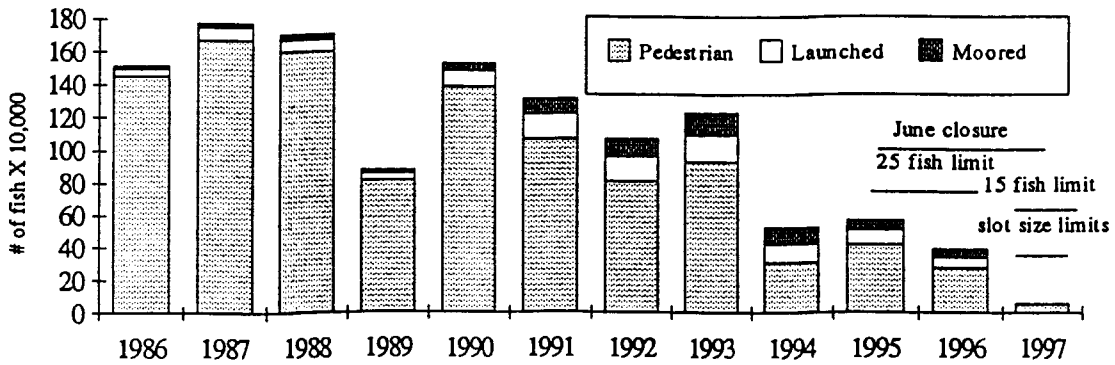


Figure 7. Lengths of creeded yellow perch from the Illinois waters of Lake Michigan, 1997

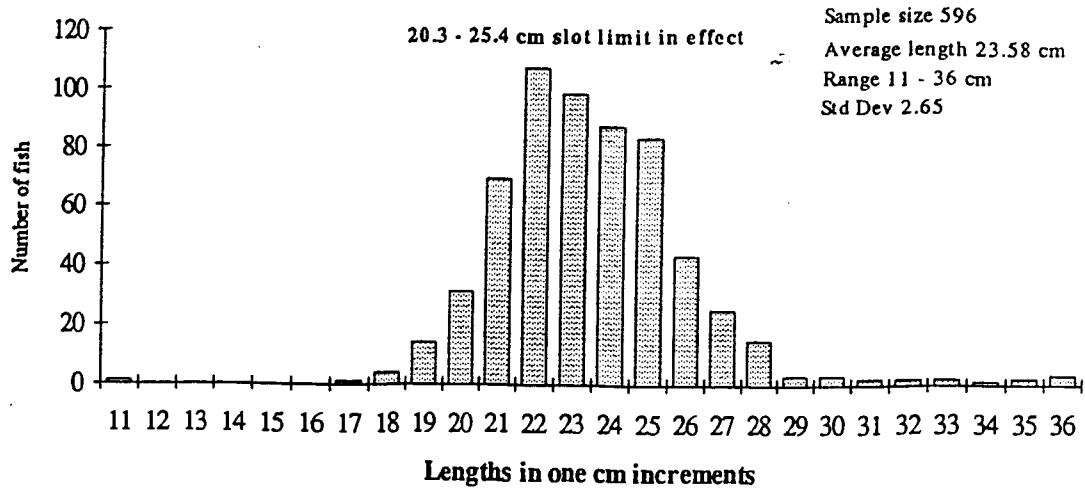


Figure 8. Average lengths of creeded yellow perch from the Illinois waters of Lake Michigan, 1986 - 1997

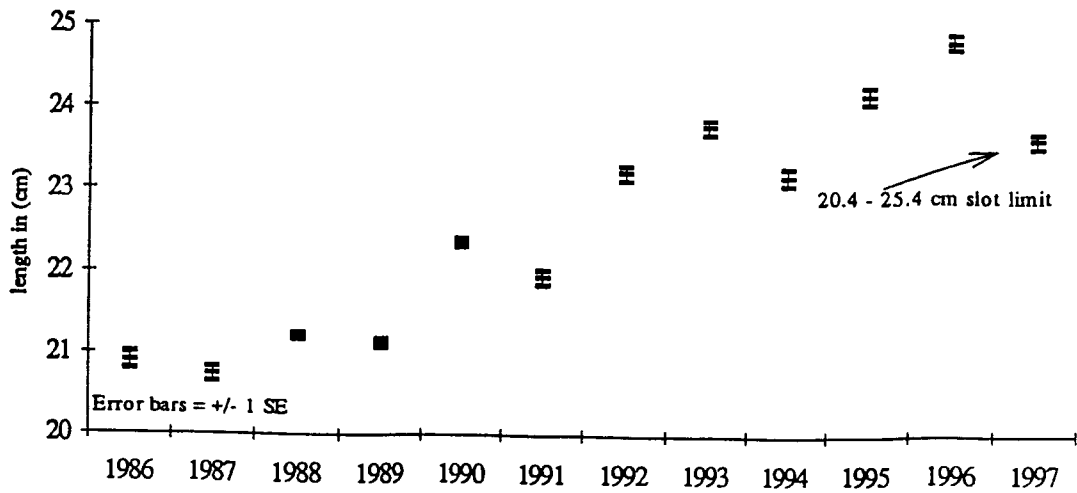


Figure 9. 1997 yellow perch sport harvest from the Illinois waters of Lake Michigan, per three week segment

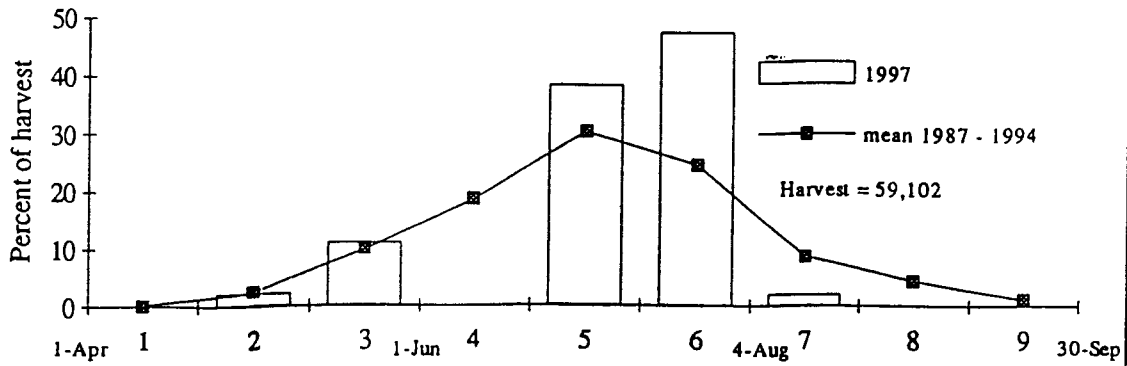


Figure 10. Total non - charter coho salmon sport harvest in the Illinois waters of Lake Michigan, 1986 - 1997

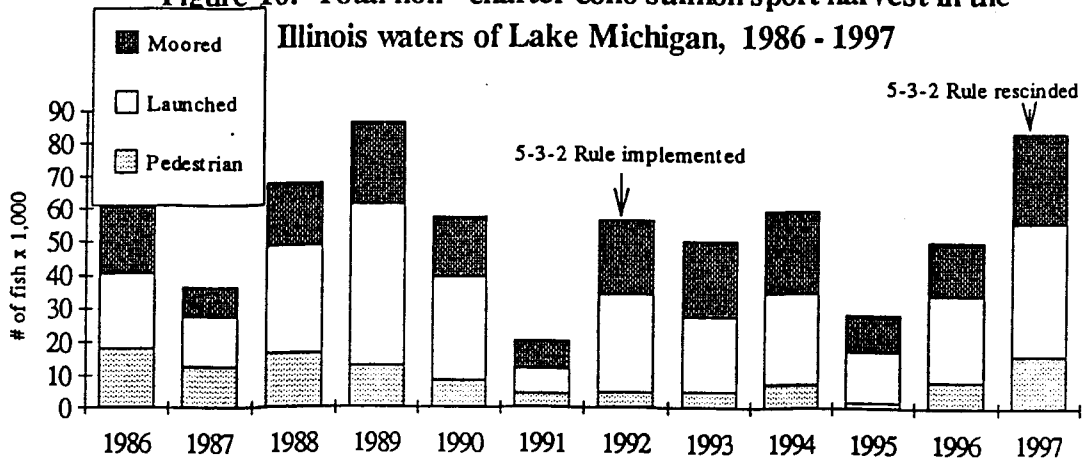


Figure 11. Average lengths of creeled coho salmon from the Illinois waters of Lake Michigan, 1986 - 1997

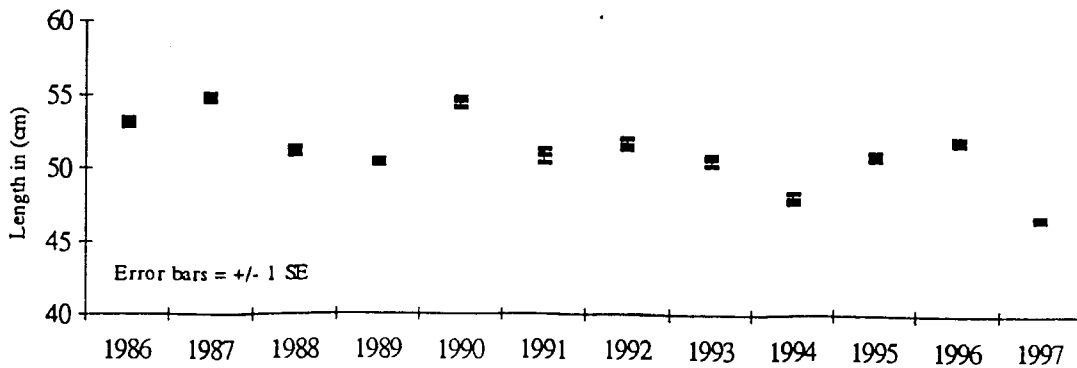


Figure 12 (a). Lengths of creeded coho salmon from the Illinois waters of Lake Michigan, spring 1997

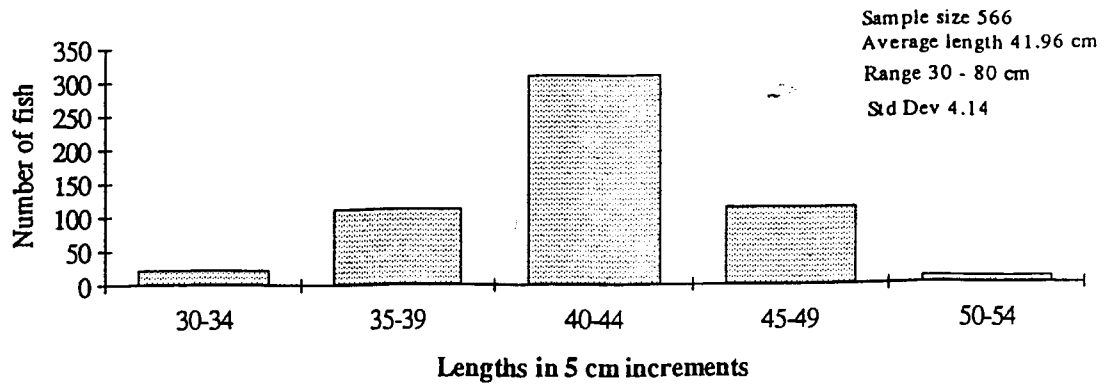


Figure 12 (b). Lengths of creeded coho salmon from the Illinois waters of Lake Michigan, summer 1997

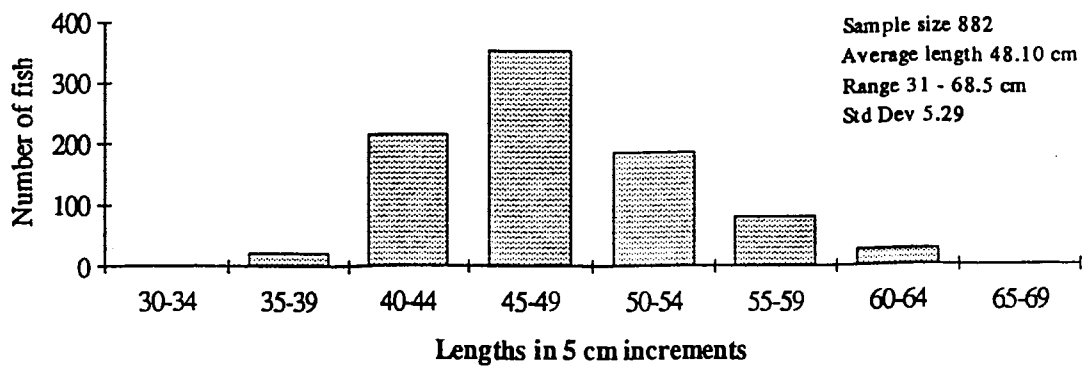


Figure 12 (c). Lengths of creeded coho salmon from the Illinois waters of Lake Michigan, fall 1997

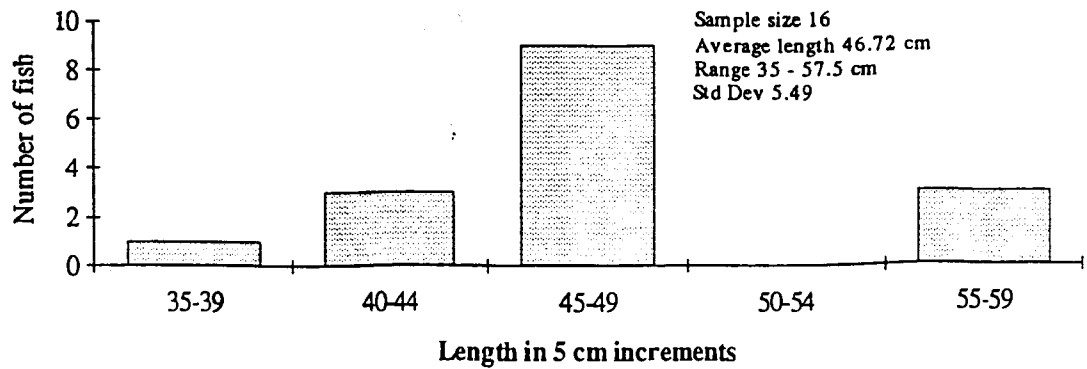


Figure 13. 1997 coho salmon sport harvest from the Illinois waters of Lake Michigan, per three week segment

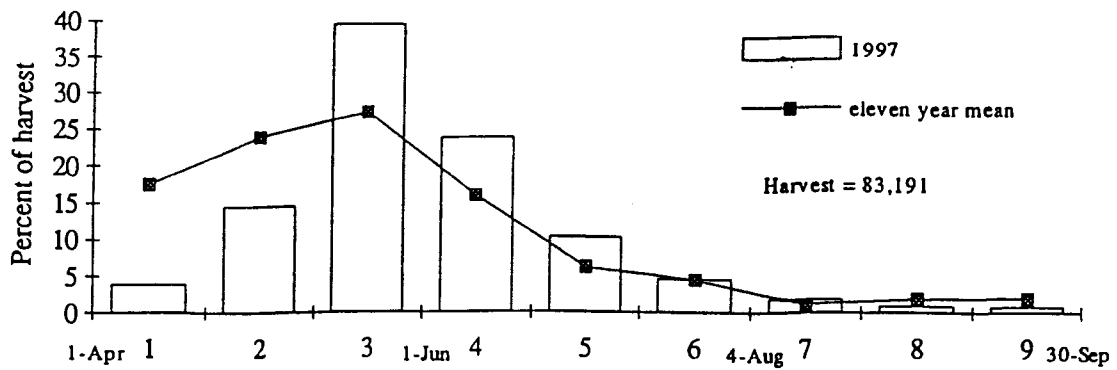


Figure 14. Total non - charter chinook salmon sport harvest in the Illinois waters of Lake Michigan, 1986 - 1997

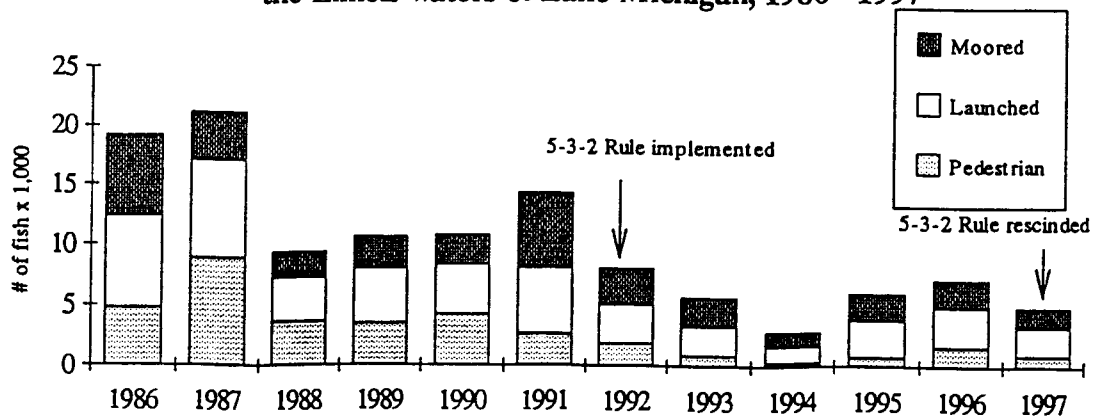


Figure 15. Average lengths of creel'd chinook salmon from the Illinois waters of Lake Michigan, 1986 - 1997

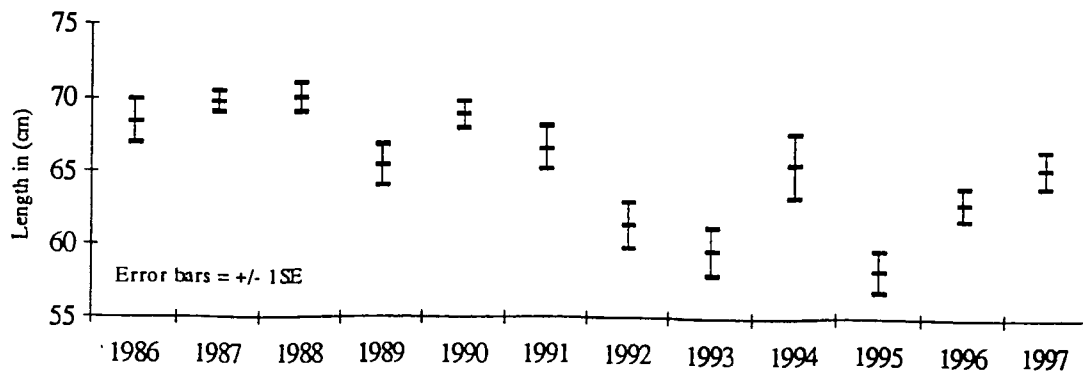


Figure 16 (a). Lengths of creled chinook salmon from the Illinois waters of Lake Michigan, spring 1997

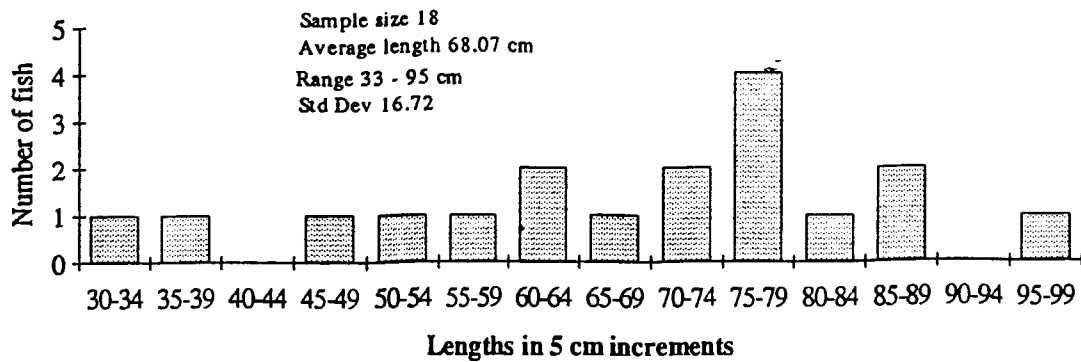


Figure 16 (b). Lengths of creled chinook salmon from the Illinois waters of Lake Michigan, summer 1997

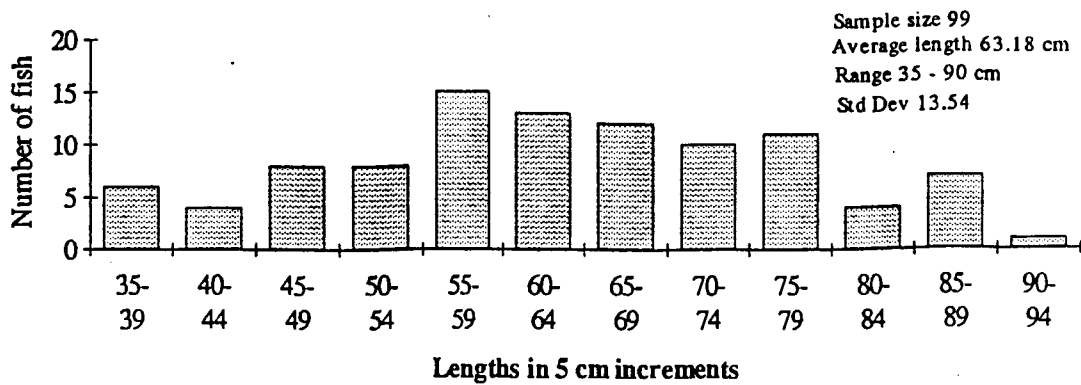


Figure 16 (c). Lengths of creled chinook salmon from the Illinois waters of Lake Michigan, fall 1997

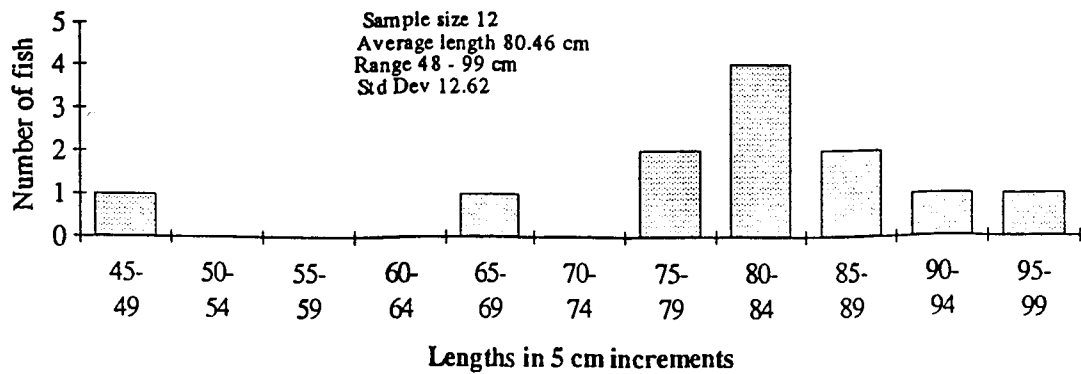


Figure 17. 1997 chinook salmon sport harvest from the Illinois waters of Lake Michigan, per three week segment

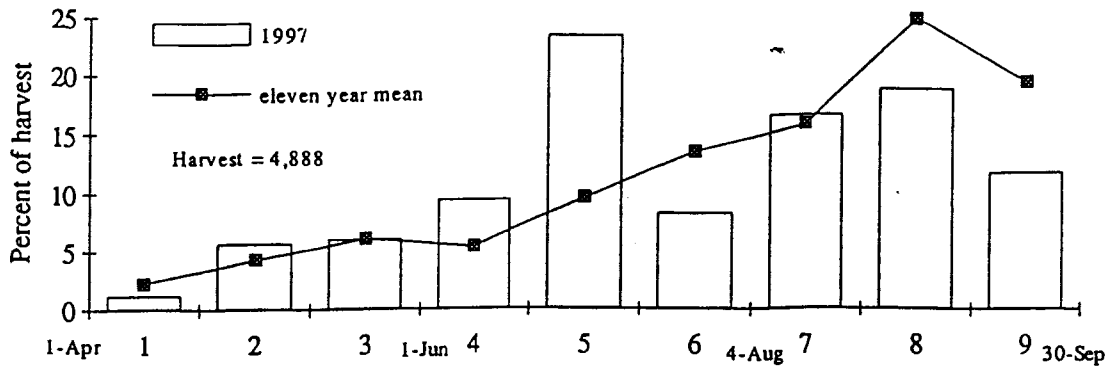


Figure 18. Total non - charter lake trout sport harvest in the Illinois waters of Lake Michigan, 1986 - 1997

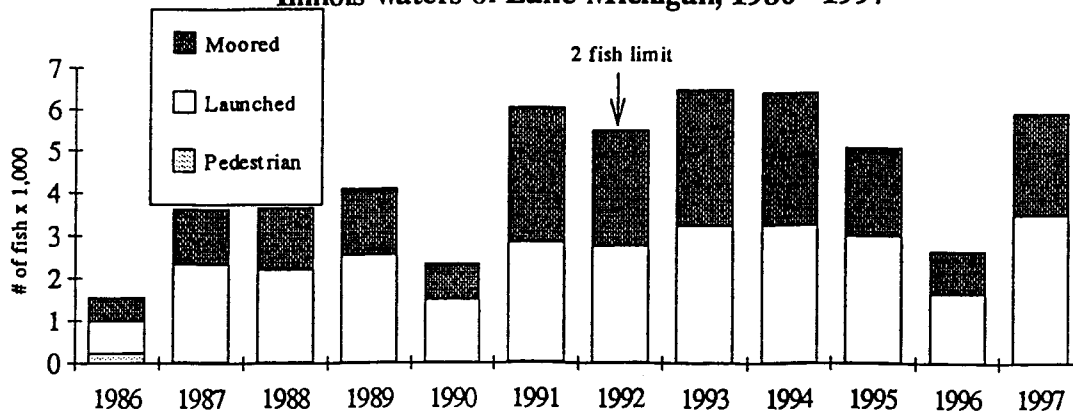


Figure 19. Average lengths of creel lake trout from the Illinois waters of Lake Michigan, 1986 - 1997

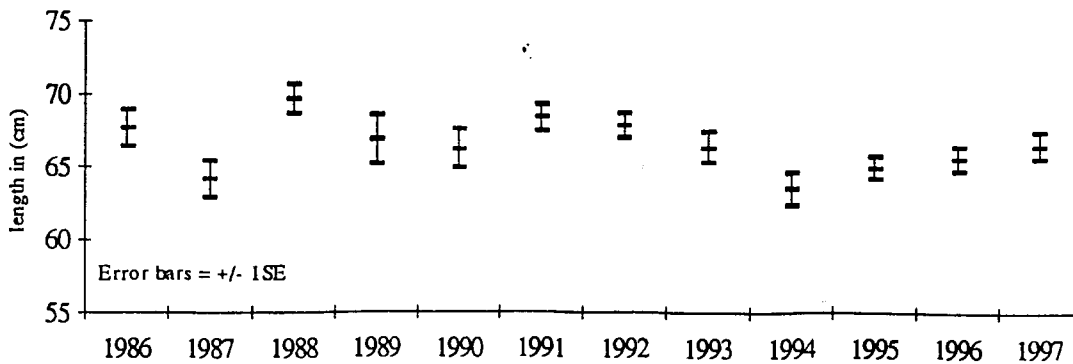


Figure 20. Lengths of creel lake trout from the Illinois waters of Lake Michigan, 1997

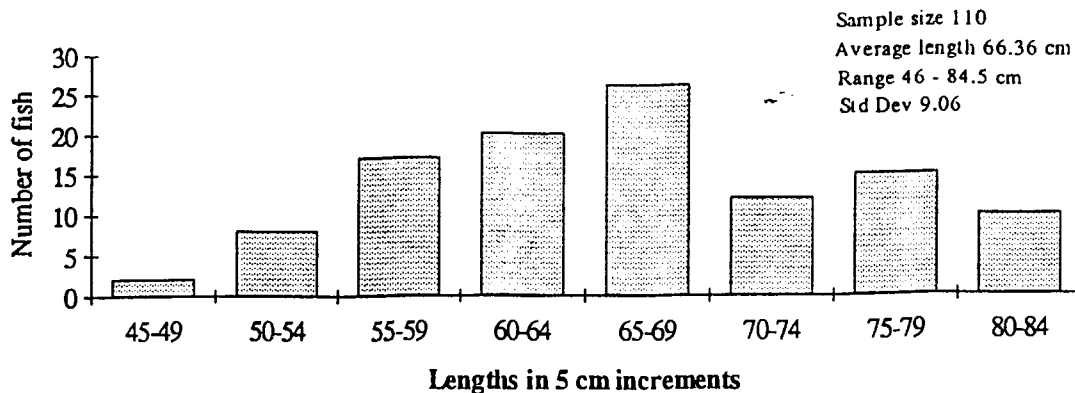


Figure 21. 1997 lake trout sport harvest from the Illinois waters of Lake Michigan, per three week segment

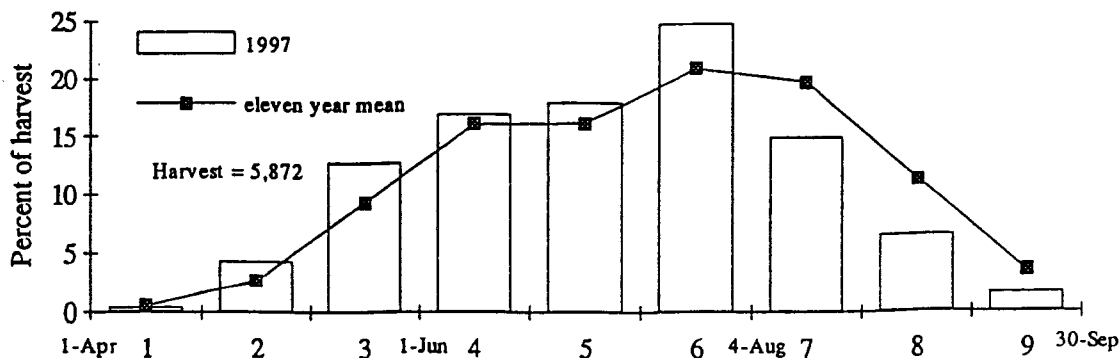


Figure 22. Total non - charter brown trout sport harvest in the Illinois waters of Lake Michigan, 1986 - 1997

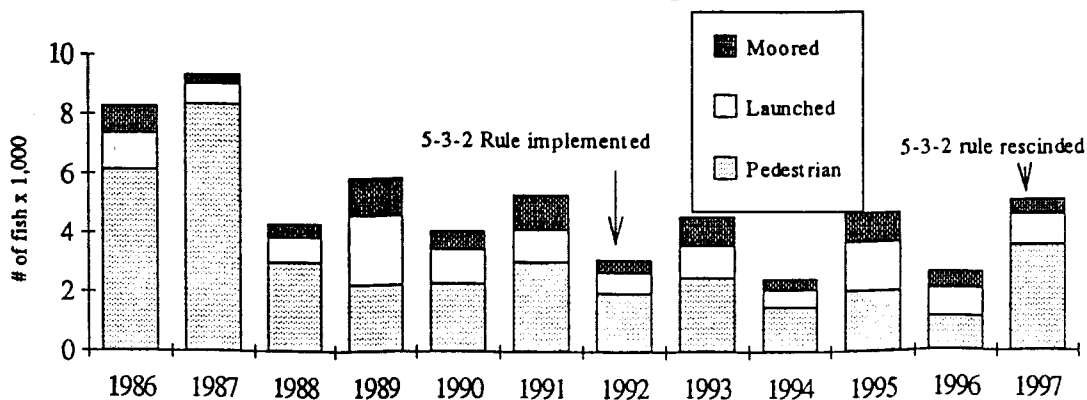


Figure 23. Lengths of creled brown trout from the Illinois waters of Lake Michigan, 1997

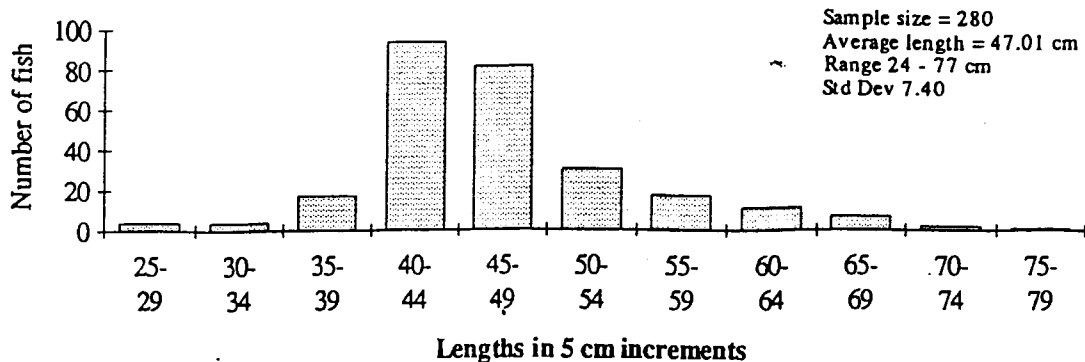


Figure 24. Average lengths of creled brown trout from the Illinois waters of Lake Michigan, 1986 - 1997

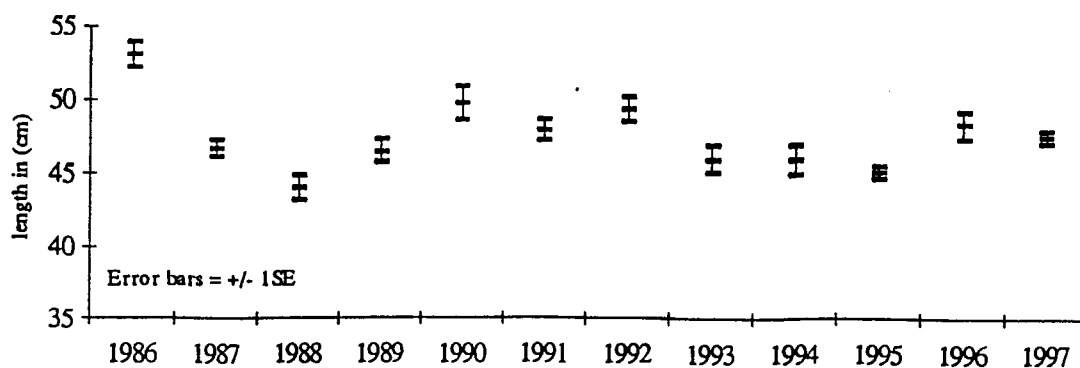


Figure 25. 1997 brown trout sport harvest from the Illinois waters of Lake Michigan, per three week segment

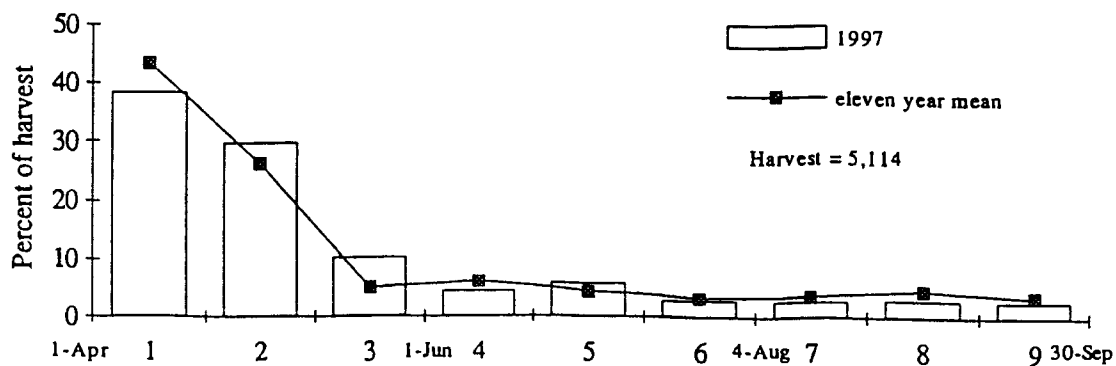


Figure 26. Total non - charter rainbow trout sport harvest in the Illinois waters of Lake Michigan, 1986 - 1997

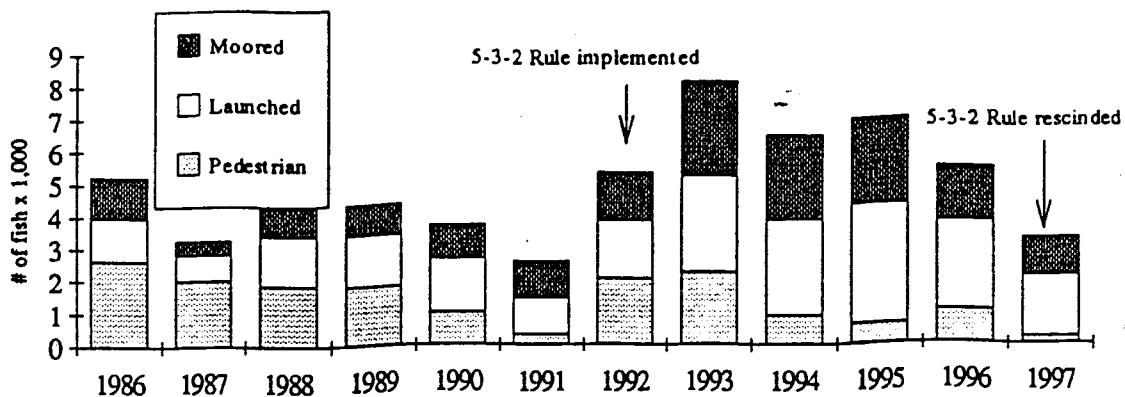


Figure 27. Lengths of creel rainbow trout from the Illinois waters of Lake Michigan, 1997

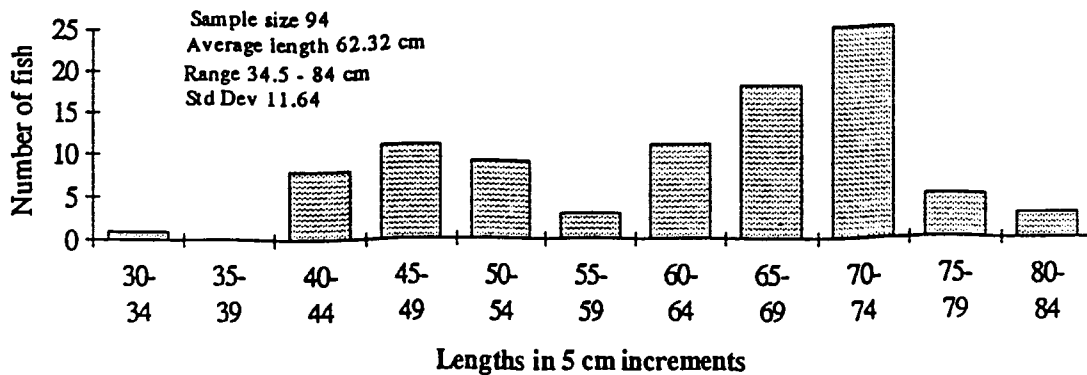


Figure 28. Average lengths of creel rainbow trout from the Illinois waters of Lake Michigan, 1986 - 1997

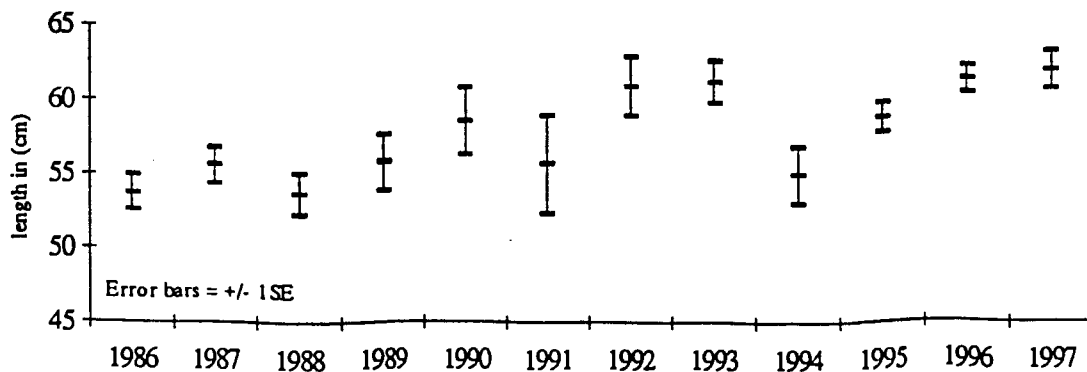


Figure 29. 1997 rainbow trout sport harvest from the Illinois waters of Lake Michigan, per three week segment

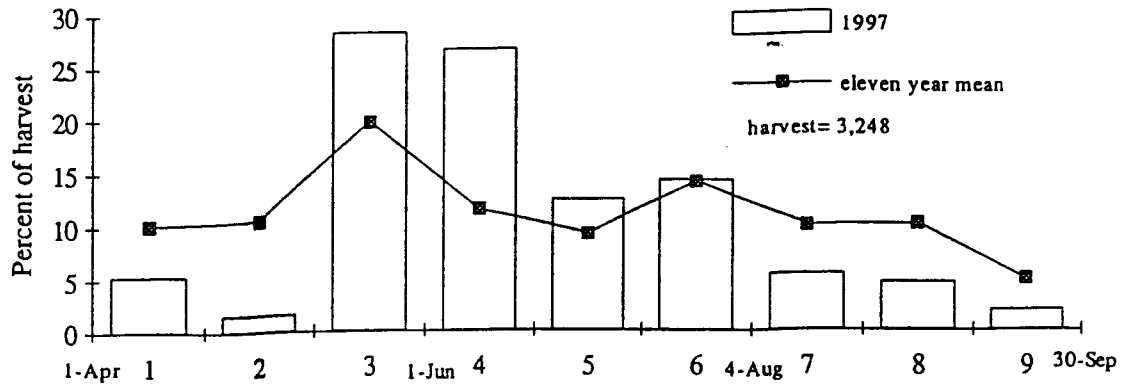


Figure 30. Mean daily weather scores by three week segment, 1997

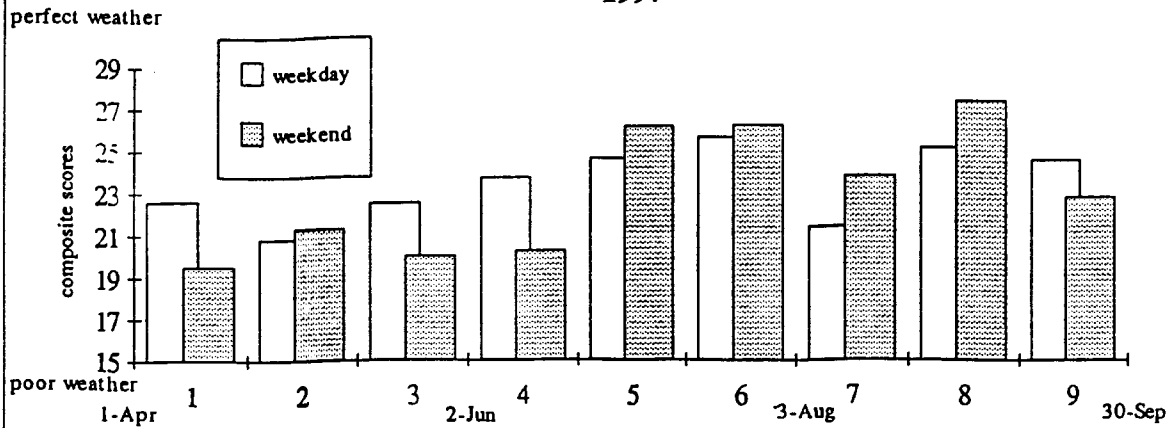


Figure 31. Mean daily launched boat effort per three week segment, 1997

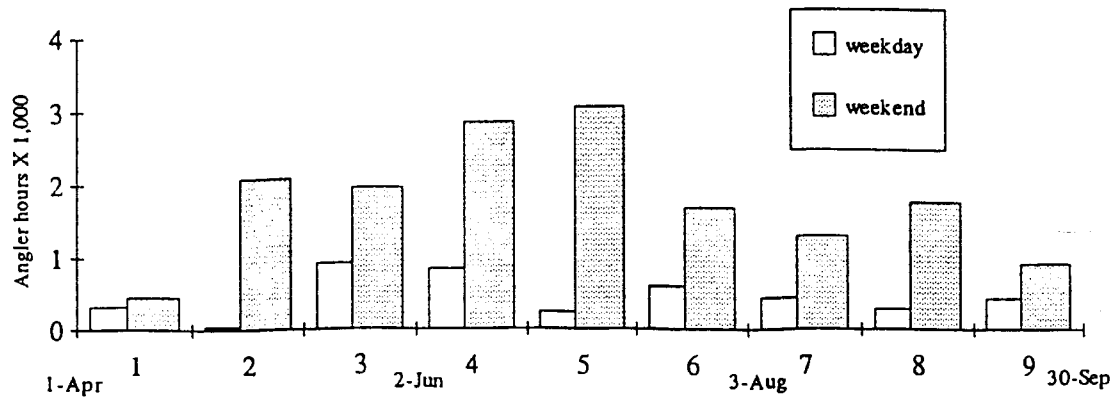
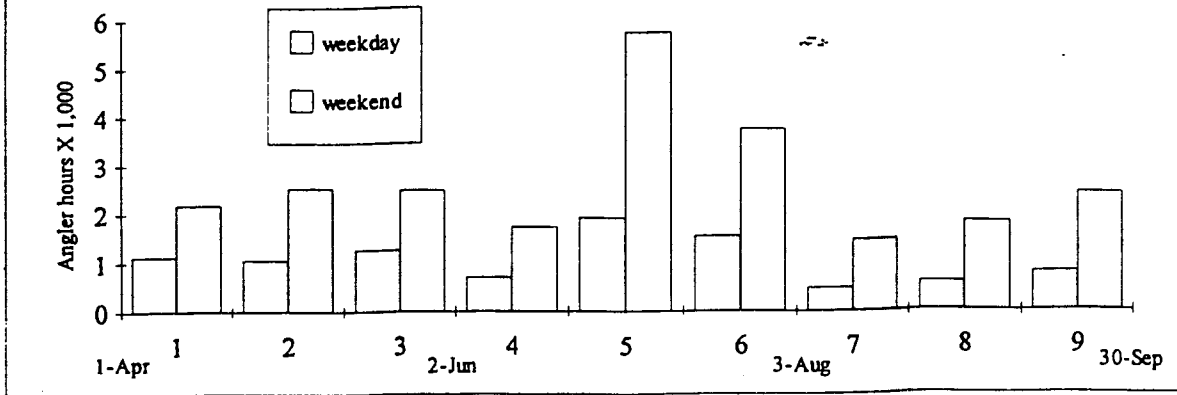


Figure 32. Mean daily pedestrian effort per three week segment, 1997



APPENDIX A - DATA FORM AND INSTRUCTIONS TO CLERKS

We record data on the Interview Form and a modified version of the same. The modified version is sometimes used by a helper in connection with interviews of boaters (see "Instructions to Clerks -- Work Assignments").

One important general rule applies to both forms: "Fill in all the blanks". If you don't know a particular value, draw a diagonal slash through that space on the form. The only exception to this rule is the "numbers in possession" section of the Interview Form. In that section, blanks are interpreted as zeros.

Interviews are obtained in sets. For each set, you visit a site and interview a number of angling parties. Each interview involves data for an entire angling party, although you might only speak with one individual angler. The interviews are taken from pedestrian anglers or from boaters returning to a launch ramp.

When pedestrian anglers are being interviewed, interview either all present or all that can be interviewed in the assigned period (usually two hours). Counts of pedestrian anglers are made at the start and finish of the interview set. When all pedestrian fishing parties cannot be interviewed, interview a representative sample of the anglers present. Thus, if the site includes harbor, shore, and structure areas (see maps), you interview parties from all three areas in proportion to their numbers. Approach all types of people (men, women, Chinese, Hispanic, white, polite, surly, etc.) without special favor for or against any. To assure impartiality skip a fixed number of anglers between interviews, with the number to skip determined so that the entire site is covered during the interview period. If you encounter an angling party that has already been interviewed in our creel survey that day, skip them.

When counting anglers, ignore spectators (casual passers-by) but include members of the angling party who are not fishing at the moment. This can include family members (spouses and children over five years old) who are accompanying the angler.

When boaters are interviewed, stay at the ramp for a predetermined time (usually two hours) and record data for all returning boats. Sometimes it is not possible to interview all angling boats. When that happens, you will interview a representative sample of boats containing anglers. When a boat is not interviewed, you record an ID number (see below), the time (under "interview time"), and one of four notes (in the right-hand margin): "ANI" (anglers - no interview), "PNA" (power - no anglers), "SAIL" (sail boat), and "CH" (charter fishing boat). Counts of trailers are made at the start and finish of the interview period. It is important that the counts indicate the number of trailers at the times when you start and finish your interview set. Sail boats, non-angling power boats, and charter boats are never interviewed.

Record the total number of trailers of all types, excluding jet ski trailers, but only count empty trailers (those without boats on them) with vehicles attached. Only count trailers at the west ramp area when covering Burnham Harbor.

The interview form has four areas for recording data: 1) Site Data, 2) Party Record, 3) **Harvest** Record, and 4) Fish Record.

1) Site Data. This area is a condensed version of the Instantaneous Counts Form. Counts are recorded at the start and finish of each interview set. Remember the rule: "Fill in all the blanks". When conducting boat interviews, record slashes in the pedestrian spaces. When conducting pedestrian interviews of any kind, enter a slash in the trailers space. When conducting pedestrian interviews with "regular peds", always enter slashes for all three types of "special peds", and vice-versa.

2) Party Record and 3) Harvest Record. These areas are filled-in during the interviews. Column headings are explained here:

ID - Interviews (and non-interviewed boats) are sequentially numbered. For pedestrians, assign a number to each pedestrian party interviewed. For boaters, assign a number to each boat that returns to the ramp, including those that are not interviewed. Each clerk assigns one series of numbers each day, with no repeats. Thus, for example, when

you conduct more than one interview set in a day, do not begin the second set with number 1; continue numbering where you left off in numbering the previous set.

angler type - One of eight mutually exclusive possibilities is circled: har (harbor), sho (shore), str (structure), lau (launched), sna (snagger), smt (smelter), ice (ice-angler), and moo (moored).

angs - For each party record the total number of anglers (tot) and the number who are Illinois residents (res). Remember, as in the Instantaneous Counts Form, include members of the angling party who are not fishing at the moment.

lines - For each party record the number of fishing rods (rod) and the number of power lines (pwr) in use by that party. Trolley lines are counted as power lines here.

nets - (ignore)

trip times - Record three times: the time the fishing trip started, the time of the interview, and the time the trip ended (or is expected to end). Always record times in 24-hour time (e.g., two o'clock p.m. is 1400). When the fishing trip has started the previous day, still record the time of day that fishing started. Fishing trips by pedestrians are considered to start when the angling party arrives at the shoreline. Fishing trips using boats are considered to start when the boat leaves the ramp and to end when the boat arrives back at the ramp.

expenses - Three specific items are recorded. Remember, that data you record applies to the entire party interviewed. You record only costs of items acquired since the last fishing trip on Lake Michigan. If this is the first trip that an angler has ever made to Lake Michigan, include the total purchase price of all items in each category, regardless of when purchased. Notice that we are not concerned with when the item was paid for, only with when it was acquired and what it cost. 1) This category applies to launched boat anglers only. For major expenses (**maj**), record the purchase price of boat, motor, and /or trailer, if acquired since the last fishing trip on Lake Michigan. Include newly purchased used equipment. 2) For minor expenses (**min**), record the purchase price of any fishing equipment (rods, reels, downriggers, line, hooks, lures, bait, nets, etc.) purchased since the last fishing trip on Lake Michigan. Include only things directly used in the capture of fish. Do not include electronic equipment, food and drink, and items for the boat. 3) In the column headed "other", record the estimated cost of driving to this site. Here we assume a cost of **ten cents per mile**, so you simply record the round trip mileage divided by ten. This should be the total round trip distance for **all cars** used for this trip by members of the fishing party.

sought - Record species sought as p (perch), s (salmonid), ps ("whatever bites"), or o (other specific target species).

numbers in possession - Record only the numbers of fish in possession of the angling party. Fish names are abbreviated as follows: BK - brook trout, BN - brown trout, RB - rainbow trout, LT - lake trout, CO - coho salmon, CH - chinook salmon, YP - yellow perch, SM - smallmouth bass, WP - white perch. Accurate identification is extremely important; don't hesitate to use your key if you have any doubt about the identification of any fish. If the fish in possession of an angling party include some harvested at any other site, exclude those from the numbers recorded here.

(# floy tags on yellow perch) - Ask the angler how many floy tags he/she has seen on **yellow perch** presently in possession. Record that number here.

4) Fish Record. Here you record physical measurements made in connection with the interviews. Above this section you record the time your interview set was scheduled to start (usually 0600, 0830, or 1100). You should be able to weigh, measure, and examine for clips (for purposes of this form, we count floy tags under the heading "clips"), scars, and wounds on all salmonids that you encounter in possession of anglers. When an angler has more than 5 yellow perch, select five fish at random from the harvest to weigh, measure, and examine for floy tags (you don't need to look for clipped fins or lamprey marks on yellow perch). In addition to the five randomly selected perch, record data for any other yellow perch on which the angler has found a floy tag. On some occasions anglers will have removed floy tags from fish before you arrive. If it is not possible to know which specific fish the tag came

"clips"), scars, and wounds on all salmonids that you encounter in possession of anglers. When an angler has more than 5 yellow perch, select five fish at random from the harvest to weigh, measure, and examine for floy tags (you don't need to look for clipped fins or lamprey marks on yellow perch). In addition to the five randomly selected perch, record data for any other yellow perch on which the angler has found a floy tag. On some occasions anglers will have removed floy tags from fish before you arrive. If it is not possible to know which specific fish the tag came from, record all information printed on the tag in the margin of the form and keep the tag. Column headings are explained here:

ID - Record the same number recorded in "Party Record" for the angling party that harvested this fish.

species - Record the two-letter abbreviation of the species name. The abbreviations are those that appear as headings in the "Harvest Record" section.

weight - Record the weight of the fish in grams. Do not record weights of gutted or beheaded fish. Be sure to "zero" the scale and to use the appropriate scale for the size of the fish being weighed.

length - Record total length (distance from tip of snout to tip of tail) in centimeters.

clipped fins - As outlined above you will examine all salmonids for clipped fins and floy tags, and you will examine some yellow perch for floy tags only. You record abbreviations for what you find (for purposes of data recording, assume that perch never have clipped fins or lamprey scars or wounds). The permitted entries are do (dorsal), ad (adipose), lp (left pectoral), rp (right pectoral), lv (left ventral), rv (right ventral), fl (floy tag), lm (left maxillary), rm (right maxillary) and no (none). Also, when you encounter a floy tag, record all the information printed on the tag. Remember, leave no blank spaces on the form; if you are unable to examine the fish, draw diagonal slashes through the spaces.

Remember all stocked lake trout have at least one fin clipped and possibly as many as three. Other salmonids may have none or up to three fins clipped so examine these fish carefully. Some fish are marked with a coded wire tag buried in the snout. These fish (primarily chinook salmon, lake trout and rainbow trout) have the adipose fin removed but no other fins are missing. Ask permission from the angler and collect the head for later tag extraction. Fill out the form included in the head bag and give the angler a copy.

scars and # wounds - This refers to marks left by sea lampreys; we are not interested in scars and wounds from other causes. The distinction is that wounds are still all or partly red, while scars are not. Since yellow perch are not examined for scars and wounds, always draw slashes through these boxes for perch.

APPENDIX B - PROJECT F-52-R12 PERFORMANCE REPORT

The foregoing report does not directly discuss progress toward each of the specific objectives listed in the AFA for this project. The purpose of this appendix is to list the jobs defined in that AFA and to comment on progress toward the objectives of those jobs.

Job 1. Interviews

Objective: To gather the necessary information from pedestrian anglers and boaters.
Progress: Completed.

Job 2. Data entry

Objective: To enter data into computer files.
Progress: Completed.

Job 3. Analysis and reporting

Objective: To produce and summarize the desired estimates of fishing effort and harvest.
Progress: Completed.

APPENDIX C - 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 C1 and C2). In general they have with similar percents of total harvest for both groups except in the 1980's where the charter fishery targeted lake trout more heavily than the non - charter fishery. This is a function of the business of the charter fishery where many captains guarantee that customers will be successful or be refunded for the trip. Lake trout are very reliable, usually inhabiting certain areas in the lake at different times of the year and they are consistently at those areas year after year. Also many charter boats are larger than typical non - charter boats and can go out farther in heavy seas than the non - charter boats to the areas that lake trout inhabit. A comparison of harvest per unit effort is also presented (Figure C1). As can be imagined the charter fishery out performed 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 (boats and pedestrians) for 1986 - 1997 is presented (Figure C2). Harvest from early spring surveys and previous snagging surveys are not included in the total.

Table C1. Non-charter boat harvest composition (boats only) 1986 - 1997.

Year	Effort	Percent of total harvest					Total salmonids
	(angler-hours)	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon	
1986	528,974	3.40	4.10	2.10	67.50	22.90	63,036
1987	389,310	2.40	3.00	8.60	56.60	29.40	41,899
1988	413,162	2.00	3.70	5.50	80.00	8.80	65,706
1989	367,322	4.00	2.80	4.50	80.90	7.80	90,701
1990	306,362	2.90	4.30	3.70	78.60	10.50	62,262
1991	275,220	6.00	5.90	15.70	41.80	30.60	37,992
1992	335,587	1.70	4.80	8.10	76.30	9.10	67,427
1993	303,208	3.30	9.10	10.00	70.10	7.40	64,265
1994	298,980	1.40	8.20	9.40	77.10	3.80	67,401
1995	259,866	5.80	13.80	11.00	58.00	11.30	45,724
1996	266,540	2.70	7.90	4.70	74.80	9.90	55,720
1997	251,790	1.90	3.70	7.20	82.30	4.90	81,579

Table C2. Charter boat harvest composition 1986 - 1997.

Year	Effort	Percent of total harvest					Total salmonids
	(angler-hours)	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon	
1986	119,509	1.40	4.20	10.60	66.00	17.80	41,871
1987	106,841	1.50	5.10	24.70	44.70	23.90	32,497
1988	159,006	0.97	5.60	30.80	55.10	7.60	56,978
1989	136,511	1.20	4.00	17.80	70.30	6.70	57,721
1990	120,188	1.40	3.00	16.10	72.90	6.50	52,836
1991	135,992	2.80	7.20	20.60	55.80	13.50	45,134
1992	105,160	1.80	5.10	13.50	73.90	5.70	43,229
1993	99,632	2.60	8.30	11.20	73.40	4.40	43,999
1994	103,148	1.00	10.50	14.70	70.40	3.30	44,426
1995	96,546	2.00	17.00	15.30	57.30	8.30	33,636
1996	101,462	1.60	9.80	6.50	76.40	8.90	44,270
1997	108,597	1.32	3.95	7.43	82.50	4.80	76,527

Figure C1. Comparison of charter and non - charter boat salmonid catch rates for the Illinois portion of Lake Michigan, 1986 - 1997

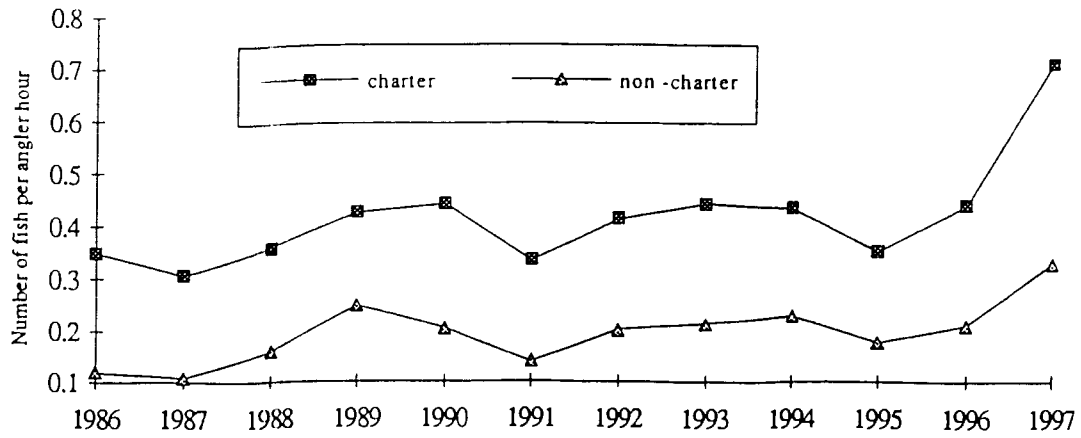


Figure C2. Illinois's Lake Michigan sportfishing harvest (charter & regular combined) 1986 - 1997

