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Waters of Lakes Michigan, Huron, Erie, and  
Superior, April 1, 1993 - March 31, 1994**

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**STATE OF MICHIGAN**  
**DEPARTMENT OF NATURAL RESOURCES**



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**Sportfishing Catch and Effort from the Michigan Waters  
of Lakes Michigan, Huron, Erie, and Superior,  
April 1, 1993 - March 31, 1994**

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*Abstract.*—Sportfishing catch and effort were sampled on lakes Michigan, Huron, Erie, and Superior from April 1, 1993 through March 31, 1994. The objective of the creel monitoring program is to obtain a continuous record of sport catch, catch rates, and catch composition for the Great Lakes and important anadromous river fisheries. Over 86,000 anglers were interviewed at the completion of their fishing trips. Catch and effort estimates were calculated by month for all areas sampled. It was estimated that anglers spent 6.6 million angler hours in all areas of the Michigan waters of the Great Lakes that were surveyed. Total harvest was estimated to be over 4.7 million fish. Yellow perch were the most abundant species in the sport catch in most sample areas, totaling 3.7 million fish. In addition to yellow perch, sport anglers harvested an estimated 417,000 walleye, 78,000 chinook salmon, 74,000 lake trout, 58,000 coho salmon, 53,000 brown trout, and 41,000 rainbow trout.

Michigan's Great Lakes sport fishery has been monitored with a statewide contact creel survey program since 1983. The objective of the program is to obtain a continuous record of sport catch, catch rates, and catch composition for the Great Lakes and important anadromous river fisheries.

A fundamental requirement for sound management of the Great Lakes fisheries is knowledge of the response of fish stocks to fishing and the contributions of various fish stocks to the fisheries. Success and future value of the Great Lakes and anadromous stream fisheries depends on long-term consequences of current management. It is essential that management decisions be based on a sound

empirical knowledge of the history, current status, and dynamics of fish communities.

Fishing statistics are needed for stock assessment and to facilitate stock identification. Coupled with fish marking studies, these kinds of data can identify Great Lakes and anadromous fish stocks and determine their distribution, movements, and contribution to various sport fisheries. Data collected from this program have been used to develop, test, and improve decision models which help discern management strategies for Great Lakes fish communities and fisheries.

## Study Area and Methods

Michigan Department of Natural Resources (MDNR) Fisheries Division personnel interviewed over 86,000 anglers at the end of their fishing trips during the 1993 license year, April 1, 1993 through March 31, 1994. Approximately 75,500 of these anglers were contacted during the April through October open-water season. A total of 10,500 anglers were interviewed during the winter ice fishing season, January through March 1994.

During the 1993 open-water season, creel surveys were conducted at important ports and angling areas on Lake Michigan from New Buffalo to Harbor Springs and on Green Bay from Menominee to the Bays de Noc (Figure 1). Lake Huron creel surveys were conducted from Lexington to Rogers City (Figure 2). A creel survey, focused on the boat fishery, was conducted on Lake Erie from Point Mouillee to the Michigan-Ohio state line (Figure 3). Seven areas were sampled on western and central Lake Superior during the 1993 open-water season, from Black River Harbor to Munising Bay (Figure 4).

Winter ice fisheries were sampled on lakes Michigan, Huron and Superior. On Lake Michigan, Menominee and Little Bay de Noc were surveyed (Figure 1). On Lake Huron, Saginaw Bay was surveyed (Figure 2). On Lake Superior, Keweenaw Bay, Marquette, Au Train and Munising Bay were sampled (Figure 4).

The creel survey used in Michigan is based on a stratified design using simple random sampling within strata. Strata included port fished by month, by weekday-weekend (holiday), and by mode of fishing. Catch and effort estimates were made for each stratum and then combined to give monthly and seasonal figures. Each work schedule was specifically tailored for the area being sampled. Both weekend days and three randomly selected weekdays were sampled each week. The entire angling day from dawn to 1 hour past dusk was covered. This was accomplished by breaking each day into two 8-hour work shifts, then randomly selecting the actual shift to be worked. When an individual was responsible for

sampling more than one area, the port or fishing areas were also randomly selected for each day.

Two types of data were collected for each area sampled: angler party interviews for catch rates and angler (or boat) counts for effort. An angler party was defined as one or more anglers who fished together. Angler parties were interviewed at the completion of their fishing trips at various boat launching ramps, marinas, piers, and along the shoreline. Anglers were queried as to their mode of fishing (i.e., boat, shore, pier, open ice, or shanty ice), where they fished, how long they fished, what they fished for, the numbers (by species) of fish they kept, and the number of fishing trips they made or intended to make that day. Additional data were collected on each angler in the party such as age and sex, zip code or county of residence, and the types of angling method used (casting, still fishing, trolling, etc.). These data were recorded on an angler interview form by census personnel (Figure 5).

Instantaneous and interval counts were used to sample fishing effort. Instantaneous counts were used when all boats or anglers in a sample area could be observed from a given point at one time. Interval counts were used when the sample area was too large to be observed from one point. In this case, the number of boats or anglers passing the observation point during a 30-minute period was used to determine the number of fishermen in the entire sampling area. All counts of boat trailers, pier anglers, shore anglers, open-ice anglers, and ice shanties were instantaneous. However, both instantaneous and interval boat counts were made depending on the sampling area. The type and number of boating access points within the sample area determined the type of boat count used. Interval counts were used in cases where boat access to the open lake was limited to harbor areas where all boats exited through defined channels.

Most fishing effort counts were done from the ground by creel clerks at randomly selected times. Instantaneous counts made from airplanes of boats, pier, and shore anglers were used only when ground counts were not feasible, such as areas with many access points or restricted visibility. Air flights were used to make fishing effort counts on Saginaw Bay and

Lake Erie. Local flight service companies were contracted to make aerial counts. Five flights were made each week at randomly selected starting times--one each weekend day, and one on each of three randomly selected week days. All effort counts, whether accomplished from the ground or air, were recorded on count data forms by census clerks or contract pilots (Figure 6).

Newly hired, seasonal creel clerks were trained on-site by permanent fisheries technicians at the beginning of the field season. Count and interview data forms, completed by both seasonal and permanent personnel, were reviewed throughout the field season at Charlevoix Fisheries Research Station prior to computer entry. The software used for data entry employed range checks on various data fields for each count or interview record that was keyed. In addition, a module of the creel catch estimate software performed a final check of the data before catch estimates were made.

Catch and effort estimates were made for each port or fishing area by month. Standard mathematical formulas for creel census (Ryckman 1981) were used to calculate all estimates. Three measures of fishing effort were calculated: angler hours, angler trips, and angler days. An angler trip is one completed fishing excursion. An angler day is composed of one or more fishing excursions during a 24-hour period. Error bounds for all catch and effort estimates in this report are defined as two standard errors of the mean (2 times the square root of the variance, divided by the number of observations for an estimate) and approximate true 70-95% confidence limits, depending on sample size. Error bounds for all mean length and weight data are 95% confidence limits.

Statistical significance in the analysis comparing lake-wide or port estimates between years is based on two standard error limits. Information from the previous year is contained the greatest amount of angler activity in 1993 of all the survey sites, with an estimated 382,025 ( $\pm 46,097$ ) angler hours.

The average length of a fishing trip (all modes of fishing) was 4.3 hours. Anglers made approximately 1.1 fishing trips per day. The length of a fishing trip varied by angling mode.

in Rakoczy and Svoboda (1994a). Also, prior to August 1, 1989, the charter boat mode of fishing was included as part of this study. As a result of legislation in Michigan during 1989, charter boat operators are required to report their clients catch and angling effort monthly to MDNR. Therefore, after that date charter boats were no longer covered by this study. However, in order to make valid year-to-year comparisons, catch and effort reported by charter fishermen were added to the catch and effort estimates generated by this study. All charter boat data used in this report for year-to-year comparisons are from Rakoczy and Rogers (1991a, b), Rakoczy (1992a), Rakoczy and Svoboda (1993) and Rakoczy and Svoboda (1994b).

Scientific and common names of fish species observed during this study are contained in Table 1. Detailed catch estimates by month, species, and sample area are contained in the appendices.

## Results

### *Lake Michigan*

Anglers spent an estimated 2,652,170 ( $\pm 117,271$ ) hours fishing the Michigan waters of Lake Michigan at the 23 areas surveyed during the April 1 through October 31, 1993 open-water season (Table 2). The number of hours fished converts to an estimated 617,069 ( $\pm 24,177$ ) individual angler trips or 574,353 ( $\pm 22,329$ ) angler days. Total angling effort by mode of fishing was 85% boat, 10% pier, and 5% shore.

Total angler effort in 1993 at 10 major sample areas combined was virtually unchanged as compared to the same period in 1992 (Table 3). Angler effort, after declining approximately 50% since the middle 1980's, has leveled off around 2.1 million angler hours during the past four seasons. Ludington had Boat trips were the longest in duration, averaging 4.8 hours. Pier and shore trips averaged 2.7 and 2.8 hours, respectively.

Anglers caught an estimated 2,041,054 ( $\pm 279,132$ ) fish comprising 31 species during 1993 (Table 2). The bulk of this catch (91%) came from the boat fishery, while pier and shore

anglers harvested 7% and 2% of the total catch, respectively (Tables 4, 5, and 6).

The yellow perch was the most numerous species in the catch, making up 86% of all the fish harvested. An estimated 1,761,000 ( $\pm 278,503$ ) yellow perch were harvested by all modes (non-charter) of sportfishing (Table 2). During 1993, 24% of all Lake Michigan angler parties interviewed said their target species was yellow perch. The largest perch catch (732,128  $\pm 221,844$  fish) of all areas sampled in 1993 occurred at South Haven.

Yellow perch catch rates at seven Lake Michigan sample areas in 1993 combined decreased significantly (39.4%) compared to 1992 (Table 7). The greatest catch rate for yellow perch during 1993 was 3.800 ( $\pm 1.380$ ) fish per angler hour at South Haven. The greatest changes in catch rates for yellow perch in 1993 compared to 1992 occurred at Little Bay de Noc (-81%), West Grand Traverse Bay (+75%), and Muskegon (-69%) (Table 7).

Although yellow perch are important to the Lake Michigan sport fishery, many anglers (49%) seek the various species of salmonines. The Lake Michigan catch of salmonines in the study area was estimated at 194,211 ( $\pm 11,546$ ) fish. The vast majority of this harvest (88%) came from the boat fishery (non-charter) (Table 4). The catch of salmonines was composed of 23% brown trout, 22% coho salmon, 22% lake trout, 17% rainbow trout and 15% chinook salmon. Since the inception of the creel survey (1985), 1993 marked the first year that brown trout dominated the catch of salmonines. During 1985-86, chinook salmon dominated the catch of salmonines, making up from 57-59% of the harvest (Rakoczy and Lockwood 1988; Rakoczy and Rogers 1987). As abundance of chinook salmon declined in Lake Michigan, rainbow trout became a larger component of the sport catch. Rainbow trout dominated the sport harvest of salmonines during 1992.

The total harvest of salmonines (charter and non-charter) at nine important Lake Michigan fishing areas (index ports) combined increased slightly (+7%) in 1993 compared to 1992 (Table 8). Catch rates for all salmonines combined in 1993 was 10.83 ( $\pm 0.64$ ) fish per 100 angler hours compared to 10.53 ( $\pm 0.75$ ) in 1992 (Table

9). Although the overall catch and catch rate for salmonines at these nine ports were virtually unchanged compared to last year, there were some major differences in the harvest and catch rates of individual species.

The brown trout was the most abundant salmonine in the sport catch. An estimated 45,157 ( $\pm 5,201$ ) brown trout were harvested from all Lake Michigan ports sampled during 1993 (Table 2). The average size of brown trout in the Lake Michigan sport harvest was 19.56 ( $\pm 0.36$ ) inches or 3.97 ( $\pm 0.28$ ) pounds. The brown trout harvest and catch rate increased significantly by 98% and 87%, respectively, at the nine index ports during 1993 compared to the previous year (Tables 8 and 9). The catch rate for brown trout (1.01  $\pm 0.16$  fish per 100 angler hours) in 1993 was the greatest point estimate since 1986. This came on the heels of the poorest catch rate during the 1992 season. The 1993 harvest of brown trout was dispersed over a period of six months (April through September) compared to the middle 1980's when 75% of the harvest was taken during April and May (Rakoczy and Rogers 1987).

An estimated 43,248 ( $\pm 5,892$ ) coho salmon were harvested in all survey areas combined in 1993 (Table 2). The average size of coho harvested by the sport fishery was 21.06 ( $\pm 0.42$ ) inches and 4.39 ( $\pm 0.29$ ) pounds. The catch and catch rate for coho at the nine index ports combined increased 29% and 22%, respectively, compared to 1992 (Tables 8 and 9). Historically (1985-91), catch rates for coho salmon varied greatly from year to year. The catch rate noted for 1993 (2.80  $\pm 0.36$  fish per 100 angler hours) was the second greatest point estimate during the nine year data series (Table 9).

A total of 41,887 ( $\pm 5,643$ ) lake trout were harvested from all the ports sampled during 1993 (Table 2). Biological data collected from the sport fishery during 1993 indicated that creeled lake trout averaged 26.13 ( $\pm 0.26$ ) inches in length and weighed 6.94 ( $\pm 0.25$ ) pounds. The harvest and catch rate of lake trout at nine index ports increased by 27% and 22%, respectively, in 1993 compared to 1992 (Tables 8 and 9). Part of the decline in the lake trout harvest at the nine index ports during the past two years (1992-93) was due to a new minimum size limit (24



inches) implemented on northern Lake Michigan during June 1992. The old size limit was 10 inches. The regulation change helped to reduce the lake trout harvest at two of the index ports (west Grand Traverse Bay and Charlevoix) by approximately 50%.

The 1993 rainbow trout harvest was estimated at 33,492 ( $\pm 4,936$ ) fish. Seventy-one percent of the harvest was taken during June, July, and August (Table 2). This was consistent with data collected during the past five years. During 1992, rainbow trout were the most abundant (29%) salmonine in the sport catch. The mean size of rainbow trout in the Lake Michigan sport catch during 1993 was 25.20 ( $\pm 0.38$ ) inches or 6.48 ( $\pm 0.27$ ) pounds. In general, the catch and catch rate for rainbow trout during 1986-92 has been trending upward at the nine index ports (Tables 8 and 9). However, the 1993 harvest and catch rate of rainbow at the index ports declined significantly by 25% and 29%, respectively, as compared to 1992.

Chinook salmon have historically been one of the most important salmonines in the Lake Michigan sport fishery in terms of numbers and weight of fish harvested (Rakoczy and Rogers 1991c). An estimated 28,337 ( $\pm 3,847$ ) chinook salmon were creel by anglers during 1993 at all sample areas combined (Table 2). The mean size of chinook in the sport catch during 1993 was 26.31 ( $\pm 0.72$ ) inches or 9.75 ( $\pm 0.70$ ) pounds. The harvest of chinook in 1993 at the nine index ports decreased slightly compared to 1992 and was the smallest harvest since 1985 (Table 8). The harvest of chinook salmon has been trending downward since 1987. Catch rates for chinook at these nine areas combined decreased 18% in 1993 compared to 1992 and were significantly lower (82%) than the peak rate noted for 1986 (Table 9).

Biological data collected from the sport fishery since 1985 indicate that the age distribution of chinook salmon in the sport catch has changed markedly. In 1985-86, age-0.3 and age-0.4 chinook salmon combined made up 53-71% of the sport catch at the nine index ports (Table 10). During the past three seasons (1991-93), these same age groups have only accounted for 27-34% of the sport catch. Although the

percentage of age-0.1 and age-0.2 chinook salmon in the sport catch has increased since the mid-1980s, their estimated harvest in numbers has not (Table 10). The return of chinook salmon by year class (effort adjusted) at the nine index ports has declined since the mid-1980s (Table 11). The effort adjusted return (per 1,000 fish stocked) of the 1984-85 year classes of chinook salmon throughout their life span in the lake was 20.19 and 20.46, respectively (Table 11). The return of the 1989 year class was 6.74, a decline of 66% during the six-year period. Decreased survival of Lake Michigan chinook salmon has been attributed to bacterial kidney disease (Nelson and Hnath 1990).

#### *Lake Huron*

A total of 15 sportfishing areas were surveyed on Lake Huron during the April through October, 1993 open-water season. During 1993, Lake Huron anglers spent an estimated 2,104,652 ( $\pm 122,647$ ) hours fishing at all areas combined (Table 12). An estimated 468,346 ( $\pm 25,888$ ) angler trips were made during the season or 418,890 ( $\pm 23,713$ ) angler days. Angler effort during 1993 was virtually unchanged compared to the previous year.

Angler effort by mode of fishing was 88% boat, 7% pier and 5% shore (Tables 13, 14, and 15). The average length of a Lake Huron fishing trip (all modes of fishing) was 4.5 hours. Anglers made approximately 1.1 fishing trips per day. Boat trips were the longest in duration, averaging 4.9 hours. Pier and shore trips averaged 3.0 and 2.5 hours, respectively.

The waters of Saginaw Bay had the greatest concentration of fishing effort (63%) on Lake Huron. Anglers spent an estimated 1,327,813 ( $\pm 114,179$ ) hours, 307,807 ( $\pm 24,129$ ) trips, or 274,506 ( $\pm 22,315$ ) days fishing Saginaw Bay (Table 16). Angler effort increased slightly (6%) on Saginaw Bay during 1993 compared to 1992 (Table 17).

Lake Huron anglers harvested an estimated 1,076,897 ( $\pm 106,939$ ) fish comprising 31 species (Table 12). Anglers fishing from boats harvested 81% of all fish. During 1993, 18% of all anglers interviewed on Lake Huron

responded that their target species was yellow perch and 45% were seeking the various species of salmonines. The percentage of anglers seeking yellow perch on Lake Huron in 1993 decreased from 26% in 1992. On Saginaw Bay, 32% of all anglers interviewed responded that they were fishing for yellow perch while 30% were fishing for walleye.

Yellow perch dominated the sport catch on Lake Huron, making up 73% of all fish harvested. An estimated 782,276 ( $\pm 103,469$ ) yellow perch were taken by all modes of fishing. The average size of yellow perch kept by Lake Huron anglers in 1993 was 8.06 ( $\pm 0.07$ ) inches. Most (94%) of these yellow perch were taken by anglers fishing in Saginaw Bay. The 1993 harvest of yellow perch from Saginaw Bay (738,712  $\pm$  102,792) decreased 35% compared to 1992 (Table 17). The average size of yellow perch kept by Saginaw Bay anglers was 7.88 ( $\pm 0.06$ ) inches. The catch rate (0.552  $\pm$  0.091 fish per hour) for Saginaw Bay yellow perch in 1993 decreased by 38% compared to 1992. The difference was not significant compared to the 1986-92 average (1.022  $\pm$  0.460).

Walleye have become an important species to the Lake Huron sport fishery. An estimated 133,960 ( $\pm 18,696$ ) walleye were harvested from all areas surveyed (Table 12). Ninety-two percent of the walleye harvest came from Saginaw Bay (Table 16). The mean size of walleye taken by the Saginaw Bay sport fishery was 21.74 ( $\pm 0.25$ ) inches and 3.84 ( $\pm 0.14$ ) pounds. The 1993 harvest (125,160  $\pm$  18,357) and catch rate (0.094  $\pm$  0.016) for Saginaw Bay walleye increased significantly (94% and 84% respectively) as compared to 1992 (Table 17). When taking into account the 1993 winter ice fishery (Rakoczy and Svoboda 1994a), the total sport harvest of walleye exceeded 139,000 fish (approximately 530,000 pounds) during the 1993 calendar year.

In addition to yellow perch and walleye, Lake Huron anglers also harvested an estimated 68,701 ( $\pm 3,991$ ) salmonines (Table 12). Although the catch of salmonines was composed of eight species, one species, chinook salmon, dominated (68%) the catch.

The mean size of chinook salmon harvested by Lake Huron anglers during 1993 was 29.55

( $\pm 0.42$ ) inches and 11.53 ( $\pm 0.42$ ) pounds. The estimated harvest of chinook salmon (47,452  $\pm$  3,360) and the catch rate (4.53  $\pm$  0.32 fish per 100 angler hours) at nine Lake Huron index ports during 1993 increased significantly 19% and 21%, respectively, compared to 1992 (Tables 18 and 19). However, the 1993 catch rate for chinook at these ports was virtually unchanged compared to the average of the four survey years (Table 19).

Lake Huron anglers harvested an estimated 6,546 ( $\pm 1,148$ ) lake trout from the index ports (Table 18). The mean size of lake trout in the sport catch was 23.00 ( $\pm 0.42$ ) inches and 4.55 ( $\pm 0.31$ ) pounds. The 1993 lake trout harvest and catch rate declined significantly (50% and 49% respectively) compared to 1992 (Tables 18 and 19). The estimated catch rate of 0.84 ( $\pm 0.16$ ) lake trout per hour 100 angler hours during 1993 was the poorest success rate noted for the Lake Huron index ports since 1986 (Table 19).

During 1993, rainbow trout and brown trout made relatively limited contributions to the Lake Huron sport catch. The harvest (6,229  $\pm$  907) and catch rate (0.59  $\pm$  0.09 fish per 100 angler hours) of rainbow trout increased 24% and 26%, respectively, compared to 1992 (Tables 18 and 19). In general, the rainbow harvest and catch rate has been trending upward during the past four survey years (1988, 1991-92) (Rakoczy and Svoboda 1994a). The Lake Huron brown trout harvest and catch rate has also been trending upward during the same time period. During 1993, the brown trout harvest (7,477  $\pm$  1,142) and catch rate (0.71  $\pm$  0.12 fish per 100 angler hours) at the index ports increased significantly by over 100% compared to 1992 (Tables 18 and 19).

#### *Lake Erie*

Approximately 30 miles of Lake Erie shoreline, from Point Mouillee to the Michigan-Ohio state line, were surveyed in 1993. Anglers spent an estimated 885,704 ( $\pm 134,495$ ) hours fishing from boats in the survey area (Table 20). A total of 166,816 ( $\pm 25,461$ ) angler trips or 165,577 ( $\pm 25,278$ ) angler days were spent in the area. Total angler effort increased 12% in 1993

compared to 1992 (Table 21). The increase was not significant. However, angler effort has declined significantly (79%) on Lake Erie since 1988. The average length of a boat fishing trip on Lake Erie was 5.3 hours. The average angler made 1.0 trips per day.

Boat anglers harvested an estimated 776,021 ( $\pm 136,679$ ) fish comprising 16 species (Table 20). Seventy percent of all Lake Erie anglers interviewed responded that they were target fishing for walleye, while 16% said they were seeking yellow perch. Walleye made up 30% of the total catch with an estimated harvest of 230,074 ( $\pm 47,319$ ) fish (Table 20). The mean size of walleye in the catch was 18.00 ( $\pm 0.38$ ) inches or 2.13 ( $\pm 0.15$ ) pounds. The walleye harvest in 1993 did not change significantly compared to 1992 (Table 21). However, 1992 and 1993 were the first two years since 1988 in which the walleye harvest increased compared to the previous year. The majority of the 1993 walleye harvest (74%) was taken during June and July (Table 20). This was consistent with previous years. The catch rate for walleye ( $0.289 \pm 0.066$ ) in 1993 was virtually unchanged compared to 1992 (Table 21).

Lake Erie anglers harvested an estimated 451,826 ( $\pm 126,436$ ) yellow perch during 1993 (Table 20). The mean total length of yellow perch kept by Lake Erie anglers was 8.11 ( $\pm 0.06$ ) inches. The yellow perch harvest during the period April through October 1993 increased significantly by 85% compared to the same period in 1992 (Table 21). The catch rate for yellow perch in 1993 compared to 1992 increased by 65%.

The catch and effort estimates for yellow perch and walleye are an important component of interagency harvest quota calculations for Lake Erie. These data are used jointly with creel estimates from Ontario, Canada, New York, and Ohio on an annual basis in an effort to prevent over harvest of these two important species.

In addition to yellow perch and walleye, an estimated 45,526 ( $\pm 18,751$ ) white bass, 23,852 ( $\pm 8,411$ ) channel catfish, and 10,871 ( $\pm 4,411$ ) white perch were harvested by Lake Erie anglers. The channel catfish harvest is probably underestimated due to the fact that most fishing for this species occurs throughout the night. No

creel sampling took place during the period 1 hour after dusk to 6 a.m.

### *Lake Superior*

Anglers spent an estimated 204,863 ( $\pm 8,262$ ) hours fishing the seven survey areas on western and central Lake Superior (Table 22). This translates to 49,907 ( $\pm 2,229$ ) individual angler trips, or 46,729 ( $\pm 2,183$ ) angler days. Angler effort did not change significantly compared to 1992. Marquette had the greatest amount of angler activity of all Lake Superior sample areas, accounting for 37% of the total effort. The average length of a Lake Superior fishing trip (all modes of fishing) was 4.1 hours and anglers made 1.1 fishing trips per day.

Lake Superior anglers harvested an estimated 48,523 ( $\pm 4,558$ ) fish comprising 17 species (Table 22). Most anglers (69%) interviewed on Lake Superior said they were fishing for the various species of salmonines. Lake trout (lean) made up 62% of the salmonine harvest. The remainder of the salmonine catch was made up mainly of coho salmon (15%), siscowet lake trout (10%) and chinook salmon (8%). In addition small numbers of rainbow trout, splake, brown trout, and pink salmon were harvested.

The lake trout harvest for all survey areas combined was estimated at 23,810 ( $\pm 2,390$ ) fish (Table 22) and was virtually unchanged compared to 1992. Lake trout averaged 23.53 ( $\pm 0.27$ ) inches and 4.55 ( $\pm 0.18$ ) pounds. The catch rate for lake trout at all survey areas combined in 1993 was 11.62 ( $\pm 1.26$ ) fish per hour 100 angler hours compared to 12.15 ( $\pm 1.48$ ) for these same areas in 1992. In addition to (lean) lake trout, 3,908 ( $\pm 1,014$ ) siscowet lake trout (fat trout) were harvested. Mean size of Siscowet lake trout was 23.04 ( $\pm 0.76$ ) inches and 5.04 ( $\pm 0.56$ ) pounds.

Lake Superior anglers also caught an estimated 5,768 ( $\pm 1,039$ ) coho salmon and 3,061 ( $\pm 733$ ) chinook salmon in 1993 (Table 22). The 1993 catch and catch rate for coho salmon decreased by 26% and 27%, respectively compared to 1992. The difference was not significant. The 1993 chinook salmon catch and

catch rate also did not change significantly compared to 1992.

In addition to salmonines, Lake Superior anglers caught an estimated 3,452 ( $\pm 1,557$ ) round whitefish, 1,718 ( $\pm 823$ ) lake whitefish and 1,538 ( $\pm 475$ ) walleye during 1993.

### *Winter Ice Fisheries*

Catch and sportfishing effort were surveyed on various areas of lakes Superior, Huron and Michigan during the winter months of 1994. The Saginaw Bay ice fishery is the largest and most important ice fishery, in terms of catch and effort, on Michigan's waters of the Great Lakes (Rakoczy and Rogers 1988). During 1994, anglers spent an estimated 477,946 ( $\pm 44,323$ ) hours fishing the Bay's waters (Table 23). This amounted to an estimated 108,315 ( $\pm 9,830$ ) angler trips, or 96,731 ( $\pm 9,136$ ) angler days. The average length of an ice fishing trip on Saginaw Bay was 4.4 hours and anglers made an average of 1.1 trips per day.

Sport catch and effort for winter ice fisheries are largely dependent upon the duration of safe ice conditions each season. Mild winter conditions limited angler access to the ice on Saginaw Bay during 1988 and 1991. In 1984 and 1987, angler effort was twice the levels noted for 1988 and 1991. During those winters, solid ice conditions existed during the entire survey period (January-March) (Rakoczy 1992b). Angler effort for the Saginaw Bay ice fishery during 1994 increased (53%) significantly compared to 1993 (Table 24). The increase in angler effort was probably due to two factors: the safe ice conditions which were the result of an abnormally cold winter, and a better than average walleye fishery.

Saginaw Bay ice anglers caught an estimated 634,919 ( $\pm 109,517$ ) fish representing 12 species (Table 23). Forty-seven percent of the angler parties interviewed on Saginaw Bay during the 1994 ice fishery responded that they were fishing for walleye. This was in contrast with 1993 when 67% of the angler parties were seeking yellow perch. The percentage of angler parties responding that their target species was yellow perch declined during each of the last

two winters. During 1992, 85% of the angler parties said they were fishing for yellow perch. Over the past two winter seasons anglers have become more interested in the walleye fishery. For example, during 1992 only 4% of the ice fishing parties on Saginaw Bay were targeting walleye.

Yellow perch made up 96% of all fish harvested on Saginaw Bay. The total harvest and catch rate for yellow perch in 1994 increased significantly (99%) compared to 1993 (Table 24). Most of the increase in harvest was due to the 53% increase in angler effort during 1994 versus 1993. The catch rate for yellow perch in 1994 did not change significantly compared to 1993. The area from Sebewaing to Sand Point had the greatest estimated catch (415,871  $\pm 96,442$ ) and catch rate (2.308  $\pm 0.634$ ) for yellow perch of all the Saginaw Bay survey sites during January through March.

The 1994 walleye harvest from Saginaw Bay was estimated at 19,597 ( $\pm 6,531$ ) fish, the highest ever recorded (Table 24). The walleye harvest and catch rate (0.041  $\pm 0.014$ ) however, was not significantly different than 1993. The winter walleye harvest has increased over eight fold during the past three seasons (1992-94).

Little Bay de Noc is the largest winter ice fishery on Lake Michigan. Angler effort for the 1994 winter ice fishery was estimated at 153,218 ( $\pm 15,364$ ) hours. Angler effort declined significantly (40%) compared to 1993 (Table 25). Anglers harvested an estimated 28,711 ( $\pm 16,047$ ) yellow perch and 2,703 ( $\pm 1,382$ ) walleye from Little Bay de Noc. Catch rates for yellow perch and walleye during 1994 did not significantly change as compared to 1993.

The Menominee River and Harbor areas were also surveyed on Lake Michigan during the winter months of 1994. Menominee Harbor, of the two sites, had the most fishing effort (45,656  $\pm 9,429$  angler hours). The yellow perch was the most abundant species in the catch (36,228  $\pm 10,282$ ).

Four areas were surveyed on Lake Superior during the winter of 1994, Keweenaw Bay, Marquette, Au Train, and Munising Bay. On Keweenaw Bay anglers spent an estimated 97,517 ( $\pm 12,247$ ) hours fishing through the ice (Table 26). Safe ice conditions during 1994

contributed to a significant increase (52%) in angler effort compared to 1993.

Keweenaw Bay anglers caught an estimated 2,378 ( $\pm 890$ ) lake trout and 16,891 ( $\pm 2,907$ ) siscowet lake trout during the winter of 1994. Siscowet lake trout, also known as fat trout, made up 88% of the total lake trout catch (fat and lean trout) on Keweenaw Bay in 1994 (Table 26). The catch and catch rate of siscowets increased significantly on Keweenaw Bay compared to 1993. For lake trout (lean), the 1994 catch was virtually unchanged compared to 1993. The catch rate for lake trout decreased (44%) compared to 1993. Although the change was not significant compared to 1993, the catch rate decline (68%) was significant compared to the winter of 1992.

In addition to lake trout, Keweenaw Bay anglers harvested an estimated 6,168 ( $\pm 1,372$ ) coho salmon. The 1994 coho catch increased significantly (76%) compared to 1993 and was the largest estimated during the 7-year data series. Historically (1988-93), the winter coho harvest has fluctuated widely (Table 26).

The winter ice fishery at Munising Bay (23,466  $\pm$  3,146 hours) was similar in angler effort to the 1993 season. Ice anglers on Munising Bay harvested an estimated 1,185 ( $\pm 871$ ) coho salmon, and 1,095 ( $\pm 995$ ) lake trout among 8 species which were observed in the catch. Fishing effort at Au Train was estimated at 9,509 ( $\pm 1,458$ ) angler hours and coho salmon (1,776  $\pm 820$ ) was the primary species in the sport harvest. At Marquette, ice fishing effort was estimated at 3,290 ( $\pm 608$ ) angler hours and the catch also consisted mainly of coho salmon (936  $\pm 268$ ).

### Summary

During the 1993 license year anglers spent an estimated 6.6 million angler hours fishing in the Michigan waters of the Great Lakes that were surveyed. This accounted for an estimated 1.5 million individual fishing trips and 1.4 million angler days. Total catch was estimated to be over 4.7 million fish. Yellow perch were the most abundant species in the sport catch in most sample areas. The yellow perch catch for all

areas surveyed was estimated at 3.7 million fish. In addition to yellow perch, sport anglers harvested an estimated 417,000 walleye, 78,000 chinook salmon, 74,000 lake trout, 58,000 coho salmon, 53,000 brown trout, and 41,000 rainbow trout.

The catch of Lake Michigan salmonines was composed of 23% brown trout, 22% coho salmon, 22% lake trout, 17% rainbow trout, and 15% chinook salmon. Since the inception of the creel survey program in 1985, 1993 was the first year in which brown trout dominated the catch of Lake Michigan salmonines. The total harvest of salmonines (charter and non-charter) at nine important Lake Michigan fishing areas (index ports) combined increased slightly (7%) in 1993 compared to 1992. The catch rate for all salmonines combined in 1993 was 10.83 ( $\pm 0.64$ ) fish per 100 angler hours compared to 10.53 ( $\pm 0.75$ ) in 1992.

The waters of Saginaw Bay had the greatest concentration of fishing effort (63%) on Lake Huron. Angler effort on Saginaw Bay during 1993 increased slightly (6%) compared to 1992. The 1993 harvest and catch rate of yellow perch from Saginaw Bay decreased by 35% and 38%, respectively, compared to 1992. The harvest (94%) and catch rate (84%) of walleye from Saginaw Bay increased significantly during 1993 as compared to 1992. The Lake Huron catch of salmonines was dominated by one species, chinook salmon (68%). The 1993 lake trout harvest and catch rate declined significantly (50% and 49% respectively) on Lake Huron compared to the previous year.

The 1993 walleye harvest and catch rate on Lake Erie did not change significantly compared to 1992. The 1993 Lake Erie yellow perch harvest (85%) and catch rate (65%) increased significantly compared to 1992.

Winter ice fisheries were surveyed at various areas on lakes Superior, Michigan, and Huron. The Saginaw Bay winter fishery is the most important in terms of angler effort (478,000 angler hours). The 1994 winter sport harvest of walleye (19,600) from Saginaw Bay was the largest ever recorded.

### **Acknowledgments**

The authors wish to thank the staffs of the fisheries districts and research stations who participated in the census program. These field units did the day to day work of angler

interviews, fishing pressure counts, and supervision of seasonal workers. Evelyn Davis keyed the data. Special thanks to Kelley Smith who wrote the computer programs for the calculation of the catch and effort estimates.



Figure 1.—Lake Michigan survey area.



Figure 2.—Lake Huron survey area.



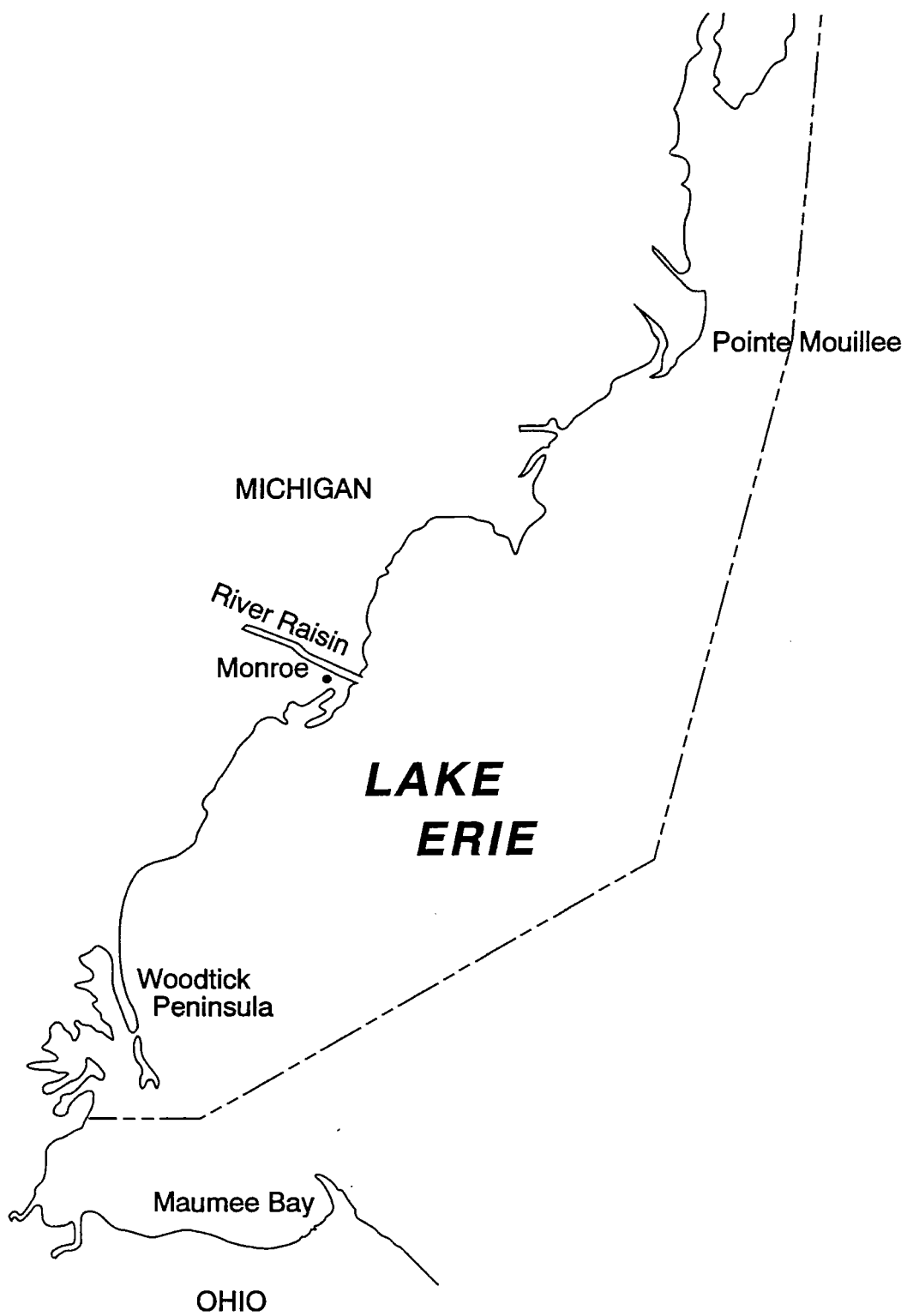


Figure 3.—Lake Erie survey area.

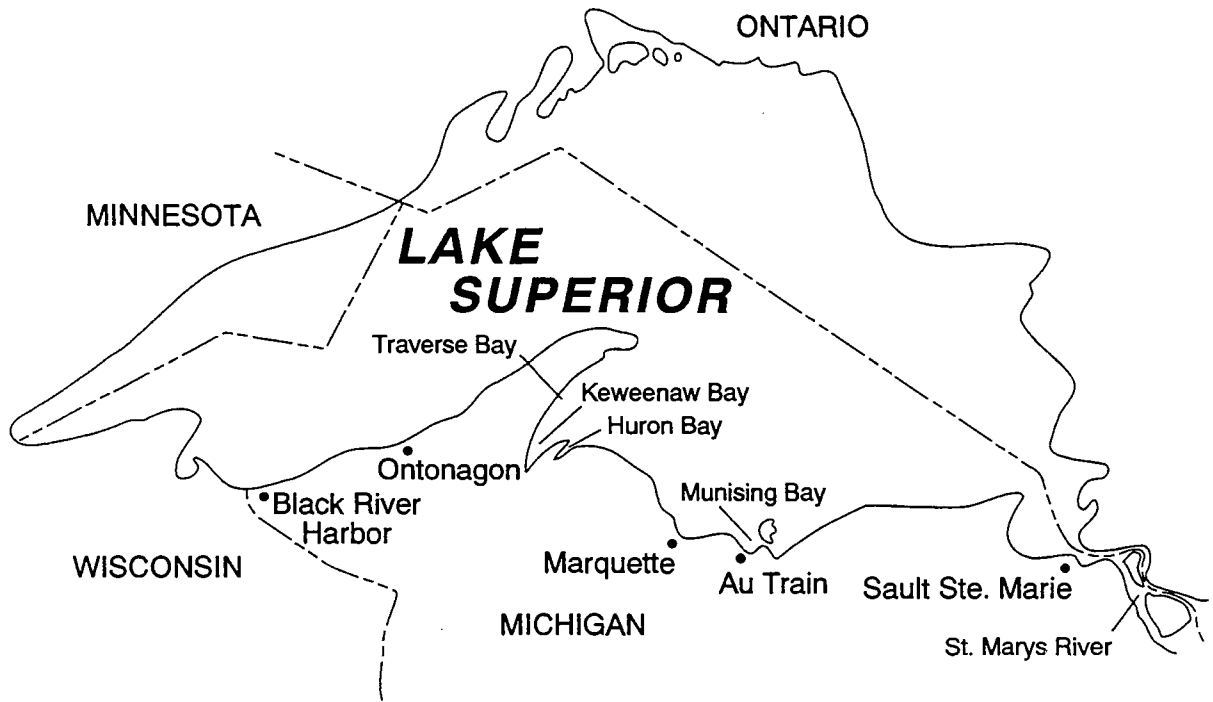


Figure 4.—Lake Superior survey area.

## ANGLER PARTY INTERVIEW FORM

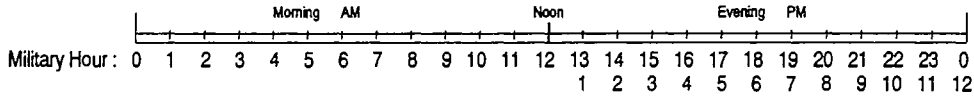
Project # : \_\_\_\_\_

Unit : \_\_\_\_\_ Soc. Sec. # : \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ Date : \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_ Seq # : \_\_\_\_\_

Interview site : \_\_\_\_\_ Site Name : \_\_\_\_\_  
 Fishing : \_\_\_\_\_ Site Name : \_\_\_\_\_

Fishery type		Mode of fishing		
<input type="checkbox"/> Gt Lk	<input type="checkbox"/> Anad	<input type="checkbox"/> Boat	<input type="checkbox"/> Shore	<input type="checkbox"/> Open ice
<input type="checkbox"/> In Lk	<input type="checkbox"/> In St	<input type="checkbox"/> Charter	<input type="checkbox"/> Non - f. shore	<input type="checkbox"/> Non - f. open ice
		<input type="checkbox"/> Non - f. boat	<input type="checkbox"/> Pier / dock	<input type="checkbox"/> Shanty ice
			<input type="checkbox"/> Non - f. pier / dock	

Start date : \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_ Day of week : \_\_\_\_\_ End time : \_\_\_\_\_  
 1 = Monday                      5 = Friday                      Start time : \_\_\_\_\_  
 2 = Tuesday                      6 = Saturday                      Hrs fished : \_\_\_\_\_  
 3 = Wednesday                      7 = Sunday                      Comp. trip :  Y     N  
 4 = Thursday                      8 = Holiday



Ang #	ler	tps	Sex	Age	Zip code	Residence (county / state)	Crty code	Fishing methods								
								cast	stil	trol	fly	drif	spea	dip	snag	jig
1								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8								<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Use this side                      or                      use this side, not both!

Target sp. : \_\_\_\_\_  Anything     Salmon     Trout     Salmon & Trout     Walleye & Perch  
 code : \_\_\_\_\_  Bass     Panfish     Bass & Bluegill     Pike & Bass     Pike & Perch

### Catch data

Code	Species	# kept	Code	Species	# kept	Code	Species	# kept
ATL	Atlantic salmon	_____	MUS	Muskellunge	_____	BUF	Buffalo (spp)	_____
BKT	Brook trout	_____	TMU	Tiger musky	_____	LNS	Longnose sucker	_____
BNT	Brown trout	_____	BCR	Black crappie	_____	QIL	Quillback	_____
CHS	Chinook salmon	_____	BLG	Bluegill	_____	RHS	Redhorse (spp)	_____
COH	Coho salmon	_____	GSF	Green sunfish	_____	CWS	White sucker	_____
LHR	Lake herring	_____	LMB	Largemouth bass	_____	BOW	Bowfin	_____
LAT	Lake trout	_____	LSF	Longear sunfish	_____	BUR	Burbot	_____
LWF	Lake whitefish	_____	OSF	Orange. sunfish	_____	DRU	Freshwater drum	_____
PKS	Pink salmon	_____	PSF	Pumpkinseed	_____	GAR	Gar (spp)	_____
RBT	Rainbow trout	_____	RSF	Redear sunfish	_____	GZS	Gizzard shad	_____
RWF	Round whitefish	_____	RKB	Rockbass	_____	MOO	Mooneye	_____
SPL	Splake	_____	SMB	Smallmouth bass	_____	STR	Sturgeon	_____
SMT	Rainbow smelt	_____	WAR	Warmouth	_____	OTH	Other	_____
SAU	Sauger	_____	WCR	White crappie	_____			_____
WAE	Walleye	_____	BLB	Black bullhead	_____			_____
YEP	Yellow perch	_____	BRB	Brown bullhead	_____			_____
WHB	White bass	_____	CCF	Channel catfish	_____			_____
WHP	White perch	_____	YLB	Yellow bullhead	_____			_____
NOP	Northern pike	_____	CAR	Carp	_____			_____

Figure 5.—Angler party interview form.



Table 1.—List of common and scientific names of fish observed in study.

Common name	Scientific Name
Rainbow smelt	<i>Osmerus mordax</i>
Northern pike	<i>Esox lucius</i>
Muskellunge	<i>Esox masquinongy</i>
Black bullhead	<i>Ictalurus melas</i>
Yellow bullhead	<i>Ictalurus natalis</i>
Brown bullhead	<i>Ictalurus nebulosus</i>
Channel catfish	<i>Ictalurus punctatus</i>
Burbot	<i>Lota lota</i>
White perch	<i>Morone americana</i>
White bass	<i>Morone chrysops</i>
Freshwater drum	<i>Aplodinotus grunniens</i>
Lake herring	<i>Coregonus artedii</i>
Lake whitefish	<i>Coregonus clupeaformis</i>
Round whitefish	<i>Prosopium cylindraceum</i>
Chinook salmon	<i>Oncorhynchus tshawytscha</i>
Coho salmon	<i>Oncorhynchus kisutch</i>
Pink salmon	<i>Oncorhynchus gorbuscha</i>
Rainbow trout	<i>Oncorhynchus mykiss</i>
Atlantic salmon	<i>Salmo salar</i>
Brown trout	<i>Salmo trutta</i>
Brook trout	<i>Salvelinus fontinalis</i>
Lake trout	<i>Salvelinus namaycush</i>
Splake	<i>S. fontinalis x S. namaycush</i>
White sucker	<i>Catostomus commersoni</i>
Redhorses	<i>Moxostoma spp.</i>
Rock bass	<i>Ambloplites rupestris</i>
Green sunfish	<i>Lepomis cyanellus</i>
Pumpkinseed	<i>Lepomis gibbosus</i>
Bluegill	<i>Lepomis macrochirus</i>
Smallmouth bass	<i>Micropterus dolomieu</i>
Largemouth bass	<i>Micropterus salmoides</i>
White crappie	<i>Pomoxis annularis</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Yellow perch	<i>Perca flavescens</i>
Walleye	<i>Stizostedion vitreum</i>

Table 2.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Lake Michigan, by all modes (non-charter) of sportfishing, at all survey areas (23) combined, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	48 (102)	58 (84)	12 (24)	0 (0)	118 (134)
Coho salmon	0.0163 (0.0023)	13,152 (3,505)	10,398 (3,060)	1,976 (1,009)	2,386 (1,151)	7,218 (2,381)	7,097 (2,187)	1,021 (525)	43,248 (5,892)
Chinook salmon	0.0107 (0.0015)	303 (272)	2,388 (1,230)	3,346 (1,303)	5,844 (1,877)	11,570 (2,559)	4,409 (1,144)	477 (370)	28,337 (3,847)
Rainbow trout	0.0126 (0.0019)	2,365 (743)	1,601 (591)	4,698 (1,734)	14,239 (4,176)	4,889 (1,165)	3,057 (1,025)	2,643 (778)	33,492 (4,936)
Atlantic salmon	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	17 (27)	0 (0)	0 (0)	0 (0)	17 (27)
Brown trout	0.0170 (0.0021)	10,865 (2,190)	4,593 (1,401)	3,962 (1,597)	10,975 (2,655)	9,563 (3,060)	3,637 (1,061)	1,562 (456)	45,157 (5,201)
Brook trout	0.0000 (0.0000)	110 (117)	9 (18)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	119 (118)
Lake trout	0.0158 (0.0022)	91 (180)	4,985 (1,458)	8,578 (2,009)	18,082 (4,475)	9,558 (2,355)	593 (286)	0 (0)	41,887 (5,643)
Splake	0.0007 (0.0003)	1,366 (628)	203 (255)	89 (185)	76 (78)	3 (7)	75 (69)	24 (37)	1,836 (711)
Rainbow smelt	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	35 (72)	7 (15)	42 (74)
Northern pike	0.0011 (0.0007)	0 (0)	480 (542)	34 (68)	1,000 (1,258)	730 (893)	398 (375)	157 (127)	2,799 (1,684)
White sucker	0.0006 (0.0005)	592 (808)	396 (799)	242 (500)	0 (0)	81 (163)	180 (364)	16 (34)	1,507 (1,304)
Redhorses	0.0001 (0.0001)	168 (345)	85 (175)	57 (83)	0 (0)	0 (0)	0 (0)	0 (0)	310 (396)
Black bullhead	0.0000 (0.0000)	0 (0)	0 (0)	98 (114)	6 (12)	0 (0)	7 (15)	0 (0)	111 (116)
Brown bullhead	0.0000 (0.0000)	0 (0)	16 (33)	0 (0)	84 (171)	0 (0)	13 (27)	0 (0)	113 (176)
Channel catfish	0.0010 (0.0004)	0 (0)	436 (329)	860 (675)	1,135 (686)	192 (252)	42 (53)	23 (37)	2,688 (1,050)
White perch	0.0000 (0.0000)	0 (0)	0 (0)	41 (82)	0 (0)	0 (0)	0 (0)	0 (0)	41 (82)
White bass	0.0000 (0.0000)	0 (0)	21 (42)	0 (0)	62 (127)	0 (0)	0 (0)	0 (0)	83 (134)
Rockbass	0.0018 (0.0013)	0 (0)	620 (1,170)	1,610 (1,972)	1,501 (1,970)	1,003 (1,876)	26 (53)	0 (0)	4,760 (3,558)

Table 2.—Continued:

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pumpkinseed	0.0002 (0.0003)	0 (0)	336 (681)	107 (219)	84 (124)	0 (0)	25 (50)	0 (0)	552 (728)
Bluegill	0.0011 (0.0011)	0 (0)	475 (959)	1,510 (2,567)	317 (395)	512 (632)	165 (231)	0 (0)	2,979 (2,849)
Lake herring	0.0000 (0.0000)	0 (0)	41 (60)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	41 (60)
Smallmouth bass	0.0075 (0.0026)	0 (0)	1,635 (1,027)	8,982 (2,825)	6,294 (5,884)	2,301 (1,462)	436 (389)	127 (265)	19,775 (6,783)
Largemouth bass	0.0000 (0.0000)	0 (0)	0 (0)	94 (191)	17 (35)	12 (25)	7 (14)	0 (0)	130 (196)
Black crappie	0.0027 (0.0038)	0 (0)	960 (1,946)	6,047 (9,660)	0 (0)	0 (0)	28 (41)	0 (0)	7,035 (9,854)
Yellow perch	0.6640 (0.1090)	155,587 (85,527)	248,458 (114,775)	228,783 (49,183)	676,694 (147,827)	354,783 (176,966)	80,300 (35,617)	16,395 (14,774)	1,761,000 (278,503)
Walleye	0.0109 (0.0023)	1,580 (877)	8,816 (3,701)	2,673 (1,495)	4,676 (2,192)	8,335 (3,441)	1,035 (465)	1,875 (1,028)	28,990 (5,884)
Freshwater drum	0.0008 (0.0004)	0 (0)	359 (416)	819 (653)	859 (579)	22 (38)	0 (0)	0 (0)	2,059 (968)
Lake whitefish	0.0010 (0.0005)	0 (0)	641 (675)	975 (550)	624 (826)	95 (137)	18 (36)	185 (196)	2,538 (1,224)
Round whitefish	0.0030 (0.0012)	262 (270)	191 (201)	474 (805)	0 (0)	383 (772)	281 (421)	6,300 (2,856)	7,891 (3,113)
Burbot	0.0003 (0.0003)	0 (0)	287 (423)	192 (156)	212 (448)	16 (34)	0 (0)	0 (0)	707 (636)
Other	0.0003 (0.0003)	0 (0)	0 (0)	412 (539)	0 (0)	0 (0)	50 (101)	230 (376)	692 (665)
Total	0.7696 (0.1106)	186,441 (85,642)	288,430 (114,943)	276,659 (50,476)	745,232 (148,152)	411,324 (177,101)	101,926 (35,747)	31,042 (15,132)	2,041,054 (279,132)
Angler hours		198,956 (22,738)	338,662 (36,679)	398,831 (32,526)	682,800 (76,523)	672,971 (62,834)	264,898 (29,951)	95,052 (11,453)	2,652,170 (117,271)
Angler trips		55,235 (5,900)	80,009 (7,729)	96,128 (7,017)	148,621 (15,069)	151,152 (12,819)	63,029 (6,606)	22,895 (2,391)	617,069 (24,177)
Angler days		51,940 (5,758)	76,989 (7,519)	91,850 (6,748)	139,822 (13,713)	136,570 (11,688)	56,818 (5,819)	20,364 (2,201)	574,353 (22,329)

Table 3.—Estimated angler (charter and non-charter) effort (hours) at ten Lake Michigan survey areas, April through October, 1985-93. Bounds on the error of estimation in parentheses.

Area	1985	1986	1987	1988	1989	1990	1991	1992	1993
New Buffalo	270,897 (45,486)	481,717 (151,319)	151,089 (92,752)	268,490 (72,843)	229,668 (85,620)	120,676 (30,285)	117,750 (84,716)	113,046 (44,127)	112,192 (26,645)
St. Joseph	834,003 (116,076)	607,060 (128,426)	369,500 (93,567)	424,635 (75,266)	440,627 (57,896)	292,064 (49,378)	388,867 (46,759)	322,592 (47,081)	349,064 (46,500)
Grand Haven	586,641 (66,939)	700,543 (152,499)	759,713 (145,251)	428,996 (121,822)	225,797 (37,108)	246,367 (44,054)	241,264 (40,106)	146,989 (16,517)	172,984 (22,363)
Muskegon	508,738 (114,646)	319,636 (53,425)	340,095 (73,750)	230,296 (58,704)	164,664 (35,554)	143,895 (38,653)	103,767 (31,851)	174,407 (32,796)	96,331 (28,743)
Ludington	714,442 (151,419)	833,763 (258,924)	614,485 (169,613)	376,995 (117,169)	442,578 <sup>d</sup> (85,069)	287,517 (47,285)	304,735 (70,738)	324,365 (60,353)	382,025 (46,097)
Manistee	629,126 (96,422)	681,144 (141,842)	509,415 (125,973)	435,687 (102,153)	283,544 (51,078)	222,637 (54,872)	235,056 (45,281)	239,396 (56,783)	287,855 (39,842)
Frankfort	322,122 (49,044)	593,406 (192,736)	547,140 (193,979)	262,501 (58,305)	365,263 (176,322)	279,720 (80,854)	250,786 (63,228)	252,712 (53,490)	265,410 (55,658)
Grand Traverse Bay <sup>a</sup>	466,505 (26,749)	335,002 (24,912)	284,478 (22,721)	262,402 (17,127)	260,728 (20,770)	191,900 (11,149)	223,139 (12,211)	191,459 (8,828)	180,178 (8,928)
Charlevoix	155,168 (35,350)	100,014 (24,447)	90,043 (12,480)	62,287 <sup>c</sup> (12,761)	64,042 <sup>c</sup> (12,003)	65,906 <sup>c</sup> (11,442)	48,529 <sup>c</sup> (8,453)	57,028 <sup>c</sup> (5,676)	63,130 <sup>c</sup> (6,536)
Little Bay de Noc <sup>b</sup>	158,157 (21,126)	239,073 (21,787)	154,421 (16,300)	157,723 (19,726)	237,044 <sup>d</sup> (67,741)	316,145 (36,008)	377,499 (32,508)	251,902 (35,557)	254,097 (22,941)
Total	4,645,799 (264,969)	4,891,358 (437,609)	3,820,379 (356,508)	2,922,773 (240,138)	2,713,955 (243,796)	2,166,827 (141,867)	2,351,392 (155,934)	2,073,896 (128,898)	2,163,266 (107,969)

<sup>a</sup> Includes the east and west arms of Grand Traverse Bay and the port of Elk Rapids.

<sup>b</sup> Includes the Ford River access site.

<sup>c</sup> May through September.

<sup>d</sup> May through October.



Table 4.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Lake Michigan boat fishery (non-charter) at all survey areas combined (22), 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	48 (102)	51 (83)	0 (0)	0 (0)	99 (132)
Coho salmon	0.0168 (0.0026)	9,032 (3,139)	9,630 (2,921)	1,963 (1,008)	2,386 (1,151)	7,207 (2,381)	6,942 (2,184)	816 (495)	37,976 (5,605)
Chinook salmon	0.0119 (0.0018)	215 (245)	2,388 (1,230)	3,322 (1,302)	5,736 (1,864)	11,512 (2,559)	3,419 (1,091)	274 (346)	26,866 (3,821)
Rainbow trout	0.0119 (0.0022)	583 (310)	1,012 (447)	4,090 (1,402)	13,294 (4,136)	4,889 (1,165)	2,410 (926)	691 (655)	26,969 (4,692)
Atlantic salmon	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	17 (27)	0 (0)	0 (0)	0 (0)	17 (27)
Brown trout	0.0158 (0.0023)	8,102 (1,899)	3,931 (1,293)	2,965 (1,479)	10,361 (2,629)	9,531 (3,059)	732 (462)	80 (84)	35,702 (4,894)
Brook trout	0.0001 (0.0001)	110 (117)	9 (18)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	119 (118)
Lake trout	0.0185 (0.0027)	91 (180)	4,985 (1,458)	8,549 (2,009)	18,082 (4,475)	9,542 (2,355)	593 (286)	0 (0)	41,842 (5,643)
Splake	0.0006 (0.0003)	1,066 (516)	203 (255)	89 (185)	70 (77)	3 (7)	0 (0)	16 (32)	1,447 (610)
Rainbow smelt	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	35 (72)	7 (15)	42 (74)
Northern pike	0.0012 (0.0007)	0 (0)	471 (542)	34 (68)	1,000 (1,258)	730 (893)	373 (373)	157 (127)	2,765 (1,683)
White sucker	0.0001 (0.0002)	0 (0)	0 (0)	242 (500)	0 (0)	0 (0)	0 (0)	0 (0)	242 (500)
Black bullhead	0.0000 (0.0000)	0 (0)	0 (0)	22 (48)	0 (0)	0 (0)	0 (0)	0 (0)	22 (48)
Brown bullhead	0.0001 (0.0002)	0 (0)	16 (33)	0 (0)	84 (171)	0 (0)	13 (27)	0 (0)	113 (176)
Channel catfish	0.0002 (0.0002)	0 (0)	19 (38)	144 (232)	162 (203)	132 (221)	21 (42)	0 (0)	478 (384)
White bass	0.0000 (0.0000)	0 (0)	21 (42)	0 (0)	62 (127)	0 (0)	0 (0)	0 (0)	83 (134)
Rockbass	0.0020 (0.0016)	0 (0)	576 (1,167)	1,507 (1,969)	1,348 (1,964)	997 (1,876)	26 (53)	0 (0)	4,454 (3,552)
Pumpkinseed	0.0002 (0.0003)	0 (0)	336 (681)	107 (219)	84 (124)	0 (0)	25 (50)	0 (0)	552 (728)

Table 4.—Continued:

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Bluegill	0.0001 (0.0001)	0 (0)	0 (0)	209 (315)	0 (0)	41 (83)	0 (0)	0 (0)	250 (326)
Lake herring	0.0000 (0.0000)	0 (0)	41 (60)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	41 (60)
Smallmouth bass	0.0068 (0.0019)	0 (0)	1,433 (1,003)	7,774 (2,719)	3,404 (2,610)	2,177 (1,456)	436 (389)	127 (265)	15,351 (4,190)
Largemouth bass	0.0000 (0.0000)	0 (0)	0 (0)	94 (191)	0 (0)	0 (0)	0 (0)	0 (0)	94 (191)
Black crappie	0.0004 (0.0008)	0 (0)	960 (1,946)	2 (6)	0 (0)	0 (0)	0 (0)	0 (0)	962 (1,946)
Yellow perch	0.7255 (0.1284)	151,200 (85,494)	238,345 (114,671)	194,683 (48,597)	619,277 (146,048)	343,392 (176,754)	74,220 (35,490)	16,384 (14,774)	1,637,501 (277,255)
Walleye	0.0113 (0.0025)	997 (736)	8,260 (3,682)	1,957 (1,145)	4,599 (2,190)	6,929 (3,131)	975 (449)	1,844 (1,026)	25,561 (5,591)
Freshwater drum	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	114 (182)	0 (0)	0 (0)	0 (0)	114 (182)
Lake whitefish	0.0011 (0.0005)	0 (0)	641 (675)	975 (550)	624 (826)	95 (137)	18 (36)	185 (196)	2,538 (1,224)
Round whitefish	0.0010 (0.0008)	0 (0)	146 (189)	473 (805)	0 (0)	383 (772)	267 (420)	913 (1,398)	2,182 (1,847)
Burbot	0.0003 (0.0003)	0 (0)	287 (423)	141 (143)	212 (448)	16 (34)	0 (0)	0 (0)	656 (633)
Other	0.0000 (0.0000)	0 (0)	0 (0)	18 (36)	0 (0)	0 (0)	0 (0)	13 (29)	31 (46)
Total	0.8263 (0.1302)	171,396 (85,579)	273,710 (114,825)	229,360 (48,853)	680,964 (146,277)	397,627 (176,882)	90,505 (35,600)	21,507 (14,907)	1,865,069 (277,613)
Angler hours		141,406 (22,190)	295,133 (36,493)	321,604 (32,179)	611,666 (76,260)	618,877 (62,673)	221,036 (29,657)	47,328 (10,519)	2,257,050 (116,590)
Angler trips		35,943 (5,588)	63,549 (7,564)	65,322 (6,579)	124,048 (14,856)	126,168 (12,616)	47,658 (6,382)	8,967 (1,911)	471,655 (23,579)
Angler days		34,938 (5,485)	61,714 (7,368)	63,072 (6,314)	117,146 (13,503)	113,981 (11,502)	42,976 (5,598)	8,431 (1,838)	442,258 (21,762)

Table 5.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Lake Michigan pier fishery at all survey areas combined (12), 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	7 (14)	0 (0)	0 (0)	7 (14)
Coho salmon	0.0192 (0.0069)	4,087 (1,558)	768 (912)	13 (26)	0 (0)	11 (23)	117 (111)	104 (107)	5,100 (1,812)
Chinook salmon	0.0017 (0.0011)	67 (113)	0 (0)	24 (49)	108 (222)	58 (48)	160 (105)	27 (30)	444 (281)
Rainbow trout	0.0122 (0.0032)	187 (135)	108 (202)	102 (73)	945 (580)	0 (0)	465 (395)	1,438 (371)	3,245 (833)
Brown trout	0.0128 (0.0036)	1,685 (800)	305 (192)	660 (346)	307 (256)	13 (26)	290 (202)	158 (112)	3,418 (957)
Lake trout	0.0002 (0.0003)	0 (0)	0 (0)	29 (59)	0 (0)	16 (32)	0 (0)	0 (0)	45 (67)
Splake	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	6 (12)	0 (0)	0 (0)	0 (0)	6 (12)
Northern pike	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	25 (41)	0 (0)	25 (41)
White sucker	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	16 (34)	16 (34)
Redhorses	0.0002 (0.0003)	0 (0)	0 (0)	57 (83)	0 (0)	0 (0)	0 (0)	0 (0)	57 (83)
Black bullhead	0.0003 (0.0004)	0 (0)	0 (0)	76 (104)	6 (12)	0 (0)	0 (0)	0 (0)	82 (105)
Channel catfish	0.0050 (0.0029)	0 (0)	175 (186)	665 (625)	413 (386)	60 (121)	7 (16)	23 (37)	1,343 (768)
White perch	0.0002 (0.0004)	0 (0)	0 (0)	41 (82)	0 (0)	0 (0)	0 (0)	0 (0)	41 (82)
Rockbass	0.0009 (0.0007)	0 (0)	44 (81)	39 (68)	153 (156)	6 (13)	0 (0)	0 (0)	242 (189)

Table 5.—Continued:

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Bluegill	0.0015 (0.0015)	0 (0)	0 (0)	41 (63)	267 (381)	34 (52)	65 (113)	0 (0)	407 (406)
Smallmouth bass	0.0004 (0.0005)	0 (0)	0 (0)	66 (134)	26 (38)	24 (51)	0 (0)	0 (0)	116 (148)
Largemouth bass	0.0001 (0.0001)	0 (0)	0 (0)	0 (0)	17 (35)	12 (25)	7 (14)	0 (0)	36 (45)
Black crappie	0.0006 (0.0007)	0 (0)	0 (0)	143 (173)	0 (0)	0 (0)	14 (29)	0 (0)	157 (175)
Yellow perch	0.4493 (0.1004)	2,466 (1,632)	8,378 (4,694)	34,100 (7,569)	57,218 (22,866)	11,391 (8,641)	6,007 (3,012)	11 (23)	119,571 (26,241)
Walleye	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	31 (62)	0 (0)	0 (0)	0 (0)	31 (62)
Freshwater drum	0.0066 (0.0034)	0 (0)	359 (416)	747 (644)	621 (490)	22 (38)	0 (0)	0 (0)	1,749 (911)
Round whitefish	0.0199 (0.0094)	158 (232)	45 (68)	1 (3)	0 (0)	0 (0)	14 (29)	5,066 (2,461)	5,284 (2,473)
Burbot	0.0002 (0.0003)	0 (0)	0 (0)	51 (64)	0 (0)	0 (0)	0 (0)	0 (0)	51 (64)
Other	0.0005 (0.0006)	0 (0)	0 (0)	90 (139)	0 (0)	0 (0)	50 (101)	0 (0)	140 (172)
Total	0.5321 (0.1020)	8,650 (2,412)	10,182 (4,813)	36,945 (7,637)	60,118 (22,888)	11,654 (8,643)	7,221 (3,053)	6,843 (2,494)	141,613 (26,484)
Angler hours		35,685 (4,329)	28,648 (3,196)	53,634 (3,445)	60,066 (6,123)	38,816 (4,018)	21,365 (3,466)	27,920 (4,119)	266,134 (11,110)
Angler trips		12,027 (1,551)	10,875 (1,341)	19,896 (1,628)	20,762 (2,366)	18,600 (2,010)	8,978 (1,523)	8,173 (1,270)	99,311 (4,519)
Angler days		10,797 (1,410)	10,131 (1,263)	18,183 (1,564)	18,982 (2,222)	16,574 (1,811)	7,940 (1,400)	6,797 (1,042)	89,404 (4,158)

Table 6.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Lake Michigan shore fishery at all survey areas combined (12), 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	12 (24)	0 (0)	12 (24)
Coho salmon	0.0013 (0.0012)	33 (67)	0 (0)	0 (0)	0 (0)	0 (0)	38 (41)	101 (139)	172 (160)
Chinook salmon	0.0080 (0.0028)	21 (31)	0 (0)	0 (0)	0 (0)	0 (0)	830 (327)	176 (127)	1,027 (352)
Rainbow trout	0.0254 (0.0100)	1,595 (662)	481 (330)	506 (1,017)	0 (0)	0 (0)	182 (190)	514 (198)	3,278 (1,287)
Brown trout	0.0468 (0.0117)	1,078 (743)	357 (505)	337 (494)	307 (268)	19 (40)	2,615 (934)	1,324 (434)	6,037 (1,478)
Splake	0.0030 (0.0029)	300 (358)	0 (0)	0 (0)	0 (0)	0 (0)	75 (69)	8 (18)	383 (365)
Northern pike	0.0001 (0.0002)	0 (0)	9 (18)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	9 (18)
White sucker	0.0097 (0.0094)	592 (808)	396 (799)	0 (0)	0 (0)	81 (163)	180 (364)	0 (0)	1,249 (1,204)
Redhorses	0.0020 (0.0031)	168 (345)	85 (175)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	253 (387)
Black bullhead	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	7 (15)	0 (0)	7 (15)
Channel catfish	0.0067 (0.0047)	0 (0)	242 (268)	51 (104)	560 (529)	0 (0)	14 (28)	0 (0)	867 (603)
Rockbass	0.0005 (0.0007)	0 (0)	0 (0)	64 (92)	0 (0)	0 (0)	0 (0)	0 (0)	64 (92)
Bluegill	0.0180 (0.0217)	0 (0)	475 (959)	1,260 (2,547)	50 (102)	437 (624)	100 (202)	0 (0)	2,322 (2,801)
Smallmouth bass	0.0334 (0.0414)	0 (0)	202 (220)	1,142 (758)	2,864 (5,274)	100 (124)	0 (0)	0 (0)	4,308 (5,334)
Black crappie	0.0459 (0.0750)	0 (0)	0 (0)	5,902 (9,658)	0 (0)	0 (0)	14 (29)	0 (0)	5,916 (9,658)

Table 6.—Continued:

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Yellow perch	0.0305 (0.0169)	1,921 (1,738)	1,735 (1,275)	0 (0)	199 (227)	0 (0)	73 (89)	0 (0)	3,928 (2,169)
Walleye	0.0263 (0.0142)	583 (477)	556 (376)	716 (960)	46 (63)	1,406 (1,429)	60 (121)	31 (62)	3,398 (1,832)
Freshwater drum	0.0015 (0.0021)	0 (0)	0 (0)	72 (112)	124 (249)	0 (0)	0 (0)	0 (0)	196 (273)
Round whitefish	0.0033 (0.0032)	104 (139)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	321 (381)	425 (406)
Other	0.0040 (0.0049)	0 (0)	0 (0)	304 (520)	0 (0)	0 (0)	0 (0)	217 (375)	521 (641)
Total	0.2665 (0.0940)	6,395 (2,272)	4,538 (1,960)	10,354 (10,141)	4,150 (5,319)	2,043 (1,573)	4,200 (1,105)	2,692 (744)	34,372 (12,016)
Angler hours		21,865 (2,420)	14,881 (1,856)	23,593 (3,256)	11,068 (1,651)	15,278 (1,999)	22,497 (2,338)	19,804 (1,890)	128,986 (5,972)
Angler trips		7,265 (1,089)	5,585 (848)	10,910 (1,818)	3,811 (877)	6,384 (1,052)	6,393 (772)	5,755 (670)	46,103 (2,851)
Angler days		6,205 (1,036)	5,144 (815)	10,595 (1,796)	3,694 (878)	6,015 (1,015)	5,902 (750)	5,136 (617)	42,691 (2,776)

Table 7.—Estimated yellow perch catch rate (fish per angler hour), number harvested, and angler effort (hours) at selected Lake Michigan ports and fishing areas, April through October, 1989-93. Bounds on the error of estimation in parentheses.

Area	1989		1990		1991		1992		1993	
	Rate	Harvest	Rate	Harvest	Rate	Harvest	Rate	Harvest	Rate	Harvest
St. Joseph	0.730 (0.196)	313,077 (84,235)	1.409 (0.592)	348,313 (128,800)	0.639 (0.201)	259,949 (62,108)	1.389 (0.578)	439,121 (145,012)	1.239 (0.447)	384,416 (126,039)
Grand Haven	0.595 (0.277)	121,713 (52,258)	0.359 (0.158)	74,151 (28,632)	0.555 (0.339)	133,937 (63,900)	0.401 (0.152)	58,917 (15,439)	0.547 (0.230)	78,364 (30,618)
Muskegon	1.102 (0.475)	174,434 (64,152)	1.460 (0.578)	195,984 (53,233)	0.407 (0.445)	42,274 (39,137)	1.173 (0.515)	204,510 (76,731)	0.360 (0.332)	32,310 (27,905)
Ludington	0.284 (0.112)	115,202 (38,771)	0.516 (0.201)	119,587 (39,674)	0.371 (0.208)	113,002 (40,971)	0.764 (0.366)	247,818 (86,280)	0.468 (0.153)	160,525 (47,738)
Manistee	0.433 (0.232)	115,093 (57,456)	0.182 (0.090)	36,484 (14,952)	0.119 (0.097)	27,969 (19,188)	0.257 (0.151)	61,574 (29,096)	0.082 (0.040)	21,962 (10,214)
West Grand Traverse Bay	0.177 (0.094)	24,167 (12,406)	0.347 (0.154)	31,445 (13,693)	0.120 (0.065)	14,042 (7,227)	0.110 (0.070)	10,827 (6,484)	0.192 (0.161)	16,163 (13,496)
Little Bay de Noc	0.403 (0.171)	95,468 (30,042)	0.357 (0.096)	112,798 (27,533)	0.509 (0.125)	191,480 (44,106)	0.361 (0.130)	90,500 (30,010)	0.070 (0.035)	17,872 (8,710)
Total	0.522 (0.077)	959,154 (140,823)	0.645 (0.118)	918,762 (151,608)	0.443 (0.066)	782,653 (116,261)	0.720 (0.149)	1,113,267 (190,756)	0.436 (0.087)	711,612 (142,279)
Angler hours		1,837,704 (144,156)		1,424,918 (111,738)		1,768,583 (114,058)		1,547,100 (108,353)		1,631,065 (88,177)

Table 8.—Estimated sport fishing catch and effort(charter and non-charter) for salmonines at nine Lake Michigan index ports combined (New Buffalo, St. Joseph, Grand Haven, Muskegon, Ludington, Manistee, Frankfort, West Grand Traverse Bay, and Charlevoix) April through October (May through August for lake trout), 1985-93. Bounds on the error of estimation in parentheses.

Species	1985	1986	1987	1988	1989	1990	1991	1992	1993
Coho salmon	75,585 (13,667)	107,588 (22,779)	86,876 (19,062)	36,646 (12,950)	75,364 (25,170)	33,229 (5,218)	33,258 (6,440)	39,370 (6,910)	50,757 (5,794)
Chinook salmon	338,855 (42,266)	404,035 (93,386)	259,718 (58,951)	106,287 (21,557)	80,114 (18,036)	58,022 (7,299)	60,223 (8,260)	37,580 (5,350)	32,560 (3,660)
Rainbow trout	29,846 (7,932)	23,296 (12,655)	26,981 (6,028)	29,081 (6,999)	29,854 (5,736)	33,725 (4,959)	53,582 (7,446)	50,521 (6,175)	37,752 (4,682)
Brown trout	33,488 (6,762)	50,897 (15,265)	19,350 (6,197)	16,336 (5,142)	14,430 (4,014)	13,669 (3,124)	16,563 (3,283)	9,254 (2,370)	18,352 (2,850)
Lake trout	87,620 (15,752)	113,382 (44,421)	79,929 (18,234)	67,955 (12,594)	79,886 (13,014)	51,283 (6,196)	67,123 (7,215)	35,953 (4,310)	45,553 (4,702)
Angler hours	4,303,895 (263,743)	3,938,697 (435,727)	3,534,084 (356,012)	2,633,377 (239,188)	2,355,718 (233,999)	1,732,593 (136,970)	1,862,224 (152,309)	1,717,801 (117,981)	1,812,540 (104,200)



Table 9.—Estimated catch rates (fish per 100 angler hours) of salmonines by charter and non-charter anglers at nine Lake Michigan index ports combined April through October (May through August for lake trout), 1985-93. Bounds on the error of estimation in parentheses.

Species	1985	1986	1987	1988	1989	1990	1991	1992	1993
Coho salmon	1.76 (0.34)	2.73 (0.65)	2.46 (0.59)	1.39 (0.51)	3.20 (1.11)	1.92 (0.34)	1.79 (0.38)	2.29 (0.43)	2.80 (0.36)
Chinook salmon	7.87 (0.98)	10.26 (2.37)	7.35 (1.67)	4.04 (0.82)	3.40 (0.77)	3.35 (0.42)	3.23 (0.44)	2.19 (0.31)	1.80 (0.20)
Rainbow trout	0.69 (0.18)	0.59 (0.32)	0.76 (0.17)	1.10 (0.27)	1.27 (0.24)	1.95 (0.29)	2.88 (0.40)	2.94 (0.36)	2.08 (0.26)
Brown trout	0.78 (0.16)	1.29 (0.39)	0.55 (0.18)	0.62 (0.20)	0.61 (0.17)	0.79 (0.18)	0.89 (0.18)	0.54 (0.14)	1.01 (0.16)
Lake trout	2.59 (0.50)	3.57 (1.48)	3.03 (0.78)	3.38 (0.72)	4.42 (0.91)	3.90 (0.59)	4.40 (0.64)	2.57 (0.37)	3.14 (0.39)
Salmonines	13.69 (1.18)	18.44 (2.91)	14.15 (1.95)	10.53 (1.25)	12.90 (1.66)	11.90 (0.87)	13.19 (0.97)	10.53 (0.75)	10.83 (0.64)

Table 10.—Estimated chinook salmon harvest at nine Lake Michigan index ports, number stocked (thousands) by the State of Michigan and effort adjusted return per 1,000 fish stocked by age and year class, 1985-93.

Year	Harvest	Age	Percent by age	Harvest by age	Year class	Number stocked	Return	Effort adjusted return
1985	338,855	0.1	13	44,051	1984	3350	13.15	3.06
		0.2	33	111,822	1983	2980	37.52	8.72
		0.3	43	145,708	1982	2580	56.48	13.12
		0.4	10	33,886	1981	2250	15.06	3.50
		0.5	1	3,389	1980	2580	1.31	0.31
1986	404,035	0.1	6	24,242	1985	2260	10.73	2.72
		0.2	23	92,928	1984	3350	27.74	7.04
		0.3	54	218,179	1983	2980	73.21	18.59
		0.4	17	68,686	1982	2580	26.62	6.76
1987	259,718	0.1	14	36,361	1986	2400	15.15	4.29
		0.2	27	70,124	1985	2260	31.03	8.78
		0.3	35	90,901	1984	3350	27.13	7.68
		0.4	23	59,735	1983	2980	20.05	5.67
		0.5	1	2,597	1982	2580	1.01	0.28
1988	106,287	0.1	19	20,195	1987	2430	8.31	3.16
		0.2	25	26,572	1986	2400	11.07	4.20
		0.3	35	37,200	1985	2260	16.46	6.25
		0.4	20	21,257	1984	3350	6.35	2.41
		0.5	1	1,063	1983	2980	0.36	0.14
1989	80,114	0.1	22	17,625	1988	2670	6.60	2.80
		0.2	32	25,636	1987	2430	10.55	4.48
		0.3	28	22,432	1986	2400	9.35	3.97
		0.4	18	14,421	1985	2260	6.38	2.71
1990	58,022	0.1	30	17,407	1989	3778	4.61	2.66
		0.2	36	20,888	1988	2670	7.82	4.51
		0.3	26	15,086	1987	2430	6.21	3.58
		0.4	8	4,642	1986	2400	1.93	1.12
		0.5	<1					

Table 10.—Continued:

Year	Harvest	Age	Percent by age	Harvest by age	Year class	Number stocked	Return	Effort adjusted return
1991	60,223	0.1	36	21,680	1990	3639	5.96	3.20
		0.2	33	19,874	1989	3778	5.26	2.83
		0.3	24	14,454	1988	2670	5.41	2.91
		0.4	6	3,613	1987	2430	1.49	0.80
		0.5	<1					
1992	37,580	0.1	45	16,911	1991	3311	5.11	2.98
		0.2	28	10,522	1990	3639	2.89	1.68
		0.3	20	7,516	1989	3778	1.99	1.16
		0.4	7	2,631	1988	2670	0.99	0.58
1993	32,560	0.1	33	10,745	1992	3412	3.15	1.74
		0.2	33	10,745	1991	3311	3.25	1.79
		0.3	32	10,419	1990	3639	2.86	1.58
		0.4	2	651	1989	3778	0.17	0.09
		0.5	<1					

Table 11.—Estimated chinook salmon return (effort adjusted) by age and year class to the Lake Michigan sport fishery at nine index ports, 1985-93.

Year class	Age					Total
	0.1	0.2	0.3	0.4	0.5	
1981				3.50		
1982			13.12	6.76	0.28	
1983		8.72	18.59	5.67	0.14	
1984	3.06	7.04	7.68	2.41		20.19
1985	2.72	8.78	6.25	2.71		20.46
1986	4.29	4.20	3.97	1.12		13.58
1987	3.16	4.48	3.58	0.80		12.02
1988	2.80	4.51	2.71	0.57		10.79
1989	2.66	2.83	1.16	0.09		6.74
1990	3.20	1.68	1.58			
1991	2.97	1.79				
1992	1.74					

Table 12.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Lake Huron, by all modes (non-charter) of sportfishing, at all survey areas combined (15), 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0008 (0.0002)	0 (0)	75 (82)	75 (103)	714 (317)	430 (223)	334 (251)	74 (77)	1,702 (486)
Coho salmon	0.0005 (0.0001)	70 (58)	267 (118)	332 (140)	178 (142)	0 (0)	148 (156)	27 (41)	1,022 (288)
Chinook salmon	0.0220 (0.0021)	2,253 (665)	3,955 (858)	2,788 (806)	8,745 (1,147)	10,060 (1,390)	11,572 (2,184)	7,018 (1,416)	46,391 (3,442)
Rainbow trout	0.0031 (0.0005)	357 (254)	1,456 (365)	830 (440)	1,726 (471)	884 (310)	617 (354)	747 (387)	6,617 (992)
Atlantic salmon	0.0001 (0.0001)	0 (0)	33 (48)	76 (58)	31 (37)	18 (43)	0 (0)	0 (0)	158 (94)
Brown trout	0.0034 (0.0006)	890 (363)	854 (378)	483 (414)	2,507 (715)	1,451 (538)	230 (115)	760 (435)	7,175 (1,204)
Brook trout	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	10 (20)	0 (0)	0 (0)	0 (0)	10 (20)
Lake trout	0.0027 (0.0006)	0 (0)	221 (168)	1,547 (773)	2,085 (638)	1,474 (472)	299 (249)	0 (0)	5,626 (1,148)
Rainbow smelt	0.0002 (0.0003)	453 (658)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	453 (658)
Northern pike	0.0007 (0.0006)	99 (198)	98 (135)	16 (33)	74 (133)	363 (258)	719 (1,084)	49 (52)	1,418 (1,149)
White sucker	0.0003 (0.0002)	501 (459)	73 (124)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	574 (475)
Yellow bullhead	0.0005 (0.0005)	0 (0)	758 (1,109)	355 (548)	0 (0)	41 (84)	0 (0)	0 (0)	1,154 (1,240)
Brown bullhead	0.0002 (0.0001)	67 (123)	170 (207)	176 (207)	68 (147)	0 (0)	0 (0)	7 (17)	488 (350)
Channel catfish	0.0272 (0.0085)	256 (434)	6,398 (3,730)	10,790 (4,753)	15,138 (6,796)	23,470 (15,052)	1,184 (793)	49 (75)	57,285 (17,609)
White perch	0.0010 (0.0016)	85 (132)	42 (46)	174 (327)	53 (67)	33 (56)	233 (459)	1,546 (3,378)	2,166 (3,429)
White bass	0.0029 (0.0010)	407 (609)	1,816 (1,069)	1,883 (1,439)	1,407 (901)	92 (186)	413 (593)	176 (295)	6,194 (2,207)
Rockbass	0.0012 (0.0008)	0 (0)	74 (101)	667 (712)	933 (859)	728 (1,362)	94 (112)	30 (61)	2,526 (1,768)
Green sunfish	0.0000 (0.0000)	0 (0)	0 (0)	26 (40)	0 (0)	0 (0)	0 (0)	0 (0)	26 (40)
Pumpkinseed	0.0005 (0.0007)	119 (192)	0 (0)	28 (42)	30 (61)	765 (1,370)	20 (35)	46 (83)	1,008 (1,388)

Table 12.—Continued:

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Bluegill	0.0003 (0.0003)	46 (79)	131 (262)	317 (514)	0 (0)	0 (0)	0 (0)	125 (223)	619 (624)
Lake herring	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	13 (26)	0 (0)	0 (0)	13 (26)
Smallmouth bass	0.0011 (0.0007)	0 (0)	503 (747)	867 (1,042)	525 (574)	315 (363)	139 (97)	0 (0)	2,349 (1,454)
Largemouth bass	0.0007 (0.0006)	0 (0)	571 (551)	345 (400)	0 (0)	34 (70)	495 (1,010)	2 (5)	1,447 (1,220)
White crappie	0.0001 (0.0002)	0 (0)	0 (0)	126 (263)	14 (29)	0 (0)	0 (0)	0 (0)	140 (265)
Black crappie	0.0011 (0.0007)	364 (406)	1,340 (1,308)	462 (609)	0 (0)	0 (0)	0 (0)	99 (163)	2,265 (1,508)
Yellow perch	0.3717 (0.0537)	87,626 (27,326)	10,042 (5,373)	28,261 (12,779)	234,846 (66,700)	149,700 (44,262)	115,823 (35,077)	155,978 (46,135)	782,276 (103,469)
Walleye	0.0636 (0.0096)	1,642 (852)	4,779 (1,470)	7,828 (3,836)	59,129 (13,309)	57,205 (12,380)	2,683 (1,002)	694 (738)	133,960 (18,696)
Freshwater drum	0.0051 (0.0022)	176 (347)	1,395 (779)	2,150 (1,073)	5,595 (4,406)	923 (480)	417 (329)	0 (0)	10,656 (4,651)
Lake whitefish	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	5 (10)	3 (7)	0 (0)	0 (0)	8 (12)
Round whitefish	0.0001 (0.0001)	0 (0)	29 (59)	0 (0)	0 (0)	3 (7)	5 (11)	146 (106)	183 (122)
Burbot	0.0000 (0.0000)	10 (21)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	10 (20)	20 (29)
Other	0.0005 (0.0006)	79 (135)	176 (156)	621 (1,186)	13 (27)	0 (0)	50 (57)	29 (68)	968 (1,207)
Total	0.5117 (0.0589)	95,500 (27,381)	35,256 (7,193)	61,223 (14,484)	333,826 (68,528)	248,005 (48,433)	135,475 (35,213)	167,612 (46,292)	1,076,897 (106,939)
Angler hours		97,235 (13,828)	174,149 (20,101)	222,337 (32,099)	709,409 (88,392)	551,456 (68,519)	244,688 (27,576)	105,378 (12,175)	2,104,652 (122,647)
Angler trips		34,627 (6,232)	42,660 (4,780)	52,198 (6,828)	143,177 (17,835)	110,525 (13,418)	55,747 (6,161)	29,412 (5,078)	468,346 (25,888)
Angler days		27,584 (4,538)	36,555 (4,135)	46,798 (6,348)	134,301 (16,828)	102,627 (12,512)	46,750 (5,236)	24,275 (4,143)	418,890 (23,713)

Table 13.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Lake Huron boat fishery (non-charter) at all survey areas combined (15), 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0009 (0.0003)	0 (0)	75 (82)	75 (103)	714 (317)	430 (223)	333 (251)	19 (43)	1,646 (482)
Coho salmon	0.0005 (0.0001)	52 (51)	267 (118)	332 (140)	178 (142)	0 (0)	116 (147)	27 (41)	972 (282)
Chinook salmon	0.0191 (0.0020)	2,250 (665)	3,955 (858)	2,788 (806)	8,745 (1,147)	9,903 (1,380)	6,925 (1,687)	809 (460)	35,375 (2,847)
Rainbow trout	0.0029 (0.0005)	302 (248)	1,391 (354)	543 (258)	1,655 (459)	828 (288)	385 (242)	221 (268)	5,325 (823)
Atlantic salmon	0.0001 (0.0001)	0 (0)	33 (48)	76 (58)	31 (37)	18 (43)	0 (0)	0 (0)	158 (94)
Brown trout	0.0031 (0.0005)	769 (356)	829 (377)	483 (414)	2,229 (551)	1,191 (321)	107 (73)	88 (102)	5,696 (929)
Brook trout	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	10 (20)	0 (0)	0 (0)	0 (0)	10 (20)
Lake trout	0.0030 (0.0006)	0 (0)	221 (168)	1,547 (773)	2,085 (638)	1,474 (472)	299 (249)	0 (0)	5,626 (1,148)
Northern pike	0.0003 (0.0002)	99 (198)	71 (130)	0 (0)	65 (132)	279 (227)	37 (42)	15 (33)	566 (358)
White sucker	0.0000 (0.0000)	0 (0)	26 (57)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	26 (57)
Yellow bullhead	0.0001 (0.0001)	0 (0)	41 (64)	14 (28)	0 (0)	41 (84)	0 (0)	0 (0)	96 (109)
Brown bullhead	0.0002 (0.0002)	67 (123)	126 (196)	176 (207)	0 (0)	0 (0)	0 (0)	0 (0)	369 (310)
Channel catfish	0.0306 (0.0097)	236 (432)	5,992 (3,708)	10,553 (4,749)	15,126 (6,796)	23,456 (15,052)	1,153 (792)	13 (28)	56,529 (17,603)
White perch	0.0003 (0.0003)	85 (132)	34 (42)	174 (327)	53 (67)	33 (56)	233 (459)	0 (0)	612 (587)
White bass	0.0034 (0.0012)	407 (609)	1,816 (1,069)	1,883 (1,439)	1,407 (901)	92 (186)	413 (593)	176 (295)	6,194 (2,207)
Rockbass	0.0005 (0.0004)	0 (0)	28 (58)	251 (422)	570 (646)	92 (133)	32 (59)	0 (0)	973 (787)

Table 13.—Continued:

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pumpkinseed	0.0001 (0.0001)	0 (0)	0 (0)	0 (0)	30 (61)	95 (192)	15 (33)	39 (81)	179 (220)
Bluegill	0.0002 (0.0003)	0 (0)	128 (262)	317 (514)	0 (0)	0 (0)	0 (0)	0 (0)	445 (577)
Lake herring	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	13 (26)	0 (0)	0 (0)	13 (26)
Smallmouth bass	0.0011 (0.0008)	0 (0)	464 (744)	631 (985)	519 (574)	259 (345)	104 (83)	0 (0)	1,977 (1,407)
Largemouth bass	0.0006 (0.0006)	0 (0)	524 (547)	131 (211)	0 (0)	34 (70)	495 (1,010)	0 (0)	1,184 (1,170)
White crappie	0.0001 (0.0002)	0 (0)	0 (0)	126 (263)	14 (29)	0 (0)	0 (0)	0 (0)	140 (265)
Black crappie	0.0008 (0.0007)	197 (289)	865 (1,084)	462 (609)	0 (0)	0 (0)	0 (0)	0 (0)	1,524 (1,277)
Yellow perch	0.3287 (0.0554)	5,395 (4,414)	6,390 (4,880)	23,504 (12,433)	231,021 (66,530)	147,967 (44,177)	114,085 (35,006)	79,029 (33,247)	607,391 (94,374)
Walleye	0.0721 (0.0112)	1,370 (798)	4,632 (1,465)	7,781 (3,835)	59,123 (13,309)	57,205 (12,380)	2,552 (993)	609 (729)	133,272 (18,692)
Freshwater drum	0.0055 (0.0025)	166 (346)	1,300 (773)	2,018 (1,060)	5,424 (4,396)	918 (480)	417 (329)	0 (0)	10,243 (4,637)
Lake whitefish	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	5 (10)	3 (7)	0 (0)	0 (0)	8 (12)
Round whitefish	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	3 (7)	5 (11)	0 (0)	8 (13)
Other	0.0005 (0.0007)	62 (130)	121 (122)	615 (1,186)	0 (0)	0 (0)	50 (57)	0 (0)	848 (1,201)
Total	0.4748 (0.0615)	11,457 (4,648)	29,329 (6,685)	54,480 (14,142)	329,004 (68,358)	244,334 (48,315)	127,756 (35,097)	81,045 (33,261)	877,405 (98,038)
Angler hours		37,830 (5,876)	147,270 (19,540)	199,207 (31,950)	696,173 (88,366)	539,774 (68,491)	190,468 (27,072)	37,373 (7,734)	1,848,095 (121,365)
Angler trips		9,457 (1,575)	30,424 (4,244)	41,467 (6,405)	136,744 (17,789)	106,504 (13,380)	42,261 (5,981)	8,340 (1,783)	375,197 (24,412)
Angler days		8,800 (1,457)	27,415 (3,810)	38,361 (6,063)	129,105 (16,792)	98,968 (12,475)	36,168 (5,094)	7,308 (1,613)	346,125 (22,794)



Table 14.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Lake Huron pier fishery at all survey areas combined (7), 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0002 (0.0004)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	24 (48)	24 (48)
Coho salmon	0.0003 (0.0004)	18 (28)	0 (0)	0 (0)	0 (0)	0 (0)	25 (51)	0 (0)	43 (58)
Chinook salmon	0.0352 (0.0082)	3 (6)	0 (0)	0 (0)	0 (0)	157 (167)	2,941 (941)	1,874 (579)	4,975 (1,117)
Rainbow trout	0.0056 (0.0034)	15 (26)	65 (88)	287 (356)	71 (103)	56 (115)	146 (218)	157 (150)	797 (479)
Brown trout	0.0089 (0.0054)	50 (49)	6 (12)	0 (0)	278 (456)	260 (432)	121 (88)	546 (410)	1,261 (757)
Northern pike	0.0058 (0.0077)	0 (0)	10 (22)	16 (33)	9 (18)	84 (122)	682 (1,084)	24 (34)	825 (1,092)
White sucker	0.0001 (0.0001)	12 (17)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	12 (17)
Yellow bullhead	0.0001 (0.0002)	0 (0)	0 (0)	14 (29)	0 (0)	0 (0)	0 (0)	0 (0)	14 (29)
Brown bullhead	0.0005 (0.0011)	0 (0)	0 (0)	0 (0)	68 (147)	0 (0)	0 (0)	0 (0)	68 (147)
Channel catfish	0.0023 (0.0023)	20 (40)	134 (290)	127 (138)	0 (0)	14 (23)	31 (44)	0 (0)	326 (327)
White perch	0.0001 (0.0002)	0 (0)	8 (19)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	8 (19)
Rockbass	0.0107 (0.0112)	0 (0)	0 (0)	416 (574)	363 (567)	636 (1,355)	62 (95)	30 (61)	1,507 (1,581)
Green sunfish	0.0001 (0.0002)	0 (0)	0 (0)	12 (25)	0 (0)	0 (0)	0 (0)	0 (0)	12 (25)
Pumpkinseed	0.0049 (0.0097)	0 (0)	0 (0)	14 (29)	0 (0)	670 (1,357)	5 (11)	0 (0)	689 (1,357)
Smallmouth bass	0.0010 (0.0010)	0 (0)	27 (55)	22 (46)	6 (12)	56 (115)	35 (50)	0 (0)	146 (145)
Black crappie	0.0007 (0.0012)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	99 (163)	99 (163)

Table 14.—Continued:

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Yellow perch	0.1876 (0.0592)	8,780 (4,001)	3,472 (2,242)	4,396 (2,906)	3,821 (4,771)	1,733 (2,751)	1,738 (2,233)	2,569 (1,482)	26,509 (8,185)
Walleye	0.0022 (0.0014)	0 (0)	93 (101)	47 (96)	6 (12)	0 (0)	131 (136)	32 (40)	309 (199)
Freshwater drum	0.0017 (0.0021)	10 (20)	46 (70)	30 (55)	153 (294)	5 (11)	0 (0)	0 (0)	244 (308)
Round whitefish	0.0012 (0.0008)	0 (0)	29 (59)	0 (0)	0 (0)	0 (0)	0 (0)	146 (106)	175 (121)
Burbot	0.0001 (0.0001)	10 (21)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	10 (20)	20 (29)
Other	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	13 (27)	0 (0)	0 (0)	0 (0)	13 (27)
<b>Total</b>	<b>0.2694</b> (0.0637)	<b>8,918</b> (4,002)	<b>3,890</b> (2,267)	<b>5,381</b> (2,990)	<b>4,788</b> (4,839)	<b>3,671</b> (3,391)	<b>5,917</b> (2,671)	<b>5,511</b> (1,664)	<b>38,076</b> (8,655)
Angler hours		18,009 (4,574)	18,164 (4,270)	15,850 (2,499)	12,732 (2,115)	11,682 (1,949)	38,887 (4,882)	25,993 (2,724)	141,317 (9,215)
Angler trips		5,704 (1,454)	7,436 (1,828)	7,297 (1,888)	6,167 (1,252)	4,021 (1,007)	10,212 (1,367)	6,306 (770)	47,143 (3,750)
Angler days		4,404 (1,098)	5,467 (1,299)	5,933 (1,550)	4,946 (1,073)	3,659 (962)	8,334 (1,139)	5,242 (607)	37,985 (3,006)

Table 15.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Lake Huron shore fishery at all survey areas combined (11), 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0003 (0.0004)	0 (0)	0 (0)	0 (0)	0 (0)	— (0)	1 (3)	31 (43)	32 (43)
Coho salmon	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	— (0)	7 (15)	0 (0)	7 (15)
Chinook salmon	0.0524 (0.0153)	0 (0)	0 (0)	0 (0)	0 (0)	— (0)	1,706 (1,019)	4,335 (1,207)	6,041 (1,580)
Rainbow trout	0.0043 (0.0025)	40 (49)	0 (0)	0 (0)	0 (0)	— (0)	86 (139)	369 (236)	495 (278)
Brown trout	0.0019 (0.0010)	71 (50)	19 (25)	0 (0)	0 (0)	— (0)	2 (4)	126 (101)	218 (116)
Rainbow smelt	0.0039 (0.0057)	453 (658)	0 (0)	0 (0)	0 (0)	— (0)	0 (0)	0 (0)	453 (658)
Northern pike	0.0002 (0.0003)	0 (0)	17 (27)	0 (0)	0 (0)	— (0)	0 (0)	10 (21)	27 (34)
White sucker	0.0047 (0.0042)	489 (458)	47 (110)	0 (0)	0 (0)	— (0)	0 (0)	0 (0)	536 (471)
Yellow bullhead	0.0091 (0.0108)	0 (0)	717 (1,107)	327 (547)	0 (0)	— (0)	0 (0)	0 (0)	1,044 (1,235)
Brown bullhead	0.0004 (0.0005)	0 (0)	44 (66)	0 (0)	0 (0)	— (0)	0 (0)	7 (17)	51 (68)
Channel catfish	0.0037 (0.0029)	0 (0)	272 (283)	110 (161)	12 (27)	— (0)	0 (0)	36 (70)	430 (334)
White perch	0.0134 (0.0293)	0 (0)	0 (0)	0 (0)	0 (0)	— (0)	0 (0)	1,546 (3,378)	1,546 (3,378)
Rockbass	0.0004 (0.0007)	0 (0)	46 (82)	0 (0)	0 (0)	— (0)	0 (0)	0 (0)	46 (82)
Green sunfish	0.0001 (0.0002)	0 (0)	0 (0)	14 (31)	0 (0)	— (0)	0 (0)	0 (0)	14 (31)
Pumpkinseed	0.0012 (0.0017)	119 (192)	0 (0)	14 (31)	0 (0)	— (0)	0 (0)	7 (17)	140 (195)
Bluegill	0.0015 (0.0021)	46 (79)	3 (6)	0 (0)	0 (0)	— (0)	0 (0)	125 (223)	174 (237)

Table 15.—Continued:

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Smallmouth bass	0.0020 (0.0030)	0 (0)	12 (18)	214 (340)	0 (0)	— (0)	0 (0)	0 (0)	226 (340)
Largemouth bass	0.0023 (0.0030)	0 (0)	47 (64)	214 (340)	0 (0)	— (0)	0 (0)	2 (5)	263 (346)
Black crappie	0.0056 (0.0069)	167 (285)	475 (732)	0 (0)	0 (0)	— (0)	0 (0)	0 (0)	642 (786)
Yellow perch	1.2875 (0.3986)	73,451 (26,669)	180 (173)	361 (535)	4 (9)	— (0)	0 (0)	74,380 (31,951)	148,376 (41,622)
Walleye	0.0033 (0.0028)	272 (298)	54 (51)	0 (0)	0 (0)	— (0)	0 (0)	53 (105)	379 (320)
Freshwater drum	0.0015 (0.0016)	0 (0)	49 (66)	102 (163)	18 (42)	— (0)	0 (0)	0 (0)	169 (181)
Other	0.0009 (0.0011)	17 (35)	55 (98)	6 (11)	0 (0)	— (0)	0 (0)	29 (68)	107 (125)
Total	1.4007 (0.4068)	75,125 (26,685)	2,037 (1,385)	1,362 (933)	34 (51)	— (0)	1,802 (1,029)	81,056 (32,154)	161,416 (41,831)
Angler hours		41,396 (11,651)	8,715 (2,005)	7,280 (1,818)	504 (509)	— (0)	15,333 (1,936)	42,012 (9,000)	115,240 (15,102)
Angler trips		19,466 (5,851)	4,800 (1,222)	3,434 (1,427)	266 (260)	— (0)	3,274 (559)	14,766 (4,691)	46,006 (7,756)
Angler days		14,380 (4,155)	3,673 (944)	2,504 (1,066)	250 (251)	— (0)	2,248 (412)	11,725 (3,768)	34,780 (5,807)

Table 16.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Saginaw Bay (Port Austin to Tawas), by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0001 (0.0001)	0 (0)	30 (65)	0 (0)	59 (122)	0 (0)	47 (74)	0 (0)	136 (157)
Coho salmon	0.0001 (0.0001)	0 (0)	0 (0)	7 (14)	0 (0)	0 (0)	100 (145)	0 (0)	107 (146)
Chinook salmon	0.0026 (0.0009)	0 (0)	128 (99)	255 (225)	495 (352)	489 (603)	1,799 (779)	236 (132)	3,402 (1,083)
Rainbow trout	0.0008 (0.0004)	195 (240)	28 (32)	16 (24)	196 (259)	106 (89)	214 (200)	371 (257)	1,126 (490)
Brown trout	0.0005 (0.0003)	269 (313)	201 (269)	0 (0)	120 (203)	69 (84)	55 (63)	6 (12)	720 (472)
Lake trout	0.0004 (0.0004)	0 (0)	59 (98)	307 (401)	176 (308)	20 (41)	20 (41)	0 (0)	582 (518)
Rainbow smelt	0.0003 (0.0004)	453 (658)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	453 (658)
Northern pike	0.0009 (0.0009)	95 (198)	88 (133)	16 (33)	65 (132)	294 (229)	579 (1,056)	49 (52)	1,186 (1,116)
White sucker	0.0004 (0.0003)	501 (459)	47 (110)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	548 (472)
Yellow bullhead	0.0009 (0.0010)	0 (0)	758 (1,109)	341 (548)	0 (0)	41 (84)	0 (0)	0 (0)	1,140 (1,240)
Brown bullhead	0.0003 (0.0002)	67 (123)	170 (207)	176 (207)	0 (0)	0 (0)	0 (0)	7 (17)	420 (318)
Channel catfish	0.0428 (0.0138)	256 (434)	6,398 (3,730)	10,764 (4,753)	14,931 (6,794)	23,274 (15,050)	1,151 (792)	49 (75)	56,823 (17,606)
White perch	0.0016 (0.0025)	85 (132)	42 (46)	174 (327)	53 (67)	33 (56)	233 (459)	1,546 (3,378)	2,166 (3,429)
White bass	0.0047 (0.0017)	407 (609)	1,816 (1,069)	1,883 (1,439)	1,407 (901)	92 (186)	413 (593)	176 (295)	6,194 (2,207)
Rockbass	0.0008 (0.0006)	0 (0)	74 (101)	261 (422)	652 (683)	41 (84)	56 (81)	30 (61)	1,114 (820)
Green sunfish	0.0000 (0.0000)	0 (0)	0 (0)	26 (40)	0 (0)	0 (0)	0 (0)	0 (0)	26 (40)
Pumpkinseed	0.0002 (0.0002)	119 (192)	0 (0)	14 (31)	30 (61)	95 (192)	20 (35)	46 (83)	324 (294)

Table 16.—Continued:

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Bluegill	0.0005 (0.0005)	46 (79)	131 (262)	317 (514)	0 (0)	0 (0)	0 (0)	125 (223)	619 (624)
Smallmouth bass	0.0011 (0.0008)	0 (0)	332 (678)	326 (396)	502 (573)	221 (336)	62 (56)	0 (0)	1,443 (1,030)
Largemouth bass	0.0011 (0.0009)	0 (0)	571 (551)	345 (400)	0 (0)	34 (70)	495 (1,010)	2 (5)	1,447 (1,220)
White crappie	0.0001 (0.0002)	0 (0)	0 (0)	126 (263)	14 (29)	0 (0)	0 (0)	0 (0)	140 (265)
Black crappie	0.0017 (0.0011)	364 (406)	1,340 (1,308)	462 (609)	0 (0)	0 (0)	0 (0)	99 (163)	2,265 (1,508)
Yellow perch	0.5552 (0.0909)	87,600 (27,326)	9,892 (5,372)	22,537 (12,316)	218,364 (66,230)	135,940 (43,883)	106,946 (34,617)	155,978 (46,135)	737,257 (102,792)
Walleye	0.0924 (0.0159)	1,482 (846)	3,792 (1,377)	7,626 (3,830)	56,580 (13,271)	50,340 (11,926)	2,199 (894)	670 (737)	122,689 (18,357)
Freshwater drum	0.0047 (0.0013)	176 (347)	1,199 (716)	1,995 (1,043)	1,680 (716)	786 (458)	360 (320)	0 (0)	6,196 (1,596)
Burbot	0.0000 (0.0000)	10 (21)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	10 (21)
Other	0.0007 (0.0009)	79 (135)	176 (156)	621 (1,186)	13 (27)	0 (0)	37 (50)	29 (68)	955 (1,207)
Total	0.7151 (0.1008)	92,204 (27,372)	27,272 (7,092)	48,595 (13,978)	295,337 (67,906)	211,875 (47,909)	114,786 (34,688)	159,419 (46,267)	949,488 (106,044)
Angler hours		71,653 (13,146)	96,051 (15,424)	141,691 (28,482)	523,059 (86,044)	351,834 (62,718)	89,879 (18,773)	53,646 (11,199)	1,327,813 (114,179)
Angler trips		28,603 (6,160)	26,898 (4,071)	34,816 (6,144)	107,027 (17,320)	69,601 (12,096)	22,511 (4,376)	18,351 (4,948)	307,807 (24,129)
Angler days		21,865 (4,457)	22,394 (3,561)	30,906 (5,735)	100,026 (16,375)	65,051 (11,485)	19,260 (4,013)	15,004 (4,045)	274,506 (22,315)

Table 17.—Estimated yellow perch and walleye catch per hour, number harvested, and angler effort (hours) for Saginaw Bay (Port Austin to Tawas) during April through October, 1983-93. Bounds on the error of estimation in parentheses.

Year	Yellow perch		Walleye		Angler hours
	Catch per hour	Number harvested	Catch per hour	Number harvested	
1983 <sup>a</sup>	2.009 (0.564)	1,459,332 (409,661)	0.003 (0.002)	2,128 (1,450)	726,273 (81,928)
1986	0.907 (0.148)	1,772,696 (289,925)	0.030 (0.013)	59,253 (25,319)	1,954,504 (145,719)
1987	1.301 (0.193)	2,455,239 (329,272)	0.034 (0.007)	63,691 (12,061)	1,882,169 (116,509)
1988 <sup>b</sup>	0.828 (0.191)	1,182,625 (239,915)	0.070 (0.019)	100,129 (25,077)	1,428,189 (155,718)
1989	1.043 (0.184)	1,209,614 (186,292)	0.049 (0.010)	56,337 (10,580)	1,159,775 (95,472)
1991	1.162 (0.249)	1,482,443 (282,231)	0.048 (0.010)	61,028 (10,817)	1,275,439 (114,980)
1992	0.892 (0.129)	1,129,163 (134,539)	0.051 (0.008)	64,477 (8,702)	1,266,174 (100,013)
1993	0.552 (0.091)	738,712 (102,792)	0.094 (0.016)	125,160 (18,357)	1,337,059 (114,179)

<sup>a</sup>Ryckman (1986).

<sup>b</sup>April through September.

Table 18.—Estimated sportfishing catch and effort (charter and non-charter) for salmonines at nine Lake Huron ports combined (Rogers City, Rockport, Alpena, Harrisville, Oscoda, Port Austin, Grindstone City/Harbor Beach, Port Sanilac and Lexington), April through October, 1986-88 and 1992-93 (May through August for lake trout). Bounds on the error of estimation in parentheses.

Species	1986	1987	1988 <sup>a</sup>	1992	1993
Coho salmon	6,143 (2,322)	3,216 (1,121)	3,875 (1,200)	768 (283)	985 (249)
Chinook salmon	69,801 (10,369)	75,184 (8,336)	85,102 (9,661)	39,889 (3,544)	47,452 (3,360)
Rainbow trout	4,247 (6,481)	4,959 (1,320)	1,955 (537)	5,023 (1,098)	6,229 (907)
Brown trout	8,494 (2,465)	5,903 (1,165)	2,152 (750)	3,000 (531)	7,477 (1,142)
Lake trout	48,059 (11,330)	40,881 (7,300)	59,930 (35,823)	13,174 (2,691)	6,546 (1,148)
Angler hours	1,716,728 (157,793)	1,669,510 (115,654)	1,575,453 (148,674)	1,064,804 (70,993)	1,046,961 (63,151)

<sup>a</sup>April through September.



Table 19.—Catch rates (fish per 100 angler hours) of salmonines by charter and non-charter anglers at nine Lake Huron ports combined (Rogers City, Rockport, Alpena, Harrisville, Oscoda, Port Austin, Grindstone City/Harbor Beach, Port Sanilac and Lexington), April through October, 1986-88 and 1992-93 (May through August for lake trout). Bounds on the error of estimation in parentheses.

Species	1986	1987	1988 <sup>a</sup>	1992	1993
Coho salmon	0.36 (0.14)	0.19 (0.07)	0.25 (0.08)	0.07 (0.03)	0.09 (0.02)
Chinook salmon	4.07 (0.71)	4.50 (0.50)	5.40 (0.61)	3.75 (0.33)	4.53 (0.32)
Rainbow trout	0.25 (0.38)	0.30 (0.08)	0.12 (0.03)	0.47 (0.10)	0.59 (0.09)
Brown trout	0.49 (0.15)	0.35 (0.07)	0.14 (0.05)	0.28 (0.05)	0.71 (0.12)
Lake trout	4.08 1.06	3.77 (0.74)	5.31 (3.24)	1.66 (0.36)	0.84 (0.16)
Salmonines	9.25 (1.35)	9.11 (0.90)	11.22 (3.03)	6.23 (0.50)	6.76 (0.39)

<sup>a</sup>April through September.

Table 20.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Lake Erie boat fishery (non-charter), 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Rainbow trout	0.0002 (0.0001)	0 (0)	52 (51)	77 (65)	85 (98)	0 (0)	0 (0)	0 (0)	214 (128)
Northern pike	0.0001 (0.0001)	0 (0)	22 (47)	19 (40)	0 (0)	0 (0)	10 (21)	0 (0)	51 (65)
Muskellunge	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	17 (36)	0 (0)	0 (0)	0 (0)	17 (36)
Redhorses	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	47 (72)	0 (0)	47 (72)
Channel catfish	0.0269 (0.0103)	299 (460)	1,257 (921)	3,682 (2,906)	4,702 (3,871)	8,224 (5,738)	3,906 (3,319)	1,782 (1,524)	23,852 (8,411)
White perch	0.0123 (0.0053)	0 (0)	469 (341)	851 (1,253)	1,251 (1,451)	3,784 (2,810)	3,130 (2,325)	1,386 (1,538)	10,871 (4,411)
White bass	0.0514 (0.0226)	416 (749)	16,171 (11,744)	10,361 (8,830)	5,299 (6,049)	8,823 (9,331)	369 (511)	4,087 (3,352)	45,526 (18,751)
Rockbass	0.0015 (0.0010)	0 (0)	5 (10)	7 (15)	310 (529)	385 (341)	635 (580)	27 (33)	1,369 (857)
Pumpkinseed	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	13 (28)	13 (28)
Bluegill	0.0017 (0.0015)	0 (0)	0 (0)	0 (0)	39 (82)	1,058 (1,266)	183 (225)	199 (229)	1,479 (1,309)
Smallmouth bass	0.0008 (0.0007)	0 (0)	280 (579)	0 (0)	103 (128)	155 (141)	79 (91)	93 (105)	710 (625)
Largemouth bass	0.0003 (0.0005)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	106 (227)	141 (306)	247 (381)
Black crappie	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	105 (203)	105 (203)
Yellow perch	0.5101 (0.1624)	10 (19)	2,966 (1,334)	12,150 (11,871)	16,331 (9,340)	234,350 (102,688)	140,748 (67,404)	45,271 (25,844)	451,826 (126,436)
Walleye	0.2598 (0.0664)	2,414 (3,404)	47,729 (19,473)	75,583 (27,340)	93,823 (32,966)	10,265 (3,736)	234 (310)	26 (43)	230,074 (47,319)
Freshwater drum	0.0099 (0.0040)	88 (188)	2,643 (2,425)	2,142 (1,660)	2,021 (1,268)	996 (567)	557 (563)	307 (265)	8,754 (3,315)
Other	0.0010 (0.0007)	80 (161)	74 (100)	362 (511)	0 (0)	0 (0)	80 (152)	270 (288)	866 (635)

Table 20.—Continued:

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Total	0.8762 (0.2038)	3,307 (3,524)	71,668 (22,937)	105,234 (31,295)	123,981 (35,066)	268,040 (103,386)	150,084 (67,534)	53,707 (26,157)	776,021 (136,679)
Angler hours		12,880 (13,985)	162,461 (61,744)	210,785 (69,498)	231,329 (77,090)	160,910 (43,849)	82,241 (34,904)	25,098 (12,933)	885,704 (134,495)
Angler trips		2,262 (2,338)	30,423 (11,618)	40,637 (13,628)	41,846 (14,136)	29,885 (8,081)	16,600 (7,070)	5,163 (2,645)	166,816 (25,461)
Angler days		2,241 (2,306)	30,114 (11,540)	40,005 (13,441)	41,597 (14,059)	29,885 (8,081)	16,600 (7,070)	5,135 (2,625)	165,577 (25,278)

Table 21.—Estimated yellow perch and walleye catch per hour, number harvested, and angler effort (hours) for the Lake Erie boat fishery (charter and non-charter) during April through October, 1986-93. Bounds on the error of estimation in parentheses.

Year	Yellow perch		Walleye		Angler hours
	Catch per hour	Number harvested	Catch per hour	Number harvested	
1986 <sup>a</sup>	0.399 (0.106)	834,310 (218,909)	0.293 (0.053)	605,666 (110,365)	2,068,779 (252,761)
1987	0.252 (0.160)	619,112 (385,740)	0.367 (0.077)	902,378 (151,024)	2,455,903 (308,709)
1988 <sup>b</sup>	0.073 (0.049)	318,786 (205,749)	0.458 (0.121)	1,996,824 (419,055)	4,362,452 (702,522)
1989	0.386 (0.084)	1,466,442 (242,822)	0.288 (0.068)	1,092,289 (205,068)	3,799,067 (545,688)
1990	0.310 (0.156)	770,507 (368,162)	0.314 (0.071)	780,508 (145,900)	2,482,242 (298,193)
1991 <sup>a</sup>	0.470 (0.129)	378,716 (80,078)	0.164 (0.037)	132,322 (22,873)	805,294 (120,402)
1992	0.306 (0.102)	255,747 (72,114)	0.299 (0.070)	249,713 (44,354)	836,216 (120,008)
1993	0.506 (0.162)	473,580 (126,436)	0.289 (0.066)	270,376 (47,319)	935,249 (134,149)

<sup>a</sup>May through October.

<sup>b</sup>May through September.

Table 22.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Lake Superior, by all modes (non-charter) of sportfishing, at all survey areas combined (7), 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0012 (0.0014)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	241 (275)	0 (0)	241 (275)
Coho salmon	0.0282 (0.0052)	2,048 (721)	1,033 (468)	597 (255)	420 (263)	561 (304)	690 (257)	419 (220)	5,768 (1,039)
Chinook salmon	0.0149 (0.0036)	214 (144)	434 (234)	1,027 (400)	455 (303)	279 (235)	404 (271)	248 (284)	3,061 (733)
Rainbow trout	0.0040 (0.0013)	160 (105)	278 (169)	250 (143)	16 (24)	1 (1)	23 (40)	95 (102)	823 (269)
Brown trout	0.0023 (0.0011)	114 (108)	193 (150)	133 (133)	11 (23)	9 (18)	0 (0)	20 (40)	480 (233)
Brook trout	0.0000 (0.0000)	0 (0)	0 (0)	8 (17)	0 (0)	0 (0)	0 (0)	0 (0)	8 (17)
Lake trout	0.1162 (0.0126)	214 (199)	1,858 (731)	5,134 (935)	7,033 (1,525)	6,936 (1,268)	1,889 (527)	746 (225)	23,810 (2,390)
Splake	0.0018 (0.0006)	42 (47)	61 (53)	15 (21)	0 (0)	13 (26)	116 (75)	119 (74)	366 (131)
Northern pike	0.0003 (0.0004)	0 (0)	0 (0)	4 (8)	0 (0)	17 (34)	43 (73)	0 (0)	64 (81)
Rockbass	0.0002 (0.0003)	0 (0)	0 (0)	0 (0)	33 (48)	2 (3)	0 (0)	0 (0)	35 (48)
Siscowet	0.0191 (0.0050)	0 (0)	411 (397)	682 (302)	1,030 (502)	1,491 (667)	290 (287)	4 (8)	3,908 (1,014)
Lake herring	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	12 (25)	0 (0)	0 (0)	0 (0)	12 (25)
Smallmouth bass	0.0010 (0.0020)	0 (0)	0 (0)	0 (0)	204 (413)	0 (0)	0 (0)	0 (0)	204 (413)
Yellow perch	0.0142 (0.0144)	0 (0)	0 (0)	420 (620)	761 (750)	1,721 (2,775)	0 (0)	0 (0)	2,902 (2,941)
Walleye	0.0075 (0.0023)	0 (0)	239 (150)	175 (150)	555 (269)	484 (317)	85 (89)	0 (0)	1,538 (475)
Lake whitefish	0.0084 (0.0040)	135 (158)	50 (73)	157 (192)	67 (156)	0 (0)	67 (133)	1,242 (754)	1,718 (823)

Table 22.—Continued:

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Round whitefish	0.0169 (0.0077)	29 (58)	328 (431)	43 (61)	0 (0)	0 (0)	60 (89)	2,992 (1,491)	3,452 (1,557)
Other	0.0006 (0.0010)	24 (43)	109 (209)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	133 (213)
Total	0.2369 (0.0242)	2,980 (797)	4,994 (1,130)	8,645 (1,295)	10,597 (1,890)	11,514 (3,163)	3,908 (788)	5,885 (1,729)	48,523 (4,558)
Angler hours		15,905 (2,097)	24,922 (2,133)	41,112 (3,464)	45,841 (5,430)	41,681 (3,413)	23,884 (1,823)	11,518 (1,690)	204,863 (8,262)
Angler trips		5,339 (726)	6,878 (700)	9,835 (865)	9,800 (1,438)	9,044 (831)	5,759 (511)	3,252 (429)	49,907 (2,229)
Angler days		4,636 (675)	6,122 (646)	9,284 (851)	9,547 (1,437)	8,760 (823)	5,437 (498)	2,943 (421)	46,729 (2,183)

Table 23.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Saginaw Bay (Port Austin to Tawas) winter ice fishery, 1994. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month			Season
		Jan	Feb	Mar	
Rainbow trout	0.0001 (0.0001)	19 (39)	0 (0)	14 (22)	33 (45)
Brown trout	0.0008 (0.0008)	0 (0)	0 (0)	393 (406)	393 (406)
Northern pike	0.0021 (0.0017)	792 (780)	226 (241)	0 (0)	1,018 (816)
White sucker	0.0002 (0.0004)	0 (0)	0 (0)	80 (163)	80 (163)
Channel catfish	0.0002 (0.0003)	0 (0)	0 (0)	74 (114)	74 (114)
White perch	0.0008 (0.0015)	364 (778)	0 (0)	40 (68)	404 (781)
White bass	0.0002 (0.0004)	0 (0)	1 (2)	77 (161)	78 (161)
Black crappie	0.0002 (0.0002)	0 (0)	0 (0)	108 (100)	108 (100)
Yellow perch	1.2813 (0.2577)	357,442 (92,477)	143,756 (44,836)	111,207 (37,244)	612,405 (109,313)
Walleye	0.0410 (0.0142)	4,751 (2,522)	7,705 (5,384)	7,141 (2,703)	19,597 (6,531)
Round whitefish	0.0007 (0.0012)	28 (61)	296 (539)	0 (0)	324 (542)
Burbot	0.0008 (0.0009)	0 (0)	395 (474)	10 (23)	405 (475)
<b>Total</b>	<b>1.3284</b> (0.2602)	<b>363,396</b> (92,518)	<b>152,379</b> (45,164)	<b>119,144</b> (37,345)	<b>634,919</b> (109,517)
Angler hours		233,246 (34,019)	143,988 (23,363)	100,712 (16,167)	477,946 (44,323)
Angler trips		55,592 (7,776)	29,790 (4,682)	22,933 (3,774)	108,315 (9,830)
Angler days		50,034 (7,313)	27,319 (4,454)	19,378 (3,185)	96,731 (9,136)

Table 24.—Estimated yellow perch and walleye catch per hour, number harvested, and angler effort (hours) for the Saginaw Bay ice fishery, January through March, 1984-94. Bounds on the error of estimation in parentheses.

Year	Yellow perch		Walleye		Angler hours
	Catch per hour	Number harvested	Catch per hour	Number harvested	
1984 <sup>a</sup>	2.454 (0.379)	1,570,402 (219,616)	0.007 (0.011)	4,481 (7,338)	639,887 (75,182)
1987	4.794 (0.832)	3,153,609 (446,851)	0.001 (0.001)	636 (388)	657,770 (65,934)
1988	2.418 (0.549)	675,723 (133,958)	0.017 (0.017)	4,658 (4,617)	279,505 (30,909)
1991	2.765 (0.519)	815,511 (127,974)	0.006 (0.004)	1,702 (1,142)	294,976 (30,401)
1992	2.538 (0.499)	907,676 (157,445)	0.007 (0.003)	2,404 (1,209)	357,651 (33,017)
1993	0.989 (0.187)	308,103 (50,724)	0.045 (0.014)	13,993 (3,997)	311,648 (29,040)
1994	1.281 (0.258)	612,405 (109,313)	0.041 (0.014)	19,597 (6,531)	477,946 (44,323)

<sup>a</sup>Ryckman (1986).



Table 25.—Estimated yellow perch and walleye catch per hour, number harvested, and angler effort (hours) for the ice fishery on Little Bay de Noc, January through March, 1986-94. Bounds on the error of estimation in parentheses.

Year	Yellow perch		Walleye		Angler hours
	Catch per hour	Number harvested	Catch per hour	Number harvested	
1986	0.824 (0.216)	226,409 (52,473)	0.020 (0.011)	4,890 (2,565)	274,745 (33,342)
1987 <sup>a</sup>					
1988	0.491 (0.191)	65,290 (22,140)	0.128 (0.076)	11,798 (6,435)	133,107 (25,403)
1989	0.476 (0.149)	87,083 (25,187)	0.036 (0.019)	6,062 (3,048)	182,963 (21,823)
1990	0.902 (0.186)	176,068 (32,411)	0.057 (0.017)	9,448 (2,758)	195,210 (18,176)
1991	0.974 (0.202)	215,532 (39,029)	0.029 (0.012)	5,183 (2,090)	221,355 (22,579)
1992	0.970 (0.212)	249,804 (47,082)	0.021 (0.007)	4,612 (1,447)	257,559 (28,427)
1993	0.144 (0.039)	36,902 (9,224)	0.021 (0.008)	5,275 (2,099)	256,842 (26,099)
1994	0.187 (0.106)	28,711 (16,047)	0.018 (0.009)	2,703 (1,382)	153,218 (15,364)

<sup>a</sup>1987 data not reliable.

Table 26.—Estimated catch per hour and number harvested of selected species and angler effort (hours) for the ice fishery on Keweenaw Bay, February through March, 1988-94. Bounds on the error of estimation in parentheses.

Year	Coho salmon		Chinook salmon		Lake trout		Siscowet <sup>a</sup>		Angler hours
	Catch per hour	Number harvested	Catch per hour	Number harvested	Catch per hour	Number harvested	Catch per hour	Number harvested	
1988	0.075 (0.030)	5,610 (2,061)	0.004 (0.003)	286 (225)	0.114 (0.035)	8,596 (2,306)			75,204 (11,044)
1989	0.004 (0.008)	320 (660)	0.007 (0.013)	552 (1,021)	0.320 (0.182)	26,446 (13,705)			82,713 (19,380)
1990 <sup>b</sup>	0.060 (0.041)	661 (413)	0.030 (0.035)	332 (373)					11,031 (2,951)
1991	0.062 (0.025)	5,774 (1,998)	0.007 (0.005)	683 (442)	0.048 (0.019)	4,414 (1,521)	0.106 (0.035)	9,776 (2,570)	92,480 (18,268)
1992	0.019 (0.022)	643 (739)	0.020 (0.022)	686 (761)	0.076 (0.074)	2,609 (2,505)	0.054 (0.023)	1,842 (740)	34,427 (5,228)
1993	0.055 (0.016)	3,496 (922)	0.015 (0.008)	965 (472)	0.043 (0.012)	2,748 (658)	0.084 (0.020)	5,374 (1,071)	64,148 (8,639)
1994 <sup>c</sup>	0.063 (0.016)	6,168 (1,372)	0.003 (0.003)	248 (247)	0.024 (0.010)	2,378 (890)	0.173 (0.037)	16,891 (2,907)	97,517 (12,247)

<sup>a</sup>Siscowet lake trout were differentiated from lean lake trout beginning with the 1991 season.

<sup>b</sup>During 1990 only the month of March was surveyed due to poor ice conditions caused by mild winter weather.

<sup>c</sup>January through the middle of April.

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Appendix 1.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for New Buffalo, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0630 (0.0236)	2,081 (1,259)	3,027 (1,353)	974 (838)	187 (186)	17 (36)	9 (26)	525 (368)	6,820 (2,071)
Chinook salmon	0.0040 (0.0023)	18 (27)	287 (206)	5 (10)	96 (98)	26 (42)	0 (0)	0 (0)	432 (234)
Rainbow trout	0.0124 (0.0058)	62 (70)	395 (270)	143 (131)	591 (432)	60 (85)	24 (52)	68 (133)	1,343 (556)
Brown trout	0.0055 (0.0058)	425 (587)	79 (89)	95 (176)	0 (0)	0 (0)	0 (0)	0 (0)	599 (619)
Lake trout	0.0157 (0.0075)	0 (0)	684 (423)	129 (123)	701 (521)	140 (201)	48 (104)	0 (0)	1,702 (719)
Yellow perch	1.5380 (0.7375)	0 (0)	0 (0)	12,106 (7,417)	40,218 (21,963)	91,162 (61,615)	17,849 (23,785)	5,089 (12,150)	166,424 (71,043)
Total	1.6387 (0.7480)	2,586 (1,391)	4,472 (1,460)	13,452 (7,468)	41,793 (21,974)	91,405 (61,615)	17,930 (23,785)	5,682 (12,156)	177,320 (71,082)
Angler hours		10,456 (4,513)	16,944 (5,237)	18,419 (9,172)	23,761 (9,993)	27,309 (16,613)	8,912 (6,479)	2,408 (2,928)	108,209 (23,629)
Angler trips		2,619 (1,059)	3,021 (883)	3,291 (1,704)	3,951 (1,682)	5,091 (3,170)	1,427 (1,053)	458 (573)	19,858 (4,373)
Angler days		2,619 (1,059)	3,021 (883)	3,291 (1,704)	3,951 (1,682)	5,091 (3,170)	1,427 (1,053)	458 (573)	19,858 (4,373)

Appendix 2.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for St. Joseph/Benton Harbor, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0591 (0.0162)	10,478 (3,202)	6,873 (2,720)	859 (552)	27 (57)	0 (0)	59 (69)	3 (6)	18,299 (4,238)
Chinook salmon	0.0047 (0.0027)	206 (254)	467 (420)	679 (621)	0 (0)	103 (154)	0 (0)	0 (0)	1,455 (806)
Rainbow trout	0.0077 (0.0032)	272 (224)	256 (249)	440 (445)	753 (574)	0 (0)	456 (412)	213 (176)	2,390 (917)
Brown trout	0.0088 (0.0039)	2,211 (1,061)	453 (375)	0 (0)	0 (0)	0 (0)	50 (101)	19 (29)	2,733 (1,130)
Lake trout	0.0103 (0.0043)	88 (180)	816 (549)	1,752 (1,001)	401 (372)	77 (156)	60 (137)	0 (0)	3,194 (1,232)
Channel catfish	0.0023 (0.0021)	0 (0)	150 (182)	417 (573)	126 (150)	0 (0)	7 (16)	0 (0)	700 (620)
Yellow perch	1.2489 (0.4608)	119 (103)	4,883 (4,303)	42,915 (20,482)	251,565 (122,830)	67,828 (34,294)	19,525 (20,983)	0 (0)	386,835 (130,926)
Walleye	0.0007 (0.0015)	0 (0)	0 (0)	0 (0)	203 (428)	0 (0)	0 (0)	0 (0)	203 (428)
Freshwater drum	0.0048 (0.0029)	0 (0)	352 (416)	721 (643)	409 (404)	0 (0)	0 (0)	0 (0)	1,482 (866)
Other	0.0002 (0.0004)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	50 (101)	0 (0)	50 (101)
Total	1.3474 (0.4670)	13,374 (3,397)	14,250 (5,177)	47,783 (20,546)	253,484 (122,833)	68,008 (34,295)	20,207 (20,988)	235 (178)	417,341 (131,016)
Angler hours		55,845 (16,374)	43,503 (12,922)	55,095 (10,404)	77,353 (34,804)	56,408 (15,905)	18,714 (7,952)	2,820 (1,072)	309,738 (45,519)
Angler trips		13,924 (4,185)	8,110 (2,235)	10,094 (1,896)	15,451 (6,436)	12,833 (3,092)	4,087 (1,577)	1,068 (438)	65,567 (8,931)
Angler days		13,615 (4,117)	8,110 (2,235)	10,094 (1,896)	15,305 (6,349)	12,585 (3,050)	4,087 (1,577)	1,068 (438)	64,864 (8,822)

Appendix 3.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for South Haven, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0048 (0.0038)	579 (666)	229 (167)	45 (50)	0 (0)	74 (133)	0 (0)	0 (0)	927 (701)
Chinook salmon	0.0043 (0.0026)	12 (26)	335 (280)	138 (117)	42 (54)	177 (277)	125 (243)	0 (0)	829 (481)
Rainbow trout	0.0015 (0.0009)	16 (24)	67 (71)	48 (61)	64 (97)	10 (21)	4 (7)	72 (89)	281 (165)
Brown trout	0.0005 (0.0007)	8 (17)	0 (0)	0 (0)	0 (0)	54 (129)	28 (40)	14 (28)	104 (139)
Lake trout	0.0069 (0.0031)	3 (6)	407 (255)	279 (214)	340 (291)	240 (286)	61 (99)	0 (0)	1,330 (536)
Channel catfish	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	6 (13)	6 (13)
Yellow perch	3.7999 (1.3798)	143,549 (85,340)	197,403 (113,603)	71,217 (30,727)	152,102 (46,456)	154,174 (160,673)	13,683 (10,405)	0 (0)	732,128 (221,844)
Walleye	0.0001 (0.0002)	0 (0)	14 (29)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	14 (29)
Round whitefish	0.0001 (0.0002)	0 (0)	0 (0)	20 (41)	0 (0)	0 (0)	0 (0)	0 (0)	20 (41)
Total	3.8181 (1.3818)	144,167 (85,343)	198,455 (113,604)	71,747 (30,728)	152,548 (46,457)	154,729 (160,674)	13,901 (10,408)	92 (94)	735,639 (221,847)
Angler hours		24,565 (11,648)	50,317 (20,637)	27,086 (8,044)	46,321 (13,002)	33,852 (25,840)	9,198 (4,765)	1,331 (458)	192,670 (38,548)
Angler trips		6,013 (2,652)	9,494 (3,545)	5,997 (1,550)	8,113 (2,145)	7,400 (5,602)	2,088 (956)	394 (172)	39,499 (7,677)
Angler days		6,013 (2,652)	9,494 (3,545)	5,967 (1,542)	8,073 (2,118)	7,400 (5,602)	2,088 (956)	388 (171)	39,423 (7,667)

Appendix 4.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Holland, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0029 (0.0046)	0 (0)	141 (254)	0 (0)	0 (0)	16 (34)	8 (21)	2 (6)	167 (257)
Chinook salmon	0.0060 (0.0067)	0 (0)	156 (260)	58 (94)	109 (245)	19 (36)	8 (19)	0 (0)	350 (372)
Rainbow trout	0.0074 (0.0066)	12 (25)	15 (33)	33 (70)	221 (281)	30 (71)	110 (196)	11 (16)	432 (360)
Brown trout	0.0015 (0.0017)	45 (49)	35 (78)	0 (0)	0 (0)	7 (21)	0 (0)	0 (0)	87 (94)
Lake trout	0.0263 (0.0202)	0 (0)	449 (685)	450 (441)	570 (664)	63 (145)	8 (21)	0 (0)	1,540 (1,061)
Bluegill	0.0011 (0.0019)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	65 (113)	0 (0)	65 (113)
Smallmouth bass	0.0004 (0.0010)	0 (0)	0 (0)	0 (0)	0 (0)	25 (64)	0 (0)	0 (0)	25 (64)
Yellow perch	1.0706 (0.7508)	291 (351)	3,054 (2,236)	16,103 (6,995)	29,270 (32,868)	11,462 (18,081)	2,405 (4,890)	0 (0)	62,585 (38,538)
Freshwater drum	0.0007 (0.0012)	0 (0)	0 (0)	10 (21)	29 (59)	0 (0)	0 (0)	0 (0)	39 (63)
Round whitefish	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4 (8)	4 (8)
Other	0.0003 (0.0006)	0 (0)	0 (0)	15 (32)	0 (0)	0 (0)	0 (0)	0 (0)	15 (32)
<b>Total</b>	<b>1.1172 (0.7587)</b>	<b>348 (355)</b>	<b>3,850 (2,368)</b>	<b>16,669 (7,010)</b>	<b>30,199 (32,877)</b>	<b>11,622 (18,082)</b>	<b>2,604 (4,895)</b>	<b>17 (19)</b>	<b>65,309 (38,558)</b>
<b>Angler hours</b>		<b>1,909 (612)</b>	<b>12,321 (7,350)</b>	<b>12,796 (3,796)</b>	<b>20,213 (16,360)</b>	<b>6,565 (6,187)</b>	<b>4,453 (3,188)</b>	<b>201 (173)</b>	<b>58,458 (19,620)</b>
<b>Angler trips</b>		<b>749 (264)</b>	<b>3,582 (1,668)</b>	<b>3,698 (1,035)</b>	<b>4,801 (3,089)</b>	<b>1,809 (1,321)</b>	<b>1,201 (748)</b>	<b>87 (76)</b>	<b>15,927 (3,972)</b>
<b>Angler days</b>		<b>749 (264)</b>	<b>3,582 (1,668)</b>	<b>3,698 (1,035)</b>	<b>4,801 (3,089)</b>	<b>1,809 (1,321)</b>	<b>1,201 (748)</b>	<b>87 (76)</b>	<b>15,927 (3,972)</b>



Appendix 5.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Grand Haven, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	7 (14)	0 (0)	0 (0)	7 (14)
Coho salmon	0.0036 (0.0026)	5 (7)	0 (0)	13 (26)	20 (42)	385 (338)	89 (104)	0 (0)	512 (357)
Chinook salmon	0.0148 (0.0073)	6 (10)	272 (265)	873 (729)	59 (91)	630 (590)	274 (166)	0 (0)	2,114 (993)
Rainbow trout	0.0043 (0.0025)	33 (39)	25 (54)	79 (118)	51 (86)	251 (283)	8 (17)	163 (106)	610 (343)
Brown trout	0.0023 (0.0018)	80 (80)	60 (77)	26 (57)	14 (31)	112 (200)	39 (79)	0 (0)	331 (251)
Lake trout	0.0248 (0.0126)	0 (0)	636 (557)	1,003 (916)	1,174 (1,210)	697 (574)	44 (65)	0 (0)	3,554 (1,717)
Channel catfish	0.0046 (0.0033)	0 (0)	25 (39)	248 (250)	287 (356)	60 (121)	21 (42)	17 (35)	658 (456)
Rockbass	0.0001 (0.0002)	0 (0)	4 (8)	0 (0)	0 (0)	6 (13)	0 (0)	0 (0)	10 (15)
Bluegill	0.0017 (0.0026)	0 (0)	0 (0)	0 (0)	207 (364)	34 (52)	0 (0)	0 (0)	241 (368)
Largemouth bass	0.0002 (0.0003)	0 (0)	0 (0)	0 (0)	17 (35)	12 (25)	0 (0)	0 (0)	29 (43)
Yellow perch	0.5474 (0.2303)	266 (344)	900 (782)	11,547 (7,381)	56,038 (29,479)	4,358 (2,337)	5,255 (2,789)	0 (0)	78,364 (30,618)
Freshwater drum	0.0003 (0.0003)	0 (0)	7 (14)	4 (7)	10 (21)	22 (38)	0 (0)	0 (0)	43 (46)
Round whitefish	0.0014 (0.0009)	11 (22)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	184 (115)	195 (117)
Total	0.6054 (0.2343)	401 (356)	1,929 (1,001)	13,793 (7,479)	57,877 (29,509)	6,574 (2,528)	5,730 (2,798)	364 (160)	86,668 (30,693)
Angler hours		5,268 (1,506)	17,839 (7,922)	38,407 (15,506)	30,913 (7,186)	29,252 (11,426)	15,255 (2,932)	6,222 (1,963)	143,156 (22,363)
Angler trips		1,574 (472)	3,953 (1,470)	8,667 (2,712)	7,930 (1,724)	7,188 (2,352)	4,155 (809)	2,009 (681)	35,476 (4,400)
Angler days		1,393 (430)	3,637 (1,402)	7,875 (2,644)	7,241 (1,618)	6,404 (2,266)	3,766 (750)	1,746 (610)	32,062 (4,222)

Appendix 6.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Muskegon, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0055 (0.0059)	0 (0)	72 (176)	0 (0)	0 (0)	422 (471)	0 (0)	0 (0)	494 (503)
Chinook salmon	0.0221 (0.0162)	0 (0)	162 (317)	304 (342)	648 (845)	686 (850)	176 (212)	5 (11)	1,981 (1,303)
Rainbow trout	0.0113 (0.0075)	112 (85)	65 (158)	90 (146)	247 (356)	423 (400)	0 (0)	76 (66)	1,013 (587)
Brown trout	0.0028 (0.0022)	160 (133)	0 (0)	0 (0)	40 (88)	39 (84)	0 (0)	8 (17)	247 (181)
Lake trout	0.0231 (0.0184)	0 (0)	234 (410)	465 (539)	654 (1,152)	723 (704)	0 (0)	0 (0)	2,076 (1,510)
Bluegill	0.0009 (0.0020)	0 (0)	0 (0)	79 (170)	0 (0)	0 (0)	0 (0)	0 (0)	79 (170)
Yellow perch	0.3603 (0.3319)	0 (0)	144 (282)	27,225 (26,585)	4,501 (8,452)	440 (650)	0 (0)	0 (0)	32,310 (27,905)
Total	0.4259 (0.3406)	272 (158)	677 (636)	28,163 (26,594)	6,090 (8,580)	2,733 (1,425)	176 (212)	89 (69)	38,200 (27,989)
Angler hours		4,853 (1,192)	13,479 (15,125)	17,235 (11,923)	21,072 (17,199)	22,196 (11,123)	9,341 (5,821)	1,506 (637)	89,682 (28,743)
Angler trips		1,511 (431)	3,646 (3,639)	4,557 (3,029)	5,416 (4,077)	5,301 (2,534)	2,522 (1,417)	560 (248)	23,513 (6,908)
Angler days		1,229 (365)	3,407 (3,452)	3,872 (2,627)	4,766 (3,582)	4,709 (2,359)	2,347 (1,350)	410 (192)	20,740 (6,261)

Appendix 7.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Ludington, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0003 (0.0004)	0 (0)	0 (0)	0 (0)	48 (102)	40 (80)	0 (0)	0 (0)	88 (130)
Coho salmon	0.0090 (0.0032)	0 (0)	0 (0)	0 (0)	843 (524)	1,849 (831)	377 (315)	25 (36)	3,094 (1,032)
Chinook salmon	0.0206 (0.0060)	0 (0)	0 (0)	153 (145)	1,355 (920)	4,516 (1,450)	1,012 (615)	49 (114)	7,085 (1,833)
Rainbow trout	0.0233 (0.0070)	0 (0)	24 (52)	325 (323)	3,576 (1,782)	2,830 (916)	1,059 (657)	183 (120)	7,997 (2,137)
Brown trout	0.0050 (0.0023)	201 (203)	166 (199)	81 (124)	365 (347)	739 (590)	143 (156)	22 (33)	1,717 (768)
Brook trout	0.0001 (0.0002)	32 (72)	9 (18)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	41 (74)
Lake trout	0.0160 (0.0054)	0 (0)	19 (25)	474 (398)	2,981 (1,461)	1,969 (810)	60 (88)	0 (0)	5,503 (1,720)
White perch	0.0001 (0.0002)	0 (0)	0 (0)	41 (82)	0 (0)	0 (0)	0 (0)	0 (0)	41 (82)
Rockbass	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	5 (7)	0 (0)	0 (0)	0 (0)	5 (7)
Bluegill	0.0000 (0.0000)	0 (0)	0 (0)	13 (26)	0 (0)	0 (0)	0 (0)	0 (0)	13 (26)
Yellow perch	0.4677 (0.1526)	0 (0)	15,069 (10,723)	25,715 (11,628)	106,576 (44,068)	13,123 (9,311)	42 (70)	0 (0)	160,525 (47,738)
Round whitefish	0.0007 (0.0005)	22 (49)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	226 (156)	248 (164)
Total	0.5429 (0.1574)	255 (221)	15,287 (10,725)	26,802 (11,641)	115,749 (44,142)	25,066 (9,557)	2,693 (973)	505 (233)	186,357 (47,869)
Angler hours		4,892 (2,782)	10,845 (5,539)	26,698 (8,602)	109,259 (36,048)	150,876 (22,144)	36,589 (14,806)	4,089 (1,863)	343,248 (46,097)
Angler trips		1,692 (909)	2,585 (1,403)	6,579 (1,798)	23,002 (7,118)	29,319 (4,214)	6,877 (2,862)	1,107 (479)	71,161 (9,103)
Angler days		1,406 (777)	2,368 (1,297)	6,128 (1,727)	21,208 (6,462)	24,674 (3,660)	6,138 (2,557)	948 (435)	62,870 (8,194)

Appendix 8.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Manistee, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0111 (0.0057)	0 (0)	0 (0)	23 (47)	1,095 (992)	567 (349)	1,278 (1,021)	2 (4)	2,965 (1,466)
Chinook salmon	0.0142 (0.0064)	0 (0)	190 (340)	100 (123)	1,066 (634)	2,073 (1,412)	336 (304)	24 (27)	3,789 (1,619)
Rainbow trout	0.0240 (0.0077)	86 (132)	0 (0)	1,946 (1,038)	3,084 (1,401)	149 (145)	424 (431)	725 (203)	6,414 (1,818)
Brown trout	0.0224 (0.0080)	1,321 (932)	1,273 (827)	1,774 (1,178)	1,111 (839)	445 (299)	50 (107)	16 (19)	5,990 (1,935)
Lake trout	0.0123 (0.0059)	0 (0)	0 (0)	511 (439)	1,592 (783)	1,167 (1,198)	18 (40)	0 (0)	3,288 (1,498)
Northern pike	0.0003 (0.0006)	0 (0)	0 (0)	0 (0)	0 (0)	76 (154)	0 (0)	0 (0)	76 (154)
Rockbass	0.0002 (0.0004)	0 (0)	40 (81)	0 (0)	6 (12)	0 (0)	0 (0)	0 (0)	46 (82)
Smallmouth bass	0.0004 (0.0006)	0 (0)	0 (0)	0 (0)	62 (126)	36 (75)	0 (0)	0 (0)	98 (147)
Yellow perch	0.0821 (0.0401)	14 (28)	8,411 (6,779)	2,892 (1,735)	8,642 (7,092)	1,912 (2,248)	91 (123)	0 (0)	21,962 (10,214)
Lake whitefish	0.0002 (0.0004)	0 (0)	0 (0)	0 (0)	58 (118)	0 (0)	0 (0)	0 (0)	58 (118)
Round whitefish	0.0038 (0.0020)	112 (225)	137 (182)	64 (130)	0 (0)	0 (0)	0 (0)	709 (410)	1,022 (518)
Other	0.0000 (0.0000)	0 (0)	0 (0)	6 (13)	0 (0)	0 (0)	0 (0)	0 (0)	6 (13)
Total	0.1710 (0.0481)	1,533 (968)	10,051 (6,841)	7,316 (2,388)	16,716 (7,416)	6,425 (2,957)	2,197 (1,161)	1,476 (459)	45,714 (10,897)
Angler hours		13,196 (5,260)	22,638 (11,218)	36,743 (8,597)	80,917 (20,740)	78,797 (26,251)	27,004 (15,465)	8,048 (1,234)	267,343 (39,842)
Angler trips		3,735 (1,370)	6,402 (2,571)	7,101 (1,547)	17,096 (4,313)	18,282 (5,290)	6,895 (3,833)	1,725 (273)	61,236 (8,499)
Angler days		3,304 (1,293)	5,740 (2,386)	6,858 (1,509)	15,962 (4,049)	15,202 (4,493)	5,562 (3,129)	1,475 (241)	54,103 (7,488)

Appendix 9.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Onekama, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0129 (0.0189)	0 (0)	16 (34)	14 (35)	0 (0)	240 (252)	246 (696)	0 (0)	516 (742)
Chinook salmon	0.0291 (0.0227)	0 (0)	0 (0)	483 (689)	242 (202)	437 (435)	0 (0)	0 (0)	1,162 (839)
Rainbow trout	0.0178 (0.0132)	4 (10)	30 (49)	225 (327)	278 (295)	98 (114)	76 (155)	0 (0)	711 (483)
Brown trout	0.0179 (0.0137)	125 (155)	545 (481)	6 (16)	17 (22)	22 (36)	0 (0)	0 (0)	715 (507)
Lake trout	0.0133 (0.0106)	0 (0)	29 (46)	209 (329)	188 (184)	78 (86)	25 (63)	0 (0)	529 (394)
Northern pike	0.0002 (0.0004)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	6 (13)	0 (0)	6 (13)
Channel catfish	0.0027 (0.0056)	0 (0)	0 (0)	108 (220)	0 (0)	0 (0)	0 (0)	0 (0)	108 (220)
Rockbass	0.0036 (0.0041)	0 (0)	0 (0)	0 (0)	142 (155)	0 (0)	0 (0)	0 (0)	142 (155)
Smallmouth bass	0.0013 (0.0017)	0 (0)	0 (0)	0 (0)	26 (38)	24 (51)	0 (0)	0 (0)	50 (64)
Black crappie	0.0001 (0.0003)	0 (0)	0 (0)	2 (6)	0 (0)	0 (0)	0 (0)	0 (0)	2 (6)
Yellow perch	0.1228 (0.1608)	0 (0)	95 (203)	408 (626)	2,288 (4,752)	530 (860)	1,575 (3,912)	0 (0)	4,896 (6,250)
Freshwater drum	0.0004 (0.0008)	0 (0)	0 (0)	0 (0)	17 (35)	0 (0)	0 (0)	0 (0)	17 (35)
Round whitefish	0.0106 (0.0204)	0 (0)	0 (0)	377 (793)	0 (0)	0 (0)	0 (0)	44 (98)	421 (799)
Total	0.2326 (0.1757)	129 (155)	715 (527)	1,832 (1,327)	3,198 (4,772)	1,429 (1,008)	1,928 (3,977)	44 (98)	9,275 (6,456)
Angler hours		2,657 (1,225)	5,876 (3,620)	3,682 (3,184)	13,590 (6,302)	10,663 (7,448)	3,215 (4,057)	195 (193)	39,878 (11,680)
Angler trips		784 (378)	1,502 (830)	830 (679)	3,403 (1,486)	2,465 (1,499)	866 (884)	116 (126)	9,966 (2,558)
Angler days		759 (370)	1,336 (755)	782 (650)	2,626 (1,200)	1,794 (1,080)	694 (710)	109 (124)	8,100 (2,063)

Appendix 10.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Frankfort, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0387 (0.0148)	9 (20)	40 (84)	48 (64)	145 (141)	3,648 (2,106)	4,981 (1,772)	323 (336)	9,194 (2,778)
Chinook salmon	0.0172 (0.0072)	0 (0)	4 (8)	553 (361)	1,563 (1,103)	1,493 (781)	449 (276)	25 (39)	4,087 (1,426)
Rainbow trout	0.0322 (0.0165)	159 (144)	54 (55)	578 (337)	4,737 (3,368)	623 (387)	638 (383)	869 (669)	7,658 (3,496)
Atlantic salmon	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	17 (27)	0 (0)	0 (0)	0 (0)	17 (27)
Brown trout	0.0204 (0.0075)	759 (415)	743 (467)	1,251 (820)	879 (708)	954 (569)	146 (122)	112 (117)	4,844 (1,384)
Lake trout	0.0261 (0.0125)	0 (0)	352 (302)	1,107 (620)	3,247 (2,365)	1,397 (794)	110 (87)	0 (0)	6,213 (2,590)
Northern pike	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	11 (23)	0 (0)	0 (0)	11 (23)
White sucker	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	16 (34)	16 (34)
Rockbass	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	27 (57)	0 (0)	0 (0)	27 (57)
Smallmouth bass	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	11 (23)	0 (0)	0 (0)	11 (23)
Largemouth bass	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	7 (14)	0 (0)	7 (14)
Yellow perch	0.0269 (0.0268)	0 (0)	0 (0)	8 (17)	5,968 (6,126)	409 (855)	0 (0)	11 (23)	6,396 (6,185)
Freshwater drum	0.0001 (0.0002)	0 (0)	0 (0)	12 (24)	0 (0)	0 (0)	0 (0)	0 (0)	12 (24)
Round whitefish	0.0174 (0.0111)	13 (16)	15 (31)	0 (0)	0 (0)	0 (0)	14 (29)	4,100 (2,452)	4,142 (2,452)
Burbot	0.0006 (0.0006)	0 (0)	28 (47)	107 (131)	0 (0)	0 (0)	0 (0)	0 (0)	135 (139)
Total	0.1799 (0.0557)	940 (440)	1,236 (568)	3,664 (1,150)	16,556 (7,497)	8,573 (2,624)	6,345 (1,840)	5,456 (2,567)	42,770 (8,655)
Angler hours		9,168 (2,861)	12,536 (6,489)	22,499 (8,309)	65,852 (42,180)	73,079 (31,722)	42,537 (13,137)	12,111 (4,529)	237,782 (55,658)
Angler trips		3,070 (928)	3,136 (1,397)	4,612 (1,506)	13,225 (8,007)	15,016 (6,012)	8,809 (2,583)	3,090 (1,090)	50,958 (10,639)
Angler days		2,600 (801)	2,922 (1,334)	4,062 (1,410)	10,943 (6,529)	11,868 (4,830)	6,915 (2,060)	2,143 (797)	41,453 (8,674)

Appendix 11.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for West Grand Traverse Bay, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	12 (24)	0 (0)	12 (24)
Chinook salmon	0.0197 (0.0139)	9 (18)	441 (921)	0 (0)	79 (123)	388 (473)	534 (399)	207 (325)	1,658 (1,163)
Rainbow trout	0.0084 (0.0054)	488 (390)	87 (152)	0 (0)	131 (154)	0 (0)	0 (0)	0 (0)	706 (446)
Brown trout	0.0020 (0.0019)	46 (69)	53 (107)	34 (69)	34 (68)	0 (0)	0 (0)	0 (0)	167 (160)
Lake trout	0.0456 (0.0160)	0 (0)	973 (674)	892 (577)	1,432 (794)	487 (526)	48 (68)	0 (0)	3,832 (1,303)
Rainbow smelt	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	7 (15)	7 (15)
Rockbass	0.0108 (0.0218)	0 (0)	0 (0)	0 (0)	911 (1,840)	0 (0)	0 (0)	0 (0)	911 (1,840)
Smallmouth bass	0.0114 (0.0116)	0 (0)	0 (0)	292 (593)	0 (0)	451 (705)	90 (184)	127 (265)	960 (976)
Yellow perch	0.1922 (0.1613)	554 (974)	294 (614)	0 (0)	0 (0)	4,882 (9,553)	4,911 (7,007)	5,522 (6,361)	16,163 (13,496)
Lake whitefish	0.0085 (0.0059)	0 (0)	0 (0)	691 (491)	27 (55)	0 (0)	0 (0)	0 (0)	718 (494)
Round whitefish	0.0108 (0.0106)	104 (139)	0 (0)	0 (0)	0 (0)	383 (772)	60 (122)	359 (387)	906 (883)
Burbot	0.0040 (0.0051)	0 (0)	251 (420)	85 (86)	0 (0)	0 (0)	0 (0)	0 (0)	336 (429)
<b>Total</b>	<b>0.3136 (0.1663)</b>	<b>1,201 (1,061)</b>	<b>2,099 (1,375)</b>	<b>1,994 (968)</b>	<b>2,614 (2,016)</b>	<b>6,591 (9,636)</b>	<b>5,655 (7,022)</b>	<b>6,222 (6,387)</b>	<b>26,376 (13,819)</b>
Angler hours		9,056 (1,550)	7,938 (2,196)	10,919 (2,854)	20,203 (3,515)	19,945 (3,403)	11,731 (2,550)	4,321 (1,508)	84,113 (6,934)
Angler trips		2,696 (577)	2,011 (646)	2,695 (713)	4,954 (913)	5,289 (955)	3,409 (766)	1,342 (458)	22,396 (1,950)
Angler days		2,040 (489)	1,838 (641)	2,520 (692)	4,642 (905)	4,823 (966)	2,714 (655)	989 (377)	19,566 (1,858)

Appendix 12.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for East Grand Traverse Bay, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0010 (0.0021)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	40 (83)	40 (83)
Chinook salmon	0.0048 (0.0048)	12 (25)	19 (39)	0 (0)	19 (39)	62 (66)	84 (173)	0 (0)	196 (195)
Rainbow trout	0.0066 (0.0046)	131 (105)	11 (23)	0 (0)	51 (82)	77 (128)	0 (0)	0 (0)	270 (186)
Brown trout	0.0037 (0.0034)	46 (54)	11 (23)	0 (0)	31 (62)	53 (108)	0 (0)	11 (24)	152 (140)
Lake trout	0.0476 (0.0248)	0 (0)	0 (0)	195 (167)	1,084 (860)	592 (444)	64 (93)	0 (0)	1,935 (987)
Rainbow smelt	0.0009 (0.0019)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	35 (72)	0 (0)	35 (72)
Channel catfish	0.0025 (0.0040)	0 (0)	0 (0)	0 (0)	103 (163)	0 (0)	0 (0)	0 (0)	103 (163)
Lake herring	0.0005 (0.0010)	0 (0)	19 (39)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	19 (39)
Smallmouth bass	0.0299 (0.0238)	0 (0)	0 (0)	111 (225)	869 (913)	161 (174)	77 (113)	0 (0)	1,218 (963)
Yellow perch	0.3697 (0.2096)	0 (0)	76 (155)	0 (0)	0 (0)	0 (0)	10,235 (6,405)	4,722 (5,393)	15,033 (8,375)
Lake whitefish	0.0212 (0.0144)	0 (0)	405 (490)	217 (207)	0 (0)	95 (137)	18 (36)	126 (175)	861 (578)
Round whitefish	0.0068 (0.0102)	0 (0)	39 (81)	13 (26)	0 (0)	0 (0)	207 (402)	18 (37)	277 (413)
Other	0.0004 (0.0008)	0 (0)	0 (0)	18 (36)	0 (0)	0 (0)	0 (0)	0 (0)	18 (36)
Total	0.4956 (0.2159)	189 (121)	580 (524)	554 (351)	2,157 (1,270)	1,040 (528)	10,720 (6,422)	4,917 (5,397)	20,157 (8,525)
Angler hours		1,229 (318)	4,227 (1,322)	4,326 (1,033)	12,005 (2,621)	10,973 (2,219)	5,356 (1,589)	2,552 (895)	40,668 (4,247)
Angler trips		419 (115)	1,124 (370)	1,091 (288)	3,064 (700)	2,854 (617)	1,438 (440)	615 (234)	10,605 (1,163)
Angler days		321 (94)	993 (343)	927 (272)	2,946 (690)	2,597 (594)	1,231 (396)	560 (227)	9,575 (1,113)



Appendix 13.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Elk Rapids, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0003 (0.0006)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	12 (24)	0 (0)	12 (24)
Coho salmon	0.0029 (0.0030)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	38 (41)	101 (139)	139 (145)
Chinook salmon	0.0019 (0.0020)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	9 (18)	83 (93)	92 (95)
Rainbow trout	0.0202 (0.0079)	536 (296)	262 (167)	0 (0)	0 (0)	25 (51)	71 (105)	65 (70)	959 (366)
Brown trout	0.0064 (0.0046)	63 (116)	0 (0)	73 (109)	0 (0)	26 (54)	55 (77)	89 (116)	306 (218)
Lake trout	0.0048 (0.0049)	0 (0)	38 (78)	0 (0)	86 (177)	105 (127)	0 (0)	0 (0)	229 (231)
White sucker	0.0051 (0.0105)	0 (0)	0 (0)	242 (500)	0 (0)	0 (0)	0 (0)	0 (0)	242 (500)
Channel catfish	0.0134 (0.0114)	0 (0)	0 (0)	51 (104)	560 (529)	26 (54)	0 (0)	0 (0)	637 (542)
Rockbass	0.0009 (0.0018)	0 (0)	0 (0)	43 (87)	0 (0)	0 (0)	0 (0)	0 (0)	43 (87)
Lake herring	0.0005 (0.0010)	0 (0)	22 (45)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	22 (45)
Smallmouth bass	0.1444 (0.1158)	0 (0)	19 (38)	3,969 (1,470)	2,826 (5,273)	43 (87)	0 (0)	0 (0)	6,857 (5,475)
Yellow perch	0.0276 (0.0245)	0 (0)	0 (0)	242 (500)	0 (0)	0 (0)	28 (57)	1,042 (1,044)	1,312 (1,159)
Freshwater drum	0.0041 (0.0057)	0 (0)	0 (0)	72 (112)	124 (249)	0 (0)	0 (0)	0 (0)	196 (273)
Lake whitefish	0.0190 (0.0202)	0 (0)	236 (464)	67 (137)	539 (816)	0 (0)	0 (0)	59 (89)	901 (953)
Round whitefish	0.0138 (0.0281)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	656 (1,334)	656 (1,334)
Other	0.0013 (0.0022)	0 (0)	0 (0)	51 (104)	0 (0)	0 (0)	0 (0)	13 (29)	64 (108)
<b>Total</b>	<b>0.2668 (0.1262)</b>	<b>599 (318)</b>	<b>577 (503)</b>	<b>4,810 (1,653)</b>	<b>4,135 (5,371)</b>	<b>225 (179)</b>	<b>213 (151)</b>	<b>2,108 (1,710)</b>	<b>12,667 (5,909)</b>
<b>Angler hours</b>		<b>6,210 (909)</b>	<b>6,467 (1,091)</b>	<b>7,587 (1,899)</b>	<b>12,185 (2,008)</b>	<b>6,631 (1,735)</b>	<b>3,342 (642)</b>	<b>5,048 (719)</b>	<b>47,470 (3,687)</b>
<b>Angler trips</b>		<b>1,565 (312)</b>	<b>1,901 (430)</b>	<b>2,524 (685)</b>	<b>3,074 (792)</b>	<b>1,978 (542)</b>	<b>948 (237)</b>	<b>1,454 (365)</b>	<b>13,444 (1,365)</b>
<b>Angler days</b>		<b>1,178 (263)</b>	<b>1,286 (329)</b>	<b>2,047 (633)</b>	<b>2,859 (793)</b>	<b>1,501 (458)</b>	<b>715 (200)</b>	<b>1,171 (323)</b>	<b>10,757 (1,249)</b>

Appendix 14.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Charlevoix, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month					Season
		May	Jun	Jul	Aug	Sep	
Pink salmon	0.0002 (0.0004)	0 (0)	0 (0)	0 (0)	11 (21)	0 (0)	11 (21)
Coho salmon	0.0001 (0.0002)	0 (0)	0 (0)	6 (12)	0 (0)	0 (0)	6 (12)
Chinook salmon	0.0362 (0.0144)	0 (0)	0 (0)	215 (184)	749 (458)	1,134 (632)	2,098 (802)
Rainbow trout	0.0009 (0.0010)	0 (0)	17 (34)	36 (51)	0 (0)	0 (0)	53 (61)
Brown trout	0.0049 (0.0053)	4 (8)	24 (34)	162 (270)	97 (140)	0 (0)	287 (306)
Lake trout	0.0599 (0.0210)	81 (100)	262 (302)	2,388 (1,040)	696 (380)	47 (59)	3,474 (1,154)
Channel catfish	0.0018 (0.0036)	0 (0)	0 (0)	0 (0)	106 (214)	0 (0)	106 (214)
Walleye	0.0002 (0.0004)	0 (0)	0 (0)	0 (0)	11 (22)	0 (0)	11 (22)
Burbot	0.0001 (0.0002)	8 (17)	0 (0)	0 (0)	0 (0)	0 (0)	8 (17)
<b>Total</b>	<b>0.1044 (0.0277)</b>	<b>93 (102)</b>	<b>303 (306)</b>	<b>2,807 (1,091)</b>	<b>1,670 (648)</b>	<b>1,181 (635)</b>	<b>6,054 (1,455)</b>
Angler hours		420 (326)	7,093 (2,615)	16,105 (4,086)	20,069 (3,766)	14,324 (2,214)	58,011 (6,536)
Angler trips		100 (79)	1,185 (469)	3,807 (1,025)	4,389 (866)	3,850 (710)	13,331 (1,591)
Angler days		100 (79)	955 (400)	3,612 (998)	4,351 (865)	3,488 (682)	12,506 (1,541)

Appendix 15.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Petoskey, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month					Season
		May	Jun	Jul	Aug	Sep	
Chinook salmon	0.0004 (0.0008)	0 (0)	0 (0)	13 (26)	0 (0)	0 (0)	13 (26)
Rainbow trout	0.0087 (0.0092)	91 (199)	0 (0)	181 (203)	0 (0)	0 (0)	272 (284)
Brown trout	0.0041 (0.0039)	20 (32)	95 (114)	0 (0)	13 (26)	0 (0)	128 (121)
Lake trout	0.0944 (0.0837)	160 (146)	709 (548)	1,244 (2,332)	845 (921)	0 (0)	2,958 (2,571)
Redhorses	0.0018 (0.0026)	0 (0)	57 (83)	0 (0)	0 (0)	0 (0)	57 (83)
Black bullhead	0.0002 (0.0004)	0 (0)	6 (12)	0 (0)	0 (0)	0 (0)	6 (12)
Rockbass	0.0012 (0.0021)	0 (0)	39 (68)	0 (0)	0 (0)	0 (0)	39 (68)
Smallmouth bass	0.0021 (0.0043)	0 (0)	66 (134)	0 (0)	0 (0)	0 (0)	66 (134)
Freshwater drum	0.0059 (0.0088)	0 (0)	0 (0)	186 (276)	0 (0)	0 (0)	186 (276)
Burbot	0.0073 (0.0144)	0 (0)	0 (0)	212 (448)	16 (34)	0 (0)	228 (449)
Other	0.0021 (0.0043)	0 (0)	66 (134)	0 (0)	0 (0)	0 (0)	66 (134)
<b>Total</b>	<b>0.1283 (0.0875)</b>	<b>271 (249)</b>	<b>1,038 (601)</b>	<b>1,836 (2,399)</b>	<b>874 (922)</b>	<b>0 (0)</b>	<b>4,019 (2,651)</b>
<b>Angler hours</b>		<b>1,867 (629)</b>	<b>11,332 (1,713)</b>	<b>10,088 (3,153)</b>	<b>7,064 (3,990)</b>	<b>972 (246)</b>	<b>31,323 (5,409)</b>
<b>Angler trips</b>		<b>711 (285)</b>	<b>2,794 (521)</b>	<b>2,894 (888)</b>	<b>2,552 (1,427)</b>	<b>486 (367)</b>	<b>9,437 (1,820)</b>
<b>Angler days</b>		<b>711 (285)</b>	<b>2,525 (494)</b>	<b>2,807 (885)</b>	<b>2,552 (1,427)</b>	<b>486 (367)</b>	<b>9,081 (1,811)</b>

Appendix 16.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Harbor Springs boat fishery (non-charter), 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month					Season
		May	Jun	Jul	Aug	Sep	
Chinook salmon	0.0014 (0.0030)	0 (0)	0 (0)	--- (0)	0 (0)	17 (36)	17 (36)
Rainbow trout	0.0044 (0.0092)	0 (0)	0 (0)	--- (0)	55 (114)	0 (0)	55 (114)
Brown trout	0.0452 (0.0502)	37 (59)	38 (78)	--- (0)	485 (599)	7 (15)	567 (607)
Lake trout	0.0423 (0.0546)	107 (219)	141 (234)	--- (0)	282 (584)	0 (0)	530 (666)
Smallmouth bass	0.0118 (0.0217)	0 (0)	131 (267)	--- (0)	0 (0)	17 (36)	148 (269)
Yellow perch	0.3167 (0.3412)	0 (0)	0 (0)	--- (0)	0 (0)	3,971 (4,112)	3,971 (4,112)
Total	0.4217 (0.3591)	144 (227)	310 (363)	--- (0)	822 (844)	4,012 (4,112)	5,288 (4,219)
Angler hours		913 (398)	2,318 (739)	--- (0)	6,711 (3,514)	2,598 (928)	12,540 (3,730)
Angler trips		260 (121)	520 (209)	--- (0)	1,496 (803)	656 (268)	2,932 (880)
Angler days		260 (121)	520 (209)	--- (0)	1,396 (780)	656 (268)	2,832 (859)

Appendix 17.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Big Bay de Noc boat fishery (non-charter), 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Northern pike	0.0054 (0.0049)	0 (0)	161 (249)	0 (0)	60 (84)	18 (37)	104 (155)	— (0)	343 (307)
Black bullhead	0.0003 (0.0007)	0 (0)	0 (0)	22 (48)	0 (0)	0 (0)	0 (0)	— (0)	22 (48)
Brown bullhead	0.0003 (0.0006)	0 (0)	16 (33)	0 (0)	0 (0)	0 (0)	0 (0)	— (0)	16 (33)
Rockbass	0.0151 (0.0294)	0 (0)	0 (0)	961 (1,867)	0 (0)	0 (0)	0 (0)	— (0)	961 (1,867)
Smallmouth bass	0.1149 (0.0522)	0 (0)	1,409 (1,002)	2,453 (1,399)	2,155 (2,421)	1,306 (1,235)	0 (0)	— (0)	7,323 (3,217)
Yellow perch	0.1942 (0.1012)	5,812 (4,400)	5,370 (3,797)	0 (0)	21 (42)	1,168 (2,384)	0 (0)	— (0)	12,371 (6,282)
Walleye	0.0274 (0.0160)	0 (0)	863 (717)	95 (208)	120 (149)	512 (601)	156 (231)	— (0)	1,746 (997)
Total	0.3576 (0.1231)	5,812 (4,400)	7,819 (4,000)	3,531 (2,343)	2,356 (2,427)	3,004 (2,752)	260 (278)	— (0)	22,782 (7,375)
Angler hours		6,251 (2,081)	20,419 (3,172)	9,447 (3,214)	14,354 (4,424)	9,895 (2,964)	3,350 (1,523)	— (0)	63,716 (7,443)
Angler trips		1,911 (868)	5,683 (1,064)	2,333 (831)	3,276 (1,055)	2,317 (741)	719 (362)	— (0)	16,239 (2,090)
Angler days		1,741 (728)	5,683 (1,064)	2,268 (795)	3,276 (1,055)	2,317 (741)	719 (362)	— (0)	16,004 (2,022)

Appendix 18.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Little Bay de Noc boat fishery (non-charter), 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Brown trout	0.0001 (0.0002)	33 (50)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	33 (50)
Splake	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	16 (32)	16 (32)
Northern pike	0.0081 (0.0064)	0 (0)	310 (481)	34 (68)	940 (1,255)	539 (869)	73 (108)	157 (127)	2,053 (1,611)
Brown bullhead	0.0004 (0.0007)	0 (0)	0 (0)	0 (0)	84 (171)	0 (0)	13 (27)	0 (0)	97 (173)
White bass	0.0003 (0.0005)	0 (0)	21 (42)	0 (0)	62 (127)	0 (0)	0 (0)	0 (0)	83 (134)
Rockbass	0.0086 (0.0091)	0 (0)	576 (1,167)	503 (619)	113 (134)	970 (1,875)	26 (53)	0 (0)	2,188 (2,298)
Pumpkinseed	0.0022 (0.0029)	0 (0)	336 (681)	107 (219)	84 (124)	0 (0)	25 (50)	0 (0)	552 (728)
Bluegill	0.0002 (0.0004)	0 (0)	0 (0)	0 (0)	0 (0)	41 (83)	0 (0)	0 (0)	41 (83)
Smallmouth bass	0.0057 (0.0044)	0 (0)	0 (0)	1,033 (1,046)	93 (140)	70 (140)	252 (322)	0 (0)	1,448 (1,112)
Largemouth bass	0.0004 (0.0008)	0 (0)	0 (0)	94 (191)	0 (0)	0 (0)	0 (0)	0 (0)	94 (191)
Black crappie	0.0038 (0.0077)	0 (0)	960 (1,946)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	960 (1,946)
Yellow perch	0.0703 (0.0348)	2,433 (2,593)	9,468 (7,834)	947 (723)	2,615 (2,045)	1,724 (1,664)	676 (536)	9 (18)	17,872 (8,710)
Walleye	0.0670 (0.0204)	0 (0)	4,820 (3,154)	1,069 (805)	2,893 (1,909)	5,624 (3,013)	781 (377)	1,844 (1,026)	17,031 (4,951)
Freshwater drum	0.0003 (0.0006)	0 (0)	0 (0)	0 (0)	84 (171)	0 (0)	0 (0)	0 (0)	84 (171)
Total	0.1675 (0.0447)	2,466 (2,593)	16,491 (8,784)	3,787 (1,654)	6,968 (3,087)	8,968 (4,018)	1,846 (742)	2,026 (1,034)	42,552 (10,673)
Angler hours		8,001 (3,795)	58,949 (10,850)	41,792 (10,658)	39,703 (8,162)	53,585 (10,138)	19,623 (5,081)	32,444 (9,240)	254,097 (22,941)
Angler trips		2,715 (1,252)	13,884 (2,856)	10,010 (2,642)	9,552 (2,066)	11,461 (2,426)	3,951 (1,072)	5,485 (1,573)	57,058 (5,521)
Angler days		2,715 (1,252)	13,597 (2,843)	9,911 (2,622)	9,279 (2,030)	11,461 (2,426)	3,951 (1,072)	5,435 (1,560)	56,349 (5,488)

Appendix 19.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Cedar River (river fishery), by all modes of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month						Season
		May	Jun	Jul	Aug	Sep	Oct	
Chinook salmon	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (2)	1 (2)
Rainbow trout	0.0014 (0.0018)	0 (0)	0 (0)	0 (0)	0 (0)	8 (16)	7 (10)	15 (19)
Brown trout	0.0932 (0.0705)	357 (505)	264 (482)	307 (268)	19 (40)	38 (79)	39 (45)	1,024 (754)
Splake	0.0076 (0.0066)	0 (0)	0 (0)	0 (0)	0 (0)	75 (69)	8 (18)	83 (71)
Redhorses	0.0077 (0.0159)	85 (175)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	85 (175)
Rockbass	0.0019 (0.0026)	0 (0)	21 (29)	0 (0)	0 (0)	0 (0)	0 (0)	21 (29)
Bluegill	0.0046 (0.0094)	0 (0)	0 (0)	50 (102)	0 (0)	0 (0)	0 (0)	50 (102)
Smallmouth bass	0.0182 (0.0192)	0 (0)	105 (171)	38 (77)	57 (89)	0 (0)	0 (0)	200 (208)
Black crappie	0.0025 (0.0049)	0 (0)	27 (53)	0 (0)	0 (0)	0 (0)	0 (0)	27 (53)
Yellow perch	0.0181 (0.0209)	0 (0)	0 (0)	199 (227)	0 (0)	0 (0)	0 (0)	199 (227)
Walleye	0.0138 (0.0222)	0 (0)	106 (235)	46 (63)	0 (0)	0 (0)	0 (0)	152 (243)
<b>Total</b>	<b>0.1690 (0.0851)</b>	<b>442 (534)</b>	<b>523 (566)</b>	<b>640 (379)</b>	<b>76 (98)</b>	<b>121 (106)</b>	<b>55 (50)</b>	<b>1,857 (879)</b>
Angler hours		1,758 (666)	2,383 (1,255)	3,749 (1,061)	1,139 (386)	958 (342)	1,001 (372)	10,988 (1,884)
Angler trips		964 (422)	1,393 (796)	1,703 (510)	557 (212)	440 (161)	386 (150)	5,443 (1,079)
Angler days		964 (422)	1,393 (796)	1,703 (510)	557 (212)	440 (161)	378 (147)	5,435 (1,079)

Appendix 20.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Lake Michigan boat fishery (non-charter) in the vicinity of Cedar River, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month						Season
		Apr	May	Jun	Jul	Aug	Sep	
Chinook salmon	0.0084 (0.0060)	40 (81)	0 (0)	0 (0)	123 (73)	143 (186)	0 (0)	306 (216)
Rainbow trout	0.0048 (0.0026)	0 (0)	0 (0)	0 (0)	100 (61)	75 (71)	0 (0)	175 (94)
Brown trout	0.0727 (0.0215)	2,067 (693)	185 (134)	0 (0)	267 (118)	146 (156)	0 (0)	2,665 (732)
Brook trout	0.0021 (0.0025)	78 (92)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	78 (92)
Splake	0.0218 (0.0103)	669 (343)	93 (123)	0 (0)	35 (29)	3 (7)	0 (0)	800 (366)
Northern pike	0.0009 (0.0018)	0 (0)	0 (0)	0 (0)	0 (0)	32 (64)	0 (0)	32 (64)
Smallmouth bass	0.0223 (0.0408)	0 (0)	0 (0)	750 (1,493)	37 (73)	31 (45)	0 (0)	818 (1,495)
Yellow perch	0.4518 (0.2120)	0 (0)	0 (0)	10,489 (6,588)	4,452 (3,286)	1,611 (1,668)	0 (0)	16,552 (7,549)
Total	0.5849 (0.2209)	2,854 (783)	278 (182)	11,239 (6,755)	5,014 (3,290)	2,041 (1,689)	0 (0)	21,426 (7,743)
Angler hours		12,667 (1,936)	3,305 (1,101)	4,570 (1,975)	10,678 (2,186)	4,170 (1,265)	1,244 (987)	36,634 (4,027)
Angler trips		3,328 (541)	730 (276)	1,509 (669)	1,819 (528)	1,001 (303)	475 (341)	8,862 (1,142)
Angler days		3,328 (541)	730 (276)	1,509 (669)	1,819 (528)	1,001 (303)	475 (341)	8,862 (1,142)



Appendix 21.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the area from Klinko Park to Stoney Point (Menominee County), by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Brown trout	0.0731 (0.0473)	615 (464)	— (0)	— (0)	204 (187)	— (0)	— (0)	60 (107)	879 (512)
Splake	0.0204 (0.0293)	246 (346)	— (0)	— (0)	0 (0)	— (0)	— (0)	0 (0)	246 (346)
Yellow perch	0.6406 (0.4521)	0 (0)	— (0)	— (0)	7,708 (4,989)	— (0)	— (0)	0 (0)	7,708 (4,989)
Total	0.7341 (0.4662)	861 (579)	— (0)	— (0)	7,912 (4,993)	— (0)	— (0)	60 (107)	8,833 (5,028)
Angler hours		2,389 (866)	— (0)	— (0)	9,433 (3,269)	— (0)	— (0)	210 (194)	12,032 (3,387)
Angler trips		557 (211)	— (0)	— (0)	2,508 (936)	— (0)	— (0)	60 (66)	3,125 (962)
Angler days		557 (211)	— (0)	— (0)	2,508 (936)	— (0)	— (0)	60 (66)	3,125 (962)

Appendix 22.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Menominee River, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Chinook salmon	0.0027 (0.0021)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	185 (190)	83 (86)	268 (209)
Rainbow trout	0.0151 (0.0117)	454 (446)	219 (285)	506 (1,017)	0 (0)	50 (101)	103 (157)	191 (154)	1,523 (1,172)
Brown trout	0.0457 (0.0129)	877 (732)	55 (117)	0 (0)	0 (0)	0 (0)	2,522 (927)	1,149 (403)	4,603 (1,253)
Splake	0.0030 (0.0036)	300 (358)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	300 (358)
Northern pike	0.0012 (0.0027)	0 (0)	9 (18)	0 (0)	0 (0)	0 (0)	115 (273)	0 (0)	124 (274)
White sucker	0.0124 (0.0120)	592 (808)	396 (799)	0 (0)	0 (0)	81 (163)	180 (364)	0 (0)	1,249 (1,204)
Redhorses	0.0017 (0.0035)	168 (345)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	168 (345)
Black bullhead	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	7 (15)	0 (0)	7 (15)
Channel catfish	0.0037 (0.0031)	0 (0)	261 (271)	36 (74)	59 (121)	0 (0)	14 (28)	0 (0)	370 (307)
Rockbass	0.0036 (0.0067)	0 (0)	0 (0)	43 (88)	324 (674)	0 (0)	0 (0)	0 (0)	367 (680)
Bluegill	0.0239 (0.0280)	0 (0)	475 (959)	1,390 (2,561)	0 (0)	437 (624)	100 (202)	0 (0)	2,402 (2,812)
Smallmouth bass	0.0055 (0.0043)	0 (0)	207 (222)	72 (147)	188 (276)	86 (186)	0 (0)	0 (0)	553 (426)
Black crappie	0.0585 (0.0960)	0 (0)	0 (0)	5,875 (9,658)	0 (0)	0 (0)	14 (29)	0 (0)	5,889 (9,658)
Yellow perch	0.0389 (0.0221)	1,921 (1,738)	1,947 (1,346)	0 (0)	0 (0)	0 (0)	45 (68)	0 (0)	3,913 (2,199)
Walleye	0.0874 (0.0292)	1,184 (727)	2,973 (1,774)	1,269 (1,187)	1,164 (865)	2,080 (1,535)	98 (145)	31 (62)	8,799 (2,866)
Other	0.0047 (0.0063)	0 (0)	0 (0)	253 (509)	0 (0)	0 (0)	0 (0)	217 (375)	470 (632)
Total	0.3081 (0.1114)	5,496 (2,277)	6,542 (2,595)	9,444 (10,128)	1,735 (1,137)	2,734 (1,678)	3,383 (1,093)	1,671 (581)	31,005 (10,961)
Angler hours		9,677 (2,493)	15,295 (2,878)	23,369 (3,124)	8,478 (2,588)	18,777 (3,854)	14,645 (3,249)	10,384 (1,500)	100,625 (7,656)
Angler trips		3,728 (1,045)	5,255 (977)	10,361 (1,677)	2,125 (782)	7,073 (1,476)	4,530 (1,317)	2,857 (471)	35,929 (3,099)
Angler days		3,728 (1,045)	5,255 (977)	10,361 (1,677)	2,125 (782)	7,073 (1,476)	4,530 (1,317)	2,857 (471)	35,929 (3,099)

Appendix 23.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Menominee, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0006 (0.0007)	0 (0)	0 (0)	0 (0)	63 (76)	0 (0)	0 (0)	0 (0)	63 (76)
Chinook salmon	0.0037 (0.0040)	0 (0)	55 (111)	0 (0)	215 (408)	68 (84)	66 (60)	0 (0)	404 (435)
Rainbow trout	0.0056 (0.0059)	0 (0)	0 (0)	268 (555)	138 (231)	133 (183)	76 (120)	0 (0)	615 (640)
Brown trout	0.1547 (0.0393)	1,783 (969)	517 (571)	201 (416)	7,544 (2,348)	6,352 (2,849)	559 (431)	23 (36)	16,979 (3,906)
Splake	0.0036 (0.0032)	151 (171)	110 (223)	89 (185)	41 (72)	0 (0)	0 (0)	0 (0)	391 (344)
Northern pike	0.0014 (0.0019)	0 (0)	0 (0)	0 (0)	0 (0)	54 (109)	100 (173)	0 (0)	154 (204)
Black bullhead	0.0007 (0.0010)	0 (0)	0 (0)	70 (103)	6 (12)	0 (0)	0 (0)	0 (0)	76 (104)
Bluegill	0.0008 (0.0012)	0 (0)	0 (0)	28 (57)	60 (113)	0 (0)	0 (0)	0 (0)	88 (127)
Black crappie	0.0014 (0.0016)	0 (0)	0 (0)	143 (173)	0 (0)	0 (0)	14 (29)	0 (0)	157 (175)
Yellow perch	0.1228 (0.0479)	628 (1,291)	1,344 (2,085)	6,969 (2,697)	4,531 (3,498)	0 (0)	9 (18)	0 (0)	13,481 (5,052)
Walleye	0.0094 (0.0074)	396 (491)	146 (297)	134 (278)	250 (449)	108 (218)	0 (0)	0 (0)	1,034 (810)
Other	0.0000 (0.0000)	0 (0)	0 (0)	3 (6)	0 (0)	0 (0)	0 (0)	0 (0)	3 (6)
<b>Total</b>	<b>0.3046 (0.0678)</b>	<b>2,958 (1,696)</b>	<b>2,172 (2,196)</b>	<b>7,905 (2,813)</b>	<b>12,848 (4,265)</b>	<b>6,715 (2,866)</b>	<b>824 (485)</b>	<b>23 (36)</b>	<b>33,445 (6,500)</b>
Angler hours		10,667 (3,307)	10,806 (4,653)	15,035 (3,804)	36,568 (7,251)	25,015 (5,240)	11,537 (3,742)	161 (134)	109,789 (11,879)
Angler trips		2,645 (873)	1,955 (803)	4,287 (1,104)	7,457 (1,517)	5,481 (1,319)	3,200 (935)	82 (72)	25,107 (2,747)
Angler days		2,645 (873)	1,955 (803)	4,287 (1,104)	7,370 (1,498)	5,405 (1,316)	3,188 (934)	82 (72)	24,932 (2,735)

Appendix 24.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Rogers City boat fishery (non-charter), 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month					Season
		May	Jun	Jul	Aug	Sep	
Pink salmon	0.0041 (0.0035)	0 (0)	0 (0)	8 (16)	62 (45)	207 (230)	277 (235)
Coho salmon	0.0001 (0.0002)	0 (0)	0 (0)	8 (16)	0 (0)	0 (0)	8 (16)
Chinook salmon	0.0935 (0.0168)	0 (0)	4 (5)	1,223 (321)	3,632 (747)	1,456 (429)	6,315 (919)
Rainbow trout	0.0022 (0.0011)	3 (6)	0 (0)	98 (60)	40 (35)	7 (14)	148 (71)
Brown trout	0.0014 (0.0009)	7 (15)	1 (3)	19 (23)	65 (48)	0 (0)	92 (55)
Brook trout	0.0001 (0.0002)	0 (0)	0 (0)	10 (20)	0 (0)	0 (0)	10 (20)
Lake trout	0.0036 (0.0024)	0 (0)	21 (33)	204 (156)	19 (25)	0 (0)	244 (161)
Yellow perch	0.0000 (0.0000)	0 (0)	2 (3)	0 (0)	0 (0)	0 (0)	2 (3)
Walleye	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	4 (7)	0 (0)	4 (7)
Round whitefish	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	3 (7)	0 (0)	3 (7)
Total	0.1052 (0.0182)	10 (16)	28 (34)	1,570 (364)	3,825 (751)	1,670 (487)	7,103 (967)
Angler hours		552 (197)	718 (224)	15,313 (2,669)	36,581 (5,949)	14,384 (2,946)	67,548 (7,161)
Angler trips		257 (95)	219 (75)	3,417 (605)	7,775 (1,283)	3,128 (662)	14,796 (1,570)
Angler days		257 (95)	219 (75)	3,417 (605)	7,775 (1,283)	3,128 (662)	14,796 (1,570)

Appendix 25.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Rockport, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month						Season
		May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0074 (0.0042)	— (0)	0 (0)	173 (165)	159 (83)	0 (0)	0 (0)	332 (185)
Coho salmon	0.0002 (0.0003)	— (0)	0 (0)	11 (18)	0 (0)	0 (0)	0 (0)	11 (18)
Chinook salmon	0.1101 (0.0208)	— (0)	54 (58)	2,061 (560)	2,785 (560)	47 (40)	24 (31)	4,971 (796)
Rainbow trout	0.0043 (0.0019)	— (0)	7 (10)	115 (72)	64 (41)	0 (0)	6 (8)	192 (84)
Brown trout	0.0027 (0.0027)	— (0)	0 (0)	51 (103)	39 (49)	0 (0)	31 (37)	121 (120)
Lake trout	0.0077 (0.0033)	— (0)	53 (88)	140 (88)	154 (73)	0 (0)	0 (0)	347 (144)
Walleye	0.0004 (0.0005)	— (0)	0 (0)	0 (0)	20 (24)	0 (0)	0 (0)	20 (24)
<b>Total</b>	<b>0.1328</b> <b>(0.0230)</b>	<b>—</b> <b>(0)</b>	<b>114</b> <b>(106)</b>	<b>2,551</b> <b>(604)</b>	<b>3,221</b> <b>(575)</b>	<b>47</b> <b>(40)</b>	<b>61</b> <b>(49)</b>	<b>5,994</b> <b>(843)</b>
Angler hours		— (0)	1,368 (428)	17,571 (3,203)	24,390 (3,186)	775 (370)	1,044 (240)	45,148 (4,559)
Angler trips		— (0)	371 (121)	3,267 (608)	4,248 (573)	337 (164)	371 (101)	8,594 (866)
Angler days		— (0)	371 (121)	3,267 (608)	4,248 (573)	337 (164)	371 (101)	8,594 (866)

Appendix 26.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Alpena, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0026 (0.0010)	0 (0)	0 (0)	0 (0)	177 (73)	11 (13)	10 (18)	31 (43)	229 (88)
Coho salmon	0.0001 (0.0001)	0 (0)	0 (0)	0 (0)	10 (14)	0 (0)	0 (0)	0 (0)	10 (14)
Chinook salmon	0.0588 (0.0086)	0 (0)	59 (47)	301 (197)	3,059 (562)	657 (247)	143 (88)	1,046 (274)	5,265 (708)
Rainbow trout	0.0076 (0.0021)	47 (33)	28 (56)	13 (16)	443 (137)	29 (39)	8 (16)	116 (103)	684 (189)
Atlantic salmon	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	3 (5)	0 (0)	0 (0)	0 (0)	3 (5)
Brown trout	0.0376 (0.0077)	335 (124)	74 (47)	425 (409)	1,712 (421)	607 (226)	65 (54)	148 (132)	3,366 (658)
Lake trout	0.0047 (0.0014)	0 (0)	12 (22)	0 (0)	375 (114)	27 (35)	4 (9)	0 (0)	418 (122)
Northern pike	0.0000 (0.0000)	4 (5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4 (5)
Channel catfish	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	2 (4)	0 (0)	0 (0)	2 (4)
Smallmouth bass	0.0001 (0.0002)	0 (0)	0 (0)	11 (23)	0 (0)	0 (0)	0 (0)	0 (0)	11 (23)
Yellow perch	0.0005 (0.0006)	13 (27)	12 (25)	0 (0)	23 (45)	0 (0)	0 (0)	0 (0)	48 (58)
Walleye	0.0070 (0.0024)	160 (98)	407 (178)	0 (0)	34 (45)	26 (31)	4 (8)	0 (0)	631 (211)
Freshwater drum	0.0007 (0.0011)	0 (0)	0 (0)	0 (0)	66 (105)	0 (0)	0 (0)	0 (0)	66 (105)
Lake whitefish	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	5 (10)	0 (0)	0 (0)	0 (0)	5 (10)
Total	0.1199 (0.0135)	559 (164)	592 (201)	750 (455)	5,907 (739)	1,359 (341)	234 (107)	1,341 (324)	10,742 (1,026)
Angler hours		4,671 (839)	4,649 (960)	5,178 (1,491)	51,497 (4,372)	11,356 (1,853)	6,606 (1,199)	5,626 (565)	89,583 (5,306)
Angler trips		1,524 (278)	1,338 (301)	1,112 (332)	7,034 (606)	2,228 (376)	1,711 (322)	1,126 (164)	16,073 (958)
Angler days		1,524 (278)	1,338 (301)	1,112 (332)	7,034 (606)	2,228 (376)	1,711 (322)	1,126 (164)	16,073 (958)

Appendix 27.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Harrisville, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month					Season
		Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0030 (0.0018)	0 (0)	79 (79)	87 (72)	46 (53)	19 (43)	231 (127)
Coho salmon	0.0002 (0.0004)	0 (0)	0 (0)	0 (0)	12 (25)	0 (0)	12 (25)
Chinook salmon	0.1103 (0.0356)	28 (42)	330 (334)	651 (407)	3,813 (1,664)	3,700 (1,228)	8,522 (2,134)
Rainbow trout	0.0043 (0.0025)	9 (20)	114 (127)	118 (95)	59 (57)	30 (49)	330 (177)
Atlantic salmon	0.0001 (0.0003)	0 (0)	6 (15)	0 (0)	0 (0)	0 (0)	6 (15)
Brown trout	0.0010 (0.0007)	3 (7)	15 (22)	38 (39)	13 (18)	12 (27)	81 (56)
Lake trout	0.0062 (0.0038)	29 (56)	219 (237)	184 (126)	49 (43)	0 (0)	481 (278)
Yellow perch	0.0008 (0.0013)	35 (81)	25 (50)	0 (0)	0 (0)	0 (0)	60 (95)
Walleye	0.0005 (0.0005)	0 (0)	4 (10)	22 (28)	16 (27)	0 (0)	42 (40)
Lake whitefish	0.0000 (0.0000)	0 (0)	0 (0)	3 (7)	0 (0)	0 (0)	3 (7)
Total	0.1265 (0.0381)	104 (109)	792 (440)	1,103 (445)	4,008 (1,667)	3,761 (1,230)	9,768 (2,167)
Angler hours		5,643 (5,144)	8,258 (7,409)	10,271 (5,785)	37,402 (11,086)	15,669 (3,263)	77,243 (15,760)
Angler trips		1,234 (1,152)	1,551 (1,386)	2,086 (1,173)	7,695 (2,366)	3,268 (778)	15,834 (3,290)
Angler days		1,205 (1,141)	1,378 (1,220)	1,894 (1,067)	5,052 (1,599)	2,209 (560)	11,738 (2,608)

Appendix 28.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Oscoda, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month						Season
		May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0029 (0.0028)	0 (0)	0 (0)	177 (204)	98 (186)	24 (39)	0 (0)	299 (279)
Coho salmon	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	5 (11)	0 (0)	5 (11)
Chinook salmon	0.0240 (0.0092)	0 (0)	58 (65)	561 (388)	891 (514)	1,008 (475)	0 (0)	2,518 (803)
Rainbow trout	0.0080 (0.0044)	28 (31)	8 (16)	386 (266)	220 (198)	6 (9)	188 (264)	836 (425)
Atlantic salmon	0.0002 (0.0005)	0 (0)	0 (0)	0 (0)	18 (43)	0 (0)	0 (0)	18 (43)
Brown trout	0.0016 (0.0011)	0 (0)	0 (0)	36 (49)	129 (105)	6 (13)	0 (0)	171 (117)
Lake trout	0.0075 (0.0043)	0 (0)	60 (68)	379 (332)	344 (233)	0 (0)	0 (0)	783 (411)
White sucker	0.0002 (0.0004)	26 (57)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	26 (57)
Channel catfish	0.0017 (0.0018)	0 (0)	17 (36)	139 (171)	5 (11)	15 (30)	0 (0)	176 (178)
Rockbass	0.0003 (0.0006)	0 (0)	0 (0)	32 (67)	0 (0)	0 (0)	0 (0)	32 (67)
Yellow perch	0.0013 (0.0022)	0 (0)	138 (229)	0 (0)	0 (0)	0 (0)	0 (0)	138 (229)
Walleye	0.0135 (0.0069)	482 (472)	202 (209)	547 (380)	162 (135)	7 (11)	16 (24)	1,416 (656)
Freshwater drum	0.0367 (0.0422)	196 (305)	155 (255)	3,491 (4,333)	5 (11)	0 (0)	0 (0)	3,847 (4,351)
Round whitefish	0.0017 (0.0012)	29 (59)	0 (0)	0 (0)	0 (0)	5 (11)	146 (106)	180 (122)
Burbot	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	10 (20)	10 (20)
Total	0.0998 (0.0482)	761 (569)	638 (414)	5,748 (4,396)	1,872 (651)	1,076 (478)	360 (286)	10,455 (4,534)
Angler hours		6,553 (2,836)	6,135 (2,978)	25,758 (12,234)	32,443 (14,293)	28,818 (11,183)	5,087 (2,257)	104,794 (22,384)
Angler trips		2,020 (716)	1,495 (741)	5,606 (2,721)	5,967 (2,712)	6,228 (2,369)	1,274 (524)	22,590 (4,659)
Angler days		1,551 (558)	1,174 (600)	5,217 (2,527)	4,786 (2,238)	4,674 (1,841)	885 (389)	18,287 (3,950)



Appendix 29.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Tawas, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0010 (0.0017)	0 (0)	0 (0)	7 (14)	0 (0)	0 (0)	68 (129)	0 (0)	75 (130)
Chinook salmon	0.0161 (0.0094)	0 (0)	116 (96)	136 (124)	200 (196)	25 (36)	705 (629)	10 (18)	1,192 (678)
Rainbow trout	0.0102 (0.0051)	195 (240)	28 (32)	16 (24)	62 (78)	11 (22)	144 (170)	297 (200)	753 (367)
Brown trout	0.0038 (0.0042)	235 (310)	9 (19)	0 (0)	0 (0)	13 (20)	21 (43)	6 (12)	284 (314)
Lake trout	0.0002 (0.0003)	0 (0)	0 (0)	7 (15)	7 (15)	0 (0)	0 (0)	0 (0)	14 (21)
Northern pike	0.0119 (0.0146)	0 (0)	17 (27)	16 (33)	0 (0)	260 (218)	565 (1,056)	24 (34)	882 (1,080)
Channel catfish	0.0002 (0.0004)	0 (0)	0 (0)	0 (0)	0 (0)	18 (36)	0 (0)	0 (0)	18 (36)
Rockbass	0.0062 (0.0086)	0 (0)	0 (0)	8 (17)	450 (631)	0 (0)	0 (0)	0 (0)	458 (631)
Green sunfish	0.0002 (0.0004)	0 (0)	0 (0)	12 (25)	0 (0)	0 (0)	0 (0)	0 (0)	12 (25)
Pumpkinseed	0.0017 (0.0027)	0 (0)	0 (0)	0 (0)	30 (61)	95 (192)	0 (0)	0 (0)	125 (201)
Smallmouth bass	0.0002 (0.0004)	0 (0)	0 (0)	0 (0)	0 (0)	13 (26)	0 (0)	0 (0)	13 (26)
Yellow perch	0.2117 (0.1791)	154 (318)	612 (610)	1,514 (1,329)	9,243 (12,760)	940 (588)	2,478 (2,553)	734 (623)	15,675 (13,127)
Walleye	0.0258 (0.0116)	40 (46)	110 (154)	0 (0)	600 (425)	1,065 (679)	30 (51)	68 (111)	1,913 (826)
Freshwater drum	0.0021 (0.0026)	0 (0)	0 (0)	0 (0)	136 (189)	17 (36)	0 (0)	0 (0)	153 (192)
Other	0.0003 (0.0005)	0 (0)	9 (19)	0 (0)	13 (27)	0 (0)	0 (0)	0 (0)	22 (33)
<b>Total</b>	<b>0.2916 (0.1822)</b>	<b>624 (507)</b>	<b>901 (638)</b>	<b>1,716 (1,336)</b>	<b>10,741 (12,786)</b>	<b>2,457 (947)</b>	<b>4,011 (2,842)</b>	<b>1,139 (665)</b>	<b>21,589 (13,242)</b>
<b>Angler hours</b>		<b>6,627 (1,977)</b>	<b>7,997 (2,350)</b>	<b>7,836 (2,637)</b>	<b>18,814 (5,860)</b>	<b>13,494 (3,480)</b>	<b>14,721 (3,739)</b>	<b>4,542 (1,146)</b>	<b>74,031 (8,839)</b>
<b>Angler trips</b>		<b>2,622 (859)</b>	<b>2,580 (754)</b>	<b>2,338 (728)</b>	<b>5,075 (1,530)</b>	<b>3,758 (970)</b>	<b>4,835 (1,246)</b>	<b>1,551 (415)</b>	<b>22,759 (2,616)</b>
<b>Angler days</b>		<b>2,209 (726)</b>	<b>2,204 (672)</b>	<b>2,058 (693)</b>	<b>4,360 (1,329)</b>	<b>3,339 (877)</b>	<b>3,760 (990)</b>	<b>1,027 (281)</b>	<b>18,957 (2,248)</b>

Appendix 30.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Au Gres area, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	32 (66)	0 (0)	32 (66)
Chinook salmon	0.0015 (0.0011)	0 (0)	12 (24)	0 (0)	96 (197)	37 (77)	232 (214)	52 (77)	429 (312)
Rainbow trout	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	19 (38)	0 (0)	0 (0)	19 (38)
Brown trout	0.0006 (0.0009)	0 (0)	56 (94)	0 (0)	96 (197)	0 (0)	3 (6)	0 (0)	155 (218)
Rainbow smelt	0.0016 (0.0024)	453 (658)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	453 (658)
Northern pike	0.0008 (0.0010)	91 (198)	62 (129)	0 (0)	0 (0)	34 (70)	9 (19)	15 (33)	211 (249)
White sucker	0.0004 (0.0009)	123 (261)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	123 (261)
Yellow bullhead	0.0002 (0.0003)	0 (0)	28 (58)	0 (0)	0 (0)	41 (84)	0 (0)	0 (0)	69 (102)
Brown bullhead	0.0003 (0.0006)	0 (0)	83 (174)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	83 (174)
Channel catfish	0.0102 (0.0055)	0 (0)	673 (795)	467 (402)	1,310 (969)	384 (459)	18 (27)	13 (28)	2,865 (1,395)
Rockbass	0.0006 (0.0006)	0 (0)	36 (61)	16 (30)	54 (109)	41 (84)	24 (56)	0 (0)	171 (163)
Pumpkinseed	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5 (11)	0 (0)	5 (11)
Smallmouth bass	0.0022 (0.0024)	0 (0)	0 (0)	14 (30)	406 (564)	180 (332)	24 (36)	0 (0)	624 (656)
Largemouth bass	0.0002 (0.0003)	0 (0)	0 (0)	36 (75)	0 (0)	34 (70)	0 (0)	0 (0)	70 (103)
Black crappie	0.0001 (0.0002)	0 (0)	31 (65)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	31 (65)

Appendix 30.—Continued:

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Yellow perch	0.8128 (0.2900)	13,416 (11,055)	802 (826)	3,128 (2,823)	103,003 (53,511)	44,382 (21,558)	36,269 (16,902)	26,690 (15,671)	227,690 (63,169)
Walleye	0.0854 (0.0425)	16 (26)	357 (355)	0 (0)	13,372 (9,628)	9,358 (4,454)	809 (525)	22 (33)	23,934 (10,627)
Freshwater drum	0.0032 (0.0022)	0 (0)	0 (0)	212 (280)	370 (416)	222 (277)	84 (107)	0 (0)	888 (583)
Other	0.0001 (0.0002)	0 (0)	37 (77)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	37 (77)
<b>Total</b>	0.9206 (0.3082)	14,099 (11,079)	2,177 (1,230)	3,873 (2,866)	118,707 (54,384)	54,732 (22,023)	37,509 (16,912)	26,792 (15,671)	257,889 (64,084)
Angler hours		8,255 (3,686)	18,522 (7,166)	19,344 (7,629)	135,890 (56,181)	69,566 (24,646)	20,125 (6,988)	8,441 (3,376)	280,143 (62,826)
Angler trips		2,632 (1,136)	5,507 (1,901)	4,749 (1,759)	28,072 (11,901)	15,854 (5,708)	5,066 (1,775)	2,300 (918)	64,180 (13,646)
Angler days		2,430 (1,080)	4,647 (1,733)	4,352 (1,666)	26,553 (11,180)	15,076 (5,470)	4,498 (1,603)	1,935 (822)	59,491 (12,849)

Appendix 31.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the area from the mouth of the Saginaw River to Saganing Creek, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Northern pike	0.0002 (0.0003)	4 (9)	9 (19)	0 (0)	65 (132)	0 (0)	0 (0)	10 (21)	88 (135)
Yellow bullhead	0.0027 (0.0032)	0 (0)	727 (1,107)	327 (547)	0 (0)	0 (0)	0 (0)	0 (0)	1,054 (1,235)
Brown bullhead	0.0001 (0.0002)	0 (0)	27 (58)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	27 (58)
Channel catfish	0.0551 (0.0408)	0 (0)	580 (428)	735 (658)	4,301 (5,000)	15,167 (14,289)	367 (564)	29 (68)	21,179 (15,170)
White perch	0.0001 (0.0002)	0 (0)	25 (38)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	25 (38)
White bass	0.0072 (0.0042)	5 (10)	786 (619)	925 (1,160)	887 (720)	0 (0)	0 (0)	176 (295)	2,779 (1,528)
Green sunfish	0.0000 (0.0000)	0 (0)	0 (0)	14 (31)	0 (0)	0 (0)	0 (0)	0 (0)	14 (31)
Pumpkinseed	0.0004 (0.0005)	104 (190)	0 (0)	14 (31)	0 (0)	0 (0)	0 (0)	46 (83)	164 (210)
Bluegill	0.0001 (0.0002)	31 (73)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	31 (73)
Smallmouth bass	0.0004 (0.0008)	0 (0)	0 (0)	164 (334)	0 (0)	0 (0)	0 (0)	0 (0)	164 (334)
Largemouth bass	0.0025 (0.0030)	0 (0)	278 (347)	213 (340)	0 (0)	0 (0)	462 (1,009)	0 (0)	953 (1,120)
Black crappie	0.0011 (0.0020)	0 (0)	404 (721)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	404 (721)
Yellow perch	0.6734 (0.2125)	7,417 (8,055)	1,430 (1,240)	3,554 (2,700)	70,600 (33,733)	64,910 (36,257)	46,310 (28,178)	64,685 (32,171)	258,906 (65,994)
Walleye	0.0818 (0.0270)	1,251 (799)	834 (583)	3,425 (3,313)	15,744 (5,936)	9,104 (5,055)	661 (544)	445 (706)	31,464 (8,575)
Freshwater drum	0.0026 (0.0016)	0 (0)	456 (419)	243 (292)	213 (224)	100 (207)	0 (0)	0 (0)	1,012 (595)
Other	0.0001 (0.0002)	0 (0)	2 (5)	17 (36)	0 (0)	0 (0)	0 (0)	29 (68)	48 (77)
<b>Total</b>	<b>0.8279 (0.2351)</b>	<b>8,812 (8,097)</b>	<b>5,558 (2,119)</b>	<b>9,631 (4,545)</b>	<b>91,810 (34,623)</b>	<b>89,281 (39,298)</b>	<b>47,800 (28,207)</b>	<b>65,420 (32,180)</b>	<b>318,312 (68,301)</b>
Angler hours		10,942 (4,402)	19,389 (7,911)	37,446 (22,228)	167,748 (50,422)	108,576 (41,422)	26,104 (15,472)	14,277 (6,053)	384,482 (71,486)
Angler trips		3,322 (1,374)	4,299 (1,621)	9,178 (4,418)	30,566 (9,193)	18,426 (7,032)	5,792 (3,437)	3,586 (1,528)	75,169 (13,120)
Angler days		3,309 (1,372)	3,924 (1,489)	8,505 (4,263)	29,347 (8,869)	17,758 (6,805)	5,544 (3,270)	3,391 (1,462)	71,778 (12,652)

Appendix 32.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the area from the mouth of the Saginaw River to Essexville, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Rainbow trout	0.0008 (0.0017)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	74 (161)	74 (161)
Northern pike	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5 (12)	0 (0)	5 (12)
Yellow bullhead	0.0002 (0.0004)	0 (0)	0 (0)	14 (28)	0 (0)	0 (0)	0 (0)	0 (0)	14 (28)
Channel catfish	0.1771 (0.0767)	236 (432)	623 (514)	1,304 (922)	6,233 (4,109)	6,490 (4,516)	596 (510)	0 (0)	15,482 (6,232)
White perch	0.0216 (0.0392)	77 (131)	9 (18)	13 (26)	25 (52)	0 (0)	217 (457)	1,546 (3,378)	1,887 (3,412)
White bass	0.0336 (0.0183)	402 (609)	954 (857)	871 (832)	204 (386)	92 (186)	413 (593)	0 (0)	2,936 (1,527)
Rockbass	0.0006 (0.0008)	0 (0)	0 (0)	0 (0)	20 (43)	0 (0)	32 (59)	0 (0)	52 (73)
Pumpkinseed	0.0002 (0.0004)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	15 (33)	0 (0)	15 (33)
Smallmouth bass	0.0003 (0.0004)	0 (0)	0 (0)	13 (26)	0 (0)	0 (0)	11 (17)	0 (0)	24 (31)
Largemouth bass	0.0036 (0.0050)	0 (0)	183 (375)	95 (197)	0 (0)	0 (0)	33 (45)	0 (0)	311 (426)
White crappie	0.0014 (0.0029)	0 (0)	0 (0)	126 (263)	0 (0)	0 (0)	0 (0)	0 (0)	126 (263)
Black crappie	0.0025 (0.0052)	0 (0)	0 (0)	221 (461)	0 (0)	0 (0)	0 (0)	0 (0)	221 (461)
Yellow perch	0.5533 (0.2209)	1,561 (2,987)	350 (359)	179 (277)	3,713 (2,410)	7,297 (5,928)	13,989 (9,437)	21,272 (13,172)	48,361 (17,682)
Walleye	0.1039 (0.0344)	175 (274)	2,475 (1,185)	3,892 (1,908)	1,675 (1,085)	675 (749)	58 (96)	133 (178)	9,083 (2,627)
Freshwater drum	0.0087 (0.0069)	166 (346)	326 (419)	205 (219)	30 (33)	0 (0)	37 (57)	0 (0)	764 (590)
Other	0.0078 (0.0137)	63 (130)	16 (33)	567 (1,184)	0 (0)	0 (0)	37 (50)	0 (0)	683 (1,193)
Total	0.9158 (0.2658)	2,680 (3,116)	4,936 (1,688)	7,500 (2,652)	11,900 (4,901)	14,554 (7,492)	15,443 (9,482)	23,025 (13,600)	80,038 (19,355)
Angler hours		2,504 (1,425)	15,040 (5,111)	18,116 (6,818)	21,088 (7,862)	14,436 (3,827)	4,562 (2,483)	11,651 (6,266)	87,397 (14,019)
Angler trips		547 (298)	3,355 (1,155)	3,726 (1,454)	4,384 (1,766)	2,973 (926)	794 (439)	4,282 (2,841)	20,061 (3,972)
Angler days		544 (298)	3,078 (1,070)	3,369 (1,306)	3,903 (1,574)	2,271 (784)	794 (439)	3,493 (2,287)	17,452 (3,384)

Appendix 33.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the area from Quanicassee to Sebawaing, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
White sucker	0.0022 (0.0030)	233 (315)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	233 (315)
Yellow bullhead	0.0000 (0.0000)	0 (0)	3 (7)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (7)
Brown bullhead	0.0009 (0.0014)	0 (0)	17 (32)	67 (140)	0 (0)	0 (0)	0 (0)	7 (17)	91 (145)
Channel catfish	0.0322 (0.0168)	0 (0)	187 (265)	2,156 (1,347)	601 (448)	303 (568)	106 (204)	7 (17)	3,360 (1,565)
White perch	0.0002 (0.0003)	0 (0)	0 (0)	0 (0)	14 (30)	9 (20)	0 (0)	0 (0)	23 (36)
White bass	0.0036 (0.0040)	0 (0)	76 (157)	0 (0)	298 (378)	0 (0)	0 (0)	0 (0)	374 (409)
Pumpkinseed	0.0001 (0.0002)	15 (30)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	15 (30)
Bluegill	0.0014 (0.0022)	15 (30)	3 (6)	0 (0)	0 (0)	0 (0)	0 (0)	125 (223)	143 (225)
Smallmouth bass	0.0001 (0.0002)	0 (0)	6 (13)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	6 (13)
Largemouth bass	0.0001 (0.0002)	0 (0)	6 (13)	0 (0)	0 (0)	0 (0)	0 (0)	2 (5)	8 (14)
Black crappie	0.0012 (0.0026)	124 (270)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	124 (270)
Yellow perch	0.4529 (0.2630)	13,885 (12,209)	9 (17)	79 (119)	1,088 (967)	2,210 (1,933)	2,461 (2,731)	27,564 (21,639)	47,296 (25,089)
Walleye	0.0873 (0.0410)	0 (0)	0 (0)	121 (111)	5,666 (3,223)	3,123 (1,773)	207 (321)	0 (0)	9,117 (3,694)
Freshwater drum	0.0096 (0.0057)	0 (0)	11 (18)	634 (459)	221 (234)	92 (160)	42 (96)	0 (0)	1,000 (548)
Other	0.0007 (0.0009)	16 (35)	36 (73)	25 (53)	0 (0)	0 (0)	0 (0)	0 (0)	77 (97)
<b>Total</b>	<b>0.5924 (0.2808)</b>	<b>14,288 (12,216)</b>	<b>354 (320)</b>	<b>3,082 (1,440)</b>	<b>7,888 (3,424)</b>	<b>5,737 (2,689)</b>	<b>2,816 (2,759)</b>	<b>27,705 (21,640)</b>	<b>61,870 (25,422)</b>
Angler hours		15,280 (9,015)	4,576 (1,739)	10,136 (4,555)	46,393 (20,033)	19,275 (8,877)	2,908 (2,328)	5,868 (4,377)	104,436 (24,693)
Angler trips		7,474 (4,692)	1,728 (710)	2,113 (952)	9,462 (4,074)	3,542 (1,629)	661 (533)	2,966 (2,616)	27,946 (7,057)
Angler days		5,057 (3,188)	1,209 (528)	1,915 (870)	9,025 (3,909)	3,511 (1,614)	608 (496)	2,415 (2,082)	23,740 (5,802)

Appendix 34.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for from Sebawaing to Sand Point, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
White sucker	0.0009 (0.0014)	133 (207)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	133 (207)
Brown bullhead	0.0014 (0.0014)	67 (123)	43 (90)	109 (152)	0 (0)	0 (0)	0 (0)	0 (0)	219 (215)
Channel catfish	0.0772 (0.0417)	0 (0)	4,313 (3,572)	5,329 (4,336)	1,626 (1,550)	720 (1,175)	14 (24)	0 (0)	12,002 (5,945)
White perch	0.0013 (0.0021)	8 (16)	0 (0)	161 (326)	0 (0)	24 (52)	16 (39)	0 (0)	209 (333)
White bass	0.0006 (0.0012)	0 (0)	0 (0)	87 (179)	0 (0)	0 (0)	0 (0)	0 (0)	87 (179)
Rockbass	0.0019 (0.0028)	0 (0)	38 (80)	237 (421)	14 (28)	0 (0)	0 (0)	0 (0)	289 (429)
Bluegill	0.0029 (0.0038)	0 (0)	128 (262)	317 (514)	0 (0)	0 (0)	0 (0)	0 (0)	445 (577)
Smallmouth bass	0.0029 (0.0045)	0 (0)	326 (678)	50 (105)	48 (71)	9 (20)	11 (24)	0 (0)	444 (690)
Largemouth bass	0.0007 (0.0014)	0 (0)	104 (207)	1 (2)	0 (0)	0 (0)	0 (0)	0 (0)	105 (207)
Black crappie	0.0089 (0.0079)	240 (303)	905 (1,089)	241 (398)	0 (0)	0 (0)	0 (0)	0 (0)	1,386 (1,198)
Yellow perch	0.4529 (0.1875)	42,554 (19,637)	2,074 (3,909)	1,453 (1,786)	9,124 (7,937)	3,858 (5,328)	3,122 (3,399)	8,264 (10,740)	70,449 (24,947)
Walleye	0.1441 (0.0640)	0 (0)	0 (0)	43 (65)	7,190 (3,172)	14,962 (8,113)	216 (241)	2 (5)	22,413 (8,715)
Freshwater drum	0.0109 (0.0067)	0 (0)	388 (400)	680 (814)	437 (340)	143 (156)	51 (73)	0 (0)	1,699 (984)
Other	0.0006 (0.0008)	0 (0)	76 (108)	12 (17)	0 (0)	0 (0)	0 (0)	0 (0)	88 (109)
<b>Total</b>	<b>0.7070 (0.2312)</b>	<b>43,002 (19,641)</b>	<b>8,395 (5,476)</b>	<b>8,720 (4,840)</b>	<b>18,439 (8,694)</b>	<b>19,716 (9,778)</b>	<b>3,430 (3,409)</b>	<b>8,266 (10,740)</b>	<b>109,968 (27,154)</b>
<b>Angler hours</b>		<b>16,293 (5,864)</b>	<b>13,491 (5,705)</b>	<b>18,531 (6,514)</b>	<b>43,833 (14,375)</b>	<b>56,276 (27,733)</b>	<b>4,082 (3,834)</b>	<b>3,040 (3,575)</b>	<b>155,546 (33,356)</b>
<b>Angler trips</b>		<b>8,454 (3,199)</b>	<b>3,897 (1,395)</b>	<b>3,473 (1,237)</b>	<b>8,843 (2,916)</b>	<b>11,048 (5,464)</b>	<b>837 (798)</b>	<b>2,002 (2,413)</b>	<b>38,554 (7,650)</b>
<b>Angler days</b>		<b>5,848 (2,277)</b>	<b>3,186 (1,192)</b>	<b>3,038 (1,117)</b>	<b>8,545 (2,832)</b>	<b>10,559 (5,235)</b>	<b>812 (767)</b>	<b>1,608 (1,923)</b>	<b>33,596 (6,897)</b>

Appendix 35.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the area from Sand Point to Port Austin, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0006 (0.0007)	0 (0)	30 (65)	0 (0)	59 (122)	0 (0)	47 (74)	0 (0)	136 (157)
Chinook salmon	0.0074 (0.0035)	0 (0)	0 (0)	119 (188)	199 (216)	427 (597)	862 (406)	174 (106)	1,781 (784)
Rainbow trout	0.0012 (0.0012)	0 (0)	0 (0)	0 (0)	134 (247)	76 (77)	70 (104)	0 (0)	280 (279)
Brown trout	0.0012 (0.0012)	34 (40)	136 (251)	0 (0)	24 (51)	56 (81)	31 (45)	0 (0)	281 (275)
Lake trout	0.0023 (0.0021)	0 (0)	59 (98)	300 (401)	169 (308)	20 (41)	20 (41)	0 (0)	568 (518)
White sucker	0.0002 (0.0004)	12 (17)	47 (110)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	59 (111)
Channel catfish	0.0079 (0.0049)	20 (40)	22 (49)	773 (729)	860 (854)	192 (178)	50 (78)	0 (0)	1,917 (1,141)
White perch	0.0001 (0.0002)	0 (0)	8 (19)	0 (0)	14 (29)	0 (0)	0 (0)	0 (0)	22 (35)
White bass	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	18 (37)	0 (0)	0 (0)	0 (0)	18 (37)
Rockbass	0.0006 (0.0010)	0 (0)	0 (0)	0 (0)	114 (232)	0 (0)	0 (0)	30 (61)	144 (240)
Smallmouth bass	0.0007 (0.0008)	0 (0)	0 (0)	85 (181)	48 (72)	19 (39)	16 (32)	0 (0)	168 (201)
White crappie	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	14 (29)	0 (0)	0 (0)	0 (0)	14 (29)
Black crappie	0.0004 (0.0007)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	99 (163)	99 (163)
Yellow perch	0.2849 (0.1050)	8,613 (3,988)	4,615 (3,294)	12,630 (11,462)	21,593 (12,352)	12,343 (8,875)	2,317 (2,023)	6,769 (9,508)	68,880 (21,999)
Walleye	0.1024 (0.0356)	0 (0)	16 (36)	145 (191)	12,333 (5,135)	12,053 (5,181)	218 (232)	0 (0)	24,765 (7,301)
Freshwater drum	0.0028 (0.0019)	10 (20)	18 (40)	21 (45)	273 (286)	212 (198)	146 (271)	0 (0)	680 (445)
Burbot	0.0000 (0.0000)	10 (21)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	10 (21)
Total	0.4129 (0.1226)	8,699 (3,989)	4,951 (3,308)	14,073 (11,497)	35,852 (13,418)	25,398 (10,298)	3,777 (2,100)	7,072 (9,510)	99,822 (23,237)
Angler hours		11,752 (4,274)	17,036 (7,533)	30,282 (11,931)	89,293 (31,635)	70,211 (27,122)	17,377 (4,895)	5,827 (2,208)	241,778 (44,526)
Angler trips		3,552 (1,299)	5,532 (2,445)	9,239 (3,171)	20,625 (6,580)	14,000 (5,476)	4,526 (1,232)	1,664 (627)	59,138 (9,639)
Angler days		2,468 (921)	4,146 (2,040)	7,669 (2,782)	18,293 (6,078)	12,537 (4,927)	3,244 (914)	1,135 (451)	49,492 (8,661)



Appendix 36.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the areas from Eagle Bay to Harbor Beach, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0008 (0.0007)	0 (0)	37 (47)	75 (103)	41 (72)	13 (26)	0 (0)	0 (0)	166 (137)
Coho salmon	0.0005 (0.0004)	0 (0)	36 (48)	53 (70)	9 (18)	0 (0)	6 (12)	0 (0)	104 (88)
Chinook salmon	0.0240 (0.0074)	284 (339)	949 (657)	1,233 (703)	575 (277)	850 (441)	648 (405)	154 (144)	4,693 (1,223)
Rainbow trout	0.0067 (0.0026)	22 (49)	440 (271)	255 (223)	196 (135)	188 (128)	208 (207)	0 (0)	1,309 (451)
Atlantic salmon	0.0001 (0.0002)	0 (0)	28 (47)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	28 (47)
Brown trout	0.0046 (0.0021)	63 (77)	281 (225)	28 (50)	244 (263)	203 (136)	54 (62)	24 (44)	897 (391)
Lake trout	0.0141 (0.0050)	0 (0)	150 (135)	1,069 (648)	592 (318)	726 (379)	226 (242)	0 (0)	2,763 (861)
Channel catfish	0.0013 (0.0010)	0 (0)	0 (0)	2 (5)	45 (44)	189 (188)	18 (37)	0 (0)	254 (197)
Rockbass	0.0003 (0.0006)	0 (0)	0 (0)	0 (0)	0 (0)	51 (103)	0 (0)	0 (0)	51 (103)
Lake herring	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	13 (26)	0 (0)	0 (0)	13 (26)
Smallmouth bass	0.0039 (0.0052)	0 (0)	144 (307)	508 (963)	17 (34)	38 (77)	58 (69)	0 (0)	765 (1,017)
Yellow perch	0.1238 (0.0516)	0 (0)	38 (69)	3,653 (3,217)	5,942 (5,258)	7,035 (4,156)	7,563 (5,576)	0 (0)	24,231 (9,293)
Walleye	0.0454 (0.0192)	0 (0)	0 (0)	0 (0)	1,934 (929)	6,537 (3,317)	405 (445)	7 (14)	8,883 (3,473)
Freshwater drum	0.0012 (0.0009)	0 (0)	0 (0)	0 (0)	67 (93)	114 (140)	57 (76)	0 (0)	238 (184)
Total	0.2268 (0.0636)	369 (351)	2,103 (824)	6,876 (3,501)	9,662 (5,366)	15,957 (5,359)	9,243 (5,619)	185 (151)	44,395 (10,108)
Angler hours		3,845 (2,927)	23,400 (11,644)	31,864 (12,826)	39,857 (11,525)	61,904 (21,446)	30,883 (11,258)	4,028 (1,492)	195,781 (32,100)
Angler trips		1,027 (652)	4,899 (2,227)	6,767 (2,489)	8,402 (2,434)	13,019 (4,656)	6,730 (2,445)	988 (390)	41,832 (6,731)
Angler days		722 (516)	3,982 (1,824)	5,896 (2,233)	7,089 (2,087)	11,044 (3,896)	5,228 (1,936)	646 (268)	34,607 (5,651)

Appendix 37.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Port Sanilac, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0003 (0.0005)	0 (0)	8 (15)	0 (0)	0 (0)	0 (0)	0 (0)	24 (48)	32 (50)
Coho salmon	0.0042 (0.0018)	15 (23)	78 (52)	175 (96)	126 (135)	0 (0)	25 (51)	27 (41)	446 (187)
Chinook salmon	0.0474 (0.0102)	233 (139)	1,261 (340)	683 (213)	343 (326)	46 (58)	1,739 (763)	736 (377)	5,041 (1,007)
Rainbow trout	0.0078 (0.0033)	15 (19)	432 (135)	231 (288)	87 (100)	43 (66)	18 (33)	0 (0)	826 (342)
Atlantic salmon	0.0005 (0.0004)	0 (0)	5 (11)	48 (46)	0 (0)	0 (0)	0 (0)	0 (0)	53 (47)
Brown trout	0.0113 (0.0071)	56 (60)	134 (76)	0 (0)	304 (458)	301 (443)	7 (11)	399 (388)	1,201 (752)
Lake trout	0.0001 (0.0002)	0 (0)	0 (0)	8 (16)	0 (0)	0 (0)	0 (0)	0 (0)	8 (16)
Northern pike	0.0003 (0.0004)	0 (0)	10 (22)	0 (0)	9 (18)	13 (26)	0 (0)	0 (0)	32 (39)
Channel catfish	0.0003 (0.0005)	0 (0)	0 (0)	7 (15)	23 (47)	0 (0)	0 (0)	0 (0)	30 (49)
Rockbass	0.0027 (0.0049)	0 (0)	0 (0)	283 (514)	0 (0)	0 (0)	0 (0)	0 (0)	283 (514)
Pumpkinseed	0.0003 (0.0006)	0 (0)	0 (0)	0 (0)	0 (0)	34 (70)	0 (0)	0 (0)	34 (70)
Smallmouth bass	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	6 (12)	0 (0)	0 (0)	0 (0)	6 (12)
Yellow perch	0.1100 (0.0407)	0 (0)	0 (0)	1,133 (698)	4,691 (2,865)	5,112 (2,956)	774 (672)	0 (0)	11,710 (4,229)
Walleye	0.0011 (0.0011)	0 (0)	52 (80)	0 (0)	11 (23)	19 (39)	39 (73)	0 (0)	121 (117)
Freshwater drum	0.0011 (0.0013)	0 (0)	0 (0)	0 (0)	95 (134)	18 (29)	0 (0)	0 (0)	113 (137)
Other	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	13 (27)	0 (0)	13 (27)
Total	0.1874 (0.0445)	319 (154)	1,980 (387)	2,568 (944)	5,695 (2,928)	5,586 (2,992)	2,615 (1,022)	1,186 (545)	19,949 (4,464)
Angler hours		4,053 (1,513)	21,239 (2,372)	17,941 (2,525)	16,105 (4,777)	12,908 (3,505)	23,067 (4,353)	11,125 (1,522)	106,438 (8,406)
Angler trips		902 (342)	3,586 (464)	3,756 (529)	3,821 (994)	3,030 (800)	4,107 (810)	2,323 (352)	21,525 (1,738)
Angler days		902 (342)	3,427 (451)	3,553 (510)	3,821 (994)	3,030 (800)	4,060 (806)	2,323 (352)	21,116 (1,727)

Appendix 38.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Lexington, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0035 (0.0015)	55 (53)	153 (94)	97 (72)	14 (28)	0 (0)	0 (0)	0 (0)	319 (133)
Chinook salmon	0.0627 (0.0121)	1,736 (555)	1,558 (421)	172 (108)	98 (121)	59 (87)	919 (479)	1,122 (490)	5,664 (994)
Rainbow trout	0.0129 (0.0046)	78 (55)	497 (191)	291 (243)	91 (108)	76 (122)	97 (195)	36 (37)	1,166 (406)
Atlantic salmon	0.0006 (0.0006)	0 (0)	0 (0)	28 (35)	22 (34)	0 (0)	0 (0)	0 (0)	50 (49)
Brown trout	0.0058 (0.0023)	167 (95)	157 (110)	26 (35)	6 (13)	0 (0)	30 (43)	140 (129)	526 (203)
Northern pike	0.0022 (0.0031)	0 (0)	0 (0)	0 (0)	0 (0)	56 (115)	140 (247)	0 (0)	196 (272)
Yellow bullhead	0.0002 (0.0004)	0 (0)	0 (0)	14 (29)	0 (0)	0 (0)	0 (0)	0 (0)	14 (29)
Brown bullhead	0.0008 (0.0017)	0 (0)	0 (0)	0 (0)	68 (147)	0 (0)	0 (0)	0 (0)	68 (147)
Rockbass	0.0116 (0.0164)	0 (0)	0 (0)	123 (254)	249 (517)	636 (1,355)	38 (77)	0 (0)	1,046 (1,474)
Pumpkinseed	0.0072 (0.0150)	0 (0)	0 (0)	14 (29)	0 (0)	636 (1,355)	0 (0)	0 (0)	650 (1,355)
Smallmouth bass	0.0014 (0.0016)	0 (0)	27 (55)	22 (46)	0 (0)	56 (115)	19 (39)	0 (0)	124 (141)
Yellow perch	0.0978 (0.0663)	13 (26)	100 (99)	763 (859)	5,801 (5,160)	1,613 (2,728)	540 (692)	0 (0)	8,830 (5,941)
Walleye	0.0017 (0.0015)	0 (0)	46 (56)	0 (0)	19 (27)	75 (116)	13 (27)	1 (2)	154 (134)
Freshwater drum	0.0022 (0.0033)	0 (0)	0 (0)	0 (0)	196 (298)	0 (0)	0 (0)	0 (0)	196 (298)
Total	0.2104 (0.0727)	2,049 (569)	2,538 (501)	1,550 (941)	6,564 (5,199)	3,207 (3,343)	1,796 (904)	1,299 (508)	19,003 (6,383)
Angler hours		13,013 (2,612)	21,705 (3,995)	11,799 (3,228)	11,991 (3,602)	9,769 (1,540)	12,874 (2,027)	9,153 (1,467)	90,304 (7,403)
Angler trips		2,571 (519)	3,662 (698)	2,428 (630)	3,052 (862)	2,571 (748)	3,300 (625)	1,711 (334)	19,295 (1,720)
Angler days		2,571 (519)	3,606 (692)	2,362 (611)	3,052 (862)	2,571 (748)	3,300 (625)	1,711 (334)	19,173 (1,711)

Appendix 39.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the boat fishery (non-charter) in the area from Point Mouillee to the mouth of the Raisin River, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Rainbow trout	0.0003 (0.0002)	0 (0)	23 (28)	38 (49)	52 (70)	0 (0)	0 (0)	0 (0)	113 (90)
Northern pike	0.0001 (0.0001)	0 (0)	22 (47)	19 (40)	0 (0)	0 (0)	10 (21)	0 (0)	51 (65)
Muskellunge	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	17 (36)	0 (0)	0 (0)	0 (0)	17 (36)
Redhorses	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	27 (57)	0 (0)	27 (57)
Channel catfish	0.0034 (0.0021)	66 (164)	57 (67)	117 (114)	770 (652)	152 (135)	47 (71)	11 (16)	1,220 (702)
White perch	0.0122 (0.0082)	0 (0)	109 (106)	180 (170)	728 (1,281)	1,944 (1,994)	1,299 (1,385)	112 (202)	4,372 (2,760)
White bass	0.0125 (0.0066)	7 (21)	1,528 (1,313)	1,002 (639)	1,155 (1,347)	411 (512)	227 (465)	163 (253)	4,493 (2,119)
Rockbass	0.0016 (0.0016)	0 (0)	5 (10)	0 (0)	267 (525)	165 (214)	144 (160)	9 (16)	590 (589)
Bluegill	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	39 (82)	0 (0)	0 (0)	0 (0)	39 (82)
Smallmouth bass	0.0007 (0.0005)	0 (0)	0 (0)	0 (0)	103 (128)	115 (128)	32 (52)	10 (23)	260 (190)
Yellow perch	0.2814 (0.1138)	10 (19)	1,120 (679)	3,213 (1,750)	4,371 (2,433)	32,577 (18,746)	42,136 (24,049)	17,739 (13,867)	101,166 (33,638)
Walleye	0.2800 (0.1103)	305 (380)	8,405 (4,361)	36,234 (19,669)	50,311 (24,921)	5,404 (2,766)	10 (21)	0 (0)	100,669 (32,167)
Freshwater drum	0.0049 (0.0028)	0 (0)	18 (25)	413 (390)	689 (686)	539 (411)	86 (152)	3 (7)	1,748 (903)
Other	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	9 (19)	0 (0)	9 (19)
<b>Total</b>	<b>0.5975 (0.1893)</b>	<b>388 (415)</b>	<b>11,287 (4,607)</b>	<b>41,216 (19,762)</b>	<b>58,502 (25,132)</b>	<b>41,307 (19,067)</b>	<b>44,027 (24,095)</b>	<b>18,047 (13,871)</b>	<b>214,774 (46,691)</b>
Angler hours		2,046 (2,415)	38,901 (17,939)	98,407 (48,325)	116,215 (55,503)	66,116 (28,209)	31,090 (17,329)	6,698 (4,964)	359,473 (82,851)
Angler trips		460 (543)	7,666 (3,378)	19,078 (9,241)	22,198 (10,701)	12,396 (5,127)	6,516 (3,624)	1,363 (1,015)	69,677 (15,876)
Angler days		460 (543)	7,583 (3,336)	18,533 (8,991)	22,090 (10,664)	12,396 (5,127)	6,516 (3,624)	1,363 (1,015)	68,941 (15,698)

Appendix 40.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the boat fishery (non-charter) in the area from the mouth of the Raisin River to the Michigan-Ohio state line, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Rainbow trout	0.0002 (0.0002)	0 (0)	29 (43)	39 (43)	33 (69)	0 (0)	0 (0)	0 (0)	101 (92)
Redhorses	0.0000 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	20 (44)	0 (0)	20 (44)
Channel catfish	0.0430 (0.0181)	233 (430)	1,200 (919)	3,565 (2,904)	3,932 (3,816)	8,072 (5,736)	3,859 (3,318)	1,771 (1,524)	22,632 (8,382)
White perch	0.0124 (0.0070)	0 (0)	360 (324)	671 (1,241)	523 (681)	1,840 (1,980)	1,831 (1,867)	1,274 (1,525)	6,499 (3,441)
White bass	0.0780 (0.0387)	409 (749)	14,643 (11,670)	9,359 (8,807)	4,144 (5,897)	8,412 (9,317)	142 (211)	3,924 (3,342)	41,033 (18,631)
Rockbass	0.0015 (0.0012)	0 (0)	0 (0)	7 (15)	43 (64)	220 (265)	491 (557)	18 (29)	779 (621)
Pumpkinseed	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	13 (28)	13 (28)
Bluegill	0.0027 (0.0025)	0 (0)	0 (0)	0 (0)	0 (0)	1,058 (1,266)	183 (225)	199 (229)	1,440 (1,306)
Smallmouth bass	0.0009 (0.0012)	0 (0)	280 (579)	0 (0)	0 (0)	40 (58)	47 (75)	83 (102)	450 (596)
Largemouth bass	0.0005 (0.0008)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	106 (227)	141 (306)	247 (381)
Black crappie	0.0002 (0.0004)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	105 (203)	105 (203)
Yellow perch	0.6664 (0.2677)	0 (0)	1,846 (1,148)	8,937 (11,741)	11,960 (9,018)	201,773 (100,962)	98,612 (62,968)	27,532 (21,809)	350,660 (121,879)
Walleye	0.2459 (0.0825)	2,109 (3,383)	39,324 (18,978)	39,349 (18,989)	43,512 (21,580)	4,861 (2,511)	224 (309)	26 (43)	129,405 (34,703)
Freshwater drum	0.0133 (0.0066)	88 (188)	2,625 (2,425)	1,729 (1,614)	1,332 (1,066)	457 (391)	471 (542)	304 (265)	7,006 (3,190)
Other	0.0016 (0.0012)	80 (161)	74 (100)	362 (511)	0 (0)	0 (0)	71 (151)	270 (288)	857 (635)
<b>Total</b>	<b>1.0665 (0.3251)</b>	<b>2,919 (3,500)</b>	<b>60,381 (22,469)</b>	<b>64,018 (24,266)</b>	<b>65,479 (24,453)</b>	<b>226,733 (101,612)</b>	<b>106,057 (63,090)</b>	<b>35,660 (22,177)</b>	<b>561,247 (128,456)</b>
Angler hours		10,834 (13,775)	123,560 (59,081)	112,378 (49,946)	115,114 (53,500)	94,794 (33,571)	51,151 (30,299)	18,400 (11,942)	526,231 (105,947)
Angler trips		1,802 (2,274)	22,757 (11,116)	21,559 (10,016)	19,648 (9,236)	17,489 (6,246)	10,084 (6,071)	3,800 (2,442)	97,139 (19,905)
Angler days		1,781 (2,241)	22,531 (11,047)	21,472 (9,991)	19,507 (9,162)	17,489 (6,246)	10,084 (6,071)	3,772 (2,421)	96,636 (19,813)

Appendix 41.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Black River Harbor (Lake Superior), by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month						Season
		May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0114 (0.0067)	5 (11)	75 (77)	85 (57)	7 (15)	21 (37)	85 (121)	278 (160)
Chinook salmon	0.0258 (0.0163)	0 (0)	14 (30)	6 (13)	23 (47)	339 (262)	248 (284)	630 (391)
Rainbow trout	0.0032 (0.0033)	15 (31)	45 (63)	0 (0)	0 (0)	19 (39)	0 (0)	79 (80)
Brown trout	0.0004 (0.0008)	0 (0)	0 (0)	11 (23)	0 (0)	0 (0)	0 (0)	11 (23)
Lake trout	0.0433 (0.0211)	16 (33)	133 (128)	436 (270)	365 (385)	110 (118)	0 (0)	1,060 (503)
Splake	0.0004 (0.0008)	0 (0)	0 (0)	0 (0)	0 (0)	9 (19)	0 (0)	9 (19)
Siscowet	0.0580 (0.0263)	0 (0)	185 (155)	549 (258)	567 (514)	117 (185)	0 (0)	1,418 (624)
Total	0.1425 (0.0403)	36 (47)	452 (226)	1,087 (379)	962 (644)	615 (346)	333 (309)	3,485 (909)
Angler hours		807 (234)	2,392 (1,145)	3,794 (960)	3,850 (948)	8,647 (1,278)	4,967 (1,544)	24,457 (2,684)
Angler trips		176 (65)	312 (151)	550 (145)	718 (191)	1,799 (313)	822 (274)	4,377 (508)
Angler days		176 (65)	312 (151)	550 (145)	718 (191)	1,799 (313)	822 (274)	4,377 (508)

Appendix 42.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Ontonagon boat fishery (non-charter), 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month					Season
		May	Jun	Jul	Aug	Sep	
Coho salmon	0.0187 (0.0139)	359 (389)	134 (142)	38 (67)	54 (94)	0 (0)	585 (430)
Chinook salmon	0.0070 (0.0053)	117 (146)	84 (75)	0 (0)	11 (23)	8 (15)	220 (166)
Rainbow trout	0.0015 (0.0019)	12 (25)	34 (51)	0 (0)	0 (0)	0 (0)	46 (57)
Brown trout	0.0025 (0.0026)	63 (78)	14 (20)	0 (0)	0 (0)	0 (0)	77 (81)
Lake trout	0.0600 (0.0224)	400 (490)	620 (294)	435 (253)	391 (261)	32 (48)	1,878 (679)
Northern pike	0.0003 (0.0006)	0 (0)	0 (0)	0 (0)	0 (0)	9 (19)	9 (19)
Rockbass	0.0007 (0.0013)	0 (0)	0 (0)	20 (40)	2 (3)	0 (0)	22 (40)
Siscowet	0.0292 (0.0159)	268 (378)	285 (224)	147 (153)	215 (154)	0 (0)	915 (490)
Lake herring	0.0004 (0.0008)	0 (0)	0 (0)	12 (25)	0 (0)	0 (0)	12 (25)
Walleye	0.0478 (0.0157)	239 (150)	175 (150)	555 (269)	484 (317)	42 (47)	1,495 (469)
Lake whitefish	0.0019 (0.0024)	20 (41)	40 (65)	0 (0)	0 (0)	0 (0)	60 (77)
Total	0.1700 (0.0379)	1,478 (766)	1,386 (438)	1,207 (408)	1,157 (449)	91 (71)	5,319 (1,073)
Angler hours		6,356 (1,507)	8,085 (1,366)	8,750 (1,403)	7,030 (1,614)	1,072 (295)	31,293 (2,966)
Angler trips		1,555 (420)	2,259 (401)	1,694 (312)	1,496 (358)	245 (73)	7,249 (754)
Angler days		1,555 (420)	2,259 (401)	1,694 (312)	1,496 (358)	245 (73)	7,249 (754)

Appendix 43.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Traverse Bay (Lake Superior), by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month						Season
		May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0186 (0.0246)	0 (0)	0 (0)	125 (213)	39 (79)	---	23 (52)	187 (233)
Rainbow trout	0.0082 (0.0095)	0 (0)	83 (89)	0 (0)	0 (0)	---	0 (0)	83 (89)
Lake trout	0.1306 (0.1145)	179 (242)	69 (92)	555 (893)	511 (350)	---	0 (0)	1,314 (993)
Siscowet	0.1052 (0.0728)	143 (120)	139 (111)	301 (399)	475 (359)	---	0 (0)	1,058 (561)
Lake whitefish	0.0067 (0.0159)	0 (0)	0 (0)	67 (156)	0 (0)	---	0 (0)	67 (156)
Total	0.2693 (0.1674)	322 (270)	291 (169)	1,048 (1,013)	1,025 (508)	---	23 (52)	2,709 (1,178)
Angler hours		952 (403)	1,890 (498)	4,157 (4,260)	2,897 (1,180)	---	165 (149)	10,061 (4,469)
Angler trips		268 (135)	525 (147)	1,134 (1,212)	784 (339)	---	71 (77)	2,782 (1,277)
Angler days		268 (135)	525 (147)	1,134 (1,212)	784 (339)	---	71 (77)	2,782 (1,277)



Appendix 44.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Keweenaw Bay, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month					Season
		Jun	Jul	Aug	Sep	Oct	
Pink salmon	0.0159 (0.0183)	0 (0)	0 (0)	0 (0)	241 (275)	0 (0)	241 (275)
Coho salmon	0.0385 (0.0189)	242 (168)	55 (81)	0 (0)	122 (145)	165 (126)	584 (268)
Chinook salmon	0.0611 (0.0292)	512 (281)	291 (227)	125 (203)	0 (0)	0 (0)	928 (414)
Rainbow trout	0.0034 (0.0042)	52 (64)	0 (0)	0 (0)	0 (0)	0 (0)	52 (64)
Brown trout	0.0009 (0.0019)	14 (29)	0 (0)	0 (0)	0 (0)	0 (0)	14 (29)
Lake trout	0.0109 (0.0100)	16 (25)	5 (11)	130 (147)	15 (17)	0 (0)	166 (150)
Northern pike	0.0025 (0.0047)	4 (8)	0 (0)	0 (0)	34 (71)	0 (0)	38 (71)
Siscowet	0.0257 (0.0171)	73 (69)	10 (21)	205 (163)	102 (176)	0 (0)	390 (250)
Yellow perch	0.1589 (0.1911)	34 (69)	658 (735)	1,721 (2,775)	0 (0)	0 (0)	2,413 (2,872)
Walleye	0.0028 (0.0049)	0 (0)	0 (0)	0 (0)	43 (75)	0 (0)	43 (75)
<b>Total</b>	<b>0.3207</b> <b>(0.2016)</b>	<b>947</b> <b>(350)</b>	<b>1,019</b> <b>(774)</b>	<b>2,181</b> <b>(2,791)</b>	<b>557</b> <b>(372)</b>	<b>165</b> <b>(126)</b>	<b>4,869</b> <b>(2,944)</b>
<b>Angler hours</b>		<b>4,607</b> <b>(1,790)</b>	<b>3,985</b> <b>(1,509)</b>	<b>2,556</b> <b>(863)</b>	<b>2,376</b> <b>(573)</b>	<b>1,658</b> <b>(503)</b>	<b>15,182</b> <b>(2,609)</b>
<b>Angler trips</b>		<b>979</b> <b>(405)</b>	<b>981</b> <b>(370)</b>	<b>845</b> <b>(341)</b>	<b>803</b> <b>(264)</b>	<b>706</b> <b>(243)</b>	<b>4,314</b> <b>(739)</b>
<b>Angler days</b>		<b>979</b> <b>(405)</b>	<b>981</b> <b>(370)</b>	<b>845</b> <b>(341)</b>	<b>770</b> <b>(255)</b>	<b>706</b> <b>(243)</b>	<b>4,281</b> <b>(736)</b>

Appendix 45.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Marquette, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month							Season
		April	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.0291 (0.0083)	1,595 (583)	157 (101)	84 (74)	35 (44)	85 (55)	82 (74)	146 (123)	2,184 (617)
Chinook salmon	0.0074 (0.0032)	214 (144)	149 (116)	83 (120)	0 (0)	54 (59)	53 (66)	0 (0)	553 (238)
Rainbow trout	0.0048 (0.0022)	131 (98)	118 (86)	4 (8)	10 (21)	1 (1)	0 (0)	95 (102)	359 (167)
Brown trout	0.0022 (0.0017)	71 (73)	44 (89)	20 (40)	0 (0)	9 (18)	0 (0)	20 (40)	164 (130)
Lake trout	0.1897 (0.0227)	214 (199)	768 (406)	3,133 (767)	4,263 (940)	3,474 (660)	1,637 (507)	746 (225)	14,235 (1,556)
Splake	0.0025 (0.0012)	42 (47)	19 (24)	7 (13)	0 (0)	0 (0)	0 (0)	119 (74)	187 (92)
Northern pike	0.0002 (0.0004)	0 (0)	0 (0)	0 (0)	0 (0)	17 (34)	0 (0)	0 (0)	17 (34)
Siscowet	0.0014 (0.0018)	0 (0)	0 (0)	0 (0)	23 (47)	15 (17)	65 (130)	4 (8)	107 (140)
Lake whitefish	0.0182 (0.0103)	63 (128)	30 (60)	29 (43)	0 (0)	0 (0)	0 (0)	1,242 (754)	1,364 (768)
Round whitefish	0.0412 (0.0200)	29 (58)	28 (57)	43 (61)	0 (0)	0 (0)	0 (0)	2,992 (1,491)	3,092 (1,494)
Other	0.0018 (0.0029)	24 (43)	109 (209)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	133 (213)
Total	0.2985 (0.0353)	2,383 (663)	1,422 (505)	3,403 (785)	4,331 (942)	3,655 (666)	1,837 (533)	5,364 (1,696)	22,395 (2,409)
Angler hours		13,738 (1,919)	8,212 (809)	12,273 (1,474)	14,733 (1,851)	14,387 (1,583)	6,962 (947)	4,728 (445)	75,033 (3,679)
Angler trips		4,759 (689)	2,714 (338)	3,077 (387)	3,391 (450)	3,269 (375)	1,583 (225)	1,653 (209)	20,446 (1,085)
Angler days		4,222 (651)	2,212 (288)	2,803 (372)	3,296 (447)	2,985 (357)	1,553 (224)	1,344 (193)	18,415 (1,029)

Appendix 46.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Au Train, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month					Season
		April	May	Jun	Jul	Aug	
Coho salmon	0.0218 (0.0123)	15 (32)	122 (98)	24 (39)	61 (83)	43 (49)	265 (146)
Chinook salmon	0.0015 (0.0029)	0 (0)	18 (35)	0 (0)	0 (0)	0 (0)	18 (35)
Rainbow trout	0.0102 (0.0115)	0 (0)	94 (133)	24 (39)	6 (12)	0 (0)	124 (139)
Brown trout	0.0037 (0.0054)	0 (0)	45 (66)	0 (0)	0 (0)	0 (0)	45 (66)
Lake trout	0.2008 (0.0683)	0 (0)	290 (178)	396 (211)	855 (612)	904 (378)	2,445 (770)
Siscowet	0.0011 (0.0023)	0 (0)	0 (0)	0 (0)	0 (0)	14 (29)	14 (29)
Round whitefish	0.0232 (0.0352)	0 (0)	282 (426)	0 (0)	0 (0)	0 (0)	282 (426)
Total	0.2622 (0.0818)	15 (32)	851 (496)	444 (218)	922 (618)	961 (382)	3,193 (907)
Angler hours		604 (385)	3,417 (642)	2,324 (670)	3,320 (850)	2,511 (858)	12,176 (1,571)
Angler trips		219 (137)	792 (202)	474 (147)	699 (218)	472 (167)	2,656 (396)
Angler days		147 (91)	714 (189)	431 (141)	687 (217)	472 (167)	2,451 (373)

Appendix 47.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for Munising Bay, by all modes (non-charter) of sportfishing, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month						Season
		April	May	Jun	Jul	Aug	Sep	
Coho salmon	0.0460 (0.0164)	438 (423)	390 (219)	38 (61)	21 (26)	333 (268)	465 (195)	1,685 (584)
Chinook salmon	0.0194 (0.0098)	0 (0)	150 (136)	334 (245)	158 (201)	66 (88)	4 (9)	712 (356)
Rainbow trout	0.0022 (0.0017)	29 (36)	39 (46)	8 (17)	0 (0)	0 (0)	4 (7)	80 (61)
Brown trout	0.0046 (0.0043)	43 (79)	41 (64)	85 (122)	0 (0)	0 (0)	0 (0)	169 (159)
Brook trout	0.0002 (0.0004)	0 (0)	0 (0)	8 (17)	0 (0)	0 (0)	0 (0)	8 (17)
Lake trout	0.0740 (0.0276)	0 (0)	205 (196)	767 (361)	484 (364)	1,161 (818)	95 (61)	2,712 (987)
Splake	0.0046 (0.0025)	0 (0)	42 (47)	8 (17)	0 (0)	13 (26)	107 (72)	170 (91)
Rockbass	0.0004 (0.0008)	0 (0)	0 (0)	0 (0)	13 (26)	0 (0)	0 (0)	13 (26)
Siscowet	0.0002 (0.0003)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	6 (8)	6 (8)
Smallmouth bass	0.0056 (0.0113)	0 (0)	0 (0)	0 (0)	204 (413)	0 (0)	0 (0)	204 (413)
Yellow perch	0.0133 (0.0173)	0 (0)	0 (0)	386 (616)	103 (147)	0 (0)	0 (0)	489 (633)
Lake whitefish	0.0062 (0.0065)	72 (93)	0 (0)	88 (176)	0 (0)	0 (0)	67 (133)	227 (239)
Round whitefish	0.0021 (0.0026)	0 (0)	18 (37)	0 (0)	0 (0)	0 (0)	60 (89)	78 (96)
Total	0.1787 (0.0424)	582 (442)	885 (339)	1,722 (788)	983 (605)	1,573 (866)	808 (270)	6,553 (1,456)
Angler hours		1,563 (751)	5,178 (997)	9,541 (1,659)	7,102 (1,423)	8,450 (1,663)	4,827 (614)	36,661 (3,079)
Angler trips		361 (183)	1,373 (369)	2,209 (455)	1,351 (308)	1,460 (354)	1,329 (192)	8,083 (796)
Angler days		267 (155)	1,197 (315)	1,975 (443)	1,205 (306)	1,460 (354)	1,070 (173)	7,174 (754)

Appendix 48.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Dead River shore fishery, 1993. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month		Season
		Sep	Oct	
Pink salmon	0.0122 (0.0249)	59 (120)	0 (0)	59 (120)
Coho salmon	0.0041 (0.0082)	20 (40)	0 (0)	20 (40)
Chinook salmon	0.0441 (0.0405)	58 (59)	156 (186)	214 (195)
Round whitefish	0.0179 (0.0361)	0 (0)	87 (175)	87 (175)
Total	0.0783 (0.0607)	137 (140)	243 (255)	380 (291)
Angler hours		2,909 (464)	1,943 (357)	4,852 (585)
Angler trips		1,293 (291)	903 (225)	2,196 (368)
Angler days		1,206 (274)	600 (166)	1,806 (320)

Appendix 49.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Menominee Harbor area winter ice fishery, by all modes of sportfishing, 1994. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month			Season
		Jan	Feb	Mar	
Brown trout	0.0013 (0.0018)	56 (83)	3 (5)	0 (0)	59 (83)
Splake	0.0034 (0.0031)	70 (86)	84 (108)	0 (0)	154 (138)
Rainbow smelt	0.0022 (0.0023)	0 (0)	102 (104)	0 (0)	102 (104)
Northern pike	0.0001 (0.0002)	0 (0)	4 (7)	0 (0)	4 (7)
Yellow perch	0.7935 (0.2785)	6,388 (3,285)	27,319 (9,551)	2,521 (1,925)	36,228 (10,282)
Walleye	0.0004 (0.0005)	0 (0)	16 (20)	0 (0)	16 (20)
<b>Total</b>	<b>0.8008</b> <b>(0.2794)</b>	<b>6,514</b> <b>(3,287)</b>	<b>27,528</b> <b>(9,552)</b>	<b>2,521</b> <b>(1,925)</b>	<b>36,563</b> <b>(10,284)</b>
Angler hours		9,014 (3,649)	28,171 (8,528)	8,471 (1,694)	45,656 (9,429)
Angler trips		2,311 (948)	5,418 (1,613)	1,673 (370)	9,402 (1,907)
Angler days		2,311 (948)	5,418 (1,613)	1,673 (370)	9,402 (1,907)

Appendix 50.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Menominee River winter ice fishery, by all modes of sportfishing, 1994. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month			Season
		Jan	Feb	Mar	
Brown trout	0.0018 (0.0031)	3 (5)	— (0)	0 (0)	3 (5)
Yellow perch	0.0175 (0.0259)	29 (42)	— (0)	0 (0)	29 (42)
Walleye	0.0103 (0.0220)	0 (0)	— (0)	17 (36)	17 (36)
<b>Total</b>	0.0296 (0.0345)	32 (42)	— (0)	17 (36)	49 (55)
Angler hours		1,288 (488)	— (0)	370 (158)	1,658 (513)
Angler trips		439 (173)	— (0)	104 (56)	543 (182)
Angler days		439 (173)	— (0)	104 (56)	543 (182)

Appendix 51.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Little Bay de Noc winter ice fishery, by all modes of sportfishing, 1994. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month			Season
		Jan	Feb	Mar	
Brown trout	0.0002 (0.0004)	0 (0)	38 (75)	0 (0)	38 (75)
Splake	0.0056 (0.0045)	88 (170)	762 (673)	15 (30)	865 (695)
Northern pike	0.0155 (0.0083)	700 (551)	1,301 (943)	376 (596)	2,377 (1,244)
Rockbass	0.0000 (0.0000)	0 (0)	0 (0)	6 (11)	6 (11)
Yellow perch	0.1874 (0.1064)	6,989 (3,755)	968 (911)	20,754 (15,575)	28,711 (16,047)
Walleye	0.0176 (0.0092)	1,309 (869)	1,394 (1,074)	0 (0)	2,703 (1,382)
Burbot	0.0005 (0.0010)	0 (0)	70 (140)	0 (0)	70 (140)
Other	0.0003 (0.0006)	0 (0)	44 (89)	0 (0)	44 (89)
<b>Total</b>	<b>0.2272 (0.1080)</b>	<b>9,086 (3,897)</b>	<b>4,577 (1,833)</b>	<b>21,151 (15,586)</b>	<b>34,814 (16,170)</b>
<b>Angler hours</b>		<b>82,505 (12,466)</b>	<b>51,150 (5,474)</b>	<b>19,563 (7,120)</b>	<b>153,218 (15,364)</b>
<b>Angler trips</b>		<b>21,033 (3,683)</b>	<b>14,865 (1,969)</b>	<b>4,847 (2,165)</b>	<b>40,745 (4,704)</b>
<b>Angler days</b>		<b>21,033 (3,683)</b>	<b>14,865 (1,969)</b>	<b>4,847 (2,165)</b>	<b>40,745 (4,704)</b>



Appendix 52.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Keweenaw Bay winter ice fishery, by all modes of sportfishing, 1994. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month				Season
		Jan	Feb	Mar	Apr	
Coho salmon	0.0633 (0.0162)	1,186 (783)	1,773 (689)	2,741 (799)	468 (394)	6,168 (1,372)
Chinook salmon	0.0025 (0.0025)	199 (242)	32 (41)	17 (24)	0 (0)	248 (247)
Rainbow trout	0.0011 (0.0011)	0 (0)	18 (36)	66 (99)	27 (38)	111 (112)
Brown trout	0.0012 (0.0012)	90 (108)	0 (0)	14 (28)	14 (30)	118 (116)
Brook trout	0.0006 (0.0012)	62 (127)	0 (0)	0 (0)	0 (0)	62 (127)
Lake trout	0.0244 (0.0096)	1,465 (753)	661 (456)	202 (119)	50 (61)	2,378 (890)
Rainbow smelt	0.0966 (0.0385)	1,839 (2,065)	2,659 (1,677)	4,134 (2,249)	789 (773)	9,421 (3,568)
White sucker	0.0001 (0.0002)	0 (0)	7 (13)	0 (0)	0 (0)	7 (13)
Siscowet	0.1732 (0.0369)	5,239 (2,028)	7,774 (1,772)	3,606 (1,047)	272 (320)	16,891 (2,907)
Lake herring	0.0119 (0.0105)	816 (994)	99 (127)	220 (189)	29 (44)	1,164 (1,021)
Yellow perch	0.0453 (0.0238)	2,645 (2,051)	1,165 (830)	492 (420)	115 (163)	4,417 (2,258)
Walleye	0.0014 (0.0015)	104 (135)	32 (64)	0 (0)	0 (0)	136 (149)
Lake whitefish	0.0042 (0.0033)	348 (301)	53 (107)	7 (14)	0 (0)	408 (320)
Round whitefish	0.0021 (0.0024)	88 (180)	59 (118)	33 (67)	20 (37)	200 (228)
Burbot	0.0002 (0.0004)	0 (0)	24 (48)	0 (0)	0 (0)	24 (48)
Other	0.0002 (0.0004)	0 (0)	20 (40)	0 (0)	0 (0)	20 (40)
<b>Total</b>	<b>0.4284</b> (0.0780)	<b>14,081</b> (3,870)	<b>14,376</b> (2,716)	<b>11,532</b> (2,652)	<b>1,784</b> (944)	<b>41,773</b> (5,503)

Appendix 52.—Continued:

Species	Total catch per hour	Month				Season
		Jan	Feb	Mar	Apr	
Angler hours		30,257 (8,415)	35,343 (5,824)	28,362 (6,155)	3,555 (2,714)	97,517 (12,247)
Angler trips		10,340 (2,657)	12,343 (1,920)	10,286 (2,215)	1,192 (922)	34,161 (4,062)
Angler days		10,340 (2,657)	12,343 (1,920)	10,286 (2,215)	1,192 (922)	34,161 (4,062)

Appendix 53.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Marquette Harbor winter ice fishery, by all modes of sportfishing, 1994. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month	
		Mar	Season
Coho salmon	0.2845 (0.0970)	936 (268)	936 (268)
Chinook salmon	0.0024 (0.0045)	8 (15)	8 (15)
Rainbow trout	0.0046 (0.0062)	15 (20)	15 (20)
Splake	0.0009 (0.0012)	3 (4)	3 (4)
Lake herring	0.0018 (0.0036)	6 (12)	6 (12)
Lake whitefish	0.0030 (0.0054)	10 (18)	10 (18)
Total	0.2973 (0.0988)	978 (270)	978 (270)
Angler hours		3,290 (608)	3,290 (608)
Angler trips		1,252 (278)	1,252 (278)
Angler days		1,252 (278)	1,252 (278)

Appendix 54.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Au Train area winter ice fishery, by all modes of sportfishing, 1994. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month	
		Mar	Season
Coho salmon	0.1868 (0.0909)	1,776 (820)	1,776 (820)
Lake trout	0.0070 (0.0076)	67 (72)	67 (72)
Siscowet	0.0019 (0.0038)	18 (36)	18 (36)
Round whitefish	0.1231 (0.2081)	1,171 (1,971)	1,171 (1,971)
Total	0.3189 (0.2299)	3,032 (2,136)	3,032 (2,136)
Angler hours		9,509 (1,458)	9,509 (1,458)
Angler trips		3,188 (545)	3,188 (545)
Angler days		2,007 (398)	2,007 (398)

Appendix 55.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Munising Bay winter ice fishery, by all modes of sportfishing, 1994. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month		Season
		Feb	Mar	
Coho salmon	0.0505 (0.0377)	637 (477)	548 (729)	1,185 (871)
Lake trout	0.0467 (0.0429)	13 (16)	1,082 (995)	1,095 (995)
Splake	0.0023 (0.0034)	7 (13)	48 (79)	55 (80)
Rainbow smelt	0.0860 (0.1732)	5 (10)	2,012 (4,053)	2,017 (4,053)
Lake herring	0.0426 (0.0864)	0 (0)	999 (2,021)	999 (2,021)
Yellow perch	0.0097 (0.0146)	74 (141)	154 (310)	228 (341)
Lake whitefish	0.0175 (0.0132)	282 (225)	128 (206)	410 (305)
Burbot	0.0021 (0.0043)	50 (101)	0 (0)	50 (101)
Total	0.2574 (0.2050)	1,068 (556)	4,971 (4,709)	6,039 (4,742)
Angler hours		5,623 (1,095)	17,843 (2,949)	23,466 (3,146)
Angler trips		1,529 (326)	5,857 (1,269)	7,386 (1,310)
Angler days		1,344 (305)	4,306 (1,155)	5,650 (1,195)

Appendix 56.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Tawas Bay winter ice fishery, by all modes of sportfishing, 1994. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month			Season
		Jan	Feb	Mar	
Brown trout	0.0004 (0.0010)	0 (0)	0 (0)	4 (10)	4 (10)
Northern pike	0.0502 (0.0503)	375 (481)	160 (200)	0 (0)	535 (521)
Yellow perch	0.0014 (0.0024)	0 (0)	0 (0)	15 (26)	15 (26)
Walleye	0.0243 (0.0427)	208 (443)	0 (0)	51 (87)	259 (451)
Burbot	0.0009 (0.0021)	0 (0)	0 (0)	10 (23)	10 (23)
Total	0.0772 (0.0672)	583 (654)	160 (200)	80 (94)	823 (690)
Angler hours		7,629 (2,274)	1,975 (499)	1,055 (880)	10,659 (2,489)
Angler trips		3,304 (1,056)	660 (178)	440 (383)	4,404 (1,137)
Angler days		2,266 (754)	564 (166)	282 (256)	3,112 (813)

Appendix 57.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the Au Gres area winter ice fishery, by all modes of sportfishing, 1994. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month			Season
		Jan	Feb	Mar	
Brown trout	0.0075 (0.0080)	0 (0)	0 (0)	385 (406)	385 (406)
Northern pike	0.0013 (0.0027)	0 (0)	66 (135)	0 (0)	66 (135)
White sucker	0.0016 (0.0033)	0 (0)	0 (0)	80 (163)	80 (163)
Yellow perch	1.6530 (0.7186)	20,158 (11,466)	27,302 (12,460)	36,997 (28,943)	84,457 (33,532)
Walleye	0.0130 (0.0100)	162 (201)	66 (100)	437 (447)	665 (500)
Burbot	0.0021 (0.0043)	0 (0)	106 (216)	0 (0)	106 (216)
<b>Total</b>	<b>1.6785</b> <b>(0.7206)</b>	<b>20,320</b> <b>(11,468)</b>	<b>27,540</b> <b>(12,463)</b>	<b>37,899</b> <b>(28,950)</b>	<b>85,759</b> <b>(33,540)</b>
Angler hours		15,022 (3,841)	13,672 (2,997)	22,400 (7,624)	51,094 (9,048)
Angler trips		5,230 (1,307)	3,680 (880)	6,865 (2,331)	15,775 (2,814)
Angler days		4,245 (1,129)	2,993 (763)	4,947 (1,663)	12,185 (2,150)

Appendix 58.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the winter ice fishery in the area from Saganing Creek to the mouth of the Saginaw River, by all modes of sportfishing, 1994. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month			Season
		Jan	Feb	Mar	
Rainbow trout	0.0002 (0.0003)	19 (39)	0 (0)	9 (19)	28 (43)
Brown trout	0.0000 (0.0000)	0 (0)	0 (0)	4 (9)	4 (9)
Northern pike	0.0006 (0.0013)	96 (209)	0 (0)	0 (0)	96 (209)
Channel catfish	0.0002 (0.0004)	0 (0)	0 (0)	27 (55)	27 (55)
White perch	0.0023 (0.0049)	364 (778)	0 (0)	0 (0)	364 (778)
Black crappie	0.0002 (0.0004)	0 (0)	0 (0)	28 (57)	28 (57)
Yellow perch	0.3874 (0.1871)	52,404 (26,306)	6,873 (5,247)	1,419 (1,744)	60,696 (26,881)
Walleye	0.0791 (0.0381)	2,786 (1,453)	5,976 (5,026)	3,624 (1,610)	12,386 (5,474)
Round whitefish	0.0021 (0.0035)	28 (61)	296 (539)	0 (0)	324 (542)
Burbot	0.0008 (0.0017)	0 (0)	130 (268)	0 (0)	130 (268)
<b>Total</b>	<b>0.4729</b> <b>(0.1975)</b>	<b>55,697</b> <b>(26,359)</b>	<b>13,275</b> <b>(7,291)</b>	<b>5,111</b> <b>(2,375)</b>	<b>74,083</b> <b>(27,452)</b>
<b>Angler hours</b>		<b>62,785</b> <b>(23,098)</b>	<b>65,805</b> <b>(16,726)</b>	<b>28,067</b> <b>(9,797)</b>	<b>156,657</b> <b>(30,154)</b>
<b>Angler trips</b>		<b>14,239</b> <b>(5,153)</b>	<b>12,958</b> <b>(3,357)</b>	<b>5,885</b> <b>(2,056)</b>	<b>33,082</b> <b>(6,485)</b>
<b>Angler days</b>		<b>13,273</b> <b>(4,782)</b>	<b>11,951</b> <b>(3,168)</b>	<b>5,092</b> <b>(1,801)</b>	<b>30,316</b> <b>(6,012)</b>



Appendix 59.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the winter ice fishery in the area from the mouth of the Saginaw River to Essexville, by all modes of sportfishing, 1994. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month		Season
		Feb	Mar	
Channel catfish	0.0076 (0.0167)	— (0)	47 (100)	47 (100)
White perch	0.0051 (0.0109)	— (0)	32 (66)	32 (66)
White bass	0.0124 (0.0268)	— (0)	77 (161)	77 (161)
Yellow perch	0.0502 (0.0867)	— (0)	312 (510)	312 (510)
Walleye	0.4640 (0.4284)	— (0)	2,884 (2,120)	2,884 (2,120)
Total	0.5393 (0.4636)	— (0)	3,352 (2,190)	3,352 (2,190)
Angler hours		2,191 (1,873)	6,215 (3,473)	6,215 (3,473)
Angler trips		— (0)	1,289 (741)	1,289 (741)
Angler days		— (0)	1,222 (711)	1,222 (711)

Appendix 60.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the winter ice fishery in the area from Quanicassee to Sebewaing, by all modes of sportfishing, 1994. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month			Season
		Jan	Feb	Mar	
Rainbow trout	0.0001 (0.0002)	0 (0)	0 (0)	5 (11)	5 (11)
White bass	0.0000 (0.0000)	0 (0)	1 (2)	0 (0)	1 (2)
Black crappie	0.0004 (0.0006)	0 (0)	0 (0)	30 (48)	30 (48)
Yellow perch	0.5782 (0.3713)	38,603 (23,680)	443 (514)	453 (473)	39,499 (23,690)
Walleye	0.0482 (0.0422)	1,537 (1,999)	1,632 (1,926)	121 (117)	3,290 (2,778)
Burbot	0.0023 (0.0047)	0 (0)	159 (325)	0 (0)	159 (325)
Total	0.6292 (0.3778)	40,140 (23,764)	2,235 (2,020)	609 (490)	42,984 (23,855)
Angler hours		40,195 (11,089)	25,681 (10,996)	2,434 (1,293)	68,310 (15,670)
Angler trips		8,440 (2,409)	4,658 (1,979)	509 (272)	13,607 (3,129)
Angler days		7,484 (2,285)	4,328 (1,902)	414 (223)	12,226 (2,981)

Appendix 61.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the winter ice fishery in the area from Sebewaing to Sand Point, by all modes of sportfishing, 1994. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month			Season
		Jan	Feb	Mar	
Northern pike	0.0018 (0.0033)	321 (578)	0 (0)	0 (0)	321 (578)
White perch	0.0000 (0.0000)	0 (0)	0 (0)	8 (15)	8 (15)
Black crappie	0.0003 (0.0004)	0 (0)	0 (0)	50 (67)	50 (67)
Yellow perch	2.3080 (0.6342)	234,722 (83,234)	109,138 (42,746)	72,011 (23,365)	415,871 (96,442)
Walleye	0.0006 (0.0008)	58 (121)	31 (65)	24 (34)	113 (141)
Total	2.3108 (0.6344)	235,101 (83,236)	109,169 (42,746)	72,093 (23,365)	416,363 (96,444)
Angler hours		102,788 (21,825)	36,855 (11,658)	40,541 (9,631)	180,184 (26,552)
Angler trips		22,971 (4,984)	7,834 (2,435)	7,945 (1,953)	38,750 (5,881)
Angler days		21,415 (4,809)	7,483 (2,361)	7,421 (1,875)	36,319 (5,676)

Appendix 62.—Estimated catch per hour, number caught, and effort (angler hours, trips, and days) for the winter ice fishery in the area from Sand Point to Port Austin, by all modes of sportfishing, 1994. Bounds on the error of estimation in parentheses.

Species	Total catch per hour	Month			Season
		Jan	Feb	Mar	
Yellow perch	2.3938 (3.3790)	11,555 (15,490)	--- (0)	--- (0)	11,555 (15,490)
Total	2.3938 (3.3790)	11,555 (15,490)	--- (0)	--- (0)	11,555 (15,490)
Angler hours		4,827 (2,134)	--- (0)	--- (0)	4,827 (2,134)
Angler trips		1,408 (668)	--- (0)	--- (0)	1,408 (668)
Angler days		1,351 (653)	--- (0)	--- (0)	1,351 (653)