

STUDY PERFORMANCE REPORT

State: Michigan

Project No.: F-81-R-3

Study No.: 427

Title: Measurement of sportfishing harvest in lakes Michigan, Huron, Erie, and Superior

Period Covered: October 1, 2001 to September 30, 2002

Study Objective: To obtain a continuous record of sport catch, catch rates, and catch composition in the Michigan waters of the Great Lakes (Superior, Michigan, Huron, and Erie) and in anadromous river fisheries.

Summary: This report presents results from the 2001 angling season. Similar data are being collected for the 2002 season; these will be summarized in next year's report. During the 2001 angling season, the Michigan Department of Natural Resources (MDNR) conducted creel surveys at key ports and fishing areas on lakes Michigan, Huron, Erie, and Superior. The creel survey was expanded in 2000 and 2001 on lakes Michigan and Huron to cover all ports and fishing areas within the 1836 Treaty Waters of each lake. The State of Michigan entered into a binding agreement (Consent Decree) with various Native American tribes in the 1836 Treaty Waters of lakes Michigan, Huron, and Superior. The Great Lakes creel survey is an integral part of that agreement and provides essential harvest data for the management of fisheries in those shared waters.

A total of 84,137 anglers were interviewed at the conclusion of their fishing trips during the 2001 season (January-December 15). The number of anglers interviewed by lake was: Lake Michigan, 28,198; Lake Huron, 29,984; Lake Erie, 2,016; Lake Superior, 5,944. The numbers of anglers interviewed on some of the large rivers surveyed were: St. Mary's River, 4,094; Manistee River, 4,822; Muskegon River, 1,323; and the Saginaw/Tittabawassee rivers, 1,159.

Anglers spent an estimated 7.5 million angler hours fishing at all sites sampled in 2001. This amounted to an estimated 1.7 million individual fishing trips or 1.5 million angler days.

A total of 2.7 million fish (of the 29 species that were on the angler party interview form) were harvested at all sample areas combined. Yellow perch was the most abundant species in the catch with an estimated harvest of 1.6 million fish. Over 319,000 walleye were estimated harvested by the sport fishery in all sample areas combined in 2001. Salmonines were also an important part of the Great Lakes sport harvest. During 2001, over 503,000 salmonines were estimated to have been harvested from all sample areas. Important species of salmonines and their estimated harvest in numbers were: chinook salmon, 232,000; rainbow trout, 109,000; lake trout, 70,000; coho salmon, 46,000 and brown trout 23,000.

During 2001, a special two-season project continued on central Lake Michigan to independently verify the boat counts conducted on the ground by creel clerks at five ports. Results from the first season indicated that there was very good agreement between each of the two boat count methods. Estimated fishing boat effort differed by less than 2% between air and ground counts in 2000. Preliminary results from 2001 also indicated that there was little difference between the ground and air counts.

Findings: Jobs 1, 2, 3, 4, 5, and 6 were scheduled for 2001-02, and progress is reported below.

Job 1. Title: Initiate aerial boat counts.—During 2001, air flights were utilized to count boats on Lake Erie (Figure 1). Boats, and shore and pier anglers were counted using air flights on Saginaw Bay, Lake Huron (Tawas to Harbor Beach), northern Lake Huron (St. Ignace to Drummond Island) (Figure 2), and the St. Mary's River system (Figure 3). During winter 2002, open ice anglers and ice shanties were also counted on Saginaw Bay during the winter ice fishery. Beginning in March 2002 the Great Lakes creel survey was expanded in southeastern Michigan to include the St. Clair River, Lake St. Clair, and the Detroit River. Air flights were used to count boats in these areas.

All air flights were conducted using stratified random sampling schedules. At each survey area, flights were attempted on each weekend day and three randomly selected weekdays per week. Random take off times were used to insure that fishing pressure counts were made at various times during daylight hours each month.

Also during 2001, a special project continued on central Lake Michigan to independently verify the boat counts conducted on the ground by creel clerks at Pentwater, Ludington, Manistee, Onekama, and Arcadia (Figure 4). An air service was contracted to count boats by grid in the area of Lake Michigan from Little Sable Point to Arcadia. Coincident with one of the times of the day when creel clerks were making interval counts of fishing boats leaving the pier heads, an airplane was counting the number of boats in 3 randomly chosen grids (one offshore grid and two inshore grids) in this area of the lake. Results from the 2000 season indicated that there was very good agreement between each of the boat count methods. Estimated fishing boat effort differed by less than 2% between air and ground counts. Preliminary results in 2001 also showed minimal difference between counting methods.

Job 2. Title: Monitor Great Lakes and anadromous sport fisheries.—Census clerks used stratified random work schedules to monitor the sport fisheries in their respective Great Lakes shoreline areas.

Throughout the 2001 season, creel clerks sent completed data forms to the Charlevoix Fisheries Research Station every two weeks for computer entry. Data entry (optical scanning) was completed by the middle of January 2002 for all sample areas surveyed in 2001. Summaries of the catch estimates by sample area were generated for all sites by the end of January 2002. Data entry (optical scanning) for the 2002 season is ongoing.

Lake Michigan.—On Lake Michigan, 29 areas were sampled from New Buffalo to Harbor Springs in the Lower Peninsula and from Menominee to Manistique in the Upper Peninsula (Figure 4). Eight ports in the 1836 Treaty waters of Lake Michigan were added to the survey in 2000. They were Whitehall/Montague, Pentwater, Arcadia, Platte Bay, Glen Arbor, Leland, Naubinway/Seul Choix Point, and Manistique. Harvest and effort estimates could not be made for Naubinway/Seul Choix Point in 2000 due to the lack of any fishing pressure throughout the entire season. Therefore, Naubinway/Seul Choix Point was dropped from the survey in 2001. The remaining seven ports (7) were sampled during 2001.

Lake Michigan anglers spent an estimated 2.7 million hours fishing the ports and areas sampled during 2001 (Table 1). This amounted to an estimated 618,851 individual fishing trips. Yellow perch were the most abundant species in the catch with an estimated harvest of 332,298 fish. Salmonines are also an important part of the Lake Michigan sport harvest. During 2001, an estimated 115,021 chinook salmon, 47,271 rainbow trout, 34,031 coho salmon, 16,107 brown

trout, and 30,434 lake trout were harvested from the survey areas (Table 1). In addition, an estimated 54,093 walleye were harvested from Lake Michigan.

The expanded creel survey in the 1836 Treaty waters (Grand Haven to Little Bay de Noc) of Lake Michigan was discontinued during the 2002 season. The ports of Whitehall/Montague and Pentwater were permanently added to the survey during 2002 (Figure 4). The remaining 5 ports will be sampled once during the next 3 to 5 years. Ratios developed during 2000 and 2001 will be used to estimate the harvest and effort at these ports during non-sampled years.

Lake Huron. – Lake Huron was surveyed in 2001 from Lexington to Cheboygan in the Lower Peninsula and from St. Ignace to Detour in the Upper Peninsula (Figure 2.). During 2000 and 2001, the following 5 ports/fishing areas were added in the 1836 Treaty waters of Lake Huron: Cheboygan, Hammond Bay, St. Ignace, Les Cheneaux Islands, and Detour. Lake Huron anglers spent an estimated 1.8 million hours fishing and made an estimated 397,887 fishing trips during the 2001 season at the 21 sample areas. (Table 2). Yellow perch made up the majority of the harvest with an estimated 871,828 fish. In addition to yellow perch, other important species in the Lake Huron sport harvest included an estimated 62,665 chinook salmon, 46,531 walleye, 18,765 lake herring, 15,810 lake trout, 7,863 rainbow trout, and 1,782 brown trout.

The St. Mary's River system, a major tributary to Lake Huron, was surveyed in 2001. Anglers on the St. Mary's River spent an estimated 482,655 hours fishing and made 112,233 fishing trips (Table 3) in the area from the rapids on the upper river to Detour, including Potagannissing Bay (Figure 3). The harvest on the St. Mary's River was diverse and included an estimated 122,925 lake herring, 77,245 yellow perch, 24,191 walleye, 6,407 northern pike, 4,989 chinook salmon, 4,132 pink salmon, and 3,016 smallmouth bass. The St. Mary's River was not surveyed during 2002, but the area will be resurveyed during one season in the next 3 to 5 years.

During the 2002 season, the expanded creel survey in the 1836 Treaty waters of Lake Huron (Alpena to Detour, Figure 3) was discontinued. However, the north shore of Lake Huron (St. Ignace to Detour) was added permanently to the study. Ratios will be used to account for the harvest and effort at the discontinued ports (Cheboygan and Hammond Bay).

Lake Erie. –The Lake Erie boat fishery was sampled from Point Mouillee to the Michigan-Ohio state line during mid-April through October 2001 (Figure 1). Lake Erie anglers spent an estimated 490,807 hours fishing Michigan waters of Lake Erie (Table 4). Anglers harvested an estimated 254,291 yellow perch and 115,289 walleye. In all, 11 species of fish were observed in the sport harvest.

St. Clair and Detroit River System. – During 2002 the Great Lakes creel survey was expanded in southeastern Michigan to include the St. Clair River, Lake St. Clair, and the Detroit River to its confluence with Lake Erie. This was the first time this system was surveyed since the early 1980s. The survey began March 1, 2002 and data collection and entry is ongoing at this time.

Lake Superior. – Six areas in western and central Lake Superior were surveyed in 2001. Lake Superior anglers at these locations fished an estimated 180,428 angler hours and made 48,933 fishing trips (Table 5). Lake trout was the most abundant species in the catch (23,294 fish harvested). The harvest also included an estimated 12,973 lake whitefish, 6,196 coho salmon, 4,564 siscowet lake trout, and 1,833 chinook salmon. During 2001, the port of Grand Marias, which is in the 1836 Treaty waters, was added to the Lake Superior survey on a permanent basis.

Job 3. Title: Quality control checks. –Throughout the field season, data forms were reviewed at the Charlevoix Fisheries Research Station prior to data entry (optical scanning). After the count

and interview forms were scanned the data were subjected to editing routines using Microsoft Access queries. The data editing queries employ range checks on various fields and search for illegal values for each count and interview record.

Frequent contacts and communications with creel clerks were employed to field questions, check progress, and head off problems. When errors were noted, those personnel responsible were contacted to rectify the problems.

In May 2002 a two-day training session was held for all creel clerks. The training session included a review of sampling methods, proper data recording for the optical forms, biological sampling, creel sampling schedules, a presentation of previous years results and personnel issues.

Job 4. Title: Prepare succeeding years sampling schedules.—Sampling schedules were prepared for the 2002 season to cover the following areas: St. Clair River, Lake St. Clair, Detroit River, Lake Erie, 23 sites on Lake Michigan, 19 sites on Lake Huron including Saginaw Bay, 6 sites on western and central Lake Superior, and various sites on the Manistee, Muskegon, St. Joseph, and Saginaw/Tittabawassee river systems.

Job 5. Title: Prepare status report summarizing results.—Summaries in tabular form of harvest and effort estimates for all sites sampled during 2001 were disseminated to the management unit and research station offices during January 2002. Required federal aid reports were completed as scheduled. The project biologist also made several presentations during the year regarding the status of the sport harvest in 2001 and comparisons to prior seasons. These presentations were made at sportsmen's clubs and charter boat workshops, and to MDNR meetings of stakeholders.

Job 6. Title: Analyze and evaluate data.—During 2000, the State of Michigan entered into a binding agreement (Consent Decree) with various Native American tribes in the 1836 Treaty waters of lakes Michigan, Huron, and Superior. The Great Lakes creel survey is an integral part of that agreement and provides essential harvest data for the management of fisheries in those shared waters. For example, lake trout harvest statistics for lakes Michigan, Huron, and Superior will be provided annually to task groups working under the Consent Decree to calculate and monitor the total allowable catch (TAC) of lake trout in various zones in the 1836 Treaty waters of the Great Lakes. These data are also provided to the Lake Technical Committees of the Great Lakes Fishery Commission (GLFC). The GLFC formulates policy recommendations for lake trout management on the upper Great Lakes through the various lake committees.

The Lake Erie sport catch estimates and biological data for walleye and yellow perch are used annually by the Lake Erie Technical Committee of the GLFC to set harvest quota limits for the various state and provincial commercial and sport fisheries. Members of the committee include the Ohio Department of Natural Resources, Pennsylvania Fish Commission, New York Department of Environmental Conservation, OMNR, and MDNR. All agencies contributed their sport and commercial assessment data to this management effort.

During 1997, under the direction of the Great Lakes Fishery Commission's Lake Michigan Technical Committee, an ad hoc committee was assigned the task of making predator stocking recommendations for Lake Michigan. The project biologist was a member of this committee, which included representatives of the State agencies (Michigan, Indiana, Illinois and Wisconsin), the U.S. Fish and Wildlife Service, and the Chippewa-Ottawa Resource Authority (CORA). Among other important inputs, the group utilized creel survey data, which have been collected over the years by all State agencies on Lake Michigan, to develop a computer model called CONNECT. The model was then used to test various salmonine stocking scenarios for Lake Michigan and their probable impact on the lake-wide forage base. The results of the committee's

work were presented to the Lake Michigan Technical Committee in January 1997. As a result of this exercise, chinook stocking was reduced by all agencies on Lake Michigan in the spring of 1999. Chinook stocking was also reduced by MDNR in Lake Huron in 1999. Creel survey harvest estimates will be used to evaluate the effectiveness of these stocking reductions beginning in 2002.

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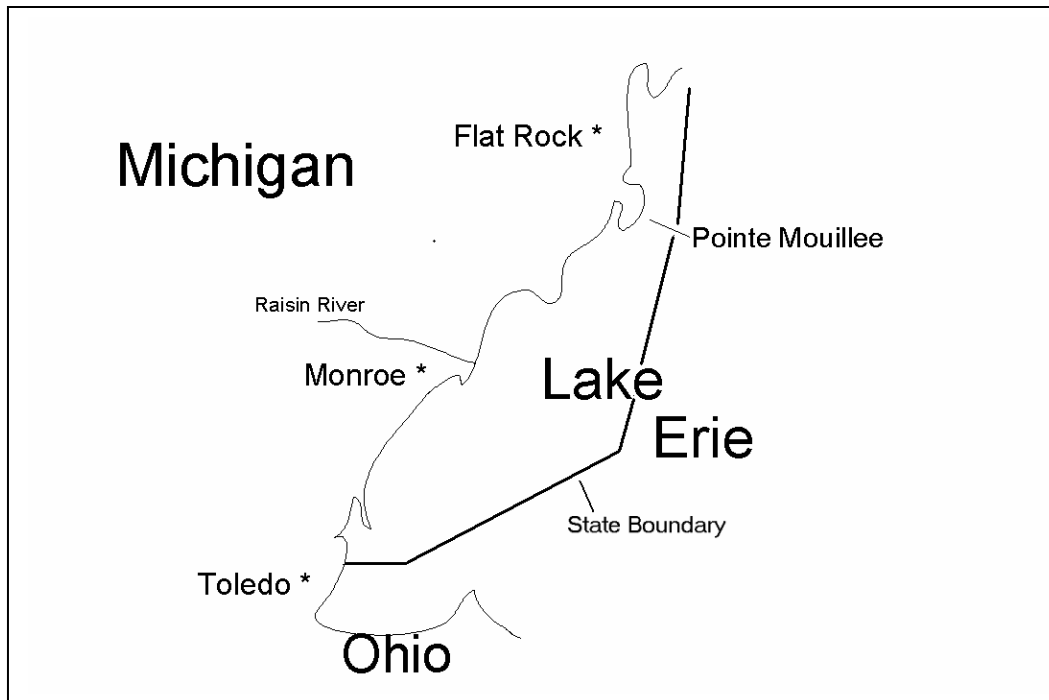


Figure 1.—Lake Erie creel survey area, 2001.



Figure 2.—Lake Huron creel survey locations, 2001.

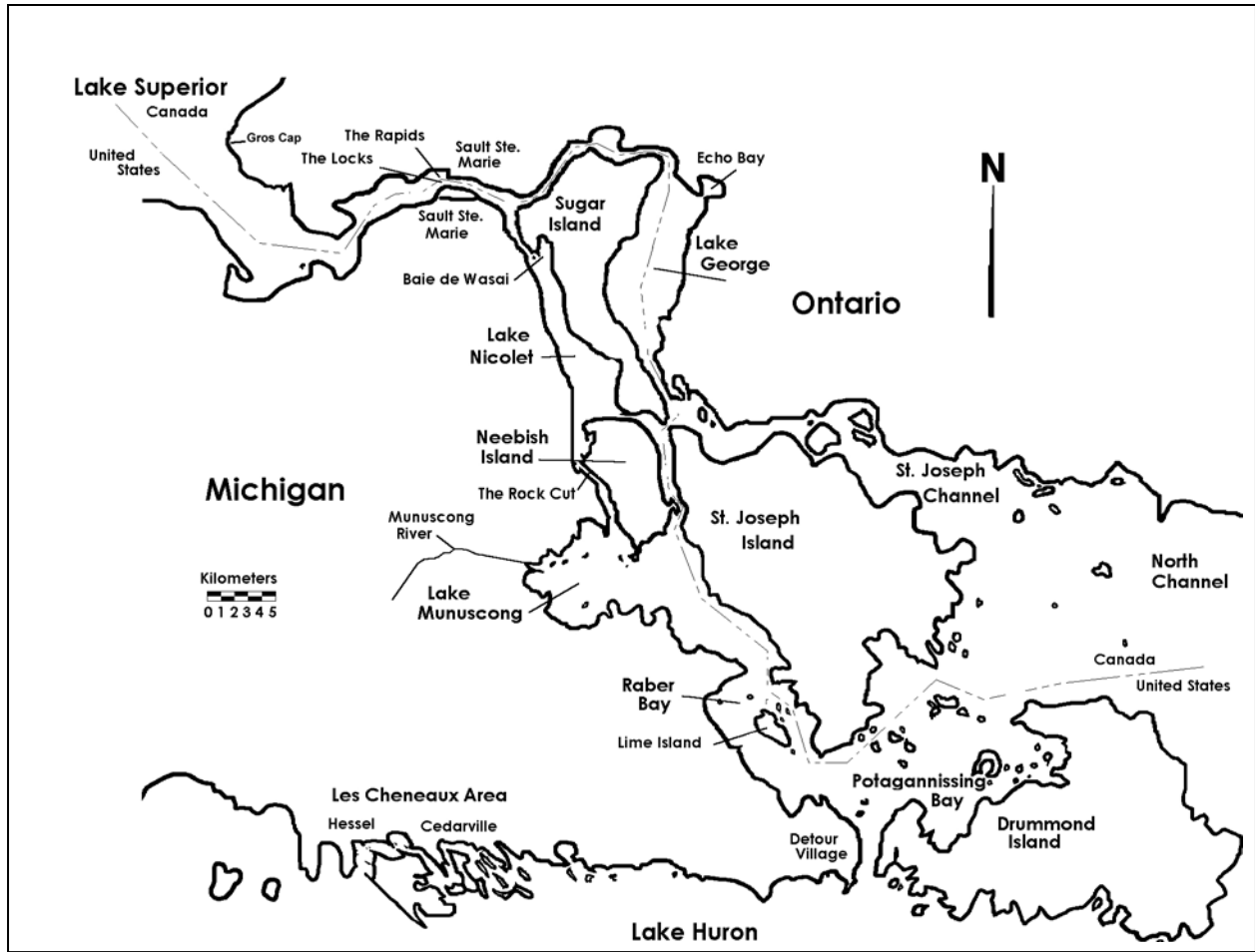


Figure 3.—St. Mary's River system.

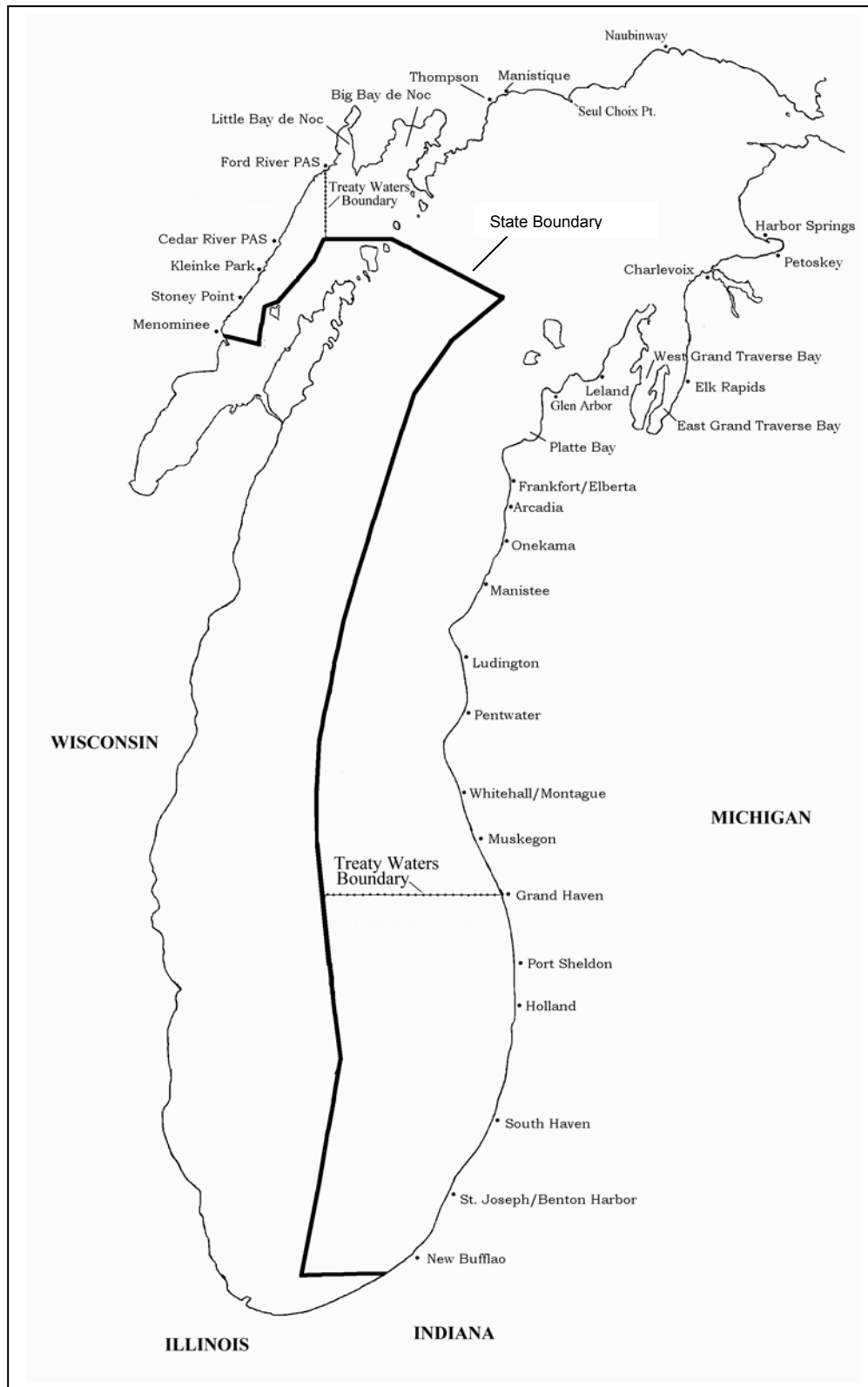


Figure 4.-Lake Michigan creel survey locations, 2001.

Table 1.—Estimated harvest per hour, number harvested, and effort (angler hours, trips, and days) for all Lake Michigan creel survey sites (n=29) combined, by all modes (non-charter) of sportfishing, 2001. Two standard errors of the mean in parentheses.

Species	Harvest per hour	Month												Season		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov				
Pink salmon	0.0001 (0.0001)	0 (0)	0 (0)	0 (0)	0 (0)	113 (172)	0 (0)	27 (55)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	140 (181)
Coho salmon	0.0127 (0.0024)	0 (0)	0 (0)	4,670 (2,253)	7,567 (3,365)	1,406 (734)	2,377 (1,530)	3,397 (1,149)	8,890 (2,771)	5,394 (3,185)	330 (136)	330 (136)	5,394 (3,185)	330 (136)	0 (0)	34,031 (6,200)
Chinook salmon	0.0428 (0.0059)	0 (0)	0 (0)	0 (0)	836 (1,025)	9,221 (2,333)	4,737 (1,743)	26,943 (5,957)	50,714 (10,561)	21,305 (6,205)	1,265 (359)	1,265 (359)	21,305 (6,205)	1,265 (359)	0 (0)	115,021 (13,971)
Rainbow trout	0.0176 (0.0029)	0 (0)	0 (0)	172 (28)	1,295 (642)	600 (350)	5,046 (1,578)	19,747 (5,593)	11,708 (3,436)	5,106 (2,498)	3,597 (761)	3,597 (761)	5,106 (2,498)	3,597 (761)	0 (0)	47,271 (7,275)
Atlantic salmon	0.0001 (0.0001)	0 (0)	0 (0)	0 (0)	6 (11)	228 (250)	0 (0)	0 (0)	26 (50)	18 (28)	0 (0)	0 (0)	18 (28)	0 (0)	0 (0)	278 (257)
Brown trout	0.0060 (0.0013)	0 (0)	4 (6)	397 (174)	8,114 (2,823)	698 (385)	226 (155)	2,627 (1,007)	3,104 (1,288)	833 (448)	104 (56)	104 (56)	833 (448)	104 (56)	0 (0)	16,107 (3,324)
Lake trout	0.0113 (0.0019)	0 (0)	0 (0)	0 (0)	414 (193)	3,028 (925)	4,295 (1,224)	14,099 (4,086)	7,793 (2,010)	801 (556)	4 (7)	4 (7)	801 (556)	4 (7)	0 (0)	30,434 (4,841)
Splake	0.0007 (0.0005)	52 (39)	92 (52)	90 (79)	1,401 (1,346)	45 (44)	0 (0)	0 (0)	25 (41)	6 (13)	69 (85)	69 (85)	6 (13)	0 (0)	0 (0)	1,780 (1,354)
Northern pike	0.0014 (0.0007)	387 (80)	961 (311)	0 (0)	56 (81)	57 (56)	158 (168)	1,325 (1,870)	132 (120)	315 (205)	74 (103)	74 (103)	315 (205)	74 (103)	191 (317)	3,656 (1,951)
White sucker	0.0003 (0.0002)	0 (0)	448 (206)	8 (8)	0 (0)	0 (0)	0 (0)	228 (350)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	684 (407)
Channel catfish	0.0003 (0.0002)	0 (0)	0 (0)	13 (26)	53 (0)	138 (196)	164 (246)	202 (338)	38 (50)	51 (80)	69 (0)	69 (0)	51 (80)	69 (0)	0 (0)	728 (472)
White perch	0.0001 (0.0001)	0 (0)	0 (0)	0 (0)	0 (0)	150 (291)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	150 (291)
White bass	0.0002 (0.0003)	6 (2)	3 (1)	0 (0)	391 (737)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	99 (177)	99 (177)	0 (0)	0 (0)	0 (0)	499 (758)
Rock bass	0.0015 (0.0009)	0 (0)	0 (0)	0 (0)	30 (64)	1,723 (2,399)	768 (519)	991 (0)	585 (526)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4,097 (2,511)

Table 1.—Continued.

Species	Harvest per hour	Month												Season	
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov			
Pumpkinseed	0.0000 (0.00000)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	48 (76)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	48 (76)
Bluegill	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	6 (12)	0 (0)	0 (0)	0 (0)	200 (403)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	206 (403)
Smallmouth bass	0.0018 (0.0006)	0 (0)	0 (0)	0 (0)	0 (0)	1,004 (1,001)	1,820 (925)	736 (427)	357 (255)	719 (703)	196 (127)	0 (0)	0 (0)	0 (0)	4,832 (1,617)
Black crappie	0.0000 (0.0001)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	97 (156)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	97 (156)
Yellow perch	0.1238 (0.0232)	29,366 (4,733)	26,302 (8,441)	23,249 (2,159)	35,255 (15,821)	12,206 (8,656)	38,736 (14,089)	117,850 (48,180)	22,315 (10,122)	15,643 (18,304)	8,174 (6,634)	3,202 (2,401)	3,202 (2,401)	3,202 (2,401)	332,298 (58,571)
Walleye	0.0202 (0.0096)	677 (93)	1,830 (589)	0 (0)	5,497 (3,635)	33,701 (25,135)	3,538 (997)	1,473 (677)	2,638 (1,247)	2,161 (1,606)	616 (411)	1,962 (1,275)	1,962 (1,275)	1,962 (1,275)	54,093 (25,549)
Freshwater drum	0.0008 (0.0006)	0 (0)	0 (0)	0 (0)	0 (0)	1,297 (1,545)	174 (274)	557 (608)	45 (73)	64 (81)	0 (0)	0 (0)	0 (0)	0 (0)	2,137 (1,686)
Lake herring	0.0002 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	616 (610)	0 (0)	11 (23)	0 (0)	14 (27)	0 (0)	0 (0)	0 (0)	641 (611)
Lake whitefish	0.0093 (0.0020)	155 (54)	290 (114)	632 (192)	5,814 (2,594)	11,745 (3,859)	3,956 (1,992)	118 (153)	0 (0)	286 (312)	2,045 (858)	0 (0)	0 (0)	0 (0)	25,041 (5,148)
Round whitefish	0.0010 (0.0006)	0 (0)	0 (0)	0 (0)	135 (85)	20 (31)	798 (948)	13 (19)	0 (0)	441 (786)	1,167 (869)	0 (0)	0 (0)	0 (0)	2,574 (1,510)
Other	0.0002 (0.0002)	0 (0)	29 (29)	0 (0)	97 (107)	0 (0)	379 (424)	0 (0)	12 (16)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	517 (438)
Angler hours		129,837 (20,398)	115,864 (33,407)	36,061 (3,382)	215,057 (36,838)	204,048 (44,019)	280,273 (37,139)	605,185 (87,332)	650,284 (100,272)	337,574 (73,922)	84,721 (9,645)	25,455 (11,300)	25,455 (11,300)	25,455 (11,300)	2,684,359 (172,000)
Angler trips		29,765 (5,303)	27,936 (8,959)	8,162 (962)	56,035 (9,090)	50,255 (9,981)	65,799 (8,045)	136,158 (17,832)	141,773 (20,490)	75,220 (14,505)	22,542 (2,543)	5,206 (2,398)	5,206 (2,398)	5,206 (2,398)	618,851 (36,286)
Angler days		26,806 (4,912)	25,362 (8,103)	7,905 (921)	50,765 (8,756)	44,201 (8,191)	60,012 (7,476)	122,238 (16,136)	121,805 (17,268)	65,022 (12,450)	17,686 (1,911)	3,490 (1,587)	3,490 (1,587)	3,490 (1,587)	545,292 (31,781)

Table 2.—Estimated harvest per hour, number harvested, and effort (angler hours, trips, and days) for all Lake Huron survey sites (n=21) combined, by all modes (non-charter) of sportfishing, 2001. Two standard errors of the mean in parentheses.

Species	Harvest per hour	Month												Season
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct			
Pink salmon	0.0050 (0.0021)	0 (0)	0 (0)	0 (0)	0 (0)	225 (868)	1,256 (1,187)	1,647 (823)	5,058 (3,039)	840 (1,549)	840 (1,549)	0 (0)	0 (0)	9,026 (3,805)
Coho salmon	0.0008 (0.0010)	0 (0)	0 (0)	0 (0)	474 (1,612)	157 (272)	102 (153)	314 (556)	332 (417)	49 (114)	49 (114)	1 (6)	1 (6)	1,429 (1,786)
Chinook salmon	0.0347 (0.0057)	0 (0)	0 (0)	0 (0)	1,862 (1,643)	2,257 (2,854)	3,503 (1,676)	19,192 (4,577)	24,712 (6,988)	9,914 (3,249)	9,914 (3,249)	1,225 (1,748)	1,225 (1,748)	62,665 (9,851)
Rainbow trout	0.0044 (0.0014)	0 (0)	33 (35)	75 (133)	471 (217)	894 (1,120)	886 (738)	2,423 (1,421)	2,741 (1,536)	216 (361)	216 (361)	124 (87)	124 (87)	7,863 (2,526)
Atlantic salmon	0.0003 (0.0005)	0 (0)	0 (0)	0 (0)	75 (95)	52 (406)	260 (732)	29 (150)	140 (218)	3 (6)	3 (6)	0 (0)	0 (0)	559 (883)
Brown trout	0.0010 (0.0010)	0 (0)	16 (111)	269 (695)	569 (1,414)	49 (165)	51 (140)	264 (592)	439 (780)	119 (259)	119 (259)	6 (-)	6 (-)	1,782 (1,889)
Lake trout	0.0087 (0.0031)	0 (0)	0 (0)	0 (0)	3 (6)	1,726 (2,380)	6,178 (3,898)	3,902 (2,533)	3,822 (2,015)	101 (334)	101 (334)	78 (112)	78 (112)	15,810 (5,609)
Splake	0.0000 (0.0001)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	15 (29)	25 (105)	0 (0)	0 (0)	0 (0)	0 (0)	40 (109)
Northern pike	0.0017 (0.0011)	1,560 (1,604)	640 (177)	0 (0)	90 (560)	0 (0)	155 (348)	362 (865)	142 (509)	72 (136)	72 (136)	17 (70)	17 (70)	3,038 (2,017)
White sucker	0.0011 (0.0061)	0 (0)	0 (0)	599 (0)	1,461 (11,026)	0 (0)	0 (0)	0 (0)	7 (41)	0 (0)	0 (0)	0 (0)	0 (0)	2,067 (11,026)
Channel catfish	0.0045 (0.0036)	0 (0)	0 (0)	0 (0)	6 (30)	1,698 (2,401)	1,936 (3,057)	2,079 (3,997)	1,107 (2,727)	1,285 (1,948)	1,285 (1,948)	36 (154)	36 (154)	8,147 (6,507)
White perch	0.0003 (0.0008)	0 (0)	0 (0)	0 (0)	510 (1,425)	0 (0)	8 (59)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	518 (1,427)
White bass	0.0000 (0.0003)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	83 (473)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	83 (473)
Rock bass	0.0009 (0.0010)	0 (0)	0 (0)	8 (30)	11 (81)	35 (126)	583 (223)	393 (1,367)	463 (1,010)	107 (212)	107 (212)	0 (0)	0 (0)	1,600 (1,734)

Table 2.—Continued.

Species	Harvest per hour	Month												Season	
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct				
Pumpkinseed	0.0001 (0.0002)	53 (214)	0 (0)	0 (0)	0 (0)	0 (0)	43 (260)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	96 (337)
Bluegill	0.0004 (0.0010)	186 (806)	0 (0)	9 (48)	451 (1,694)	0 (0)	11 (65)	0 (0)	0 (0)	24 (253)	11 (23)	0 (0)	24 (253)	11 (23)	692 (1,895)
Smallmouth bass	0.0003 (0.0005)	0 (0)	0 (0)	0 (0)	0 (0)	15 (30)	189 (758)	132 (396)	75 (220)	51 (123)	11 (22)	0 (0)	0 (0)	0 (0)	473 (893)
Largemouth bass	0.0001 (0.0005)	0 (0)	0 (0)	0 (0)	0 (0)	28 (154)	203 (828)	12 (24)	27 (86)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	270 (847)
Black crappie	0.0008 (0.0028)	251 (1,100)	0 (0)	0 (0)	995 (4,910)	19 (145)	78 (556)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	99 (199)	1,442 (5,068)
Yellow perch	0.4823 (0.1317)	56,011 (30,019)	61,321 (40,231)	144,701 (86,492)	59,353 (61,541)	1,272 (1,379)	43,253 (40,363)	68,043 (69,344)	133,402 (109,679)	250,808 (140,251)	53,664 (54,888)	0 (0)	0 (0)	0 (0)	871,828 (234,393)
Walleye	0.0257 (0.0108)	777 (1,440)	1,728 (2,459)	1,492 (1,900)	1,803 (4,690)	2,801 (8,051)	3,276 (3,751)	23,093 (12,229)	11,039 (10,709)	496 (1,308)	26 (143)	0 (0)	0 (0)	0 (0)	46,531 (19,457)
Freshwater drum	0.0008 (0.0016)	0 (0)	0 (0)	0 (0)	0 (0)	114 (1,461)	299 (1,232)	606 (1,816)	462 (1,158)	10 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1,491 (2,879)
Lake herring	0.0104 (0.0113)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4,569 (8,147)	14,196 (18,635)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	18,765 (20,338)
Lake whitefish	0.0004 (0.0012)	15 (55)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	591 (2,198)	15 (22)	0 (0)	0 (0)	0 (0)	0 (0)	15 (69)	636 (2,200)
Round whitefish	0.0002 (0.0003)	22 (138)	135 (413)	80 (314)	0 (0)	0 (0)	0 (0)	37 (166)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	42 (49)	316 (564)
Other	0.0004 (0.0010)	9 (-)	0 (0)	55 (245)	130 (418)	205 (1,201)	182 (1,131)	12 (98)	51 (237)	7 (39)	1 (1)	0 (0)	0 (0)	0 (0)	652 (1,739)
Angler hours		103,953 (13,544)	92,082 (8,221)	74,491 (15,895)	112,175 (17,867)	101,626 (14,772)	205,651 (22,196)	421,424 (42,446)	411,950 (49,570)	230,615 (39,844)	53,552 (12,012)	1,807,519 (86,744)			
Angler trips		25,234 (3,427)	22,820 (2,179)	20,324 (4,132)	32,761 (6,384)	21,208 (3,155)	41,120 (4,344)	85,665 (8,747)	86,389 (10,525)	49,566 (8,484)	12,800 (2,755)	397,887 (19,236)			
Angler days		21,457 (2,832)	20,132 (1,978)	18,025 (3,591)	26,708 (5,035)	18,977 (2,915)	37,621 (4,026)	79,203 (8,155)	80,142 (10,024)	45,503 (7,966)	11,885 (2,659)	359,653 (17,675)			

Table 3.—Estimated harvest per hour, number harvested, and effort (angler hours, trips, and days) for Michigan waters of the St. Mary's River (Sault Ste. Marie rapids to Drummond Island), by all modes (non-charter) of sportfishing, 2001. Two standard errors of the mean in parentheses.

Species	Harvest per hour	Month												Season
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct			
Pink salmon	0.0086 (0.0209)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1,420 (7,411)	2,712 (6,808)	0 (0)	0 (0)	4,132 (10,063)	
Coho salmon	0.0001 (0.0005)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	40 (247)	0 (0)	0 (0)	0 (0)	0 (0)	40 (247)	
Chinook salmon	0.0103 (0.0165)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	268 (1,388)	0 (0)	2,647 (6,702)	2,029 (4,008)	45 (345)	0 (0)	4,989 (7,939)	
Rainbow trout	0.0001 (0.0006)	0 (0)	0 (0)	0 (0)	0 (0)	11 (140)	0 (0)	39 (240)	0 (0)	0 (0)	0 (0)	7 (77)	57 (288)	
Atlantic salmon	0.0010 (0.0059)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	451 (2,826)	36 (258)	0 (0)	0 (0)	0 (0)	487 (2,838)	
Northern pike	0.0133 (0.0227)	190 (209)	49 (56)	0 (0)	0 (0)	488 (1,185)	978 (1,837)	2,940 (9,634)	806 (3,902)	902 (2,532)	54 (162)	0 (0)	6,407 (10,922)	
Muskellunge	0.0019 (0.0016)	876 (692)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	49 (329)	0 (0)	4 (28)	0 (0)	929 (767)	
Channel catfish	0.0000 (0.0001)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	11 (70)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	11 (70)	
White perch	0.0004 (0.0021)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	215 (1,037)	0 (0)	0 (0)	215 (1,037)	
White bass	0.0002 (0.0013)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	26 (158)	0 (0)	82 (602)	0 (0)	108 (622)	
Smallmouth bass	0.0062 (0.0104)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	183 (500)	289 (973)	991 (3,435)	1,469 (3,489)	84 (279)	0 (0)	3,016 (5,024)	
Largemouth bass	0.0001 (0.0007)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	49 (328)	0 (0)	0 (0)	0 (0)	49 (328)	
Yellow perch	0.1600 (0.1443)	8,815 (6,166)	122 (124)	109 (164)	0 (0)	1,138 (4,375)	137 (696)	5,603 (21,555)	10,168 (21,826)	47,667 (61,578)	3,486 (3,349)	0 (0)	77,245 (69,295)	

Table 3.—Continued.

Species	Harvest per hour	Month												Season
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct			
Walleye	0.0501 (0.0250)	0 (0)	249 (214)	95 (191)	0 (0)	2,444 (3,481)	4,769 (3,518)	4,951 (6,499)	8,324 (7,364)	2,873 (4,090)	486 (1,573)	24,191 (11,842)		
Lake herring	0.2547 (0.1281)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	12,675 (14,144)	110,115 (59,102)	0 (0)	123 (251)	12 (43)	122,925 (60,771)		
Lake whitefish	0.0084 (0.0144)	0 (0)	0 (0)	0 (0)	0 (0)	21 (208)	162 (924)	3,551 (6,801)	73 (515)	181 (866)	50 (514)	4,038 (6,959)		
Other	0.0016 (0.0042)	0 (0)	0 (0)	0 (0)	0 (0)	66 (443)	14 (81)	0 (0)	0 (0)	610 (1,937)	68 (420)	758 (2,032)		
Angler hours		41,630 (17,219)	9,935 (2,084)	2,516 (1,586)	0 (0)	22,232 (5,073)	55,427 (10,431)	148,653 (29,348)	97,487 (15,836)	96,455 (19,969)	8,320 (2,747)	482,655 (44,229)		
Angler trips		8,178 (3,876)	3,006 (749)	473 (293)	0 (0)	5,623 (1,437)	13,548 (2,683)	35,105 (7,260)	22,236 (4,050)	22,172 (5,157)	1,892 (650)	112,233 (11,003)		
Angler days		8,178 (3,876)	2,935 (735)	452 (280)	0 (0)	4,464 (1,122)	9,738 (1,904)	27,567 (6,066)	20,028 (3,760)	19,487 (4,634)	1,612 (539)	94,461 (9,655)		

Table 4.—Estimated harvest per hour, number harvested, and effort (angler hours, trips, and days) for the boat fishery (non-charter) in the Michigan waters of Lake Erie, 2001. Two standard errors of the mean in parentheses.

Species	Harvest per hour	Month							Season
		Apr	May	Jun	Jul	Aug	Sep	Oct	
Northern pike	0.0002 (0.0015)	0 (0)	0 (0)	0 (0)	102 (725)	0 (0)	0 (0)	0 (0)	102 (725)
Channel catfish	0.0071 (0.0179)	139 (583)	447 (2,107)	408 (2,583)	427 (1,691)	1,468 (5,858)	518 (5,047)	57 (1,552)	3,464 (8,747)
White perch	0.0019 (0.0074)	179 (838)	416 (2,580)	0 (0)	0 (0)	289 (2,267)	71 (738)	0 (0)	955 (3,611)
White bass	0.0078 (0.0166)	208 (582)	1,074 (3,944)	2,209 (6,943)	68 (377)	221 (1,251)	39 (282)	0 (0)	3,819 (8,117)
Rock bass	0.0001 (0.0008)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	35 (369)	0 (0)	35 (369)
Bluegill	0.0000 (0.0003)	0 (0)	0 (0)	0 (0)	0 (0)	19 (166)	0 (0)	0 (0)	19 (166)
Smallmouth bass	0.0005 (0.0027)	0 (0)	0 (0)	30 (162)	102 (725)	0 (0)	113 (1,118)	0 (0)	245 (1,342)
Largemouth bass	0.0002 (0.0015)	0 (0)	0 (0)	0 (0)	102 (725)	0 (0)	0 (0)	0 (0)	102 (725)
Yellow perch	0.5181 (0.5138)	111 (278)	3,440 (8,396)	25,808 (79,599)	6,063 (19,578)	86,675 (118,606)	122,437 (199,638)	9,757 (33,596)	254,291 (248,679)
Walleye	0.2349 (0.1265)	2,998 (3,292)	14,321 (16,889)	27,447 (29,143)	65,646 (47,729)	3,725 (6,771)	1,017 (5,054)	135 (1,089)	115,289 (59,127)
Freshwater drum	0.0008 (0.0023)	26 (203)	13 (82)	121 (772)	68 (522)	151 (621)	0 (0)	0 (0)	379 (1,142)
Angler hours		9,014 (3,880)	57,918 (23,397)	84,269 (35,849)	175,108 (55,656)	70,034 (19,554)	79,183 (32,406)	15,281 (11,766)	490,807 (80,723)
Angler trips		1,831 (782)	10,887 (4,314)	15,247 (6,575)	34,242 (10,812)	12,826 (3,682)	15,765 (6,474)	3,536 (2,533)	94,334 (15,532)
Angler days		1,831 (782)	10,887 (4,314)	14,913 (6,435)	34,242 (10,812)	12,700 (3,642)	15,765 (6,474)	3,470 (2,521)	93,808 (15,462)

Table 5.—Estimated harvest per hour, number harvested, and effort (angler hours, trips, and days) for all Lake Superior sites (n=6) combined, by all modes (non-charter) of sportfishing, 2001. Two standard errors of the mean in parentheses.

Species	Harvest per hour	Month												Season
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct			
Coho salmon	0.0343 (0.0059)	142 (42)	491 (128)	1,183 (353)	2,503 (749)	641 (427)	226 (190)	310 (122)	270 (177)	330 (133)	100 (61)	6,196 (995)		
Chinook salmon	0.0102 (0.0033)	3 (3)	12 (3)	23 (5)	167 (94)	604 (304)	644 (459)	178 (127)	121 (131)	70 (50)	11 (16)	1,833 (589)		
Rainbow trout	0.0036 (0.0011)	2 (2)	0 (0)	47 (49)	304 (145)	129 (59)	17 (20)	77 (106)	0 (0)	61 (43)	15 (8)	652 (201)		
Brown trout	0.0010 (0.0004)	0 (0)	0 (0)	17 (22)	74 (30)	61 (58)	0 (0)	0 (0)	5 (10)	12 (22)	6 (0)	175 (73)		
Lake trout	0.1291 (0.0160)	0 (0)	304 (23)	447 (220)	62 (28)	1,043 (331)	4,063 (877)	7,281 (1,490)	7,272 (1,429)	2,417 (960)	405 (181)	23,294 (2,479)		
Splake	0.0027 (0.0012)	0 (0)	33 (53)	1 (5)	65 (50)	96 (26)	24 (47)	85 (156)	0 (0)	16 (31)	166 (95)	486 (207)		
Siscowet	0.0253 (0.0050)	0 (0)	510 (42)	1,500 (94)	8 (2)	279 (239)	580 (400)	696 (169)	746 (678)	199 (149)	46 (0)	4,564 (859)		
Northern pike	0.0001 (0.0001)	6 (5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (8)	0 (0)	7 (0)	16 (9)		
Yellow perch	0.0302 (0.0135)	190 (78)	1,130 (80)	3,540 (2,380)	67 (87)	0 (0)	0 (0)	371 (0)	157 (307)	0 (0)	0 (0)	5,455 (2,404)		
Walleye	0.0000 (0.0000)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (2)	0 (0)	0 (0)	0 (0)	0 (0)	1 (2)		
Lake herring	0.0106 (0.0037)	310 (144)	1,129 (605)	391 (152)	85 (104)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1,915 (649)		

Table 5.-Continued.

Species	Harvest per hour	Month												Season
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct			
Lake whitefish	0.0719 (0.0728)	0 (0)	2,247 (863)	2,097 (1,583)	231 (228)	7,041 (12,985)	375 (374)	743 (0)	27 (44)	28 (35)	184 (103)	12,973 (13,118)		
Round whitefish	0.0065 (0.0028)	0 (0)	65 (106)	106 (112)	56 (54)	0 (0)	0 (0)	0 (0)	108 (175)	33 (64)	810 (444)	1,178 (508)		
Other	0.0122 (0.0129)	0 (0)	6 (9)	54 (78)	2,108 (2,326)	0 (0)	36 (0)	0 (0)	0 (0)	0 (0)	5 (6)	2,209 (2,328)		
Angler hours		930 (199)	14,648 (821)	27,506 (2,708)	19,006 (3,171)	21,136 (7,493)	22,505 (3,325)	30,741 (4,076)	26,374 (4,311)	12,675 (2,633)	4,907 (2,463)	180,428 (11,554)		
Angler trips		227 (56)	4,023 (316)	8,409 (887)	6,011 (986)	5,377 (2,178)	5,568 (896)	7,627 (1,084)	7,017 (1,243)	3,555 (760)	1,119 (204)	48,933 (3,278)		
Angler days		227 (56)	3,865 (316)	8,061 (852)	5,882 (981)	4,987 (1,731)	5,350 (835)	7,384 (1,035)	6,830 (1,211)	3,477 (746)	1,119 (204)	47,182 (2,936)		