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**MICHIGAN DEPARTMENT OF NATURAL RESOURCES
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**Fisheries Technical Report 2002-3
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**Gerald P. Rakoczy
and
Donna Wesander-Russell**



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Charter Boat Catch and Effort from the Michigan Waters of the Great Lakes, 1999

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Abstract.—Legislation enacted in 1992 by the State of Michigan requires all charter boat operators to report sportfishing catch and effort to the Michigan Department of Natural Resources. The objective of the catch and activity reporting system is to obtain a continuous annual record of the number, type, and location of fish harvested by charter boat clients in Michigan.

Ninety-seven percent of approximately 500 charter fishing operators complied with the law by returning their completed catch reporting forms in 1999. These operators reported making 17,881 charter fishing excursions during April through October. The total number of charter excursions decreased slightly (-2%) in 1999 compared to 1998. Approximately 497,000 angler hours were spent fishing by some 82,400 charter clients. The distribution of charter fishing excursions was: 64% Lake Michigan, 18% Lake Huron, 13% Lake Erie, 3% Lake Superior, and 2% Lake St. Clair. Over 273,000 fish were reported harvested. The harvest was composed of about 102,000 yellow perch, 65,000 walleye, 39,300 chinook salmon, 33,800 lake trout, 12,000 coho salmon, 12,000 rainbow trout, and 5,600 brown trout.

Michigan's charter boat industry increased from 250 operations in 1979 to nearly 900 in 1989. Since the late 1980s, the number of charter boats used for sport fishing excursions on Michigan's Great Lakes waters has declined to approximately 500. The charter fishing industry provides Michigan's economy with significant economic benefits each year. For example, 239,000 clients spent an estimated \$21 million in addition to charter fees in 1985, and the total statewide investment by charter boat

firms in the same year was estimated to exceed \$30 million (Mahoney et al. 1986).

The Michigan Legislature in 1992 passed Act 115, Public Acts of 1992. This legislation re-authorized and strengthened the law, first enacted during 1989 (Act 22, Public Acts of 1989), which required the reporting of sport catch and effort by the charter fishing industry. The legislation was supported by Michigan Charter Boat Association (MCBA), an industry representative, and Michigan Department of Natural Resources (MDNR). Among other

provisions, the law includes stringent penalties for charter fishing operators who are delinquent by more than 60 days with their catch reports. Also, the law requires that all operators maintain on board an up to date daily log of their catch and fishing activity.

The objective of the catch reporting system is to obtain a continuous annual record of fishing effort and the number, type, and location of fish harvested by charter boat anglers in Michigan. These data have assisted MDNR's Great Lakes fishery management efforts by providing valuable trend information about charter harvest and catch rates, which reflect the status of fish stocks important to the industry. The data also allows MCBA to monitor the health and welfare of its industry.

Methods

The Michigan Charter Boat Daily Catch Report form was developed in 1989 by a committee made up of two members each from MDNR and MCBA (Figure 1). Forms and grid maps of the Great Lakes are mailed annually to all known charter operators during March. Charter operators are identified from previous years' lists of reporting operators and from Sport Trolling Licenses purchased from MDNR's Law Enforcement Division. Charter operators who used their vessels for fishing were informed that they are required by law to complete the form each time they fished. A form is to be mailed by the tenth of each month following the month of fishing to MDNR's Charlevoix Fisheries Research Station.

The data form requires the following information: an assigned identification number for each charter boat, lake, date fished, port, grid, hours fished, number of resident and nonresident anglers, catch (number) of major species, and number of sea lamprey seen attached to chinook salmon or lake trout. Space is also provided on the form for comments or observations.

Completed data forms returned to Charlevoix Fisheries Research Station were logged, coded by port fished, and entered on computer. Incomplete forms were logged and

returned to the charter operator with a letter explaining why the report was returned.

Each month (June through October), postcard notices were sent to charter operators who had not filed a report for the previous month. Two notices were sent each month, the first after an operator was delinquent for 10 days, and the second after 30 days.

In December 1999, operators who had not filed reports for one or more months during the period May through September were sent letters via certified mail. These letters informed the operator that this would be the last notice he or she would receive. If the recipient did not respond in writing within 14 days of receipt of this notice, his or her name was submitted to MDNR's Law Enforcement Division recommending non-issuance of an inspection certificate for the 2000 season.

Three measures of fishing effort were summarized: angler hours, angler trips, and charter excursions. Angler hours were based upon total hours fished (dock to dock) by each angler. An angler trip was one completed fishing outing by one individual. A charter excursion was one completed boat trip. For example, if a charter operator took four anglers fishing for 6 hours, total fishing effort would be 24 angler hours, 4 angler trips, and 1 charter excursion. Tables summarizing catch and effort for selected ports around the Great Lakes are contained in the appendices.

Data regarding number of sea lamprey observed by charter operators were collected at request of the U.S. Fish and Wildlife Service's (USFWS) Sea Lamprey Control Station at Marquette, Michigan. These data are used by USFWS as an index of sea lamprey abundance.

Results

Compliance

During the 1999 fishing season, an average of 65% of all charter boat operators complied with the law by submitting their catch reports on time, while 78% submitted reports within 30 days of the due date. Monthly rate of compliance in 1999 was slightly less than 1998.

By the end of 1999, 97% of all charter operators had complied with the law, which was one percent less than 1998 (Rakoczy and Wesander-Russell 2001).

Catch and effort

Charter operators submitted reports on 17,881 charter excursions during April through October, 1999 on lakes Michigan, Huron, Erie, Superior and St. Clair (Tables 1 through 5). The total number of charter excursions in 1999 decreased by 2% compared to 1998 (Rakoczy and Wesander-Russell 2001). Increases in the number of charter excursions in 1999 as compared to 1998 occurred on lakes Erie (+42%), Superior (+17%) and Huron (+3%), but declined on lakes St. Clair (-10%) and Michigan (-8%). The increase in the number of charter excursions on Lake Erie was due to the inclusion of trips during 1999 originating in Michigan but where fishing occurred outside state borders. The Lake Erie Technical Committee of the Great Lakes Fishery Commission requested that MDNR gather information on these charter trips.

The distribution of charter fishing excursions by lake was: 64% Lake Michigan, 18% Lake Huron, 13% Lake Erie, 3% Lake Superior, and 2% Lake St. Clair. This distribution was very similar to previous years.

A total of 497,304 hours were spent fishing by 82,380 charter anglers in Michigan's waters and tributaries of the Great Lakes (Tables 1 through 5). The total number of charter anglers in 1999 decreased slightly (<1%) compared to 1998. Twenty-six percent of all charter clients were not residents of Michigan. Lake Superior charter operators had the greatest percentage of nonresident clients (51%; Table 4), while Lake St. Clair charter captains had the lowest percentage (7%; Table 5). The main reason Lake Superior has always had a large percentage of non-resident charter anglers can be attributed to the active charter fishery in the vicinity of Isle Royale National Park. The majority of these charter trips originate in Minnesota.

A total of 273,000 fish were reported harvested in all lakes (Tables 1 through 5). Lake Michigan accounted for 43% of all fish

harvested, while lakes Erie and Huron accounted for 41% and 11%, respectively. The most numerous species in the harvest was yellow perch (102,000), which accounted for 37% of the total harvest. Numbers of other species harvested were: 65,000 walleye (24%), 39,300 chinook salmon (14%), 33,800 lake trout (12%), 12,000 coho salmon (4%), 12,000 rainbow trout (4%), and 2,500 brown trout (1%). The "other" species category accounted for the remainder of the catch. Since other species are not identified on the catch reporting form, the actual composition of this category is unknown.

In general, the overall numbers of salmonines harvested from Michigan's Great Lakes waters decreased by nearly 21,000 fish (-17%) during 1999 compared to 1998. The harvest of coho salmon (-30%), lake trout (-26%), and rainbow trout (-20%) decreased as compared to the previous year. The number of chinook salmon and brown trout were virtually unchanged in 1999 compared to 1998.

In Lake Michigan, declines occurred in the harvest of coho salmon (-5,900 or -35%), rainbow trout (-3,100 or -22%) and lake trout (-12,900 or -39%) during 1999 as compared to 1998. The harvest of brown trout (+231 or +11%) increased compared to the previous year, while chinook salmon remained virtually unchanged.

In Lake Huron, the harvest of coho salmon increased 120% (+300 fish), while the harvest of lake trout (-600 or -7%) and brown trout (-260 or -68%) declined compared to 1998. The harvest of chinook salmon and rainbow trout remained virtually unchanged in 1999 compared to 1998.

The number of walleye and yellow perch harvested in 1999 increased compared to 1998. Walleye increased by 11,000 fish (+20%) while the yellow perch harvest increased by about 37,500 fish (58%). The majority of walleye harvested by charter anglers in the Michigan waters of the Great Lakes come from Lake Erie. The Lake Erie walleye harvest increased by 23% in 1999 compared to 1998. Forty-nine percent of the total yellow perch harvest during 1999 came from Lake Erie, while 41% came from Lake Michigan. The harvest of yellow perch increased 57% in Lake Erie and 61% in Lake

Michigan during 1999 as compared to the previous year.

Catch rates (fish per 100 angler hours) by Lake Michigan charter anglers increased in 1999 as compared to 1998 for chinook salmon (+10%) and brown trout (+17%), while rates for coho salmon (-29%), rainbow trout (-15%) and lake trout (-34%) declined (Table 6). On Lake Huron, catch rates for chinook salmon, rainbow trout and lake trout remained virtually unchanged ($\pm 10\%$) compared to 1998. Coho salmon catch rates increased by over 100% for the second year in a row on Lake Huron compared to the previous year. Coho salmon, however, are still a minor species on Lake Huron with an annual harvest of only 600 fish in 1999. Lake trout are the most important salmonine in the charter catch from Lake Superior and catch rates for lake trout have been virtually unchanged during the past decade.

Walleye play an important role in charter fisheries on Lakes Erie, Huron, and St. Clair. Catch rates for walleye by charter anglers on Lake Huron and the St. Clair system changed very little during 1999 as compared to 1998 (Table 7). Walleye catch rates on Lake Erie declined by 25% in 1999 compared to 1998, but were very similar to rates noted during 1995-97.

Most charter excursions that took place on Michigan's Great Lakes waters during 1999 were aimed at the various species of salmonines. The total catch per charter excursion for all five species of salmonines combined changed very little ($\pm 10\%$) during 1999 compared to the 1990-98 mean catch rate at the Lake Michigan ports of Grand Haven, Ludington, and Manistee (Table 8). The ports of St. Joseph/Benton Harbor and Leland had a decrease in the mixed bag salmonine catch rate, while Frankfort/Elberta had an increase compared to

the 1990-98 mean. Catch rates for salmonines increased in 1999 compared to the nine year mean at all five selected Lake Huron ports. Salmonine catch rates in 1999 at Alpena, Oscoda, Grindstone City and Harbor Beach were more than 40% greater than the previous nine year average which indicates that the 1999 fishery for salmonines on Lake Huron was one of the best on record. On Lake Superior, salmonine catch rates were virtually unchanged at Marquette, but increased at Ontonagon and Black River Harbor during 1999 compared to the mean.

As has been the case in previous years (1990-98), numbers of sea lamprey attached to chinook salmon and lake trout were higher on Lake Huron than the other Great Lakes (Table 9). Numbers of sea lamprey attached per 100 lake trout harvested from Lake Huron in 1999 were 1.8, as compared to 1.2 for Lake Michigan and 0.5 for Lake Superior. Charter captains also reported 4.6 lamprey per 100 chinook salmon harvested on Lake Huron during 1999 as compared to 0.2 for Lake Michigan and zero for Lake Superior. However, the numbers of sea lamprey observed during the 1990s have decreased considerably on Lake Huron for both chinook salmon and lake trout.

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MICHIGAN DEPARTMENT OF NATURAL RESOURCES - FISHERIES DIVISION

MICHIGAN CHARTER BOAT DAILY CATCH REPORT

Submission of this information is required by authority of Section 44508 of Part 445 of Act 451, P. A. of 1994, as amended. Failure to comply with the provisions of this Act will prohibit issuance of an Inspection Certificate for the following season.

Please reference instructions on reverse side.

IDENTIFICATION NUMBER	
LAKE	
MONTH	YEAR

Date	Port Fished	Grid Fished	Hours Fished (Dock to Dock)	No. of Anglers		Daily Catch								No. of Lamprey Seen On		
				Res.	Non-Res.	COH	CHS	RBT	BNT	LAT	YEP	WAE	OTH	CHS	LAT	
1																
2																
3																
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Comments:

Signature _____ Date _____

DISTRIBUTION: White - Charlevox; Canary - Charter Captain

PR 8206 (Rev. 02/26/98)

Figure 1.-Michigan charter boat daily catch report form.

Table 1.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.034	0.957	539	1,948	1,083	858	5,133	1,239	91	10,891
Chinook salmon	0.089	2.521	58	1,549	1,709	4,631	14,509	6,030	203	28,689
Rainbow trout	0.034	0.969	341	1,349	1,460	1,723	2,049	2,867	1,236	11,025
Brown trout	0.007	0.211	612	278	139	446	708	190	30	2,403
Lake trout	0.062	1.780	28	2,598	4,231	6,634	6,027	731	6	20,255
Yellow perch	0.130	3.698	25,290	2,548	2,384	8,132	2,408	1,310	18	42,090
Walleye	0.006	0.163	16	256	459	361	283	226	259	1,860
Other	0.001	0.021	26	16	79	20	43	24	26	234
Lamprey on:										
Chinook salmon			0	1	2	5	38	6	0	52
Lake trout			0	34	52	80	73	8	0	247
Angler hours			16,537	40,157	50,043	72,467	99,629	38,378	6,920	324,129
Angler trips			2,873	6,642	8,148	12,114	16,262	6,532	1,001	53,572
Resident anglers			1,737	4,176	5,516	8,354	11,592	4,726	481	36,582
Nonresident anglers			1,136	2,469	2,632	3,765	4,674	1,810	520	17,006
Charter excursions			344	1,285	1,729	2,553	3,609	1,562	300	11,382

Table 2.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on Lake Huron, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.009	0.203	48	257	148	97	65	19	1	635
Chinook salmon	0.157	3.367	49	689	591	3,003	4,682	1,397	104	10,515
Rainbow trout	0.013	0.269	103	69	125	312	156	64	11	840
Brown trout	0.002	0.041	11	10	9	40	36	22	0	128
Lake trout	0.117	2.519	11	1,734	2,022	2,074	1,823	202	0	7,866
Yellow perch	0.084	1.811	0	132	92	1,432	2,241	1,759	0	5,656
Walleye	0.034	0.738	7	35	110	1,573	541	39	0	2,305
Other	0.011	0.239	0	65	76	332	223	49	0	745
Lamprey on:										
Chinook salmon			2	29	28	157	201	56	6	479
Lake trout			0	39	41	33	28	4	0	145
Angler hours			1,291	7,408	8,852	19,883	22,042	7,257	401	67,133
Angler trips			202	1,236	1,550	3,471	3,998	1,335	63	11,855
Resident anglers			192	1,161	1,404	2,958	3,325	1,207	54	10,301
Nonresident anglers			17	83	146	516	677	128	9	1,576
Charter excursions			73	317	410	916	1,036	348	23	3,123

Table 3.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on Lake Erie, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.000	0.002	0	0	0	5	0	0	0	5
Chinook salmon	0.000	0.000	0	0	0	0	0	0	0	0
Rainbow trout	0.001	0.029	0	1	16	9	44	0	0	70
Brown trout	0.000	0.000	0	0	0	0	0	0	0	0
Lake trout	0.000	0.000	0	0	0	0	0	0	0	0
Yellow perch	0.672	20.905	47	294	856	2,697	22,779	18,549	4,532	49,754
Walleye	0.800	24.864	103	7,189	33,483	16,945	453	1,003	1	59,177
Other	0.022	0.675	0	376	794	362	10	41	24	1,607
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	0	0	0	0
Angler hours			323	9,082	34,077	19,883	5,029	4,737	875	74,006
Angler trips			46	1,579	5,229	3,586	936	939	172	12,487
Resident anglers			38	1,380	4,593	3,230	869	874	162	11,146
Nonresident anglers			8	199	642	356	72	65	10	1,352
Charter excursions			13	326	1,052	567	197	191	34	2,380

Table 4.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on Lake Superior, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.023	0.832	0	32	178	117	136	41	1	505
Chinook salmon	0.006	0.204	0	0	10	52	48	14	0	124
Rainbow trout	0.003	0.099	0	3	14	7	30	6	0	60
Brown trout	0.000	0.003	0	0	2	0	0	0	0	2
Lake trout	0.263	9.331	0	181	1,119	2,253	1,794	304	13	5,664
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.008	0	0	0	1	1	3	0	5
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	9	8	6	2	1	26
Angler hours			0	818	4,563	8,173	6,667	1,218	72	21,510
Angler trips			0	135	540	1,060	941	187	12	2,875
Resident anglers			0	93	286	479	419	132	5	1,414
Nonresident anglers			0	42	258	581	522	55	7	1,465
Charter excursions			0	28	112	220	197	46	4	607

Table 5.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on Lake St. Clair and the St. Clair River, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.000	0.000	0	0	0	0	0	0	0	0
Chinook salmon	0.000	0.000	0	0	0	0	0	0	0	0
Rainbow trout	0.000	0.000	0	0	0	0	0	0	0	0
Brown trout	0.000	0.000	0	0	0	0	0	0	0	0
Lake trout	0.000	0.000	0	0	0	0	0	0	0	0
Yellow perch	0.413	11.172	50	575	576	815	748	802	780	4,346
Walleye	0.163	4.419	280	288	489	420	206	36	0	1,719
Other	0.317	8.568	50	262	832	998	1,012	173	6	3,333
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	0	0	0	0
Angler hours			681	1,059	2,087	2,464	2,331	1,563	341	10,526
Angler trips			99	162	326	380	349	221	54	1,591
Resident anglers			66	162	323	339	330	212	52	1,484
Nonresident anglers			33	0	3	41	19	9	2	107
Charter excursions			30	46	76	89	81	53	14	389

Table 6.—Catch rates (fish per 100 angler hours) by charter anglers for salmonines on Lakes Michigan, Huron and Superior during 1990-99.

Lake and Species	Year									
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Michigan										
Coho salmon	3.9	2.8	3.4	4.5	2.6	2.2	2.9	3.8	4.8	3.4
Chinook salmon	7.4	7.0	4.9	4.0	4.0	5.0	9.0	9.6	8.1	8.9
Rainbow trout	4.0	7.2	6.5	5.0	5.2	3.0	6.3	4.8	4.0	3.4
Brown trout	0.6	0.8	0.4	0.7	1.1	0.7	1.1	1.5	0.6	0.7
Lake trout	8.4	8.7	7.6	9.7	10.4	10.2	7.5	7.2	9.4	6.2
Huron										
Coho salmon	0.2	0.2	0.2	0.3	0.3	0.1	0.4	0.2	0.4	0.9
Chinook salmon	6.0	6.4	6.4	7.2	8.3	11.7	11.8	18.5	16.1	15.7
Rainbow trout	0.3	0.6	0.7	1.4	1.3	2.6	2.6	2.0	1.3	1.3
Brown trout	0.1	0.2	0.7	1.7	2.1	1.9	0.8	0.4	0.6	0.2
Lake trout	9.8	7.9	6.6	4.3	6.3	6.6	9.4	9.8	12.6	11.7
Superior										
Coho salmon	1.2	3.2	1.3	1.0	1.6	1.7	1.9	1.1	0.7	2.3
Chinook salmon	0.3	0.4	0.3	0.3	0.1	0.2	0.3	0.1	0.7	0.6
Rainbow trout	0.3	0.3	0.1	0.2	0.3	0.3	0.3	0.3	0.2	0.3
Brown trout	0.1	0.2	0.1	0.0	0.1	<0.1	<0.1	0.1	<0.1	<0.1
Lake trout	28.5	27.9	25.5	28.2	25.3	26.2	28.5	26.9	25.2	26.3

Table 7.—Catch rates (fish per 100 angler hours) by charter anglers for yellow perch and walleye on Lakes Huron, St. Clair and Erie during 1990-99.

Lake and Species	Year									
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Huron										
Yellow perch	9.2	7.4	6.3	4.0	4.9	3.7	2.8	1.6	2.5	8.4
Walleye	5.1	7.1	6.7	7.4	6.7	3.5	3.4	3.0	3.7	3.4
St. Clair										
Yellow perch	13.8	16.8	15.1	40.4	85.5	66.9	100.3	103.3	42.9	41.3
Walleye	32.4	20.4	12.5	18.4	12.3	15.5	12.3	13.1	16.1	16.3
Erie										
Yellow perch	29.4	34.1	43.3	43.9	28.7	51.7	78.4	74.6	70.4	67.2
Walleye	74.5	62.8	78.5	81.4	69.6	82.4	82.2	83.9	106.7	80.0

Table 8.—Total and mean (1990-98) catch per excursion (number of fish) for all salmonines combined by charter anglers at various ports on lakes Michigan, Huron and Superior 1990-99.

Port	1990	1991	1992	1993	1994	1995	1996	1997	1998	Mean	1999
Lake Michigan											
St. Joseph/Benton Harbor	7.3	8.7	7.3	8.1	7.7	7.7	10.0	9.8	9.3	8.4	7.0
Grand Haven	5.0	5.5	4.7	5.3	5.0	5.2	6.1	6.7	6.7	5.6	5.3
Ludington	9.3	11.1	8.4	8.8	7.4	7.2	10.8	8.4	8.1	8.8	8.8
Manistee	6.2	8.0	5.7	6.2	5.8	6.9	10.3	8.8	8.2	7.3	7.5
Frankfort/Elberta	7.1	7.5	5.8	6.6	6.2	6.7	8.8	7.6	8.2	7.2	8.1
Leland	7.2	9.5	9.0	6.9	9.1	8.6	9.4	9.1	8.1	8.5	7.1
Lake Huron											
Rogers City	3.2	3.3	2.5	3.9	5.2	6.6	5.9	8.2	5.4	4.9	6.3
Alpena	3.4	3.5	4.7	4.9	4.7	5.1	5.2	6.4	6.6	4.9	7.2
Oscoda	4.0	4.0	3.6	3.0	3.2	5.2	6.2	7.1	7.1	4.8	7.0
Grindstone City	5.6	6.1	5.9	4.7	5.5	7.0	8.0	9.3	10.7	7.0	10.1
Harbor Beach	3.6	2.9	3.2	2.8	3.5	4.9	6.6	6.5	6.7	4.5	7.1
Lake Superior											
Marquette	10.9	10.9	11.4	10.9	8.3	11.2	13.0	11.9	7.0	10.6	10.4
Ontonagon	12.5	11.5	14.1	14.0	10.1	11.1	15.9	11.9	13.7	12.8	14.8
Black River Harbor	12.0	12.9	10.6	13.5	14.1	12.6	14.0	13.1	10.7	12.6	13.6

Table 9.—Sea lamprey incidence (lamprey per 100 fish) for chinook salmon and lake trout harvested by the charter fishery in the Michigan waters of the Great Lakes, 1990-99.

Species/Year	Lake		
	Michigan	Huron	Superior
Chinook salmon			
1990	0.5	18.6	0.0
1991	0.3	13.9	8.0
1992	0.2	13.6	0.0
1993	0.1	7.6	0.0
1994	0.3	7.1	0.0
1995	0.3	6.2	3.0
1996	0.1	3.9	0.0
1997	0.2	4.7	0.0
1998	0.4	5.2	0.0
1999	0.2	4.6	0.0
Lake trout			
1990	1.8	6.6	1.8
1991	1.2	5.7	1.6
1992	0.8	4.6	0.8
1993	0.6	2.1	0.5
1994	0.6	3.3	1.1
1995	1.0	2.7	0.7
1996	0.7	1.9	1.0
1997	1.1	3.0	0.6
1998	1.1	2.1	0.5
1999	1.2	1.8	0.5

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Appendix 1.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Michigan City, Indiana (catch in Michigan waters of Lake Michigan), 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.132	4.535	172	634	590	9	71	7	0	1,483
Chinook salmon	0.041	1.404	11	30	18	45	274	81	0	459
Rainbow trout	0.034	1.153	68	156	49	57	43	4	0	377
Brown trout	0.002	0.058	10	0	0	0	8	1	0	19
Lake trout	0.056	1.914	17	94	17	211	249	38	0	626
Yellow perch	0.016	0.535	0	0	0	175	0	0	0	175
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.000	0	0	0	0	0	0	0	0
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	1	1	2	0	0	4
Angler hours			695	2,390	2,588	2,027	2,874	620	0	11,194
Angler trips			91	365	392	286	404	87	0	1,625
Resident anglers			32	27	5	0	24	10	0	98
Nonresident anglers			59	338	387	286	380	77	0	1,527
Charter excursions			18	71	80	59	81	18	0	327

Appendix 2.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at New Buffalo, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.120	3.653	37	58	81	2	0	1	0	179
Chinook salmon	0.028	0.857	2	10	7	1	15	7	0	42
Rainbow trout	0.034	1.020	12	26	5	0	4	3	0	50
Brown trout	0.005	0.143	1	0	3	0	0	3	0	7
Lake trout	0.019	0.592	0	7	0	12	9	1	0	29
Yellow perch	0.035	1.061	0	0	0	52	0	0	0	52
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.000	0	0	0	0	0	0	0	0
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	0	0	0	0
Angler hours			328	454	322	128	144	114	0	1,490
Angler trips			45	57	44	20	20	18	0	204
Resident anglers			26	8	9	0	0	0	0	43
Nonresident anglers			19	49	35	20	20	18	0	161
Charter excursions			13	13	9	6	4	4	0	49

Appendix 3.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at St. Joseph/Benton Harbor, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.049	1.563	310	1,128	177	31	93	39	2	1,780
Chinook salmon	0.060	1.924	31	594	87	49	854	575	1	2,191
Rainbow trout	0.069	2.198	101	635	575	986	194	13	0	2,504
Brown trout	0.004	0.113	16	41	8	36	20	8	0	129
Lake trout	0.037	1.179	10	653	181	79	418	2	0	1,343
Yellow perch	0.041	1.310	0	0	116	966	275	135	0	1,492
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.004	0	1	1	1	0	2	0	5
Lamprey on:										
Chinook salmon			0	0	0	0	1	2	0	3
Lake trout			0	2	0	2	2	0	0	6
Angler hours			2,117	11,013	7,002	6,356	6,609	3,098	56	36,250
Angler trips			295	1,527	991	917	952	461	8	5,151
Resident anglers			84	518	256	259	342	131	7	1,597
Nonresident anglers			211	1,009	735	658	614	330	1	3,558
Charter excursions			68	331	209	204	213	112	2	1,139

Appendix 4.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on the St. Joseph River, 1999.

Species	Total catch per hour	Total catch per excursion	Month												Dec	Season		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov					
Coho salmon	0.0032	0.0886	0	0	29	11	0	0	0	0	0	0	0	6	22	1	0	69
Chinook salmon	0.0067	0.1849	0	0	0	0	0	0	0	0	0	0	0	74	69	1	0	144
Rainbow trout	0.1459	4.0282	8	269	480	141	1	14	0	2	96	873	811	443	3,138			
Brown trout	0.0126	0.3492	0	24	175	43	0	0	0	0	1	7	12	10	272			
Lake trout	0.0000	0.0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow perch	0.0000	0.0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walleye	0.0221	0.6098	22	40	11	0	4	206	78	45	8	0	1	60	475			
Other	0.0053	0.1463	0	0	3	25	0	39	6	19	8	14	0	0	114			
Angler hours			229	1,684	4,550	1,551	40	837	521	364	1,389	4,230	3,702	2,408	21,505			
Angler trips			32	243	614	216	5	106	70	47	194	591	521	354	2,993			
Resident anglers			7	53	248	106	0	41	22	18	71	213	209	130	1,118			
Nonresident anglers			25	190	366	110	5	65	48	29	127	378	312	224	1,879			
Charter excursions			10	61	161	52	2	27	20	14	56	158	129	89	779			

Appendix 5.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at South Haven, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.002	0.176	2	17	22	2	36	8	0	87
Chinook salmon	0.008	0.626	0	69	28	35	134	44	0	310
Rainbow trout	0.002	0.168	0	45	5	15	10	8	0	83
Brown trout	0.001	0.040	0	1	0	1	16	2	0	20
Lake trout	0.006	0.420	0	47	54	56	41	10	0	208
Yellow perch	1.047	79.867	25,090	2,547	2,268	6,755	1,699	1,175	0	39,534
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.012	1	2	0	0	1	2	0	6
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	1	1	0	1	0	0	3
Angler hours			8,871	7,404	5,139	8,235	6,276	1,839	0	37,762
Angler trips			1,793	1,559	1,043	1,657	1,279	364	0	7,695
Resident anglers			1,097	1,049	757	1,090	914	238	0	5,145
Nonresident anglers			696	510	286	567	365	126	0	2,550
Charter excursions			79	109	79	94	101	33	0	495

Appendix 6.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Saugatuck, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.022	0.626	7	90	67	78	242	29	0	513
Chinook salmon	0.103	2.930	11	349	203	244	1,127	466	0	2,400
Rainbow trout	0.022	0.617	4	322	47	60	59	13	0	505
Brown trout	0.009	0.242	96	10	20	17	45	10	0	198
Lake trout	0.101	2.863	0	450	354	703	821	17	0	2,345
Yellow perch	0.009	0.247	200	0	0	0	2	0	0	202
Walleye	0.001	0.029	16	7	0	0	0	1	0	24
Other	0.000	0.002	0	0	0	0	2	0	0	2
Lamprey on:										
Chinook salmon			0	1	0	0	3	0	0	4
Lake trout			0	3	0	5	9	0	0	17
Angler hours			702	5,396	4,193	4,875	6,138	1,979	0	23,282
Angler trips			104	802	653	774	973	320	0	3,626
Resident anglers			91	596	472	527	717	215	0	2,618
Nonresident anglers			13	206	181	247	256	105	0	1,008
Charter excursions			24	178	144	178	217	78	0	819

Appendix 7.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Holland, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.014	0.414	0	4	2	15	57	11	0	89
Chinook salmon	0.091	2.660	0	26	11	100	307	128	0	572
Rainbow trout	0.019	0.567	0	15	1	34	49	23	0	122
Brown trout	0.005	0.135	0	1	0	7	14	7	0	29
Lake trout	0.082	2.409	0	39	32	131	258	58	0	518
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.000	0	0	0	0	0	0	0	0
Lamprey on:										
Chinook salmon			0	0	0	0	3	0	0	3
Lake trout			0	0	0	6	10	1	0	17
Angler hours			0	711	488	1,718	2,462	916	0	6,295
Angler trips			0	122	76	234	326	136	0	894
Resident anglers			0	105	40	158	185	74	0	562
Nonresident anglers			0	17	36	76	141	62	0	332
Charter excursions			0	33	18	53	75	36	0	215

Appendix 8.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Grand Haven, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.022	0.517	0	13	75	72	538	207	8	913
Chinook salmon	0.128	3.058	0	307	689	519	2,281	1,594	14	5,404
Rainbow trout	0.017	0.396	0	100	73	71	72	353	31	700
Brown trout	0.007	0.168	0	15	36	47	131	58	10	297
Lake trout	0.048	1.139	0	244	298	881	545	38	6	2,012
Yellow perch	0.009	0.204	0	0	0	0	360	0	0	360
Walleye	0.000	0.001	0	0	0	0	0	1	0	1
Other	0.000	0.001	0	0	0	0	1	1	0	2
Lamprey on:										
Chinook salmon			0	0	1	0	6	2	0	9
Lake trout			0	3	2	4	2	0	0	11
Angler hours			54	5,031	8,206	8,359	12,952	7,522	199	42,321
Angler trips			9	870	1,400	1,504	2,300	1,379	38	7,500
Resident anglers			9	746	1,201	1,238	1,970	1,220	32	6,416
Nonresident anglers			0	124	199	266	330	159	6	1,084
Charter excursions			2	207	335	350	546	317	10	1,767

Appendix 9.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Muskegon, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.036	0.776	0	0	9	26	119	31	6	191
Chinook salmon	0.120	2.573	0	18	38	68	353	140	16	633
Rainbow trout	0.023	0.488	0	3	11	17	43	42	4	120
Brown trout	0.010	0.207	0	1	0	9	32	6	3	51
Lake trout	0.023	0.496	0	9	14	48	50	1	0	122
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.002	0.049	0	0	0	0	0	0	12	12
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	0	0	0	0
Angler hours			0	389	802	1,237	1,928	816	100	5,272
Angler trips			0	68	150	221	333	145	19	936
Resident anglers			0	61	126	182	249	115	16	749
Nonresident anglers			0	7	24	39	84	30	3	187
Charter excursions			0	17	39	60	89	36	5	246

Appendix 10.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Whitehall/Montague, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.056	1.683	0	1	12	42	147	37	0	239
Chinook salmon	0.118	3.563	0	7	35	42	347	75	0	506
Rainbow trout	0.039	1.183	0	2	14	27	44	81	0	168
Brown trout	0.017	0.528	7	1	2	16	40	9	0	75
Lake trout	0.034	1.028	0	6	22	30	79	9	0	146
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.000	0	0	0	0	0	0	0	0
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	1	0	0	1
Angler hours			15	180	619	1,021	1,841	615	0	4,291
Angler trips			3	30	96	123	287	103	0	642
Resident anglers			3	19	52	39	132	58	0	303
Nonresident anglers			0	11	44	84	155	45	0	339
Charter excursions			1	8	20	29	62	22	0	142

Appendix 11.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Pentwater, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.057	1.250	0	1	1	52	299	62	0	415
Chinook salmon	0.203	4.497	0	27	91	458	731	186	0	1,493
Rainbow trout	0.051	1.130	0	6	23	48	75	223	0	375
Brown trout	0.021	0.455	7	5	0	74	59	6	0	151
Lake trout	0.057	1.253	0	25	75	182	117	17	0	416
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.001	0.021	0	5	0	0	2	0	0	7
Lamprey on:										
Chinook salmon			0	0	0	0	1	0	0	1
Lake trout			0	1	1	0	0	0	0	2
Angler hours			31	360	1,000	2,397	2,669	886	0	7,342
Angler trips			5	65	155	402	455	157	0	1,239
Resident anglers			5	62	123	314	293	110	0	907
Nonresident anglers			0	3	32	88	162	47	0	332
Charter excursions			2	21	41	112	113	43	0	332

Appendix 12.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Ludington, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.056	1.684	0	1	16	266	1,636	320	13	2,252
Chinook salmon	0.133	3.987	1	26	221	831	3,140	1,081	31	5,331
Rainbow trout	0.065	1.948	3	17	123	203	991	1,207	60	2,604
Brown trout	0.010	0.289	76	55	13	77	144	20	2	387
Lake trout	0.029	0.874	0	53	203	314	547	51	0	1,168
Yellow perch	0.003	0.095	0	0	0	125	2	0	0	127
Walleye	0.001	0.029	0	0	0	39	0	0	0	39
Other	0.000	0.003	0	0	0	3	0	1	0	4
Lamprey on:										
Chinook salmon			0	0	0	2	12	0	0	14
Lake trout			0	2	1	1	8	1	0	13
Angler hours			483	1,992	4,074	8,567	18,368	6,333	370	40,185
Angler trips			65	261	566	1,243	2,638	896	47	5,716
Resident anglers			57	239	463	1,032	2,081	717	46	4,635
Nonresident anglers			8	22	103	216	557	179	1	1,086
Charter excursions			15	56	136	294	606	216	14	1,337

Appendix 13.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Manistee, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.045	1.260	0	1	13	124	1,022	154	4	1,318
Chinook salmon	0.120	3.319	2	76	167	961	1,891	356	19	3,472
Rainbow trout	0.029	0.792	12	16	379	143	91	162	25	828
Brown trout	0.019	0.536	269	43	26	100	93	27	3	561
Lake trout	0.059	1.634	0	86	478	704	409	32	0	1,709
Yellow perch	0.000	0.002	0	0	0	2	0	0	0	2
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.006	0	0	0	0	1	5	0	6
Lamprey on:										
Chinook salmon			0	0	0	0	4	0	0	4
Lake trout			0	0	5	3	1	0	0	9
Angler hours			1,210	1,180	5,071	7,543	11,538	2,363	91	28,996
Angler trips			173	198	692	1,152	1,741	382	17	4,355
Resident anglers			153	176	629	1,035	1,454	330	15	3,792
Nonresident anglers			20	25	63	117	287	52	2	566
Charter excursions			44	45	160	278	415	97	7	1,046

Appendix 14.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Onekama, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.029	0.985	0	0	0	12	100	21	0	133
Chinook salmon	0.090	3.037	0	1	7	174	194	34	0	410
Rainbow trout	0.039	1.304	0	0	70	20	29	57	0	176
Brown trout	0.012	0.415	15	1	2	19	12	7	0	56
Lake trout	0.061	2.059	0	2	56	143	68	9	0	278
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.001	0.022	0	0	0	0	0	3	0	3
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	0	0	0	0
Angler hours			24	20	517	1,932	1,612	450	0	4,555
Angler trips			4	4	65	238	220	70	0	601
Resident anglers			4	2	51	200	159	48	0	464
Nonresident anglers			0	2	14	38	61	22	0	137
Charter excursions			1	1	15	52	50	16	0	135

Appendix 15.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Frankfort/Elberta, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.037	1.013	0	0	11	64	557	206	30	868
Chinook salmon	0.077	2.092	0	0	75	319	1,012	346	41	1,793
Rainbow trout	0.037	1.005	0	3	19	13	314	471	41	861
Brown trout	0.009	0.246	25	99	15	19	43	7	3	211
Lake trout	0.136	3.697	0	306	1,024	1,053	754	31	0	3,168
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.005	0	0	0	1	3	0	0	4
Lamprey on:										
Chinook salmon			0	0	0	0	4	0	0	4
Lake trout			0	1	5	3	0	0	0	9
Angler hours			78	1,356	3,319	5,308	9,730	3,204	276	23,270
Angler trips			12	221	559	869	1,593	526	51	3,831
Resident anglers			12	180	488	765	1,372	476	43	3,336
Nonresident anglers			0	41	71	104	221	50	8	495
Charter excursions			4	56	117	185	366	115	14	857

Appendix 16.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Leland, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.017	0.397	0	0	3	63	168	44	0	278
Chinook salmon	0.132	3.106	0	0	24	668	1,305	180	0	2,177
Rainbow trout	0.004	0.100	0	0	46	16	5	3	0	70
Brown trout	0.002	0.044	0	0	2	9	15	5	0	31
Lake trout	0.148	3.482	0	194	734	801	566	146	0	2,441
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.001	0.020	0	2	0	2	8	2	0	14
Lamprey on:										
Chinook salmon			0	0	1	1	0	0	0	2
Lake trout			0	10	19	33	16	5	0	83
Angler hours			0	484	2,700	5,994	6,199	1,149	0	16,526
Angler trips			0	103	472	1,099	1,095	221	0	2,990
Resident anglers			0	86	354	736	776	163	0	2,115
Nonresident anglers			0	17	118	363	319	58	0	875
Charter excursions			0	24	114	258	249	56	0	701

Appendix 17.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on West Grand Traverse Bays (grids 715, 815 and 915), Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.002	0.026	0	0	0	0	2	6	0	8
Chinook salmon	0.071	1.204	0	6	0	2	145	213	0	366
Rainbow trout	0.001	0.013	0	1	0	2	0	1	0	4
Brown trout	0.004	0.069	0	2	2	3	10	4	0	21
Lake trout	0.218	3.684	0	106	183	452	304	75	0	1,120
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.005	0.086	0	5	14	4	3	0	0	26
Lamprey on:										
Chinook salmon			0	0	0	0	1	1	0	2
Lake trout			0	1	3	4	5	1	0	14
Angler hours			0	249	606	1,508	1,588	1,175	0	5,126
Angler trips			0	72	145	341	366	281	0	1,205
Resident anglers			0	57	108	232	284	216	0	897
Nonresident anglers			0	15	37	109	82	65	0	308
Charter excursions			0	18	38	80	93	75	0	304

Appendix 18.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on East Grand Traverse Bays (grids 716, 816 and 916), Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.001	0.009	0	0	0	0	2	1	0	3
Chinook salmon	0.083	1.306	0	1	2	6	201	217	0	427
Rainbow trout	0.001	0.009	0	0	0	0	1	2	0	3
Brown trout	0.006	0.101	0	0	10	5	18	0	0	33
Lake trout	0.121	1.911	0	149	149	198	101	28	0	625
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.006	0.095	0	1	25	2	3	0	0	31
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	2	0	0	0	0	2
Angler hours			0	436	461	980	1,874	1,413	0	5,164
Angler trips			0	112	117	250	441	348	0	1,268
Resident anglers			0	101	62	173	297	265	0	898
Nonresident anglers			0	11	55	77	144	83	0	370
Charter excursions			0	27	30	64	114	92	0	327

Appendix 19.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Charlevoix, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.002	0.036	0	0	0	0	7	3	0	10
Chinook salmon	0.002	0.043	0	0	0	1	7	4	0	12
Rainbow trout	0.000	0.000	0	0	0	0	0	0	0	0
Brown trout	0.001	0.014	0	0	0	1	2	1	0	4
Lake trout	0.270	5.767	1	80	226	514	636	152	0	1,609
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.004	0	0	0	1	0	0	0	1
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	2	5	12	14	0	0	33
Angler hours			4	280	872	1,714	2,448	634	0	5,951
Angler trips			1	72	199	389	490	144	0	1,295
Resident anglers			1	71	118	159	166	69	0	584
Nonresident anglers			0	1	81	230	324	75	0	711
Charter excursions			1	17	44	80	103	34	0	279

Appendix 20.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Harbor Springs/Petoskey, Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.000	0.000	0	0	0	0	0	0	0	0
Chinook salmon	0.041	0.541	0	0	0	0	12	21	0	33
Rainbow trout	0.000	0.000	0	0	0	0	0	0	0	0
Brown trout	0.002	0.033	0	0	0	0	0	2	0	2
Lake trout	0.115	1.525	0	6	15	38	29	5	0	93
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.000	0	0	0	0	0	0	0	0
Lamprey on:										
Chinook salmon			0	0	0	0	1	1	0	2
Lake trout			0	2	0	4	2	0	0	8
Angler hours			0	44	100	272	228	168	0	812
Angler trips			0	11	25	68	57	42	0	203
Resident anglers			0	9	11	25	20	28	0	93
Nonresident anglers			0	2	14	43	37	14	0	110
Charter excursions			0	4	8	19	16	14	0	61

Appendix 21.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on Little Bay de Noc (grids 206 and 306), Lake Michigan, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.000	0.000	0	0	0	0	0	0	0	0
Chinook salmon	0.000	0.000	0	0	0	0	0	0	0	0
Rainbow trout	0.000	0.000	0	0	0	0	0	0	0	0
Brown trout	0.000	0.000	0	0	0	0	0	0	0	0
Lake trout	0.000	0.000	0	0	0	0	0	0	0	0
Yellow perch	0.050	0.723	0	1	0	57	70	0	18	146
Walleye	0.465	6.792	0	245	243	244	201	180	259	1,372
Other	0.000	0.000	0	0	0	0	0	0	0	0
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	0	0	0	0
Angler hours			0	469	482	489	489	429	591	2,949
Angler trips			0	66	77	92	76	72	90	473
Resident anglers			0	12	29	56	34	30	18	179
Nonresident anglers			0	54	48	36	42	42	72	294
Charter excursions			0	30	33	36	32	28	43	202

Appendix 22.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Rogers City, Lake Huron, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.002	0.026	0	0	0	0	0	3	0	3
Chinook salmon	0.383	5.565	0	0	3	179	351	92	15	640
Rainbow trout	0.020	0.287	0	0	7	22	2	2	0	33
Brown trout	0.002	0.035	0	0	0	2	2	0	0	4
Lake trout	0.024	0.348	0	0	9	27	4	0	0	40
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.000	0	0	0	0	0	0	0	0
Lamprey on:										
Chinook salmon			0	0	0	14	22	7	2	45
Lake trout			0	0	1	5	1	0	0	7
Angler hours			0	0	32	570	868	174	27	1,671
Angler trips			0	0	8	136	194	41	7	386
Resident anglers			0	0	6	92	124	41	7	270
Nonresident anglers			0	0	2	44	70	0	0	116
Charter excursions			0	0	3	41	56	13	2	115

Appendix 23.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Rockport, Lake Huron, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.006	0.117	0	0	0	2	10	2	0	14
Chinook salmon	0.299	5.500	0	0	9	224	384	43	0	660
Rainbow trout	0.014	0.250	0	0	0	13	14	3	0	30
Brown trout	0.001	0.025	0	0	1	1	1	0	0	3
Lake trout	0.074	1.350	0	0	7	73	82	0	0	162
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.008	0	0	0	1	0	0	0	1
Other	0.004	0.067	0	0	0	4	4	0	0	8
Lamprey on:										
Chinook salmon			0	0	0	27	37	3	0	67
Lake trout			0	0	0	2	2	0	0	4
Angler hours			0	0	50	754	1,236	164	0	2,204
Angler trips			0	0	9	143	240	34	0	426
Resident anglers			0	0	9	81	150	10	0	250
Nonresident anglers			0	0	0	62	90	24	0	176
Charter excursions			0	0	2	40	68	10	0	120

Appendix 24.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Alpena, Lake Huron, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.004	0.080	0	0	1	8	2	0	0	11
Chinook salmon	0.241	4.606	0	2	53	343	170	63	0	631
Rainbow trout	0.020	0.380	0	0	7	38	6	1	0	52
Brown trout	0.002	0.036	0	0	1	3	0	1	0	5
Lake trout	0.112	2.139	0	9	61	168	55	0	0	293
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.015	0.277	0	31	6	1	0	0	0	38
Other	0.002	0.029	0	0	0	4	0	0	0	4
Lamprey on:										
Chinook salmon			0	0	1	19	15	0	0	35
Lake trout			0	0	5	3	1	0	0	9
Angler hours			0	107	255	1,418	616	223	0	2,619
Angler trips			0	26	49	220	109	45	0	449
Resident anglers			0	24	34	197	89	34	0	378
Nonresident anglers			0	2	15	23	20	11	0	71
Charter excursions			0	8	17	69	29	14	0	137

Appendix 25.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Harrisville, Lake Huron, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.000	0.009	0	0	0	0	2	0	0	2
Chinook salmon	0.150	3.121	0	7	52	217	384	36	0	696
Rainbow trout	0.020	0.413	0	1	21	47	22	1	0	92
Brown trout	0.002	0.036	0	0	0	1	7	0	0	8
Lake trout	0.130	2.704	0	14	202	165	216	6	0	603
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.001	0.013	0	0	0	0	3	0	0	3
Other	0.000	0.009	0	1	0	0	1	0	0	2
Lamprey on:										
Chinook salmon			0	1	0	0	8	1	0	10
Lake trout			0	0	3	5	6	0	0	14
Angler hours			0	71	718	1,341	2,108	407	0	4,645
Angler trips			0	13	128	224	366	67	0	798
Resident anglers			0	13	119	204	321	62	0	719
Nonresident anglers			0	0	9	20	45	5	0	79
Charter excursions			0	4	41	61	99	18	0	223

Appendix 26.— Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Oscoda, Lake Huron, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.003	0.064	0	0	1	20	10	5	1	37
Chinook salmon	0.216	4.060	2	16	80	572	1,084	540	65	2,359
Rainbow trout	0.016	0.296	1	4	11	90	47	18	1	172
Brown trout	0.003	0.050	1	4	3	5	14	2	0	29
Lake trout	0.137	2.577	0	63	263	529	591	51	0	1,497
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.001	0.022	3	0	1	5	4	0	0	13
Other	0.001	0.010	0	0	1	3	2	0	0	6
Lamprey on:										
Chinook salmon			0	0	2	20	40	7	4	73
Lake trout			0	4	6	8	12	1	0	31
Angler hours			36	267	965	2,905	4,708	1,843	222	10,945
Angler trips			6	48	163	497	820	308	37	1,879
Resident anglers			6	48	147	434	653	301	32	1,621
Nonresident anglers			0	0	16	63	171	7	5	262
Charter excursions			2	13	49	148	252	106	11	581

Appendix 27.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats Saginaw Bay (Port Austin to Tawas), Lake Huron, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.001	0.036	0	4	2	3	1	6	0	16
Chinook salmon	0.026	0.770	0	12	22	146	82	83	0	345
Rainbow trout	0.005	0.158	0	1	10	36	6	18	0	71
Brown trout	0.000	0.011	0	0	0	4	0	1	0	5
Lake trout	0.028	0.819	0	95	132	62	57	21	0	367
Yellow perch	0.419	12.460	0	132	92	1,432	2,241	1,685	0	5,582
Walleye	0.162	4.826	0	0	81	1,540	510	31	0	2,162
Other	0.024	0.717	0	0	44	215	45	17	0	321
Lamprey on:										
Chinook salmon			0	0	1	9	6	0	0	16
Lake trout			0	0	5	1	0	0	0	6
Angler hours			0	340	1,343	6,157	3,534	1,937	0	13,311
Angler trips			0	58	243	1,026	644	357	0	2,328
Resident anglers			0	58	224	899	595	353	0	2,129
Nonresident anglers			0	0	19	127	49	4	0	199
Charter excursions			0	16	55	221	111	45	0	448

Appendix 28.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Grindstone City, Lake Huron, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.007	0.145	0	45	12	24	9	3	0	93
Chinook salmon	0.168	3.552	0	297	117	868	763	232	0	2,277
Rainbow trout	0.007	0.151	0	23	19	33	13	9	0	97
Brown trout	0.002	0.045	0	0	0	19	4	6	0	29
Lake trout	0.294	6.218	0	1,270	1,130	797	678	111	0	3,986
Yellow perch	0.000	0.006	0	0	0	0	0	4	0	4
Walleye	0.005	0.103	0	0	21	23	17	5	0	66
Other	0.005	0.112	0	39	16	5	10	2	0	72
Lamprey on:										
Chinook salmon			0	15	12	28	11	2	0	68
Lake trout			0	21	14	8	3	2	0	48
Angler hours			0	3,007	2,837	3,884	3,136	689	0	13,552
Angler trips			0	516	483	683	566	126	0	2,374
Resident anglers			0	456	451	652	537	121	0	2,217
Nonresident anglers			0	60	32	34	29	5	0	160
Charter excursions			0	138	122	185	156	40	0	641

Appendix 29.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Harbor Beach, Lake Huron, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.007	0.152	0	3	2	19	3	0	0	27
Chinook salmon	0.178	3.944	0	21	22	214	297	148	0	702
Rainbow trout	0.012	0.264	0	3	10	12	16	6	0	47
Brown trout	0.006	0.140	0	0	2	3	8	12	0	25
Lake trout	0.119	2.646	0	52	102	214	90	13	0	471
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.004	0.079	0	0	1	3	7	3	0	14
Other	0.004	0.079	0	2	2	2	4	4	0	14
Lamprey on:										
Chinook salmon			0	0	1	15	14	10	0	40
Lake trout			0	0	5	0	3	1	0	9
Angler hours			0	234	451	1,101	1,413	752	0	3,951
Angler trips			0	46	77	199	265	139	0	726
Resident anglers			0	39	73	183	256	137	0	688
Nonresident anglers			0	7	4	16	9	2	0	38
Charter excursions			0	13	19	49	63	34	0	178

Appendix 30.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Port Sanilac, Lake Huron, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.066	1.676	9	194	124	15	0	0	0	342
Chinook salmon	0.105	2.696	11	301	207	31	0	0	0	550
Rainbow trout	0.012	0.304	2	31	24	5	0	0	0	62
Brown trout	0.002	0.059	2	6	2	2	0	0	0	12
Lake trout	0.062	1.593	0	225	85	15	0	0	0	325
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.001	0.015	2	1	0	0	0	0	0	3
Other	0.005	0.123	0	18	7	0	0	0	0	25
Lamprey on:										
Chinook salmon			1	11	9	0	0	0	0	21
Lake trout			0	14	2	0	0	0	0	16
Angler hours			273	2,930	1,740	250	0	24	0	5,217
Angler trips			48	452	289	46	0	4	0	839
Resident anglers			44	451	277	42	0	4	0	818
Nonresident anglers			4	9	12	4	0	0	0	29
Charter excursions			12	105	74	12	0	1	0	204

Appendix 31.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Lexington, Lake Huron, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.045	0.886	28	11	0	0	0	0	0	39
Chinook salmon	0.090	1.750	29	33	4	8	3	0	0	77
Rainbow trout	0.012	0.227	4	6	0	0	0	0	0	10
Brown trout	0.007	0.136	6	0	0	0	0	0	0	6
Lake trout	0.026	0.500	11	6	2	2	1	0	0	22
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.006	0.114	2	3	0	0	0	0	0	5
Other	0.006	0.114	0	5	0	0	0	0	0	5
Lamprey on:										
Chinook salmon			1	2	0	0	0	0	0	3
Lake trout			0	0	0	0	0	0	0	0
Angler hours			330	452	24	32	20	0	0	858
Angler trips			63	77	8	7	4	0	0	159
Resident anglers			70	72	5	7	4	0	0	158
Nonresident anglers			0	5	3	0	0	0	0	8
Charter excursions			19	20	2	2	1	0	0	44

Appendix 32.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Black River Harbor, Lake Superior, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.073	3.515	0	29	164	70	58	27	0	348
Chinook salmon	0.008	0.364	0	0	3	10	16	7	0	36
Rainbow trout	0.009	0.455	0	3	12	2	22	6	0	45
Brown trout	0.000	0.020	0	0	2	0	0	0	0	2
Lake trout	0.194	9.283	0	54	359	262	157	87	0	919
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.001	0.030	0	0	0	0	0	3	0	3
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	3	1	0	1	0	5
Angler hours			0	250	1,784	1,420	856	433	0	4,743
Angler trips			0	48	196	155	119	59	0	577
Resident anglers			0	23	44	27	34	29	0	157
Nonresident anglers			0	25	152	128	85	30	0	420
Charter excursions			0	9	32	25	22	11	0	99

Appendix 33.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Ontonagon, Lake Superior, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.022	0.781	0	0	2	13	10	0	0	25
Chinook salmon	0.011	0.375	0	0	0	9	3	0	0	12
Rainbow trout	0.001	0.031	0	0	0	0	1	0	0	1
Brown trout	0.000	0.000	0	0	0	0	0	0	0	0
Lake trout	0.391	13.625	0	0	60	263	113	0	0	436
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.000	0	0	0	0	0	0	0	0
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	0	2	0	0	0	2
Angler hours			0	0	208	636	272	0	0	1,116
Angler trips			0	0	26	97	40	0	0	163
Resident anglers			0	0	12	29	14	0	0	55
Nonresident anglers			0	0	14	68	26	0	0	108
Charter excursions			0	0	5	19	8	0	0	32

Appendix 34.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Marquette, Lake Superior, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.007	0.265	0	3	9	9	13	5	1	40
Chinook salmon	0.004	0.132	0	0	0	7	8	5	0	20
Rainbow trout	0.000	0.000	0	0	0	0	0	0	0	0
Brown trout	0.000	0.000	0	0	0	0	0	0	0	0
Lake trout	0.280	10.033	0	83	251	659	366	143	13	1,515
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.000	0	0	0	0	0	0	0	0
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	0	1	1	2
Angler hours			0	358	895	2,151	1,394	540	72	5,410
Angler trips			0	49	99	258	194	86	12	698
Resident anglers			0	41	87	210	143	76	5	562
Nonresident anglers			0	8	12	48	51	10	7	136
Charter excursions			0	10	22	51	42	22	4	151

Appendix 35.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats in the vicinity of Isle Royale National Park, Lake Superior, 1999.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.004	0.130	0	0	0	1	12	0	0	13
Chinook salmon	0.001	0.040	0	0	0	2	2	0	0	4
Rainbow trout	0.001	0.030	0	0	0	1	2	0	0	3
Brown trout	0.000	0.000	0	0	0	0	0	0	0	0
Lake trout	0.260	8.500	0	4	14	345	487	0	0	850
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.000	0	0	0	0	0	0	0	0
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	1	0	2	0	0	3
Angler hours			0	32	108	1,323	1,800	0	0	3,263
Angler trips			0	4	21	195	264	0	0	484
Resident anglers			0	0	8	2	7	0	0	17
Nonresident anglers			0	4	13	193	257	0	0	467
Charter excursions			0	1	6	42	51	0	0	100