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**MICHIGAN DEPARTMENT OF NATURAL RESOURCES
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**Fisheries Technical Report 2001-4
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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, 1998

**Gerald P. Rakoczy
and
Donna Wesander-Russell**

*Michigan Department of Natural Resources
Charlevoix Fisheries Research Station
96 Grant Street
Charlevoix, Michigan 49720*

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-eight percent of approximately 500 charter fishing operators complied with the law by returning their completed catch reporting forms in 1998. These operators reported making 18,171 charter fishing excursions during April through October. The total number of charter excursions increased by 14% in 1998 compared to 1997. Approximately 495,000 angler hours were spent fishing by some 82,600 charter clients. The distribution of charter fishing excursions was: 68% Lake Michigan, 18% Lake Huron, 9% Lake Erie, 3% Lake Superior, and 2% Lake St. Clair. Over 243,000 fish were reported harvested. The harvest was composed of about 64,300 yellow perch, 54,000 walleye, 45,900 lake trout, 39,800 chinook salmon, 17,300 coho salmon, 15,100 rainbow trout, and 2,600 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 in 1998. 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 requires the reporting of sport catch and effort by the charter fishing industry. The legislation was supported by the Michigan Charter Boat Association (MCBA), an industry representative, and the Michigan Department of Natural Resources (MDNR). Among other provisions, the law provides more 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 MDNR, Fisheries Division's 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 will aid the 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 will also allow the MCBA to monitor the health and welfare of its industry.

Methods

The Michigan Charter Boat Daily Catch Report Form (PR8206) was developed in 1989 by a committee made up of two members each from the MDNR and the MCBA (Figure 1). Forms and grid maps of the Great Lakes are mailed annually to all known charter operators during March. Charter operators were identified from previous years' lists of reporting operators and from Sport Trolling Licenses purchased from Law Enforcement Division. Charter operators who used their vessels for fishing were informed that they were required by law to complete the form each time they fished. A form was to be mailed by the tenth of each month following the month of fishing to the MDNR, Charlevoix Fisheries Station.

The data form requires the following information: an assigned identification number for each charter boat, lake, date fished, port, grid fished, 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 was also provided on the form for comments or observations.

Completed data forms returned to the Charlevoix Fisheries Station were logged, coded by port, and entered on computer. Incomplete forms were logged then returned to the charter operator with a letter stating 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 1998, 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 the MDNR, Law Enforcement Division recommending non-issuance of an inspection certificate for the 1999 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 the USFWS as an index of sea lamprey abundance.

Results

Compliance

During the 1998 fishing season, an average of 66% of all charter boat operators complied with the law by submitting their catch reports by the due date, while 85% submitted reports within 30 days of the due date. Monthly rate of compliance in 1998 was virtually the same as compared to 1997. By the end of 1998, 98% of all charter operators had complied with the law, which was the same as 1997 (Rakoczy and Wesander-Russell 1998).

Catch and effort

Charter operators submitted reports on 18,171 charter excursions during April through October, 1998 on lakes Michigan, Huron, Erie,

Superior, and St. Clair (Tables 1 through 5). The total number of charter excursions in 1998 increased by 14% compared to 1997 (Rakoczy and Wesander-Russell 1998). Increases in the number of charter excursions in 1998 as compared to 1997 occurred on lakes Michigan (+16%), Huron (+20%), Superior (+4%), and St. Clair (+10%); but declined slightly (-3%) on Lake Erie. The distribution of charter fishing effort (excursions) by lake was: 68% Lake Michigan, 18% Lake Huron, 9% Lake Erie, 3% Lake Superior, and 2% Lake St. Clair. This distribution of charter fishing effort by lake in 1998 was very similar to previous years.

A total of 494,662 hours were spent fishing by 82,553 charter anglers in Michigan's waters and tributaries of the Great Lakes (Tables 1 through 5). The total number of charter anglers in 1998 increased by 13% compared to 1997. Twenty-nine percent of all charter clients were not residents of Michigan. Lake Superior charter operators had the greatest percentage of nonresident clients (52%; 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 243,000 fish were reported harvested in all lakes. Lake Michigan accounted for 51% of all fish harvested, while lakes Erie and Huron accounted for 33% and 10%, respectively, of the total harvest. The most numerous species in the harvest was yellow perch (64,300) which accounted for 26% of the total harvest. Numbers of other species harvested were: 54,000 walleye (22%), 45,900 lake trout (19%), 39,800 chinook salmon (16%), 17,300 coho salmon (7%), 15,100 rainbow trout (6%), and 2,600 brown trout (1%). The "other" species category was approximately 2% of the total reported 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 increased during 1998 compared to 1997. The harvest of coho salmon (+40%) and lake trout (+38%) increased compared to the previous year. The numbers of chinook salmon

and rainbow trout decreased slightly, while the number of brown trout harvested declined by 48%.

Most of the 1997-98 increase in total salmonine harvest came from lakes Michigan and Huron. In Lake Michigan, harvest increased 48% (+10,700 fish) for lake trout and 41% (+4,900) for coho salmon. Harvest decreased 4% (-1,200 fish) for chinook salmon, 5% (-800) for rainbow trout, and 4% (-2,600) for brown trout. In Lake Huron, harvest increased 57% (+3,000 fish) for lake trout, 7% (+800) for chinook salmon, and 100% (+198) for brown trout. The harvest of rainbow trout decreased 20% (-213).

The number of walleye harvested in 1998, compared to 1997, increased by 12,000 fish (+29%), while the yellow perch harvest decreased by nearly 25,000 fish (-28%). The majority of walleye harvested by charter anglers in Michigan waters of the Great Lakes come from Lake Erie. The Lake Erie walleye harvest increased by 40% in 1998. Forty-nine percent of the total yellow perch harvest during 1998 came from Lake Erie, while 41% came from Lake Michigan. Harvest of yellow perch decreased 7% in Lake Erie and 40% in Lake Michigan.

Catch rates (fish per 100 angler hours) for Lake Michigan charter anglers in 1998, compared to 1997, increased for coho salmon (+26%) and lake trout (+31%), while rates declined for chinook salmon (-16%), rainbow trout (-17%), and brown trout (-60%) (Table 6). On Lake Huron, catch rates increased for coho salmon (+100%), brown trout (+50%), and lake trout (+29%). Lake trout catch rates were the highest recorded over the nine year data series and have been trending upward since 1994. Catch rates declined for chinook salmon (-13%) and rainbow trout (-35%) on Lake Huron. 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 nine seasons.

Walleye play an important role in charter fisheries on lakes Erie, Huron, and St. Clair. Catch rates for walleye by charter anglers increased on all three lakes by approximately 23-27% during 1998, compared to 1997 (Table 7).

Most charter excursions which took place on Michigan's Great Lakes waters during 1998 were aimed at the various species of salmonines. The total catch per charter excursion for all five species of salmonines combined increased during 1998 compared to the 1990-97 mean catch rate at the Lake Michigan ports of St. Joseph/Benton Harbor, Grand Haven, Manistee, and Frankfort/Elberta (Table 8). The ports of Ludington and Leland had slight (<10%) declines compared to the mean. Catch rates for salmonines increased in 1998 compared to the eight year mean at all five selected Lake Huron ports. Salmonine catch rates in 1998 at Oscoda, Grindstone City, and Harbor Beach were more than 50% greater than the previous eight year average, indicating that the 1998 fishery on Lake Huron was one of the best on record. On Lake Superior, salmonine catch rates decreased compared to the 1990-97 mean, at Marquette and Black River Harbor, but increased at Ontonagon.

As has been the case in previous years (1990-97), numbers of sea lamprey attached to chinook salmon and lake trout were much higher on Lake Huron than on the other Great Lakes (Table 9). Numbers of sea lamprey attached per

100 lake trout harvested from Lake Huron in 1998 was 2.1, as compared to 1.1 for Lake Michigan and 0.5 for Lake Superior. Charter captains also reported 5.2 lamprey per 100 chinook salmon harvested on Lake Huron during 1998, compared to 0.4 for Lake Michigan and zero for Lake Superior. In general, the numbers of sea lamprey observed during 1998, compared to 1997, increased on Lakes Michigan and Huron for chinook salmon, but remained virtually unchanged for lake trout. However, since the early 1990s sea lamprey attachments have declined approximately 70% 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																
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Comments:	_____ Signature _____ Date
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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, 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.048	1.367	1,967	5,566	1,929	1,981	3,268	2,027	124	16,862
Chinook salmon	0.081	2.336	287	4,920	3,294	7,556	9,710	2,900	144	28,811
Rainbow trout	0.040	1.147	783	1,815	3,235	3,136	3,211	1,235	733	14,148
Brown trout	0.006	0.176	484	428	264	524	335	95	42	2,172
Lake trout	0.094	2.688	99	5,601	6,439	9,258	10,175	1,583	1	33,156
Yellow perch	0.074	2.114	4,137	11,475	2,294	3,904	2,820	1,441	0	26,071
Walleye	0.005	0.137	0	246	318	200	312	320	298	1,694
Other	0.001	0.015	15	12	45	37	36	19	22	186
Lamprey on:										
Chinook salmon			3	16	9	26	54	9	0	117
Lake trout			0	98	62	71	110	16	0	357
Angler hours			14,606	51,498	54,499	78,881	109,974	37,440	7,168	354,065
Angler trips			2,460	8,345	9,067	13,248	17,888	6,322	1,039	58,369
Resident anglers			1,285	4,788	5,763	8,764	12,098	4,393	535	37,626
Nonresident anglers			1,175	3,557	3,308	4,484	3,936	1,486	292	12,333
Charter excursions			389	1,590	1,845	2,795	3,936	1,486	292	12,333

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, 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.004	0.090	9	45	34	54	93	14	40	289
Chinook salmon	0.161	3.385	90	1,120	900	3,241	4,434	1,065	17	10,867
Rainbow trout	0.013	0.274	139	125	157	228	170	39	21	879
Brown trout	0.006	0.123	13	67	188	59	61	5	3	396
Lake trout	0.126	2.639	56	1,519	2,277	2,049	2,318	251	0	8,470
Yellow perch	0.025	0.518	0	59	0	451	326	812	16	1,664
Walleye	0.037	0.784	17	105	267	1,440	647	40	0	2,516
Other	0.005	0.106	0	18	57	162	91	10	1	339
Lamprey on:										
Chinook salmon			3	56	45	147	278	39	0	568
Lake trout			0	21	57	52	36	9	0	175
Angler hours			1,443	8,039	9,232	19,058	23,176	6,032	447	67,426
Angler trips			228	1,388	1,639	3,415	4,084	1,087	65	11,906
Resident anglers			208	1,288	1,478	3,027	3,535	979	55	10,567
Nonresident anglers			20	100	161	391	608	111	10	1,401
Charter excursions			80	364	457	885	1,098	297	29	3,210

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, 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.000	0.001	0	0	1	0	0	0	0	1
Chinook salmon	0.000	0.001	0	0	1	0	0	0	0	1
Rainbow trout	0.000	0.010	0	10	6	1	0	0	0	17
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	0.704	18.880	0	185	300	2,380	11,485	13,370	3,979	31,699
Walleye	1.067	28.610	298	7,392	28,127	10,646	69	1,415	90	48,037
Other	0.018	0.485	11	130	388	137	15	69	64	814
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	0	0	0	0
Angler hours			435	8,785	21,105	8,898	2,415	2,635	758	45,031
Angler trips			79	1,507	3,798	1,620	489	524	150	8,167
Resident anglers			58	1,413	3,438	1,510	473	487	148	7,527
Nonresident anglers			21	94	360	157	16	37	2	687
Charter excursions			20	311	750	348	103	114	33	1,679

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, 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.007	0.234	0	14	21	28	46	12	0	121
Chinook salmon	0.007	0.232	0	0	1	7	37	75	0	120
Rainbow trout	0.002	0.075	0	1	2	10	22	4	0	39
Brown trout	0.000	0.004	0	0	0	2	0	0	0	2
Lake trout	0.252	8.172	0	97	680	1,656	1,572	214	6	4,225
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.002	0	1	0	0	0	0	0	1
Other	0.001	0.046	0	0	14	6	4	0	0	24
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	1	4	8	5	1	0	19
Angler hours			0	400	2,857	6,324	6,027	1,105	28	16,740
Angler trips			0	70	371	850	818	190	4	2,303
Resident anglers			0	55	179	377	342	143	4	1,100
Nonresident anglers			0	15	192	473	476	47	0	1,203
Charter excursions			0	18	83	184	176	55	1	517

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, 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.001	0.014	0	0	0	0	0	0	6	6
Chinook salmon	0.000	0.007	0	0	1	0	2	0	0	3
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	0.429	11.324	0	44	687	661	1,643	1,009	848	4,892
Walleye	0.161	4.243	42	228	262	895	340	66	0	1,833
Other	0.254	6.692	0	56	635	884	850	448	18	2,891
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	0	0	0	0	0	0
Angler hours			94	1,111	2,176	3,293	2,649	1,585	492	11,400
Angler trips			17	212	339	520	409	233	78	1,808
Resident anglers			13	205	325	469	374	224	78	1,688
Nonresident anglers			4	7	14	51	35	9	0	120
Charter excursions			6	45	85	123	99	57	17	432

Table 6.—Catch rates (fish per 100 angler hours) by charter anglers for salmonines on lakes Michigan, Huron, and Superior during 1990-98.

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

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 1990-98.

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

Table 8.—Total and mean (1990-97) catch per excursion for all salmonines combined by charter anglers at various ports on lakes Michigan, Huron, and Superior 1990-98.

Port	Year									Mean
	1990	1991	1992	1993	1994	1995	1996	1997	1998	
Lake Michigan										
St. Joseph/Benton Harbor	7.3	8.7	7.3	8.1	7.7	7.7	10.0	9.8	9.3	8.3
Grand Haven	5.0	5.5	4.7	5.3	5.0	5.2	6.1	6.7	6.7	5.4
Ludington	9.3	11.1	8.4	8.8	7.4	7.2	10.8	8.4	8.1	8.9
Manistee	6.2	8.0	5.7	6.2	5.8	6.9	10.3	8.8	8.2	7.2
Frankfort/Elberta	7.1	7.5	5.8	6.6	6.2	6.7	8.8	7.6	8.2	7.0
Leland	7.2	9.5	9.0	6.9	9.1	8.6	9.4	9.1	8.1	8.6
Lake Huron										
Rogers City	3.2	3.3	2.5	3.9	5.2	6.6	5.9	8.2	5.4	4.9
Alpena	3.4	3.5	4.7	4.9	4.7	5.1	5.2	6.4	6.6	4.7
Oscoda	4.0	4.0	3.6	3.0	3.2	5.2	6.2	7.1	7.1	4.5
Grindstone City	5.6	6.1	5.9	4.7	5.5	7.0	8.0	9.3	10.7	6.5
Harbor Beach	3.6	2.9	3.2	2.8	3.5	4.9	6.6	6.5	6.7	4.3
Lake Superior										
Marquette	10.9	10.9	11.4	10.9	8.3	11.2	13.0	11.9	7.0	11.1
Ontonagon	12.5	11.5	14.1	14.0	10.1	11.1	15.9	11.9	13.7	12.6
Black River Harbor	12.0	12.9	10.6	13.5	14.1	12.6	14.0	13.1	10.7	12.9

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, 1990-98.

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
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

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James W. Peck, Reviewer
Paul W. Webb, Editor
Deborah L. MacConnell, Desktop Publisher
Ellen S. Grove, Word Processor
Alan D. Sutton, Graphics

Approved by Paul W. Seelbach

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 (Lake Michigan, Michigan waters only) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.238	8.384	730	3,287	1,026	695	96	1	0	5,835
Chinook salmon	0.013	0.474	27	136	36	81	35	14	1	330
Rainbow trout	0.062	2.170	300	697	235	234	41	3	0	1,510
Brown trout	0.004	0.128	2	44	19	15	8	1	0	89
Lake trout	0.133	4.697	0	806	456	481	1,258	268	0	3,269
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	2	0	0	0	0	0	2
Lake trout			0	19	8	3	11	3	0	44
Angler hours			1,642	8,906	3,936	3,951	5,018	1,021	54	24,528
Angler trips			265	1,293	603	596	792	146	9	3,704
Resident anglers			11	41	3	18	14	11	0	98
Nonresident anglers			254	1,252	600	578	778	135	9	3,606
Charter excursions			49	232	115	120	151	27	2	696

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, Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.175	6.192	134	150	21	13	4	0	0	322
Chinook salmon	0.027	0.962	10	24	3	10	3	0	0	50
Rainbow trout	0.049	1.750	37	26	8	15	5	0	0	91
Brown trout	0.007	0.231	0	6	6	0	0	0	0	12
Lake trout	0.037	1.308	0	22	11	2	31	2	0	68
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	0	0	0
Angler hours			311	493	356	358	294	30	0	1,842
Angler trips			54	64	45	46	36	5	0	250
Resident anglers			0	0	11	0	0	0	0	11
Nonresident anglers			54	64	34	46	36	5	0	239
Charter excursions			12	15	7	9	8	1	0	52

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, Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.087	2.926	976	1,466	495	262	196	49	0	3,444
Chinook salmon	0.054	1.803	63	772	205	459	419	204	0	2,122
Rainbow trout	0.075	2.519	271	423	1,140	687	349	95	0	2,965
Brown trout	0.006	0.216	11	90	74	46	24	8	1	254
Lake trout	0.056	1.872	26	1,401	328	169	232	47	0	2,203
Yellow perch	0.010	0.325	0	0	24	200	116	43	0	383
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.003	0	0	1	0	2	0	0	3
Lamprey on:										
Chinook salmon			0	3	0	3	0	0	0	6
Lake trout			0	25	3	1	1	0	0	30
Angler hours			3,569	10,961	8,460	6,320	6,994	3,051	49	39,404
Angler trips			517	1,468	1,185	923	1,027	440	7	5,567
Resident anglers			273	639	398	372	368	167	1	2,218
Nonresident anglers			244	829	787	551	659	273	6	3,349
Charter excursions			108	303	247	197	223	97	2	1,177

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, Michigan during 1998.

Species	Total catch per hour	Total catch per excursion	Month														
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Season		
Coho salmon	0.0073	0.2016	0	0	30	0	0	0	0	0	0	0	44	74	4	0	152
Chinook salmon	0.0067	0.1844	5	0	2	2	0	0	0	0	0	0	78	51	1	0	139
Rainbow trout	0.1233	3.3992	110	355	351	113	0	16	2	6	45	576	758	231	2,563		
Brown trout	0.0166	0.4576	5	47	190	51	0	0	0	0	2	33	15	2	345		
Lake trout	0.0000	0.0013	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Yellow perch	0.0000	0.0000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walleye	0.0159	0.4377	9	11	1	0	25	109	52	81	14	2	12	14	14	330	
Other	0.0054	0.1485	0	1	8	9	4	38	5	13	6	20	8	0	112		
Angler hours			673	2,128	3,099	1,454	156	662	428	401	1,781	4,620	4,312	1,070	20,784		
Angler trips			91	300	422	201	17	78	54	54	247	645	611	152	2,872		
Resident anglers			37	103	161	85	4	26	13	21	81	225	244	72	1,072		
Nonresident anglers			54	197	261	116	13	52	41	33	166	420	367	80	1,800		
Charter excursions			26	71	111	52	4	23	17	16	73	169	153	39	754		

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, Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.010	0.550	75	97	22	69	136	40	5	444
Chinook salmon	0.029	1.635	3	61	108	374	686	85	4	1,321
Rainbow trout	0.009	0.519	14	51	86	146	98	18	6	419
Brown trout	0.001	0.038	1	4	1	6	17	1	1	31
Lake trout	0.037	2.101	8	120	134	472	939	25	0	1,698
Yellow perch	0.557	31.563	4,137	11,475	2,147	3,692	2,668	1,384	0	25,503
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.022	3	0	0	13	0	2	0	18
Lamprey on:										
Chinook salmon			0	0	0	1	0	0	0	1
Lake trout			0	1	1	10	9	0	0	21
Angler hours			4,940	8,810	6,736	10,154	12,873	2,193	78	45,784
Angler trips			999	1,755	1,490	1,979	2,377	432	12	9,044
Resident			533	1,011	806	1,092	1,414	253	12	5,121
Nonresident anglers			466	744	684	887	963	179	0	3,923
Charter excursions			52	116	112	183	301	42	2	808

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, Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.035	0.985	26	292	67	110	73	78	2	648
Chinook salmon	0.168	4.804	67	1,105	665	751	329	242	2	3,161
Rainbow trout	0.037	1.067	11	236	176	201	32	33	13	702
Brown trout	0.009	0.264	43	104	8	8	3	8	0	174
Lake trout	0.148	4.228	0	775	733	810	394	69	1	2,782
Yellow perch	0.002	0.059	0	0	39	0	0	0	0	39
Walleye	0.000	0.002	0	1	0	0	0	0	0	1
Other	0.000	0.005	0	0	0	0	1	1	1	3
Lamprey on:										
Chinook salmon			0	4	3	0	2	0	0	9
Lake trout			0	10	4	7	4	0	0	25
Angler hours			463	5,520	4,295	4,170	2,559	1,706	58	18,771
Angler trips			62	829	663	673	400	268	10	2,905
Resident anglers			56	620	479	504	274	189	10	2,132
Nonresident anglers			6	209	184	169	126	79	0	773
Charter excursions			15	179	152	148	93	68	3	658

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, Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.022	0.522	4	21	8	33	20	26	8	120
Chinook salmon	0.094	2.243	6	61	88	159	163	38	1	516
Rainbow trout	0.020	0.487	0	3	7	59	29	6	8	112
Brown trout	0.005	0.117	2	5	7	0	10	1	2	27
Lake trout	0.115	2.743	0	72	116	189	217	37	0	631
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	0	0	1
Lake trout			0	0	0	0	5	0	0	5
Angler hours			71	594	877	1,389	1,810	605	120	5,466
Angler trips			16	108	148	232	295	103	21	923
Resident anglers			14	75	98	162	148	66	17	580
Nonresident anglers			2	33	50	70	147	37	4	343
Charter excursion			5	27	35	55	77	25	6	230

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, Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.024	0.583	16	137	25	171	335	384	0	1,068
Chinook salmon	0.129	3.096	91	1,470	573	1,222	1,434	836	49	5,675
Rainbow trout	0.018	0.427	8	109	80	253	109	186	38	783
Brown trout	0.007	0.161	29	34	21	159	27	22	3	295
Lake trout	0.102	2.450	0	682	626	1,228	1,777	178	0	4,491
Yellow perch	0.002	0.043	0	0	67	12	0	0	0	79
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.002	0	0	0	0	1	3	0	4
Lamprey on:										
Chinook salmon			3	4	0	1	5	4	0	17
Lake trout			0	10	9	5	10	1	0	35
Angler hours			548	7,222	5,836	8,901	14,095	7,136	248	43,986
Angler trips			100	1,261	1,027	1,584	2,520	1,277	48	7,817
Resident anglers			91	1,110	868	1,290	2,061	1,128	43	6,591
Nonresident anglers			9	151	159	294	459	149	5	1,226
Charter excursions			26	308	237	372	589	290	11	1,833

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, Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.049	1.278	0	33	9	49	263	74	0	428
Chinook salmon	0.087	2.301	0	35	36	239	381	80	0	771
Rainbow trout	0.051	1.343	0	12	9	93	252	84	0	450
Brown trout	0.003	0.075	0	1	2	8	12	2	0	25
Lake trout	0.037	0.973	0	37	18	85	172	14	0	326
Yellow perch	0.000	0.003	0	0	0	0	1	0	0	1
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.003	0	0	0	0	1	0	0	1
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	1	0	1	0	0	0	2
Angler hours			0	343	450	2,209	4,815	1,002	0	8,818
Angler trips			0	71	92	340	733	186	0	1,422
Resident anglers			0	65	90	265	516	133	0	1,069
Nonresident anglers			0	6	2	75	217	53	0	353
Charter excursions			0	18	22	82	161	52	0	335

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, Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.043	1.229	1	16	6	55	83	53	6	220
Chinook salmon	0.093	2.687	5	118	36	171	124	27	0	481
Rainbow trout	0.046	1.318	11	15	5	64	85	52	4	236
Brown trout	0.004	0.106	0	5	0	5	5	4	0	19
Lake trout	0.027	0.771	0	37	17	34	33	17	0	138
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	0	0	1
Lake trout			0	0	0	0	0	0	0	0
Angler hours			92	558	496	1,589	1,635	743	41	5,154
Angler trips			12	93	86	225	263	117	8	804
Resident anglers			12	65	61	101	174	78	5	496
Nonresident anglers			0	28	25	124	89	39	3	308
Charter excursions			6	22	17	47	62	23	2	179

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, Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.036	0.735	0	19	18	45	131	17	0	230
Chinook salmon	0.151	3.048	2	177	111	349	297	18	0	954
Rainbow trout	0.076	1.527	0	11	46	131	249	41	0	478
Brown trout	0.010	0.195	27	5	8	13	7	1	0	61
Lake trout	0.074	1.505	3	91	121	150	102	4	0	471
Yellow perch	0.003	0.054	0	0	17	0	0	0	0	17
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	1	0	0	0	0	1
Lake trout			0	1	1	1	1	0	0	4
Angler hours			73	430	997	1,849	2,661	317	0	6,325
Angler trips			14	74	162	315	435	60	0	1,060
Resident anglers			14	63	152	251	301	54	0	835
Nonresident anglers			0	11	10	64	134	6	0	225
Charter excursions			6	26	47	93	122	19	0	313

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, Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.037	1.094	5	23	85	265	848	302	14	1,542
Chinook salmon	0.110	3.226	3	494	513	1,266	1,827	429	16	4,548
Rainbow trout	0.067	1.972	1	88	468	619	1,168	415	22	2,781
Brown trout	0.007	0.219	106	25	26	63	80	8	1	309
Lake trout	0.054	1.577	0	286	487	654	707	90	0	2,224
Yellow perch	0.000	0.001	0	0	0	0	2	0	0	2
Walleye	0.000	0.000	0	0	0	0	0	0	0	0
Other	0.000	0.006	0	2	0	2	4	0	1	9
Lamprey on:										
Chinook salmon			0	0	3	11	12	3	0	29
Lake trout			0	2	4	12	8	0	0	26
Angler hours			326	2,055	5,796	9,927	17,880	5,156	246	41,384
Angler trips			50	315	821	1,437	2,454	726	41	5,844
Resident anglers			50	273	665	1,209	1,897	561	38	4,693
Nonresident anglers			0	42	156	228	557	165	3	1,151
Charter excursions			13	81	197	337	600	172	10	1,410

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, Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.022	0.630	0	16	83	73	262	147	7	588
Chinook salmon	0.127	3.667	7	333	323	734	1,718	298	12	3,425
Rainbow trout	0.059	1.712	9	116	575	306	443	140	10	1,599
Brown trout	0.015	0.437	200	21	58	47	64	18	0	408
Lake trout	0.062	1.785	28	370	364	430	416	59	0	1,667
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	3	1	7	25	1	0	37
Lake trout			0	16	9	5	12	2	0	44
Angler hours			704	2,083	4,427	5,841	11,134	2,727	107	27,023
Angler trips			106	332	646	874	1,636	444	19	4,057
Resident anglers			96	279	595	765	1,411	380	19	3,545
Nonresident anglers			10	53	55	109	225	64	0	516
Charter excursions			27	76	140	203	375	108	5	934

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, Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.029	0.846	0	0	48	12	33	44	0	137
Chinook salmon	0.123	3.605	0	0	56	225	273	30	0	584
Rainbow trout	0.058	1.716	0	0	99	54	72	53	0	278
Brown trout	0.005	0.148	0	0	0	9	13	2	0	24
Lake trout	0.078	2.290	0	0	75	179	117	0	0	371
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	0	0	0
Angler hours			0	0	660	1,699	1,715	683	0	4,757
Angler trips			0	0	85	240	239	115	0	679
Resident anglers			0	0	70	197	208	80	0	555
Nonresident anglers			0	0	15	43	31	35	0	124
Charter excursions			0	0	21	54	59	28	0	162

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, Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.058	1.524	0	4	5	82	743	714	5	1,553
Chinook salmon	0.062	1.635	0	89	183	331	914	145	4	1,666
Rainbow trout	0.016	0.429	0	9	118	98	151	52	9	437
Brown trout	0.004	0.111	4	15	8	49	28	9	0	113
Lake trout	0.171	4.494	0	246	1,162	1,537	1,420	214	0	4,579
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.007	0	0	0	7	0	0	0	7
Other	0.000	0.007	0	0	1	3	2	1	0	7
Lamprey on:										
Chinook salmon			0	0	0	0	3	0	0	3
Lake trout			0	1	8	3	8	0	0	20
Angler hours			16	981	3,742	6,385	11,531	4,058	129	26,842
Angler trips			2	171	608	1,045	1,834	677	28	4,365
Resident anglers			2	160	501	822	1,489	556	15	3,545
Nonresident anglers			0	11	107	223	345	121	13	820
Charter excursions			1	43	138	234	432	163	8	1,019

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, Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.004	0.095	5	4	40	14	7	0	5	75
Chinook salmon	0.115	2.709	22	296	966	778	66	0	4	2,132
Rainbow trout	0.015	0.355	6	96	105	59	4	0	9	279
Brown trout	0.006	0.147	60	10	29	16	1	0	0	116
Lake trout	0.205	4.839	315	877	1,416	860	340	0	0	3,808
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	0.017	1	1	4	6	1	0	0	13
Lamprey on:										
Chinook salmon			0	1	3	2	0	0	0	6
Lake trout			7	11	9	18	7	0	0	52
Angler hours			968	3,136	7,280	5,577	1,352	90	129	18,532
Angler trips			185	537	1,324	1,051	262	18	28	3,405
Resident anglers			157	444	888	736	178	14	15	2,432
Nonresident anglers			28	93	436	315	84	4	13	973
Charter excursions			45	118	298	252	62	4	8	787

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 Bay (grids 715, 815, and 915), Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.004	0.058	0	0	0	0	6	10	0	16
Chinook salmon	0.045	0.748	1	1	1	41	74	87	0	205
Rainbow trout	0.006	0.102	0	2	7	14	5	0	0	28
Brown trout	0.008	0.128	2	2	7	13	9	2	0	35
Lake trout	0.264	4.350	34	114	297	425	258	64	0	1,192
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	0.004	0.058	0	3	1	4	7	1	0	16
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	3	1	11	2	2	0	19
Angler hours			66	224	675	1,462	1,115	977	0	4,519
Angler trips			19	61	168	330	277	218	0	1,073
Resident anglers			7	56	112	209	209	127	0	720
Nonresident anglers			12	5	56	121	68	91	0	353
Charter excursions			5	15	42	84	75	53	0	274

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 Bay (grids 716, 816, and 916), Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.001	0.023	0	0	0	0	1	5	0	6
Chinook salmon	0.052	0.807	0	0	0	6	63	144	0	213
Rainbow trout	0.003	0.053	0	2	2	6	4	0	0	14
Brown trout	0.008	0.129	0	2	7	20	0	5	0	34
Lake trout	0.214	3.322	0	104	199	233	287	54	0	877
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.002	0.038	0	0	0	0	10	0	0	10
Other	0.001	0.023	0	0	3	0	0	3	0	6
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	2	0	0	0	0	0	2
Angler hours			0	218	627	1,119	1,344	790	0	4,098
Angler trips			0	61	168	285	335	197	0	1,046
Resident anglers			0	45	136	176	215	148	0	720
Nonresident anglers			0	16	32	109	120	49	0	326
Charter excursions			0	16	41	73	84	50	0	264

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, Michigan (Lake Michigan) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.001	0.022	0	0	3	1	3	0	0	7
Chinook salmon	0.017	0.387	0	1	0	44	66	12	0	123
Rainbow trout	0.002	0.053	0	0	6	5	6	0	0	17
Brown trout	0.001	0.019	0	1	1	4	0	0	0	6
Lake trout	0.230	5.242	0	57	203	536	800	71	0	1,667
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	4	14	0	0	18
Angler hours			0	145	745	1,593	4,204	550	0	7,237
Angler trips			0	36	161	399	768	131	0	1,495
Resident anglers			0	26	65	208	435	83	0	817
Nonresident anglers			0	10	96	191	333	48	0	678
Charter excursions			0	8	38	90	149	33	0	318

Appendix 20.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats at Petoskey/Harbor Springs, Michigan (Lake Michigan) during 1998.

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	0.057	0.646	0	1	0	8	22	20	0	51
Rainbow trout	0.008	0.089	0	1	6	0	0	0	0	7
Brown trout	0.004	0.051	0	1	0	2	1	0	0	4
Lake trout	0.247	2.797	0	17	51	83	67	3	0	221
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	0.013	0	0	0	0	0	1	0	1
Lamprey on:										
Chinook salmon			0	0	0	0	2	1	0	3
Lake trout			0	0	3	0	5	1	0	9
Angler hours			0	46	168	249	280	152	0	895
Angler trips			0	12	40	65	69	38	0	224
Resident anglers			0	8	28	34	29	14	0	113
Nonresident anglers			0	4	12	31	40	24	0	111
Charter excursions			0	6	16	21	21	15	0	79

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), Michigan (Lake Michigan) during 1998.

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	0.002	0.026	0	0	0	0	5	0	0	5
Yellow perch	0.014	0.221	0	0	0	0	28	14	0	42
Walleye	0.406	6.300	0	220	209	104	138	254	272	1,197
Other	0.003	0.042	0	2	0	6	0	0	0	8
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	580	623	280	402	527	533	2,945
Angler trips			0	90	100	56	60	79	70	455
Resident anglers			0	44	47	27	15	15	64	212
Nonresident anglers			0	46	53	29	45	64	6	243
Charter excursions			0	36	40	19	26	37	32	190

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, Michigan (Lake Huron) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.008	0.122	0	0	0	0	17	0	0	17
Chinook salmon	0.294	4.439	0	0	8	212	328	69	0	617
Rainbow trout	0.008	0.115	0	0	2	7	7	0	0	16
Brown trout	0.004	0.058	0	0	0	4	4	0	0	8
Lake trout	0.045	0.683	0	0	5	79	11	0	0	95
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.001	0.014	0	0	0	1	1	0	0	2
Other	0.000	0.000	0	0	0	0	0	0	0	0
Lamprey on:										
Chinook salmon			0	0	1	18	21	3	0	43
Lake trout			0	0	0	10	1	0	0	11
Angler hours			0	0	32	783	990	293	0	2,098
Angler trips			0	0	8	180	223	68	0	479
Resident anglers			0	0	8	135	134	48	0	325
Nonresident anglers			0	0	0	45	89	20	0	154
Charter excursions			0	0	3	53	65	18	0	139

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, Michigan (Lake Huron) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.005	0.125	0	0	0	0	14	0	0	14
Chinook salmon	0.219	5.009	0	2	21	97	441	0	0	561
Rainbow trout	0.002	0.045	0	0	1	1	3	0	0	5
Brown trout	0.000	0.000	0	0	0	0	0	0	0	0
Lake trout	0.099	2.250	0	1	37	58	156	0	0	252
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.001	0.018	0	0	0	1	1	0	0	2
Other	0.000	0.009	0	0	1	0	0	0	0	1
Lamprey on:										
Chinook salmon			0	0	6	11	50	0	0	67
Lake trout			0	0	15	5	4	0	0	24
Angler hours			0	18	120	494	1,926	0	0	2,558
Angler trips			0	3	24	81	308	0	0	416
Resident anglers			0	0	2	45	244	0	0	291
Nonresident anglers			0	3	22	36	64	0	0	125
Charter excursions			0	1	7	22	82	0	0	112

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, Michigan (Lake Huron) during 1998.

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	0.226	4.247	0	0	24	243	377	44	0	688
Rainbow trout	0.011	0.198	0	0	0	24	8	0	0	32
Brown trout	0.015	0.290	0	8	0	28	6	3	2	47
Lake trout	0.101	1.889	0	33	47	152	65	9	0	306
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.042	0.790	0	88	38	1	1	0	0	128
Other	0.001	0.019	0	0	0	3	0	0	0	3
Lamprey on:										
Chinook salmon			0	0	0	20	16	0	0	36
Lake trout			0	0	1	5	1	0	0	7
Angler hours			0	177	196	1,102	1,356	205	3	3,039
Angler trips			0	41	39	178	234	40	1	533
Resident anglers			0	35	32	168	178	35	1	449
Nonresident anglers			0	6	7	13	56	5	0	87
Charter excursions			0	14	11	54	70	12	1	162

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, Michigan (Lake Huron) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.009	0.151	0	0	0	0	25	11	0	36
Chinook salmon	0.145	2.454	0	29	65	156	283	51	0	584
Rainbow trout	0.020	0.345	0	0	10	39	30	3	0	82
Brown trout	0.022	0.370	0	0	63	1	24	0	0	88
Lake trout	0.175	2.954	0	51	140	260	220	32	0	703
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.000	0.008	0	0	0	0	2	0	0	2
Other	0.002	0.034	0	2	0	0	6	0	0	8
Lamprey on:										
Chinook salmon			0	1	3	7	10	3	0	24
Lake trout			0	0	4	7	4	2	0	17
Angler hours			0	186	515	1,114	1,890	324	0	4,029
Angler trips			0	33	97	215	374	65	0	784
Resident anglers			0	30	88	211	349	65	0	743
Nonresident anglers			0	3	9	4	25	0	0	41
Charter excursions			0	10	35	70	104	19	0	238

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, Michigan (Lake Huron) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.004	0.073	0	0	0	2	5	0	40	47
Chinook salmon	0.189	3.511	29	54	148	443	997	590	0	2,261
Rainbow trout	0.016	0.298	1	4	32	61	69	23	2	192
Brown trout	0.009	0.165	2	2	73	8	18	2	1	106
Lake trout	0.164	3.053	54	119	554	619	595	25	0	1,966
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.002	0.037	0	11	0	3	7	3	0	24
Other	0.001	0.011	0	0	1	3	2	1	0	7
Lamprey on:										
Chinook salmon			0	6	6	12	50	18	0	92
Lake trout			0	3	9	7	9	1	0	29
Angler hours			144	593	1,587	2,827	4,325	2,374	144	11,994
Angler trips			24	99	271	501	737	401	24	2,057
Resident anglers			20	88	242	455	659	359	20	1,843
Nonresident anglers			4	11	29	46	134	42	4	270
Charter excursions			7	33	84	147	227	137	9	644

Appendix 27.—Total catch per hour, catch per excursion, number caught, and fishing effort (angler hours, trips, and charter excursions) for charter boats on Saginaw Bay (Port Austin to Tawas), Michigan (Lake Huron) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.001	0.035	0	9	0	7	0	0	0	16
Chinook salmon	0.038	1.070	4	69	38	171	156	50	0	488
Rainbow trout	0.006	0.173	6	17	8	25	15	8	0	79
Brown trout	0.004	0.110	3	0	41	3	3	0	0	50
Lake trout	0.027	0.743	0	108	79	40	97	15	0	339
Yellow perch	0.130	3.627	0	49	0	451	326	812	16	1,654
Walleye	0.179	4.991	2	2	228	1,414	596	34	0	2,276
Other	0.018	0.507	0	0	46	139	46	0	0	231
Lamprey on:										
Chinook salmon			1	5	3	6	6	1	0	22
Lake trout			0	5	2	2	3	3	0	15
Angler hours			36	706	1,336	5,914	3,425	1,258	20	12,694
Angler trips			8	123	249	1,037	614	222	4	2,257
Resident anglers			8	114	201	947	574	221	0	2,065
Nonresident anglers			0	9	48	90	40	1	4	192
Charter excursions			4	33	65	201	126	26	1	456

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, Michigan (Lake Huron) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.001	0.025	0	12	2	1	0	0	0	15
Chinook salmon	0.209	4.293	1	503	220	1,115	726	58	0	2,623
Rainbow trout	0.012	0.241	0	32	73	32	5	5	0	147
Brown trout	0.004	0.088	0	47	4	3	0	0	0	54
Lake trout	0.294	6.039	0	910	1,172	627	818	163	0	3,690
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.004	0.077	0	0	0	15	29	3	0	47
Other	0.001	0.028	0	10	6	0	0	1	0	17
Lamprey on:										
Chinook salmon			0	14	9	36	18	2	0	79
Lake trout			0	7	17	11	3	3	0	41
Angler hours			17	2,760	3,068	3,090	3,107	492	0	12,534
Angler trips			5	481	533	576	558	85	0	2,238
Resident anglers			5	423	520	547	512	84	0	2,091
Nonresident anglers			0	58	13	29	46	1	0	147
Charter excursions			2	128	143	156	155	27	0	611

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, Michigan (Lake Huron) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.004	0.095	0	17	1	0	3	0	0	21
Chinook salmon	0.133	3.231	0	110	19	203	311	71	0	714
Rainbow trout	0.010	0.235	0	18	3	15	16	0	0	52
Brown trout	0.003	0.068	0	5	1	3	6	0	0	15
Lake trout	0.127	3.100	0	202	87	91	302	3	0	685
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.001	0.032	0	0	0	0	7	0	0	7
Other	0.001	0.023	0	0	1	2	2	0	0	5
Lamprey on:										
Chinook salmon			0	11	3	1	21	1	0	37
Lake trout			0	2	5	0	11	0	0	18
Angler hours			20	1,047	301	785	2,653	575	0	5,381
Angler trips			4	186	59	134	423	105	0	911
Resident anglers			4	185	58	121	395	91	0	854
Nonresident anglers			0	1	1	13	28	14	0	57
Charter excursions			1	42	17	37	96	28	0	221

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, Michigan (Lake Huron) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.004	0.104	1	7	7	7	0	0	0	22
Chinook salmon	0.144	3.502	14	335	267	102	20	1	0	739
Rainbow trout	0.017	0.417	4	49	23	10	2	0	0	88
Brown trout	0.003	0.085	2	5	6	5	0	0	0	18
Lake trout	0.050	1.218	0	94	106	52	5	0	0	257
Yellow perch	0.002	0.047	0	10	0	0	0	0	0	10
Walleye	0.001	0.033	4	0	1	1	1	0	0	7
Other	0.001	0.033	0	6	1	0	0	0	0	7
Lamprey on:										
Chinook salmon			0	16	11	1	0	0	0	28
Lake trout			0	4	3	0	0	0	0	7
Angler hours			228	2,317	1,625	567	381	30	0	5,148
Angler trips			38	372	265	101	58	6	0	840
Resident anglers			36	363	250	92	58	3	0	802
Nonresident anglers			2	9	15	9	3	3	0	41
Charter excursions			10	90	62	29	18	2	0	211

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, Michigan (Lake Huron) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.014	0.286	8	0	0	1	3	0	0	12
Chinook salmon	0.100	2.000	25	18	4	37	0	0	0	84
Rainbow trout	0.011	0.214	2	4	0	3	0	0	0	9
Brown trout	0.005	0.095	3	0	0	1	0	0	0	4
Lake trout	0.025	0.500	1	1	0	18	1	0	0	21
Yellow perch	0.000	0.000	0	0	0	0	0	0	0	0
Walleye	0.010	0.190	3	4	0	1	0	0	0	8
Other	0.000	0.000	0	0	0	0	0	0	0	0
Lamprey on:										
Chinook salmon			1	3	0	0	0	0	0	4
Lake trout			0	0	0	0	0	0	0	0
Angler hours			298	211	12	290	25	0	0	836
Angler trips			55	46	3	50	5	0	0	159
Resident anglers			53	46	3	41	5	0	0	148
Nonresident anglers			2	0	0	9	0	0	0	11
Charter excursions			14	12	1	14	1	0	0	42

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, Michigan (Lake Superior) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.013	0.630	0	10	20	11	5	5	0	51
Chinook salmon	0.002	0.099	0	0	1	2	3	2	0	8
Rainbow trout	0.002	0.074	0	0	2	0	1	3	0	6
Brown trout	0.000	0.012	0	0	0	1	0	0	0	1
Lake trout	0.202	9.889	0	47	222	242	210	80	0	801
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	0.012	0	0	0	1	0	0	0	1
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	3	3	1	0	0	7
Angler hours			0	202	1,298	1,348	836	276	0	3,960
Angler trips			0	32	150	156	104	31	0	473
Resident anglers			0	32	39	27	41	25	0	164
Nonresident anglers			0	0	111	129	63	6	0	309
Charter excursions			0	6	25	26	18	6	0	81

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, Michigan (Lake Superior) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.003	0.108	0	2	0	2	0	0	0	4
Chinook salmon	0.001	0.027	0	0	0	1	0	0	0	1
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	0.339	13.541	0	10	79	202	210	0	0	501
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	1	0	0	0	1
Angler hours			0	16	272	619	569	0	0	1,476
Angler trips			0	4	34	86	76	0	0	200
Resident anglers			0	0	9	28	29	0	0	66
Nonresident anglers			0	4	25	58	47	0	0	134
Charter excursions			0	1	6	16	14	0	0	37

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, Michigan (Lake Superior) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.002	0.051	0	1	0	1	3	0	0	5
Chinook salmon	0.001	0.031	0	0	0	1	1	1	0	3
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	0.252	6.929	0	23	112	223	230	85	6	679
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	0.041	0	0	0	0	4	0	0	4
Lamprey on:										
Chinook salmon			0	0	0	0	0	0	0	0
Lake trout			0	0	0	1	0	0	0	1
Angler hours			0	98	340	928	981	315	28	2,690
Angler trips			0	17	54	139	121	60	4	395
Resident anglers			0	12	49	107	110	53	4	335
Nonresident anglers			0	8	8	32	11	7	0	60
Charter excursions			0	5	18	29	27	18	1	98

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, Michigan (Lake Superior) during 1998.

Species	Total catch per hour	Total catch per excursion	Month							Season
			Apr	May	Jun	Jul	Aug	Sep	Oct	
Coho salmon	0.011	0.338	0	0	0	8	35	1	0	44
Chinook salmon	0.008	0.269	0	0	0	1	33	1	0	35
Rainbow trout	0.006	0.192	0	0	0	9	16	0	0	25
Brown trout	0.000	0.008	0	0	0	1	0	0	0	1
Lake trout	0.262	8.354	0	0	11	484	587	4	0	1,086
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	3	0	0	3
Angler hours			0	0	24	1,659	2,436	28	0	4,147
Angler trips			0	0	6	233	322	7	0	568
Resident anglers			0	0	4	47	37	7	0	95
Nonresident anglers			0	0	2	186	285	0	0	473
Charter excursions			0	0	3	55	69	3	0	130