Biological and Commercial Catch Statistics from the Chippewa Inter-Tribal Gill Net Fishery within Michigan Waters of Lake Superior During 2011

by
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ABSTRACT

The 2011 commercial inter-tribal fishery in the 1842 treaty-ceded waters of Michigan consisted of 10 large boats and 10 small boats, representing 20 tribal licensees from the Keweenaw Bay, Bad River and Red Cliff Bands of Lake Superior Chippewa. Gill nets were the only gear used in the fishery.

The fishing season for whitefish and lake trout was closed from November 1 through November 27 and commercial fishing was prohibited during October in seven seasonal refuges. Target fishing for lean lake trout (fishing in water less than 35 fathoms) in areas outside the refuges was prohibited during October to reduce the impact of fishing on spawning stocks of lake trout. The Keweenaw Bay tribe managed their cisco (lake herring) fishery through a quota system.

Fishermen reported fishing 4.2 million feet of gill net and harvesting 739,748 round pounds of fish. Whitefish was the primary target species, making up 86.9% of the total, followed by lake trout (10.6%), with the remaining 2.5% consisting of cisco (lake herring), siscowet, salmon, rainbow, walleye, and sucker.

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The author would like to thank all tribal commercial fishermen who fished in the 1842 ceded territory within Michigan waters of Lake Superior for submitting harvest and effort information and cooperating with monitors during biological surveys of catches. Appreciation goes to Chad Able and Mike DeFoe (Red Cliff Fishery Department) and Gene Mensch (Keweenaw Bay Fishery Biologist) for providing data for this report; Edward Leoso (Bad River Natural Resources Department); Evelyn Ravindran (Keweenaw Bay Natural Resources Department); Michelle Gurnoe and Bryan Bainbridge (Red Cliff Fisheries Department); Michael Plucinski (Great Lakes Fisheries Technician); Clara Smoniewski and Sara Weed (Northland College Interns), and Acorn Armagost (LCO Ojibwe Community College Intern) for their assistance in data collection, ageing fish and entering and proofing data. I also thank Neil Kmiecik for editing this report.

INTRODUCTION

The Red Cliff, Bad River and Keweenaw Bay Bands of Lake Superior Chippewa entered into an agreement to establish an inter-tribal off-reservation assessment fishery in the western Michigan waters of Lake Superior (from the Wisconsin- Michigan state line to the West Entry in the Keweenaw Peninsula) on 23 August 1984. In 1988 tribal off-reservation commercial fishing expanded to include more fishermen and fishing in waters east of the Keweenaw Peninsula. An inter-tribal agreement was developed to manage this expanded fishery. Since 1990 Bad River and Red Cliff have managed their fishery within the guidelines of this inter-tribal agreement, while Keweenaw Bay has managed its fishery through a fisheries management plan. Results of the early assessment fishery and the expanded commercial fishery have been reported annually as administrative reports of the Great Lakes Indian Fish and Wildlife Commission.

Biological and commercial fishery statistics were summarized for calendar year 2011 from the inter-tribal fishery in the 1842 treaty-ceded territory within Michigan waters of Lake Superior (Figure 1), and compared to those from previous years. Statistics were reported by management unit, grid, and gear type as indicated on individual catch reports.

Description of the Fishery

The 2011 commercial inter-tribal fishery in the 1842 treaty-ceded waters of Michigan consisted of 10 large boats and 10 small boats, representing 20 tribal licensees from the Keweenaw Bay, Bad River, and Red Cliff Bands of Lake Superior Chippewa. As in previous years, the area south of a line from the East Entry of Keweenaw Peninsula to Point Abbaye (Figure 1) was open only to Keweenaw Bay small boat fishermen. Gill nets were the only gear used in the fishery during 2011.

The fishing season for whitefish and lake trout was closed from November 1 through November 27. Fishing for siscowet was prohibited in water less than 35 fathoms during the closed season for lake trout and whitefish. Commercial fishing was prohibited during October in seasonal refuges, of which four were created in 1988, and three in 1989 (Figure 1). Target fishing for lean lake trout in other areas was prohibited during October to reduce the impact of fishing on spawning stocks of lake trout. The Keweenaw Bay tribe employed a quota system for regulating cisco (lake herring) harvest by its fishermen. The Bad River and Red Cliff tribes did not use this system for cisco. Also, the three bands allowed fishing for cisco year-round (i.e. no seasonal restriction).

Quota Management System

Since 1985, the tribes have used a quota management system to regulate lake trout harvest and to limit mortality on lake trout stocks in the 1842 inter-tribal gill net fishery within Michigan waters of Lake Superior. In 1985 and 1986, each gill net tug was assigned a lake trout quota of 3,750 or 15,000 pounds depending on tribal affiliation. Starting with the 1987-1990 time period and for each of the four management units, total allowable catch (TAC, expressed as number of fish) values were estimated for each year within the time period. The average TAC was then calculated and used as the TAC for each fishing year within the time period. Harvest quotas applied only to lean lake trout (referred to as "lake trout" in this report). Harvest of siscowet, a form of lake trout that generally inhabits deeper water and has a higher fat content than lean lake trout, was not regulated by quotas. TAC's and tribal quotas by management unit, and each fishing year within a 4-6 year period were as follows:

UNIT		YEARS					
		Nov. 1987-Oct. 1990[1]	Nov. 1990-Oct. 1994[2]	Nov. 1994-Oct. 1999[3]	Nov.1999-Oct. 2005[4,5]	Nov. 2006-Oct. 2010[6]	Nov. 2010-Oct. 2011[7]
MI-2	TAC	19,800	10,400	9,700	6,606	6,606	2,500
	Tribal	9,900	5,200	4,850	3,303	3,303	1,250
MI-3	TAC	5,000	7,600	6,600	4,950	4,950	5,000
	Tribal	2,500	3,800	3,300	2,475	2,475	2,500
MI-4	TAC	20,600	53,400	46,920	40,440	43,200	50,000
	Tribal	10,300	26,700	23,460	20,220	21,600	25,000
MI-5	TAC	16,100	15,700	17,080	33,130	33,130	34,000
	Tribal	4,830	4,710	5,124	16,565	16,565	17,000
Total	TAC	61,500	87,100	80,300	85,126	87,886	91,500
	Tribal	27,530	40,410	36,734	42,563	43,943	45,750

[1]GLIFWC. 1987.
[2]Ebener et al. 1989.
[3]Mattes. 1994.
[4]Mattes. 2000.
[5]Mattes. 2004.
[6]Mattes. 2006.
[7]Mattes. 2010

METHODS

Effort and harvest data were collected from mandatory daily catch reports filed bi-weekly by all fishermen who sold fish in their names, or by the boat captain who reported all effort and catch for his vessel. Gill net effort was reported as linear feet of gill net lifted. Harvest was reported in both dressed and round pounds. Species for which harvest was reported by fishermen as dressed pounds and conversion factors used to calculate round pounds are as follows:

Species	Conversion
Whitefish	1.17
Lake trout	1.25
Siscowet	1.25
Salmon and Trout	1.25
Cisco	1.20

Harvest of other species (walleye and northern pike) were reported by fishermen as round pounds.

Biological statistics were derived from biological monitoring data. Biological monitoring of catches occurred several times a month by the Keweenaw Bay Natural Resources Department, the Red Cliff Fisheries Department, and the Great Lakes Indian Fish and Wildlife Commission.

RESULTS AND DISCUSSION

Commercial Catch and Effort Statistics

Fishermen reported fishing 4.2 million feet of gill net and harvesting 739,748 round pounds of fish (Table 1). Whitefish was the primary target species, making up 86.9% of the total, followed by lake trout (10.6%), with the remaining 2.5% consisting of cisco (lake herring), siscowet, salmon, walleye, and sucker.

Unit MI-2

Harvest. Fourteen percent of the overall harvest was taken in MI-2 (Table 1). Of the 101,376 round pounds harvested in MI-2, 97.6% were whitefish and 2.4% were lake trout (Table 2). Harvest occurred in seven statistical grids, where lake trout harvest was less than 2,500 dressed pounds in each of the grids fished (Figure 2). Whitefish harvest was greatest in grid 1315 (32,520 dressed pounds), followed by grid 1512 (22,704 dressed pounds) and grid 1413 (10,362 dressed pounds). Less than 10,000 pounds were taken in each of the other four grids fished (Figure 3).

Effort. Eleven percent of the overall gill-net effort occurred in MI-2 (Table 1) which was fished by two tribes (Table 3). Fishing effort in MI-2 was 448,800 feet with 33.2% (148,800 feet) occurring in grid 1512 and 18.7% (84,000 feet) occurring in grid 1315. Less than 75,000 feet were fished in the remaining five grids (Figure 4). Gill-nets of 4 ½ inch mesh accounted for 89.7% of the unit's effort (Table 2 and Figure 5).

Target Effort and Harvest. All fishing effort (448,800) was targeted at whitefish and lake trout (Tables 4 and 5). Target effort (0.45 million feet) and harvest of whitefish (84,596 dressed pounds) was near the 1985-2011 average (399,987 feet and 73,615 dressed pounds, respectively). Target lake trout harvest (1,919 dressed pounds) was below the 1985-2012 average of 6,763 dressed pounds.

Catch Per Effort (CPE). Whitefish CPE (pounds harvested per 1,000 feet of gill-net) for targeted fishing in the seven grids fished in MI-2 ranged from 72-387 pounds (Table 4). Whitefish CPE for the seven grids combined was 188, below the average CPE of 184 for this unit for the 26 year period 1985-2011 (Table 5). Lake trout CPE for targeted fishing ranged from 1-8 per grid and was 4 for all grids combined, below the1985-2011 average CPE of 17 pounds.

Unit MI-3

Harvest. Fifty-eight percent of the overall harvest was taken in MI-3 (Table 1). Of the 431,438 round pounds harvested in MI-3, 95.8% were whitefish, 1.5% lake trout, and 2.7% cisco (Table 2). Harvest occurred in seven statistical grids, and lake trout harvest was less than 2,500 dressed pounds in each grid (Figure 2). Whitefish harvest was greatest in grids 1023 (156,686 dressed pounds), followed by grids 1121, 1024, and 1219 (78,567, 53,767, and 35,055 dressed pounds, respectively). Less than 30,000 dressed pounds taken in each of the remaining three statistical grids fished (Figure 3).

Effort. Fifty-two percent of the overall gill-net effort occurred in MI-3 (Table 1) which was fished by one tribe (Table 3). Fishing effort in MI-3 was 2,181,400 feet with 36.5% (796,000 feet) occurring in grid 1121 followed by 31.5% (687,000 feet) in grid 1023, 13.1% (286,400 feet) in grid 1024, 12.1% (264,000 feet) in grid 1219, and less than 100,000 feet fished in each of the remaining three grids (Figure 4). Gill-nets of 4 ½ inch mesh accounted for 96.2% of the unit's effort (Table 2 and Figure 5).

Target Effort and Harvest. The majority of fishing effort (2,148,400 feet) was targeted at whitefish and lake trout combined with 33,000 feet of this effort also directed at cisco (Tables 4 and 5). Target gill-net effort (2.15 million feet) was above the 1985-2011 average of 1.86 million feet (Table 5). Target harvest of whitefish (353,164 dressed pounds) was above the 1985-2011 average (194,179 dressed pounds). Target harvest of lake trout (5,334 dressed pounds) was below the 1985-2011 average (17,389 dressed pounds).

Catch Per Effort (CPE). Whitefish CPE (pounds harvested per 1,000 feet of gill-net) for targeted fishing in the seven grids fished ranged from 99-275 pounds (Table 4). Whitefish CPE for the seven grids combined was 164 pounds and above the average CPE of 104 for this unit for the 27 year period 1985-2011 (Table 5). Lake trout CPE for targeted fishing ranged from <1-27 pounds and was 3 for all grids combined, below the 1985-2011 average CPE of 9 pounds.

Unit MI-4

Harvest. Twenty-two percent of the overall harvest was taken in MI-4 (Table 1). Of the 161,769 round pounds harvested, 69.5% were whitefish, 28.7% lake trout, 1.2% siscowet, 0.4% cisco, and 0.2% a mix of sucker, salmon, and walleye (Table 2). Harvest occurred in nine statistical grids. Lake trout harvest was highest in grid 1224 (12,891 dressed pounds) followed by grids 1423, 1323, and 1125 (6,396, 5,710, and 5,315 dressed pounds, respectively) (Figure 2). Less than 5,000 dressed pounds were harvested in each of the other five grids fished. Whitefish harvest was greatest in grid 1224 (35,621 dressed pounds) followed by grids 1125, 1423, 1026, and 1323 (15,241, 11,592, 11,124, 10,562 dressed pounds, respectively) (Figure 3). Less than 5,000 dressed pounds were harvested in each of the other four grids fished.

Effort. Twenty-nine percent of the overall gill-net effort occurred in MI-4 (Table 1) which was fished by two tribes (Table 3). Fishing effort in MI-4 was 1,227,800 feet with 31.5% (386,700 feet) occurring in grid 1224, followed by 25.2% (310,000 feet) in grid 1423 and 20.1% (247,000 feet) in grid 1125. More than 100,000 feet was fished in grid 1323 and less than 100,000 feet fished in each of the remaining five grids (Figure 4). Gill-nets of 4 ½ inch mesh accounted for 96.9% of the unit's effort (Table 2 and Figure 5).

Target Effort and Harvest. The majority of fishing effort (1,217,600 feet) was targeted at whitefish and lake trout (Table 4). Target effort for whitefish and lake trout (1.2 million feet) was lower than the 1985-2011 average of 2.95 million feet (Table 5). Target harvest of whitefish (95,936 dressed pounds) was below the 1985-2011 average (181,053 dressed pounds). Target harvest of lake trout (37,065 dressed pounds) was also below the 1985-2011 average (66,766 dressed pounds).

Catch Per Effort (CPE). Whitefish CPE (pounds harvested per 1,000 feet of gill-net) for targeted fishing in the nine grids fished ranged from 38-414 pounds (Table 4). Whitefish CPE for the nine grids combined was 79 pounds and above the average CPE of 61 for this unit for the 27 year period 1985-2011 (Table 5). Lake trout CPE for targeted fishing ranged from 9-259 pounds and was 30 for all grids combined, above the 1985-2011 average CPE of 23 pounds.

Unit MI-5

Harvest. Six percent of the overall harvest was taken in MI-5 (Table 1). Of the 45,165 round pounds harvested in MI-5, 41.2% were whitefish, 50.6% lake trout, 7.5% cisco, and 0.7% salmon (Table 2). Harvest occurred in three statistical grids. Lake trout harvest was 14,258 dressed pounds in grid 1529, 3,847 in grid 1428, and 188 in grid 1429 (Figure 2). Whitefish harvest was 12,576 dressed pounds in grid 1529, 3,090 in grid 1428, and 240 in grid 1429 (Figure 3).

Effort. Nine percent of the overall gill-net effort occurred in MI-5 (Table 1) which was fished by one tribe (Table 3). Fishing effort was 370,200 feet with 71.7% (265,300 feet) occurring in grid 1529, 27.3% (100,900 feet) in grid 1428, and 1.1% (4,000 feet) in grid 1429 (Table 2 and Figure 4). Gill-nets of 4 ½ inch mesh accounted for 95.6% of the unit's effort (Table 2 and Figure 5).

Target Effort and Harvest. The majority of fishing effort (353,900 feet) was targeted at whitefish and lake trout with 16,300 feet directed at cisco (Table 4). Target effort for whitefish and lake trout (0.35 million feet) was near the 1985-2011 average of 0.43 million feet (Table 5). Target harvest of whitefish (15,896 dressed pounds) was below the 1986-2011 average (26,435 dressed pounds). Target harvest of lake trout (18,293 dressed pounds) was near the 1986-2011 average (20,205 dressed pounds).

Catch Per Effort (CPE). Whitefish CPE (pounds harvested per 1,000 feet of gill-net) for targeted fishing was 60 in grid 1429, 50 in grid 1529, and 32 in grid 1428 (Table 4). Whitefish CPE for the three grids combined was 45 pounds which was below the average CPE of 62 for this unit for the 26 year period 1986-2011 (Table 5). Lake trout CPE for targeted fishing was 56 in grid 1529, 47 in grid 1429, and 40 in grid 1428 (Table 4). Lake trout CPE for the three grids combined was 52 pounds, near the 1986-2011 average CPE of 47 pounds.

Biological Statistics

Lake Trout

MI-2. Eleven year classes of wild trout (5-15) and two hatchery fish (ages 8 and 9) were represented in a sample of 113 lake trout aged from MI-2 (Table 6). Mean age of wild fish was 9.0 years with fish ten years and older representing 41% of the wild component of the catch. Mean length was 23.3 inches for the 123 wild fish sampled, no fish were weighed. Average length at age of 7-10 year old wild lake trout has generally increased since 2005, however average length of age has fluctuated due to low sample sizes in some years (Figure 6). Lamprey marking rates were 0.8 wounds/100 fish for all fish and 50.0 wounds/100 fish for fish > 29 inches (Table 7). Annual total mortality was estimated to be 69% ($Z=1.16 \pm 0.12$) for wild fish ages 10-13 (Table 8).

MI-3. Eleven year classes of wild trout (5-9, 11, 13, 14, 16-18) were represented in a sample of 59 lake trout aged from MI-3 (Table 6). Mean age was 7.8 years. Fish ten years and older made up 10% of the wild component of the catch. Mean length was 21.7 inches and mean weight was 3.2 round pounds for the 71 fish sampled. Average length at age of 7-10 year old wild lake trout decreased between 1985 and 2001, but has since remained fairly stable (Figure 6). Overall lamprey-marking rates were 0.0 wounds/100 fish (Table 7). Annual total mortality rate was estimated at 61% ($Z=0.93, \pm 0.22$) for wild fish ages 8-11 (Table 8).

MI-4. Thirteen year classes of wild trout (6-17, 20) and five year classes of hatchery fish (8-10, 12-13) were represented in a sample of 87 lake trout aged from MI-4 (Table 6). Mean age was 9.4 years. Fish ten years and older made up 39% of the wild component of the catch. Mean length was 21.5 inches and mean weight was 3.3 round pounds for the 98 fish sampled. Average length at age of 7-10 year old wild lake trout decreased between 1985 and 2005, but has since remained fairly stable (Figure 6). Overall lamprey-marking rates were 0.0 wounds/100 fish (Table 7). Annual total mortality rate was estimated at 30% ($Z=0.35, \pm 0.15$) for wild fish ages 10-13 (Table 8).

MI-5. Eleven year classes of wild trout (5-15) were represented in a sample of 143 lake trout aged from MI-5 (Table 6). Mean age was 8.6 years. Fish ten years and older made up 32% of the catch. Mean length was 23.3 inches and mean weight was 4.2 round pounds for the 220 fish sampled. Average length at age of 7-10 year old wild lake trout decreased between 1986 and 2004, but has since remained fairly stable (Figure 6). Overall lamprey-marking rates were 0.0 wounds/100 fish (Table 7). Annual total mortality rate was estimated at 34% ($Z=0.41, \pm 0.10$) for wild fish ages 10-13 (Table 8).

Whitefish

MI-2. whitefish were sampled from MI-2 in 2011.

MI-3. Sixteen age groups (5-20) were represented in the 235 whitefish aged in MI-3, which had a mean age of 12.1 years (Table 9). Mean length of 367 lake whitefish measured was 20.0 inches and the mean weight of 285 whitefish weighed was 2.4 round pounds. The average length

of age 7 to 10 has been similar since 2005 (Figure 7). Annual total mortality was estimated at 50% (Z=0.69 +/-0.18) for ages 15-19.

MI-4. Ten age groups (4, 6-12, 14-15) were represented in the 71 whitefish aged in MI-4, which had a mean age of 8.4 years (Table 9). Mean length and weight of 72 lake whitefish sampled was 21.0 inches and 3.0 round pounds, respectively. The average length of age 7 to 10 year old fish has increased slightly since 2003 (Figure 7). Annual total mortality was estimated at 49% (Z=0.67 +/-0.06) for ages 9-12.

MI-5. Eleven age groups (5-15, 18) were represented in the 104 whitefish aged in MI-5, which had a mean age of 8.7 years (Table 9). Mean length and weight of 152 lake whitefish sampled was 22.2 inches and 3.8 round pounds, respectively. The average length of age 7 to 10 year old fish has remained relatively stable since 2003 (Figure 7). Annual total mortality was estimated at 32% (Z=0.38 +/-0.14) for ages 10-13.

Other Species

Cisco

Thirteen age groups (5-14, 18, 20, 23) were represented in the 127 cisco aged from MI-4 where the mean age was 9.5 years. Mean length and weight for the 132 cisco measured was 14.9 inches and 1.1 round pounds, respectively (Table 10). Annual total mortality was estimated at 24% (Z=0.27 +/-0.04) for ages 8-12.

Eleven age groups (6-12, 14-15, 20, 22) were represented in the 28 cisco aged from MI-5 where the mean age was 9.5 years. Mean length and weight for the 28 cisco measured was 18.4 inches and 2.1 round pounds, respectively (Table 10).

Siscowet

Twenty-two siscowet were sampled from MI-4 and seven siscowet from MI-5 (Table 10). Mean age was 15.0 in MI-4 and 14.2 in MI-5; mean length and weight was 20.8 inches and 3.1 round pounds and 21.4 inches and 3.1 round pounds in MI-4 and MI-5, respectively (Table 10).

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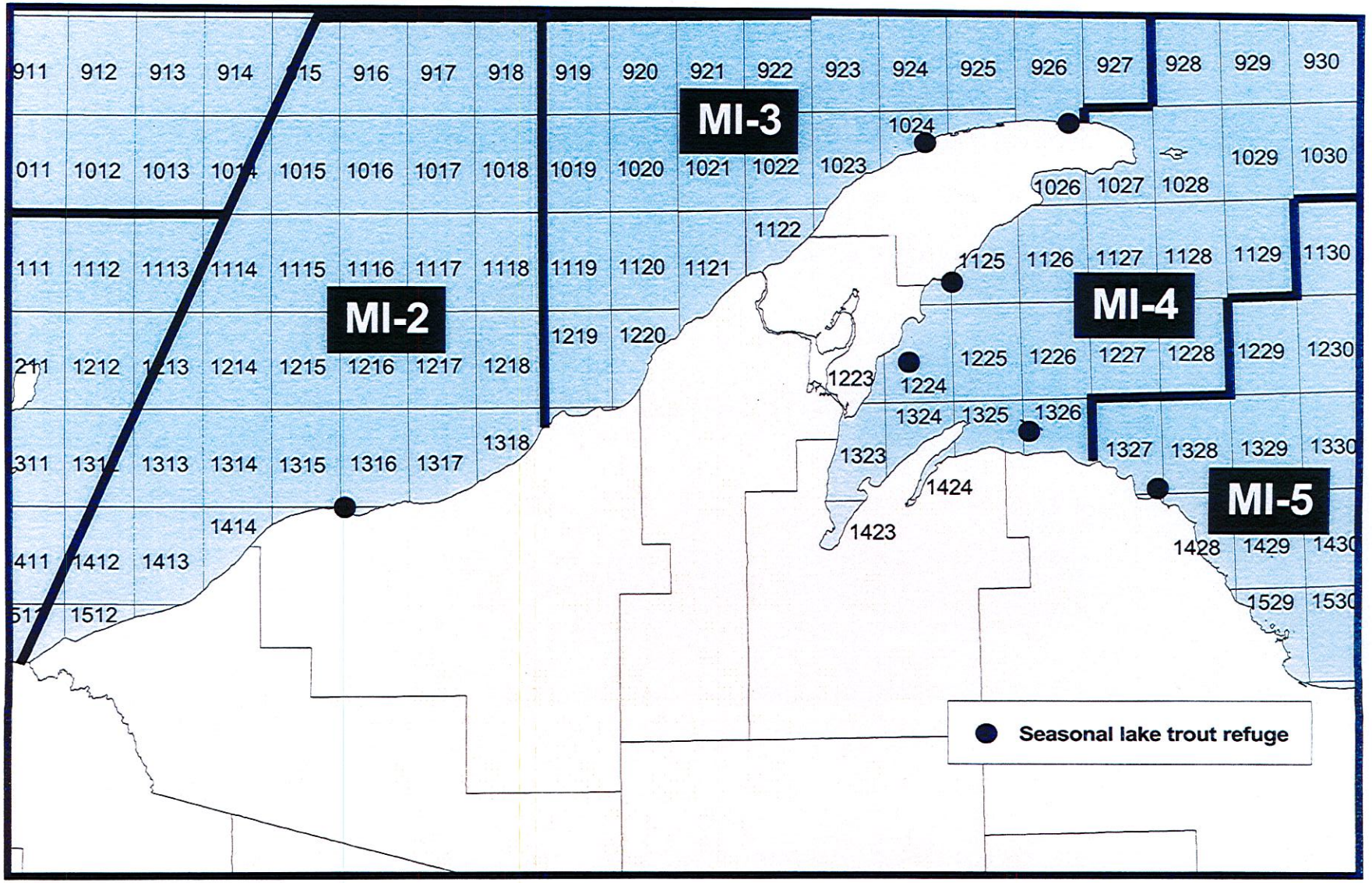


Figure 1. Management units and statistical grids in the 1842 treaty ceded area within Michigan waters of Lake Superior.

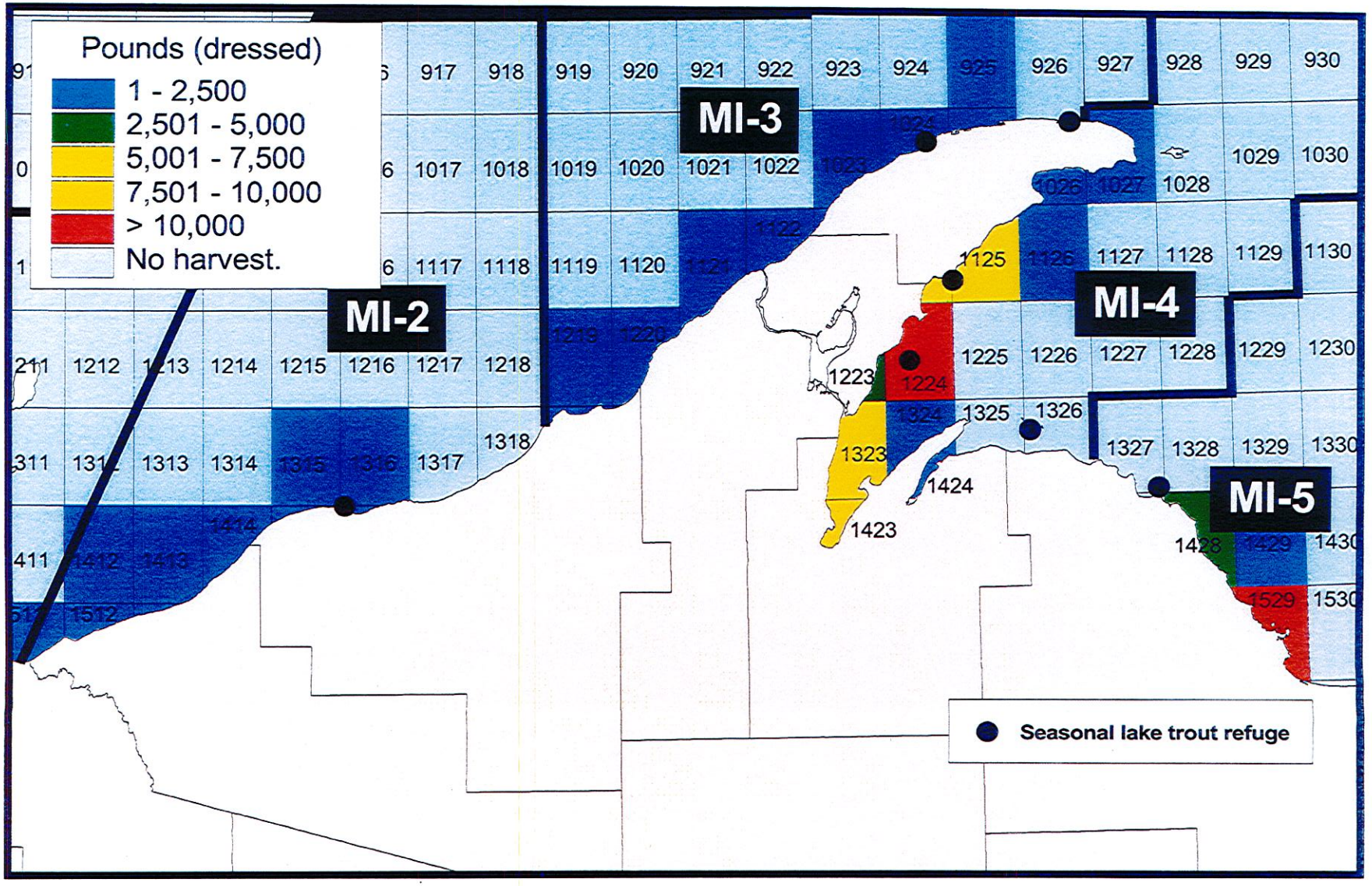


Figure 2. Lake trout harvest (dressed pounds) by statistical grid in the 1842 treaty ceded area within Michigan waters of Lake Superior during 2011.

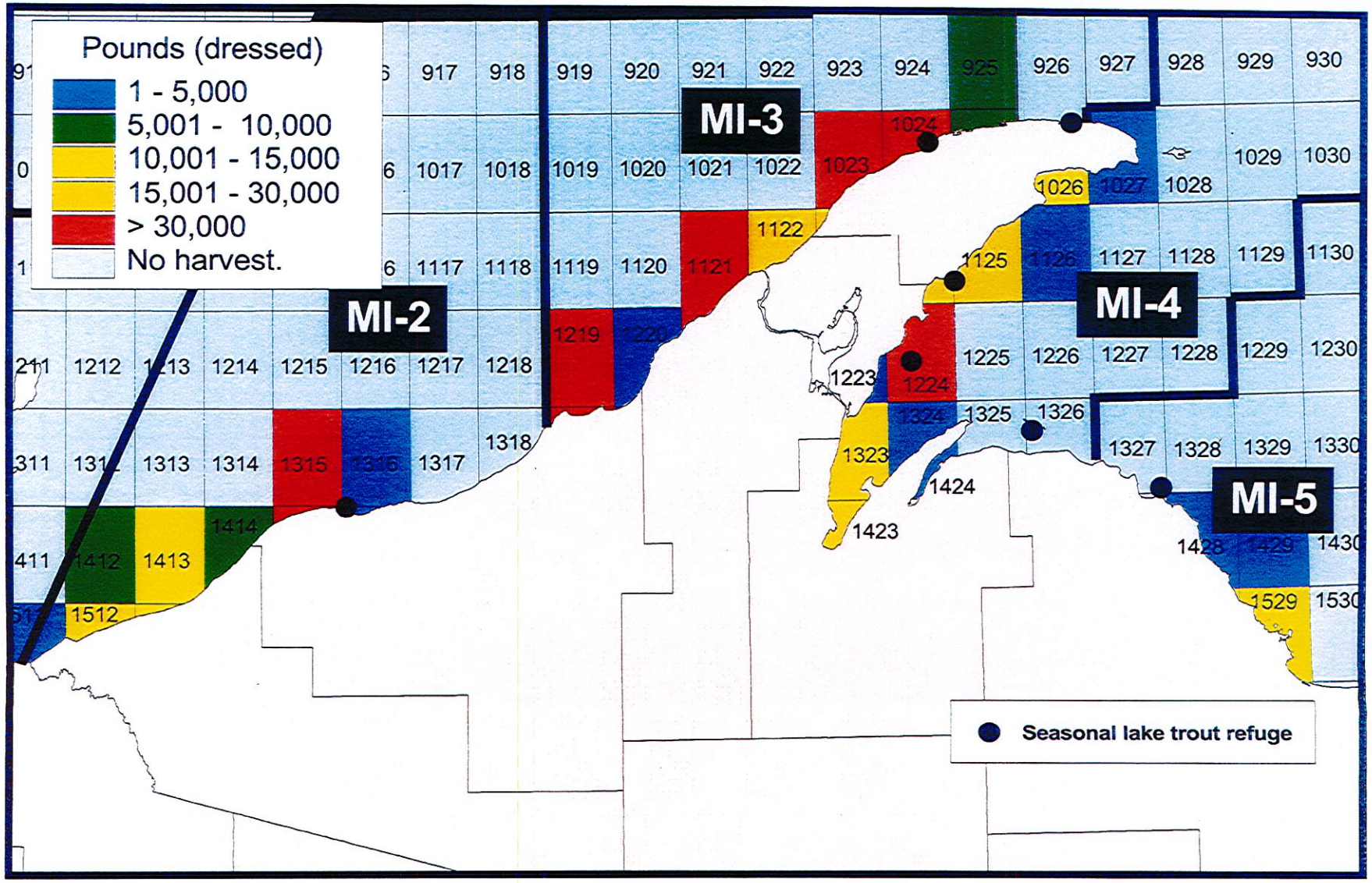


Figure 3. Whitefish harvest (dressed pounds) by statistical grid in the 1842 treaty ceded area within Michigan waters of Lake Superior during 2011.

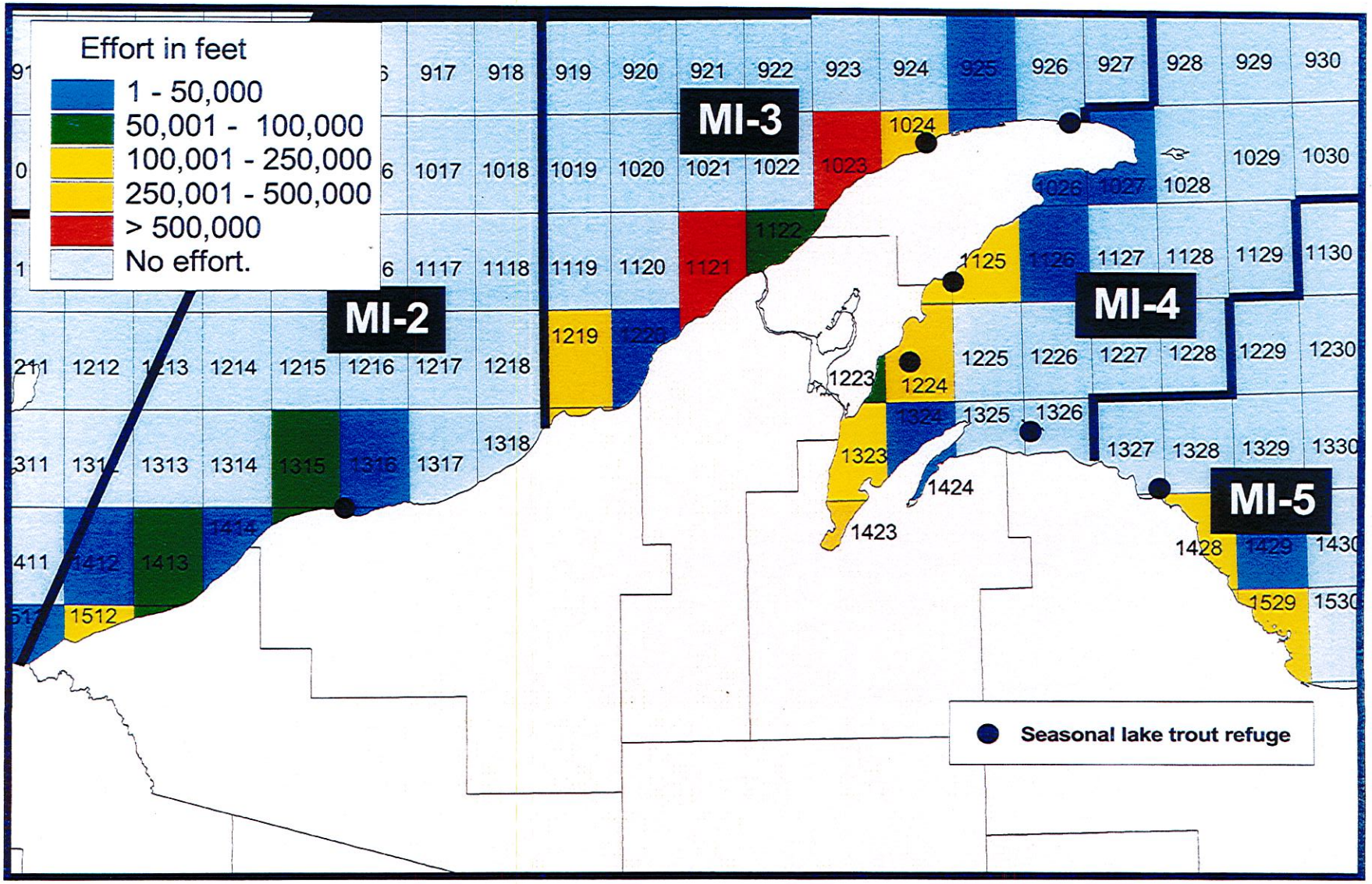
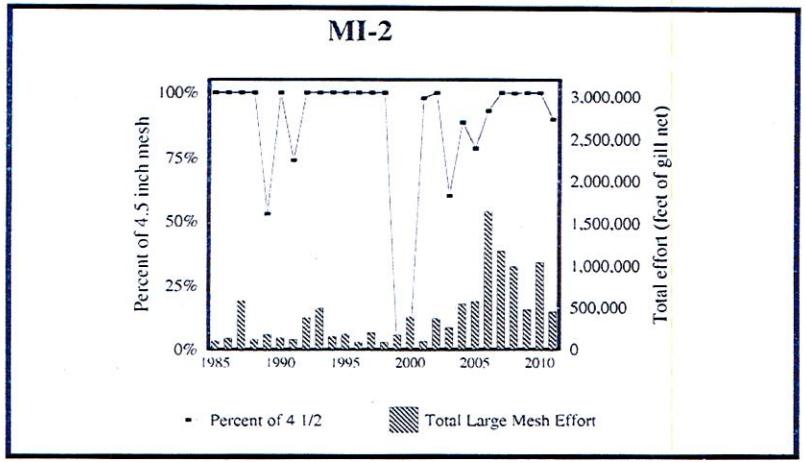
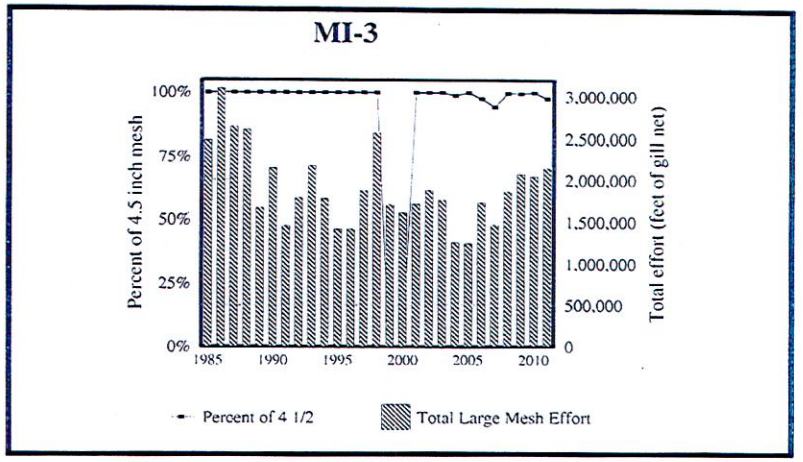
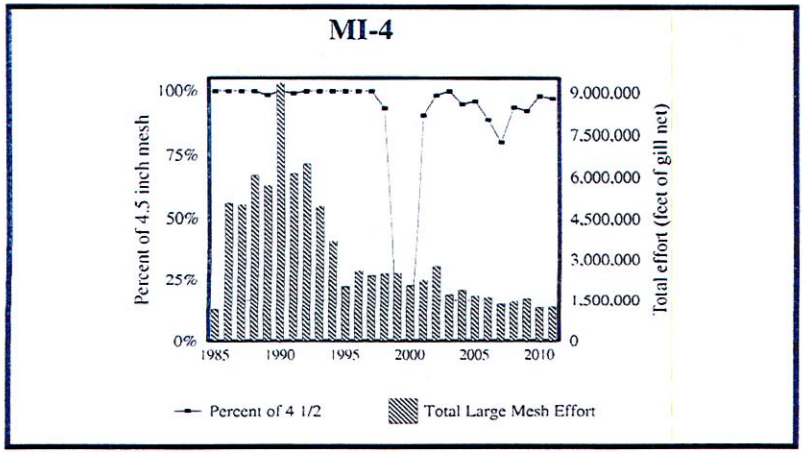


Figure 4. Effort in feet by statistical grid in the 1842 treaty ceded area within Michigan waters of Lake Superior during 2011.







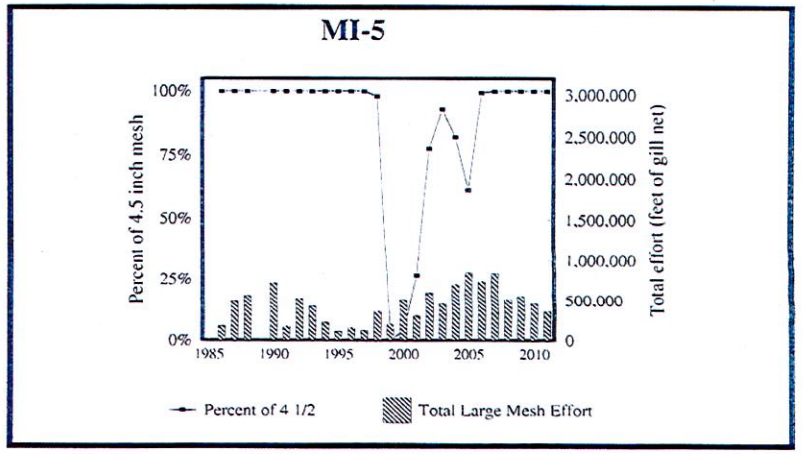
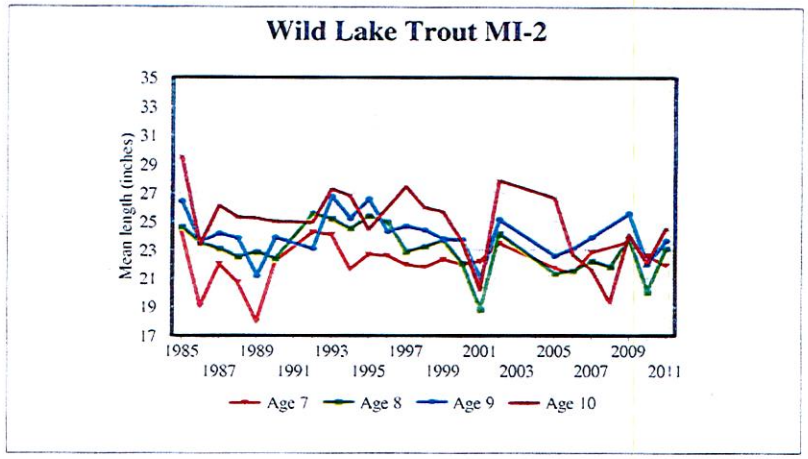
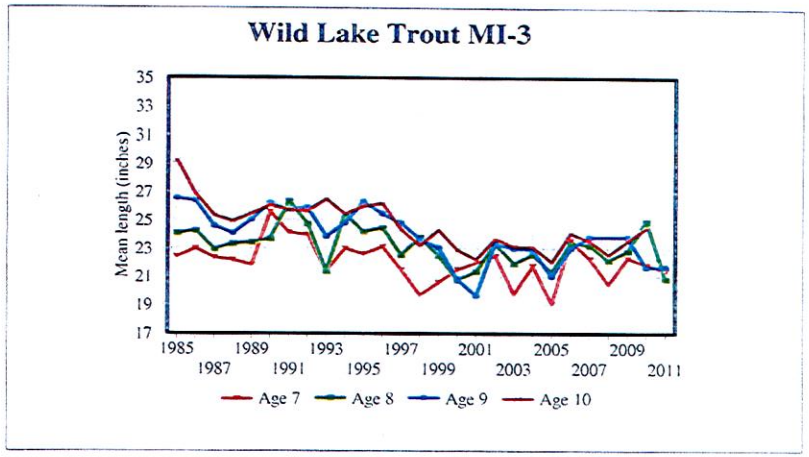
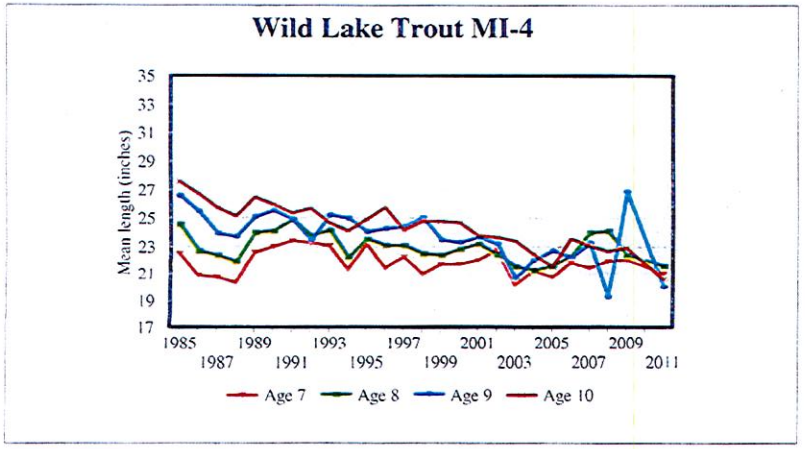


Figure 5. Total tribal large mesh gill net effort and percent composed of 4 1/2 inch mesh by management unit, 1985 to 2011.







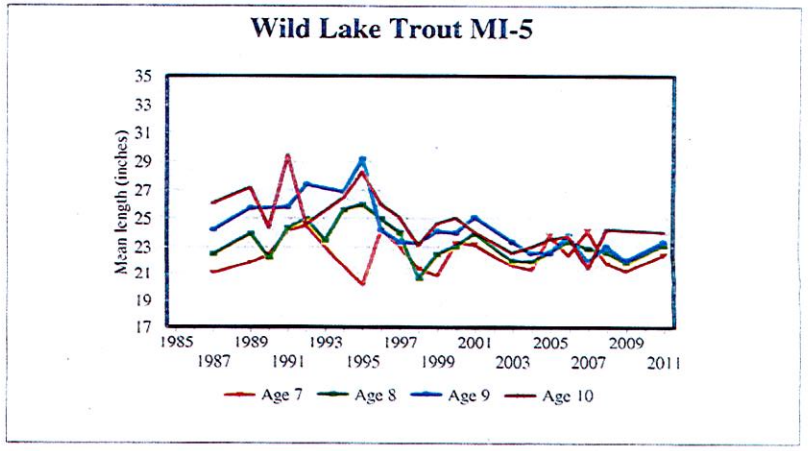
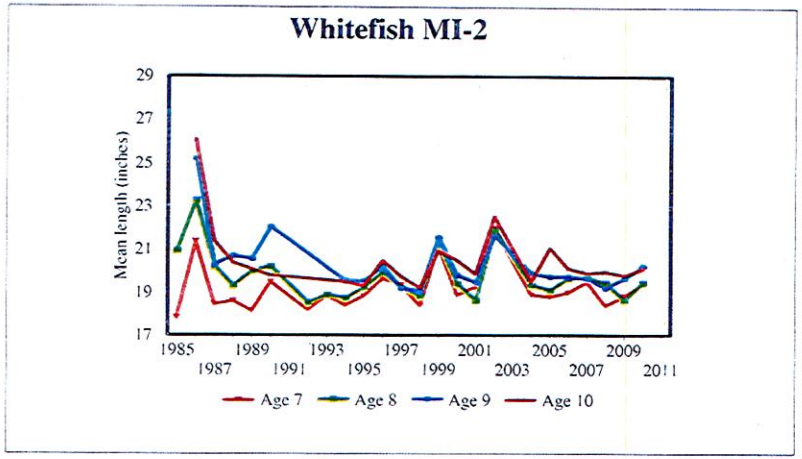
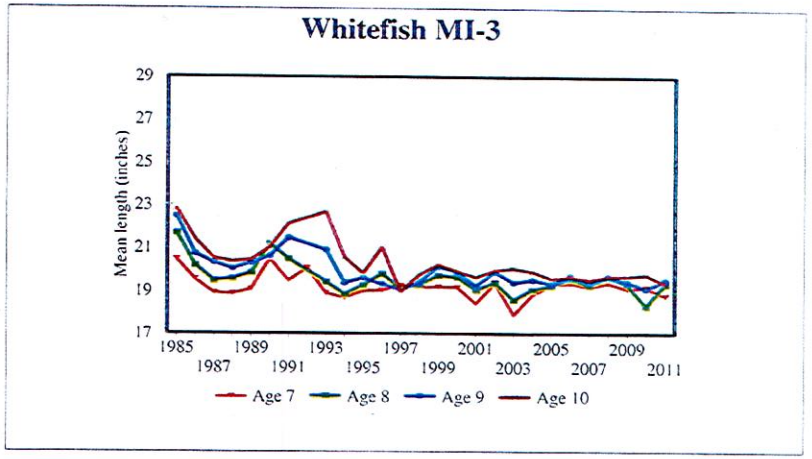
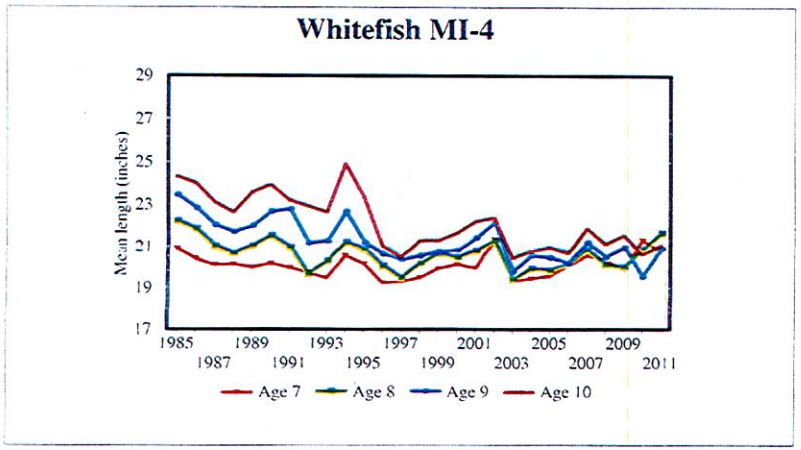


Figure 6. Trends in average length (inches) of wild lake trout (ages 7-10) in Michigan management units within the 1842 treaty ceded area, from 1985-2011.







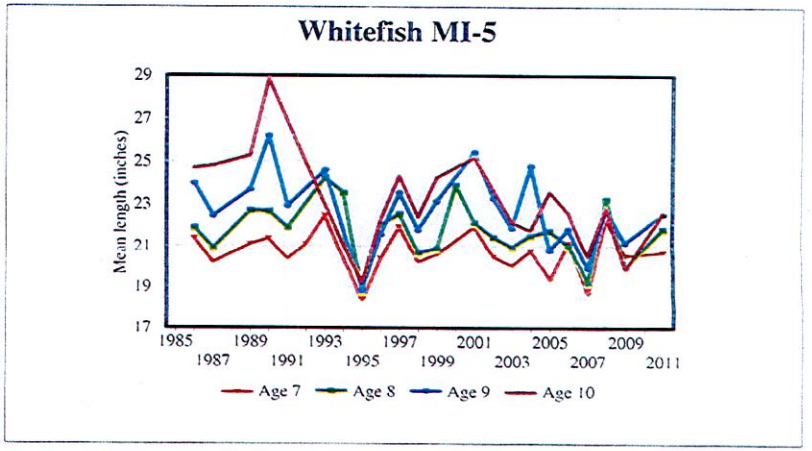


Figure 7. Trends in average length (inches) of whitefish (ages 7-10) in Michigan management units within the 1842 treaty ceded area, from 1985-2011.

Table 1. Total tribal commercial gill net effort (feet) and harvest (pounds) by management unit, grid, and species from the 1842 ceded area within Michigan waters of Lake Superior in 2011.

Management Unit	Grid	Effort	Percent of Total Effort*	Whitefish	Lake trout	Siscowet	Cisco	Salmon	Walleye	Sucker	Total Harvest Round Pounds	Percent of Total Harvest
MI-2	1315	84.000	18.7%	32.520	284	0	0	0	0	0		
	1316	36.000	8.0%	2.595	43	0	0	0	0	0		
	1412	48.000	10.7%	6.830	330	0	0	0	0	0		
	1413	74.400	16.6%	10.362	629	0	0	0	0	0		
	1414	36.000	8.0%	5.460	37	0	0	0	0	0		
	1511	21.600	4.8%	4.125	107	0	0	0	0	0		
	1512	148.800	33.2%	22.704	489	0	0	0	0	0		
Subtotals:	Effort:	448.800	10.6%									
	Dressed Pounds:			84.596	1.919	0	0	0				
	Round Pounds:			98.977.3	2.398.8	0.0	0.0	0.0	0	0	101.376.1	13.7%
MI-3	925	25.000	1.1%	6.877	5	0	0	0	0	0		
	1023	687.000	31.5%	156.686	1.371	0	0	0	0	0		
	1024	286.400	13.1%	53.767	610	0	9.605	0	43	0		
	1121	796.000	36.5%	78.567	1.900	0	0	0	0	0		
	1122	95.000	4.4%	18.028	340	0	0	0	0	0		
	1219	264.000	12.1%	35.055	344	0	0	0	0	0		
	1220	28.000	1.3%	4.185	766	0	0	0	0	0		
Subtotals:	Effort:	2.181.400	51.6%									
	Dressed Pounds:			353.164	5.334	0	9.605	0				
	Round Pounds:			413.201.9	6.667.5	0.0	11.526.0	0.0	43	0	431.438.4	58.3%
MI-4	1026	44.000	3.6%	11.124	783	0	51	0	5	0		
	1027	16.000	1.3%	3.269	157	0	0	0	0	0		
	1125	247.000	20.1%	15.241	5.315	0	4	0	0	0		
	1126	12.000	1.0%	2.219	114	0	35	0	5	0		
	1223	54.000	4.4%	4.000	4.200	0	0	0	0	0		
	1224	386.700	31.5%	35.621	12.891	554	298	0	24	0		
	1323	152.300	12.4%	10.562	5.770	456	16	16	0	0		
	1324	5.800	0.5%	2.400	1.500	0	0	0	0	0		
	1423	310.000	25.2%	11.592	6.431	583	86	80	26	210		
Subtotals:	Effort:	1.227.800	29.0%									
	Dressed Pounds:			96.026	37.160	1.593	490	96				
	Round Pounds:			112.350.4	46.450.0	1.991.3	588.0	120.0	59	210	161.768.7	21.9%
MI-5	1428	100.900	27.3%	3.090	3.847	0	764	79	0	0		
	1429	4.000	1.1%	240	188	0	0	0	0	0		
	1529	265.300	71.7%	12.576	14.258	0	2.047	174	2	0		
Subtotals:	Effort:	370.200	8.8%									
	Dressed Pounds:			15.906	18.293	0	2.811	253				
	Round Pounds:			18.609.4	22.865.6	0.0	3.372.6	315.6	2	0	45.165.3	6.1%
Grand Totals:	Effort:	4.228.200										
	Dressed Pounds:			549.692	62.706	1.593	12.906	349				
	Round Pounds:			643.139.1	78.381.9	1.991.3	15.486.6	435.6	104.0	210.0	739.748.4	

*For subtotals, percentage refers to percent of overall effort fished in unit.

Table 2. Tribal commercial gill net effort (feet) harvest (pounds) by management unit, gill net mesh size, and species from the 1842 ceded area within Michigan waters of Lake Superior in 2011.

Unit	Mesh	Effort	Percent of Total Effort*	Whitefish	Lake trout	Siscowet	Cisco	Salmon	Walleye	Sucker	Total Harvest Round Pounds
MI-2	4.4375	43,200	9.6%	6,044	167	0	0	0	0	0	
MI-2	4.5	402,400	89.7%	78,387	1,717	0	0	0	0	0	
MI-2	5	3,200	0.7%	165	35	0	0	0	0	0	
Subtotals:	Effort:	448,800	10.6%								
	Dressed Pounds:			84,596	1,919	0	0	0			
	Round Pounds:			98,977.3	2,398.8	0.0	0.0	0.0	0.0	0.0	101,376.1
Percent of Unit Harvest:				97.6%	2.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
MI-3	3.0	33,000	1.5%	0	0	0	9,605	0	0	0	
MI-3	4.5	2,098,400	96.2%	343,032	5,272	0	0	0	43	0	
MI-3	4.5-5.0	50,000	2.3%	10,132	62	0	0	0	0	0	
Subtotals:	Effort:	2,181,400	51.6%								
	Dressed Pounds:			353,164	5,334	0	9,605	0			
	Round Pounds:			413,201.9	6,667.5	0.0	11,526.0	0.0	43.0	0.0	431,438.4
Percent of Unit Harvest:				95.8%	1.5%	0.0%	2.7%	0.0%	0.0%	0.0%	
MI-4	2.5	1,800	0.1%	0	0	0	66	23	0	0	
MI-4	4.5	1,190,000	96.9%	84,479	36,648	1,593	400	73	59	210	
MI-4	4.5-5.0	36,000	2.9%	11,547	512	0	24	0	0	0	
Subtotals:	Effort:	1,227,800	29.0%								
	Dressed Pounds:			96,026	37,160	1,593	490	96			
	Round Pounds:			112,350.4	46,450.0	1,991.3	588.0	120.0	59.0	210.0	161,768.7
Percent of Unit Harvest:				69.5%	28.7%	1.2%	0.4%	0.1%	0.0%	0.1%	
MI-5	3.0	16,300	4.4%	10	0	0	2,803	148	2	0	
MI-5	4.5	353,900	95.6%	15,896	18,293	0	8	105	0	0	
Subtotals:	Effort:	370,200	8.8%								
	Dressed Pounds:			15,906	18,293	0	2,811	253			
	Round Pounds:			18,609.4	22,865.6	0.0	3,372.6	315.6	2.0	0.0	45,165.3
Percent of Unit Harvest:				41.2%	50.6%	0.0%	7.5%	0.7%	0.0%	0.0%	
Totals:	Effort:	4,228,200									
	Dressed Pounds:			549,692	62,706	1,593	12,906	349			
	Round Pounds:			643,139.1	78,381.9	1,991.3	15,486.6	435.6	104.0	210.0	739,748.4
Percent of Total Harvest:				86.9%	10.6%	0.3%	2.1%	0.1%	0.0%	0.0%	

*For subtotals, percentage refers to percent of overall effort fished in unit.

Table 3. Total and target gill net harvest and effort statistics by tribe for lake trout, whitefish, and siscowet in Michigan waters of Lake Superior in 2011.*

		TOTAL HARVEST							TARGET HARVEST							
			Whitefish		Lake trout		Siscowet			Whitefish		Lake trout		Siscowet		
Unit	Tribe	Effort	pounds	CPE	pounds	CPE	pounds	CPE	Effort	pounds	CPE	pounds	CPE	Effort	pounds	CPE
MI-2	Bad River	160,800	26,761	166	999	6	0	0	160,800	26,761	166	999	6	0	0	0
	Keweenaw Bay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red Cliff	288,000	57,835	201	920	3	0	0	288,000	57,835	201	920	3	0	0	0
	subtotal	448,800	84,596	188	1,919	4	0	0	448,800	84,596	188	1,919	4	0	0	0
MI-3	Bad River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Keweenaw Bay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red Cliff	2,181,400	353,164	162	5,334	2	0	0	2,148,400	353,164	164	5,334	2	0	0	0
	subtotal	2,181,400	353,164	162	5,334	2	0	0	2,148,400	353,164	164	5,334	2	0	0	0
MI-4	Bad River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Keweenaw Bay	814,800	42,978	53	30,370	37	1,593	2	804,600	42,888	53	30,275	38	7,200	210	29
	Red Cliff	413,000	53,048	128	6,790	16	0	0	413,000	53,048	128	6,790	16	0	0	0
	subtotal	1,227,800	96,026	78	37,160	30	1,593	1	1,217,600	95,936	79	37,065	30	7,200	210	29
MI-5	Bad River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Keweenaw Bay	370,200	15,906	43	18,293	49	0	0	353,900	15,896	45	18,293	52	0	0	0
	Red Cliff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	subtotal	370,200	15,906	43	18,293	49	0	0	353,900	15,896	45	18,293	52	0	0	0
Total	Bad River	160,800	26,761	166	999	6	0	0	160,800	26,761	166	999	6	0	0	0
	Keweenaw Bay	1,185,000	58,884	50	48,663	41	1,593	1	1,158,500	58,784	51	48,568	42	7,200	210	29
	Red Cliff	2,882,400	464,047	161	13,044	5	0	0	2,849,400	464,047	163	13,044	5	0	0	0
	All Tribes	4,228,200	549,692	130	62,706	15	1,593	0	4,168,700	549,592	132	62,611	15	7,200	210	29

*Pounds are in dressed weight, effort is feet of net lifted and CPE is pounds/1000 ft of net lifted. Target species was assigned to each lift based on reported target species from individual catch reports. Target effort for whitefish and lake trout was combined.

Table 4. Gill net harvest and effort statistics for target species by grid and management unit in Michigan waters of Lake Superior in 2011*

		Whitefish			Lake trout			Siscowet			Cisco			Sucker		
Unit	Grid	Effort	pounds	CPE	Effort	pounds	CPE	Effort	pounds	CPE	Effort	pounds	CPE	Effort	pounds	CPE
MI-2	1315	84,000	32,520	387	84,000	284	3									
	1316	36,000	2,595	72	36,000	43	1									
	1412	48,000	6,830	142	48,000	330	7									
	1413	74,400	10,362	139	74,400	629	8									
	1414	36,000	5,460	152	36,000	37	1									
	1511	21,600	4,125	191	21,600	107	5									
	1512	148,800	22,704	153	148,800	489	3									
	subtotal	448,800	84,596	188	448,800	1,919	4	0	0	0	0	0	0	0	0	0
MI-3	925	25,000	6,877	275	25,000	5	0									
	1023	687,000	156,686	228	687,000	1,371	2									
	1024	253,400	53,767	212	253,400	610	2				33,000	9,605	291			
	1121	796,000	78,567	99	796,000	1,900	2									
	1122	95,000	18,028	190	95,000	340	4									
	1219	264,000	35,055	133	264,000	344	1									
	1220	28,000	4,185	149	28,000	766	27									
	subtotal	2,148,400	353,164	164	2,148,400	5,334	2	0	0	0	33,000	9,605	291	0	0	0
MI-4	1026	44,000	11,124	253	44,000	783	18									
	1027	16,000	3,269	204	16,000	157	10									
	1125	247,000	15,241	62	247,000	5,315	22									
	1126	12,000	2,219	185	12,000	114	9									
	1223	54,000	4,000	74	54,000	4,200	78									
	1224	386,700	35,621	92	386,700	12,891	33									
	1323	148,700	10,512	71	148,700	5,710	38	3,600	90	25						
	1324	5,800	2,400	414	5,800	1,500	259									
	1423	303,400	11,552	38	303,400	6,396	21	3,600	120	33	1,800	66	37	1,200	210	175
	subtotal	1,217,600	95,936	79	1,217,600	37,065	30	7,200	210	29	1,800	66	37	1,200	210	175
MI-5	1428	97,000	3,090	32	97,000	3,847	40				3,900	763	196			
	1429	4,000	240	60	4,000	188	47									
	1529	252,900	12,566	50	252,900	14,258	56				12,400	2,040	165			
	subtotal	353,900	15,896	45	353,900	18,293	52	0	0	0	16,300	2,803	172	0	0	0
Grand Total		4,168,700	549,592	132	4,168,700	62,611	15	7,200	210	29	47,200	11,711	248	1,200	210	175

*Pounds are in dressed weight, effort is feet of net lifted and CPE is pounds/1,000 ft of net lifted. Target species was assigned to each lift based on reported target species from individual catch reports. Target effort for whitefish and lake trout was combined.

Table 5. Tribal commercial gill net effort (feet), harvest (dressed pounds), and catch per unit effort (CPE, pounds/1,000 feet) for whitefish, lake trout and siscowet by management unit and year from the 1842 ceded area within Michigan waters of Lake Superior from 1985-2011. Target effort for whitefish and lake trout was combined.

		Whitefish				Lake trout				Siscowet			
Unit	Year	Target effort	Target harvest	CPE	Total Harvest	Target effort	Target harvest	CPE	Total Harvest	Target effort	Target harvest	CPE	Total Harvest
MI-2	1985	101,100	5,664	56	5,664	101,100	9,238	91	9,238	0	0	0	45
	1986	128,000	16,234	127	16,234	128,000	7,550	59	7,550	0	0	0	63
	1987	576,200	80,246	139	80,246	576,200	18,568	32	18,633	3,200	0	0	2,059
	1988	98,000	2,809	29	2,809	98,000	17,374	177	17,374	24,000	4,945	206	5,377
	1989	178,000	33,511	188	33,511	178,000	13,488	76	13,488	0	0	0	4,181
	1990	113,000	22,867	202	24,012	113,000	2,789	25	3,269	28,000	8,145	291	13,308
	1991	136,800	32,003	234	32,003	136,800	5,273	39	5,273	0	0	0	812
	1992	217,000	44,814	207	45,377	217,000	2,290	11	2,332	166,000	25,946	156	27,476
	1993	419,100	74,220	177	74,473	419,100	7,780	19	8,263	52,400	10,029	191	18,680
	1994	148,200	17,629	119	17,629	148,200	7,790	53	7,790	5,000	747	149	1,990
	1995	155,000	11,236	73	12,160	155,000	9,729	63	10,104	15,000	3,307	221	6,682
	1996	89,600	4,418	49	4,418	89,600	7,777	87	7,777	1,200	3	3	189
	1997	196,300	19,512	99	19,512	196,300	10,675	54	11,302	5,000	1,608	322	2,311
	1998	85,400	10,250	120	10,250	85,400	3,125	37	3,125	0	0	0	250
	1999	170,100	31,466	185	31,466	170,100	1,130	7	1,130	0	0	0	3,628
	2000	391,800	120,494	308	120,494	391,800	3,925	10	3,925	0	0	0	3,911
	2001	95,000	16,944	178	16,944	95,000	463	5	463	0	0	0	1,483
	2002	371,800	43,377	117	43,377	371,800	3,582	10	3,582	0	0	0	6,667
	2003	261,600	37,887	145	37,887	261,600	2,910	11	2,910	0	0	0	1,700
	2004	526,900	80,959	154	80,959	526,900	5,745	11	5,745	0	0	0	26
	2005	577,600	129,062	223	129,062	577,600	7,103	12	7,103	0	0	0	280
	2006	1,642,450	360,434	219	360,434	1,642,450	9,072	6	9,072	0	0	0	705
	2007	1,171,600	207,745	177	207,745	1,171,600	11,582	10	11,582	0	0	0	1,339
	2008	987,600	213,266	216	213,266	987,600	7,660	8	7,660	0	0	0	1,077
	2009	475,900	112,789	237	112,789	475,900	1,830	4	1,830	0	0	0	561
	2010	1,036,800	173,173	167	173,173	1,036,800	2,221	2	2,221	0	0	0	144
	2011	448,800	84,596	188	84,596	448,800	1,919	4	1,919	0	0	0	0
Average:		399,987	73,615	184	73,722	399,987	6,763	17	6,839	11,104	2,027	183	3,887
MI-3	1985	2,475,200	309,525	125	309,525	2,475,200	31,501	13	31,501	0	0	0	6,098
	1986	2,936,200	265,269	90	266,919	2,936,200	39,682	14	39,888	161,000	26,172	163	44,384
	1987	2,098,900	136,353	65	145,245	2,098,900	36,409	17	37,340	538,800	58,797	109	78,320
	1988	2,427,300	222,321	92	225,440	2,427,300	32,677	14	33,158	176,400	21,934	124	34,289
	1989	1,596,000	134,078	84	134,182	1,596,000	28,215	18	28,224	68,000	10,660	157	22,461
	1990	2,127,500	110,615	52	110,615	2,127,500	28,361	13	28,361	20,000	2,967	148	28,771
	1991	1,329,900	62,714	47	65,264	1,329,900	22,507	17	23,790	123,400	14,458	117	30,005
	1992	1,675,200	119,291	71	120,176	1,675,200	19,537	12	19,912	84,600	8,272	98	27,350
	1993	2,100,100	172,270	82	172,488	2,100,100	16,958	8	17,255	63,700	5,933	93	22,052
	1994	1,703,800	73,556	43	74,632	1,703,800	12,651	7	13,433	71,000	5,053	71	22,099
	1995	1,408,400	91,358	65	91,358	1,408,400	8,013	6	8,013	0	0	0	9,774
	1996	1,359,700	135,822	100	136,622	1,359,700	9,843	7	10,798	56,000	2,750	49	6,277
	1997	1,854,100	136,221	74	136,971	1,854,100	15,954	9	16,435	18,000	1,546	86	13,270
	1998	2,556,700	267,336	105	267,411	2,556,700	24,629	10	24,759	9,500	400	42	11,706
	1999	1,706,300	178,485	105	178,485	1,706,300	12,430	7	12,430	0	0	0	11,455
	2000	1,609,300	204,065	127	204,065	1,609,300	8,951	6	8,951	0	0	0	3,389
	2001	1,711,600	154,154	90	154,154	1,711,600	17,246	10	17,246	0	0	0	7,819
	2002	1,879,000	85,980	46	85,980	1,879,000	19,558	10	19,558	0	0	0	8,986
	2003	1,759,000	196,274	112	196,274	1,759,000	12,585	7	12,585	0	0	0	0
	2004	1,255,400	67,579	54	67,579	1,255,400	9,973	8	9,973	0	0	0	0
	2005	1,246,000	118,185	95	118,185	1,246,000	4,738	4	4,738	0	0	0	0
	2006	1,731,000	264,460	153	264,460	1,731,000	12,714	7	12,714	0	0	0	56
	2007	1,466,400	249,555	170	249,555	1,466,400	5,414	4	5,414	0	0	0	0
	2008	1,871,150	373,411	200	373,411	1,871,150	12,697	7	12,697	0	0	0	1,155
	2009	2,073,300	475,227	229	475,227	2,073,300	15,392	7	15,392	0	0	0	3,881
	2010	2,042,500	265,459	130	265,459	2,042,500	5,547	3	5,547	0	0	0	1,439
	2011	2,148,400	353,164	164	353,164	2,148,400	5,334	2	5,334	0	0	0	400
Average:		1,857,346	193,434	104	194,179	1,857,346	17,389	9	17,609	51,496	5,887	114	14,646
MI-4	1985	1,083,275	218,666	202	219,376	1,083,275	43,118	40	44,289	0	0	0	241
	1986	4,864,900	526,710	108	527,148	4,864,900	129,258	27	129,565	105,800	25,924	245	32,038
	1987	4,110,190	300,332	73	301,898	4,110,190	71,863	18	72,864	768,200	136,596	178	160,297
	1988	5,547,065	245,246	44	246,854	5,547,065	117,982	21	119,281	266,000	34,653	130	53,689
	1989	6,781,675	371,247	55	372,637	6,781,675	112,829	17	114,353	70,000	21,781	311	58,127
	1990	8,557,900	377,190	44	382,839	8,557,900	133,645	16	139,272	600,500	38,606	64	81,902
	1991	5,945,200	278,295	47	286,046	5,945,200	94,581	16	104,481	789,300	55,800	71	96,699
	1992	5,152,100	299,967	58	313,370	5,152,100	74,849	15	86,074	950,750	46,489	49	96,550
	1993	3,939,425	165,440	42	176,357	3,939,425	65,184	17	76,105	747,500	55,090	74	92,518
	1994	2,801,325	88,866	32	95,085	2,801,325	53,075	19	62,290	559,050	38,703	69	60,395
	1995	1,529,225	74,466	49	84,682	1,529,225	47,471	31	61,986	376,000	35,363	94	51,510
	1996	2,096,400	101,931	49	108,219	2,096,400	43,737	21	50,828	336,900	23,662	70	38,361
	1997	2,238,988	127,998	57	129,103	2,238,988	54,929	25	56,302	137,986	41,753	303	65,555
	1998	2,202,700	136,100	62	139,384	2,202,700	60,014	27	63,419	196,870	19,377	98	33,038
	1999	2,338,100	141,873	61	143,432	2,338,100	69,671	30	70,896	79,400	14,920	188	25,154
	2000	1,922,025	128,261	67	129,288	1,922,025	78,318	41	79,097	43,700	6,616	151	17,851
	2001	2,193,800	114,051	52	114,867	2,193,800	66,726	30	67,347	22,800	6,949	305	34,091
	2002	2,735,450	160,561	59	160,564	2,735,450	91,897	34	91,897	0	0	0	19,050
	2003	1,714,600	158,437	92	158,437	1,714,600	45,406	27	45,406	0	0	0	500
	2004	1,864,550	147,536	79	147,594	1,864,550	49,185	26	49,208	0	0	0	664
	2005	1,660,670	142,676	86	142,676	1,660,670	41,026	25	41,026	0	0	0	123
	2006	1,601,855	90,777	57	90,833	1,601,855	52,758	33	52,857	3,375	165	49	1,538
	2007	1,345,140	87,772	65	87,807	1,345,140	40,856	30	40,891	0	0	0	514
	2008	1,465,750	113,059	77	113,059	1,465,750	46,669	32	46,669	0	0	0	2,480
	2009	1,553,550	122,643	79	122,717	1,553,550	46,568	30	46,572	0	0	0	3,175
	2010	1,211,300	72,394	60	72,832	1,211,300	33,990	28	34,428	2,400	82	34	1,569
	2011	1,217,600	95,936	79	96,026	1,217,600	37,065	30	37,160	7,200	210	29	1,593
Average:		2,950,917	181,053	61	183,820	2,950,917	66,766	23	69,799	224,583	22,324	99	38,119

Table 5. Continued.

		Whitefish				Lake trout				Siscowet			
Unit	Year	Target effort	Target harvest	CPE	Total Harvest	Target effort	Target harvest	CPE	Total Harvest	Target effort	Target harvest	CPE	Total Harvest
MI-5	1986	180,000	25,205	140	25,205	180,000	10,667	59	10,667	4,000	750	188	1,772
	1987	440,000	32,095	73	33,126	440,000	13,509	31	13,509	48,000	2,502	52	6,269
	1988	551,900	47,233	86	47,363	551,900	32,105	58	32,105	6,000	333	56	5,449
	1989	225,500	42,809	190	42,809	225,500	12,661	56	12,661	0	0	0	2,785
	1990	706,000	80,394	114	80,394	706,000	18,490	26	18,490	0	0	0	10,026
	1991	305,500	24,355	80	24,540	305,500	7,789	26	7,899	36,000	405	11	9,787
	1992	426,000	35,827	84	37,169	426,000	8,042	19	8,977	72,000	2,970	41	8,672
	1993	416,000	21,375	51	21,522	416,000	25,555	61	25,597	4,500	206	46	2,833
	1994	211,000	5,318	25	5,388	211,000	24,974	118	24,974	14,000	290	21	2,878
	1995	113,400	9,288	82	9,288	113,400	8,445	75	8,445	0	0	0	1,839
	1996	161,400	7,672	48	7,672	161,400	8,040	50	8,040	0	0	0	1,033
	1997	102,300	17,997	176	18,831	102,300	5,249	51	6,105	8,000	200	25	1,855
	1998	280,300	23,950	85	24,452	280,300	14,942	53	16,247	74,000	1,989	27	4,023
	1999	178,000	12,213	69	12,813	178,000	18,342	103	19,824	15,500	1,222	79	4,038
	2000	481,800	44,454	92	44,842	481,800	48,030	100	48,479	7,500	578	77	3,073
	2001	292,700	22,949	78	22,949	292,700	6,377	22	7,321	0	0	0	0
	2002	576,600	31,159	54	31,329	576,600	23,010	40	23,010	0	0	0	1,849
	2003	454,500	14,988	33	14,988	454,500	37,706	83	37,706	0	0	0	5
	2004	705,700	20,742	29	20,742	705,700	31,827	45	31,827	0	0	0	480
	2005	835,070	29,985	36	29,988	835,070	29,505	35	29,530	1,190	60	50	383
	2006	738,700	44,839	61	44,839	738,700	36,650	50	36,668	0	0	0	0
	2007	820,500	29,254	36	29,313	820,500	32,988	40	32,988	0	0	0	0
	2008	508,500	7,691	15	7,691	508,500	11,949	24	11,949	0	0	0	0
	2009	551,722	21,070	38	21,134	551,722	21,042	38	21,042	0	0	0	0
	2010	450,000	18,554	41	18,708	450,000	12,966	29	12,966	0	0	0	0
	2011	353,900	15,896	45	15,906	353,900	18,293	52	18,293	0	0	0	0
Average:		425,654	26,435	62	26,654	425,654	19,967	47	20,205	11,180	443	40	2,656
All	1985	3,659,575	533,855	146	534,565	3,659,575	83,857	23	85,028	0	0	0	6,384
units	1986	8,109,100	833,418	103	835,506	8,109,100	187,157	23	187,670	270,800	52,846	195	78,257
	1987	7,225,290	549,026	76	560,515	7,225,290	140,349	19	142,346	1,358,200	197,895	146	246,945
	1988	8,624,265	517,609	60	522,466	8,624,265	200,138	23	201,918	472,400	61,865	131	98,804
	1989	8,781,175	581,645	66	583,139	8,781,175	167,193	19	168,726	138,000	32,441	235	87,554
	1990	11,504,400	591,066	51	597,860	11,504,400	183,285	16	189,392	648,500	49,718	77	134,007
	1991	7,717,400	397,367	51	407,853	7,717,400	130,150	17	141,443	948,700	70,663	74	137,303
	1992	7,470,300	499,899	67	516,092	7,470,300	104,718	14	117,295	1,273,350	83,677	66	160,048
	1993	6,874,625	433,305	63	444,840	6,874,625	115,477	17	127,220	868,100	71,258	82	136,083
	1994	4,864,325	185,369	38	192,734	4,864,325	98,490	20	108,487	649,050	44,793	69	87,362
	1995	3,206,025	186,348	58	197,488	3,206,025	73,658	23	88,548	391,000	38,670	99	69,805
	1996	3,707,100	249,843	67	256,931	3,707,100	69,397	19	77,443	394,100	26,415	67	45,860
	1997	4,391,688	301,728	69	304,417	4,391,688	86,807	20	90,144	168,986	45,107	267	82,991
	1998	5,125,100	437,636	85	441,497	5,125,100	102,710	20	107,550	280,370	21,766	78	49,017
	1999	4,392,500	364,037	83	366,196	4,392,500	101,573	23	104,280	94,900	16,142	170	44,275
	2000	4,404,925	497,274	113	498,689	4,404,925	139,224	32	140,452	51,200	7,194	141	28,224
	2001	4,293,100	308,098	72	308,914	4,293,100	90,812	21	92,377	22,800	6,949	305	43,393
	2002	5,562,850	321,077	58	321,250	5,562,850	138,047	25	138,047	0	0	0	36,552
	2003	4,189,700	407,586	97	407,586	4,189,700	98,607	24	98,607	0	0	0	2,205
	2004	4,352,550	316,816	73	316,874	4,352,550	96,730	22	96,753	0	0	0	1,170
	2005	4,319,340	419,908	97	419,911	4,319,340	82,372	19	82,397	1,190	60	50	786
	2006	5,714,005	760,510	133	760,566	5,714,005	111,194	19	111,311	3,375	165	49	2,299
	2007	4,803,640	574,326	120	574,420	4,803,640	90,840	19	90,875	0	0	0	1,853
	2008	4,833,000	707,427	146	707,427	4,833,000	78,975	16	78,975	0	0	0	4,712
	2009	4,654,472	731,729	157	731,867	4,654,472	84,832	18	84,836	0	0	0	7,617
	2010	4,740,600	529,580	112	530,172	4,740,600	54,724	12	55,162	2,400	82	34	3,152
	2011	4,168,700	549,592	132	549,692	4,168,700	62,611	15	62,706	7,200	210	29	1,993
Average:		5,618,139	473,558	84	477,388	5,618,139	110,145	20	113,703	297,949	30,664	103	59,209

Table 6. Age and size composition of hatchery and wild lake trout by unit from tribal commercial harvests during 2011. Weight is in round pounds, length is in inches, and sd=standard deviation.

Unit	Origin	Age	Number Aged	Number Measured	Length (in.) mean	Length (in.) sd	Number Weighed	Weight (lbs) mean	Weight (lbs) sd
MI-2									
	Hatchery								
		8	1	1	22.7		0		
		9	1	1	26.2		0		
Sample Size:			2	2			0		
Means:		8.5			24.5	2.5			
	Wild								
			0	10	23.8	3.1	0		
		5	4	4	19.5	2.3	0		
		6	7	7	20.1	1.7	0		
		7	10	10	21.9	2.4	0		
		8	23	23	23.1	2.3	0		
		9	22	22	23.6	3.0	0		
		10	28	28	24.5	1.8	0		
		11	10	10	23.2	3.3	0		
		12	2	2	25.1	0.5	0		
		13	1	1	26.9		0		
		14	2	2	24.0	4.3	0		
		15	2	2	23.7	3.7	0		
Sample Size:			111	121			0		
Means:		9.0			23.3	2.8			
MI-3									
	Wild								
			0	12	21.7	1.7	12	3.0	0.8
		5	4	4	19.2	3.2	4	1.6	0.6
		6	17	17	20.9	1.9	17	2.9	0.9
		7	14	14	21.4	2.0	14	3.0	0.8
		8	13	13	20.8	2.4	13	2.8	1.0
		9	5	5	21.7	1.9	5	3.0	0.9
		11	1	1	21.6		1	2.9	
		13	1	1	33.1		1	12.8	
		14	1	1	26.7		1	4.5	
		16	1	1	30.3		1	9.5	
		17	1	1	25.9		1	4.7	
		18	1	1	28.5		1	7.0	
Sample Size:			59	71			71		
Means:		7.8			21.7	2.9		3.2	1.7

Table 6. Continued.

Unit	Origin	Age	Number Aged	Number Measured	Length (in.) mean	Length (in.) sd	Number Weighed	Weight (lbs) mean	Weight (lbs) sd
MI-4									
	Hatchery								
			0	2	20.3	0.3	2	2.8	0.0
		8	2	2	21.5	3.6	2	3.8	2.2
		9	1	1	19.9		1	2.9	
		10	3	3	21.0	0.5	3	3.2	0.3
		12	1	1	23.1		1	4.1	
		13	1	1	20.9		1	2.9	
Sample Size:			8	10			10		
Means:		10.0			21.0	1.5		3.3	0.9
	Wild								
			0	9	22.9	2.5	9	3.8	1.3
		6	7	7	21.1	0.9	7	3.2	0.3
		7	14	14	21.0	1.1	14	3.2	0.5
		8	16	16	21.5	1.5	16	3.4	0.6
		9	11	11	20.0	1.5	11	2.7	0.7
		10	12	12	20.6	1.7	12	3.0	0.8
		11	6	6	22.2	2.8	6	3.6	1.2
		12	4	4	24.0	2.0	4	3.7	1.7
		13	4	4	22.8	2.7	4	2.6	1.3
		14	1	1	29.3		1	9.5	
		15	1	1	22.9		1	3.6	
		16	1	1	19.6		1	2.5	
		17	1	1	21.9		1	2.4	
		20	1	1	21.6		1	3.2	
Sample Size:			79	88			88		
Means:		9.3			21.5	2.1		3.3	1.1
MI-5									
	Wild								
			0	77	23.6	2.6	77	4.4	2.0
		5	5	5	21.0	0.7	5	3.2	0.4
		6	20	20	22.2	1.8	20	3.6	0.9
		7	24	24	22.5	1.6	24	3.7	0.9
		8	31	31	23.1	1.4	31	4.1	0.8
		9	17	17	23.3	2.8	17	4.2	2.0
		10	15	15	24.1	1.6	15	4.5	1.0
		11	15	15	23.2	2.4	15	4.2	1.3
		12	7	7	23.6	1.9	7	4.3	1.3
		13	5	5	26.6	4.4	5	6.5	3.9
		14	3	3	25.1	1.7	3	5.0	0.9
		15	1	1	25.8		1	6.1	
Sample Size:			143	220			220		
Means:		8.6			23.3	2.3		4.2	1.6

Table 7. Lamprey wounding and scarring rates (marks/100 fish) on lake trout, per Lake Superior Technical Committee protocol, captured in the tribal commercial harvests from management units in the 1842 ceded area within Michigan waters of Lake Superior during 2011.

Unit	Length Category (Inches)	Fish Examined	Type AI, AII, AIII Wounds	Wounds per 100 fish	Scars	Scars per 100 fish
MI-2						
	1: < 17	2	0	0.0	0	0.0
	2: 17-20.9	28	0	0.0	0	0.0
	3: 21-24.9	52	0	0.0	0	0.0
	4: 25-28.9	39	0	0.0	0	0.0
	5: > 29	2	1	50.0	0	0.0
	Total:	123	1	0.8	0	0.0
MI-3						
	1: < 17	1	0	0.0	0	0.0
	2: 17-20.9	33	0	0.0	1	3.0
	3: 21-24.9	31	0	0.0	0	0.0
	4: 25-28.9	4	0	0.0	1	25.0
	5: > 29	2	0	0.0	0	0.0
	Total:	71	0	0.0	2	2.8
MI-4						
	2: 17-20.9	46	0	0.0	0	0.0
	3: 21-24.9	45	0	0.0	0	0.0
	4: 25-28.9	6	0	0.0	0	0.0
	5: > 29	1	0	0.0	0	0.0
	Total:	98	0	0.0	0	0.0
MI-5						
	2: 17-20.9	26	0	0.0	0	0.0
	3: 21-24.9	153	0	0.0	0	0.0
	4: 25-28.9	35	0	0.0	0	0.0
	5: > 29	6	0	0.0	0	0.0
	Total:	220	0	0.0	0	0.0

Table 8. Catch curve mortality and survival rates on lake trout from management units in the 1842 ceded area within Michigan waters of Lake Superior, 1996-2011.

		Wild and Hatchery Lake Trout Combined					Wild Lake Trout				
Management Unit	Year	Ages	Instantaneous total mortality Z	95% confidence limit for Z	Annual total mortality A	Annual Survival S	Ages	Instantaneous total mortality Z	95% confidence limit for Z	Annual total mortality A	Annual Survival S
MI-2	1996			Insufficient data.							
	1997			Insufficient data.							
	1998	9-12	0.33	+/- 0.09	0.28	0.72	9-12	0.30	+/- 0.03	0.26	0.74
	1999	10-13	0.38	+/- 0.17	0.32	0.68	10-13	0.38	+/- 0.17	0.32	0.68
	2000	9-12	0.25	+/- 0.07	0.22	0.78	9-12	0.27	+/- 0.10	0.24	0.76
	2001	9-12	0.41	+/- 0.52	0.34	0.66	9-12	0.36	+/- 0.50	0.30	0.70
	2002	9-11	0.46	+/- 0.03	0.37	0.63	9-11	0.46	+/- 0.03	0.37	0.63
	2003			Insufficient data.							
	2004			Insufficient data.							
	2005	12-15	0.51	+/- 0.15	0.40	0.60	12-15	0.51	+/- 0.15	0.40	0.60
	2006	10-13	0.15	+/- 0.04	0.14	0.86	10-13	0.15	+/- 0.04	0.14	0.86
	2007	10-13	0.61	+/- 0.17	0.46	0.54	10-13	0.61	+/- 0.17	0.46	0.54
	2008	14-16	0.35	+/- 0.20	0.30	0.70	14-16	0.35	+/- 0.20	0.30	0.70
	2009	13-16	0.42	+/- 0.24	0.34	0.66	13-16	0.42	+/- 0.24	0.34	0.66
	2010	10-13	0.38	+/- 0.14	0.32	0.68	10-13	0.38	+/- 0.14	0.32	0.68
	2011	10-13	1.16	+/- 0.12	0.69	0.31	10-13	1.16	+/- 0.12	0.69	0.31
MI-3	1996	8-11	0.33	+/- 0.13	0.28	0.72	8-11	0.45	+/- 0.21	0.36	0.64
	1997	8-11	0.32	+/- 0.11	0.27	0.73	8-11	0.32	+/- 0.10	0.27	0.73
	1998	9-12	0.52	+/- 0.09	0.41	0.59	9-12	0.52	+/- 0.09	0.41	0.59
	1999	9-12	0.19	+/- 0.03	0.17	0.83	9-12	0.18	+/- 0.04	0.60	0.40
	2000			Insufficient data.							
	2001	9-11	0.35	+/- 0.20	0.30	0.70	9-11	0.35	+/- 0.20	0.30	0.70
	2002	9-12	0.22	+/- 0.04	0.20	0.80	9-12	0.21	+/- 0.05	0.19	0.81
	2003	9-11	0.29	+/- 0.10	0.25	0.75	9-11	0.29	+/- 0.17	0.25	0.75
	2004	10-13	0.68	+/- 0.09	0.49	0.51	10-13	0.67	+/- 0.10	0.49	0.51
	2005	10-13	0.70	+/- 0.07	0.50	0.50	10-13	0.70	+/- 0.07	0.50	0.50
	2006	10-13	0.89	+/- 0.11	0.59	0.41	10-13	1.05	+/- 0.12	0.65	0.35
	2007	10-13	0.41	+/- 0.10	0.34	0.66	10-13	0.40	+/- 0.09	0.33	0.67
	2008	11-14	0.49	+/- 0.12	0.39	0.61	11-14	0.49	+/- 0.12	0.39	0.61
	2009	13-16	0.65	+/- 0.15	0.48	0.52	13-16	0.65	+/- 0.15	0.48	0.52
	2010	13-16	0.48	+/- 0.28	0.38	0.62	13-16	0.48	+/- 0.28	0.38	0.62
	2011	8-11	0.93	+/- 0.22	0.61	0.39	8-11	0.93	+/- 0.22	0.61	0.39

Table 8. Continued.

Management Unit	Year	Wild and Hatchery Lake Trout Combined					Wild Lake Trout				
		Ages	Instantaneous total mortality Z	95% confidence limit for Z	Annual total mortality A	Annual Survival S	Ages	Instantaneous total mortality Z	95% confidence limit for Z	Annual total mortality A	Annual Survival S
MI-4	1996	8-11	0.36	+/- 0.13	0.30	0.70	8-11	0.74	+/- 0.06	0.52	0.48
	1997	8-11	0.33	+/- 0.11	0.28	0.72	8-11	0.44	+/- 0.12	0.36	0.64
	1998	8-11	0.32	+/- 0.12	0.27	0.73	8-11	0.24	+/- 0.17	0.21	0.79
	1999	9-12	0.16	+/- 0.02	0.15	0.85	9-12	0.23	+/- 0.07	0.21	0.79
	2000	9-12	0.39	+/- 0.19	0.32	0.68	9-12	0.39	+/- 0.19	0.32	0.68
	2001	9-12	0.58	+/- 0.06	0.44	0.56	9-12	0.54	+/- 0.11	0.42	0.58
	2002	9-12	0.39	+/- 0.03	0.32	0.68	9-12	0.38	+/- 0.06	0.32	0.68
	2003	11-13	0.69	+/- 0.27	0.50	0.50	14-16	0.66	+/- 0.38	0.48	0.52
	2004	11-14	0.27	+/- 0.07	0.24	0.76	11-14	0.26	+/- 0.02	0.23	0.77
	2005	11-14	0.45	+/- 0.11	0.36	0.64	11-14	0.48	+/- 0.12	0.38	0.62
	2006	10-13	0.50	+/- 0.19	0.39	0.61	9-15	0.49	+/- 0.15	0.39	0.61
	2007	14-16	0.35	+/- 0.20	0.30	0.70	14-16	0.35	+/- 0.20	0.30	0.70
	2008	14-16	0.35	+/- 0.20	0.30	0.70	14-16	0.35	+/- 0.20	0.30	0.70
	2009	10-13	0.28	+/- 0.10	0.24	0.76	10-13	0.16	+/- 0.06	0.15	0.85
	2010			Insufficient data.							
	2011	10-13	0.35	+/- 0.15	0.30	0.70	10-13	0.37	+/- 0.11	0.31	0.69
MI-5	1996	10-13	0.38	+/- 0.08	0.32	0.68	10-13	0.33	+/- 0.09	0.28	0.72
	1997	10-13	0.47	+/- 0.17	0.36	0.64	10-13	0.21	+/- 0.12	0.19	0.81
	1998	10-13	0.43	+/- 0.17	0.35	0.65	10-13	0.20	+/- 0.21	0.18	0.82
	1999										
	2000	10-12	0.35	+/- 0.15	0.30	0.70	10-12	0.35	+/- 0.15	0.30	0.70
	2001	11-14	0.41	+/- 0.30	0.34	0.66	11-14	0.44	+/- 0.28	0.36	0.64
	2002			Insufficient data.							
	2003	12-14	0.47	+/- 0.13	0.38	0.62	12-14	0.47	+/- 0.09	0.38	0.62
	2004	10-13	0.61	+/- 0.12	0.46	0.54	10-13	0.54	+/- 0.23	0.42	0.58
	2005	10-13	0.54	+/- 0.13	0.42	0.58	10-13	0.54	+/- 0.13	0.42	0.58
	2006	10-13	0.69	+/- 0.17	0.50	0.50	10-13	0.69	+/- 0.17	0.50	0.50
	2007	9-12	0.36	+/- 0.09	0.30	0.70	9-12	0.48	+/- 0.12	0.38	0.62
	2008	12-15	0.62	+/- 0.06	0.46	0.54	12-15	0.62	+/- 0.06	0.46	0.54
	2009	10-12	0.46	+/- 0.27	0.37	0.63	10-12	0.46	+/- 0.27	0.37	0.63
	2010			Insufficient data.							
	2011	10-13	0.41	+/- 0.10	0.34	0.66	10-13	0.41	+/- 0.10	0.34	0.66

Table 9. Age and size composition of whitefish in tribal commercial harvests from management units in the 1842 ceded area within Michigan waters of Lake Superior during 2011. Weight is in round pounds, length is in inches, and sd=standard deviation.

		Number	Number	Length (in.)		Number	Weight (lbs)	
Unit	Age	Aged	Measured	mean	sd	Weighed	mean	sd
MI-3								
		0	132	20.2	1.4	50	2.3	0.6
	5	1	1	21.2		1	2.6	
	6	3	3	19.8	0.5	3	2.2	0.1
	7	6	6	18.8	0.9	6	2.1	0.3
	8	7	7	19.3	1.4	7	2.4	0.7
	9	21	21	19.5	0.8	21	2.2	0.3
	10	32	32	19.4	0.8	32	2.2	0.3
	11	30	30	19.7	1.2	30	2.4	0.6
	12	32	32	19.6	1.1	32	2.3	0.5
	13	35	35	20.3	1.7	35	2.5	0.5
	14	20	20	19.8	0.8	20	2.4	0.3
	15	29	29	20.5	1.2	29	2.6	0.5
	16	6	6	20.4	1.3	6	2.6	0.3
	17	4	4	21.2	1.1	4	3.0	0.6
	18	5	5	21.0	1.0	5	2.7	0.3
	19	1	1	20.5		1	2.2	
	20	3	3	20.6	1.3	3	2.5	0.5
Sample Size:		235	367			285		
Means:	12.1			20.0	1.3		2.4	0.5
MI-4								
		0	1	21.1		1	3.0	
	4	1	1	20.9		1	3.1	
	6	5	5	19.7	0.5	5	2.6	0.2
	7	22	22	20.8	1.3	22	2.9	0.4
	8	14	14	21.7	2.0	14	3.1	0.5
	9	14	14	20.9	1.3	14	3.0	0.5
	10	7	7	21.1	2.4	7	3.1	1.3
	11	3	3	21.7	1.6	3	3.5	1.1
	12	2	2	18.9	4.0	2	2.1	1.6
	14	2	2	20.7	0.3	2	2.8	0.1
	15	1	1	22.3		1	3.5	
Sample Size:		71	72			72		
Means:	8.4			21.0	1.7		3.0	0.6

Table 9. Continued.

Unit	Age	Number Aged	Number Measured	Length (in.) mean	Length (in.) sd	Number Weighed	Weight (lbs) mean	Weight (lbs) sd
MI-5								
		0	48	22.6	1.9	48	4.1	1.3
	5	4	4	19.7	0.6	4	2.4	0.2
	6	14	14	20.9	1.0	14	3.0	0.6
	7	19	19	20.8	2.4	19	3.2	0.7
	8	18	18	21.8	1.4	18	3.5	0.7
	9	15	15	22.6	1.8	15	4.0	1.1
	10	15	15	22.7	1.6	15	4.2	1.1
	11	6	6	23.4	1.6	6	4.3	0.8
	12	7	7	23.2	1.5	7	4.4	1.0
	13	4	4	24.4	1.3	4	5.2	1.0
	15	1	1	25.9		1	5.5	
	18	1	1	21.5		1	3.1	
Sample Size:		104	152			152		
Means:	8.7			22.2	2.0		3.8	1.1

Table 10. Age and size composition of other species sampled from tribal commercial harvests in management units of the 1842 ceded area within Michigan waters of Lake Superior during 2011. Weight is in round pounds, length is in inches, and sd=standard deviation.

			Number	Number	Length (in.)		Number	Weight (lbs)	
Species	Unit	Age	Aged	Measured	mean	sd	Weighed	mean	sd
Cisco									
	MI-4								
			0	5	14.9	1.0	5	1.0	0.2
		5	2	2	15.6	0.6	2	1.0	0.0
		6	8	8	14.6	1.0	8	0.9	0.4
		7	20	20	14.4	1.7	20	1.2	0.7
		8	26	26	15.1	0.8	26	1.1	0.2
		9	21	21	15.0	1.0	21	1.1	0.2
		10	14	14	14.9	1.0	14	1.0	0.3
		11	10	10	15.2	1.0	10	1.1	0.3
		12	10	10	15.1	0.8	10	1.0	0.1
		13	7	7	14.9	1.2	7	0.9	0.2
		14	5	5	15.6	0.8	5	1.0	0.2
		18	2	2	15.2	0.6	2	0.8	0.1
		20	1	1	14.4		1	0.8	
		23	1	1	14.3		1	0.8	
Sample Size:			127	132			132		
Means:		9.5			14.9	1.1		1.1	0.3
	MI-5								
		6	4	4	18.5	0.3	4	2.1	0.1
		7	5	5	17.9	0.4	5	2.0	0.2
		8	7	7	18.4	0.3	7	2.0	0.2
		9	4	4	18.4	1.1	4	1.9	0.2
		10	1	1	18.6		1	2.1	
		11	1	1	19.3		1	2.1	
		12	2	2	18.1	0.8	2	2.1	0.2
		14	1	1	19.2		1	2.9	
		15	1	1	18.5		1	2.2	
		20	1	1	20.9		1	2.8	
		22	1	1	17.1		1	1.4	
Sample Size:			28	28			28		
Means:		9.5			18.4	0.8		2.1	0.3

Table 10. Continued.

Species	Unit	Age	Number Aged	Number Measured	Length (in.) mean	sd	Number Weighed	Weight (lbs) mean	sd
Siscowet									
	MI-4								
			0	2	17.3	1.4	2	1.3	0.3
		8	2	2	21.1	2.1	2	2.6	0.8
		10	1	1	18.2		1	1.9	
		11	1	1	17.9		1	1.7	
		12	3	3	18.7	1.3	3	2.0	0.7
		13	2	2	21.6	3.4	2	3.3	1.4
		14	1	1	20.7		1	2.4	
		15	4	4	22.3	5.2	4	4.3	3.3
		16	1	1	17.5		1	1.5	
		17	1	1	19.4		1	2.5	
		18	1	1	21.3		1	3.5	
		20	2	2	26.3	0.8	2	5.5	0.8
		21	1	1	20.7		1	3.0	
		22	2	2	23.2	0.8	2	4.2	0.1
Sample Size:			22	24			24		
Means:		15.0			20.8	3.3		3.1	1.8
	MI-5								
			0	1	21.7		1	3.0	
		9	1	1	18.5		1	2.2	
		12	1	1	20.5		1	2.5	
		13	2	2	21.6	0.3	2	3.3	0.0
		15	1	1	22.7		1	3.6	
		23	1	1	23.2		1	4.1	
Sample Size:			6	7			7		
Means:		14.2			21.4	1.6		3.1	0.7