



**Biological and Commercial Catch Statistics  
from the Chippewa Inter-Tribal Gill Net Fishery  
within Michigan Waters of Lake Superior  
During 2009**

by  
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## ABSTRACT

The 2009 commercial inter-tribal fishery in the 1842 treaty-ceded waters of Michigan consisted of 7 large boats and 15 small boats, representing 22 tribal licensees from the Keweenaw Bay, Bad River and Red Cliff Bands of Lake Superior Chippewa. Gill nets were the primary 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 < 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 lake herring fishery through a quota system.

Fishermen reported fishing 4.7 million feet of gill net and harvesting 979,850 round pounds of fish. Whitefish was the primary target species, making up 87.4% of the total, followed by lake trout (10.8%), with the remaining 1.8% consisting of siscowet, lake herring (cisco), salmon, and walleye.

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## 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 manages their 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 2009 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 commercial fishery consisted of seven large boats and 15 small boats, representing 22 tribal licenses from the Keweenaw Bay, Bad River, and Red Cliff Bands. 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 primary gear used in the fishery during 2009.

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 lake herring harvest by its fishermen. The Bad River and Red Cliff tribes did not use this system for lake herring. Also, the three bands allowed fishing for lake herring 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. A tribal fishing year began in November and ran through October of the next year. 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 <sup>1</sup>	Nov. 1990- Oct. 1994 <sup>2</sup>	Nov. 1994- Oct. 1999 <sup>3</sup>	Nov. 1999- Oct. 2005 <sup>4,5</sup>	Nov. 2006- Oct. 2009 <sup>6</sup>
MI-2	TAC	19,800	10,400	9,700	6,606	6,606
	Tribal	9,900	5,200	4,850	3,303	3,303
MI-3	TAC	5,000	7,600	6,600	4,950	4,950
	Tribal	2,500	3,800	3,300	2,475	2,475
MI-4	TAC	20,600	53,400	46,920	40,440	43,200
	Tribal	10,300	26,700	23,460	20,220	21,600
MI-5	TAC	16,100	15,700	17,080	33,130	33,130
	Tribal	4,830	4,710	5,124	16,565	16,565
Total	TAC	61,500	87,100	80,300	85,126	87,886
	Tribal	27,530	40,410	36,734	42,563	43,943

<sup>1</sup>GLIFWC. 1987.

<sup>4</sup>Mattes. 2000.

<sup>2</sup>Ebener et al. 1989.

<sup>5</sup>Mattes. 2004.

<sup>3</sup>Mattes. 1994.

<sup>6</sup>Mattes. 2006.

## 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:

<b>Species</b>	<b>Conversion</b>
Whitefish	1.17
Lake trout	1.25
Siscowet	1.25
Salmon and Trout	1.25
Herring	1.20

Harvest of other species (walleye, burbot, 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 4.7 million feet of gill net and harvesting 979,850 round pounds of fish. Whitefish was the primary target species, making up 87.4% of the total, followed by lake trout (10.8%), with the remaining 1.8% consisting of siscowet, lake herring (cisco), salmon, and walleye.

#### Unit MI-2

Harvest. Fourteen percent of the overall harvest was taken in MI-2 (Table 1). Of the 134,953 round pounds harvested in MI-2, 97.8% were whitefish, 1.7% lake trout, and 0.5% siscowet (Table 2). Lake trout harvest was highest in grid 1413 (1,003 dressed pounds), with less than 1,000 dressed pounds taken in each of the remaining four statistical grids fished (Figure 2). Whitefish harvest was greatest in grid 1413 (55,800 dressed pounds), followed by grids 1316 and 1315 (46,094 and 9,573 dressed pounds respectively). Less than 1,000 pounds were taken in each of the other two grids fished (Figure 3).

Effort. Ten 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 475,900 feet with 57.9% (275,400 feet) occurring in grid 1413 and over 100,000 feet fished in grid 1316 (Figure 4). Gill-nets of 4 ½ inch mesh accounted for all of the unit's effort (Table 2 and Figure 5).

Target Effort and Harvest. All fishing effort was targeted at whitefish and lake trout (Tables 4 and 5). Target effort (0.48 million feet) and harvest of whitefish (112,789 dressed pounds) was greater than the 1985-2009 average (372,562 feet and 69,193 dressed pounds, respectively). Target lake trout harvest (1,830 dressed pounds) was below the 1985-2009 average of 7,138 dressed pounds.

Catch Per Effort (CPE). Whitefish CPE (pounds harvested per 1,000 feet of gill-net) for targeted fishing in the five grids fished in MI-2 ranged from 55-681 pounds (Table 4). Whitefish CPE for the five grids combined was 237, above the average CPE of 186 for this unit for the 25 year period 1985-2009 (Table 5). Lake trout CPE for targeted fishing ranged from 0-5 per grid and was 4 for all grids combined, well below the 1985-2009 average CPE of 19 pounds.

#### Unit MI-3

Harvest. Fifty-nine percent of the overall harvest was taken in MI-3 (Table 1). Of the 580,107 round pounds harvested in MI-3, 95.8% were whitefish, 3.3% lake trout, and 0.8% siscowet (Table 2). Harvest occurred in eight statistical grids, where lake trout harvest was highest in grid 1121 (7,847 dressed pounds) and less than 2,500 dressed pounds in the remaining seven grids fished (Figure 2). Whitefish harvest was greatest in grids 1121, 1023, and 1219

(186,810, 115,449, and 76,579 dressed pounds, respectively) followed by grids 1220 and 1122 (28,427 and 10,761 dressed pounds, respectively) with less than 10,000 dressed pounds taken in each of the remaining statistical grids fished (Figure 3).

Effort. Forty-four percent of the overall gill-net effort occurred in MI-3 (Table 1) which was fished by three tribes (Table 3). Fishing effort in MI-3 was 2,073,300 feet with 45.8% (950,500 feet) occurring in grid 1121, followed by 16.8% (349,000 feet) in grid 1219 and 15.3% (316,500 feet) in grid 1023 (Figure 4). Gill-nets of 4 ½ inch mesh accounted for 99.6% of the unit's effort (Table 2 and Figure 5).

Target Effort and Harvest. All fishing effort in MI-3 was targeted at whitefish and lake trout (Table 4). Target gill-net effort (2.07 million feet) was near the 1985-2009 average of 1.84 million feet (Table 5). Target harvest of whitefish (475,227 dressed pounds) was above the 1985-2009 average (184,164 dressed pounds). Target harvest of lake trout (15,392 dressed pounds) was below the 1985-2009 average (18,345 dressed pounds).

Catch Per Effort (CPE). Whitefish CPE (pounds harvested per 1,000 feet of gill-net) for targeted fishing in the eight grids fished ranged from 136-365 pounds (Table 4). Whitefish CPE for the eight grids combined was 229 pounds and above the average CPE of 100 for this unit for the 25 year period 1985-2009 (Table 5). Lake trout CPE for targeted fishing ranged from 3-37 pounds and was 7 for all grids combined, below the 1985-2009 average CPE of 10 pounds.

#### Unit MI-4

Harvest. Twenty-two percent of the overall harvest was taken in MI-4 (Table 1). Of the 212,871 round pounds harvested, 67.4% were whitefish, 27.3% lake trout, 2.8% herring, 1.9% siscowet, 0.4% salmon, 0.1% burbot, and 0.1% a mix of walleye and rainbow trout (Table 2). Harvest occurred in ten statistical grids. Lake trout harvest was highest in grid 1224 (15,256 dressed pounds) followed by grids 1223 and 1423 (9,338 and 8,051 dressed pounds, respectively) (Figure 2). Less than 5,000 dressed pounds were harvested in each of the other seven grids fished. Whitefish harvest was greatest in grid 1224 (38,955 dressed pounds) followed by grids 1125 and 1423 (19,265 and 16,024 dressed pounds, respectively) and was less than 15,000 pounds in each of the other seven other grids fished (Figure 3).

Effort. Thirty-four 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 1,590,700 feet with 23.4% (373,000 feet) occurring in grid 1224 (Table 2), followed by 22.4% (356,000 feet) in grid 1125. More than 100,000 feet were fished in three grids (1223, 1323, and 1423) with less than 100,000 feet being fished in each of the remaining five grids (Figure 4). Gill-nets of 4 ½ inch mesh accounted for 89.9% of the unit's effort (Table 2 and Figure 5). Hook and line was also used to harvest lake trout for commercial sale in 2009.

Target Effort and Harvest. The majority of fishing effort (1,553,550 feet) was targeted at whitefish and lake trout with 37,150 feet directed at lake herring (Table 4). Target effort for whitefish and lake trout (1.6 million feet) was lower than the 1985-2009 average of 3.1 million feet (Table 5). Target harvest of whitefish (122,643 dressed pounds) was below the 1985-2009 average (188,804 dressed pounds). Target harvest of lake trout (46,568 dressed pounds) was also below the 1985-2009 average (69,265 dressed pounds).

Catch Per Effort (CPE). Whitefish CPE (pounds harvested per 1,000 feet of gill-net) for targeted fishing in the ten grids fished ranged from 13-193 pounds (Table 4). Whitefish CPE for the ten grids combined was 79 pounds and above the average CPE of 61 for this unit for the 25 year period 1985-2009 (Table 5). Lake trout CPE for targeted fishing ranged from 9-51 pounds and was 30 for all grids combined, above the 1985-2009 average CPE of 22 pounds.

### Unit MI-5

Harvest. Five percent of the overall harvest was taken in MI-5 (Table 1). Of the 51,920 round pounds harvested in MI-5, 47.6% were whitefish, 50.7% lake trout, 0.2% salmon, 1.4% herring, and 0.1% brown trout, rainbow trout, northern pike, walleye and burbot (Table 2). Harvest occurred in five statistical grids. Lake trout harvest was greatest in grid 1428 (7,694 dressed pounds) and was less than 5,000 dressed pounds in each of the other four grids fished (Figure 2). Whitefish harvest was greatest in grid 1428 (7,891 dressed pounds) and was less than 5,000 dressed pounds in each of the other four grids fished (Figure 3).

Effort. Twelve percent of the overall gill-net effort occurred in MI-5 (Table 1) which was fished by two tribes (Table 3). Fishing effort in MI-5 was 556,622 feet with 42.4% (236,000 feet) occurring in grid 1529 and 40.1% (223,422 feet) in grid 1428 (Table 2). Less than 50,000 feet were fished in each of the remaining grids (Figure 4). Gill-nets of 4 ½ inch mesh accounted for 99.3% of the unit's effort (Table 2 and Figure 5).

Target Effort and Harvest. The majority of fishing effort (551,722 feet) was targeted at whitefish and lake trout with 4,900 feet directed at lake herring (Table 4). Target effort for whitefish and lake trout (0.6 million feet) was higher than the 1985-2009 average of 0.4 million feet (Table 5). Target harvest of whitefish (21,070 dressed pounds) was below the 1986-2009 average (27,203 dressed pounds). Target harvest of lake trout (21,042 dressed pounds) was above the 1986-2009 average (20,329 dressed pounds).

Catch Per Effort (CPE). Whitefish CPE (pounds harvested per 1,000 feet of gill-net) for targeted fishing in the five grids fished ranged from 18-197 pounds (Table 4). Whitefish CPE for the five grids combined was 38 pounds and below the average CPE of 64 for this unit for the 24 year period 1986-2009 (Table 5). Lake trout CPE for targeted fishing ranged from 17-114 pounds and was 38 for all grids combined, below the 1986-2009 average CPE of 48 pounds.

## Biological Statistics

### Lake Trout

MI-2. Twelve year classes of wild trout (6-16, 20) were represented in a sample of 38 lake trout aged from MI-2 (Table 6). Mean age of wild fish was 10.4 years with fish ten years and older representing 53% of the catch. For the 43 wild fish sampled, mean length was 25.1 inches and mean weight was 5.4 round pounds. Average length at age of 7-9 year old wild lake trout has increased slightly since 2005, while average length of age 10 wild fish has fluctuated due to low sample sizes in some years (Figure 6). Lamprey marking rates were 0.0 wounds/100 fish (Table 7). Annual total mortality was estimated to be 21% ( $Z=0.25 \pm 0.04$ ) for wild fish ages 8-16 (Table 8).

MI-3. One hatchery fish (age 9) and fifteen year classes of wild trout (5-18, 25) were represented in a sample of 66 lake trout aged from MI-3 (Table 9). Mean age of wild fish was 10.6 years. Fish ten years and older made up 62% of the wild component of the catch. For the 72 wild fish sampled, mean length was 23.9 inches and mean weight was 4.2 round pounds. Average length at age of 7-10 year old wild lake trout decreased since 1985, but has increased slightly since 2005 (Figure 6). Overall lamprey-marking rates were 2.7 wounds/100 fish (Table 7). Annual total mortality rate was estimated at 30% ( $Z=0.35, \pm 0.05$ ) for wild fish ages 10-18 (Table 8).

MI-4. Six age groups of hatchery fish (age 6-11) and ten year classes of wild trout (5-14) were represented in a sample of 63 lake trout aged from MI-4 (Table 10). Mean age of wild fish was 8.1 and fish ten years and older made up 21% of the catch. For the 66 wild fish sampled, mean length was 22.8 inches and mean weight was 3.3 round pounds (Table 10). Average length of wild fish at ages 7-10 has generally decreased since 1985, but has been increasing slightly since 2005 (Figure 6). Lamprey marking rates were 5.1 wounds/100 fish. Annual total mortality for fish ages 7-11 was estimated to be 24% ( $Z=0.27 \pm 0.07$ ) for wild fish ages 6-14 (Table 8).

MI-5. Ten year classes of wild trout (5-14) were represented in a sample of 49 lake trout aged from MI-5 (Table 11). Mean age of wild fish was 8.3 years with fish ten years and older representing 31% of the catch. For the 55 fish sampled, mean length was 23.0 inches and mean weight was 3.3 round pounds. Average length of wild fish at ages 7-10 has continued to decline since 1987 (Figure 6). Lamprey marking rates were 0.0 wounds/100 fish (Table 7). Annual total mortality was estimated to be 23% ( $Z=0.26 \pm 0.15$ ) for wild fish ages 6-8 (Table 8).

### Whitefish

MI-2. Thirteen age groups (7-19) were represented in the 144 whitefish aged in MI-2 which had a mean age of 11.5 years (Table 12). Mean length of the 313 fish measured was 19.9 inches and mean weight of the 178 fish weighed was 2.7 round pounds. The average length of age 7 to

10 year old fish has generally been similar since 2004 (Figure 7). Annual total mortality was estimated at 30% ( $Z=0.36 \pm 0.04$ ) for ages 10-19.

MI-3. Sixteen age groups (5, 7-20, 22) were represented in the 436 whitefish aged in MI-3, which had a mean age of 12.1 years (Table 12). Mean length of 844 lake whitefish measured was 20.1 inches and weight for 476 lake 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 37% ( $Z=0.46 \pm 0.08$ ) for ages 10-19.

MI-4. Eleven age groups (6-14, 16-17) were represented in the 27 whitefish aged in MI-4, which had a mean age of 10.9 years (Table 12). Mean length of 31 lake whitefish measured was 20.8 inches and weight for 31 lake whitefish weighed averaged 2.5 round pounds. The average length of age 7 to 10 year old fish has increased slightly since 2003 (Figure 7). Annual total mortality was estimated at 37% ( $Z=0.46 \pm 0.03$ ) for ages 10-17.

MI-5. Eleven age groups (7-16, 18) were represented in the 39 whitefish aged in MI-5 (Table 12), where mean age was 11.1 years. Mean length for the 53 lake whitefish measured was 20.9 inches, and weight for the 40 lake whitefish weighed averaged 3.0 round pounds. The average length of age 7 to 10 year old fish has decreased slightly since 2000 (Figure 7). Annual total mortality was estimated at 33% ( $Z=0.40 \pm 0.03$ ) for ages 10-15.

#### Siscowet and Cisco

There were four age groups of siscowet for the eight fish sampled in units MI-3, MI-4, and MI-5 (Table 13) which had a mean age of 11.8 years. Mean length and weight for 13 fish sampled was 20.3 inches and 2.1 round pounds, respectively. Annual total mortality could not be estimated due to low sample size.

Cisco were sampled from two management units in 2009. From unit MI-3, three cisco were aged with a mean age of 7.7 and 5 were sampled for length (mean 14.6 inches) and weight (mean 1.0 round pounds). From unit MI-4, 63 cisco were aged with a mean age of 9.7 and 66 were sampled for length (mean 16.5 inches) and weight (mean 1.1 round pounds). Annual total mortality was estimated at 42% ( $Z=0.54 \pm 0.14$ ) for ages 14-17 (Table 14).

## REFERENCES CITED

- Ebener, M.P., J. Selgeby, M. Gallinat, and M. Donofrio. 1989. Methods for determining total allowable catch of lake trout in the 1842 treaty-ceded area within Michigan waters of Lake Superior, 1990-1995. Great Lakes Indian Fish and Wildlife Commission, Biological Services Division Administrative Report 89-11. Odanah, Wisconsin.
- GLIFWC. 1987. Calculation of lake trout total allowable catches for Michigan waters of Lake Superior. Intra-agency report dated January 16, 1987.
- Mattes W.P. 1994. Memorandum to Great Lakes Indian Fish and Wildlife Commission Lake Committee Biologists dated November 30, 1994.
- Mattes W.P. 2000. Memorandum to Great Lakes Indian Fish and Wildlife Commission Lake Committee Members and Biologists dated March 29, 2000.
- Mattes W.P. 2004. Memorandum to Great Lakes Indian Fish and Wildlife Commission Lake Committee Members and Biologists dated June 24, 2004.
- Mattes W.P. 2006. Memorandum to Great Lakes Indian Fish and Wildlife Commission Lake Committee Members and Biologists dated September 18, 2006.



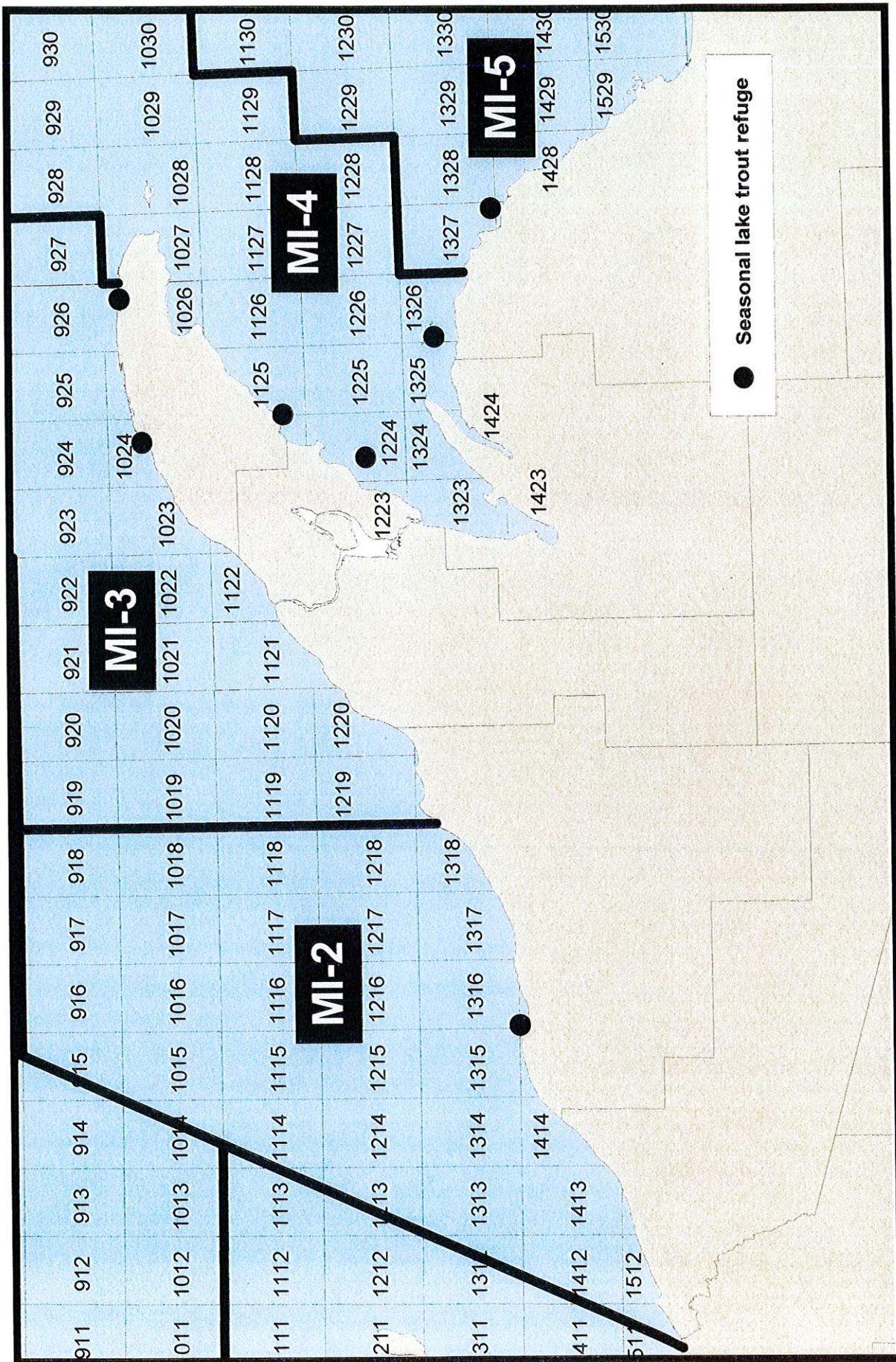


Figure 1. Management units and statistical grids in the 1842 treaty ceded area within Michigan waters of Lake Superior.

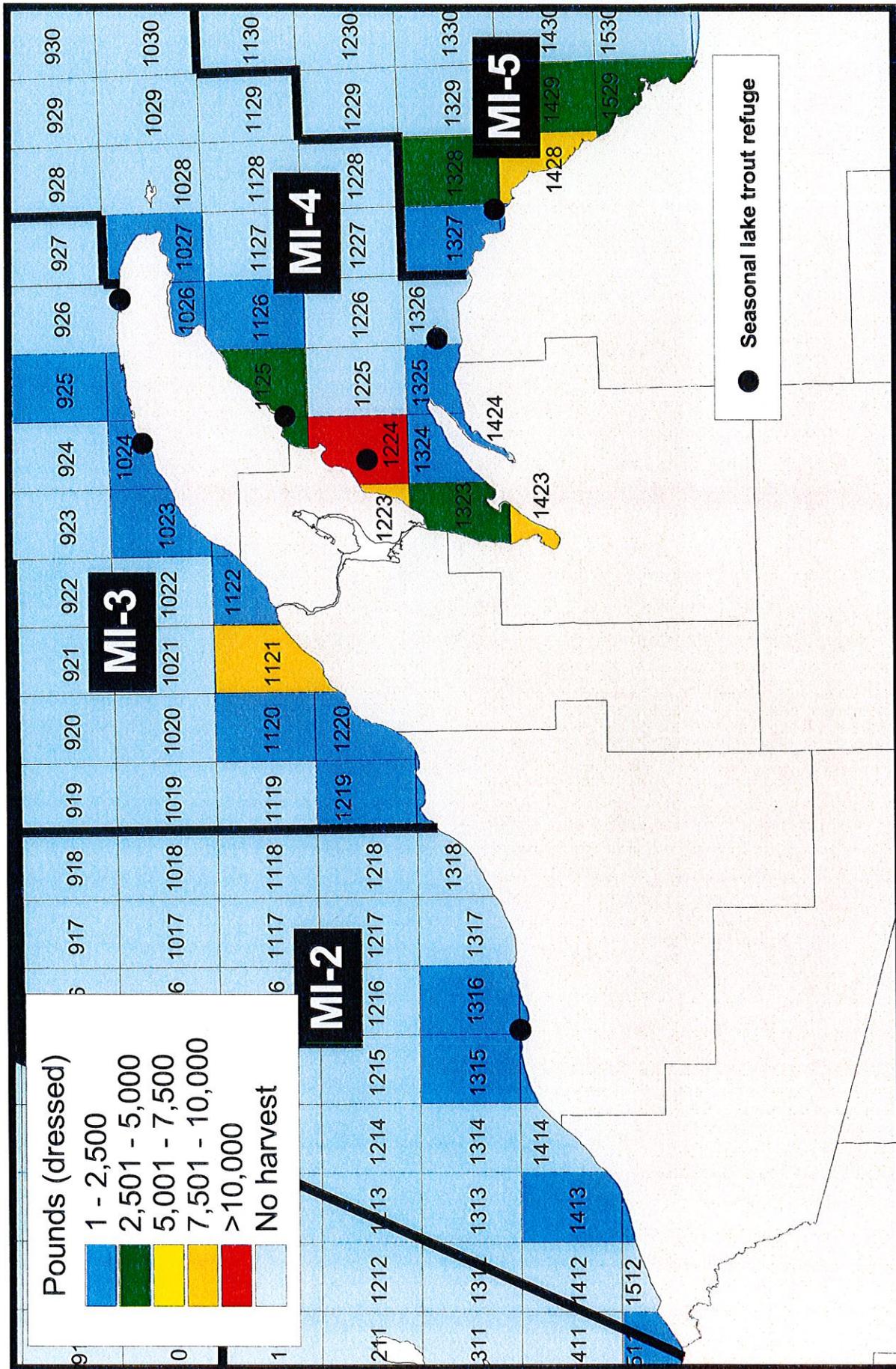


Figure 2. Lake trout harvest (dressed pounds) by statistical grid in the 1842 treaty ceded area within Michigan waters of Lake Superior during 2009.

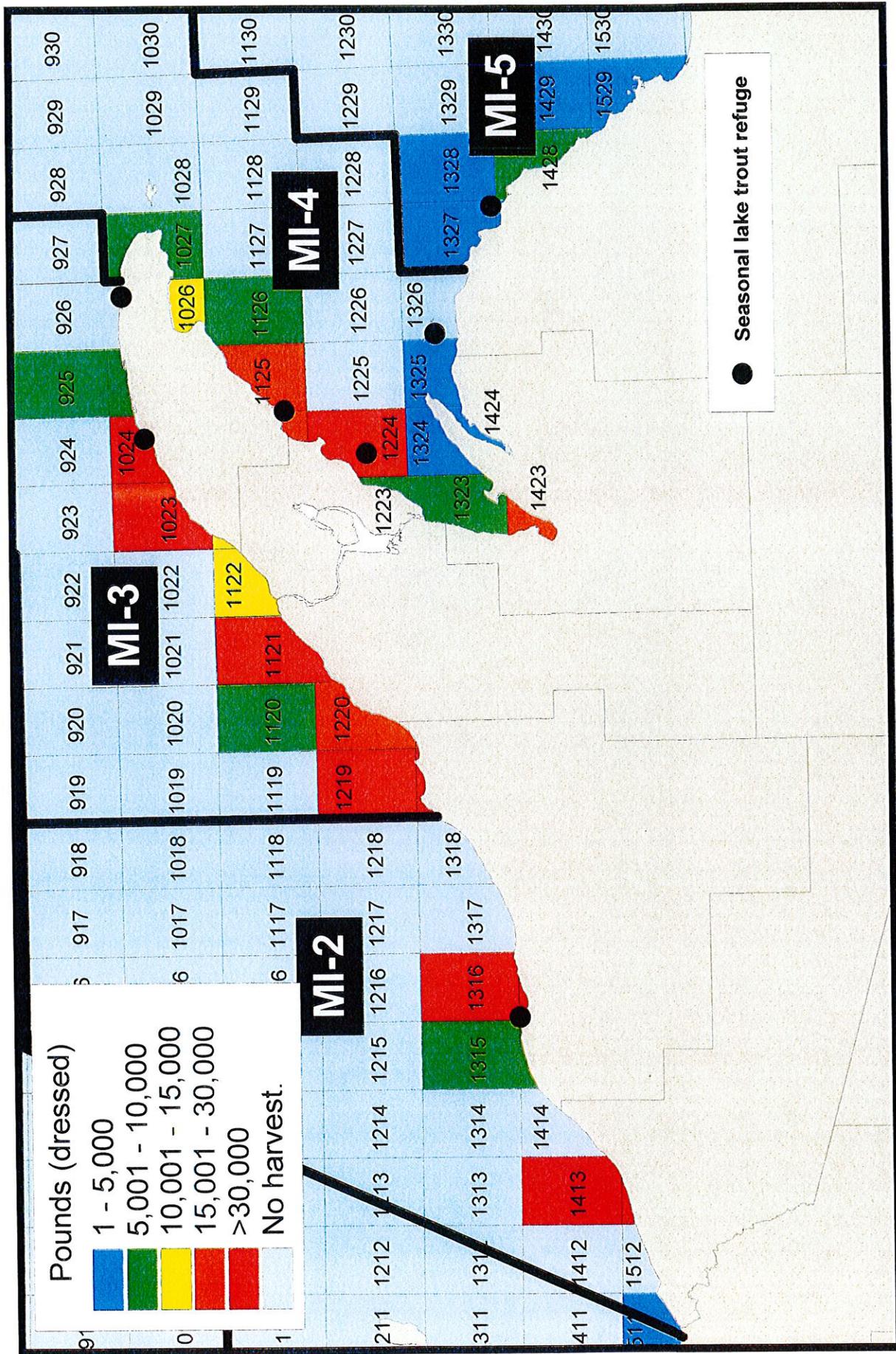


Figure 3. Whitefish harvest (dressed pounds) by statistical grid in the 1842 treaty ceded area within Michigan waters of Lake Superior during 2009.

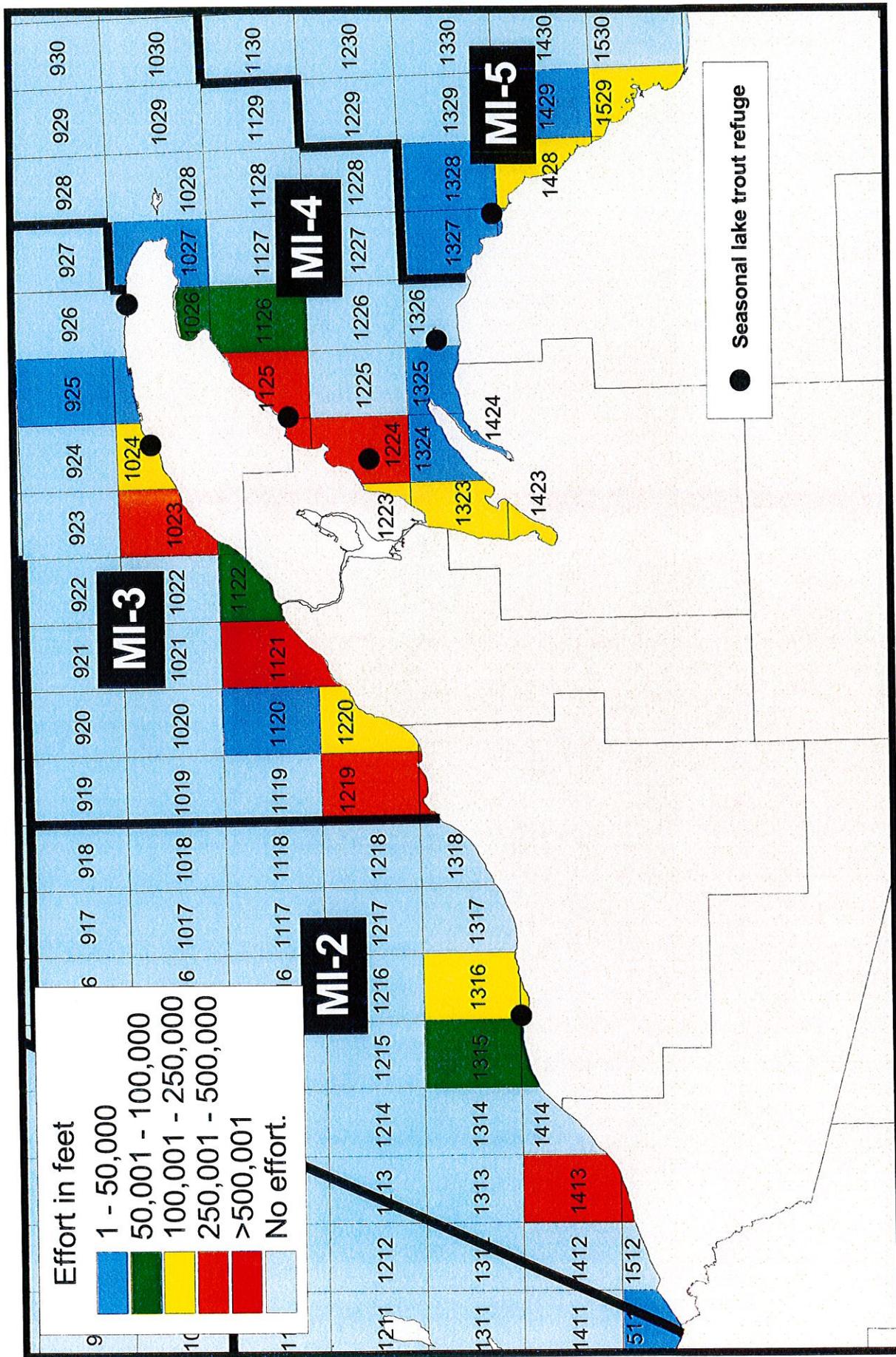


Figure 4. Effort in feet by statistical grid in the 1842 treaty ceded area within Michigan waters of Lake Superior during 2009.

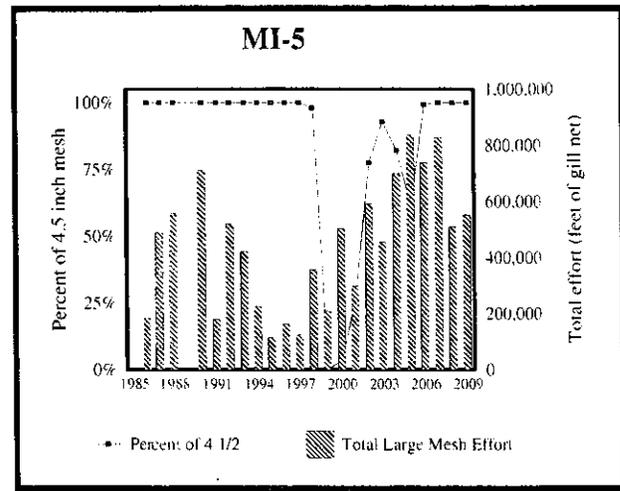
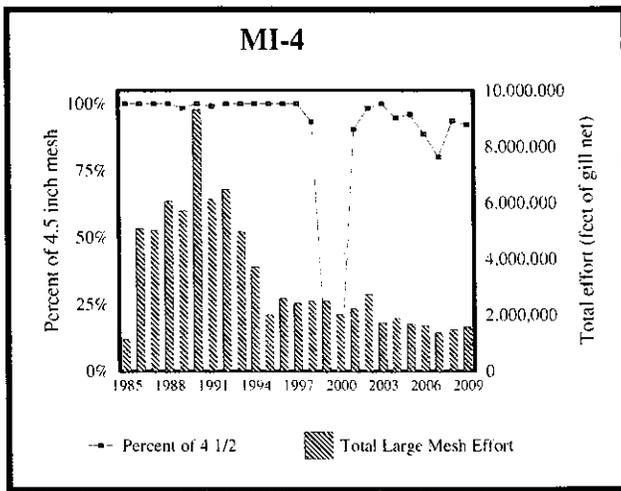
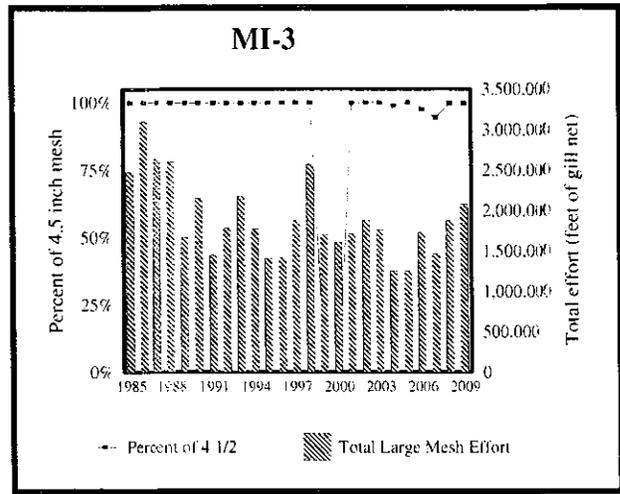
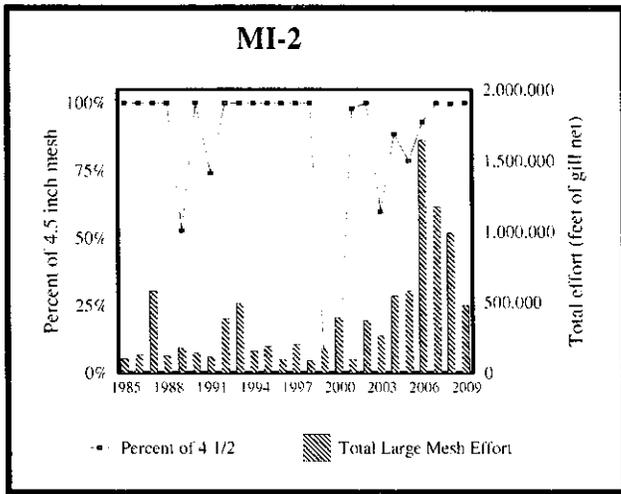
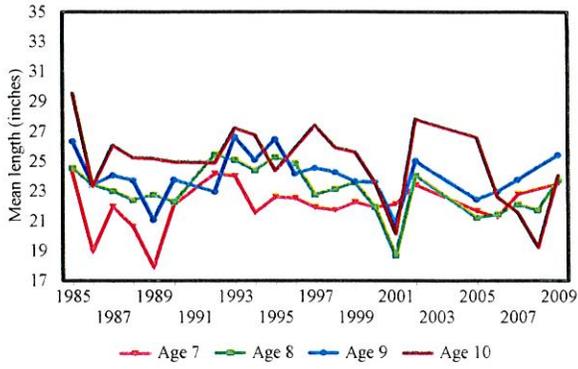
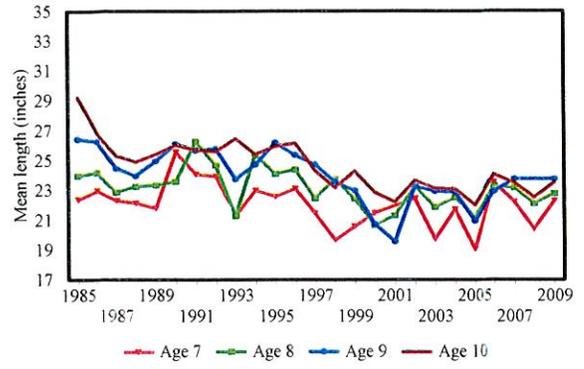


Figure 5. Total tribal large mesh gill net effort and percent composed of 4 1/2 inch mesh by management unit, 1985 to 2009.

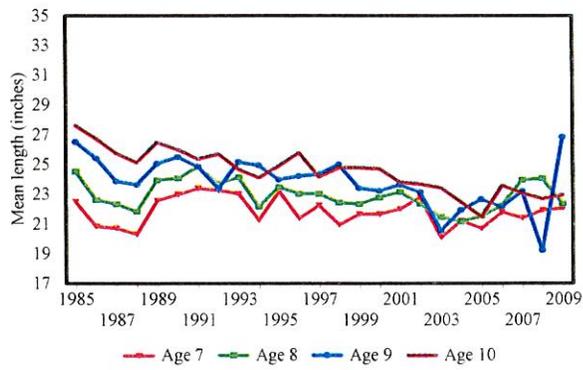
**Wild Lake Trout MI-2**



**Wild Lake Trout MI-3**



**Wild Lake Trout MI-4**



**Wild Lake Trout MI-5**

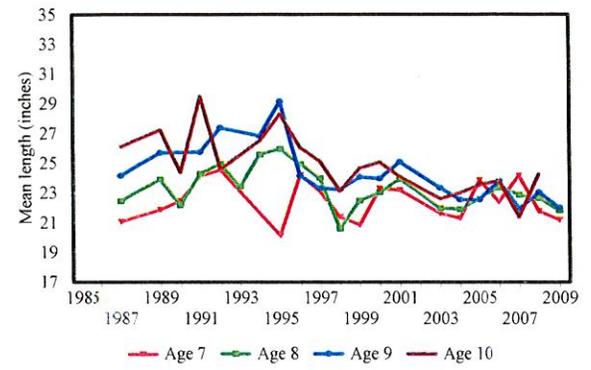
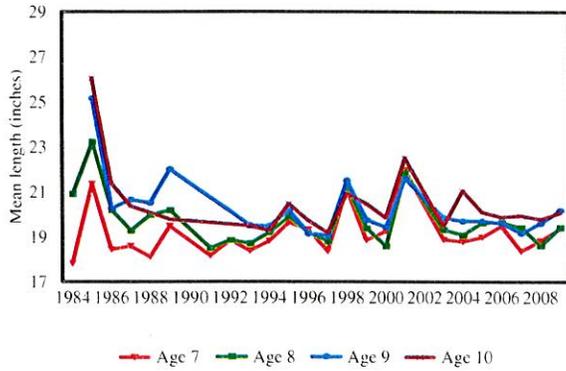
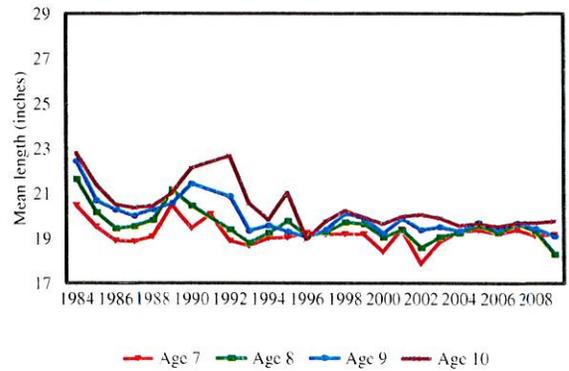


Figure 6. Trends in average length (inches) of wild lake trout (ages 7-10) in Michigan management units within the 1842 treaty ceded area, from 1985-2009.

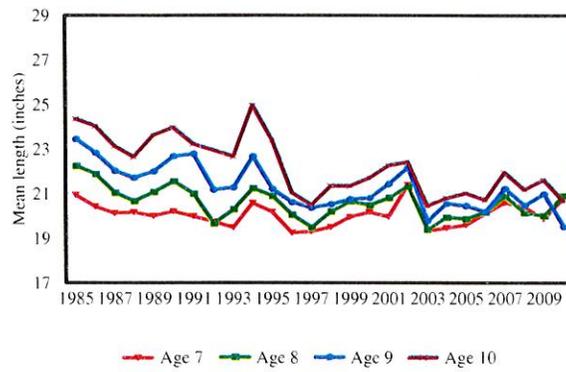
**Whitefish MI-2**



**Whitefish MI-3**



**Whitefish MI-4**



**Whitefish MI-5**

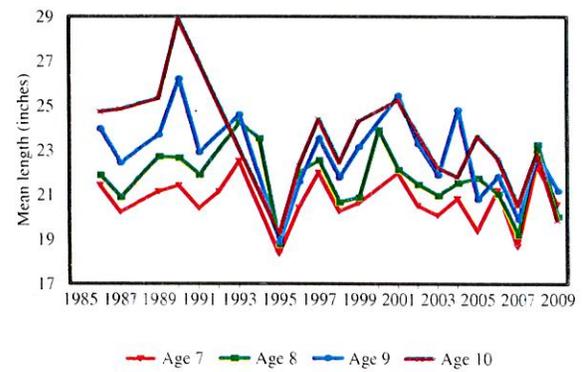


Figure 7. Trends in average length (inches) of whitefish (ages 7-10) in Michigan management units within the 1842 treaty ceded area, from 1985-2009.

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 2009.

Management Unit	Grid	Effort	Percent of Total Effort*	Whitefish	Lake trout	Siscowet	Herring	Salmon	Rainbow Trout	Brown Trout	Walleye	Northern Pike	Burbot	Total Harvest Round Pounds	Percent of Total Harvest	
MI-2	1315	65,600	13.8%	10,254	122	193	0	0	0	0	0	0	0	0	0	
	1316	123,300	25.9%	46,094	668	130	0	0	0	0	0	0	0	0	0	
	1413	275,400	57.9%	55,800	1,003	238	1	0	0	0	0	0	0	0	0	
	1511	11,600	2.4%	641	37	0	0	0	0	0	0	0	0	0	0	
	Effort:	475,900	10.1%	112,789	1,830	561	1	0	0	0	0	0	0	0	134,953.1	13.8%
Dressed Pounds:				131,963.1	2,287.5	701.3	1.2	0.0	0.0	0.0	0	0	0	0	0	
Round Pounds:				5,386	403	0	0	0	0	0	0	0	0	0	0	0
MI-3	925	15,000	0.7%	115,449	1,253	18	0	0	0	0	0	0	0	0	0	
	1023	316,500	15.3%	45,715	2,364	0	0	0	0	0	0	0	0	0	0	
	1024	154,300	7.4%	6,100	878	0	0	0	0	0	0	0	0	0	0	
	1120	24,000	1.2%	186,810	7,847	2,975	0	0	0	0	0	0	0	0	0	
	1121	950,500	45.8%	10,761	453	51	0	0	0	0	0	0	0	0	0	
	1122	55,500	2.7%	76,579	1,612	720	0	0	0	0	0	0	0	0	0	
	1219	349,000	16.8%	28,427	582	117	0	0	0	0	0	0	0	0	0	
	1220	208,500	10.1%	475,227	15,392	3,881	0	0	0	0	0	0	0	0	0	
	Effort:	2,073,300	44.1%	556,015.6	19,240.0	4,851.3	0.0	0.0	0.0	0.0	0.0	0	0	0	580,106.8	59.2%
	Dressed Pounds:				11,418	2,154	781	0	0	0	0	0	0	0	0	0
Round Pounds:				9,671	1,097	772	0	0	0	0	0	0	0	0	0	
MI-4	1026	60,000	3.8%	19,265	3,059	48	0	0	0	0	0	0	0	0	0	
	1027	50,000	3.1%	9,497	925	0	0	0	0	0	0	0	0	0	0	
	1125	356,000	22.4%	8,061	9,338	416	0	0	0	0	0	0	0	0	0	
	1126	56,000	3.5%	38,955	15,256	1,001	0	0	0	0	0	0	0	0	0	
	1223	183,000	11.5%	5,326	4,608	0	0	56	0	0	51	0	0	0	0	
	1224	373,000	23.4%	4,300	1,900	0	0	0	0	0	0	0	0	0	0	
	1323	209,000	13.1%	200	184	0	0	0	0	0	27	0	0	0	0	
	1324	40,000	2.5%	16,024	8,051	157	5,023	595	10	0	0	0	0	0	0	
	1325	16,000	1.0%	122,717	46,572	3,175	5,023	651	10	0	0	0	0	0	0	
	1423	247,700	15.6%	143,578.9	58,215.0	3,968.8	6,027.6	813.8	12.5	0.0	78	0	0	176	212,870.5	21.7%
	Effort:	1,590,700	33.9%	1,815	388	0	0	0	0	0	0	0	0	0	0	
	Dressed Pounds:				3,600	4,554	0	0	0	0	0	0	0	0	0	
	Round Pounds:				7,891	7,694	0	587	78	14	17	3	12	4	0	
MI-5	1327	9,200	1.7%	3,567	4,354	0	0	12	0	0	0	0	0	0	0	
	1328	40,000	7.2%	4,261	4,052	0	3	10	0	0	0	0	0	0	0	
	1428	223,422	40.1%	21,134	21,042	0	590	100	14	17	0	0	0	0	0	
	1429	48,000	8.6%	24,726.8	26,302.5	0.0	708.0	125.0	17.5	21.3	3	12	4	51,920.0	5.3%	
	1529	236,000	42.4%	731,867	84,836	7,617	5,614	751	24	17	0	0	0	0	0	
Effort:	556,622	11.9%	856,284.4	106,045.0	9,521.3	6,736.8	938.8	30.0	21.3	81.0	12.0	180.0	979,850.4			
Dressed Pounds:				731,867	84,836	7,617	5,614	751	24	17	0	0	0	0	0	
Round Pounds:				856,284.4	106,045.0	9,521.3	6,736.8	938.8	30.0	21.3	81.0	12.0	180.0	979,850.4		

\*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 2009.

Unit	Mesh	Effort	Percent of										Total Harvest		
			Total Effort*	Whitefish	Lake trout	Siscowet	Herring	Salmon	Rainbow	Brown Trout	Walleye	Northern Pike	Burbot	Round	Pounds
MI-2	4.5	475,900	100.0%	112,789	1,830	561	1	0	0	0	0	0	0	0	0
Subtotals:		Effort: 475,900	10.1%	112,789	1,830	561	1	0	0	0	0	0	0	0	0
Dressed Pounds:				131,963.1	2,287.5	701.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	134,953.1
Round Pounds:				97.8%	1.7%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Percent of Unit Harvest:				472,200	15,325	3,881	0	0	0	0	0	0	0	0	0
MI-3	4.5	2,065,300	99.6%	475,227	15,392	3,881	0	0	0	0	0	0	0	0	
MI-3	4.5-5.0	8,000	0.4%	3,027	67	0	0	0	0	0	0	0	0	0	
Subtotals:		Effort: 2,073,300	44.1%	475,227	15,392	3,881	0	0	0	0	0	0	0	0	
Dressed Pounds:				556,015.6	19,240.0	4,851.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	580,106.8
Round Pounds:				95.8%	3.3%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Percent of Unit Harvest:				20,400	0	0	2,588	38	0	0	0	0	0	0	
MI-4	2.75	20,400	1.3%	84	8	9	2,023	42	0	0	0	0	0	0	
MI-4	3.0	17,500	1.1%	118,968	44,022	3,166	412	571	10	0	78	0	176	0	
MI-4	4.5	1,430,400	89.9%	845	0	0	0	0	0	0	0	0	0	0	
MI-4	4.5-5.0	6,000	0.4%	2,820	2,336	0	0	0	0	0	0	0	0	0	
MI-4	4.9375	116,400	7.3%	0	206	0	0	0	0	0	0	0	0	0	
MI-4	HOOK	0	0.0%												
Subtotals:		Effort: 1,590,700	33.9%	122,717	46,572	3,175	5,023	651	10	0	78.0	0.0	176.0	212,870.5	
Dressed Pounds:				143,578.9	58,215.0	3,968.8	6,027.6	813.8	12.5	0.0	0.0%	0.0%	0.1%		
Round Pounds:				67.4%	27.3%	1.9%	2.8%	0.4%	0.0%	0.0%	0.0%	0.0%	0.1%		
Percent of Unit Harvest:				0	0	0	196	0	0	0	0	0	0	0	
MI-5	3.0	4,000	0.7%	21,134	21,042	0	394	100	14	17	3	12	4	0	
MI-5	4.5	552,622	99.3%	21,134	21,042	0	394	100	14	17	3	12	4	0	
Subtotals:		Effort: 556,622	11.9%	21,134	21,042	0	590	100	14	17	3.0	12.0	4.0	51,920.0	
Dressed Pounds:				24,726.8	26,302.5	0.0	708.0	125.0	17.5	21.3	0.0%	0.0%	0.0%		
Round Pounds:				47.6%	50.7%	0.0%	1.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%		
Percent of Unit Harvest:				731,867	84,836	7,617	5,614	751	24	17	81.0	12.0	180.0	979,850.4	
Totals:		Effort: 4,696,522		856,284.4	106,045.0	9,521.3	6,736.8	938.8	30.0	21.3	0.0%	0.0%	0.0%		
Dressed Pounds:				87.4%	10.8%	1.0%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%		
Round Pounds:															
Percent of Total Harvest:															

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

Table 3. Total and target harvest, effort, and CPE by management unit and tribe for lake trout, whitefish, and siscowet in Michigan waters of Lake Superior in 2009.\*

Unit	Tribe	TOTAL HARVEST						TARGET HARVEST								
		Effort	Whitefish pounds	CPE	Lake trout pounds	CPE	Siscowet pounds	CPE	Effort	Whitefish pounds	CPE	Lake trout pounds	CPE	Effort	Siscowet pounds	CPE
MI-2	Bad River	216,900	36,988	171	925	4	561	3	216,900	36,988	171	925	4	0	0	0
	Keweenaw Bay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red Cliff	259,000	75,801	293	905	3	0	0	259,000	75,801	293	905	3	0	0	0
	subtotal	475,900	112,789	237	1,830	4	561	1	475,900	112,789	237	1,830	4	0	0	0
MI-3	Bad River	8,400	349	42	0	0	0	0	8,400	349	42	0	0	0	0	0
	Keweenaw Bay	272,000	25,600	94	5,650	21	2,900	11	272,000	25,600	94	5,650	21	0	0	0
	Red Cliff	1,792,900	449,278	251	9,742	5	981	1	1,792,900	449,278	251	9,742	5	0	0	0
	subtotal	2,073,300	475,227	229	15,392	7	3,881	2	2,073,300	475,227	229	15,392	7	0	0	0
MI-4	Bad River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Keweenaw Bay	999,700	53,711	54	38,431	38	1,574	2	962,550	53,637	56	38,427	40	0	0	0
	Red Cliff	591,000	69,006	117	8,141	14	1,601	3	591,000	69,006	117	8,141	14	0	0	0
	subtotal	1,590,700	122,717	77	46,572	29	3,175	2	1,553,550	122,643	79	46,568	30	0	0	0
MI-5	Bad River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Keweenaw Bay	516,622	17,534	34	16,488	32	0	0	511,722	17,470	34	16,488	32	0	0	0
	Red Cliff	40,000	3,600	90	4,554	114	0	0	40,000	3,600	90	4,554	114	0	0	0
	subtotal	556,622	21,134	38	21,042	38	0	0	551,722	21,070	38	21,042	38	0	0	0
Total	Bad River	225,300	37,337	166	925	4	561	2	225,300	37,337	166	925	4	0	0	0
	Keweenaw Bay	1,788,322	96,845	54	60,569	34	4,474	3	1,746,272	96,707	55	60,565	35	0	0	0
	Red Cliff	2,682,900	597,685	223	23,342	9	2,582	1	2,682,900	597,685	223	23,342	9	0	0	0
	All Tribes	4,696,522	731,867	156	84,836	18	7,617	2	4,654,472	731,729	157	84,832	18	0	0	0

\*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, effort, and CPE for target species by management unit and grid in Michigan waters of Lake Superior in 2009.\*

Unit	Grid	Whitefish		Lake trout		Siscowet		Salmon		Herring				
		Effort	pounds	Effort	pounds	Effort	pounds	Effort	pounds	Effort	pounds			
			CPE		CPE		CPE		CPE		CPE			
MI-2	1315	64,600	9,573	148	122	64,600	122	2						
	1316	123,300	46,094	374	668	123,300	668	5						
	1413	275,400	55,800	203	1,003	275,400	1,003	4						
	1415	1,000	681	681	0	1,000	0	0						
	1511	11,600	641	55	37	11,600	37	3						
	subtotal	475,900	112,789	237	1,830	475,900	1,830	4	0	0	0	0		
MI-3	925	15,000	5,386	359	403	15,000	403	27						
	1023	316,500	115,449	365	1,253	316,500	1,253	4						
	1024	154,300	45,715	296	2,364	154,300	2,364	15						
	1120	24,000	6,100	254	878	24,000	878	37						
	1121	950,500	186,810	197	7,847	950,500	7,847	8						
	1122	55,500	10,761	194	453	55,500	453	8						
	1219	349,000	76,579	219	1,612	349,000	1,612	5						
	1220	208,500	28,427	136	582	208,500	582	3						
	subtotal	2,073,300	475,227	229	15,392	2,073,300	15,392	7	0	0	0	0		
	MI-4	1026	60,000	11,418	190	2,154	60,000	2,154	36					
1027		50,000	9,671	193	1,097	50,000	1,097	22						
1125		356,000	19,265	54	3,059	356,000	3,059	9						
1126		56,000	9,497	170	925	56,000	925	17						
1223		183,000	8,061	44	9,338	183,000	9,338	51						
1224		373,000	38,955	104	15,256	373,000	15,256	41						
1323		209,000	5,326	25	4,608	209,000	4,608	22						
1324		40,000	4,300	108	1,900	40,000	1,900	48						
1325		16,000	200	13	184	16,000	184	12						
1423		210,550	15,950	76	8,047	210,550	8,047	38						
subtotal		1,553,550	122,643	79	46,568	1,553,550	46,568	30	0	0	0	0		
MI-5		1327	9,200	1,815	197	388	9,200	388	42					
	1328	40,000	3,600	90	4,554	40,000	4,554	114						
	1428	218,522	7,827	36	7,694	218,522	7,694	35						
	1429	48,000	3,567	74	4,354	48,000	4,354	91						
	1529	236,000	4,261	18	4,052	236,000	4,052	17						
	subtotal	551,722	21,070	38	21,042	551,722	21,042	38	0	0	0	0		
Grand Total		4,654,472	731,729	157	84,832	4,654,472	84,832	18	0	0	0	42,050	4,855	115

\*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 1985-2009. Target effort for whitefish and lake trout was combined.

Unit	Year	Whitefish			Lake trout			Siscowet		
		Target effort	Target harvest	Total CPE	Target effort	Target harvest	Total CPE	Target effort	Target harvest	Total CPE
MI-2	1985	101,100	5,664	56	101,100	9,238	91	0	0	0
	1986	128,000	16,234	127	128,000	7,550	59	0	0	0
	1987	576,200	80,246	139	576,200	18,568	32	3,200	0	0
	1988	98,000	2,809	29	98,000	17,374	177	24,000	4,945	206
	1989	178,000	33,511	188	178,000	13,488	76	0	0	0
	1990	113,000	22,867	202	113,000	2,789	25	28,000	8,145	291
	1991	136,800	32,003	234	136,800	5,273	39	0	0	0
	1992	217,000	44,814	207	217,000	2,290	11	166,000	25,946	156
	1993	419,100	74,220	177	419,100	7,780	19	52,400	10,029	191
	1994	148,200	17,629	119	148,200	7,790	53	5,000	747	149
	1995	155,000	11,236	73	155,000	9,729	63	15,000	3,307	221
	1996	89,600	4,418	49	89,600	7,777	87	1,200	3	3
	1997	196,300	19,512	99	196,300	10,675	54	5,000	1,608	322
	1998	85,400	10,250	120	85,400	3,125	37	0	0	0
	1999	170,100	31,466	185	170,100	1,130	7	0	0	0
	2000	391,800	120,494	308	391,800	3,925	10	0	0	0
	2001	95,000	16,944	178	95,000	463	5	0	0	0
	2002	371,800	43,377	117	371,800	3,582	10	0	0	0
	2003	261,600	37,887	145	261,600	2,910	11	0	0	0
	2004	526,900	80,959	154	526,900	5,745	11	0	0	0
2005	577,600	129,062	223	577,600	7,103	12	0	0	0	
2006	1,642,450	360,434	219	1,642,450	9,072	6	0	0	0	
2007	1,171,600	207,745	177	1,171,600	11,582	10	0	0	0	
2008	987,600	213,266	216	987,600	7,660	8	0	0	0	
2009	475,900	112,789	237	475,900	1,830	4	0	0	0	
Average:		372,562	69,193	186	372,562	7,138	19	11,992	2,189	183
MI-3	1985	2,475,200	309,525	125	2,475,200	31,501	13	0	0	0
	1986	2,936,200	265,269	90	2,936,200	39,682	14	161,000	26,172	163
	1987	2,098,900	136,353	65	2,098,900	36,409	17	538,800	58,797	109
	1988	2,427,300	222,321	92	2,427,300	32,677	14	176,400	21,934	124
	1989	1,596,000	134,078	84	1,596,000	28,215	18	68,000	10,660	157
	1990	2,127,500	110,615	52	2,127,500	28,361	13	20,000	2,967	148
	1991	1,329,900	62,714	47	1,329,900	22,507	17	123,400	14,458	117
	1992	1,675,200	119,291	71	1,675,200	19,537	12	84,600	8,272	98
	1993	2,100,100	172,270	82	2,100,100	16,958	8	63,700	5,933	93
	1994	1,703,800	73,556	43	1,703,800	12,651	7	71,000	5,053	71
	1995	1,408,400	91,358	65	1,408,400	8,013	6	0	0	0
	1996	1,359,700	135,822	100	1,359,700	9,843	7	56,000	2,750	49
	1997	1,854,100	136,221	74	1,854,100	15,954	9	18,000	1,546	86
	1998	2,556,700	267,336	105	2,556,700	24,629	10	9,500	400	42
	1999	1,706,300	178,485	105	1,706,300	12,430	7	0	0	0
	2000	1,609,300	204,065	127	1,609,300	8,951	6	0	0	0
	2001	1,711,600	154,154	90	1,711,600	17,246	10	0	0	0
	2002	1,879,000	85,980	46	1,879,000	19,558	10	0	0	0
	2003	1,759,000	196,274	112	1,759,000	12,585	7	0	0	0
	2004	1,255,400	67,579	54	1,255,400	9,973	8	0	0	0
2005	1,246,000	118,185	95	1,246,000	4,738	4	0	0	0	
2006	1,731,000	264,460	153	1,731,000	12,714	7	0	0	0	
2007	1,466,400	249,555	170	1,466,400	5,414	4	0	0	0	
2008	1,871,150	373,411	200	1,871,150	12,697	7	0	0	0	
2009	2,073,300	475,227	229	2,073,300	15,392	7	0	0	0	
Average:		1,838,298	184,164	100	1,838,298	18,345	10	55,616	6,358	114
MI-4	1985	1,083,275	218,666	202	1,083,275	43,118	40	0	0	0
	1986	4,864,900	526,710	108	4,864,900	129,258	27	105,800	25,924	245
	1987	4,110,190	300,332	73	4,110,190	71,863	18	768,200	136,596	178
	1988	5,547,065	245,246	44	5,547,065	117,982	21	266,000	34,653	130
	1989	6,781,675	371,247	55	6,781,675	112,829	17	70,000	21,781	311
	1990	8,557,900	377,190	44	8,557,900	133,645	16	600,500	38,606	64
	1991	5,945,200	278,295	47	5,945,200	94,581	16	789,300	55,800	71
	1992	5,152,100	299,967	58	5,152,100	74,849	15	950,750	46,489	49
	1993	3,939,425	165,440	42	3,939,425	65,184	17	747,500	55,090	74
	1994	2,801,325	88,866	32	2,801,325	53,075	19	559,050	38,703	69
	1995	1,529,225	74,466	49	1,529,225	47,471	31	376,000	35,363	94
	1996	2,096,400	101,931	49	2,096,400	43,737	21	336,900	23,662	70
	1997	2,238,988	127,998	57	2,238,988	54,929	25	137,986	41,753	303
	1998	2,202,700	136,100	62	2,202,700	60,014	27	196,870	19,377	98
	1999	2,338,100	141,873	61	2,338,100	69,671	30	79,400	14,920	188
	2000	1,922,025	128,261	67	1,922,025	78,318	41	43,700	6,616	151
	2001	2,193,800	114,051	52	2,193,800	66,726	30	22,800	6,949	305
	2002	2,735,450	160,561	59	2,735,450	91,897	34	0	0	0
	2003	1,714,600	158,437	92	1,714,600	45,406	27	0	0	0
	2004	1,864,550	147,536	79	1,864,550	49,185	26	0	0	0
2005	1,660,670	142,676	86	1,660,670	41,026	25	0	0	0	
2006	1,601,855	90,777	57	1,601,855	52,758	33	3,375	165	49	
2007	1,345,140	87,772	65	1,345,140	40,856	30	0	0	0	
2008	1,465,750	113,059	77	1,465,750	46,669	32	0	0	0	
2009	1,553,550	122,643	79	1,553,550	46,568	30	0	0	0	
Average:		3,089,834	188,804	61	3,089,834	69,265	22	242,165	24,098	100

Table 5. Continued.

Unit	Year	Whitefish				Lake trout				Siscowet			
		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	
Average:		427,629	27,203	64	27,433	427,629	20,329	48	20,586	12,112	479	40	2,877
All units	1985	3,659,575	533,855	146	534,565	3,659,575	83,857	23	85,028	0	0	0	6,384
	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	
Average:		5,711,218	468,276	82	472,384	5,711,218	114,264	20	118,085	321,401	33,105	103	63,740

Table 6. Age and size composition of hatchery and wild lake trout in tribal commercial harvests from unit MI-2 during 2009. Weight is in round pounds, length is in inches, and sd=standard deviation.

Unit	Origin	Age	Number		Length (in.)		Number		Weight (lbs)	
			Aged	Measured	mean	sd	Weighed	mean	sd	
MI-2										
Hatchery										
			0	2	25.0	5.4	2	6.8	2.9	
Sample Size:			0	2			2			
Means:					25.0	5.4		6.8	2.9	
Wild										
			0	5	25.1	4.7	5	6.4	2.9	
		6	1	1	21.5		1	2.8		
		7	6	6	23.6	1.8	6	4.4	0.9	
		8	6	6	23.8	2.1	6	4.1	0.9	
		9	5	5	25.5	2.9	5	5.4	2.2	
		10	5	5	24.1	2.4	5	4.5	1.8	
		11	3	3	27.4	1.6	3	7.0	2.3	
		12	3	3	26.0	0.7	3	5.6	1.2	
		13	4	4	25.1	1.4	4	4.7	1.0	
		14	1	1	22.7		1	3.6		
		15	1	1	25.7		1	5.6		
		16	1	1	26.4		1	6.2		
		20	2	2	33.0	4.2	2	12.3	3.3	
Sample Size:			38	43			43			
Means:			10.4		25.1	3.1		5.4	2.4	
Sample Size:										
Sample Size:			38	45			45			
Means:			10.4		25.1	3.1		5.5	2.4	

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 2009.

Unit	Length Category (Inches)	Fish Examined	Type AI, AII, AIII Wounds	Wounds per 100 fish	Scars	Scars per 100 fish
MI-2						
	2: 17-20.9	1	0	0.0	0	0.0
	3: 21-24.9	22	0	0.0	0	0.0
	4: 25-28.9	18	0	0.0	0	0.0
	5: > 29	4	0	0.0	0	0.0
	Total:	45	0	0.0	0	0.0
MI-3						
	1: < 17	2	0	0.0	0	0.0
	2: 17-20.9	8	0	0.0	0	0.0
	3: 21-24.9	42	2	4.8	0	0.0
	4: 25-28.9	17	0	0.0	0	0.0
	5: > 29	4	0	0.0	0	0.0
	Total:	73	2	2.7	0	0.0
MI-4						
	2: 17-20.9	13	0	0.0	0	0.0
	3: 21-24.9	34	1	2.9	0	0.0
	4: 25-28.9	12	2	16.7	0	0.0
	Total:	59	3	5.1	0	0.0
MI-5						
	2: 17-20.9	8	0	0.0	0	0.0
	3: 21-24.9	11	0	0.0	0	0.0
	4: 25-28.9	1	0	0.0	0	0.0
	Total:	20	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, 1988-2009.

Management Unit	Year	Wild and Hatchery Lake Trout Combined						Wild Lake Trout									
		Ages	Instantaneous total mortality	95% confidence limit for Z	Annual mortality	Annual Survival	Ages	Instantaneous total mortality	95% confidence limit for Z	Annual mortality	Annual Survival	A	S				
														Z	A	S	Z
MI-2	1988	9-13	0.41	+/- 0.31	0.33	0.67	9-13	0.41	+/- 0.31	0.33	0.67	9-13	0.41	+/- 0.31	0.33	0.67	
	1990	8-12	0.71	+/- 0.25	0.51	0.49	8-11	0.75	+/- 0.42	0.53	0.47	8-11	0.75	+/- 0.42	0.53	0.47	
	1998	7-13	0.39	+/- 0.11	0.32	0.68	7-13	0.39	+/- 0.11	0.32	0.68	7-13	0.39	+/- 0.11	0.32	0.68	
	1999	7-13	0.29	+/- 0.16	0.25	0.75	7-13	0.26	+/- 0.16	0.23	0.77	7-13	0.26	+/- 0.16	0.23	0.77	
	2000	9-13	0.22	+/- 0.30	0.20	0.80	9-13	0.22	+/- 0.34	0.20	0.80	9-13	0.22	+/- 0.34	0.20	0.80	
	2001	9-15	0.34	+/- 0.10	0.29	0.71	9-15	0.33	+/- 0.10	0.28	0.72	9-15	0.33	+/- 0.10	0.28	0.72	
	2002	9-11	0.46	+/- 0.03	0.37	0.63	9-11	0.46	+/- 0.03	0.37	0.63	9-11	0.46	+/- 0.03	0.37	0.63	
	2005	6-17	0.23	+/- 0.05	0.21	0.79	6-17	0.23	+/- 0.05	0.21	0.79	6-17	0.23	+/- 0.05	0.21	0.79	
	2006	7-13	0.25	+/- 0.03	0.22	0.78	7-13	0.25	+/- 0.03	0.22	0.78	7-13	0.25	+/- 0.03	0.22	0.78	
	2007	10-13	0.61	+/- 0.17	0.46	0.54	10-13	0.61	+/- 0.17	0.46	0.54	10-13	0.61	+/- 0.17	0.46	0.54	
	2008	8-12	0.28	+/- 0.16	0.25	0.75	8-12	0.28	+/- 0.16	0.25	0.75	8-12	0.28	+/- 0.16	0.25	0.75	
	2009	8-16	0.25	+/- 0.04	0.21	0.79	8-16	0.25	+/- 0.04	0.21	0.79	8-16	0.25	+/- 0.04	0.21	0.79	
	MI-3	1988	11-13	0.78	+/- 0.45	0.54	0.46	9-13	0.65	+/- 0.40	0.48	0.52	9-13	0.65	+/- 0.40	0.48	0.52
1989		8-11	0.64	+/- 0.09	0.47	0.53	8-12	0.72	+/- 0.08	0.51	0.49	8-12	0.72	+/- 0.08	0.51	0.49	
1991		8-11	0.40	+/- 0.33	0.33	0.67	8-11	0.47	+/- 0.35	0.38	0.63	8-11	0.47	+/- 0.35	0.38	0.63	
1992		7-13	0.37	+/- 0.36	0.31	0.69	Insufficient data.						8-11	0.52	+/- 0.33	0.41	0.60
1995		8-11	0.56	+/- 0.33	0.43	0.57	8-11	0.52	+/- 0.33	0.41	0.60	8-11	0.52	+/- 0.33	0.41	0.60	
1996		8-13	0.28	+/- 0.19	0.24	0.76	8-13	0.24	+/- 0.27	0.21	0.79	8-13	0.24	+/- 0.27	0.21	0.79	
1997		7-11	0.21	+/- 0.20	0.19	0.81	7-11	0.18	+/- 0.21	0.17	0.84	7-11	0.18	+/- 0.21	0.17	0.84	
1999		7-16	0.04	+/- 0.09	0.20	0.80	7-16	0.22	+/- 0.10	0.20	0.80	7-16	0.22	+/- 0.10	0.20	0.80	
2000		7-11	0.20	+/- 0.45	0.18	0.82	7-11	0.20	+/- 0.45	0.18	0.81	7-11	0.20	+/- 0.45	0.18	0.81	
2002		7-20	0.31	+/- 0.04	0.27	0.73	7-20	0.31	+/- 0.04	0.27	0.73	7-20	0.31	+/- 0.04	0.27	0.73	
2003		7-14	0.29	+/- 0.07	0.25	0.87	7-14	0.28	+/- 0.08	0.24	0.87	7-14	0.28	+/- 0.08	0.24	0.87	
2004		8-17	0.39	+/- 0.05	0.32	0.68	8-17	0.39	+/- 0.04	0.32	0.68	8-17	0.39	+/- 0.04	0.32	0.68	
2005		9-15	0.32	+/- 0.08	0.27	0.73	9-15	0.32	+/- 0.08	0.27	0.73	9-15	0.32	+/- 0.08	0.27	0.73	
2006	9-11	0.50	+/- 0.01	0.39	0.61	9-11	0.60	+/- 0.04	0.45	0.55	9-11	0.60	+/- 0.04	0.45	0.55		
2007	10-13	0.41	+/- 0.10	0.34	0.66	10-13	0.40	+/- 0.09	0.33	0.67	10-13	0.40	+/- 0.09	0.33	0.67		
2008	8-16	0.27	+/- 0.16	0.24	0.76	11-15	0.32	+/- 0.09	0.27	0.73	11-15	0.32	+/- 0.09	0.27	0.73		
2009	10-18	0.35	+/- 0.05	0.30	0.70	10-18	0.35	+/- 0.05	0.30	0.70	10-18	0.35	+/- 0.05	0.30	0.70		



Table 8. Continued.

Management Unit	Year	Wild and Hatchery Lake Trout Combined						Wild Lake Trout							
		Instantaneous total mortality			95% confidence limit for			Instantaneous total mortality			95% confidence limit for				
		Z	A	S	Z	A	S	Z	A	S	Z	A	S		
MI-4	1988	8-13	0.54	0.42	0.58	+/- 0.28	0.42	0.58	9-13	0.91	0.60	0.40	+/- 0.13	0.60	0.40
	1989	7-11	0.71	0.51	0.49	+/- 0.22	0.51	0.49	7-11	0.79	0.55	0.45	+/- 0.40	0.55	0.45
	1990	6-11	0.59	0.45	0.55	+/- 0.09	0.45	0.55	6-11	0.72	0.51	0.49	+/- 0.15	0.51	0.49
	1991	6-11	0.58	0.44	0.56	+/- 0.10	0.44	0.56	6-11	0.59	0.45	0.55	+/- 0.13	0.45	0.55
	1992	5-11	0.45	0.36	0.64	+/- 0.08	0.36	0.64	5-11	0.43	0.35	0.65	+/- 0.11	0.35	0.65
	1993	6-11	0.30	0.26	0.74	+/- 0.24	0.26	0.74	6-11	0.35	0.30	0.71	+/- 0.33	0.30	0.71
	1994	7-12	0.31	0.27	0.73	+/- 0.09	0.27	0.73	7-12	0.28	0.24	0.76	+/- 0.10	0.24	0.76
	1995	7-12	0.25	0.22	0.78	+/- 0.17	0.22	0.78	7-12	0.20	0.18	0.82	+/- 0.23	0.18	0.82
	1996	7-12	0.57	0.43	0.57	+/- 0.15	0.43	0.57	7-12	0.56	0.43	0.57	+/- 0.16	0.43	0.57
	1997	7-12	0.34	0.29	0.71	+/- 0.12	0.29	0.71	7-12	0.46	0.37	0.63	+/- 0.18	0.37	0.63
	1998	7-12	0.30	0.26	0.74	+/- 0.13	0.26	0.74	7-12	0.22	0.20	0.80	+/- 0.17	0.20	0.80
	1999	7-12	0.25	0.22	0.78	+/- 0.03	0.22	0.78	7-12	0.20	0.18	0.82	+/- 0.07	0.18	0.82
	2000	5-13	0.27	0.24	0.76	+/- 0.52	0.24	0.76	6-13	0.32	0.28	0.72	+/- 0.59	0.28	0.72
	2001	7-15	0.37	0.31	0.69	+/- 0.06	0.31	0.69	7-15	0.36	0.30	0.70	+/- 0.05	0.30	0.70
	2002	7-12	0.27	0.24	0.76	+/- 0.06	0.24	0.76	7-12	0.23	0.21	0.79	+/- 0.07	0.21	0.79
	2003	8-17	0.27	0.24	0.88	+/- 0.04	0.24	0.88	8-17	0.26	0.23	0.88	+/- 0.05	0.23	0.88
	2004	8-15	0.30	0.26	0.74	+/- 0.04	0.26	0.74	8-15	0.26	0.23	0.88	+/- 0.04	0.23	0.88
	2005	8-18	0.31	0.27	0.73	+/- 0.06	0.27	0.73	8-18	0.29	0.25	0.75	+/- 0.06	0.25	0.75
	2006	9-15	0.59	0.45	0.55	+/- 0.09	0.45	0.55	9-15	0.56	0.43	0.57	+/- 0.08	0.43	0.57
2007	9-16	0.35	0.30	0.70	+/- 0.07	0.30	0.70	9-16	0.33	0.28	0.72	+/- 0.06	0.28	0.72	
2008	7-11	0.47	0.38	0.62	+/- 0.14	0.38	0.62	8-13	0.20	0.18	0.82	+/- 0.15	0.18	0.82	
2009	6-14	0.27	0.24	0.76	+/- 0.07	0.24	0.76	6-14	0.27	0.24	0.76	+/- 0.07	0.24	0.76	
MI-5	1991	5-8	0.60	0.45	0.55	+/- 0.45	0.45	0.55	5-8	0.74	0.52	0.48	+/- 0.56	0.52	0.48
	2000	10-16	0.17	0.16	0.84	+/- 0.26	0.16	0.84	10-16	0.19	0.17	0.83	+/- 0.34	0.17	0.83
	2001	7-15	0.28	0.24	0.76	+/- 0.07	0.24	0.76	7-15	0.27	0.24	0.76	+/- 0.07	0.24	0.76
	2003	12-22	0.27	0.24	0.88	+/- 0.05	0.24	0.88	12-22	0.26	0.23	0.88	+/- 0.05	0.23	0.88
	2004	8-15	0.44	0.36	0.64	+/- 0.06	0.36	0.64	8-15	0.47	0.37	0.63	+/- 0.06	0.37	0.63
	2005	8-17	0.33	0.28	0.72	+/- 0.03	0.28	0.72	8-17	0.33	0.28	0.72	+/- 0.03	0.28	0.72
	2006	8-13	0.66	0.48	0.52	+/- 0.10	0.48	0.52	8-13	0.66	0.48	0.52	+/- 0.10	0.48	0.52
	2007	9-17	0.23	0.21	0.79	+/- 0.05	0.21	0.79	9-17	0.23	0.21	0.79	+/- 0.05	0.21	0.79
	2008	8-17	0.35	0.30	0.70	+/- 0.03	0.30	0.70	8-17	0.35	0.30	0.70	+/- 0.03	0.30	0.70
2009	6-8	0.26	0.23	0.77	+/- 0.15	0.23	0.77	6-8	0.26	0.23	0.77	+/- 0.15	0.23	0.77	

Table 9. Age and size composition of hatchery and wild lake trout in tribal commercial harvests from unit MI-3 during 2009. Weight is in round pounds, length is in inches, and sd=standard deviation.

Unit	Origin	Age	Number		Length (in.)		Weight (lbs)		
			Aged	Measured	mean	sd	Weighed	mean	sd
MI-3									
Hatchery									
		9	1	1	25.1		1	4.1	
Sample Size:			1	1			1		
Means:			9.0		25.1			4.1	
Wild									
			0	7	24.2	2.7	7	4.4	1.7
		5	1	1	19.4		1	1.7	
		6	2	2	13.9	1.1	2	0.8	0.0
		7	6	6	22.3	1.5	6	3.4	0.7
		8	6	6	22.8	0.9	6	3.5	0.7
		9	10	10	23.8	2.5	10	4.1	1.7
		10	11	11	23.6	1.4	11	3.6	0.8
		11	6	6	25.8	2.0	6	5.3	1.2
		12	9	9	24.7	3.3	9	4.5	2.1
		13	6	6	24.6	4.1	6	5.0	2.6
		14	3	3	25.3	2.5	3	4.7	1.6
		15	1	1	30.2		1	9.4	
		16	1	1	23.7		1	3.6	
		17	1	1	26.0		1	5.5	
		18	1	1	24.5		1	4.2	
		25	1	1	32.7		1	9.7	
Sample Size:			65	72			72		
Means:			10.6		23.9	3.2		4.2	1.9
Sample Size:									
Sample Size:			66	73			73		
Means:			10.6		23.9	3.2		4.2	1.9

Table 10. Age and size composition of hatchery and wild lake trout in tribal commercial harvests from unit MI-4 during 2009. Weight is in round pounds, length is in inches, and sd=standard deviation.

Unit	Origin	Age	Number Aged	Number Measured	Length (in.) mean	sd	Number Weighed	Weight (lbs) mean	sd
MI-4									
Hatchery									
		6	1	1	23.1		1	3.5	
		7	1	1	21.1		1	2.9	
		8	1	1	18.6		1	1.5	
		9	1	1	21.3		1	3.3	
		10	1	1	22.8		1	3.7	
		11	1	1	21.7		1	2.9	
Sample Size:			6	6			6		
Means:		8.5			21.5	1.6		3.0	0.8
Wild									
			0	9	24.1	2.8	9	3.7	1.7
		5	3	3	20.7	2.7	3	2.7	0.9
		6	11	11	22.3	1.7	11	3.2	0.9
		7	12	12	22.1	1.7	12	3.0	0.7
		8	17	17	22.0	1.6	17	3.0	0.6
		9	2	2	26.9	1.9	2	5.9	1.1
		10	3	3	22.5	2.8	3	2.9	0.8
		11	3	3	23.2	1.9	3	3.4	0.8
		12	2	2	26.2	0.9	2	3.4	1.5
		13	2	2	25.2	3.9	2	4.7	2.7
		14	2	2	22.2	1.7	2	2.5	0.0
Sample Size:			57	66			66		
Means:		8.1			22.8	2.3		3.3	1.1
Sample Size:			63	72			72		
Means:		8.1			22.7	2.2		3.2	1.1

Table 11. Age and size composition of hatchery and wild lake trout in tribal commercial harvests from unit MI-5 during 2009. Weight is in round pounds, length is in inches, and sd=standard deviation.

Unit	Origin	Age	Number	Number	Length (in.)		Number	Weight (lbs)	
			Aged	Measured	mean	sd	Weighed	mean	sd
MI-5									
	Wild								
			0	6	22.4	2.2	6	3.2	1.3
		5	1	1	21.5		1	2.4	
		6	9	9	22.7	2.0	9	3.1	0.8
		7	7	7	21.8	1.7	7	2.8	0.8
		8	10	10	22.9	1.4	10	3.2	0.7
		9	7	7	23.0	1.9	7	3.3	0.8
		10	5	5	24.0	1.1	5	3.7	0.7
		11	2	2	24.0	2.2	2	3.5	0.6
		12	2	2	24.4	1.6	2	3.8	1.3
		13	3	3	24.1	2.5	3	3.7	1.2
		14	3	3	24.3	5.4	3	4.1	2.9
Sample Size:			49	55			55		
Means:					23.0	2.1		3.3	1.0
Sample Size:			49	55			55		
Means:					23.0	2.1		3.3	1.0

Table 12. 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 2009. Weight is in round pounds, length is in inches, and sd=standard deviation.

Unit	Age	Number		Length (in.)		Number		Weight (lbs)	
		Aged	Measured	mean	sd	Weighed	mean	sd	
MI-2									
		0	169	19.8	1.2	34	2.6	1.0	
	7	5	5	18.8	1.5	5	2.9	1.2	
	8	6	6	18.6	0.6	6	2.1	0.3	
	9	12	12	19.6	1.3	12	2.9	1.0	
	10	30	30	19.8	1.1	30	2.6	0.9	
	11	28	28	20.3	1.3	28	2.4	0.6	
	12	22	22	20.1	1.2	22	2.6	0.7	
	13	14	14	20.4	1.5	14	2.5	0.6	
	14	13	13	19.9	1.1	13	2.8	0.9	
	15	3	3	21.0	0.6	3	2.7	0.1	
	16	5	5	19.9	0.9	5	3.9	1.1	
	17	2	2	22.6	0.5	2	3.6	0.0	
	18	2	2	23.1	0.1	2	3.8	0.3	
	19	2	2	21.0	3.3	2	4.4	0.4	
Sample Size:		144	313			178			
Means:		11.5		19.9	1.3		2.7	0.9	
MI-3									
		0	408	20.0	1.2	40	2.3	0.7	
	5	1	1	22.7		1	3.1		
	7	5	5	19.1	1.8	5	2.1	0.6	
	8	16	16	19.3	1.8	16	2.2	0.7	
	9	30	30	19.4	0.8	30	2.2	0.4	
	10	61	61	19.7	0.9	61	2.3	0.5	
	11	77	77	20.1	1.3	77	2.3	0.4	
	12	67	67	20.2	0.9	67	2.4	0.6	
	13	69	69	20.4	1.1	69	2.4	0.5	
	14	55	55	20.3	1.0	55	2.5	0.4	
	15	20	20	21.0	1.3	20	2.7	0.6	
	16	20	20	20.4	1.1	20	2.4	0.6	
	17	10	10	20.8	1.5	10	2.6	0.6	
	18	1	1	24.2		1	3.7		
	19	2	2	22.3	1.2	2	3.2	1.3	
	20	1	1	20.8		1	2.5		
	22	1	1	20.1		1	2.6		
Sample Size:		436	844			476			
Means:		12.1		20.1	1.2		2.4	0.5	

Table 12. Continued.

Unit	Age	Number Aged	Number Measured	Length (in.)		Number Weighed	Weight (lbs)	
				mean	sd		mean	sd
MI-4								
		0	4	19.9	1.7	4	2.1	0.5
	6	1	1	18.8		1	1.7	
	7	2	2	19.9	0.3	2	2.1	0.0
	8	4	4	20.0	0.4	4	2.0	0.2
	9	2	2	21.0	0.3	2	2.3	0.4
	10	5	5	21.6	1.4	5	2.7	0.8
	11	3	3	19.6	0.4	3	2.0	0.3
	12	2	2	20.6	1.5	2	2.5	0.5
	13	3	3	21.4	2.5	3	2.8	0.9
	14	2	2	20.7	1.1	2	2.2	0.5
	16	2	2	23.1	1.5	2	3.7	1.3
	17	1	1	24.3		1	4.9	
Sample Size:		27	31			31		
Means:		10.9		20.8	1.6		2.5	0.8
MI-5								
		0	14	19.9	1.8	1	5.2	
	7	3	3	20.6	0.4	3	2.5	0.4
	8	4	4	20.0	1.2	4	2.3	0.5
	9	4	4	21.2	1.2	4	2.7	0.6
	10	8	8	19.9	1.5	8	2.2	0.5
	11	6	6	21.3	1.8	6	2.9	0.9
	12	4	4	19.9	1.6	4	2.3	0.4
	13	3	3	20.9	1.0	3	2.6	0.3
	14	2	2	22.8	0.1	2	3.5	0.4
	15	1	1	23.2		1	3.9	
	16	3	3	25.1	0.9	3	5.4	1.0
	18	1	1	28.6		1	7.9	
Sample Size:		39	53			40		
Means:		11.1		20.9	2.2		3.0	1.3

Table 13. Age and size composition of siscowet in tribal commercial harvests from management units in the 1842 ceded area within Michigan waters of Lake Superior during 2009. Weight is in round pounds, length is in inches, and sd=standard deviation.

Unit	Age	Number		Length (in.)		Number		Weight (lbs)	
		Aged	Measured	mean	sd	Weighed	mean	sd	
MI-3									
		0	2	22.3	2.5	2	2.5	1.4	
	11	1	1	15.3		1	0.9		
	13	1	1	18.0		1	1.4		
	15	2	2	20.6	2.9	2	2.3	1.4	
Sample Size:		4	6			6			
Means:	13.5			19.9	3.2		2.0	1.1	
MI-4									
		0	1	20.3		1	2.2		
	11	1	1	21.8		1	2.6		
Sample Size:		1	2			2			
Means:	11.0			21.1	1.1		2.4	0.3	
MI-5									
		0	2	20.4	1.3	2	2.3	0.5	
	9	2	2	19.4	2.3	2	1.8	0.6	
	11	1	1	22.8		1	2.5		
Sample Size:		3	5			5			
Means:	9.7			20.5	1.9		2.1	0.5	
Sample Size:		8	13			13			
Means:	11.8			20.3	2.4		2.1	0.8	

Table 14. Age and size composition of cisco in tribal commercial harvests from management units in the 1842 ceded area within Michigan waters of Lake Superior during 2009. Weight is in round pounds, length is in inches, and sd=standard deviation.

Unit	Age	Number		Length (in.)		Number		Weight (lbs)	
		Aged	Measured	mean	sd	Weighed	mean	sd	
MI-2									
		0	2	13.9	0.1	2	0.8	0.2	
	5	1	1	16.3		1	1.4		
	9	2	2	14.6	1.4	2	0.9	0.3	
Sample Size:		3	5			5			
Means:		7.7		14.6	1.2		1.0	0.3	
MI-4									
		0	3	16.1	1.3	3	0.8	0.4	
	2	1	1	16.0		1	0.8		
	3	1	1	14.8		1	0.7		
	5	6	6	15.8	0.7	6	1.1	0.1	
	6	5	5	16.0	1.3	5	1.0	0.4	
	7	4	4	16.6	1.6	4	1.2	0.5	
	8	8	8	16.4	0.7	8	1.0	0.2	
	9	7	7	17.1	1.3	7	1.3	0.5	
	10	10	10	17.0	1.2	10	1.2	0.4	
	11	3	3	16.9	0.9	3	1.2	0.4	
	12	4	4	16.1	2.4	4	1.0	0.4	
	14	6	6	16.4	1.3	6	1.1	0.3	
	15	3	3	16.2	0.9	3	1.1	0.3	
	16	3	3	16.1	1.2	3	1.1	0.4	
	17	1	1	17.0		1	0.9		
	19	1	1	18.1		1	1.3		
Sample Size:		63	66			66			
Means:		9.7		16.5	1.2		1.1	0.4	