



**Biological and Commercial Catch Statistics
from the Chippewa Inter-Tribal Gill Net Fishery
within Michigan Waters of Lake Superior
During 2010**

by
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ABSTRACT

The 2010 commercial inter-tribal fishery in the 1842 treaty-ceded waters of Michigan consisted of ten 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 < 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 4.8 million feet of gill net and harvesting 710,365 round pounds of fish. Whitefish was the primary target species, making up 87.3% of the total, followed by lake trout (9.7%), with the remaining 3.0% consisting of cisco (lake herring), siscowet, salmon, rainbow, northern pike, brown trout, 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 2010 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 2010 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 2010.

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
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

¹GLIFWC. 1987.

⁴Mattes. 2000.

²Ebener et al. 1989.

⁵Mattes. 2004.

³Mattes. 1994.

⁶Mattes. 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:

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 4.8 million feet of gill net and harvesting 710,365 round pounds of fish. Whitefish was the primary target species, making up 87.3% of the total, followed by lake trout (9.7%), with the remaining 3.0% consisting of cisco (lake herring), siscowet, salmon, rainbow, northern pike, brown trout, and walleye.

Unit MI-2

Harvest. Thirty percent of the overall harvest was taken in MI-2 (Table 1). Of the 213,069 round pounds harvested in MI-2, 95.1% were whitefish, 1.3% lake trout, 3.5% cisco, and 0.1% siscowet (Table 2). Lake trout harvest was highest in grid 1512 (1,235 dressed pounds), with less than 1,000 dressed pounds taken in each of the remaining six statistical grids fished (Figure 2). Whitefish harvest was greatest in grids 1316 and 1512 (53,542 and 36,463 dressed pounds respectively), followed by grids 1315 and 1317 (24,995 and 20,680 dressed pounds respectively). Between 10,000 and 15,000 pounds were taken in each of the other three grids fished (Figure 3).

Effort. Twenty-two 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 1,054,200 feet with 31.4% (330,800 feet) occurring in grid 1512 and 24.7% (260,000 feet) occurring in grid 1316. Over 100,000 feet were fished in grids 1315, 1317, and 1414, with less than 100,000 feet fished in the remaining two grids (Figure 4). Gill-nets of 4 ½ inch mesh accounted for 98.3% of the unit's effort (Table 2 and Figure 5).

Target Effort and Harvest. The majority of fishing effort (1,036,800 feet) was targeted at whitefish and lake trout with 17,400 feet directed at cisco (Tables 4 and 5). Target effort (1.04 million feet) and harvest of whitefish (173,173 dressed pounds) was greater than the 1985-2010 average (398,110 feet and 73,193 dressed pounds, respectively). Target lake trout harvest (2,221 dressed pounds) was below the 1985-2010 average of 6,949 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 110-264 pounds (Table 4). Whitefish CPE for the seven grids combined was 167, below the average CPE of 184 for this unit for the 26 year period 1985-2010 (Table 5). Lake trout CPE for targeted fishing ranged from 1-4 per grid and was 2 for all grids combined, well below the 1985-2010 average CPE of 17 pounds.

Unit MI-3

Harvest. Forty-five percent of the overall harvest was taken in MI-3 (Table 1). Of the 320,304 round pounds harvested in MI-3, 97.0% were whitefish, 2.2% lake trout, 0.6% siscowet, and 0.3% cisco (Table 2). Harvest occurred in six 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 grids 1121, 1023, and 1122 (134,789, 72,353, and 47,224 dressed pounds, respectively) with less than 5,000 dressed pounds taken in each of the remaining three statistical grids fished (Figure 3).

Effort. Forty-three percent of the overall gill-net effort occurred in MI-3 (Table 1) which was fished by three two tribes (Table 3). Fishing effort in MI-3 was 2,047,900 feet with 61.5% (1,260,000 feet) occurring in grid 1121, followed by 18.6% (381,500 feet) in grid 1023 and 17.5% (357,400 feet) in grid 1122, with less than 50,000 feet being fished in each of the remaining three grids (Figure 4). Gill-nets of 4 ½ inch mesh accounted for 99.7% of the unit's effort (Table 2 and Figure 5).

Target Effort and Harvest. The majority of fishing effort (2,042,500 feet) was targeted at whitefish and lake trout with 5,400 feet directed at cisco (Tables 4 and 5). Target gill-net effort (2.04 million feet) was near the 1985-2010 average of 1.85 million feet (Table 5). Target harvest of whitefish (265,459 dressed pounds) was above the 1985-2010 average (187,291 dressed pounds). Target harvest of lake trout (5,547 dressed pounds) was below the 1985-2010 average (17,853 dressed pounds).

Catch Per Effort (CPE). Whitefish CPE (pounds harvested per 1,000 feet of gill-net) for targeted fishing in the six grids fished ranged from 107-867 pounds (Table 4). Whitefish CPE for the six grids combined was 130 pounds and above the average CPE of 101 for this unit for the 26 year period 1985-2010 (Table 5). Lake trout CPE for targeted fishing ranged from 1-31 pounds and was 3 for all grids combined, below the 1985-2010 average CPE of 10 pounds.

Unit MI-4

Harvest. Nineteen percent of the overall harvest was taken in MI-4 (Table 1). Of the 135,972 round pounds harvested, 62.7% were whitefish, 31.6% lake trout, 3.7% cisco, 1.4% siscowet, 0.5% salmon, and 0.1% a mix of rainbow trout and walleye (Table 2). Harvest occurred in eight statistical grids. Lake trout harvest was highest in grid 1224 (21,665 dressed pounds) followed by grids 1423 and 1125 (3,157 and 2,567 dressed pounds, respectively) (Figure 2). Less than 2,500 dressed pounds were harvested in each of the other five grids fished. Whitefish harvest was greatest in grid 1224 (31,843 dressed pounds) followed by grids 1125, 1027 and 1026 (13,110, 9,777 and 8,717 dressed pounds, respectively) (Figure 3). Less than 5,000 dressed pounds were harvested in each of the other four grids fished.

Effort. Twenty-six 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 1,219,700 feet with 44.9% (548,000 feet) occurring in grid 1224 (Table 2), followed by 15.6% (190,000 feet) in grid 1125. More than 100,000 feet were fished in two other grids (1026 and 1323) with 100,000 feet or less being fished in each of the remaining four grids (Figure 4). Gill-nets of 4 ½ inch mesh accounted for 97.9% of the unit's effort (Table 2 and Figure 5).

Target Effort and Harvest. The majority of fishing effort (1,211,300 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 1985-2010 average of 3.0 million feet (Table 5). Target harvest of whitefish (72,394 dressed pounds) was below the 1985-2010 average (184,327 dressed pounds). Target harvest of lake trout (33,990 dressed pounds) was also below the 1985-2010 average (67,908 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 24-98 pounds (Table 4). Whitefish CPE for the eight grids combined was 60 pounds and below the average CPE of 67 for this unit for the 26 year period 1985-2010 (Table 5). Lake trout CPE for targeted fishing ranged from 9-40 pounds and was 28 for all grids combined, near the 1985-2010 average CPE of 26 pounds.

Unit MI-5

Harvest. Six percent of the overall harvest was taken in MI-5 (Table 1). Of the 41,021 round pounds harvested in MI-5, 53.4% were whitefish, 39.5% lake trout, 5.7% cisco, 1.2% salmon with the remaining 0.2% consisting of northern pike, rainbow, brown trout, and walleye (Table 2). Harvest occurred in two statistical grids. Lake trout harvest was 8,328 dressed pounds in grid 1428 and 4,638 dressed pounds in grid 1429 (Figure 2). Whitefish harvest was 14,909 in grid 1428 and 3,799 dressed pounds in grid 1429 (Figure 3).

Effort. Ten percent of the overall gill-net effort occurred in MI-5 (Table 1) which was fished by one tribe (Table 3). Fishing effort in MI-5 was 455,000 feet with 84.8% (383,800 feet) occurring in grid 1428 and 15.2% (69,200 feet) in grid 1429 (Table 2 and 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. The majority of fishing effort (450,000 feet) was targeted at whitefish and lake trout with 5,000 feet directed at cisco (Table 4). Target effort for whitefish and lake trout (0.45 million feet) was near the 1985-2010 average of 0.43 million feet (Table 5). Target harvest of whitefish (18,554 dressed pounds) was below the 1986-2010 average (26,857 dressed pounds). Target harvest of lake trout (12,966 dressed pounds) was below the 1986-2010 average (20,034 dressed pounds).

Catch Per Effort (CPE). Whitefish CPE (pounds harvested per 1,000 feet of gill-net) for targeted fishing was 55 in grid 1429 and 39 in grid 1428 (Table 4). Whitefish CPE for the two grids combined was 41 pounds which was below the average CPE of 63 for this unit for the 25 year period 1986-2010 (Table 5). Lake trout CPE for targeted fishing was 67 in grid 1429 and 22 in grid 1428 (Table 4). Lake trout CPE for the two grids combined was 29 pounds, below the 1986-2010 average CPE of 47 pounds.

Biological Statistics

Lake Trout

MI-2. Eighteen year classes of wild trout (4-20, 22) were represented in a sample of 118 lake trout aged from MI-2 (Table 6). Mean age of wild fish was 10.4 years with fish ten years and older representing 56% of the catch. Mean length was 22.4 inches for the 172 wild fish sampled, and mean weight for 72 wild fish sampled was 4.4 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 1.7 wounds/100 fish (Table 7). Annual total mortality was estimated to be 30% ($Z=0.35 \pm 0.06$) for wild fish ages 8-16 (Table 8).

MI-3. One hatchery fish (age 9) and thirteen year classes of wild trout (5-13, 15, 16, 25, 36) were represented in a sample of 54 lake trout aged from MI-3 (Table 6). Mean age was 10.1 years. Fish ten years and older made up 41% of the wild component of the catch. Mean length was 23.9 inches and mean weight was 4.7 round pounds for the 61 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 3.3 wounds/100 fish (Table 7). Annual total mortality rate was estimated at 25% ($Z=0.29, \pm 0.06$) for wild fish ages 8-16 (Table 8).

MI-4 and MI-5. Only one lake trout was sampled from MI-4 and no lake trout were sampled from MI-5 in 2010 (Table 6).

Whitefish

MI-2. Sixteen age groups (5-19, 21) were represented in the 325 whitefish aged in MI-2 which had a mean age of 10.6 years (Table 9). Mean length of the 592 fish measured was 20.2 inches and mean weight of the 443 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 32% ($Z=0.39 \pm 0.05$) for ages 10-19.

MI-3. Twenty age groups (6-23, 25, 26) were represented in the 379 whitefish aged in MI-3, which had a mean age of 13.9 years (Table 9). Mean length of 498 lake whitefish measured was 19.9 inches and the mean weight was 2.5 round pounds. The average length of age 7 to 10 has been similar since 2005 (Figure 7). Annual total mortality was estimated at 30% ($Z=0.36 \pm 0.03$) for ages 13-23.

MI-4. Thirteen age groups (5-15, 19, 20) were represented in the 59 whitefish aged in MI-4, which had a mean age of 11.9 years (Table 9). Mean length and weight of 81 lake whitefish sampled was 20.4 inches and 2.4 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% ($Z=0.67 \pm 0.14$) for ages 12-15.

MI-5. No whitefish were sampled from MI-5 in 2010.

Other Species

Sixteen age groups (5-16, 18, 19, 21, 23) were represented in the 110 cisco aged from MI-2 in 2010 where the mean age was 10.6 years. Mean length and weight for the 115 cisco measured was 15.5 inches and 1.1 round pounds, respectively (Table 10). Annual total mortality was estimated at 27% ($Z=0.31 \pm 0.05$) for ages 9-16.

In addition, eight cisco were sampled from MI-4, eight siscowet from MI-2, and one coho salmon from MI-4 (Table 10).

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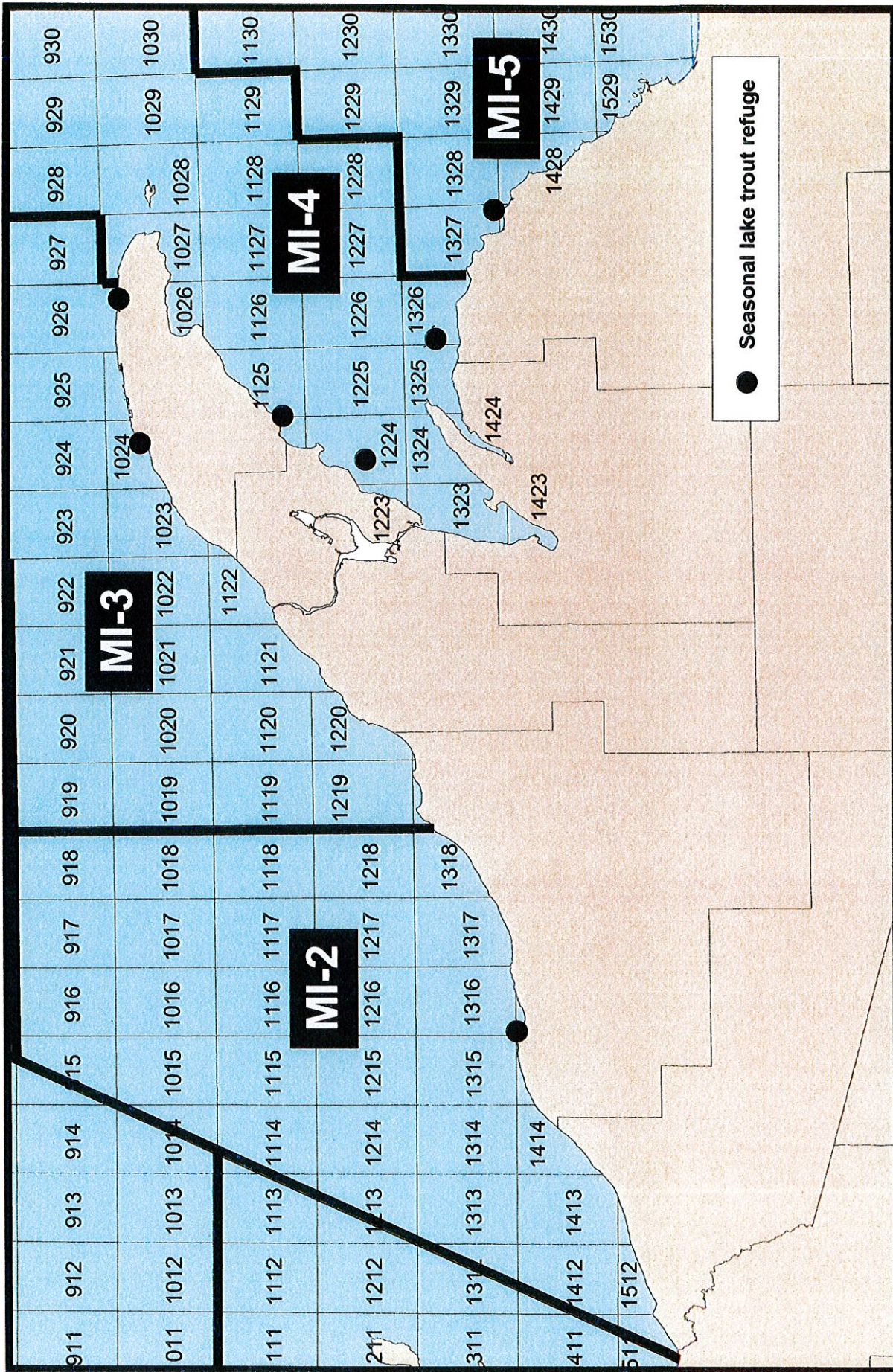


Figure 1. Management units and statistical grids in the 1842 treaty ceded area within Michigan waters of Lake Superior.

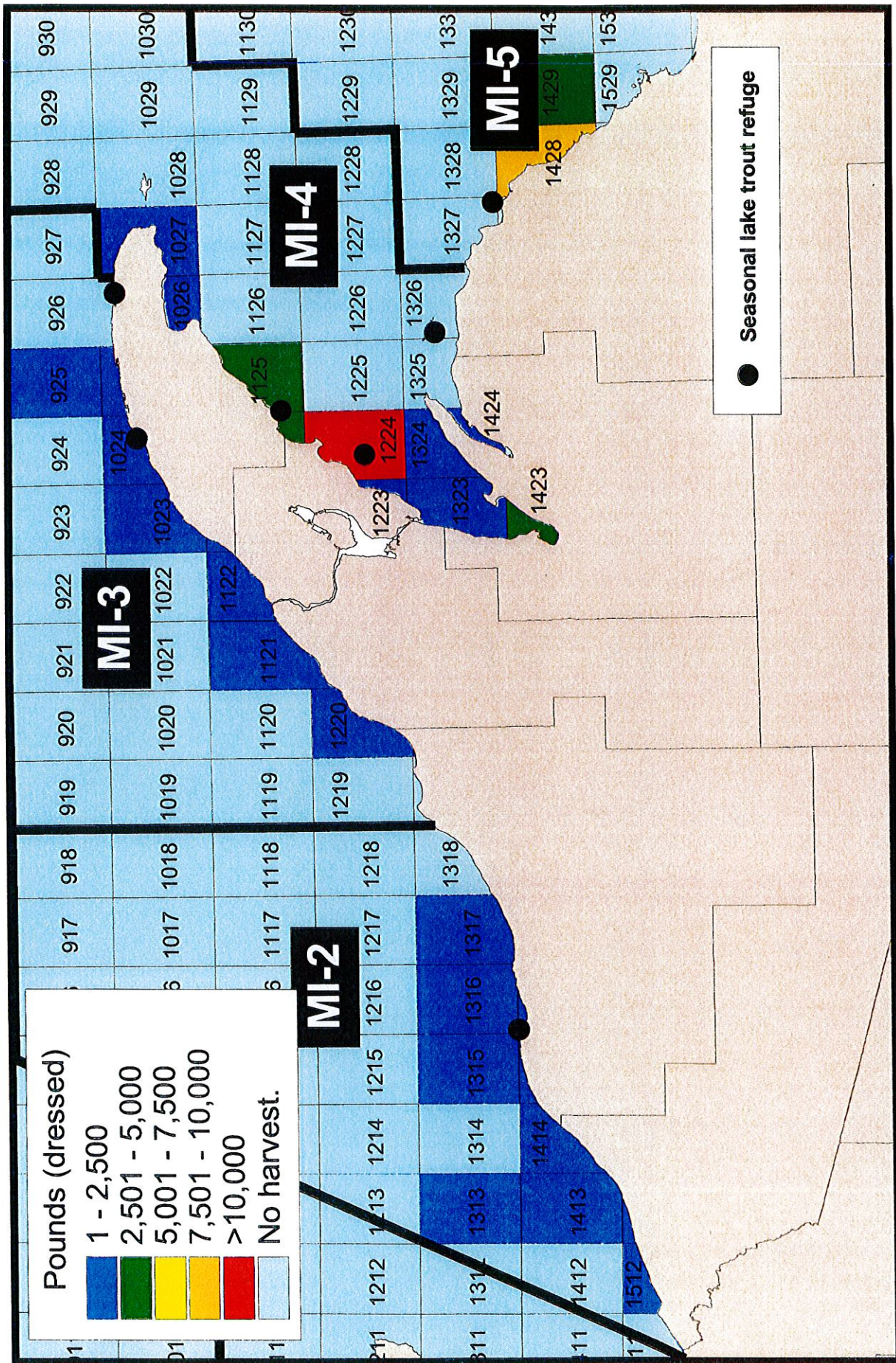


Figure 2. Lake trout harvest (dressed pounds) by statistical grid in the 1842 treaty ceded area within Michigan waters of Lake Superior during 2010.

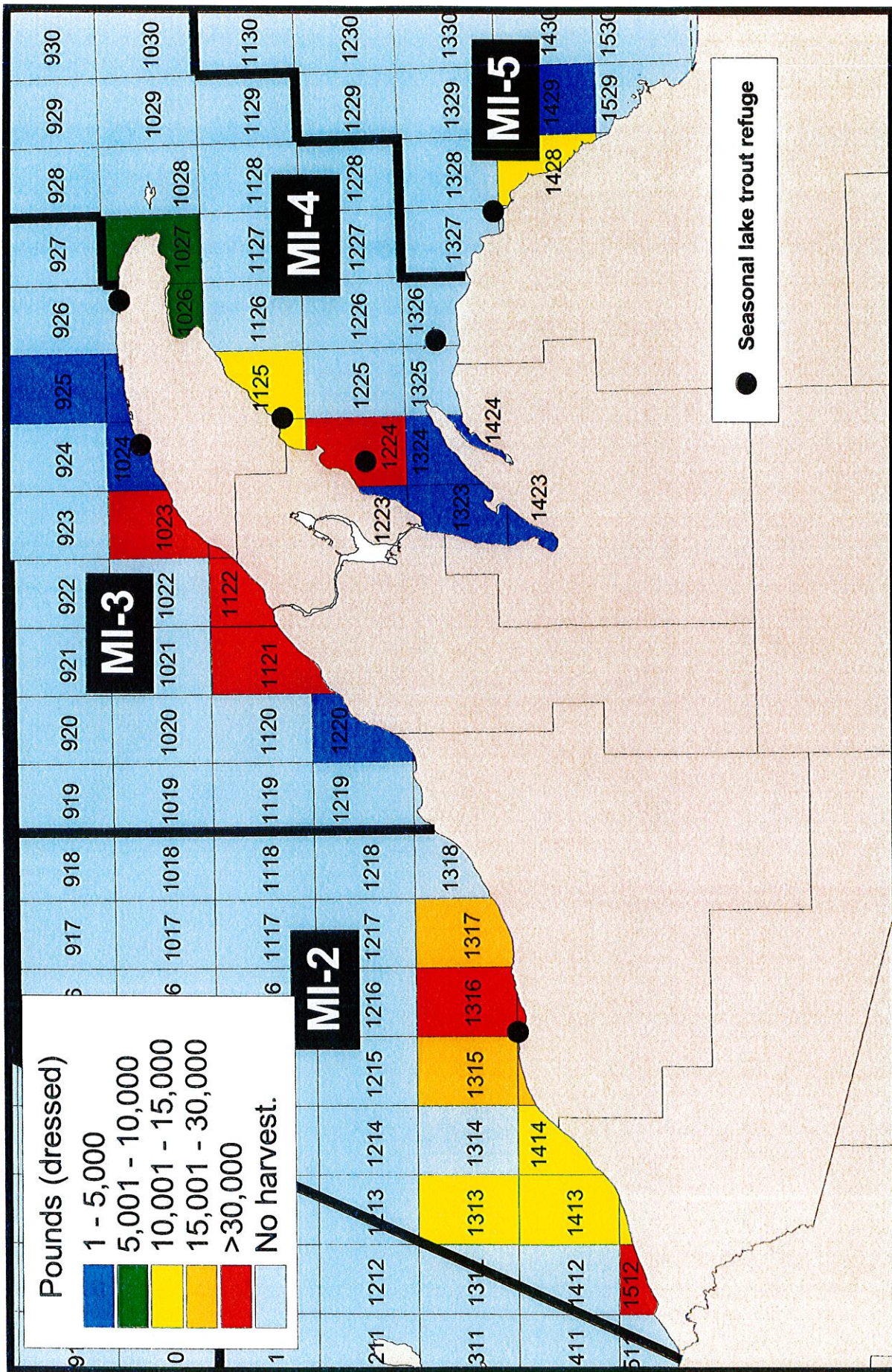


Figure 3. Whitefish harvest (dressed pounds) by statistical grid in the 1842 treaty ceded area within Michigan waters of Lake Superior during 2010.

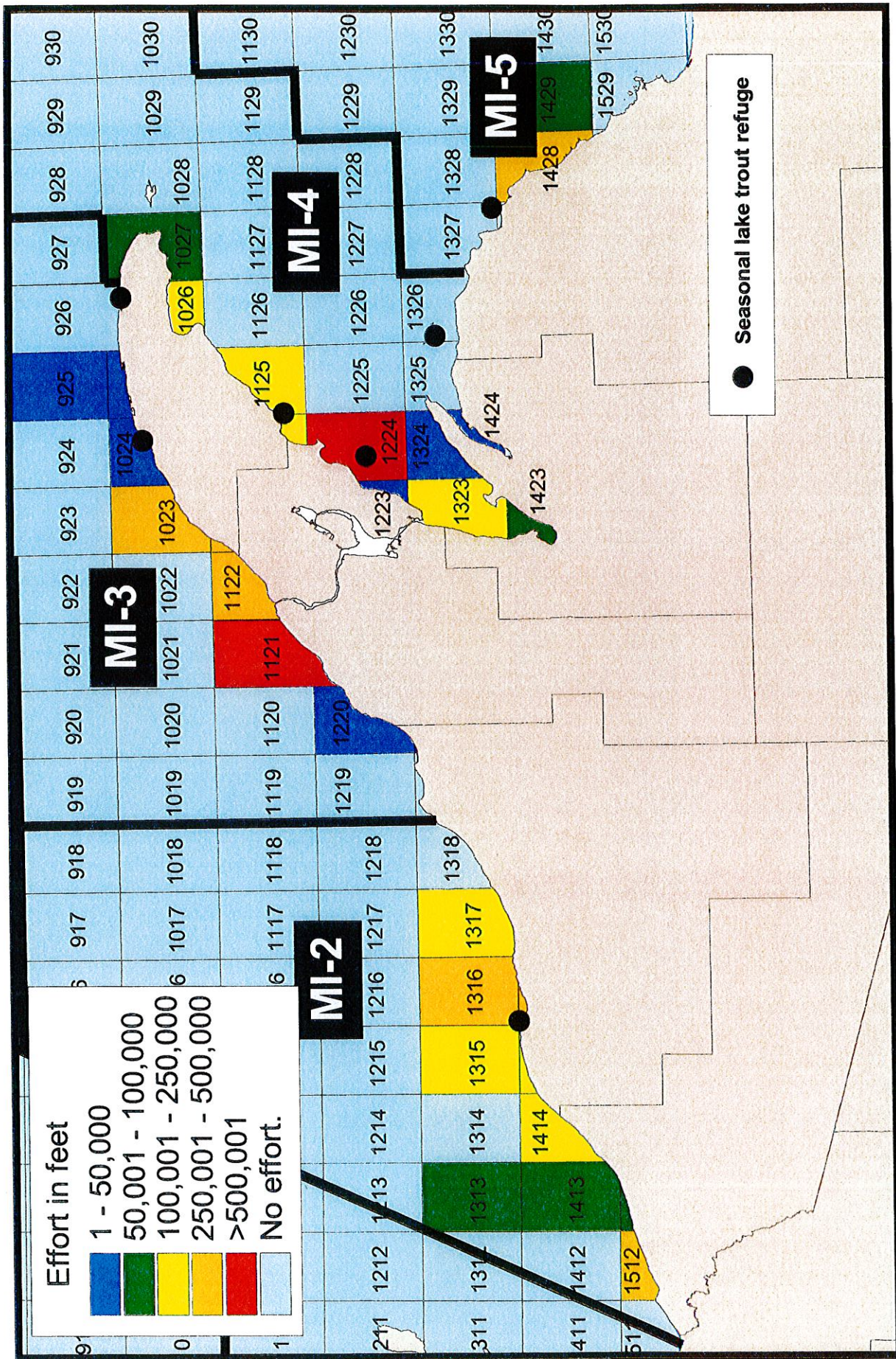


Figure 4. Effort in feet by statistical grid in the 1842 treaty ceded area within Michigan waters of Lake Superior during 2010.

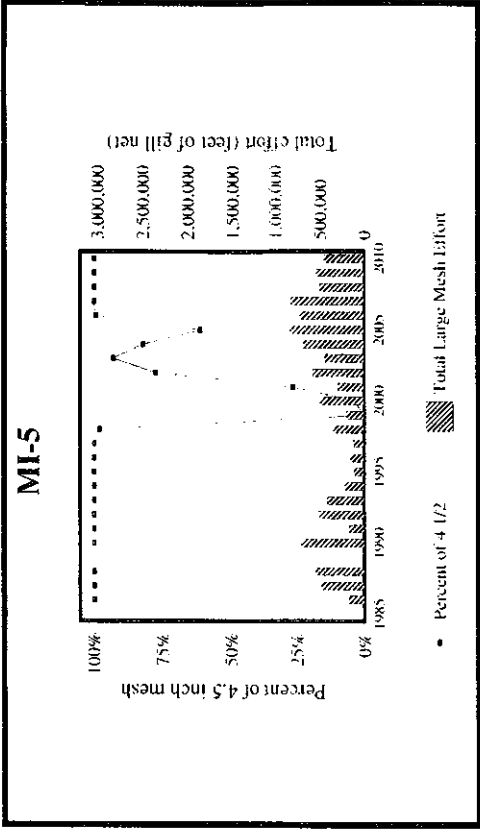
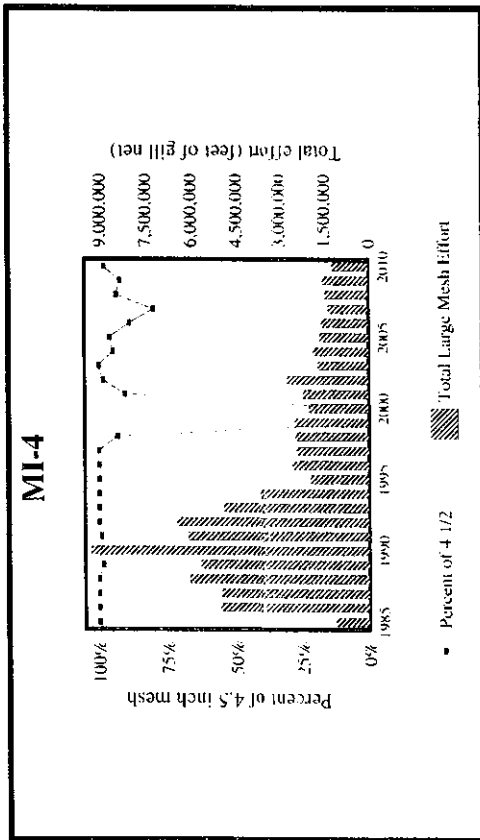
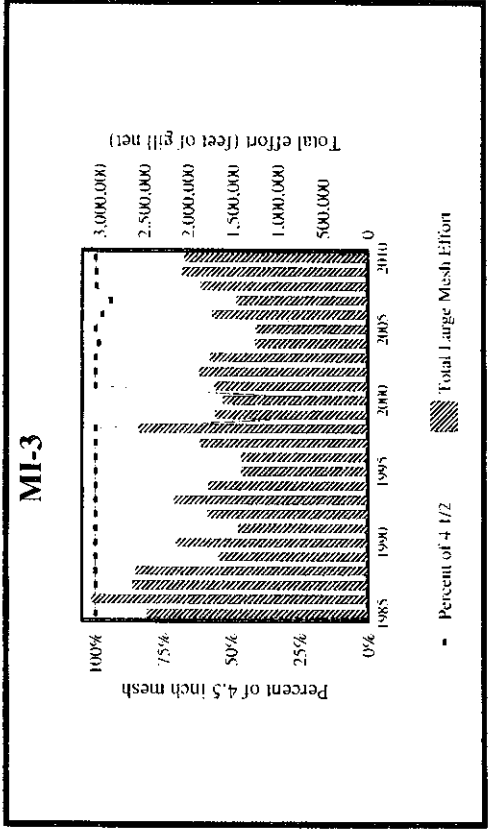
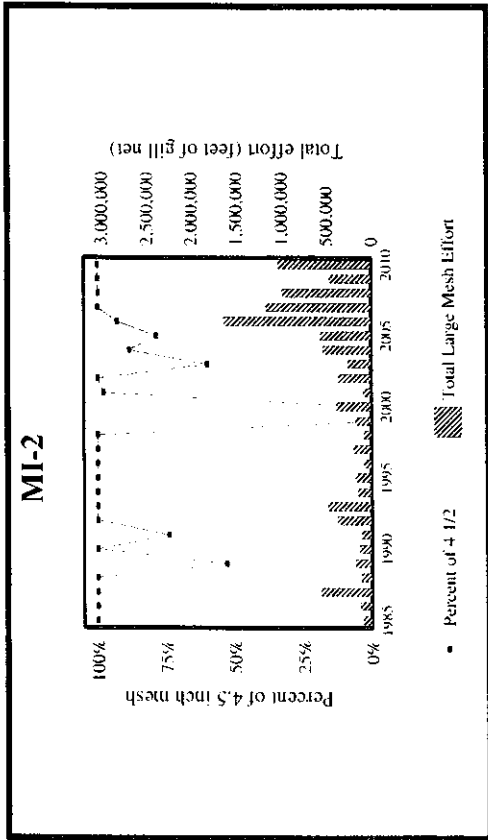
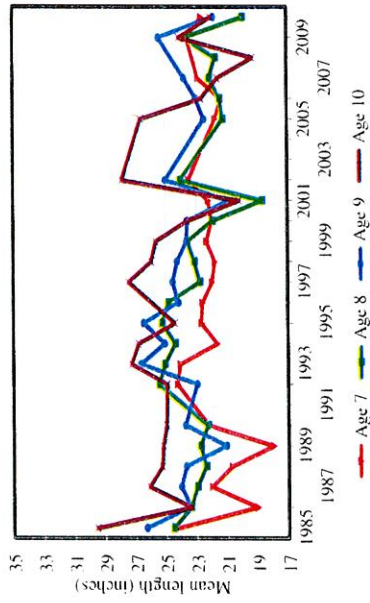
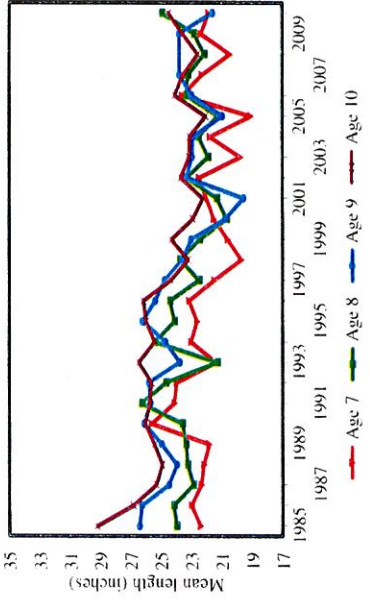


Figure 5. Total tribal large mesh gill net effort and percent composed of 4 1/2 inch mesh by management unit, 1985 to 2010.

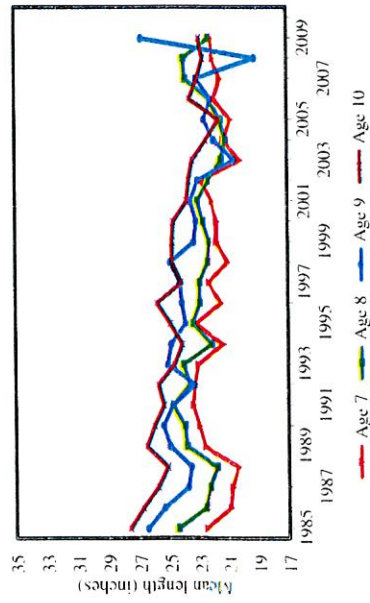
Wild Lake Trout MI-2



Wild Lake Trout MI-3



Wild Lake Trout MI-4



Wild Lake Trout MI-5

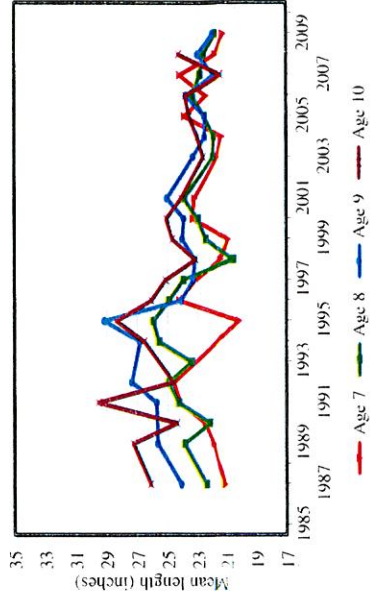
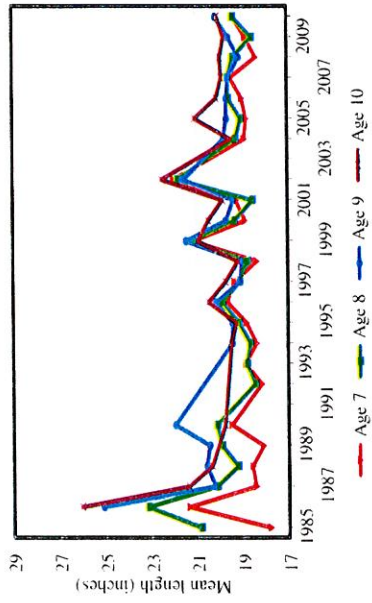
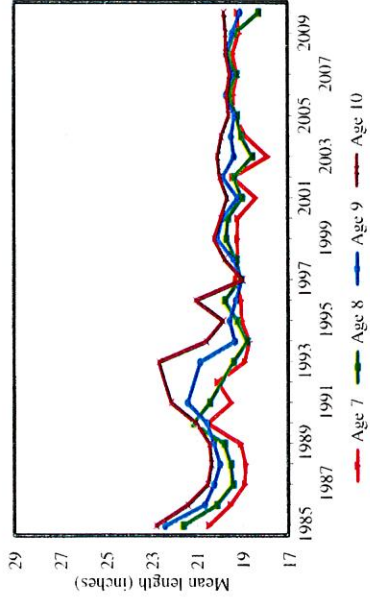


Figure 6. Trends in average length (inches) of wild lake trout (ages 7-10) in Michigan management units within the 1842 treaty ceded area, from 1985-2010.

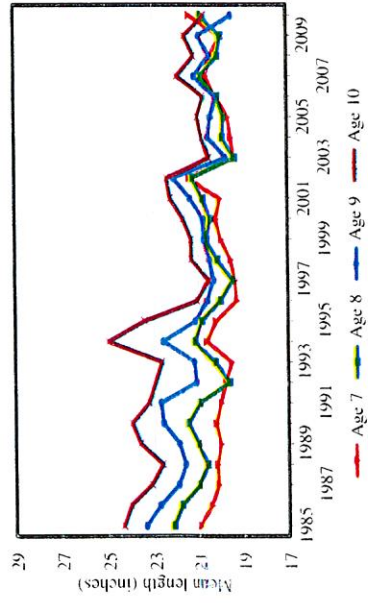
Whitefish MI-2



Whitefish MI-3



Whitefish MI-4



Whitefish MI-5

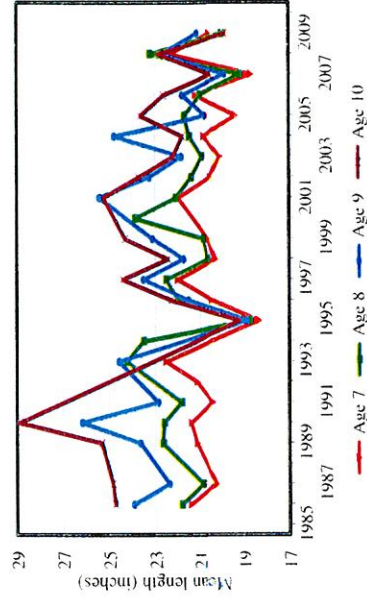


Figure 7. Trends in average length (inches) of whitefish (ages 7-10) in Michigan management units within the 1842 treaty ceded area, from 1985-2010.

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 2010.

Management Unit	Grid	Effort	Percent of Total Effort*	Whitefish	Lake trout	Siscowet	Cisco	Salmon	Rainbow	Brown Trout	Walleye	Northern Pike	Total Harvest Round Pounds	Percent of Total Harvest	
MI-2	1313	56,000	5.3%	14,800	225	0	0	0	0	0	0	0	0		
	1315	120,000	11.4%	24,995	125	0	0	0	0	0	0	0	0		
	1316	260,000	24.7%	53,542	349	50	0	0	0	0	0	0	0		
	1317	108,000	10.2%	20,680	117	0	0	0	0	0	0	0	0		
	1413	77,400	7.3%	10,215	96	0	6,250	0	0	0	0	0	0		
	1414	102,000	9.7%	12,478	74	94	0	0	0	0	0	0	0		
	1512	330,800	31.4%	36,463	1,235	0	0	0	0	0	0	0	0		
	Effort:	1,054,200	22.1%	173,173	2,221	144	6,250	0	0	0	0	0	0	213,068.7	30.0%
	Dressed Pounds:				202,612.4	2,776.3	180.0	7,500.0	0.0	0.0	0.0	0	0		
	Round Pounds:														
MI-3	925	4,500	0.2%	3,900	141	0	0	0	0	0	0	0	0		
	1023	381,500	18.6%	72,353	1,271	100	0	0	0	0	0	0	0		
	1024	4,500	0.2%	2,590	122	0	0	0	0	0	0	0	0		
	1121	1,260,000	61.5%	134,789	1,869	269	0	0	0	0	0	0	0		
	1122	357,400	17.5%	47,224	1,991	1,070	820	0	0	0	0	0	0		
	1220	40,000	2.0%	4,604	154	0	0	0	0	0	0	0	0		
	Effort:	2,047,900	42.9%	265,459	5,547	1,439	820	0	0	0	0	0	0	320,303.5	45.1%
	Dressed Pounds:				310,587.0	6,933.8	1,798.8	984.0	0.0	0.0	0.0	0	0		
	Round Pounds:														
	MI-4	1026	112,000	9.2%	8,717	971	5	0	0	0	0	0	0	0	
1027		100,000	8.2%	9,777	1,824	5	0	0	0	0	0	0	0		
1125		190,000	15.6%	13,110	2,567	600	0	0	0	0	0	0	0		
1223		42,000	3.4%	1,504	1,325	150	0	0	0	0	0	0	0		
1224		548,000	44.9%	31,843	21,665	728	0	0	0	0	0	0	0		
1323		106,400	8.7%	2,604	2,392	0	1	0	0	0	10	0	0		
1324		22,800	1.9%	1,448	527	0	0	0	0	0	0	0	0		
1423		98,500	8.1%	3,830	3,157	82	4,180	490	98	0	0	0	0		
Effort:		1,219,700	25.5%	72,832	34,428	1,569	4,181	490	98	0	0	0	0	135,971.9	19.1%
Dressed Pounds:					85,213.4	43,035.0	1,961.3	5,017.2	612.5	122.5	0.0	10	0		
Round Pounds:															
MI-5	1428	385,800	84.8%	14,909	8,328	0	1,954	366	21	16	3	37	0		
	1429	69,200	15.2%	3,799	4,638	0	0	29	0	0	0	0	0		
	Effort:	455,000	9.5%	18,708	12,966	0	1,954	395	21	16	3	37	0		
	Dressed Pounds:				21,888.4	16,207.5	0.0	2,344.8	493.8	26.3	20.0	3	37	41,020.7	5.8%
Round Pounds:															
Grand Totals:	Effort:	4,776,800		530,172	55,162	3,152	13,205	885	119	16	13.0	37.0	710,364.7		
	Dressed Pounds:			620,301.2	68,952.5	3,940.0	15,846.0	1,106.3	148.8	20.0	13.0	37.0	710,364.7		
Round Pounds:															

*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 2010.

Unit	Mesh	Effort	Percent of										Total Harvest Round Pounds		
			Total Effort*	Whitefish	Lake trout	Siscowet	Cisco	Salmon	Rainbow	Brown Trout	Walleye	Northern Pike			
MI-2	2.93	17,400	1.7%	0	0	0	6,250	0	0	0	0	0	0	0	0
MI-2	4.5	1,036,800	98.3%	173,173	2,221	144	0	0	0	0	0	0	0	0	0
Subtotals:	Effort:	1,054,200	22.1%	173,173	2,221	144	6,250	0	0	0	0	0	0	0	0
	Dressed Pounds:			202,612.4	2,776.3	180.0	7,500.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	213,068.7
	Round Pounds:			95.1%	1.3%	0.1%	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Percent of Unit Harvest:														
MI-3	2.93	5,400	0.3%	0	0	0	820	0	0	0	0	0	0	0	0
MI-3	4.5	2,042,500	99.7%	265,459	5,547	1,439	0	0	0	0	0	0	0	0	0
Subtotals:	Effort:	2,047,900	42.9%	265,459	5,547	1,439	820	0	0	0	0	0	0	0	0
	Dressed Pounds:			310,587.0	6,933.8	1,798.8	984.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	320,303.5
	Round Pounds:			97.0%	2.2%	0.6%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Percent of Unit Harvest:														
MI-4	2.5	800	0.1%	0	0	0	3,380	490	0	0	0	0	0	0	0
MI-4	4.5	1,194,100	97.9%	65,808	34,230	1,569	801	0	0	0	10	0	0	0	0
MI-4	4.5625	6,800	0.6%	1,947	70	0	0	0	98	0	0	0	0	0	0
MI-4	5.0	18,000	1.5%	5,077	128	0	0	0	0	0	0	0	0	0	0
Subtotals:	Effort:	1,219,700	25.5%	72,832	34,428	1,569	4,181	490	98	0	0	0	0	0	0
	Dressed Pounds:			85,213.4	43,035.0	1,961.3	5,017.2	612.5	122.5	0.0	10.0	0.0	0.0	0.0	135,971.9
	Round Pounds:			62.7%	31.6%	1.4%	3.7%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Percent of Unit Harvest:														
MI-5	4.5	455,000	100.0%	18,708	12,966	0	1,954	395	21	16	3	37	0	0	0
Subtotals:	Effort:	455,000	9.5%	18,708	12,966	0	1,954	395	21	16	3	37	0	0	0
	Dressed Pounds:			21,888.4	16,207.5	0.0	2,344.8	493.8	26.3	20.0	3.0	37.0	0.0	0.0	41,020.7
	Round Pounds:			53.4%	39.5%	0.0%	5.7%	1.2%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	
	Percent of Unit Harvest:														
Totals:	Effort:	4,776,800		530,172	55,162	3,152	13,205	885	119	16	13	37	0	0	0
	Dressed Pounds:			620,301.2	68,952.5	3,940.0	15,846.0	1,106.3	148.8	20.0	13.0	37.0	0.0	0.0	710,364.7
	Round Pounds:			87.3%	9.7%	0.6%	2.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	Percent of Total Harvest:														

*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 2010.*

Unit	Tribe	TOTAL HARVEST						TARGET HARVEST						
		Effort	Whitefish pounds	CPE	Lake trout pounds	CPE	Siscowet pounds	Effort	Whitefish pounds	CPE	Lake trout pounds	CPE	Siscowet pounds	
MI-2	Bad River	316,800	40,643	128	1,413	4	144	0	0	0	0	0	0	0
	Keweenaw Bay	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red Cliff	737,400	132,530	180	808	1	0	0	184	808	1	0	0	0
	subtotal	1,054,200	173,173	164	2,221	2	144	0	173,173	167	2,221	2	0	0
MI-3	Bad River	0	0	0	0	0	0	0	0	0	0	0	0	0
	Keweenaw Bay	118,000	12,088	102	1,050	9	800	7	12,088	102	1,050	9	0	0
	Red Cliff	1,929,900	253,371	131	4,497	2	639	0	253,371	132	4,497	2	0	0
	subtotal	2,047,900	265,459	130	5,547	3	1,439	1	265,459	130	5,547	3	0	0
MI-4	Bad River	0	0	0	0	0	0	0	0	0	0	0	0	0
	Keweenaw Bay	813,700	34,075	42	30,011	37	1,560	2	33,637	42	29,573	37	2,400	82
	Red Cliff	406,000	38,757	95	4,417	11	9	0	38,757	95	4,417	11	0	0
	subtotal	1,219,700	72,832	60	34,428	28	1,569	1	72,394	60	33,990	28	2,400	82
MI-5	Bad River	0	0	0	0	0	0	0	0	0	0	0	0	0
	Keweenaw Bay	455,000	18,708	41	12,966	28	0	0	18,554	41	12,966	29	0	0
	Red Cliff	0	0	0	0	0	0	0	0	0	0	0	0	0
	subtotal	455,000	18,708	41	12,966	28	0	0	18,554	41	12,966	29	0	0
Total	Bad River	316,800	40,643	128	1,413	4	144	0	40,643	128	1,413	4	0	0
	Keweenaw Bay	1,386,700	64,871	47	44,027	32	2,360	2	64,279	47	43,589	32	2,400	82
	Red Cliff	3,073,300	424,658	138	9,722	3	648	0	424,658	139	9,722	3	0	0
	All Tribes	4,776,800	530,172	111	55,162	12	3,152	1	529,580	112	54,724	12	2,400	82

*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 2010*

Unit	Grid	Whitefish			Lake trout			Siscowet			Rainbow Trout			Cisco		
		Effort	pounds	CPE	Effort	pounds	CPE	Effort	pounds	CPE	Effort	pounds	CPE	Effort	pounds	CPE
MI-2	1313	56,000	14,800	264	56,000	225	4									
	1315	120,000	24,995	208	120,000	125	1									
	1316	260,000	53,542	206	260,000	349	1									
	1317	108,000	20,680	191	108,000	117	1									
	1413	60,000	10,215	170	60,000	96	2									
	1414	102,000	12,478	122	102,000	74	1									
	1512	330,800	36,463	110	330,800	1,235	4									
	subtotal	1,036,800	173,173	167	1,036,800	2,221	2	0	0	0	0	0	0	0	0	0
MI-3	925	4,500	3,900	867	4,500	141	31									
	1023	381,500	72,353	190	381,500	1,271	3									
	1024	4,500	2,590	576	4,500	122	27									
	1121	1,260,000	134,789	107	1,260,000	1,869	1									
	1122	352,000	47,224	134	352,000	1,991	6									
	1220	40,000	4,604	115	40,000	154	4									
		subtotal	2,042,500	265,459	130	2,042,500	5,547	3	0	0	0	0	0	0	0	0
MI-4	1026	112,000	8,717	78	112,000	971	9									
	1027	100,000	9,777	98	100,000	1,824	18									
	1125	190,000	13,110	69	190,000	2,567	14									
	1223	42,000	1,504	36	42,000	1,325	32									
	1224	548,000	31,843	58	548,000	21,665	40									
	1323	106,400	2,604	24	106,400	2,392	22									
	1324	22,800	1,448	64	22,800	527	23									
1423	90,100	3,392	38	90,100	2,719	30										
	subtotal	1,211,300	72,394	60	1,211,300	33,990	28	2,400	82	34	400	48	400	48	120	120
MI-5	1428	380,800	14,755	39	380,800	8,328	22									
	1429	69,200	3,799	55	69,200	4,638	67									
	subtotal	450,000	18,554	41	450,000	12,966	29	0	0	0	0	0	0	0	0	0
Grand Total		4,740,600	529,580	112	4,740,600	54,724	12	2,400	82	34	400	48	400	48	120	120

*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 1985-2010. Target effort for whitefish and lake trout was combined.

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-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	
Average:		398,110	73,193	184	73,304	398,110	6,949	17	7,029	11,531	2,105	183	4,036
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	
Average:		1,846,152	187,291	101	188,065	1,846,152	17,853	10	18,081	53,477	6,113	114	15,194
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	
Average:		3,017,583	184,327	67	187,196	3,017,583	67,908	26	71,054	232,944	23,174	96	39,524

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	
2010	450,000	18,554	41	18,708	450,000	12,966	29	12,966	0	0	0	0	
Average:		428,524	26,857	63	27,084	428,524	20,034	47	20,281	11,628	460	40	2,762
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	
2010	4,740,600	529,580	112	530,172	4,740,600	54,724	12	55,162	2,400	82	34	3,152	
Average:		5,673,887	470,634	83	474,607	5,673,887	111,974	20	115,665	309,132	31,835	103	61,410

Table 6. Age and size composition of hatchery and wild lake trout by unit from tribal commercial harvests during 2010. 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	Number Weighed	mean	sd
MI-2									
Wild									
			0	54	23.4	4.0	10	4.4	2.6
		4	1	1	16.0		1	0.9	
		5	4	4	20.8	0.3	2	3.1	0.0
		6	4	4	19.3	4.4	1	5.7	
		7	11	11	22.6	1.9	10	4.6	2.0
		8	20	20	20.0	2.6	6	4.3	2.0
		9	12	12	21.9	3.6	6	4.0	1.0
		10	18	18	22.0	2.5	12	4.3	2.2
		11	13	13	22.7	3.4	4	6.4	3.9
		12	13	13	23.3	2.9	7	3.6	1.8
		13	5	5	22.9	2.4	2	3.9	1.8
		14	5	5	25.3	5.4	4	5.5	4.5
		15	2	2	20.3	3.5	0		
		16	1	1	19.3		0		
		17	2	2	21.4	0.8	1	3.7	
		18	2	2	19.9	0.1	1	2.2	
		19	2	2	22.5	2.1	2	3.1	0.6
		20	1	1	32.4		1	12.1	
		22	2	2	20.7	1.8	2	2.8	0.8
Sample Size:			118	172			72		
Means:			10.4		22.4	3.6		4.4	2.4
MI-3									
Hatchery									
		9	1	1	22.2		1	3.9	
Wild									
			0	7	23.1	2.1	7	4.1	1.0
		5	3	3	22.5	3.0	3	3.8	1.0
		6	5	5	20.8	2.5	5	3.1	1.3
		7	5	5	21.9	1.8	5	3.4	0.8
		8	9	9	24.9	1.8	9	5.2	1.2
		9	9	9	21.6	3.1	9	3.5	1.6
		10	3	3	24.5	0.9	3	4.9	0.7
		11	5	5	23.6	1.3	5	4.1	0.9
		12	5	5	25.5	1.9	5	5.3	1.1
		13	5	5	26.9	1.6	5	6.1	1.7
		15	1	1	24.4		1	4.4	
		16	1	1	25.3		1	5.1	
		25	1	1	31.7		1	10.7	
		36	1	1	38.0		1	17.9	
Sample Size:			54	61			61		
Means:			10.1		23.9	3.4		4.7	2.4
MI-4									
Wild									
		7	1	1	19.3		1	2.0	
Sample Size:			1	1			1		
Means:			7.0		19.3			2.0	

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 2010.

Unit	Length Category (Inches)	Fish Examined	Type AI, AII, AIII Wounds	Wounds per 100 fish	Scars	Scars per 100 fish
MI-2						
	1: < 17	6	0	0.0	0	0.0
	2: 17-20.9	60	0	0.0	0	0.0
	3: 21-24.9	69	1	1.4	1	1.4
	4: 25-28.9	33	2	6.1	1	3.0
	5: > 29	4	0	0.0	0	0.0
	Total:	172	3	1.7	2	1.2
MI-3						
	1: < 17	1	0	0.0	0	0.0
	2: 17-20.9	9	0	0.0	0	0.0
	3: 21-24.9	30	0	0.0	0	0.0
	4: 25-28.9	18	2	11.1	2	11.1
	5: > 29	3	0	0.0	6	200.0
	Total:	61	2	3.3	8	13.1
MI-4						
	2: 17-20.9	1	0	0.0	0	0.0
	Total:	1	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, 1988-2010.

Management Unit	Year	Ages	Wild and Hatchery Lake Trout Combined					Wild Lake Trout					
			Instantaneous total mortality	95% confidence limit for	Annual mortality	Annual Survival	Instantaneous total mortality	95% confidence limit for	Annual mortality	Annual Survival			
			Z	Z	A	S	Z	Z	A	S			
MI-2	1988	9-13	0.41	+/- 0.31	0.33	0.67	0.41	9-13	0.41	+/- 0.31	0.33	0.67	
	1990	8-12	0.71	+/- 0.25	0.51	0.49	0.75	8-11	0.75	+/- 0.42	0.53	0.47	
	1998	7-13	0.39	+/- 0.11	0.32	0.68	0.39	7-13	0.39	+/- 0.11	0.32	0.68	
	1999	7-13	0.29	+/- 0.16	0.25	0.75	0.26	7-13	0.26	+/- 0.16	0.23	0.77	
	2000	9-13	0.22	+/- 0.30	0.20	0.80	0.22	9-13	0.22	+/- 0.34	0.20	0.80	
	2001	9-15	0.34	+/- 0.10	0.29	0.71	0.33	9-15	0.33	+/- 0.10	0.28	0.72	
	2002	9-11	0.46	+/- 0.03	0.37	0.63	0.46	9-11	0.46	+/- 0.03	0.37	0.63	
	2005	6-17	0.23	+/- 0.05	0.21	0.79	0.23	6-17	0.23	+/- 0.05	0.21	0.79	
	2006	7-13	0.25	+/- 0.03	0.22	0.78	0.25	7-13	0.25	+/- 0.03	0.22	0.78	
	2007	10-13	0.61	+/- 0.17	0.46	0.54	0.61	10-13	0.61	+/- 0.17	0.46	0.54	
	2008	8-12	0.28	+/- 0.16	0.25	0.75	0.28	8-12	0.28	+/- 0.16	0.25	0.75	
	2009	8-16	0.25	+/- 0.04	0.21	0.79	0.25	8-16	0.25	+/- 0.04	0.21	0.79	
	2010	8-16	0.35	+/- 0.06	0.30	0.70	0.35	8-16	0.35	+/- 0.06	0.30	0.70	
MI-3	1988	11-13	0.78	+/- 0.45	0.54	0.46	0.65	9-13	0.65	+/- 0.40	0.48	0.52	
	1989	8-11	0.64	+/- 0.09	0.47	0.53	0.72	8-12	0.72	+/- 0.08	0.51	0.49	
	1991	8-11	0.40	+/- 0.33	0.33	0.67	0.47	8-11	0.47	+/- 0.35	0.38	0.63	
	1992	7-13	0.37	+/- 0.36	0.31	0.69	Insufficient data.						
	1995	8-11	0.56	+/- 0.33	0.43	0.57	0.52	8-11	0.52	+/- 0.33	0.41	0.60	
	1996	8-13	0.28	+/- 0.19	0.24	0.76	0.24	8-13	0.24	+/- 0.27	0.21	0.79	
	1997	7-11	0.21	+/- 0.20	0.19	0.81	0.18	7-11	0.18	+/- 0.21	0.17	0.84	
	1999	7-16	0.04	+/- 0.09	0.20	0.80	0.22	7-16	0.22	+/- 0.10	0.20	0.80	
	2000	7-11	0.20	+/- 0.45	0.18	0.82	0.20	7-11	0.20	+/- 0.45	0.18	0.81	
	2002	7-20	0.31	+/- 0.04	0.27	0.73	0.31	7-20	0.31	+/- 0.04	0.27	0.73	
	2003	7-14	0.29	+/- 0.07	0.25	0.87	0.28	7-14	0.28	+/- 0.08	0.24	0.87	
	2004	8-17	0.39	+/- 0.05	0.32	0.68	0.39	8-17	0.39	+/- 0.04	0.32	0.68	
	2005	9-15	0.32	+/- 0.08	0.27	0.73	0.32	9-15	0.32	+/- 0.08	0.27	0.73	
2006	9-11	0.50	+/- 0.01	0.39	0.61	0.60	9-11	0.60	+/- 0.04	0.45	0.55		
2007	10-13	0.41	+/- 0.10	0.34	0.66	0.40	10-13	0.40	+/- 0.09	0.33	0.67		
2008	8-16	0.27	+/- 0.16	0.24	0.76	0.32	11-15	0.32	+/- 0.09	0.27	0.73		
2009	10-18	0.35	+/- 0.05	0.30	0.70	0.35	10-18	0.35	+/- 0.05	0.30	0.70		
2010	9-16	0.31	+/- 0.08	0.27	0.73	0.29	8-16	0.29	+/- 0.06	0.25	0.75		

Table 8. Continued.

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

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 2010. Weight is in round pounds, length is in inches, and sd=standard deviation.

Unit	Age	Number	Number	Length (in.)		Number	Weight (lbs)	
		Aged	Measured	mean	sd	Weighed	mean	sd
MI-2								
		0	267	20.0	1.5	119	2.8	0.8
	5	5	5	18.6	1.0	5	2.5	1.2
	6	15	15	20.0	1.3	15	2.5	0.5
	7	31	31	19.4	1.6	31	2.2	0.6
	8	35	35	19.4	1.4	35	2.4	0.6
	9	34	34	20.2	1.3	34	2.6	0.7
	10	40	40	20.1	1.4	40	2.7	0.6
	11	48	48	20.6	1.5	48	2.8	0.6
	12	40	40	20.5	1.3	40	2.8	0.5
	13	25	25	21.2	1.8	25	3.0	0.8
	14	19	19	21.1	1.4	18	3.1	0.7
	15	16	16	20.6	1.2	16	3.0	0.7
	16	4	4	21.1	1.0	4	3.2	0.6
	17	4	4	21.9	2.1	4	2.9	0.4
	18	6	6	23.4	2.4	6	4.4	1.6
	19	1	1	21.2		1	3.1	
	21	2	2	20.8	5.1	2	2.9	1.9
Sample Size:		325	592			443		
Means:		10.6		20.2	1.6		2.7	0.8
MI-3								
		0	119	19.7	1.2	119	2.5	0.6
	6	1	1	16.5		1	1.5	
	7	1	1	19.2		1	2.1	
	8	6	6	18.3	2.8	6	2.0	0.7
	9	6	6	19.1	0.4	6	2.2	0.1
	10	18	18	19.8	0.9	18	2.3	0.3
	11	27	27	20.0	1.5	27	2.7	0.9
	12	67	67	19.6	1.3	67	2.4	0.4
	13	66	66	19.8	1.1	66	2.5	0.4
	14	46	46	20.1	1.1	46	2.5	0.5
	15	51	51	20.4	1.3	51	2.7	0.6
	16	31	31	20.4	1.5	31	2.7	0.8
	17	17	17	20.0	1.0	17	2.6	0.4
	18	14	14	20.4	1.0	14	2.7	0.4
	19	7	7	20.5	1.0	7	2.7	0.5
	20	8	8	20.2	1.1	8	2.3	0.3
	21	6	6	20.6	0.7	6	2.5	0.3
	22	2	2	20.8	0.9	2	2.8	0.5
	23	3	3	20.1	0.6	3	2.4	0.2
	25	1	1	21.2		1	2.4	
	26	1	1	19.7		1	2.2	
Sample Size:		379	498			498		
Means:		13.9		19.9	1.3		2.5	0.5

Table 9. Continued.

Unit	Age	Number		Length (in.)		Number		Weight (lbs)	
		Aged	Measured	mean	sd	Weighed	mean	sd	
MI-4		0	22	20.7	1.0	22	2.5	0.4	
	5	1	1	18.5		1	1.7		
	6	1	1	19.0		1	1.9		
	7	2	2	20.8	0.8	2	2.6	0.5	
	8	2	2	20.9	0.6	2	2.3	0.0	
	9	5	5	19.5	0.6	5	2.1	0.2	
	10	5	5	20.7	1.6	5	2.5	0.5	
	11	8	8	19.8	0.6	8	2.2	0.3	
	12	13	13	19.8	0.7	13	2.2	0.3	
	13	12	12	20.3	0.7	12	2.3	0.2	
	14	4	4	20.7	0.9	4	2.4	0.3	
	15	2	2	21.8	0.9	2	2.9	0.3	
	19	2	2	23.0	0.6	2	3.4	0.7	
	20	2	2	21.3	0.3	2	2.8	0.0	
Sample Size:		59	81			81			
Means:	11.9			20.4	1.1		2.4	0.4	

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 2010. Weight is in round pounds, length is in inches, and sd=standard deviation.

Species	Unit	Age	Number	Number	Length (in.)		Number	Weight (lbs)	
			Aged	Measured	mean	sd	Weighed	mean	sd
Cisco									
	MI-2		0	5	14.2	1.4	5	0.9	0.2
		5	1	1	13.8		1	0.8	
		6	5	5	15.0	0.5	5	1.1	0.2
		7	8	8	15.2	1.2	8	1.1	0.3
		8	15	15	15.3	1.3	15	1.1	0.4
		9	17	17	15.0	0.9	17	1.1	0.3
		10	12	12	15.8	1.6	12	1.2	0.4
		11	15	15	15.3	0.8	15	1.1	0.2
		12	17	17	16.1	2.6	17	1.1	0.2
		13	6	6	16.0	1.7	6	1.3	0.5
		14	2	2	17.0	1.3	2	1.4	0.5
		15	5	5	14.8	1.1	5	0.9	0.2
		16	2	2	16.6	1.6	2	1.2	0.3
		18	2	2	14.7	0.8	2	1.0	0.2
		19	1	1	18.4		1	1.7	
		21	1	1	16.3		1	1.5	
		23	1	1	17.6		1	1.5	
Sample Size:			110	115			115		
Means:			10.6		15.5	1.6		1.1	0.3
MI-4									
		2	1	1	17.6		1	2.0	
		6	1	1	16.7		1	1.3	
		7	1	1	19.0		1	1.8	
		8	1	1	11.7		1	0.5	
		9	1	1	15.2		1	1.0	
		10	1	1	17.0		1	1.3	
		11	1	1	18.0		1	1.5	
		12	1	1	16.7		1	1.4	
Sample Size:			8	8			8		
Means:			8.1		16.5	2.2		1.3	0.5
Coho salmon									
MI-4									
		2	1	1	16.7		1	1.4	
Sample Size:			1	1			1		
Means:			2.0		16.7			1.4	
Siscowet									
MI-2									
		9	1	1	18.5		1	3.7	
		12	4	4	20.2	1.4	4	2.9	0.8
		13	1	1	22.0		1	3.3	
		14	1	1	20.0		1	2.0	
		17	1	1	25.5		1	5.5	
Sample Size:			8	8			8		
Means:			12.6		20.9	2.3		3.3	1.2