Biological and Commercial Catch Statistics from the Chippewa Inter-Tribal Gill Net Fishery within Michigan Waters of Lake Superior During 2005

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ABSTRACT

The 2005 commercial inter-tribal fishery in the 1842 treaty-ceded waters of Michigan consisted of seven (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 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 lake herring fishery through a quota system.

Fishermen reported fishing 4.4 million feet of gill net and harvesting 601,289 round pounds of fish. Whitefish was the primary target species, making up 81.7% of the total, followed by lake trout (17.1%), and lake herring (0.6%). The remaining 0.6% consisted of siscowet, salmon, walleye, trout (rainbow and brown), suckers, northern pike, smelt, and burbot.

TABLE OF CONTENTS

LIST OF FIGURES

PAGE

LIST OF TABLES

ACKNOWLEDGMENTS

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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 2005 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 (7) 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 only gear used in the fishery during 2005.

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

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

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
Herring	1.20
Round whitefish (menominee)	1.15
Chub	1.20

Harvest of other species (walleye, sucker, smelt, 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 4.4 million feet of gill net and harvesting 601,289 round pounds of fish. Whitefish was the primary target species, making up 81.7% of the total, followed by lake trout (17.1%), and lake herring (0.6%). The remaining 0.6% consisted of siscowet, salmon, walleye, trout (rainbow and brown), suckers, northern pike, smelt, and burbot.

Unit MI-2

Harvest. Twenty-seven percent of the overall harvest was taken in MI-2 (Table 1). Of the 160,358 round pounds harvested in MI-2, 94.2% were whitefish, 5.5% lake trout, 0.2% siscowet, and 0.1% walleye (Table 2). Lake trout harvest was highest in grid 1512 (2,357 dressed pounds) but less than 2,500 dressed pounds were taken in each of the five statistical grids fished (Figure 2). Whitefish harvest was greatest in grid 1413 (71,879 dressed pounds), followed by grids 1512 and 1414 (28,598 and 21,131 dressed pounds, respectively). Less than 15,000 pounds were taken in each of the other two grids fished (Figure 3).

Effort. Thirteen 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 577,600 feet with 40% (230,800 feet) occurring in grid 1413 (Figure 4). Gill-nets of 4 ½ inch mesh accounted for 454,400 feet or 79% 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 (577,600 feet) and harvest of whitefish (129,062 dressed pounds) was greater than the 1985-2005 average (239,833 feet and 39,791 dressed pounds, respectively). Target lake trout harvest (7,103 dressed pounds) was near the 1985-2005 average of 7,062 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 19-311 pounds (Table 4). Whitefish CPE for the five grids combined was 223 above the average CPE of 166 for this unit for the 21 year period 1985-2005 (Table 5). Lake trout CPE for targeted fishing ranged from 9-130 per grid and was 12 for all grids combined, below the1985-2005 average CPE of 29 pounds.

Unit MI-3

Harvest. Twenty-four percent of the overall harvest was taken in MI-3 (Table 1). Of the 144,199 round pounds harvested in MI-3, 95.9% were whitefish and 4.1% lake trout (Table 2). Harvest occurred in five statistical grids. Lake trout harvest was greatest in grids 1024 and 1122 (1,580 and 1,504 dressed pounds respectively), but less than 2,500 dressed pounds in each of the five grids fished (Figure 2). Whitefish harvest was greatest in grid 1121 (68,430 dressed pounds) followed by grid 1023 (26,145 dressed pounds). Whitefish harvest was less than 15,000 pounds in each of the other three grids fished (Figure 3).

Effort. Twenty-nine 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 1,246,400 feet with 65% (810,000 feet) occurring in grid 1121 and over 100,000 feet fished in two other grids (1219 and 1023) (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 in MI-3 was targeted at whitefish and lake trout (Table 4). Target gill-net effort (1.25 million feet) was below the 1985-2005 average of 1.85 million feet (Table 5). Target harvest of whitefish (118,185 dressed pounds) was below the 1985-2005 average (154,355 dressed pounds). Target harvest of lake trout (4,738 dressed pounds) was also below the 1985-2005 average (19,639 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 52-145 pounds (Table 4). Whitefish CPE for the five grids combined was 95 pounds and above the average CPE of 84 for this unit for the 21 year period 1985-2005 (Table 5). Lake trout CPE for targeted fishing ranged from 1-31 pounds and was 4 for all grids combined, below the 1985-2005 average CPE of 11 pounds.

Unit MI-4

Harvest. Thirty-seven percent of the overall harvest was taken in MI-4 (Table 1). Of the 221,989 round pounds harvested, 75.2% were whitefish, 23.1% lake trout, 1.4% herring, 0.1% siscowet, and 0.2% salmon (Table 2). Harvest occurred in eleven statistical grids. Lake trout harvest was highest in grid 1224 (15,004 dressed pounds), greater than 7,500 pounds in two other grids (1423 and 1223), and greater than 2,500 pounds in another two grids (1323 and 1026) (Figure 2). Less than 2,500 dressed pounds were harvested in each of the other six grids fished. Whitefish harvest was also greatest in grid 1224 (49,988 dressed pounds) and exceeded 15,000 pounds in two other grids (1126 and 1223) (Figure 3). Less than 15,000 dressed pounds were harvested in each of the other eight grids fished.

Effort. Thirty-nine percent of the overall gill-net effort occurred in MI-4 (Table 1) which was fished by three tribes (Table 3). Fishing effort in MI-4 was 1,695,070 feet with all but 30,800 feet being large mesh effort (Table 2). Effort was greatest in grid 1224 (553,000 feet or 33% of the unit's effort) and exceeded 250,000 feet in two other grids (1125 and 1223) (Figure 4). Gill-nets of 4 ½ inch mesh accounted for 1,597,700 feet or 94% of the unit's effort (Figure 5).

Target Effort and Harvest. The majority of fishing effort (1,660,670 feet) was targeted at whitefish and lake trout with 30,000 feet directed at lake herring, 3,600 feet targeted at sucker, and 800 feet targeted at smelt (Table 4). Target effort for whitefish and lake trout (1.7 million feet) was lower than the 1985-2005 average of 3.4 million feet (Table 5). Target harvest of whitefish (142,676 dressed pounds) was below the 1985-2005 average (205,040 dressed pounds). Target harvest of lake trout (41,026 dressed pounds) was also below the 1985-2005 average (73,560 dressed pounds). Target harvest was 2,475 dressed pounds for herring, 72 round pounds for sucker, and 26 round pounds for smelt.

Catch Per Effort (CPE). Whitefish CPE (pounds harvested per 1,000 feet of gill-net) for targeted fishing in the eleven grids fished ranged from 8-888 pounds (Table 4). Whitefish CPE for the eleven grids combined was 86 pounds and above the average CPE of 60 for this unit for the 21 year period 1985-2005 (Table 5). Lake trout CPE for targeted fishing ranged from 3-54 pounds and was 25 for all grids combined, near the 1985-2005 average CPE of 22 pounds. CPE for targeted effort was 83 dressed pounds for herring, 20 round pounds for sucker, and 33 round pounds for smelt.

Unit MI-5

Harvest. Twelve percent of the overall harvest was taken in MI-5 (Table 1). Of the 74,743 round pounds harvested in MI-5, 46.9% were whitefish, 49.4% lake trout, 1.7% salmon, 1.1% herring, 0.6% siscowet, and 0.3% other species (Table 2). Harvest occurred in four statistical grids. Lake trout harvest was highest in grid 1529 (20,534 dressed pounds) and exceeded 2,500 dressed pounds in two other grids (1428 and 1327) (Figure 2). Whitefish harvest was also greatest in grid 1529 (17,618 dressed pounds). Less than 15,000 dressed pounds were harvested in each of the other three grids fished (Figure 3).

Effort. Nineteen 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 841,760 feet with 68% (575,950 feet) occurring in grid 1529 (Figure 4). Gill-nets of 4 ½ inch mesh accounted for 512,750 feet or 61% of the unit's effort (Table 2 and Figure 5).

Target Effort and Harvest. The majority of fishing effort (835,070 feet) was targeted at whitefish and lake trout with 5,500 feet directed at lake herring, and 1,190 feet targeted at siscowet (Table 4). Gill net effort targeted at whitefish and lake trout (0.8 million feet) was the highest reported and higher than the 1986-2005 average of 0.38 million feet (Table 5). Target harvest of whitefish (29,985 dressed pounds) was above the 1986-2005 average (27,500 dressed pounds). Target harvest of lake trout (29,505 dressed pounds) was lower than in 2004 (31,827 dressed pounds) and higher than the 1986-2005 average (19,263 dressed pounds).

Catch Per Effort (CPE). Whitefish CPE (pounds harvested per 1,000 feet of gill-net) for targeted fishing in the four grids fished ranged from 0-62 pounds (Table 4). Whitefish CPE for the four grids combined was 36 pounds and below the average CPE of 72 for this unit for the 20 year period 1986-2005 (Table 5). Lake trout CPE for targeted fishing ranged from 30-43 pounds and was 35 for all grids combined, below the 1986-2005 average CPE of 50 pounds.

Biological Statistics

Lake Trout MI-2

Two age groups of hatchery fish (4, 9) and fourteen year classes of wild trout (5-17, 21) were represented in a sample of 79 lake trout aged from MI-2 (Table 6). Mean age of hatchery and wild fish was 6.5 and 9.1 years, respectively. Fish ten years and older made up 31% of the wild component of the catch.

For wild fish mean length for the 80 fish measured was 22.4 inches and mean weight for the 80 fish weighed was 2.9 pounds round. Average size at age of 7-9 year old wild lake trout has decreased and become narrower since 1985, while average size of age 10 wild fish has fluctuated due to low sample size in some years (Figure 6).

Lamprey marking rates were 1.2 wounds/100 fish (Table 7). Annual total mortality was estimated to be 21% ($Z=0.23 \pm 0.05$) for wild fish ages 6-17 (Table 8).

Lake Trout MI-3

Eleven age groups of wild lake trout (6-15, and 18) were represented in the 57 fish aged (Table 9). Mean age was 10.4 years, mean length for 62 fish measured was 21.6 inches and mean weight for these 62 fish was 3.3 pounds round. Average size at age of 7-10 year old wild lake trout has decreased and become narrower since 1985 (Figure 6).

Overall lamprey-marking rates were 3.0 wounds and 3.0 scars/100 fish, with fish 25-28.9 inches exhibiting the highest scarring rate (Table 7). Annual total mortality rate was estimated at 27% ($Z=0.32, \pm 0.08$) for wild fish for ages 9-15 (Table 8).

Lake Trout MI-4

Ten age groups of hatchery fish (6-15) and seventeen year classes of wild trout (5-18, 20, 23, and 25) were represented in a sample of 236 lake trout aged from MI-4 (Table 10). Mean age of hatchery and wild fish was 10.5 and 11.0 years, respectively. Fish ten years and older made up 68% of the wild component of the catch.

Mean length of the 285 fish sampled was 22.5 inches and mean weight of the 284 fish weighed was 3.7 round pounds (Table 10). The average size of wild fish (22.5 inches, 3.7 pounds) was similar to hatchery fish (22.2 inches, 3.7 pounds). Average length of wild fish at ages 7-10 has decreased and become narrower since 1985 (Figure 6).

Lamprey marking rates were 2.1 wounds and 1.8 scars/100 fish (Table 7). Annual total mortality was estimated to be 25% ($Z=0.29 \pm 0.06$) for wild fish ages 8-18 and 27% ($Z=0.31 \pm 0.06$) for wild and hatchery fish combined (Table 8).

Lake Trout MI-5

One hatchery fish (age 9) and thirteen year classes of wild trout (5-15, 17, 19) were represented in a sample of 75 lake trout aged from MI-5 (Table 11). Mean age of wild fish was 9.6 years. Fish ten years and older made up 45% of the wild component of the catch.

Mean length and weight of the 81 fish sampled was 23.6 inches and 4.7 round pounds (Table 11). The average size of wild fish was 23.7 inches and 4.7 pounds; the hatchery fish was 21.7 inches and 3.3 pounds. Average length of wild fish at ages 7-10 has been tracked since 1987 (Figure 6). The variation in the average length of wild fish at ages 7-10 has become narrower since 1987.

Lamprey marking rates were zero wounds and 3.7 scars/100 fish (Table 7). Annual total mortality was estimated to be 28% ($Z=0.33 \pm 0.03$) for wild fish ages 8-17 (Table 8).

Lake Whitefish MI-2

Ten age groups (6-15) were represented in the 214 whitefish aged in MI-2 which had a mean age of 9.0 years (Table 12). Average length and weight of lake whitefish was 19.8 inches and 2.7 pounds. The average length of age 7 to 10 year old fish has generally been similar since 1995 (Figure 7). Annual total mortality was estimated at 51% ($Z=0.73$ +/-0.09) for ages 8-15.

Lake Whitefish MI-3

Nine age groups (6-14) were represented in the 653 whitefish aged in MI-3, which had a mean age of 8.9 years (Table 12). The large 1990-93 year classes (age 12-15) comprised only 6% of the sample, while the 1996 and 1997 year classes (ages 9 and 8) comprised 27% and 28%, respectively. Average length and weight of 658 lake whitefish sampled was 19.5 inches and 2.5 round pounds, respectively. The average length of age 7 to 10 year old fish has generally been similar since 1995 (Figure 7). Annual total mortality was estimated at 46% ($Z=0.62$ +/-0.08) for ages 8-14.

Lake Whitefish MI-4

Ten age groups (6-14, 17) were represented in the 577 whitefish aged in MI-4, which had a mean age of 9.0 years (Table 12). The large 1990-93 year classes (age 12-15) comprised only 3% of the sample, while the 1996 and 1997 year classes (ages 9 and 8) comprised 26% and 36%, respectively. Average length and weight of 591 lake whitefish sampled was 20.4 inches and 2.9 round pounds, respectively. The average length of age 7 to 10 year old fish, which had increased from 1998-2002, remained low in 2005 (Figure 7). Annual total mortality was estimated at 63% ($Z=0.99$ +/-0.16) for ages 9-14.

Lake Whitefish MI-5

Nine age groups (7-15) were represented in the 26 whitefish aged in MI-5 (Table 12). Mean age was 10.3 years, mean length was 23.1 inches, and mean weight was 4.7 round pounds. The average length of age 7 to 10 year old fish has generally shown the most variation of any of the units since 1995 (Figure 7). Annual total mortality was estimated at 31% (Z=0.38 +/-0.13) for ages 10-15.

Siscowet

There were ten age groups of siscowet in the 12 fish sampled in units MI-5 and MI-4 (Table 13). Small sample size prevented the calculation of mortality rates.

Lake Herring and Menominee Whitefish

In MI-4 twelve age groups (4-14, 16) were represented in 34 fish aged; mean age was 8.8, mean length was 14.7 inches and mean weight was 1.2 round pounds (Table 14). For the sixth consecutive year otoliths replaced scale samples as the aging structure used to assign age to individual fish. Total annual mortality was estimated at 28% (Z=0.33 +/-0.11) for ages 8-14.

Two menominee whitefish were sampled in 2005. Both were age 5. Average size was 13.8 inches and 0.6 round pounds (Table 15).

Coho and Chinook Salmon

Only one chinook salmon was sampled from MI-4 in 2005 (Table 16). It was age 5 and 14.2 inches. Weight was not recorded.

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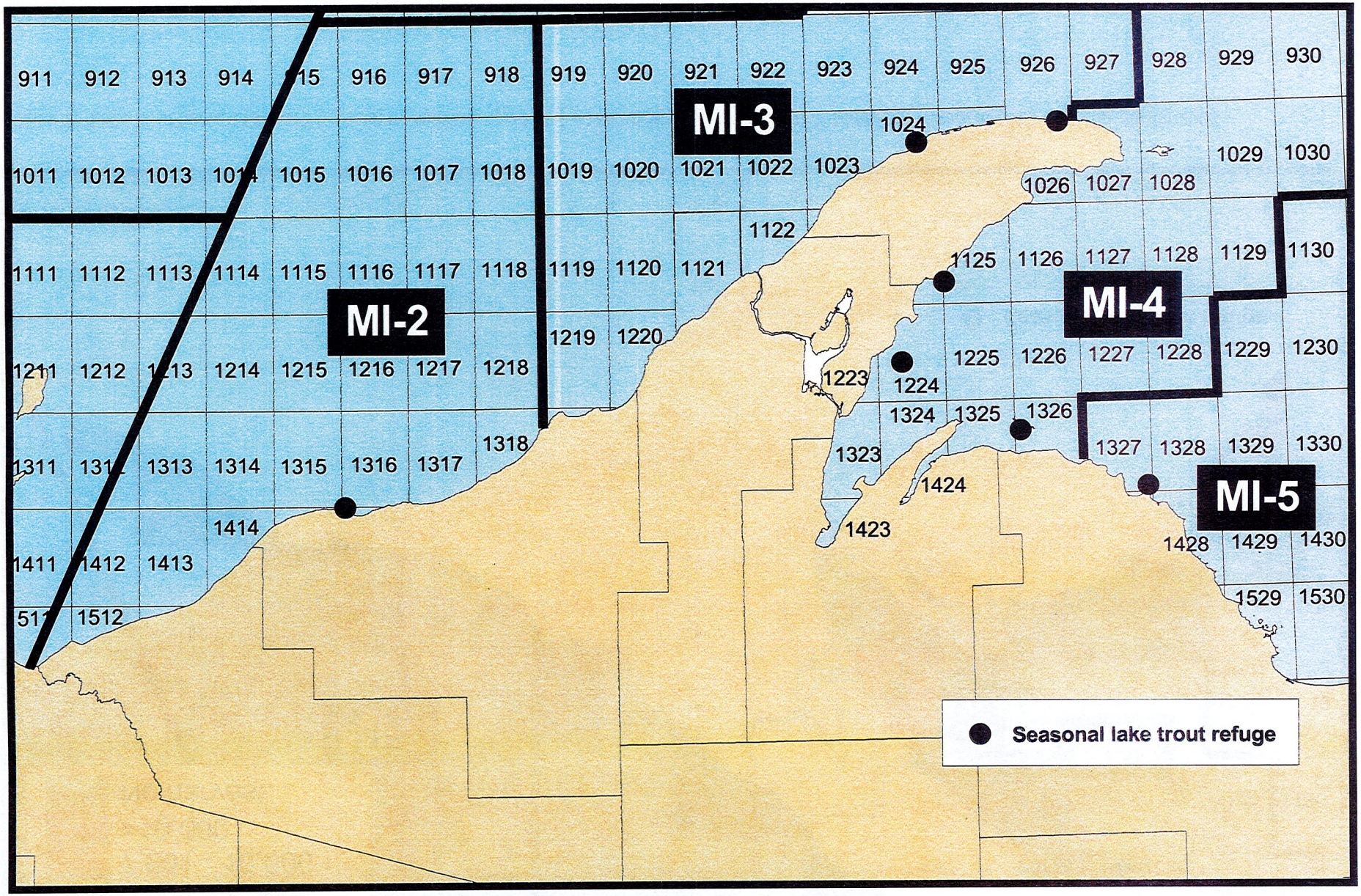

Figure 1. Management units and statistical grids in the 1842 treaty ceded area within Michigan waters of Lake Superior.

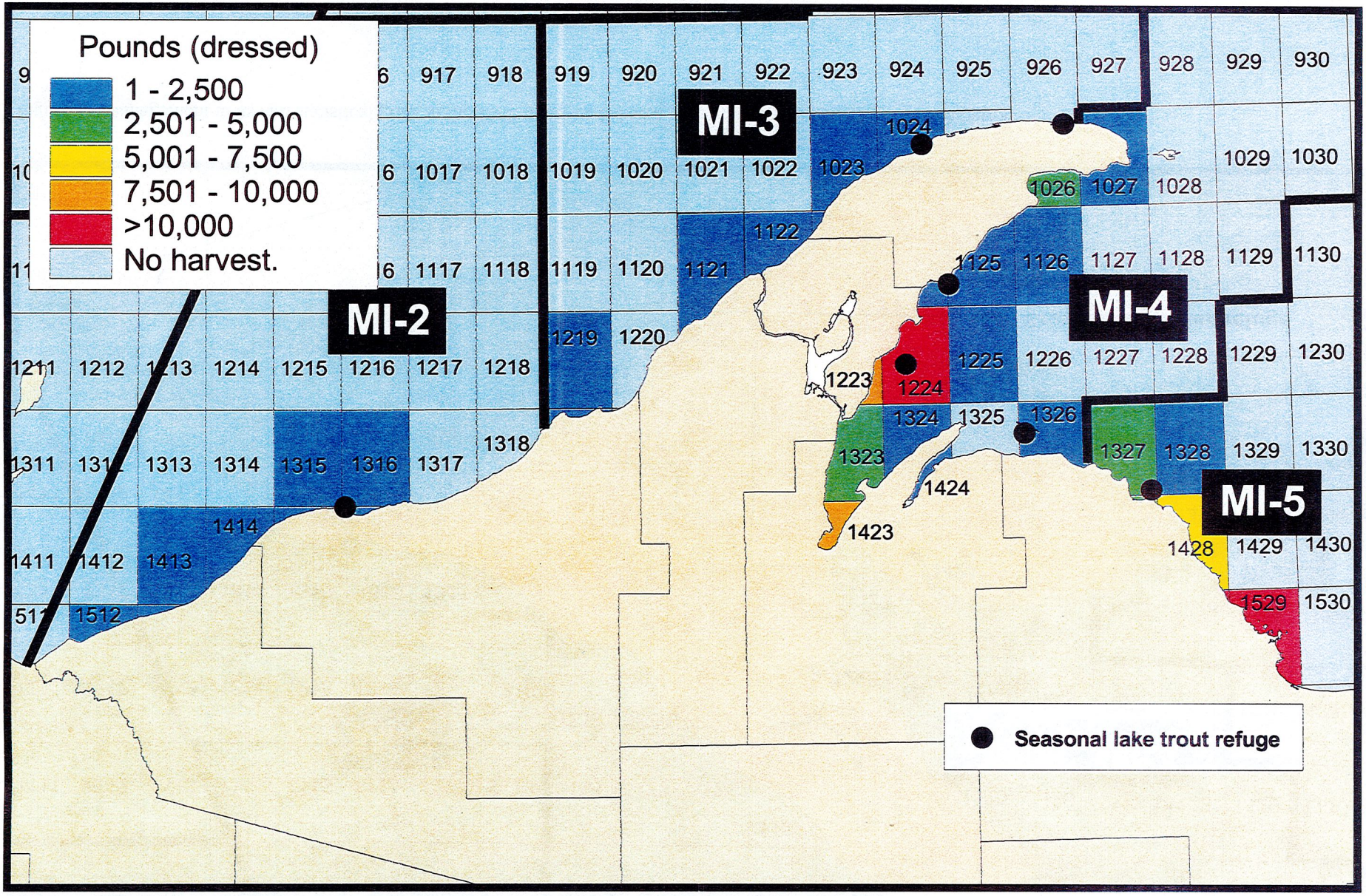

Figure 2. Lake trout harvest (dressed pounds) by statistical grid in the 1842 treaty ceded area within Michigan waters of Lake Superior during 2005.

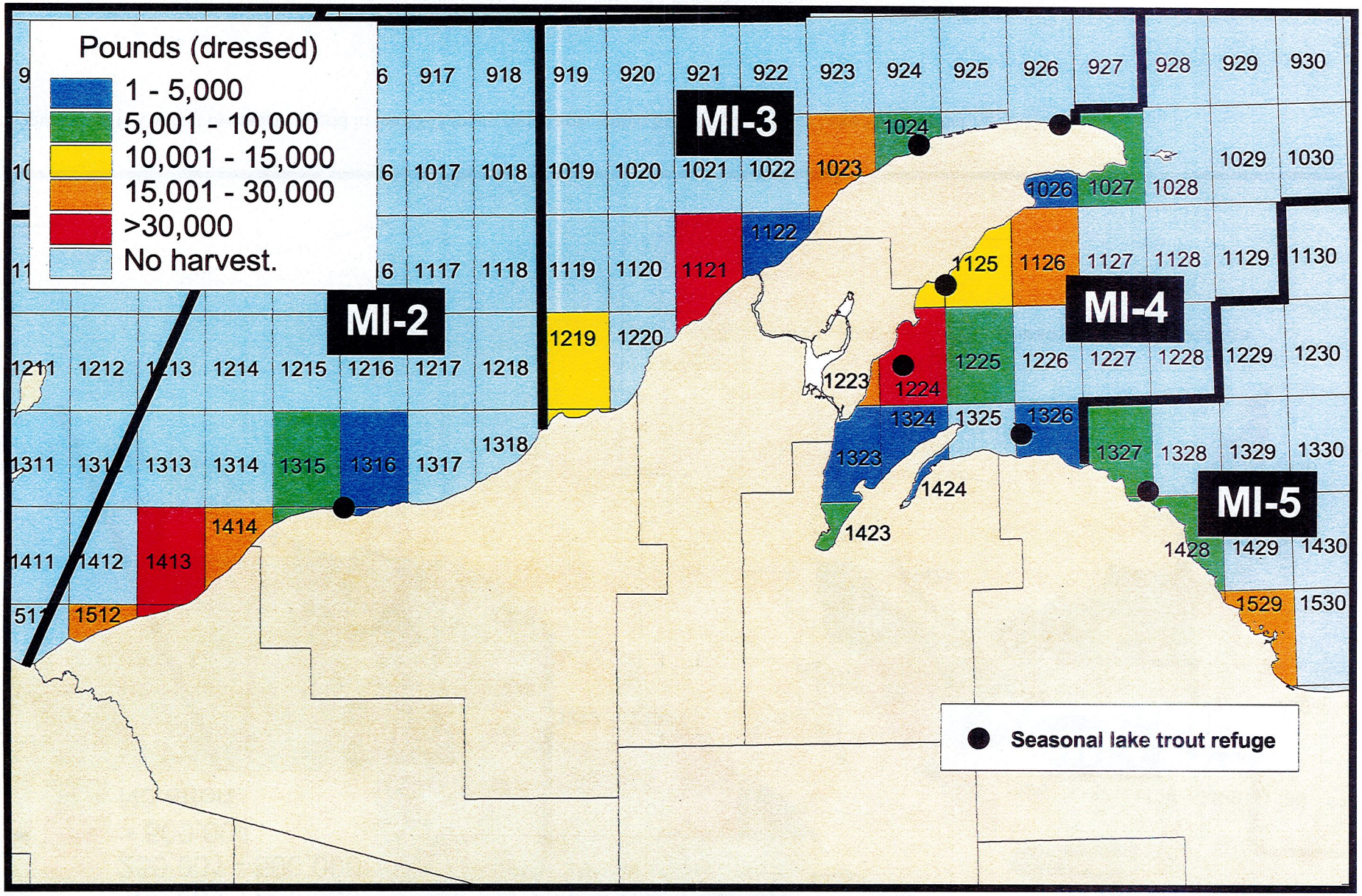

Figure 3. Whitefish harvest (dressed pounds) by statistical grid in the 1842 treaty ceded area within Michigan waters of Lake Superior during 2005.

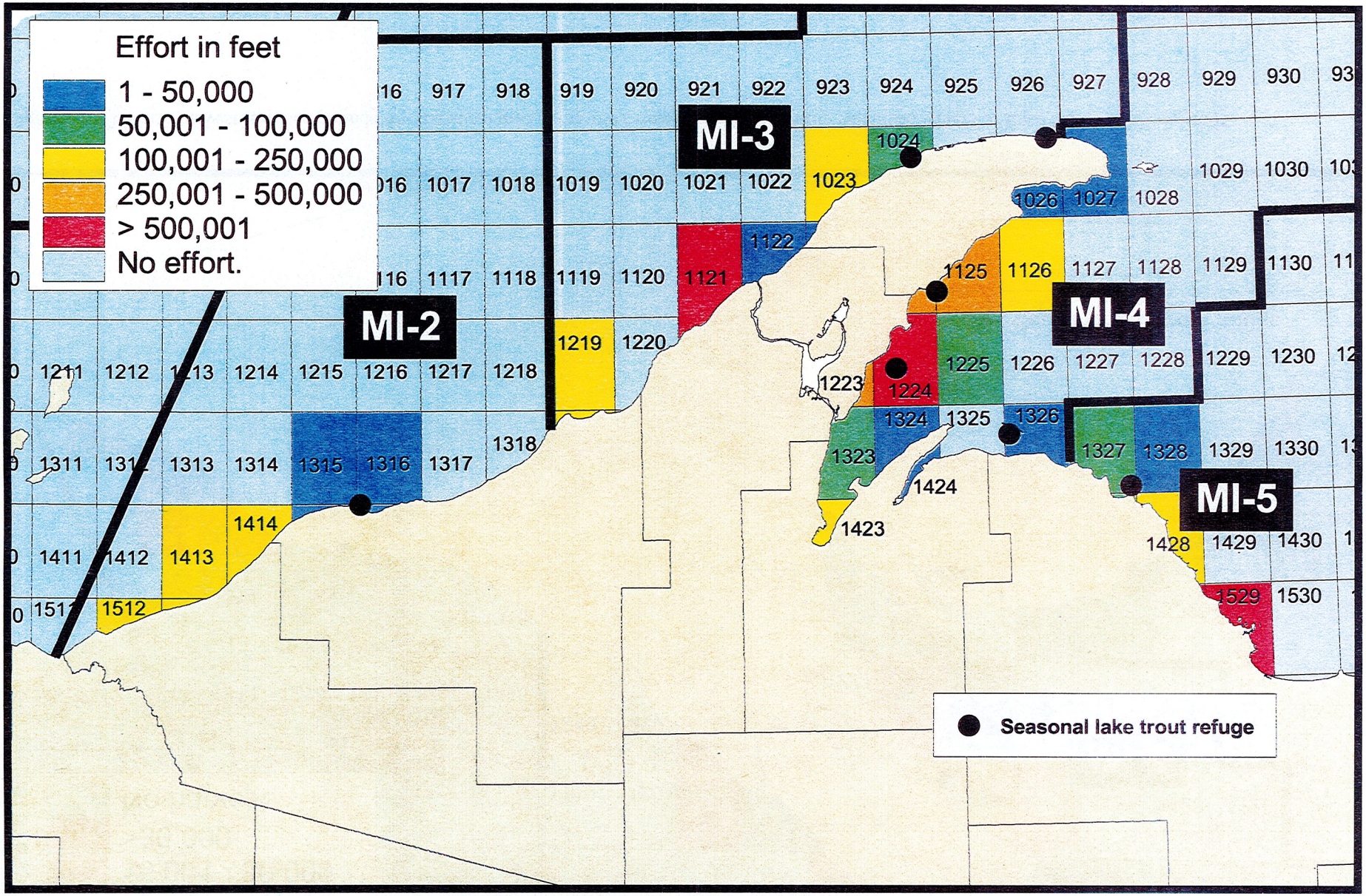

Figure 4. Effort in feet by statistical grid in the 1842 treaty ceded area within Michigan waters of Lake Superior during 2005.

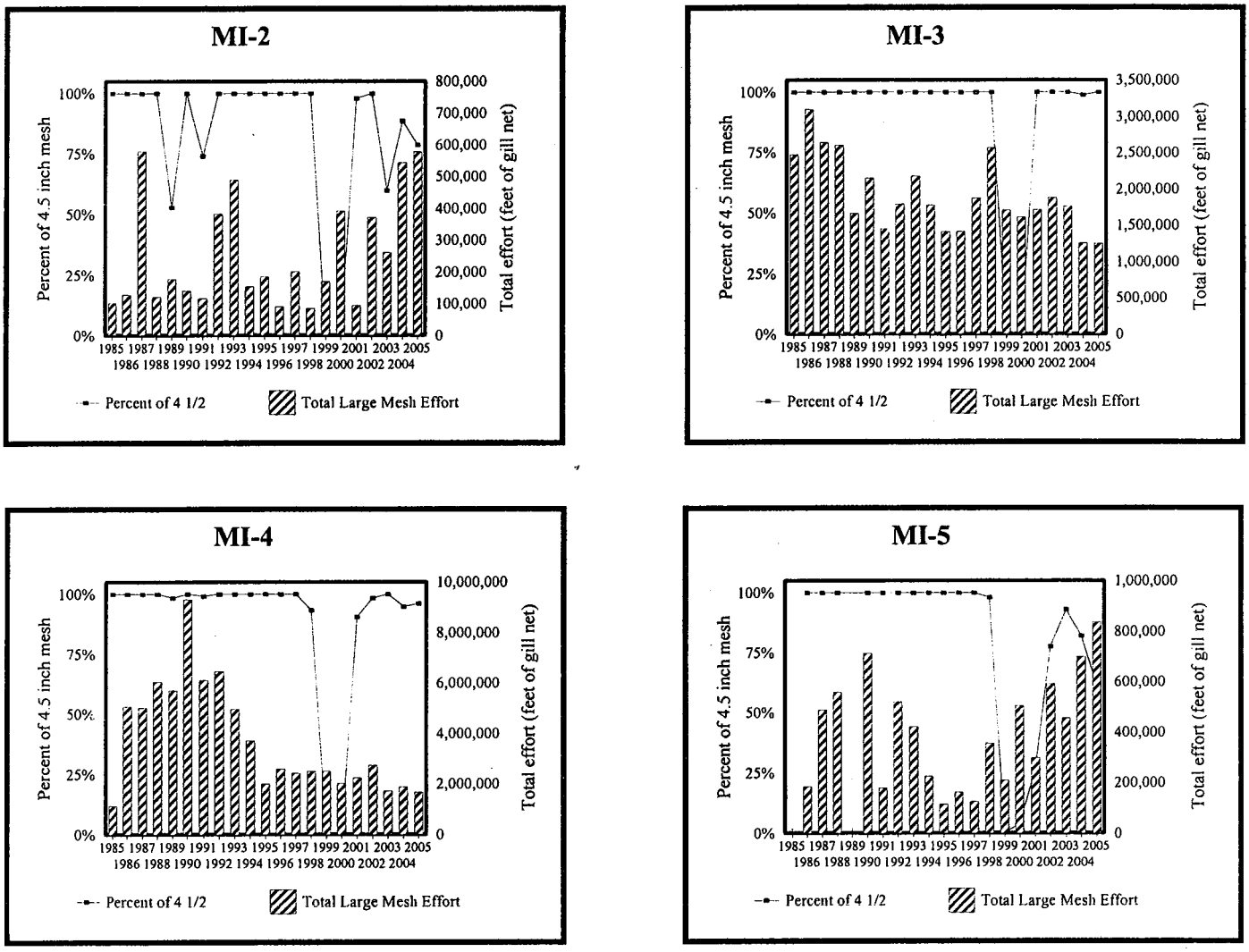

Figure 5. Total tribal large mesh gill net effort and percent composed of 4 1/2 inch mesh by management unit, 1985 to 2005.

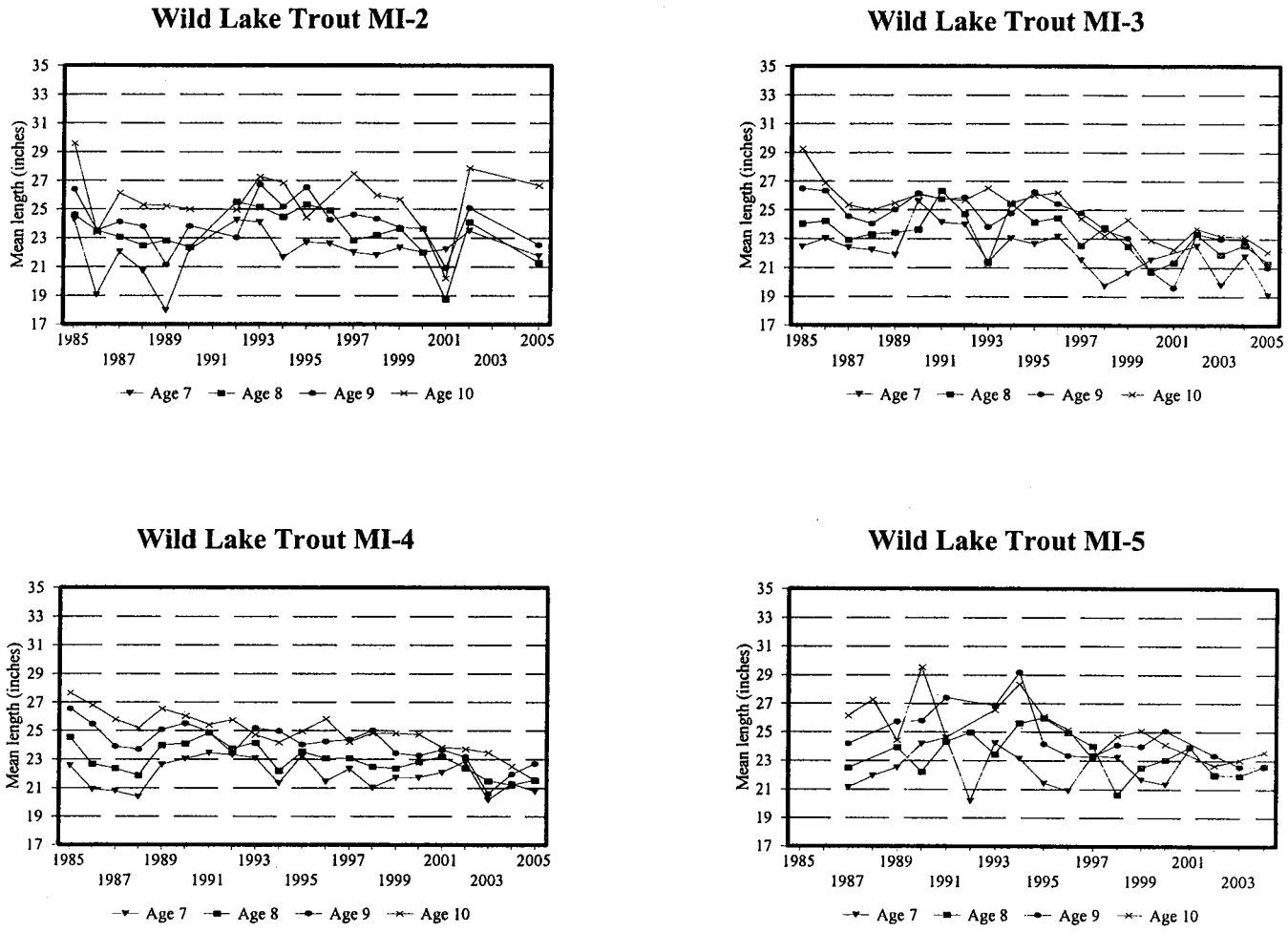

Figure 6. Trends in average length (inches) of wild lake trout (ages 7-10) in Michigan management units within the 1842 treaty ceded area, from 1985-2005.

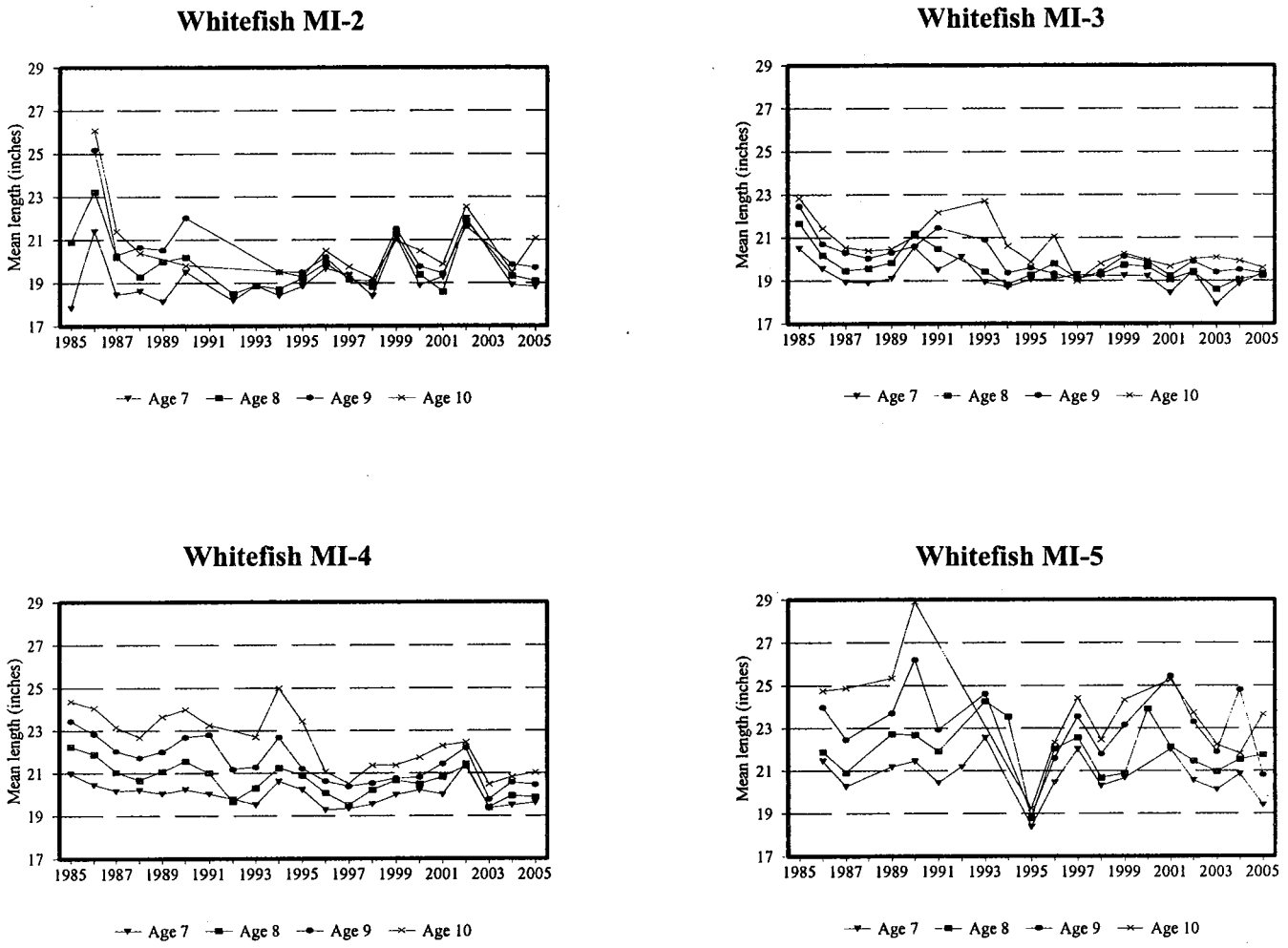

Figure 7. Trends in average length (inches) of whitefish (ages 7-10) in Michigan management units within the 1842 treaty ceded area, from 1985-2005.

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 2005.

Management Unit	Grid	Effort	Percent of Total Effort*	Lake trout	Whitefish	Siscowet	Herring	Salmon	Trout	Walleye	Northern Pike	Sucker	Smelt	Burbot	Total Harvest Round Pounds	Percent of Total Harvest
MI-2	1315	49,000	8.5%	1,100	7,379	0	0	0	0	0	0	0	0	0		
	1316	4,000	0.7%	520	75	10	0	0	0	8	0	0	0	0		
	1413	230,800	40.0%	1,979	71,879	250	0	0	0	0	0	0	0	0		
	1414	113,000	19.6%	1,147	21,131	0	0	0	0	0	0	0	0	0		
	1512	180,800	31.3%	2,357	28,598	20	14	0	0	102	0	0	0	0		
Subtotals:	Effort:	577,600	13.2%													
	Dressed Pounds:			7,103	129,062	280	14	0	0							
	Round Pounds:			8,878.8	151,002.5	350.0	16.8	0.0	0.0	110	0	0	0	0	160,358.1	26.7%
MI-3	1023	180,000	14.4%	630	26,145	0	0	0	0	0	0	0	0	0		
	1024	88,000	7.1%	1,580	9,116	0	0	0	0	0	0	0	0	0		
	1121	810,000	65.0%	793	68,430	0	0	0	0	0	0	0	0	0		
	1122	48,000	3.9%	1,504	2,499	0	0	0	0	0	0	0	0	0		
	1219	120,000	9.6%	231	11,995	0	0	0	0	0	0	0	0	0		
Subtotals:	Effort:	1,246,000	28.6%													
	Dressed Pounds:			4,738	118,185	0	0	0	0							
	Round Pounds:			5,922.5	138,276.5	0.0	0.0	0.0	0.0	0	0	0	0	0	144,199.0	24.0%
MI-4	1026	49,700	2.9%	2,688	4,367	0	0	116	0	0	0	0	0	0		
	1027	8,000	0.5%	40	7,102	0	0							0		
	1125	278,000	16.4%	1,350	13,920	0	0	0	0	0	0	0	0	0		
	1126	140,000	8.3%	1,720	28,743	0	0	0	0	0	0	0	0	0		
	1223	267,000	15.8%	8,115	16,790	0	0	0	0	0	0	0	0	0		
	1224	553,000	32.6%	15,004	49,988	0	0	0	0	4	0	0	0	3		
	1225	96,000	5.7%	316	9,140	0	0	0	0	0	0	0	0	0		
	1323	64,500	3.8%	2,739	2,840	40	0	0	0	0	0	0	0	0		
	1324	21,000	1.2%	700	1,500	0	0	0	0	0	0	0	0	0		
	1326	3,570	0.2%	24	28	0	0	0	0	0	0	0	0	0		
	1423	214,300	12.6%	8,330	8,258	83	2,518	260	20	0	0	72	26	0		
Subtotals:	Effort:	1,695,070	38.9%													
	Dressed Pounds:			41,026	142,676	123	2,518	376	20							
	Round Pounds:			51,282.5	166,930.9	153.8	3,021.6	470.0	25.0	4	0	72	26	3	221,988.8	36.9%
MI-5	1327	96,580	11.5%	2,893	5,934	60	0	110	0	0	0	0	0	0		
	1328	1,400	0.2%	60	0	0	0	0	0	0	0	0	0	0		
	1428	167,830	19.9%	6,043	6,436	253	60	108	0	0	0	0	0	0		
	1529	575,950	68.4%	20,534	17,618	70	614	816	51	44	50	0	0	7		
Subtotals:	Effort:	841,760	19.3%													
	Dressed Pounds:			29,530	29,988	383	674	1,034	51							
	Round Pounds:			36,912.5	35,086.0	478.8	808.8	1,292.5	63.8	44	50	0	0	7	74,743.3	12.4%
Grand Totals:	Effort:	4,360,430														
	Dressed Pounds:			82,397	419,911	786	3,206	1,410	71							
	Round Pounds:			102,996.3	491,295.9	982.5	3,847.2	1,762.5	88.8	158	50	72	26	10	601,289.1	

*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 2005.

Unit	Mesh	Effort	Percent of Total Effort*	Lake trout	Whitefish	Siscowet	Herring	Salmon	Trout	Walleye	Other^	Total Harvest Round Pounds
MI-2	4.5	454,400	78.7%	4,287	116,516	10	0	0	0	8	0	
	5	106,400	18.4%	2,226	11,246	20	14	0	0	102	0	
	5.25	16,800	2.9%	590	1,300	250	0	0	0	0	0	
Subtotals:	Effort:	577,600	13.2%									
	Dressed Pounds:			7,103	129,062	280	14	0	0			
	Round Pounds:			8,878.8	151,002.5	350.0	16.8	0.0	0.0	110.0	0.0	160,358.1
Percent of Unit Harvest:				5.5%	94.2%	0.2%	0.0%	0.0%	0.0%	0.1%	0.0%	
MI-3	4.5	1,246,000	100.0%	4,738	118,185	0	0	0	0	0	0	
Subtotals:	Effort:	1,246,000	28.6%									
	Dressed Pounds:			4,738	118,185	0	0	0	0			
	Round Pounds:			5,922.5	138,276.5	0.0	0.0	0.0	0.0	0.0	0.0	144,199.0
Percent of Unit Harvest:				4.1%	95.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
MI-4	.5	800	0.0%	0	0	0	23	0	0	0	26	
	2.75	30,000	1.8%	0	0	0	2,475	175	20	0	0	
	4.5	1,597,700	94.3%	40,593	114,509	123	20	201	0	4	72	
	5.0	3,000	0.2%	40	140	0	0	0	0	0	0	
	5.5	3,570	0.2%	24	28	0	0	0	0	0	0	
	4.5-5	60,000	3.5%	369	27,999	0	0	0	0	0	3	
Subtotals:	Effort:	1,695,070	.38.9%									
	Dressed Pounds:			41,026	142,676	123	2,518	376	20			
	Round Pounds:			51,282.5	166,930.9	153.8	3,021.6	470.0	25.0	4.0	101.0	221,988.8
Percent of Unit Harvest:				23.1%	75.2%	0.1%	1.4%	0.2%	0.0%	0.0%	0.0%	
MI-5	3.0	5,500	0.7%	19	0	0	396	0	0	0	0	
	4.5	512,750	60.9%	18,869	17,946	130	242	578	51	44	57	
	5.0	134,600	16.0%	3,329	2,303	3	16	204	0	0	0	
	5.25	123,470	14.7%	3,346	7,767	92	20	121	0	0	0	
	5.5	65,440	7.8%	3,967	1,972	158	0	131	0	0	0	
Subtotals:	Effort:	841,760	19.3%									
	Dressed Pounds:			29,530	29,988	383	674	1,034	51			
	Round Pounds:			36,912.5	35,086.0	478.8	808.8	1,292.5	63.8	44.0	57.0	74,743.3
Percent of Unit Harvest:				49.4%	46.9%	0.6%	1.1%	1.7%	0.1%	0.1%	0.1%	
Totals:	Effort:	4,360,430										
	Dressed Pounds:			82,397	419,911	786	3,206	1,410	71			
	Round Pounds:			102,996.3	491,295.9	982.5	3,847.2	1,762.5	88.8	158.0	158.0	601,289.1
Percent of Total Harvest:				17.1%	81.7%	0.2%	0.6%	0.3%	0.0%	0.0%	0.0%	

*For subtotals, percentage refers to percent of overall effort fished in unit.
^Other is the sum of northern pike, sucker, smelt and burbot.

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 2005.*

		TOTAL HARVEST							TARGET HARVEST							
			Whitefish		Lake trout		Siscowet			Whitefish		Lake trout			Siscowet	
Unit	Tribe	Effort	pounds	CPE	pounds	CPE	pounds	CPE	Effort	pounds	CPE	pounds	CPE	Effort	pounds	CPE
MI-2	Bad River	213,600	30,473	143	5,057	24	280	1	213,600	30,473	143	5,057	24			0
	Keweenaw Bay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red Cliff	364,000	98,589	271	2,046	6	0	0	364,000	98,589	271	2,046	6	0	0	0
	subtotal	577,600	129,062	223	7,103	12	280	0	577,600	129,062	223	7,103	12	0	0	0
MI-3	Bad River	66,000	4,130	63	2,006	30	0	0	66,000	4,130	63	2,006	30	0	0	0
	Keweenaw Bay	94,000	9,000	96	1,575	17	0	0	94,000	9,000	96	1,575	17	0	0	0
	Red Cliff	1,086,000	105,055	97	1,157	1	0	0	1,086,000	105,055	97	1,157	1	0	0	0
	subtotal	1,246,000	118,185	95	4,738	4	0	0	1,246,000	118,185	95	4,738	4	0	0	0
MI-4	Bad River	397,000	26,228	66	13,935	35	0	0	397,000	26,228	66	13,935	35	0	0	0
	Keweenaw Bay	648,070	35,083	54	23,796	37	123	0	613,670	35,083	57	23,796	39	0	0	0
	Red Cliff	650,000	81,365	125	3,295	5	0	0	650,000	81,365	125	3,295	5	0	0	0
	subtotal	1,695,070	142,676	84	41,026	24	123	0	1,660,670	142,676	86	41,026	25	0	0	0
MI-5	Bad River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Keweenaw Bay	841,760	29,988	36	29,530	35	383	0	835,070	29,985	36	29,505	35	1,190	60	50
	Red Cliff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	subtotal	841,760	29,988	36	29,530	35	383	0	835,070	29,985	36	29,505	35	1,190	60	0
Total	Bad River	676,600	60,831	90	20,998	31	280	0	676,600	60,831	90	20,998	31	0	0	0
	Keweenaw Bay	1,583,830	74,071	47	54,901	35	506	0	1,542,740	74,068	48	54,876	36	1,190	60	0
	Red Cliff	2,100,000	285,009	136	6,498	3	0	0	2,100,000	285,009	136	6,498	3	0	0	0
	All Tribes	4,360,430	419,911	96	82,397	19	786	0	4,319,340	419,908	97	82,372	19	1,190	60	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 2005.*

		Whitefish			Lake trout			Siscowet			Sucker			Herring			Smelt		
Unit	Grid	Effort	pounds	CPE	Effort	pounds	CPE	Effort	pounds	CPE	Effort	pounds	CPE	Effort	pounds	CPE	Effort	pounds	CPE
MI-2	1315	49,000	7,379	151	49,000	1,100	22												
	1316	4,000	75	19	4,000	520	130												
	1413	230,800	71,879	311	230,800	1,979	9												
	1414	113,000	21,131	187	113,000	1,147	10												
	1512	180,800	28,598	158	180,800	2,357	13												
	subtotal	577,600	129,062	223	577,600	7,103	12	0	0	0	0	0	0	0	0	0	0	0	0
MI-3	1023	180,000	26,145	145	180,000	630	4												
	1024	88,000	9,116	104	88,000	1,580	18												
	1121	810,000	68,430	84	810,000	793	1												
	1122	48,000	2,499	52	48,000	1,504	31												
	1219	120,000	11,995	100	120,000	231	2												
	subtotal	1,246,000	118,185	95	1,246,000	4,738	4	0	0	0	0	0	0	0	0	0	0	0	0
MI-4	1026	49,700	4,367	88	49,700	2,688	54												
	1027	8,000	7,102	888	8,000	40	5												
	1125	278,000	13,920	50	278,000	1,350	5												
	1126	140,000	28,743	205	140,000	1,720	12												
	1223	267,000	16,790	63	267,000	8,115	30												
	1224	553,000	49,988	90	553,000	15,004	27												
	1225	96,000	9,140	95	96,000	316	3												
	1323	64,500	2,840	44	64,500	2,739	42												
	1324	21,000	1,500	71	21,000	700	33												
	1326	3,570	28	8	3,570	24	7												
	1423	179,900	8,258	46	179,900	8,330	46				3,600	72	20	30,000	2,475	83	800	26	33
	subtotal	1,660,670	142,676	86	1,660,670	41,026	25	0	0	0	3,600	72	20	30,000	2,475	83	800	26	33
MI-5	1327	95,390	5,931	62	95,390	2,887	30	1,190	60	50									
	1328	1,400	0	0	1,400	60	43												
	1428	167,830	6,436	38	167,830	6,043	36												
	1529	570,450	17,618	31	570,450	20,515	36							5,500	396	72			
	subtotal	835,070	29,985	36	835,070	29,505	35	1,190	60	50	0	0	0	5,500	396	72	0	0	0
Grand Total		4,319,340	419,908	97	4,319,340	82,372	19	1,190	60	50	3,600	72	20	35,500	2,871	81	800	26	33

*Pounds are in dressed weight (except for sucker and smelt are round 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 1985-2005. Target effort for whitefish and lake trout was combined.

		Whitefish				Lake trout				Siscowet			
Unit	Year	Target effort	Target harvest	CPE	Total Harvest	Target effort	Target harvest	CPE	Total Harvest	Target effort	Target harvest	CPE	Total Harvest
MI-2	1985	101,100	5,664	56	5,664	101,100	9,238	91	9,238	0	0	0	45
	1986	128,000	16,234	127	16,234	128,000	7,550	59	7,550	0	0	0	63
	1987	576,200	80,246	139	80,246	576,200	18,568	32	18,633	3,200	0	0	2,059
	1988	98,000	2,809	29	2,809	98,000	17,374	177	17,374	24,000	4,945	206	5,377
	1989	178,000	33,511	188	33,511	178,000	13,488	76	13,488	0	0	0	4,181
	1990	113,000	22,867	202	24,012	113,000	2,789	25	3,269	28,000	8,145	291	13,308
	1991	136,800	32,003	234	32,003	136,800	5,273	39	5,273	0	0	0	812
	1992	217,000	44,814	207	45,377	217,000	2,290	11	2,332	166,000	25,946	156	27,476
	1993	419,100	74,220	177	74,473	419,100	7,780	19	8,263	52,400	10,029	191	18,680
	1994	148,200	17,629	119	17,629	148,200	7,790	53	7,790	5,000	747	149	1,990
	1995	155,000	11,236	73	12,160	155,000	9,729	63	10,104	15,000	3,307	221	6,682
	1996	89,600	4,418	49	4,418	89,600	7,777	87	7,777	1,200	3	3	189
	1997	196,300	19,512	99	19,512	196,300	10,675	54	11,302	5,000	1,608	322	2,311
	1998	85,400	10,250	120	10,250	85,400	3,125	37	3,125	0	0	0	250
	1999	170,100	31,466	185	31,466	170,100	1,130	7	1,130	0	0	0	3,628
	2000	391,800	120,494	308	120,494	391,800	3,925	10	3,925	0	0	0	3,911
	2001	95,000	16,944	178	16,944	95,000	463	5	463	0	0	0	1,483
	2002	371,800	43,377	117	43,377	371,800	3,582	10	3,582	0	0	0	6,667
	2003	261,600	37,887	145	37,887	261,600	2,910	11	2,910	0	0	0	1,700
	2004	526,900	80,959	154	80,959	526,900	5,745	11	5,745	0	0	0	26
	2005	577,600	129,062	223	129,062	577,600	7,103	12	7,103	0	0	0	280
Average:		239,833	39,791	166	39,928	239,833	7,062	29	7,161	14,276	2,606	183	4,815
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
Average:		1,848,362	154,355	84	155,313	1,848,362	19,639	11	19,921	66,210	7,569	114	18,500
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
Average:		3,394,265	205,040	60	208,565	3,394,265	73,560	22	77,428	288,131	28,680	100	48,493

Table 5. Continued.

		Whitefish				Lake trout				Siscowet			
Unit	Year	Target effort	Target harvest	CPE	Total Harvest	Target effort	Target harvest	CPE	Total Harvest	Target effort	Target harvest	CPE	Total Harvest
MI-5	1986	180,000	25,205	140	25,205	180,000	10,667	59	10,667	4,000	750	188	1,772
	1987	440,000	32,095	73	33,126	440,000	13,509	31	13,509	48,000	2,502	52	6,269
	1988	551,900	47,233	86	47,363	551,900	32,105	58	32,105	6,000	333	56	5,449
	1989	225,500	42,809	190	42,809	225,500	12,661	56	12,661	0	0	0	2,785
	1990	706,000	80,394	114	80,394	706,000	18,490	26	18,490	0	0	0	10,026
	1991	305,500	24,355	80	24,540	305,500	7,789	26	7,899	36,000	405	11	9,787
	1992	426,000	35,827	84	37,169	426,000	8,042	19	8,977	72,000	2,970	41	8,672
	1993	416,000	21,375	51	21,522	416,000	25,555	61	25,597	4,500	206	46	2,833
	1994	211,000	5,318	25	5,388	211,000	24,974	118	24,974	14,000	290	21	2,878
	1995	113,400	9,288	82	9,288	113,400	8,445	75	8,445	0	0	0	1,839
	1996	161,400	7,672	48	7,672	161,400	8,040	50	8,040	0	0	0	1,033
	1997	102,300	17,997	176	18,831	102,300	5,249	51	6,105	8,000	200	25	1,855
	1998	280,300	23,950	85	24,452	280,300	14,942	53	16,247	74,000	1,989	27	4,023
	1999	178,000	12,213	69	12,813	178,000	18,342	103	19,824	15,500	1,222	79	4,038
	2000	481,800	44,454	92	44,842	481,800	48,030	100	48,479	7,500	578	77	3,073
	2001	292,700	22,949	78	22,949	292,700	6,377	22	7,321	0	0	0	0
	2002	576,600	31,159	54	31,329	576,600	23,010	40	23,010	0	0	0	1,849
	2003	454,500	14,988	33	14,988	454,500	37,706	83	37,706	0	0	0	5
	2004	705,700	20,742	29	20,742	705,700	31,827	45	31,827	0	0	0	480
	2005	835,070	29,985	36	29,988	835,070	29,505	35	29,530	1,190	60	50	383
Average:		382,184	27,500	72	27,771	382,184	19,263	50	19,571	14,535	575	40	3,452
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	0	786
Average:		5,846,444	425,377	73	430,253	5,846,444	118,607	20	123,149	382,459	39,403	103	75,096

Table 6. Age and size composition of hatchery (H) and wild (N) lake trout in tribal commercial harvests from unit MI-2 during 2005. Weight is in round pounds, length is in inches, and sd=standard deviation.

			Number	Number	Length (in.)		Number	Weight (lbs)	
Unit	Origin	Age	Aged	Measured	mean	sd	Weighed	mean	sd
MI-2									
	H								
		4	1	1	10.9		1	0.2	
		9	1	1	27.1		1	0.0	
Sample Size:			2	2			2		
Means:		6.5			19.0	11.4		0.1	0.1
	N								
			0	3	24.7	0.6	3	2.9	2.5
		5	1	1	14.5		1	1.2	
		6	14	14	19.6	2.1	14	2.3	1.0
		7	18	18	21.8	2.0	18	2.4	1.7
		8	16	16	21.3	1.5	16	2.4	1.1
		9	4	4	22.5	1.4	4	1.6	1.9
		10	2	2	26.7	1.3	2	6.1	1.5
		11	4	4	25.1	1.5	4	3.7	2.8
		12	5	5	24.3	1.6	5	4.4	1.4
		13	4	4	24.1	1.5	4	3.5	2.4
		14	3	3	25.3	1.7	3	3.0	2.6
		15	1	1	26.2		1	5.3	
		16	3	3	26.3	1.1	3	3.9	3.3
		17	1	1	27.6		1	7.2	
		21	1	1	25.9		1	5.6	
Sample Size:			77	80			80		
Means:		9.1			22.4	2.8		2.9	1.9
Sample Size:			79	82			82		
Means:		9.0			22.3	3.1		2.8	1.9

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 2005.

Unit	Length Category (Inches)	Fish Examined	Type AI, AII, AIII Wounds	Wounds per 100 fish	Scars	Scars per 100 fish
MI-2						
	1: < 17	3	0	0.0	0	0.0
	2: 17-20.9	20	0	0.0	0	0.0
	3: 21-24.9	43	1	2.3	0	0.0
	4: 25-28.9	16	0	0.0	0	0.0
	Total:	82	1	1.2	0	0.0
MI-3						
	2: 17-20.9	32	0	0.0	0	0.0
	3: 21-24.9	26	1	3.8	1	3.8
	4: 25-28.9	7	1	14.3	1	14.3
	5: > 29	1	0	0.0	0	0.0
	Total:	66	2	3.0	2	3.0
MI-4						
	1: < 17	2	0	0.0	0	0.0
	2: 17-20.9	86	0	0.0	2	2.3
	3: 21-24.9	158	3	1.9	3	1.9
	4: 25-28.9	35	1	2.9	0	0.0
	5: > 29	4	2	50.0	0	0.0
	Total:	285	6	2.1	5	1.8
MI-5						
	2: 17-20.9	22	0	0.0	0	0.0
	3: 21-24.9	36	0	0.0	1	2.8
	4: 25-28.9	14	0	0.0	1	7.1
	5: > 29	9	0	0.0	1	11.1
	Total:	81	0	0.0	3	3.7

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 for data collected January-December 1988-2005.

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

Table 8. Continued.

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

Table 9. Age and size composition of hatchery (H) and wild (N) lake trout in tribal commercial harvests from unit MI-3 during 2005. Weight is in round pounds, length is in inches, and sd=standard deviation.

Unit	Origin	Age	Number Aged	Number Measured	Length (in.) mean	Length (in.) sd	Number Weighed	Weight (lbs) mean	Weight (lbs) sd
MI-3									
	N								
			0	5	20.0	1.3	5	2.6	0.6
		6	1	1	18.9		1	1.9	
		7	3	3	19.1	1.1	3	2.1	0.6
		8	5	5	21.3	3.9	5	3.0	1.9
		9	10	10	21.0	1.4	10	3.1	0.7
		10	15	15	22.1	2.3	15	3.4	1.2
		11	10	10	21.3	2.0	10	3.3	1.0
		12	4	4	22.6	1.3	4	3.5	0.7
		13	2	2	22.8	2.6	2	2.7	0.1
		14	4	4	23.0	2.6	4	3.7	1.3
		15	2	2	23.2	4.2	2	3.9	1.6
		18	1	1	29.7		1	8.3	
Sample Size:			57	62			62		
Means:		10.4			21.6	2.5		3.3	1.2
Sample Size:			57	62			62		
Means:		10.4			21.6	2.5		3.3	1.2

Table 10. Age and size composition of hatchery (H) and wild (N) lake trout in tribal commercial harvests from unit MI-4 during 2005. Weight is in round pounds, length is in inches, and sd=standard deviation.

Unit	Origin	Age	Number Aged	Number Measured	Length (in.) mean	Length (in.) sd	Number Weighed	Weight (lbs) mean	Weight (lbs) sd
MI-4									
	H								
			0	17	21.0	2.5	17	3.2	1.5
		6	2	2	24.1	1.8	2	4.5	0.2
		7	1	1	21.8		1	3.3	
		8	2	2	20.3	5.8	2	5.0	0.8
		9	5	5	22.6	0.9	5	3.6	0.8
		10	7	7	23.5	3.6	7	4.3	2.1
		11	5	5	22.2	1.6	5	3.4	0.9
		12	3	3	23.9	1.4	3	5.0	1.6
		13	4	4	23.6	1.9	4	3.8	0.7
		14	2	2	23.5	2.3	2	4.2	0.7
		15	1	1	21.4		1	2.8	
Sample Size:			32	49			49		
Means:		10.5			22.2	2.6		3.7	1.4
	N								
			0	32	22.7	2.5	32	3.9	1.7
		5	1	1	19.7		1	2.2	
		6	14	14	20.7	2.0	14	3.0	0.9
		7	11	11	20.8	2.0	11	3.2	1.3
		8	22	22	21.5	2.4	22	3.4	1.4
		9	17	17	22.7	1.8	17	3.7	0.8
		10	20	20	21.5	2.0	20	3.2	0.9
		11	36	36	22.4	2.0	36	3.5	0.9
		12	36	36	23.2	1.7	36	4.0	1.0
		13	18	18	23.9	2.5	18	4.3	1.2
		14	9	9	22.6	2.2	9	3.6	1.1
		15	4	4	21.7	1.0	4	3.5	0.8
		16	4	4	22.9	4.4	4	3.8	1.9
		17	4	4	23.7	3.4	3	4.5	1.9
		18	1	1	21.1		1	2.9	
		20	4	4	24.1	0.7	4	4.1	0.0
		23	2	2	28.9	2.1	2	7.2	2.3
		25	1	1	29.5		1	6.2	
Sample Size:			204	236			235		
Means:		11.0			22.5	2.4		3.7	1.3
Sample Size:			236	285			284		
Means:		10.9			22.5	2.4		3.7	1.3

Table 11. Age and size composition of hatchery (H) and wild (N) lake trout in tribal commercial harvests from unit MI-5 during 2005. Weight is in round pounds, length is in inches, and sd=standard deviation.

			Number	Number	Length (in.)		Number	Weight (lbs)	
Unit	Origin	Age	Aged	Measured	mean	sd	Weighed	mean	sd
MI-5									
	H								
		9	1	1	21.7		1	3.3	
Sample Size:			1	1			1		
Means:		9.0			21.7			3.3	
	N								
			0	6	26.2	3.9	6	7.0	3.5
		5	2	2	21.5	0.8	2	3.3	1.6
		6	3	3	21.4	2.5	3	3.5	1.1
		7	8	8	23.9	5.5	8	4.7	3.6
		8	15	15	22.6	1.8	15	3.7	1.0
		9	13	13	22.6	3.0	13	3.9	2.1
		10	13	13	23.6	3.3	13	4.6	2.6
		11	8	8	22.7	2.7	8	4.0	1.5
		12	3	3	23.4	3.3	3	3.7	1.0
		13	3	3	21.9	2.9	3	3.3	1.5
		14	2	2	31.4	6.5	2	12.1	7.8
		15	2	2	33.1	4.0	2	13.8	7.0
		17	1	1	29.1		1	8.8	
		19	1	1	22.4		1	3.0	
Sample Size:			74	80			80		
Means:		9.6			23.7	3.9		4.7	3.2
Sample Size:			75	81			81		
Means:		9.6			23.6	3.8		4.7	3.2

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 2005. Weight is in round pounds, length is in inches, and sd=standard deviation.

		Number	Number	Length (in.)		Number	Weight (lbs)	
Unit	Age	Aged	Measured	mean	sd	Weighed	mean	sd
MI-2								
	6	2	2	18.1	1.3	2	2.1	0.6
	7	16	16	18.8	1.3	16	2.4	0.5
	8	73	73	19.1	1.3	73	2.4	0.6
	9	54	54	19.7	1.7	54	2.6	0.8
	10	47	47	21.1	2.3	47	3.3	1.1
	11	16	16	20.6	2.4	16	3.1	1.1
	12	2	2	20.5	4.2	2	3.1	1.9
	13	2	2	22.1	4.4	2	3.7	2.1
	14	1	1	19.8		1	3.6	
	15	1	1	22.3		1	3.9	
Sample Size:		214	214			214		
Means:	9.0			19.8	2.0		2.7	0.9
MI-3								
		0	5	19.2	1.3	5	2.3	0.3
	6	12	12	18.9	1.2	12	2.3	0.3
	7	95	95	19.3	1.0	95	2.4	0.4
	8	186	186	19.3	1.0	186	2.4	0.4
	9	177	177	19.3	1.2	177	2.4	0.4
	10	97	97	19.6	1.1	97	2.6	0.4
	11	46	46	20.2	1.2	46	2.7	0.4
	12	25	25	20.6	0.9	25	2.8	0.5
	13	6	6	20.8	0.9	6	2.8	0.3
	14	9	9	21.3	0.7	9	3.0	0.3
Sample Size:		653	658			658		
Means:	8.9			19.5	1.2		2.5	0.4

Table 12. Continued.

Unit	Age	Number Aged	Number Measured	Length (in.) mean	sd	Number Weighed	Weight (lbs) mean	sd
MI-4								
		0	14	19.9	1.7	14	2.7	0.9
	6	5	5	19.6	0.3	5	2.5	0.2
	7	47	47	19.6	1.6	47	2.5	0.7
	8	148	148	19.9	1.5	148	2.7	0.8
	9	210	210	20.5	1.6	210	2.9	0.7
	10	112	112	21.0	1.7	112	3.1	0.8
	11	36	36	21.2	1.5	36	3.1	0.7
	12	16	16	22.4	2.5	16	4.0	1.6
	13	1	1	21.4		1	2.8	
	14	1	1	22.5		1	3.4	
	17	1	1	29.3		1	8.3	
Sample Size:		577	591			591		
Means:	9.0			20.4	1.7		2.9	0.8
MI-5								
	7	3	3	19.4	1.9	3	2.6	0.5
	8	3	3	21.7	1.0	3	3.7	0.6
	9	3	3	20.8	0.8	3	3.2	0.4
	10	5	5	23.6	3.8	5	4.9	2.2
	11	3	3	21.5	2.0	3	3.4	0.9
	12	6	6	24.8	1.0	6	5.4	1.0
	13	1	1	23.2		1	4.4	
	14	1	1	29.9		1	11.1	
	15	1	1	29.6		1	10.3	
Sample Size:		26	26			26		
Means:	10.3			23.1	3.2		4.7	2.3

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 2005. Weight is in round pounds, length is in inches, and sd=standard deviation.

		Number	Number	Length (in.)		Number	Weight (lbs)	
Unit	Age	Aged	Measured	mean	sd	Weighed	mean	sd
MI-4								
		0	28	19.7	3.5	28	2.8	1.5
	9	1	1	19.7		1	2.3	
	11	1	1	18.5		1	2.2	
	14	1	1	23.6		1	4.4	
	15	1	1	25.6		1	4.4	
	18	1	1	24.4		1	4.4	
	21	2	2	27.6	1.1	2	7.7	1.6
	22	1	1	27.6		1	8.8	
Sample Size:		8	36			36		
Means:	16.4			20.7	4.0		3.4	2.0
MI-5								
	7	1	1	23.6		1	4.4	
	8	1	1	23.6		1	4.4	
	9	1	1	25.2		1	4.4	
	10	1	1	21.3		1	4.4	
Sample Size:		4	4			4		
Means:	8.5			23.4	1.6		4.4	0.0

Table 14. Age and size composition of lake herring in tribal commercial harvests from management units in the 1842 ceded area within Michigan waters of Lake Superior during 2005. Weight is in round pounds, length is in inches, and sd=standard deviation.

		Number	Number	Length (in.)		Number	Weight (lbs)	
Unit	Age	Aged	Measured	mean	sd	Weighed	mean	sd
MI-4								
		0	2	13.2	1.4	2	0.0	0.0
	4	1	1	12.6		1	0.6	
	5	1	1	13.8		1	0.0	
	6	3	3	14.9	2.5	3	1.6	1.4
	7	3	3	15.2	2.2	3	1.7	1.5
	8	13	13	14.2	0.9	13	1.1	1.2
	9	3	3	14.7	1.9	3	1.4	0.8
	10	2	2	15.3	0.1	2	1.4	0.0
	11	3	3	13.7	1.6	3	0.8	0.4
	12	1	1	17.1		1	1.4	
	13	2	2	15.2	1.1	2	1.2	0.2
	14	1	1	19.3		1	2.2	
	16	1	1	19.9		1	2.9	
Sample Size:		34	36			36		
Means:	8.8			14.7	1.9		1.2	1.1
MI-5								
	8	1	1	17.3		1	2.3	
Sample Size:		1	1			1		
Means:	8.0			17.3			2.3	

Table 15. Age and size composition of menominee in tribal commercial harvests from management units in the 1842 ceded area within Michigan waters of Lake Superior during 2005. Weight is in round pounds, length is in inches, and sd=standard deviation.

Unit	Age	Number Aged	Number Measured	Length (in.) mean	sd	Number Weighed	Weight (lbs) mean	sd
MI-4								
	5	2	2	13.8	0.0	2	0.6	0.1
Sample Size:		2	2			2		
Means:	5.0			13.8	0.0		0.6	0.1

Table 16. Age and size composition of chinook salmon in tribal commercial harvests during 2005. Weight is in round pounds (rlbs), length is in inches (in), and sd=standard deviation.

				Length			Weight	
Unit	Age	N(Age)	N(length)	mean(in.)	sd(in.)	N(weight)	mean(lb.)	sd(lb.)
MI-4								
	5	1	1	14.2		1	0.0	
Sample Size:		1	1			1		
Means:	5.0			14.2			0.0	