

**2005 Annual Report on Implementation of the 2000 Consent Decree
for 1836 Treaty-Ceded Waters of the Great Lakes**

Prepared for:

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Introduction

The September 27, 2001 Memorandum of Understanding (MOU) between the State of Michigan, Department of Natural Resources and the Michigan United Conservation Clubs, Inc., Michigan Fisheries Resource Conservation Coalition, and Bay de Noc Great Lakes Sportfishermen, Inc. specified that an annual report would be provided detailing implementation of the August 7, 2000 court-ordered Consent Decree. This report provides the information requirements listed in the MOU for the 1836 Treaty-ceded waters of the Great Lakes for 2005.

I. General Information

A. Large-mesh gill net retirement

In an effort to reduce the amount of large-mesh gill net used by tribal fishers, the Consent Decree called for the Sault Tribe to remove at least 14 million feet of large-mesh gill-net effort from Lakes Michigan and Huron by 2003. Removal of large-mesh gill-net effort by other Tribes also counted towards this commitment. The amount of gill net retired is based on comparison with the average effort during the base years 1993 through 1998 (Table 1). Gill net retirement is being accomplished through the trap-net conversion program and other methods.

The removal of large-mesh gill-net effort in lakes Huron and Michigan was successfully completed by 2003 when tribal fishers used approximately 25.5 million feet less than the 1993-1998 average. The 2005 tribal large-mesh gill-net effort in Lakes Michigan and Huron was approximately 24.5 million feet (Table 1) less than the 1993-1998 average. For all three lakes, approximately 26.9 million feet less effort was fished in 2005 compared to the 1993-1998 average.

Table 1. Amount of large-mesh gill-net effort in the 1836 Treaty-ceded waters of the Great Lakes during base years 1993 to 1998 and in 2001 through 2005.

Lake	Management Unit	Effort						2005 reduction ^c
		1993-98 ^a	2001	2002	2003 ^b	2004 ^b	2005	
Michigan	MM-1, 2, 3	17,912	8,089	5,170	5,116	4,180	4,336	13,576
	MM-4	1,794	733	835	624	846	555	879
	MM-5	240	188	63	96	644	499	-259 ^d
Huron	MH-1	16,470	11,517	8,015	7,907	5,907	6,197	10,273
	MH-2	6	0	0	0	0	0	6
Superior	MI-6	780	949	414	1,365	854	32	748
	MI-7	2,028	3,119	2,578	2,080	4,220	2,391	-363 ^d
	MI-8	6,578	3,826	3,905	3,999	4,291	4,578	2,000
Totals		45,808	28,421	20,980	21,187	20,942	18,588	26,860

^a Average annual effort during base years.

^b Updated numbers resulted in changes from previous reports.

^c The reduction relative to 2005 (average effort in base years minus effort in current year).

^d Increase, rather than reduction, of large-mesh gill-net effort.

B. Report from Modeling Subcommittee and modeling process description

The Modeling Subcommittee (MSC) of the Technical Fisheries Committee (TFC) authored a report entitled “Summary Status of Lake Trout and Lake Whitefish Populations in the 1836 Treaty-ceded waters of Lakes Superior, Huron, and Michigan in 2004, with recommended yield and effort levels for 2005” (referred to as the 2005 Status of the Stocks Report). This report is provided as a separate document. It documents the status of lake trout and lake whitefish stocks at the time the 2005 harvest limits were developed and describes the parameters used in the 2005 modeling efforts.

The modeling process contains three parts, beginning with the estimation of parameters that describe the population dynamics of lake trout and whitefish stocks over time. The type of modeling utilized is statistical catch-at-age analysis (SCAA). Models are developed for stocks in each defined management area with data from both standard

assessments and commercial and recreational fisheries. Age-specific abundance and mortality rates are estimated for each year for which data are available. Each model is tested for accuracy by comparing predictions to actual observations. The agreement between predictions and observations is measured by statistical likelihood. The set of adjustable parameters that gives the maximum likelihood (highest agreement) is used as the best estimate. After parameters are estimated, the fish population is projected forward through the next fishing season in order to make short-term projections of harvest and yield that will meet criteria, such as target mortality rates and spawning biomass, set forth in the Consent Decree. The final step of modeling encompasses long-term projections under potential management scenarios.

All fish populations are regulated by three forces or dynamic rate functions, including growth, mortality, and recruitment. These rates are estimated in the first stage of the modeling process, and are then incorporated into the projection models. Growth is described using mean length at age, which is fit to a nonlinear regression model based on evidence that growth slows as fish approach a maximum size. Mortality is estimated from age structure data by examining the decline in catch at age across age classes. Generally, there is a steady decline in the relative abundance of successive age classes over time. Total mortality is comprised of fishing and natural mortality. Fishing mortality includes recreational, subsistence, and commercial harvest, as well as mortality of fish returned to the water due to hooking and netting injuries. Harvest is monitored annually for each user group through direct reporting, wholesale fish reports, charter boat reports, and creel surveys. Models incorporate an estimate of hooking mortality (approximately 15%) for lake trout derived from a controlled study on the Great Lakes.

The estimate of hooking mortality is applied to age classes of catchable size. Natural mortality is comprised of losses due to old age, disease, parasitism, and predation. Natural mortality is usually estimated by subtracting exploitation, or the percentage of fish harvested from the population, from the total annual mortality. Additionally, sea lamprey mortality is calculated from wounds observed during assessments, along with the estimated probability of surviving an attack. Finally, recruitment is the process of reproduction and growth to a certain size class that is beyond the initially high mortality. Recruitment may also imply the entry into a fishery of individuals of legal size for harvest. Most exploited fisheries demonstrate variable recruitment due to an assortment of abiotic or biotic conditions. Recruitment variability is measured by assessing the relative abundance of a single age class using a standard effort, location, and time of year. For example, managers may use the relative abundance of age-3 fish in spring gill net surveys as an index of year-class strength. In the case of a fishery that relies almost entirely on stocking (lake trout in Lakes Michigan and Huron), recruitment is essentially known.

In order to describe the dynamics of a population over time, modelers specify the initial numbers of fish at each age in the first year and recruitment of the youngest age in subsequent years. In Lakes Michigan and Huron, lake trout recruitment is defined as the number of yearlings stocked or migrating into an area less those migrating out of the area. Movement into an area is calculated from tag return data and incorporated into a movement matrix, which shows the proportion of fish stocked in one unit that are actually recruited to another unit. For wild lake trout and whitefish, recruitment is

estimated from a Ricker stock-recruit function. In general, a stock-recruit relationship describes how the number of young fish (recruits) relates to the number of spawners.

After parameters have been estimated, the second step is the short-term projection of total allowable catches (TACs). The model is used as an abstract of reality in our case to predict a recommended harvest that will permit sustainable yield in the fishery.

Harvest levels are set in order to not exceed target mortality rates set forth in the Consent Decree, and are derived by applying various fishing mortality rates to the population abundance estimated at the start of the year. Target mortality rates are comprised of an assortment of age-specific mortality rates. Additionally, the target mortality rates are defined by taking into consideration the concept of spawning stock biomass per recruit, or the amount of spawning biomass that an average recruit is expected to produce. This provision ensures that there is an adequate amount of spawning stock per recruit and that more than one age class is contributing considerably to the spawning population.

The final step of the modeling process involves long-term projections of the fish stocks under potential management scenarios, which is called “gaming”. To date, investigations into various gaming scenarios have been limited. The need for determining how changing length limits in the recreational fishery affects the model projections of TAC’s has also been identified as a charge for the MSC. A more extensive description of the entire modeling process is contained in the *Stock Assessment Models* section of the 2005 Status of the Stocks Report.

C. Model estimates used during negotiation

During the final stages of negotiations, model estimates of harvest quotas, total allowable catch, and total allowable effort were projected under likely scenarios for the

commercial and recreational fisheries over the life of the Consent Decree. For lake trout, the projections are separated into a phase-in period (where applicable), and rehabilitation period or sustainable management period. Phase-in periods are intended to allow for a more gradual transition to target mortality rates and final allocation percentages. For comparison, a reference period is also included for each management unit. Information regarding the lake trout fishery is detailed by management unit in Appendix 1.

Information regarding the whitefish fishery is detailed by whitefish management unit in Appendix 2.

II. Harvest Quotas, TAC's and TAE's (Total Allowable Effort)

A. Lake trout

As required by the Consent Decree, the Modeling Subcommittee of the Technical Fisheries Committee (TFC) calculates annual harvest and effort limits for lake trout and provides these recommendations to the TFC. After reviewing the recommendations, the TFC is to present final harvest and effort limits to the parties by April 30 of each year; these figures were sent to the parties on May 11, 2005. The 2005 lake trout harvest and effort limits for each management unit are provided in Table 2. A map of lake trout management units is provided as Figure 1. The TFC reached consensus on harvest and effort limits for all management units.

The Consent Decree has a provision that harvest limits in fully-phased units should not change by more than 15% over the previous year unless the parties agree a greater change is appropriate. In 2005, there were three fully-phased management units where the model recommendation represented a change of greater than 15% above the 2004 harvest limit; MI-5, MM-5, and MM-6,7. In MI-5, where the model

recommendation was higher than allowed by the 15% rule, the TFC agreed to adopt the model recommendation because lake trout stocks have increased. In MM-5 and MM-6,7, where the model recommendation was lower than allowed by the 15% rule, the TFC agreed to invoke the 15% rule and restrict the harvest limit to 15% less than the 2004 harvest limit.

Table 2. Model estimates of total allowable catch [TAC (pounds)] and total allowable effort [TAE (linear feet of gill net)] for lake trout by management unit in 1836 Treaty-ceded waters of the Great Lakes for the 2005 fishing season.

Lake	Unit	Model-output TACs		Final TACs		Tribal TAE
		State	Tribal	State	Tribal	
Michigan	MM-1,2,3	9,100	453,000	9,100	453,000	9,360,000
	MM-4	43,300	87,500	43,300	87,500	1,030,000
	MM-5 ^a	41,600	27,700	50,065	33,320	231,000
	MM-6,7 ^a	308,700	34,300	330,650	36,720	NA
Huron	MH-1	15,600	178,900	15,600	178,900	9,071,000
	MH-2	132,700	7,000	132,700	7,000	NA
Superior	MI-5 ^b	178,200	9,400	178,200	9,400	NA
	MI-6	35,900	35,900	35,900	35,900	5,086,000
	MI-7	39,600	92,400	39,600	92,400	10,815,000

^a TFC invoked the 15% rule, limiting the TAC to -15% deviation from the 2004 harvest limit.

^b TFC agreed to adopt model recommendation that exceeded +15% deviation from 2004 TAC.

B. Lake Whitefish

As required by the Consent Decree, the Modeling Subcommittee of the TFC calculates annual lake whitefish harvest limits for shared management units, and provides these recommendations to the TFC. For each whitefish management unit that is not shared, the tribes set a harvest regulation guideline (HRG) in accordance with their Tribal Management Plan. The Modeling Subcommittee generates recommendations for HRGs that are considered by the tribes. After reviewing the recommendations, the TFC is to present final harvest limits to the parties by December 1 for the subsequent year; these

figures were sent to the parties on December 8, 2004. The 2005 whitefish harvest limits for each management unit are provided in Table 3. A map of whitefish management units is provided as Figure 2.

The Modeling Subcommittee was able to generate recommendations for harvest limits or HRGs in all but three management units. In units WFH-03 and WFM-07 there are insufficient series of data, thus the models are not reliable for estimating harvest limits. The HRG for WFH-03 is consistent with the 2004 HRG, and reflects the previous 3-year average (2001-2003) commercial harvest. The HRG for WFM-07 is also consistent with the 2004 HRG, and represents the approximate average of the model-generated harvest limits from adjacent units WFM-06 and WFM-08 in 2004. In unit WFS-06 there was little sampling of the commercial catch from 2000 to 2003, which resulted in poor model performance. Thus, the 2005 HRG was set consistent with the 2004 HRG, which was based on the model output. The TFC reached consensus on harvest limits for all shared whitefish management units. The tribes accepted model-generated recommendations for HRGs in all units for which they were generated.

Table 3. Model estimates of total allowable catch [TAC (pounds)] or harvest regulation guideline [HRG (pounds)] for whitefish by management unit in 1836 Treaty-ceded waters of the Great Lakes for the 2005 fishing season.

Lake	Unit	Final State TAC	Model output Tribal TAC	Final Tribal TAC or HRG
Michigan	WFM-01	123,000	1,110,000	1,110,000
	WFM-02	0	577,000	577,000
	WFM-03	0	1,970,000	1,970,000
	WFM-04	0	704,000	704,000
	WFM-05	0	347,000	347,000
	WFM-06	65,000	258,000	258,000
	WFM-07 ^a	0	–	500,000
	WFM-08	500,000	904,000	904,000
Huron	WFH-01	0	348,000	348,000
	WFH-02	0	298,000	298,000
	WFH-03 ^b	0	–	306,000
	WFH-04	0	415,000	415,000
	WFH-05	0	927,000	927,000
Superior	WFS-04	18,000	159,000	159,000
	WFS-05	60,000	312,000	312,000
	WFS-06 ^c	0	–	210,000
	WFS-07	0	611,000	611,000
	WFS-08	0	164,000	164,000

^a No model output - HRG is consistent with the 2004 HRG, which was based on the average of model-generated recommendations from WFM-06 and WFM-08.

^b No model output - HRG is consistent with the 2004 HRG, which was based on the average commercial harvest from 2001-2003.

^c No model output - HRG is consistent with 2004 HRG, which was based on the model recommendation.

III. Harvest and Effort Reporting

A. State-licensed commercial and recreational fishing

1. Lake Trout

Lake trout harvest by the state consists almost entirely of harvest by sport anglers. Lake trout harvest by state-licensed recreational fishers in 2005 was below harvest limits in all but one management unit. The harvest limit and reported harvest in Lake Superior represent lean lake trout only. Throwback mortality from the State recreational fishery

(lake trout caught by hook and line and returned to the water that subsequently die) was estimated for each management unit. This weight was added to the weight of lake trout harvested in the recreational fishery (Table 4).

There was only one lake trout regulation change for the State recreational fishery in 2005. In Lake Superior management unit MI-6 the daily limit was changed from two to three fish.

Estimated state-licensed recreational harvest of walleye, yellow perch, and Chinook and Coho salmon are also listed in Table 4. Effort indicated is for all species combined. Harvest limits are not set for these species.

Table 4. Summary of estimated state-licensed recreational harvest [number and weight (pounds)] and effort (angler hours) by management unit in 1836 Treaty-ceded waters of the Great Lakes for the 2005 fishing season.

Lake	Management unit	Total effort (angler hours)	Lake trout ^{a,b}		Walleye		Yellow perch		Chinook salmon		Coho salmon	
			Number	Weight	Number	Weight	Number	Weight	Number	Weight	Number	Weight
Michigan	MM-1	470,389	125	788	19,657	51,108	66,216	13,243	28,118	314,922	113	601
	MM-2	12,120	26	164	295	766	6	1	884	9,904	36	192
	MM-3	89,035	2,019	12,315	49	112	278	111	11,548	146,665	2	11
	MM-4	188,822	7,061	35,305	0	0	45,636	18,711	10,174	134,292	33	175
	MM-5	239,388	2,067	12,610	14	35	0	0	42,189	447,201	2,698	18,344
	MM-6	708,069	5,872	33,470	55	143	9,060	5,164	124,158	1,477,484	3,071	20,266
	MM-7	551,441	2,170	11,503	119	308	111,284	53,416	83,143	831,434	3,229	18,408
Totals		2,259,264	19,340	106,155	20,189	52,472	232,480	90,646	300,214	3,361,902	9,182	57,997
Huron	MH-1	335,305	1,249	4,910	14,097	46,520	65,870	19,761	8,071	88,781	39	168
	MH-2	103,548	6,699	33,295	829	4,725	310	93	14,149	148,565	358	1,790
	Totals	438,853	7,948	38,205	14,926	51,245	66,180	19,854	22,220	237,346	397	1,958
Superior	MI-5 ^c	37,414	7,631	25,868	0	0	0	0	110	611	1,956	2,778
	MI-6	42,907	4,081	15,628	0	0	33	12 ^d	336	1,280	2,630	4,234
	MI-7	16,821	1,815	5,935	0	0	165	41	16	32	649	1,012
Totals		97,142	13,527	47,431	0	0	198	53	462	1,923	5,235	8,024
Grand totals		2,795,259	40,815	191,791	35,115	103,717	298,858	110,553	322,896	3,601,171	14,814	67,979

^a Lake Superior lake trout number and weight do not include Siscowets; number of Siscowet harvested were estimated at 423, 209, and 457 fish, for MI-5, MI-6, and MI-7, respectively.

^b Includes throwback mortality for all units.

^c Includes recreational harvest from entire unit; harvest from 1842 Treaty-ceded area was not removed.

^d Weighted average weight from 2000, 2002, and 2003 was used for yellow perch.

2. Lake Whitefish

Whitefish harvest by state-licensed commercial fishers was below harvest limits in all whitefish management units. The commercial whitefish harvest reported in Table 5 includes catch from targeted effort (trap nets). Catch of lake whitefish in chub nets is minimal most years and was zero pounds for 2005.

There is one major sport fishery for whitefish in Lake Michigan waters that takes place in unit WFM-05 (Grand Traverse Bay area). Recreational harvest of whitefish in Grand Traverse Bay was an estimated 4,019 pounds in 2005. There are three sport fisheries for whitefish in Lake Superior, including units WFS-04 (Marquette area), WFS-05 (Munising area), and WFS-06 (Grand Marais area). Estimated recreational harvest of whitefish in these areas was 336, 2,046, and 6,959 pounds, respectively. The state does not estimate targeted recreational effort for whitefish in these units.

Table 5. Summary of state-licensed commercial whitefish harvest (pounds) and effort (trap-net lifts) by whitefish management unit in 1836 Treaty-ceded waters of the Great Lakes for the 2005 fishing season.

Lake	Unit	Harvest	Effort
Michigan	WFM-01	71,370	73
	WFM-06	0	0
	WFM-08	274,659	153
Lake totals		346,029	226
Superior	WFS-04	7,935	17
	WFS-05	42,942	359
Lake totals		50,877	376
Grand totals		396,906	602

B. Tribal commercial and subsistence fishing

The Chippewa Ottawa Resource Authority had not finalized harvest data for 2005 by the time this report was compiled, so the following numbers are considered preliminary.

1. Lake trout

Lake trout harvest by tribal commercial fishers was below harvest limits in all management units in 2005. Lake trout are harvested by tribal commercial fishers as bycatch in the lake whitefish fishery; thus, effort is not reported in Table 6 (see Table 7). The tribes estimated the discard mortality from trap and gill nets in MH-1 where they have special regulations. The pounds of discarded lake trout killed count against the harvest limit in MH-1.

Table 6. Summary of tribal commercial lake trout harvest (pounds) by management unit in 1836 Treaty-ceded waters of the Great Lakes for the 2005 fishing season. Harvest from small-mesh gill nets is also included in gill-net harvest.

Lake	Unit	Trap-net harvest	Gill-net harvest	Total harvest
Michigan	MM-1,2,3	12,901	121,746	134,647
	MM-4	5,501	35,428	40,929
	MM-5	2,118	19,134	21,252
	MM-6,7	1,341	119	1,460
Lake total		21,861	176,427	198,288
Huron	MH-1	16,806	107,846	124,652
	MH-2	0	0	0
Lake total		16,806	107,846	124,652
Superior	MI-5	0	0	0
	MI-6	0	710	710
	MI-7	864	7,236	8,100
	MI-8	12,798	26,753	39,551
Lake total		13,662	34,699	48,361
Grand total		52,329	318,972	371,301

2. Lake Whitefish

Whitefish harvest by tribal commercial fishers was below harvest limits and HRGs in all, but one management unit. In Lake Huron management unit WFH-01 the model-based HRG was exceeded by approximately 68,000 pounds, which represents an overharvest of about 19.6%. In

management units that are not shared the Tribes manage the fishery in accordance with the Tribal Plan and no penalty is incurred for overharvest. In shared whitefish management zones, overharvest penalties are incurred when a party exceeds the harvest limit by greater than 25%; no harvest limits were exceeded in shared zones.

Table 7. Summary of tribal commercial whitefish harvest (pounds) and targeted effort (trap net-lifts or 1,000 feet of large-mesh gill net) by management unit in 1836 Treaty-ceded waters of the Great Lakes for the 2005 fishing season. Minor harvest from small-mesh gill nets is also included in gill-net harvest, but not effort.

Lake	Unit	Trap nets		Gill nets		Total harvest
		Harvest	Effort	Harvest	Effort	
Michigan	WFM-01	454,806	873	0	0	454,806
	WFM-02	302,526	741	251,328	2,511	553,854
	WFM-03	376,335	822	27,848	283	404,183
	WFM-04	92,632	170	37,661	618	130,293
	WFM-05	42,394	81	95,359	906	137,753
	WFM-06	12,002	55	43,672	438	55,674
	WFM-07	154,572	72	0	0	154,572
	WFM-08	0	0	0	0	0
Lake totals		1,435,267	2,814	455,868	4,756	1,891,135
Huron	WFH-01	267,924	1,070	148,413	1,870	416,337
	WFH-02	249,180	489	1,238	0	250,418
	WFH-03	60,406	177	1,187	17	61,593
	WFH-04	108,250	382	140,909	2,815	249,159
	WFH-05	548,854	692	0	0	548,854
Lake totals		1,234,614	2,810	291,747	4,702	1,526,361
Superior	WFS-04	0	0	0	0	0
	WFS-05	0	0	1,697	32	1,697
	WFS-06	0	0	7,049	200	7,049
	WFS-07	191,334	845	271,688	5,847	463,022
	WFS-08	92,029	288	60,154	890	152,183
Lake totals		283,363	1,133	340,588	6,969	623,951
Grand totals		2,953,244	6,757	1,088,203	16,427	4,041,447

3. Walleye

Commercial fishing for walleye is allowed in and around Grand Traverse Bay and the Manitou Islands, in northeastern Lake Michigan (Naubinway to Gros Cap), and around the Les

Cheneaux Islands in Lake Huron. There are gear, season, depth, size, and area restrictions on the various walleye fisheries, though no harvest limits are set forth in the Consent Decree. The largest walleye harvest in 2005 occurred in Lake Michigan management unit MM-1,2,3 (13,693 pounds) and in Lake Huron management unit MH-1 (7,702 pounds; Table 8). Walleye are occasionally harvested as incidental catch; thus, sometimes there is harvest with no effort listed for a unit because the fishers were actually targeting other species.

Table 8. Summary of tribal commercial walleye harvest (pounds) and targeted effort (trap-net lifts or 1,000 feet of small or large mesh gill net) by management unit in 1836 Treaty-ceded waters of the Great Lakes for the 2005 fishing season.

Lake	Unit	Trap nets		Gill nets		Total harvest
		Harvest	Effort	Harvest	Effort	
Michigan	MM-1,2,3	23	0	13,670	30	13,693
	MM-4	244	0	3,615	67.4	3,859
	MM-5	0	0	299	6	299
Lake totals		267	0	17,584	103.4	17,851
Huron	MH-1	287	0	7,415	31.3	7,702
Lake totals		287	0	7,415	31.3	7,702
Superior	MI-7	0	0	1,668	0	1,668
	MI-8	80	0	734	16.8	814
Lake totals		80	0	2,402	16.8	2,482
Grand totals		634	0	27,401	151.5	28,035

4. Yellow perch

Commercial fisheries for yellow perch exist in northeastern Lake Michigan around Grand Traverse Bay and the Manitou Islands, around the Beaver Islands, and near the northeastern shore. A yellow perch fishery also exists in Lake Huron around the Les Cheneaux Islands. The fishery has gear, depth, area, season, and size restrictions; though no harvest limits are set forth in the Consent Decree. The largest yellow perch harvests in 2005 were in Lake Michigan units MM-1,2,3 and MM-4, where harvests were 668 and 233 pounds, respectively (Table 9). Yellow

perch are occasionally harvested as incidental catch; thus, sometimes there is harvest with no effort listed for a unit because the fishers were actually targeting other species.

Table 9. Summary of tribal commercial yellow perch harvest (pounds) and targeted effort (trap-net lifts or 1,000 feet of large mesh and small mesh gill net) by management unit in 1836 Treaty-ceded waters of the Great Lakes for the 2005 fishing season.

Lake		Trap nets		Gill nets		Total
		Harvest	Effort	Harvest	Effort	Harvest
Michigan	MM-1,2,3	0	0	668	11	668
	MM-4	0	0	233	0	233
	MM-5	0	0	174	0	174
Lake totals		0	0	1,075	11	1,075
Huron	MH-1	0	0	6	0	6
	Lake totals	0	0	6	0	6
Superior	MI-8	0	0	84	0	84
	Lake totals	0	0	84	0	84
Grand totals		0	0	1,165	11	1,165

5. Chinook and Coho salmon

Tribal commercial fisheries for salmon exist in northeastern Lake Michigan nearshore from McGulpin Point south to Seven Mile Point, around the tip of the Leelanau Peninsula, and in Suttons Bay. Fisheries in northern Lake Huron exist in St Martin Bay, and nearshore from Cordwood Point to Hammond Bay Harbor light. Fishing is restricted by season, gear, depth, and area, though no harvest limits are set. The largest Chinook salmon harvest in 2005 occurred in Lake Huron unit MH-1 (157,353 pounds; Table 10). Coho salmon were only harvested from Lake Superior (Table 11).

Table 10. Summary of tribal commercial Chinook salmon harvest (pounds) and targeted effort (trap-net or 1,000 feet of gill net) by management unit in 1836 Treaty-ceded waters of the Great Lakes for the 2005 fishing season.

Lake		Trap nets		Gill nets		Total harvest
		Harvest	Effort	Harvest	Effort	
Michigan	MM-1,2,3	143	0	1,201	0	1,344
	MM-4	0	0	2,703	5	2,703
Lake totals		143	0	3,904	5	4,047
Huron	MH-1	65	0	157,288	1,186	157,353
Lake totals		65	0	157,288	1,186	157,353
Superior	MI-7	0	0	7	0	7
	MI-8	0	0	47	0	47
Lake totals		0	0	54	0	54
Grand totals		208	0	161,246	1,191	161,454

Table 11. Summary of tribal commercial Coho salmon harvest (pounds) and targeted effort (trap-net lifts or 1,000 feet of gill net) by management unit in 1836 Treaty-ceded waters of the Great Lakes for the 2005 fishing season.

Lake		Trap nets		Gill nets		Total harvest
		Harvest	Effort	Harvest	Effort	
Superior	MI-7	0	0	466	0	466
	MI-8	326	0	707	0	1,033
Lake totals		326	0	1,173	0	1,499
Grand totals		326	0	1,173	0	1,499

6. Subsistence fishing

Subsistence fishing as defined in the Consent Decree means taking fish for personal or family consumption and not for sale or trade. Tribal subsistence fishing is allowed in all 1836 Treaty-ceded waters with some exceptions. These exceptions include: no gill nets in lake trout refuges; no nets within 100 yards of a break wall or pier; no nets within a 0.3-mile radius of some stream mouths (listed in section IV.C.8 of the Consent Decree); no prevention of fish passage into and out of streams that flow into 1836 Treaty waters; no gill nets or walleye possession in portions of the Bays De Noc during March 1 - May 15; no gill nets within 50 feet

of other gill nets. Fishers are limited to 100 pounds aggregate catch of all species in possession, and catch may not be sold or traded. Subsistence fishers may use impoundment gear, hooks, spears, seines, dip nets, and gill nets. Gill netting is limited to one 300-ft or smaller net per vessel per day. In the St. Marys River a single gill net may not exceed 100 ft in length. All subsistence gear must be marked clearly with floats, and Tribal identification numbers. Tribal fishers must obtain subsistence licenses issued by their Tribe, and must abide by provisions of the Tribal Code. Additionally, subsistence fishing with gill or trap nets requires a Tribal permit that may be limited in duration and by area. The Michigan Department of Natural Resources (MDNR) is to be provided with copies of all subsistence permits.

In 2005, walleye and whitefish made up the majority of tribal subsistence harvest with 5,890 and 4,644 pounds, respectively from Treaty-ceded waters of the Great Lakes (Table 12). Total gill-net effort was 87,575 feet for the entire Treaty-ceded area of the Great Lakes.

Table 12. Summary of tribal subsistence harvest (round pounds) by species and gill-net effort (feet) in 1836 Treaty-ceded waters of the Great Lakes for the 2005 fishing season. Numbers were considered preliminary at the time this report was written.

Lake	Management Unit	Lake trout	Whitefish	Walleye	Yellow perch	Chinook & Coho salmon	Gill-net effort (feet)
Michigan	MM-1	18	947	4,533	233	6	27,690
	MM-3	147	574	99	0	23	12,050
	MM-7	0	0	0	0	61	600
Lake total		165	1,521	4,632	233	90	40,340
Huron	St.Marys River	0	105	1,159	615	285	5,050
	MH-1	68	1,769	99	298	100	22,735
Lake total		68	1,874	1,258	913	385	27,785
Superior	MI-5	21	223	0	0	30	5,400
	MI-6	240	449	0	0	328	6,150
	MI-7	4	59	0	0	48	850
	MI-8	92	518	0	5	23	7,050
Lake total		357	1,249	0	5	429	19,450
Grand total		590	4,644	5,890	1,151	904	87,575

IV. Enforcement

Introduction

The 2000 Consent Decree (Decree) establishes a Law Enforcement Committee (LEC) as the primary body for consultation and collaboration on enforcement issues pertaining to the fishery in 1836 Treaty-Ceded Waters of the Great Lakes. The LEC is composed of the chief law enforcement officer or designee of each Tribe and the chief law enforcement officer or designee of the Michigan Department of Natural Resources (MDNR). The LEC is required to meet four times a year with the first meeting taking place in January. The Decree requires that the LEC review summary reports of all law enforcement activities of member agencies during the previous year. This report provides a summary of 1836 Treaty fishery enforcement activity of the MDNR for the year 2005. Information is also provided in the tables regarding other commercial fisheries enforcement activities.

A. General Information

The Consent Decree requires that the State maintain adequate staffing and equipment to allow for implementation of enforcement activities.

1. Staffing

The MDNR began the 2005 calendar year with six full time conservation officer positions whose primary responsibilities are commercial fisheries enforcement. Six of the seven officers, commercial fish enforcement specialists (CFS), are assigned to locations within the 1836 Treaty-Ceded Area. Two specialists are stationed in Grand Traverse County, one specialist and the Unit supervisor, a staff sergeant, are assigned to Charlevoix County, one specialist is stationed in Presque Isle County, and one specialist is assigned to Delta County. An additional

position, a seventh CFS, remains vacant in Presque Isle County. Intentions are to fill the vacancy as overall staffing levels permit. The remaining officer is assigned to the Saginaw Bay Area. The officer's primary enforcement responsibilities are directed toward the state licensed commercial fishery on southern Lake Huron and Lake Erie. The Saginaw Bay officer also provides manpower and equipment assistance to officers working in 1836 Treaty-Ceded waters. A detective whose responsibility is commercial fish investigations was assigned to the Department's Special Investigation Unit in 2001. In October of this past year the position was re-assigned to the Commercial Fish Enforcement Unit (CFEU) under the title of Commercial Fish Investigator. The investigator provided assistance to local CFS and monitored the wholesale and other commercial industries. Wholesale fish dealers were monitored to ensure compliance with both State and Decree reporting requirements.

During 2003 the MDNR Law Enforcement Division restructured the manner in which time incurred during the enforcement of fish and game regulations was tracked. As a result it was no longer possible to track hours spent on state licensed commercial fish enforcement. During the later stages of 2004 measures were instituted to resolve the issue. Beginning January 2005 we once again began to track the number of officer hours incurred during the enforcement of state commercial and wholesale fish regulations. Table 1 represents the total manpower hours dedicated to Great Lakes Consent Decree enforcement for the calendar year 2005.

Table 1. Officer hours worked in 2005 to address Consent Decree and State commercial fish related issues. LED represents hours worked by other MDNR Law Enforcement Division personnel to address commercial fish issues. (Preliminary at the time of report).

Enforcement Effort	CFS (hrs)	Overtime(CFS)	LED (hrs)	Total (hrs)
Consent Decree	7,356.7	355.7	417.1	8,129.5
State Commercial	1895	77.7	N/A	1,972.7
Totals	9,251.7	433.4	417.1	10,102.2

2. Equipment

The MDNR Commercial Fish Enforcement Unit's inventory includes five Great Lakes patrol boats. The boats are assigned to ports in the counties where our commercial fish specialists are stationed (Leland, Charlevoix, Rogers City, Caseville and Escanaba). In addition to the boats assigned to the CFS section, a number of smaller boats are assigned to officers at shoreline locations throughout the Treaty-Ceded waters. CFS will at times utilize these smaller boats to supplement enforcement efforts or to conduct patrols when their boats are down for repairs. While all boats assigned to Great Lakes ports engage in commercial fisheries enforcement to some degree, the vast majority of on water enforcement is accomplished by the boats assigned to the CFEU.

MDNR Commercial Fish Enforcement Specialists who are assigned to operate the Unit's five patrol boats are USCG licensed Captains. Officers have successfully completed training and testing and have received 50 Gross Ton Master of the Great Lakes licenses.

All Unit boats are equipped with Law Division's AVL GPS system that allows the boats location to be monitored by personnel logged onto the division's computer system. All boats are equipped with 800 MHz radio systems as well as conventional Hi and Lo Band radio systems. Additional communications capabilities include VHF Marine radios and cell phones. All five unit boats are equipped with laptop computers. Computers allow each vessel to have access to a variety of resources and references, as well as the AVL-GPS system and future interface with DGPS charting capabilities.

A 40-foot Dauntless Class SeaArk (The "William Alden Smith") is assigned to Charlevoix and is moored under lease at the USCG Station Charlevoix. The boat is powered by twin 420Hp Caterpillar diesel engines. Electronics on the vessel, as well as the remaining Unit

boats, include Furuno radar, DGPS chart plotter, and color display fishfinder. Safety equipment available on all vessels includes; six person off-shore self inflating life rafts, Stearns Survival Worksuits, Mustang cold water immersion suits and EPIRBs. Additionally, all other equipment required by State and Federal regulations is assigned to each boat. Inspection schedules for re-certifying life saving equipment are strictly observed.

In addition to its duties of patrolling the waters on northern Lake Michigan the “William Alden Smith” acts as the primary vessel during many of the Unit’s group patrols. During the year the “Smith” monitored the commercial fishery on southern Lake Michigan, Lake Huron from Detour to Port Huron, and on Lake Erie during a brief visit early in the year. The “Smith” is utilized because of its ability to handle rougher seas and to accommodate larger crews while traveling longer distances.

The “Rick Asher” is a 36’ Dauntless Class SeaArk powered by twin 440Hp Yanmar diesel engines. The “Asher”, assigned to Leland, patrols the waters of North Central and Southern Lake Michigan. A unique feature of the “Asher” is the presence of dual system inflatable collar around the entire perimeter of the boat. The collar provides a built in protection system for both the boat and personnel and helps to facilitate boardings and on water inspections. The “Asher” is equipped with Raymarine radar, DGPS chart plotter and color display fishfinder.

A 32-foot Boston Whaler (PB-5) is assigned to Rogers City PB-5 is equipped as detailed above and has the primary responsibility of patrolling the waters of Northern Lake Huron from the State/Tribal “Disputed Zone” to the Detour/Drummond Island area. At this time PB-5 is the only unit boat equipped with a gill net lifter. Twin 454 MerCruiser gas engines with Bravo II out drives power PB-5. The vessel and its captain were instrumental in responding to and addressing a variety of complaints and issues on Northern Lake Huron. Our objective is to have all vessels

ready for launch no later than April 1st. Patrols will commence as soon as ice is out of the lakes and harbors.

PB-7, a 32-foot Boston Whaler, is assigned to Escanaba. PB-7 is equipped as stated, and has the primary responsibility of patrolling the waters of the Bays De Noc, Green Bay, and northern Lake Michigan to Naubinway. PB-7 has the additional responsibility of monitoring the various fisheries on Lake Superior. In an effort to address issues that had arisen on Lake Superior during the 2005 season, CFS Ken Johnson moved PB-7 to Marquette and spent a good portion of the year working out of that location.

The “M.W. Neal” is a 28’ Dauntless Class SeaArk assigned to Caseville in Huron County. The “Neal” is equipped in a fashion similar to the four vessels above but is powered by twin 240 Hp Yanmar diesels with Bravo outdrives. The “Neal’s” primary patrol area extends from Alpena to Saginaw Bay on Lake Huron and has the additional responsibility of monitoring the state licensed commercial fishery on Lake Erie. The “Neal” and her captain also participated in MDNR group patrols in the 1836 Treaty Ceded waters of Northern Lake Huron during the month of June. Sea service hours for CFEU vessels are shown in Table 2 below.

Table 2. 2005 MDNR CFEU vessel service hours. Hours accumulated on non-unit boats are also shown (other vessels).

<i>VESSEL</i>	1836 TREATY- WATERS	STATE FISHERY	1842 TREATY- WATERS	TOTALS
<i>WILLIAM ALDEN SMITH</i>	182	15	N/A	197
<i>PATROL BOAT No. 5</i>	180	N/A	N/A	180
<i>PATROL BOAT No. 7</i>	105	29	8	142
<i>M.W. NEAL</i>	51	333.6	N/A	384.6
<i>RICK ASHER</i>	288.9	N/A	N/A	288.9
<i>OTHER VESSELS</i>	30	4	10	44
TOTALS	836.9	381.6	18	1236.5

During the 2005 season, the MDNR Commercial Fish Enforcement Unit conducted a total of 226 patrols on board the Unit's assigned and supplemental vessels. CFEU boats consumed a total of 11972.29 gallons of fuel. Due to rising fuel costs, a 17% increase in fuel consumption resulted in a 53% increase in fuel expenditures. 2005 fuel costs totaled \$ 31,753.18 (Table 3.).

Table 3. Commercial fish enforcement patrols, fuel consumption and fuel costs.

<i>VESSEL</i>	PATROLS	FUEL (GALS.)	COST (\$)
<i>WILLIAM ALDEN SMITH</i>	35	2308.00	5,170.00
<i>PATROL BOAT No. 5</i>	32	2,831.99	8,125.47
<i>PATROL BOAT No. 7</i>	24	2,539.50	7,487.64
<i>M.W. NEAL</i>	77	1,395.10	3,652.05
<i>RICK ASHER</i>	48	2,857.70	7,318.02
<i>OTHER VESSELS (est.)</i>	10	40.00	N/A
TOTALS	226	11,972.29	31,753.18

B. Enforcement

1. Complaints

MDNR commercial fish specialists received approximately 94 complaints (Table 4) related to commercial fisheries activity during the year. The complaints were submitted from a variety of sources. Forty-Seven (47) complaints were assigned to CFS through the State’s “Report All Poaching” system. Forty-Seven (47) additional complaints were submitted by the public, tribal fishers, tribal law enforcement and other law enforcement personnel and agencies as well as other MDNR personnel.

All complaints were investigated, many proved to be unfounded, and others resulted in a verbal warning, a citation from a CFS, a request for warrants from the appropriate tribal court, or were referred to the proper tribal law enforcement agency. The overwhelming majority of complaints (61) were related to tribal nets in 1836 Treaty-ceded waters. Of the 61 net related complaints in the 1836 Treaty-ceded waters, 27 were related to nets scattered throughout Northern Lake Huron. From the Detour Passage to the Disputed Zone and St. Martins Bay

complaints primarily revolved around concerns of improperly or unmarked nets. Additional complaints were related to unattended or abandoned nets. Gill nets discovered in closed waters, or gill nets deemed to be abandoned, were pulled by MDNR CFS. Over the course of the year several thousand feet of abandoned net were removed.

Of particular concern again this year was the 21 complaints received regarding nets set in the waters off of Ludington in Mason County. Abandoned trap nets located and marked for removal during the 2004 season were allowed to over winter and were once again a problem during the 2005 season. Complaints of wholly unmarked nets began to be submitted in the early spring and continued throughout the 2005 season. Several patrols were conducted by MDNR CFS to locate and remark abandoned nets. By September, 3 confirmed abandoned trap nets had been re-located and remarked. At the time of this report it is believed that the nets will once again over winter and will have to be relocated in 2006. MDNR CFS spent a great deal of time working with tribal authorities and local sport fishing groups to address these complaints and to help resolve the conflicts that had resulted. A breakdown of additional complaints is available in Table 4.

Table 4. 2005 Commercial fish related complaints investigated by MDNR Commercial Fish Specialists.

Complaints	1836 Treaty Fishery	State-licensed	1842 Treaty Fishery	Totals
<i>Nets</i>	61	10	6	77
<i>Licensing</i>	5	1	N/A	6
<i>Access</i>	1	N/A	N/A	1
<i>Wholesale</i>	N/A	3	N/A	3
<i>Closed Area / Season</i>	1	N/A	N/A	1
<i>Other</i>	3	2	1	6
Totals	72	15	7	94

The Decree requires that a 24-hour, toll free “hotline” be established. The purpose of the hotline is for registering complaints related to violations of fishing regulations, harassment of fishers, and vandalism to fishing gear. A hotline number has been established and activated. Final details need to be worked out by the LEC prior to publication of the number and advertisement of its existence and purpose.

2. Inspections

A total of 894 inspections were conducted by MDNR Commercial Fish Specialists statewide (Table 5). There were 471 inspections of 1836 tribal fishers or their gear in the treaty-ceded waters. 327 involved inspections of nets, 144 involved inspections of tribal fishing vessels either at the dock or on the water.

Inspections of state licensed wholesale fish dealers decreased from 248 in 2004 to approximately 106 in 2005. Wholesale fish dealer record reviews indicated that 54 wholesale fish dealers had failed to report purchases as prescribed by law during the 2005 calendar year. Delinquent wholesalers were sent notices providing them with 30 days to comply with reporting requirements or face potential prosecution. Six of the 54 were fish cleaning stations that did not open for business until August. Of the remaining 48, 46 submitted the missing reports within the required time frame. Incident reports were written and submitted to prosecutors for the remaining 2. Two additional dealers were charged as unlicensed wholesalers during 2005.

Table 5. 2004 MDNR CFS commercial fish enforcement inspections.

INSPECTIONS	1836 TREATY FISHERY	STATE LICENSED	1842 TREATY FISHERY	TOTALS
<i>NETS</i>	327	174	9	510
<i>BOARDINGS</i>	27	26	1	54
<i>DOCKSIDES</i>	117	107	N/A	224
<i>STATE WHOLESALE</i>	N/A	106	N/A	106
TOTALS	471	413	10	894

3. Violations

Inspections and investigation of complaints revealed a total of 55 reported violations of the CORA Code or related regulations (Table 6). MDNR Commercial Fish Specialists submitted a total of eight cases to various tribal courts for prosecution. In addition, MDNR CFS referred nine instances of violations of the CORA Code to various tribal law enforcement agencies; twenty three verbal warnings were also issued.

Sixty-Five percent of all complaints were related to net marking insufficiencies. It is therefore not surprising that the overwhelming majority of arrests, warnings and referrals were related to violations of net marking requirements.

Three of the eight citations involved nets that were unattended as well as improperly marked. Abandonment continues to be a major concern with at least five abandoned trap nets known to be over wintering at this time. In addition to abandoned trap nets MDNR CFS pulled and removed several thousand feet of abandoned gill nets, primarily from Northern Lake Huron waters. Two abandoned Salmon nets were removed. One, the subject of several complaints was removed from St. Martins Bay, the other belonging to the same fisher had drifted as far south as the Presque Isle light south of Rogers City.

The 23 verbal warnings represent documented warnings; several undocumented warnings were issued during dockside and on water inspections. Many undocumented verbal warnings were given to fishers as a result of improper placement or for failure to attached required trap net tags. During the first year of the use of these tags by the tribal fishery a more discretionary stance was taken and many warnings were issued when at least one of the two tags was present. Two citations were issued for trap nets found to be unmarked by either of the two tags that are required to be placed on each trap net.

Referrals to the various tribal enforcement agencies generally concerned net marking insufficiencies. One referral involved a non-tribal member on board a tribal vessel. The referral also involved a request for an incident report to determine whether or not sufficient evidence existed to charge the non-tribal member in state court with commercial fishing without a license. While his presence on board the vessel constituted a violation of the CORA Code, and subjected the tribal members to enforcement actions, insufficient proofs of observed activity were presented to MDNR CFS to allow officers to charge the non-tribal member in state court. Mere presence on board the vessel is not, in and of itself, a violation under state law. The individual must be observed involved in overt fishing activity, no such observations were documented.

Tribal fishers permitted to fish in the Disputed Zone do so under regulations set forth by the state. As such, seasonal spawning closures comply with state regulations and are somewhat more restrictive than tribal regulations. Two of the four permitted fishers were found to be fishing a total of four trap nets in the zone while the state spawning closure was still in effect. The fishers were instructed to release all fish contained in the nets and tie the tunnels shut until the season re-opened. No citations were issue. Adequate notification of Disputed Zone

regulatory requirements and improved permit language will lead to increased scrutiny of the fishery in this area during the 2006 season.

Table 6. MDNR CFS 2004 summary of commercial fisheries related violations.

VIOLATIONS	1836 TREATY FISHERY	STATE LICENSED	1842 TREATY FISHERY	TOTALS
<i>ARRESTS</i>	8	4	N/A	12
<i>REFERRALS</i>	9	N/A	2	11
<i>WARNINGS</i>	23	9	N/A	32
TOTALS	40	13	2	55

4. Joint Patrols

Officers from the State’s Commercial Fish Enforcement Unit conducted patrols jointly with officers from the five signatory tribes. Joint patrols consisted of routine patrols with 1 or more tribal law enforcement officers but do not include Law Enforcement Committee (LEC) sponsored group patrols which are summarized below. MDNR CFS reported conducting a total of 13 joint patrols with tribal law enforcement officers. MDNR CFS and Little Traverse Bay Band (LTBB) conservation officers combined efforts on 11 of the 13 joint patrols.

5. Group Patrols

The Decree requires the LEC to schedule a minimum of eight group patrols during the year [Section XVII (B) (f) (1)]. At the January 29, 2004 LEC meeting the committee approved the use of a standardized group patrol summary report. The purpose of the report is to document the results of all agencies activities and findings during a LEC scheduled group patrol. The LEC assigns lead worker responsibilities to one officer for each patrol. It is the lead worker’s

responsibility to make notification to the LEC member agencies the following information: the area to be covered, the date(s) and time(s) of the proposed patrol, boat assignments, coordination of launching sites, and communication arrangements. Member agencies are expected to provide the lead worker with documentation of all inspections and activities following the completion of the group patrol. Using the prescribed format, the lead work is then expected to compile the information into a final summary report. The report is then to be reviewed by the LEC.

The Law Enforcement Committee scheduled a total of three group patrols at the January 27, 2005 meeting. Committee members decided that group patrols should be scheduled at locations and times where specific concerns exist. As a result it was decided to delay the scheduling of the remaining group patrols until the fishing season had progressed and issues arose.

The initial LEC group patrol for the 2005 season was led by SSM Conservation Officer Sgt. Sam Gardner on May 5th and 6th on Northern Lake Huron. The second patrol scheduled for the Ludington area to address abandoned net concerns was to be led by LRB Officer Art de Bres on May 19th and 20th. The 3rd of the first three patrols scheduled for 2005 was conducted out of the Bay De Noc area of Lake Michigan and was led by MDNR CFS Ken Johnson.

Two additional group patrols were scheduled and completed prior to the September 29, 2005 LEC meeting. On July 14th and 15th LTBB officers led a patrol that was centered on the waters off of the Northwestern Lower Peninsula.

On September 15th and 16th MDNR CFS John Casto acted as lead officer for a patrol that was conducted on the waters of Northern Lake Huron.

Continued concerns about the abandoned net issue in the Ludington area resulted in the scheduling of a 2nd group patrol to the area during the period of October 2nd-4th. MDNR CFS Steve Huff acted as lead officers during this effort.

It was agreed that a group patrol would be scheduled to address the November whitefish and lake trout season closure. It was intended that each agency would develop patrol plans for areas of specific concern near their communities. These plans would then be provided to Bev Aikens for distribution to the committee members so that a loosely coordinated effort could be undertaken. The sharing of patrol plans failed to materialize and the result was an even more loosely coordinated effort and no summary report of activity during the period.

All participating members must observe the established protocol to ensure that group efforts are effectively and efficiently conducted and to ensure that an adequate record of accomplishments is kept. The LEC must re-commit itself to ensure the following:

- 1) Adequate notification of group patrol details by lead agency.
- 2) Participating agencies must provide the lead agency with copies of inspection forms that are to be utilized during the joint effort.
- 3) The lead agency/officer must complete and submit a group patrol summary report to the LEC for review.
- 4) The LEC must place more significance on the review of these reports to ensure that objectives are being met.

6. MDNR Patrols

In addition to the LEC Group Patrols, and the joint patrols conducted with tribal law enforcement officers, officers from the MDNR Wildlife Resource Protection Section Commercial Fish Enforcement Unit organized and executed several additional multi-day patrols to address complaints that were received during the year.

In addition to the LEC group patrols in May and October, three MDNR patrols were organized to address complaints in the Ludington area. In an effort to limit the incidence of sportfisher entanglement in commercial nets, a patrol was conducted prior to the commencement of the 2005 Gander Mountain Fishing Tournament out of Ludington. Known net locations were documented and supplied to tournament organizers as well as personnel at the USCG Station Ludington, the Ludington Harbor Master and local charter boat association authorities in an effort to reduce the number of entanglements being experienced by sport fishers. Efforts were also made to locate the source of several complaints concerning unmarked nets. Despite our efforts no abandoned nets were located during this patrol.

On June 12th, 13th and 14th CFS combined efforts with local conservation officers and conducted a patrol of Northern Lake Huron from Rogers City to the Mackinaw Straits and Drummond Island. Conservation Officers from the Northeastern Lower Peninsula accompanied CFS on three of the Unit's five patrol boats. In addition to completing an extensive inventory of nets in the area officers conducted multiple boardings and removed the remains of a balled-up and abandoned salmon net from a shoal in St. Martins Bay (See photo below). The net had been the source of several complaints over the last two years. The MDNR airplane was used to locate activity and to direct CFEU vessels to commercial boats to conduct boardings. The patrol functioned as both an extensive effort to monitor the commercial fishery in the area and to provide training to officers stationed along the Lake Huron shore line.



Local officers and Commercial Fish Specialists removing balled-up and abandoned gill net from Lake Huron's St. Martins Bay.

On June 26th, 27th and 28th CFS and local officers from the Northwestern Lower Peninsula conducted a three-day patrol of Lake Michigan's Beaver Island Chain. Once again a comprehensive net inventory was completed and on this occasion two tribal commercial fishing vessels were boarded. The patrol originated out of Charlevoix but MDNR vessels from Escanaba and Manistique surveyed the U.P. shore line and converged with officers at the Beaver Islands. The MDNR aircraft was also used during the patrol but persistent ground fog limited its success.

During the month of July several patrols were conducted in the Rockport and Disputed Zone portion of the ceded waters. Net locations were documented and provided to tournament officials for the July Alpena Trout Tournament in an effort to limit conflicts between sport fishers and commercial nets. Questions regarding court jurisdiction arose during the year and needed to be resolved before addressing violations that were encountered in the zone. It became

increasingly apparent as the year wore on that fishers operating out of Rockport and permitted to fish in the Disputed Zone were unaware of the regulatory differences between the remainder of the Southern Lake Huron Trap Net Zone and the Disputed Zone. As a result officers from the CFEU spent several days attempting to update fishers on regulations associated with the state permits. There were varying degrees of acceptance to this effort even though warnings were given in lieu of citations being written.

On October 10th, 11th and 12th CFS aboard 2 of the Unit's vessels returned to Ludington in an effort to locate and re-mark abandoned trap nets in preparation for their removal. Complaints from throughout the year were re-examined and efforts were made to grapple locations to locate the nets. In the end, the location of three unmarked abandoned trap nets were confirmed and documented. Nets were marked and prepared for removal by tribal authorities. Efforts to contract a fisher failed and as previously stated it is believed that the nets will over winter for what may very well be the 4th straight year. Plans are underway to relocate the nets early in the spring.

On October 31st and November 1st the CFEU conducted patrols statewide to address the state whitefish closure. MDNR CFS were assigned to two-man teams with specific areas of responsibility. Within those areas officers were instructed to contact as many fishers as possible and to conduct wholesale fish dealer inspections at all locations known to purchase fish directly from commercial fishers. Wholesale inspections were intended to complete a full inventory, and through accounting of all whitefish and lake trout on hand. Fishers were inspected and questioned as to the status of their nets, all nets were to be either removed from the water or rendered inoperable by noon on the 6th. The Disputed Zone on Northern Lake Michigan was

monitored to ensure compliance with state issued permits. Two tickets were issued to two different fishers in the Disputed Zone for failing to properly tag their trap nets.

Similar patrols were conducted during November 5th and 6th to address the tribal closure. Officers again worked throughout the ceded waters to identify activity and to contact fishers when ever possible. LTBB officers arranged for a coordinated flight by the USCG Air Station at Traverse City but weather conditions limited activity during the effort.

MDNR CFS teams were reassembled on November 29th and the re-opening of the season was again monitored over several days. The location of vessels and their continued presence at ports were again documented group efforts were conducted during the tribal re-opener. While no citations were issued, warnings were provided to two of the four Southern Lake Huron Trap Net Zone fishers who had opened their Disputed Zone nets early. As previously indicated fish were required to be returned to the water and nets were rendered inoperable.

C. Law Enforcement Committee

The Law Enforcement Committee convened on four occasions during 2005. A planned December meeting was cancelled due to widespread conflicts. While the committee is only required to meet on a quarterly basis it is hoped that additional meetings can be planned to ensure that the committee's objectives are being met. Differences on trap net tagging, and the reporting of group patrol activity are two areas that needed additional attention. The lack of meetings after September left the committee with unfinished business that must be addressed at a time when the obligation to address new commitments is at hand. As much as is possible we should attempt to finalize all old business by the end of the year.

I would once again like to thank Kevin Willis for his efforts as chairman and sole member of the Net Removal Sub-Committee and would also like to thank Captain Bill Bailey for his efforts as LEC Chairman over the past year. MDNR representatives look forward to working with LEC members and LEC member agencies during the coming year.

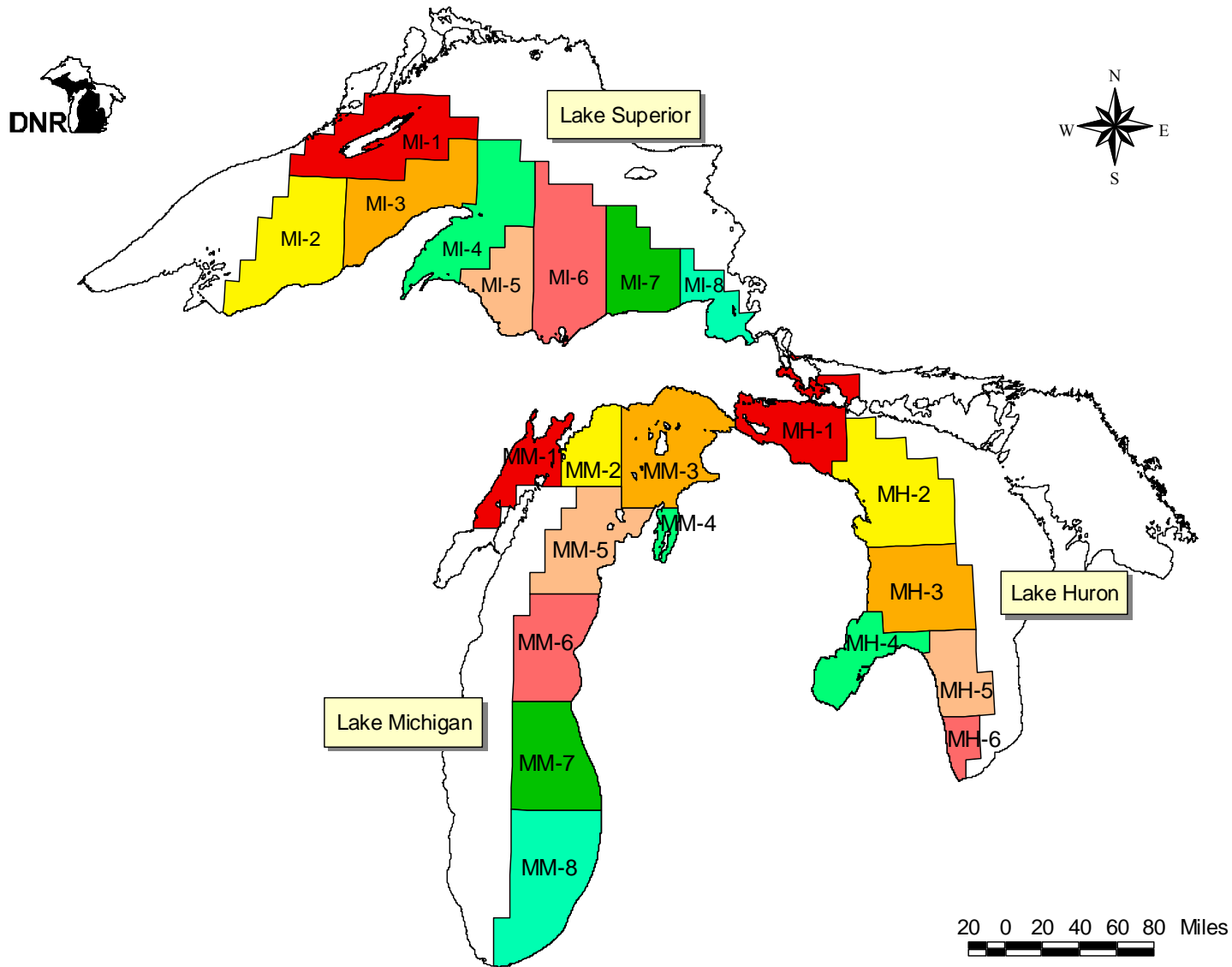


Figure 1. Lake trout management units for Lakes Superior, Michigan and Huron.

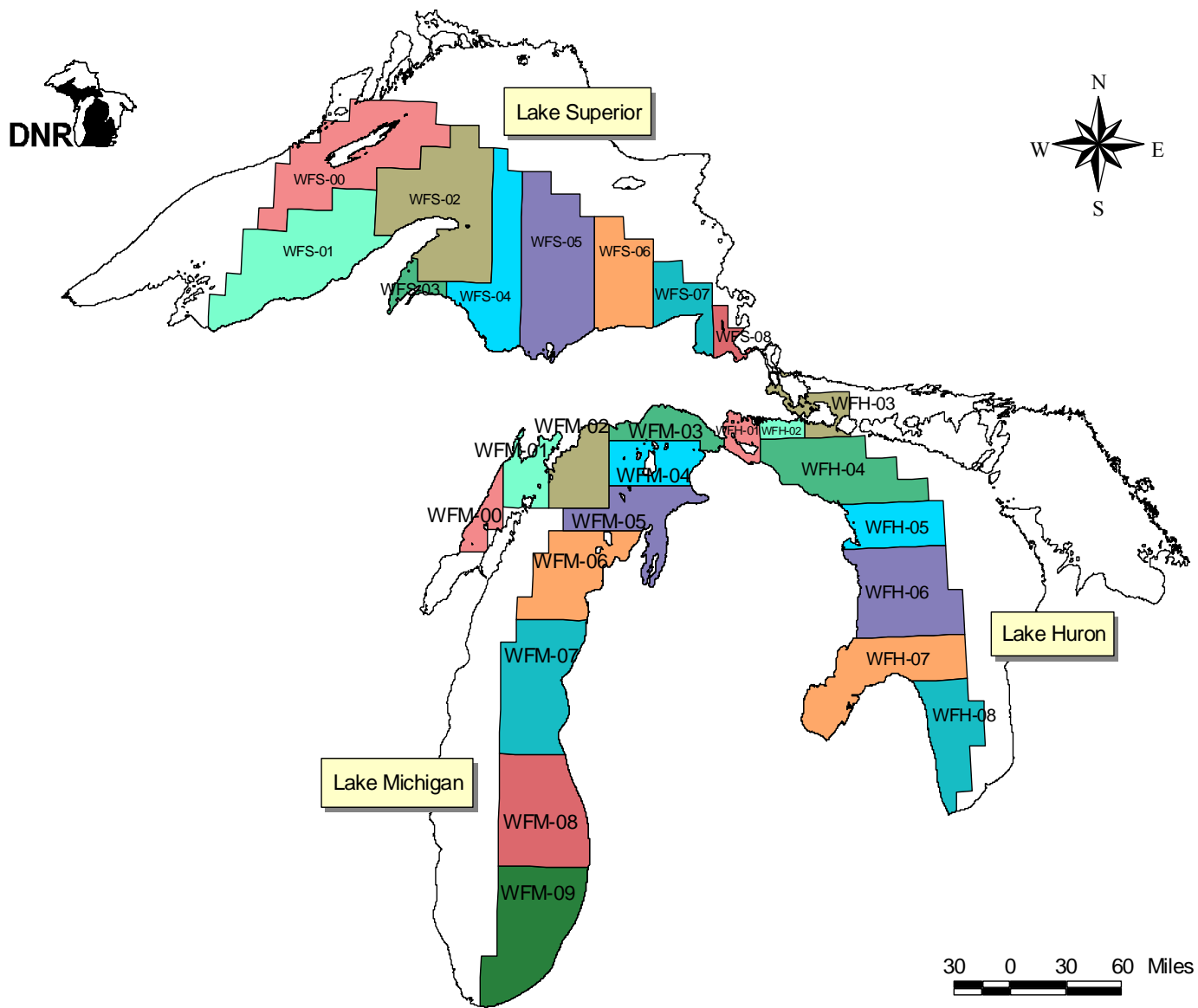


Figure 2. Lake whitefish management units for Lakes Superior, Michigan and Huron.

Appendices

Appendix 1. Model estimates of harvest quota for lake trout by lake trout management unit in the 1836 Treaty-ceded waters of the Great Lakes as used during the final stages of negotiations.

Appendix 2. Model estimates of harvest quota for lake whitefish by whitefish management unit in the 1836 Treaty-ceded waters of the Great Lakes as used during the final stages of negotiations.

Appendix 1. Lake Trout, Lake Huron, MH-1

Scenario = Effort-based, phase-in on commercial fishery from 2001 through 2005. Phase in a 24-in minimum size limit on sport fishery by 2005.

Extended phase-in of allocation percentages at 47% TAM from 2006 through 2011. Rehabilitation period at 45% TAM from 2012 through 2020.

Starting in 2002, stock 0.6 per acre of federal yearlings plus 100,000 MDNR yearlings. No change in Canadian commercial effort.

47% SSBR = 0.11

45% SSBR = 0.13

Year	Commercial (Tribal)				Recreational (State)							Lake trout population	
	Effort limit (million feet)	Harvest limit (pounds)	CPUE (pounds per million feet)	Percent of allowable harvest	Potential effort (hours)	Minimum size limit	Harvest limit (pounds)	CPUE (fish per 100 hours)	CPUE (pounds per 100 hours)	Average size (pounds)	Percent of allowable harvest	Female spawning biomass	SSBR
Reference Period													
1996	17.155	242,057	14,110	94%	116,026	10	15,869	4.0	13.7	3.4	6%		
1997	13.107	163,885	12,504	93%	124,637	10	12,665	2.8	10.2	3.6	7%		
1998	13.139	130,863	9,960	92%	129,874	10	11,939	2.3	9.2	4.0	8%	8,782	
Phase-in Period (Effort-Based for Commercial Fishery, Size Limit-Based for Recreational Fishery)													
2001	12.297	155,548	12,649	94%	123,512	20	9,400	2.0	7.6	3.8	6%	10,929	0.03
2002	7.957	112,004	14,077	91%	123,512	20	10,793	2.2	8.7	3.9	9%	15,974	0.04
2003	6.655	104,682	15,730	92%	123,512	22	9,141	1.8	7.4	4.1	8%	22,439	0.06
2004	5.787	107,177	18,521	91%	123,512	22	11,029	2.1	8.9	4.2	9%	30,473	0.09
2005	5.787	137,309	23,728	93%	123,512	24	9,919	1.9	8.0	4.2	7%	40,315	0.10
Extended Phase-in Period (TAM = 47%, Phase in of Allocation Percentages)													
2006	5.497	160,708	29,233	92%	135,864	24	13,934	2.4	10.3	4.3	8%	52,623	0.11
2007	5.931	196,919	33,199	92%	142,039	24	17,734	2.8	12.5	4.5	8%	67,344	0.11
2008	6.221	220,556	35,455	91%	148,215	24	21,113	3.1	14.2	4.6	9%	82,793	0.11
2009	6.365	233,171	36,631	91%	154,390	24	23,952	3.3	15.5	4.7	9%	96,081	0.11
2010	6.365	237,507	37,312	90%	154,390	24	25,410	3.4	16.5	4.8	10%	106,565	0.11
2011	6.510	245,712	37,743	90%	154,390	24	26,540	3.5	17.2	4.8	10%	114,382	0.11
Rehabilitation Period (TAM = 45%, Final Allocation - Tribal Share=88%, State Share=12%)													
2012	5.642	217,239	38,503	88%	158,096	24	28,378	3.7	18.0	4.9	12%	122,637	0.13
2013	5.642	223,029	39,530	88%	158,096	24	29,784	3.8	18.8	4.9	12%	130,495	0.13
2014	5.642	226,658	40,173	88%	158,096	24	30,920	3.9	19.6	5.0	12%	137,403	0.13
2015	5.787	234,045	40,445	88%	154,390	24	30,984	4.0	20.1	5.0	12%	142,788	0.13
2016	5.787	234,278	40,485	88%	154,390	24	31,483	4.0	20.4	5.0	12%	146,676	0.13
2017	5.787	234,257	40,482	88%	154,390	24	31,827	4.1	20.6	5.1	12%	149,351	0.13
2018	5.787	234,192	40,470	88%	154,390	24	32,069	4.1	20.8	5.1	12%	151,166	0.13
2019	5.787	234,147	40,463	88%	154,390	24	32,241	4.1	20.9	5.1	12%	152,418	0.13
2020	5.787	234,126	40,459	88%	154,390	24	32,364	4.1	21.0	5.1	12%	153,296	0.13

Appendix 1. Lake Trout, Lake Huron, MH-2

Scenario = Phase in a 24-in minimum size limit on sport fishery by 2005. Assume minimal subsistence fishing.
Assume sport fishing effort gradually increases by 25%. No change in Canadian commercial effort.

40% SSBR = 0.32

Year	Commercial (Tribal)				Recreational (State)							Lake trout population	
	Effort limit (million feet)	Harvest limit (pounds)	CPUE (pounds per million feet)	Percent of allowable harvest	Potential effort (hours)	Minimum size limit	Harvest limit (pounds)	CPUE (fish per 100 hours)	CPUE (pounds per 100 hours)	Average size (pounds)	Percent of allowable harvest	Female spawning biomass	SSBR
Reference Period													
1996	0.000	-	-	0%	213,906	10	45,841	5.1	21.4	4.2	100%		
1997	0.000	-	-	0%	212,802	10	53,203	6.1	25.0	4.1	100%		
1998	0.000	-	-	0%	157,710	10	41,558	5.9	26.4	4.5	100%	106,461	
Phase-in Period (Size Limit-Based for Recreational Fishery)													
2001	Subsistence	442	na	1%	194,806	20	47,517	5.7	24.4	4.3	99%	160,291	0.40
2002	Subsistence	333	na	1%	194,806	20	51,329	6.1	26.3	4.3	99%	193,286	0.35
2003	Subsistence	473	na	1%	214,287	22	44,672	4.3	20.8	4.9	99%	221,535	0.42
2004	Subsistence	608	na	1%	214,287	22	41,897	3.9	19.6	5.0	99%	248,990	0.51
2005	Subsistence	686	na	2%	233,767	24	33,975	2.9	14.5	5.1	98%	267,891	0.58
Rehabilitation Period (TAM = 40%)													
2006	Subsistence	816	na	2%	233,767	24	34,419	3.0	14.7	4.9	98%	282,713	0.64
2007	Subsistence	943	na	2%	243,508	24	38,251	3.2	15.7	4.9	98%	301,388	0.69
2008	Subsistence	991	na	2%	243,508	24	41,065	3.4	16.9	5.0	98%	325,931	0.73
2009	Subsistence	1,033	na	2%	243,508	24	43,311	3.5	17.8	5.0	98%	353,119	0.75
2010	Subsistence	1,076	na	2%	243,508	24	44,837	3.6	18.4	5.1	98%	380,032	0.78
2011	Subsistence	1,091	na	2%	243,508	24	45,872	3.7	18.8	5.1	98%	404,769	0.80
2012	Subsistence	1,102	na	2%	243,508	24	46,592	3.7	19.1	5.1	98%	426,678	1
2013	Subsistence	1,110	na	2%	243,508	24	47,098	3.8	19.3	5.2	98%	445,792	1
2014	Subsistence	1,115	na	2%	243,508	24	47,432	3.8	19.5	5.2	98%	461,963	0.82
2015	Subsistence	1,118	na	2%	243,508	24	47,635	3.8	19.6	5.2	98%	475,258	0.82
2016	Subsistence	1,119	na	2%	243,508	24	47,746	3.8	19.6	5.2	98%	485,903	0.82
2017	Subsistence	1,120	na	2%	243,508	24	47,803	3.8	19.6	5.2	98%	494,300	0.82
2018	Subsistence	1,120	na	2%	243,508	24	47,830	3.8	19.6	5.2	98%	500,853	0.82
2019	Subsistence	1,121	na	2%	243,508	24	47,842	3.8	19.6	5.2	98%	505,928	0.82
2020	Subsistence	1,121	na	2%	243,508	24	47,847	3.8	19.6	5.2	98%	509,839	0.82

Appendix 1. Lake Trout, Lake Michigan, MM-1/2/3

Scenario = Assume commercial effort and sport effort increases by 25%.
 Maintain 24-inch size limit on sport fishery.

40% SSBR = 0.77
 2006 SSBR = 0.98
 2020 SSBR = 1.02

Year	Commercial (Tribal)				Recreational (State)							Lake trout population	
	Effort limit (million feet)	Harvest limit (pounds)	CPUE (pounds per million feet)	Percent of allowable harvest	Potential effort (hours)	Minimum size limit	Harvest limit (pounds)	CPUE (fish per 100 hours)	CPUE (pounds per 100 hours)	Average size (pounds)	Percent of allowable harvest	Female spawning biomass	SSBR
Reference Period													
1996	17.536	749,556	42,744	90%	103,045	24	80,837	13.1	78.4	6.0	10%		
1997	15.311	685,279	44,757	89%	124,056	24	87,450	11.0	70.5	6.4	11%		
1998	14.472	781,010	53,967	88%	135,878	24	110,251	12.1	81.1	6.7	12%		
Rehabilitation Period (TAM = 40%)													
2001	19.716	548,805	27,835	89%	151,241	24	67,589	6.4	44.7	7.0	11%		
2002	19.716	498,310	25,274	89%	151,241	24	60,877	5.9	40.3	6.8	11%		
2003	19.716	464,066	23,537	89%	151,241	24	56,730	5.6	37.5	6.7	11%		
2004	19.716	442,790	22,458	89%	151,241	24	54,102	5.4	35.8	6.6	11%		
2005	19.716	431,674	21,894	89%	151,241	24	52,243	5.3	34.5	6.5	11%		
2006	19.716	427,203	21,668	89%	151,241	24	51,318	5.3	33.9	6.4	11%		
2007	19.716	426,332	21,623	89%	151,241	24	51,056	5.3	33.8	6.4	11%		
2008	19.716	426,837	21,649	89%	151,241	24	51,030	5.3	33.7	6.4	11%		
2009	19.716	427,734	21,695	89%	151,241	24	51,101	5.3	33.8	6.4	11%		
2010	19.716	428,616	21,739	89%	151,241	24	51,244	5.3	33.9	6.4	11%		
2011	19.716	429,374	21,778	89%	151,241	24	51,374	5.3	34.0	6.4	11%		
2012	19.716	430,011	21,810	89%	151,241	24	51,460	5.3	34.0	6.4	11%		
2013	19.716	430,504	21,835	89%	151,241	24	51,530	5.3	34.1	6.4	11%		
2014	19.716	430,827	21,851	89%	151,241	24	51,582	5.3	34.1	6.4	11%		
2015	19.716	431,013	21,861	89%	151,241	24	51,613	5.3	34.1	6.4	11%		
2016	19.716	431,111	21,866	89%	151,241	24	51,630	5.3	34.1	6.4	11%		
2017	19.716	431,159	21,868	89%	151,241	24	51,639	5.3	34.1	6.4	11%		
2018	19.716	431,181	21,869	89%	151,241	24	51,644	5.3	34.1	6.4	11%		
2019	19.716	431,191	21,870	89%	151,241	24	51,646	5.3	34.1	6.4	11%		
2020	19.716	431,195	21,870	89%	151,241	24	51,647	5.3	34.1	6.4	11%		

Appendix 1. Lake Trout, Lake Michigan, MM-4

Scenario =Effort-based, phase-in on commercial fishery from 2001 through 2005. Phase in a 24-in minimum size limit on sport fishery by 2005.
Forty-five percent TAM and 60/40 split from 2006 through 2009. Forty-five percent TAM and 55/45 split from 2010 through 2020.

45% SSBR = 0.40

Year	Commercial (Tribal)				Recreational (State)							Lake trout population	
	Effort limit (million feet)	Harvest limit (pounds)	CPUE (pounds per million feet)	Percent of allowable harvest	Potential effort (hours)	Minimum size limit	Harvest limit (pounds)	CPUE (fish per 100 hours)	CPUE (pounds per 100 hours)	Average size (pounds)	Percent of allowable harvest	Female spawning biomass	SSBR
Reference Period													
1996	2.260	112,637	49,840	78%	191,401	24	31,935	2.5	16.7	6.7	22%		
1997	1.776	109,354	61,573	59%	278,426	24	76,613	4.3	27.5	6.4	41%		
1998	1.556	160,063	102,868	52%	303,290	20	147,006	8.9	48.5	5.4	48%	149,532	
Effort-Based, Phase-in Period													
2001	1.864	129,753	69,610	64%	257,706	20	74,398	5.0	28.9	5.8	36%	124,666	
2002	1.268	93,833	74,029	54%	257,706	20	78,623	5.2	30.5	5.8	46%	135,249	
2003	1.268	100,951	79,645	59%	257,706	22	70,682	4.4	27.4	6.2	41%	149,413	
2004	1.268	105,272	83,054	58%	257,706	22	75,041	4.6	29.1	6.3	42%	159,232	
2005	1.268	108,645	85,714	64%	257,706	24	62,260	3.7	24.2	6.6	36%	167,267	
Rehabilitation Period (TAM = 45%, Tribal Share 60%, State Share 40%)													
2006	1.230	108,487	88,183	60%	288,630	24	72,421	3.8	25.1	6.6	40%	172,800	0.40
2007	1.230	110,259	89,624	60%	288,630	24	74,098	3.8	25.7	6.7	40%	176,541	0.40
2008	1.230	111,435	90,580	60%	288,630	24	75,202	3.9	26.1	6.7	40%	178,995	0.40
2009	1.230	112,146	91,158	60%	288,630	24	75,879	3.9	26.3	6.7	40%	180,579	0.40
Rehabilitation Period (TAM = 45%, Tribal Share 55%, State Share 45%)													
2010	1.156	105,649	91,417	55%	322,132	24	84,988	3.9	26.4	6.7	45%	180,988	0
2011	1.156	105,777	91,528	55%	322,132	24	85,063	3.9	26.4	6.8	45%	181,357	0
2012	1.156	105,888	91,624	55%	322,132	24	85,152	3.9	26.4	6.8	45%	181,706	0.40
2013	1.156	105,979	91,703	55%	322,132	24	85,237	3.9	26.5	6.8	45%	181,979	0.40
2014	1.156	106,046	91,760	55%	322,132	24	85,299	3.9	26.5	6.8	45%	182,169	0.40
2015	1.156	106,087	91,796	55%	322,132	24	85,339	3.9	26.5	6.8	45%	182,294	0.40
2016	1.156	106,111	91,817	55%	322,132	24	85,363	3.9	26.5	6.8	45%	182,370	0.40
2017	1.156	106,125	91,829	55%	322,132	24	85,377	3.9	26.5	6.8	45%	182,417	0.40
2018	1.156	106,133	91,836	55%	322,132	24	85,384	3.9	26.5	6.8	45%	182,444	0.40
2019	1.156	106,137	91,839	55%	322,132	24	85,387	3.9	26.5	6.8	45%	182,462	0.40
2020	1.156	106,139	91,841	55%	322,132	24	85,388	3.9	26.5	6.8	45%	182,473	0.40

Appendix 1. Lake Trout, Lake Michigan, MM-5

Scenario = Assume sport effort increases by 25% and commercial effort is controlled by harvest limit.
Phase in a 24-in minimum size limit on sport fishery by 2005.

45% SSBR = 0.29

Year	Commercial (Tribal)				Recreational (State)							Lake trout population	
	Effort limit (million feet)	Harvest limit (pounds)	CPUE (pounds per million feet)	Percent of allowable harvest	Potential effort (hours)	Minimum size limit	Harvest limit (pounds)	CPUE (fish per 100 hours)	CPUE (pounds per 100 hours)	Average size (pounds)	Percent of allowable harvest	Female spawning biomass	SSBR
Reference Period													
1996	0.215	40,965	190,533	32%	323,133	10	86,964	4.8	26.9	5.6	68%		
1997	0.332	75,478	227,344	53%	332,193	10	68,233	3.7	20.5	5.6	47%		
1998	0.487	47,996	98,555	35%	363,157	10	88,251	4.0	24.3	6.1	65%	131,889	
Rehabilitation Period (TAM = 45%)													
2001	0.312	45,876	147,075	42%	339,494	22	62,179	2.7	18.3	6.8	58%	134,820	
2002	0.312	46,579	149,329	43%	339,494	22	62,814	2.7	18.5	6.8	57%	136,008	
2003	0.314	47,028	149,939	42%	339,494	22	63,776	2.8	18.8	6.8	58%	138,536	
2004	0.324	48,156	148,635	43%	339,494	22	64,003	2.7	18.9	6.9	57%	139,226	
2005	0.362	53,498	147,825	46%	339,494	24	63,763	2.7	18.8	6.9	54%	139,419	
2006	0.334	49,753	148,817	49%	339,494	24	52,693	2.2	15.5	7.2	51%	141,429	0.33
2007	0.327	48,998	149,644	46%	373,444	24	58,473	2.2	15.7	7.2	54%	142,217	0.32
2008	0.321	47,909	149,463	43%	407,393	24	63,678	2.2	15.6	7.2	57%	141,596	0.32
2009	0.324	48,146	148,604	42%	424,368	24	65,757	2.2	15.5	7.2	58%	140,282	0.31
2010	0.326	48,145	147,815	42%	424,368	24	65,281	2.1	15.4	7.2	58%	139,378	0.31
2011	0.327	48,250	147,358	43%	424,368	24	64,969	2.1	15.3	7.2	57%	138,840	0.31
2012	0.327	48,176	147,133	43%	424,368	24	64,790	2.1	15.3	7.1	57%	138,578	0.31
2013	0.331	48,636	146,991	43%	424,368	24	64,678	2.1	15.2	7.1	57%	138,358	0.31
2014	0.331	48,594	146,864	43%	424,368	24	64,594	2.1	15.2	7.1	57%	138,195	0.31
2015	0.331	48,570	146,792	43%	424,368	24	64,538	2.1	15.2	7.1	57%	138,088	0.31
2016	0.331	48,557	146,752	43%	424,368	24	64,504	2.1	15.2	7.1	57%	138,021	0.31
2017	0.331	48,550	146,731	43%	424,368	24	64,485	2.1	15.2	7.1	57%	137,980	0.31
2018	0.331	48,547	146,719	43%	424,368	24	64,474	2.1	15.2	7.1	57%	137,956	0.31
2019	0.331	48,545	146,714	43%	424,368	24	64,468	2.1	15.2	7.1	57%	137,941	0.31
2020	0.331	48,544	146,711	43%	424,368	24	64,465	2.1	15.2	7.1	57%	137,932	0.31

Appendix 1. Lake Trout, Lake Michigan, MM-6/7

Scenario = Assume minimal subsistence fishing. Assume sport effort increases by 25%.

40% SSBR = 0.63
2006 SSBR = 1.13
2020 SSBR = 1.13

Year	Commercial (Tribal)				Recreational (State)							Lake trout population	
	Effort limit (million feet)	Harvest limit (pounds)	CPUE (pounds per million feet)	Percent of allowable harvest	Potential effort (hours)	Minimum size limit	Harvest limit (pounds)	CPUE (fish per 100 hours)	CPUE (pounds per 100 hours)	Average size (pounds)	Percent of allowable harvest	Female spawning biomass	SSBR
Reference Period													
1996	0.000	-	-	0%	1,137,475	10	155,230	2.8	13.6	4.9	100%		
1997	0.000	-	-	0%	1,321,468	10	183,520	2.4	13.9	5.9	100%		
1998	0.000	-	-	0%	1,359,033	10	254,120	3.6	18.7	5.2	100%		
Rehabilitation Period (TAM = 40%)													
2001	Subsistence	4,265	na	1%	1,590,823	10	319,710	3.1	20.1	6.6	99%		
2002	Subsistence	4,172	na	1%	1,590,823	10	311,448	2.9	19.6	6.7	99%		
2003	Subsistence	4,000	na	1%	1,590,823	10	295,197	2.8	18.6	6.7	99%		
2004	Subsistence	3,842	na	1%	1,590,823	10	279,365	2.6	17.6	6.8	99%		
2005	Subsistence	3,657	na	1%	1,590,823	10	264,016	2.5	16.6	6.7	99%		
2006	Subsistence	3,548	na	1%	1,590,823	10	254,767	2.4	16.0	6.6	99%		
2007	Subsistence	3,426	na	1%	1,590,823	10	247,308	2.4	15.5	6.6	99%		
2008	Subsistence	3,358	na	1%	1,590,823	10	243,548	2.3	15.3	6.5	99%		
2009	Subsistence	3,314	na	1%	1,590,823	10	241,364	2.3	15.2	6.5	99%		
2010	Subsistence	3,290	na	1%	1,590,823	10	240,417	2.3	15.1	6.5	99%		
2011	Subsistence	3,276	na	1%	1,590,823	10	239,902	2.3	15.1	6.5	99%		
2012	Subsistence	3,271	na	1%	1,590,823	10	239,698	2.3	15.1	6.5	99%		
2013	Subsistence	3,270	na	1%	1,590,823	10	239,602	2.3	15.1	6.5	99%		
2014	Subsistence	3,270	na	1%	1,590,823	10	239,550	2.3	15.1	6.5	99%		
2015	Subsistence	3,269	na	1%	1,590,823	10	239,513	2.3	15.1	6.5	99%		
2016	Subsistence	3,269	na	1%	1,590,823	10	239,486	2.3	15.1	6.5	99%		
2017	Subsistence	3,269	na	1%	1,590,823	10	239,466	2.3	15.1	6.5	99%		
2018	Subsistence	3,269	na	1%	1,590,823	10	239,452	2.3	15.1	6.5	99%		
2019	Subsistence	3,269	na	1%	1,590,823	10	239,442	2.3	15.1	6.5	99%		
2020	Subsistence	3,269	na	1%	1,590,823	10	239,434	2.3	15.1	6.5	99%		

Appendix 1. Lake Trout, Lake Superior, MI-5

Scenario = Assume minimal subsistence fishing. Assume sport fishing effort increases by 20%.

45% SSBR = 0.37
2006 SSBR = 1.06
2020 SSBR = 1.06

Year	Commercial (Tribal)				Recreational (State)							Lake trout population	
	Effort limit (million feet)	Harvest limit (pounds)	CPUE (pounds per million feet)	Percent of allowable harvest	Potential effort (hours)	Minimum size limit	Harvest limit (pounds)	CPUE (fish per 100 hours)	CPUE (pounds per 100 hours)	Average size (pounds)	Percent of allowable harvest	Female spawning biomass	SSBR
Reference Period													
1996	0.000	-	-	-	61,750	10	55,409	18.1	89.7	4.9	100%		
1997	0.000	-	-	-	72,922	10	72,385	20.7	99.3	4.8	100%		
1998	0.000	-	-	-	54,612	10	57,867	21.6	106.0	4.9	100%		
Sustainable Management Period (TAM = 45%)													
2001	Subsistence	2,041	na	4%	75,714	10	51,914	17.7	68.6	3.9	96%		
2002	Subsistence	1,949	na	4%	75,714	10	50,787	17.6	67.1	3.8	96%		
2003	Subsistence	1,902	na	4%	75,714	10	51,977	18.1	68.6	3.8	96%		
2004	Subsistence	1,913	na	4%	75,714	10	52,448	18.2	69.3	3.8	96%		
2005	Subsistence	1,908	na	4%	75,714	10	51,677	17.9	68.3	3.8	96%		
2006	Subsistence	1,908	na	4%	75,714	10	51,174	17.7	67.6	3.8	96%		
2007	Subsistence	1,893	na	4%	75,714	10	50,873	17.6	67.2	3.8	96%		
2008	Subsistence	1,883	na	4%	75,714	10	50,750	17.6	67.0	3.8	96%		
2009	Subsistence	1,882	na	4%	75,714	10	50,713	17.6	67.0	3.8	96%		
2010	Subsistence	1,878	na	4%	75,714	10	50,647	17.6	66.9	3.8	96%		
2011	Subsistence	1,875	na	4%	75,714	10	50,614	17.6	66.8	3.8	96%		
2012	Subsistence	1,875	na	4%	75,714	10	50,614	17.6	66.8	3.8	96%		
2013	Subsistence	1,875	na	4%	75,714	10	50,614	17.6	66.8	3.8	96%		
2014	Subsistence	1,875	na	4%	75,714	10	50,614	17.6	66.8	3.8	96%		
2015	Subsistence	1,875	na	4%	75,714	10	50,614	17.6	66.8	3.8	96%		
2016	Subsistence	1,875	na	4%	75,714	10	50,614	17.6	66.8	3.8	96%		
2017	Subsistence	1,875	na	4%	75,714	10	50,614	17.6	66.8	3.8	96%		
2018	Subsistence	1,875	na	4%	75,714	10	50,614	17.6	66.8	3.8	96%		
2019	Subsistence	1,875	na	4%	75,714	10	50,614	17.6	66.8	3.8	96%		
2020	Subsistence	1,875	na	4%	75,714	10	50,614	17.6	66.8	3.8	96%		

Appendix 1. Lake Trout, Lake Superior, MI-6

Scenario =Effort-based, phase-in on commercial fishery from 2001 through 2005. Phase in a 22-in minimum size limit on sport fishery by 2005.
Adjust commercial and sport effort to achieve a 50/50 split from 2006 through 2020.

45% SSBR = 0.24
2006 SSBR = 0.24
2020 SSBR = 0.24

Year	Commercial (Tribal)				Recreational (State)							Lake trout population	
	Effort limit (million feet)	Harvest limit (pounds)	CPUE (pounds per million feet)	Percent of allowable harvest	Potential effort (hours)	Minimum size limit	Harvest limit (pounds)	CPUE (fish per 100 hours)	CPUE (pounds per 100 hours)	Average size (pounds)	Percent of allowable harvest	Female spawning biomass	SSBR
Reference Period													
1996	0.820	17,322	21,130	47%	35,370	10	19,256	12.0	54.4	4.5	53%		
1997	0.452	20,107	44,496	48%	42,493	10	21,819	11.6	51.3	4.4	52%		
1998	0.879	19,604	22,308	48%	38,157	10	21,439	12.6	56.2	4.4	52%		
Phase-in Period (Effort-Based for Commercial Fishery, Size Limit-Based for Recreational Fishery)													
2001	0.717	10,942	15,265	51%	46,408	20	10,458	5.8	22.5	3.9	49%		
2002	0.681	10,920	16,035	50%	46,408	20	10,752	6.1	23.2	3.8	50%		
2003	0.638	10,532	16,508	48%	46,408	20	11,203	6.3	24.1	3.8	52%		
2004	0.638	10,034	15,728	51%	46,408	22	9,705	5.4	20.9	3.9	49%		
2005	0.638	10,267	16,093	50%	46,408	22	10,142	5.6	21.9	3.9	50%		
Sustainable Management Period (TAM = 45%)													
2006	0.638	10,632	16,666	50%	46,408	22	10,442	5.8	22.5	3.9	50%		
2007	0.638	10,706	16,782	50%	46,408	22	10,644	5.9	22.9	3.9	50%		
2008	0.638	10,742	16,838	50%	46,408	22	10,758	5.9	23.2	3.9	50%		
2009	0.638	10,757	16,861	50%	46,408	22	10,805	5.9	23.3	3.9	50%		
2010	0.638	10,762	16,870	50%	46,408	22	10,826	6.0	23.3	3.9	50%		
2011	0.638	10,765	16,873	50%	46,408	22	10,835	6.0	23.3	3.9	50%		
2012	0.638	10,765	16,874	50%	46,408	22	10,838	6.0	23.4	3.9	50%		
2013	0.638	10,765	16,875	50%	46,408	22	10,839	6.0	23.4	3.9	50%		
2014	0.638	10,765	16,875	50%	46,408	22	10,839	6.0	23.4	3.9	50%		
2015	0.638	10,765	16,875	50%	46,408	22	10,839	6.0	23.4	3.9	50%		
2016	0.638	10,765	16,875	50%	46,408	22	10,839	6.0	23.4	3.9	50%		
2017	0.638	10,765	16,875	50%	46,408	22	10,839	6.0	23.4	3.9	50%		
2018	0.638	10,765	16,875	50%	46,408	22	10,839	6.0	23.4	3.9	50%		
2019	0.638	10,765	16,875	50%	46,408	22	10,839	6.0	23.4	3.9	50%		
2020	0.638	10,765	16,875	50%	46,408	22	10,839	6.0	23.4	3.9	50%		

Appendix 1. Lake Trout, Lake Superior, MI-7

Scenario = Assume commercial effort and sport effort increases by 20%.

45% SSBR = 0.20
2006 SSBR = 0.53
2020 SSBR = 0.53

Year	Commercial (Tribal)				Recreational (State)							Lake trout population	
	Effort limit (million feet)	Harvest limit (pounds)	CPUE (pounds per million feet)	Percent of allowable harvest	Potential effort (hours)	Minimum size limit	Harvest limit (pounds)	CPUE (fish per 100 hours)	CPUE (pounds per 100 hours)	Average size (pounds)	Percent of allowable harvest	Female spawning biomass	SSBR
Reference Period													
1996	1.047	23,450	22,403	69%	14,872	10	10,712	13.9	72.0	5.2	31%		
1997	3.400	41,499	12,207	78%	17,563	10	11,802	14.4	67.2	4.7	22%		
1998	3.010	27,299	9,069	74%	13,153	10	9,665	16.0	73.5	4.6	26%		
Sustainable Management Period (TAM = 45%)													
2001	2.983	48,045	16,108	69%	18,235	10	21,153	32.2	116.0	3.6	31%		
2002	2.983	51,486	17,262	73%	18,235	10	19,451	27.9	106.7	3.8	27%		
2003	2.983	54,064	18,126	72%	18,235	10	20,745	29.6	113.8	3.8	28%		
2004	2.983	55,313	18,545	72%	18,235	10	21,470	30.5	117.7	3.9	28%		
2005	2.983	55,700	18,674	72%	18,235	10	21,684	30.7	118.9	3.9	28%		
2006	2.983	55,934	18,753	72%	18,235	10	21,722	30.7	119.1	3.9	28%		
2007	2.983	55,986	18,770	72%	18,235	10	21,686	30.6	118.9	3.9	28%		
2008	2.983	55,935	18,753	72%	18,235	10	21,636	30.6	118.7	3.9	28%		
2009	2.983	55,931	18,752	72%	18,235	10	21,610	30.5	118.5	3.9	28%		
2010	2.983	55,827	18,717	72%	18,235	10	21,577	30.5	118.3	3.9	28%		
2011	2.983	55,773	18,699	72%	18,235	10	21,564	30.5	118.3	3.9	28%		
2012	2.983	55,773	18,699	72%	18,235	10	21,564	30.5	118.3	3.9	28%		
2013	2.983	55,773	18,699	72%	18,235	10	21,564	30.5	118.3	3.9	28%		
2014	2.983	55,773	18,699	72%	18,235	10	21,564	30.5	118.3	3.9	28%		
2015	2.983	55,773	18,699	72%	18,235	10	21,564	30.5	118.3	3.9	28%		
2016	2.983	55,773	18,699	72%	18,235	10	21,564	30.5	118.3	3.9	28%		
2017	2.983	55,773	18,699	72%	18,235	10	21,564	30.5	118.3	3.9	28%		
2018	2.983	55,773	18,699	72%	18,235	10	21,564	30.5	118.3	3.9	28%		
2019	2.983	55,773	18,699	72%	18,235	10	21,564	30.5	118.3	3.9	28%		
2020	2.983	55,773	18,699	72%	18,235	10	21,564	30.5	118.3	3.9	28%		

Appendix 2. Model estimates of harvest quota for lake whitefish by whitefish management unit in 1836 Treaty-ceded waters of the Great Lakes as used during the final stages of negotiations.

Total harvest (lb) for whitefish in Lake Michigan whitefish management units (WFMU) for 1999-2020 with target mortality rate used in the unit.

Year and TAM used ¹	Whitefish management unit								State share		
	WFM-00 65%	WFM-01 59%	WFM-02 65%	WFM-03 85%	WFM-04 65%	WFM-05 60%	WFM-06 65%	WFM-08 65%	WFM-01 200K or 10%	WFM-06 65 K or 30%	WFM-08 500 K or 22.5%
1999	1,420,742	477,853	211,960	1,223,717	332,021	170,017	140,976	416,853	47,785	42,293	93,792
2000	1,216,222	847,198	173,320	1,203,052	306,771	158,806	322,036	415,147	84,720	96,611	93,408
2001	1,323,355	659,310	143,700	2,397,616	577,825	258,313	551,763	2,551,846	65,931	165,529	574,165
2002	1,272,192	854,887	188,129	1,686,142	565,289	241,118	349,487	1,676,415	85,489	104,846	377,193
2003	1,250,747	960,488	225,231	1,524,416	558,347	233,733	249,959	1,312,155	96,049	74,988	295,235
2004	1,242,439	1,013,997	244,311	1,493,578	557,877	228,845	212,595	1,168,241	101,400	63,778	262,854
2005	1,239,875	1,040,501	251,961	1,488,065	558,631	226,743	185,382	1,113,252	104,050	55,615	250,482
2006	1,238,931	1,052,527	254,740	1,487,144	558,703	226,041	176,252	1,092,576	105,253	52,876	245,830
2007	1,238,597	1,057,639	255,718	1,486,992	558,715	225,646	173,390	1,085,045	105,764	52,017	244,135
2008	1,238,481	1,059,745	256,060	1,486,967	558,720	225,517	172,086	1,082,351	105,974	51,626	243,529
2009	1,238,440	1,060,612	256,180	1,486,963	558,721	225,454	171,622	1,081,402	106,061	51,487	243,316
2010	1,238,426	1,060,969	256,221	1,486,963	558,722	225,425	171,457	1,081,070	106,097	51,437	243,241
2011	1,238,421	1,061,116	256,236	1,486,963	558,722	225,413	171,399	1,080,954	106,112	51,420	243,215
2012	1,238,419	1,061,177	256,241	1,486,963	558,722	225,408	171,378	1,080,913	106,118	51,413	243,205
2013	1,238,418	1,061,202	256,243	1,486,963	558,722	225,406	171,371	1,080,899	106,120	51,411	243,202
2014	1,238,418	1,061,212	256,244	1,486,963	558,722	225,405	171,368	1,080,894	106,121	51,410	243,201
2015	1,238,418	1,061,216	256,244	1,486,963	558,722	225,405	171,367	1,080,892	106,122	51,410	243,201
2016	1,238,418	1,061,218	256,244	1,486,963	558,722	225,405	171,367	1,080,891	106,122	51,410	243,201
2017	1,238,418	1,061,219	256,244	1,486,963	558,722	225,405	171,367	1,080,891	106,122	51,410	243,201
2018	1,238,418	1,061,219	256,244	1,486,963	558,722	225,405	171,367	1,080,891	106,122	51,410	243,201
2019	1,238,418	1,061,219	256,244	1,486,963	558,722	225,405	171,367	1,080,891	106,122	51,410	243,201
2020	1,238,418	1,061,219	256,244	1,486,963	558,722	225,405	171,367	1,080,891	106,122	51,410	243,201

¹ Rule 4 is to increase total mortality on fully vulnerable age class to 65% (Z=1.05) by increasing fishing mortality unless resulting SPR_T (Spawning potential reduction target) is less than 0.20. If SPR_T is less than 0.20, find fishing multiplier that produces SPR = 0.20

Total harvest (lb) for whitefish in Lake Superior whitefish management units (WFMU) for 1999-2020 with target mortality rate used in the unit.

Year and TAM used ¹	Whitefish management unit					State share	
	WFS-04 55%	WFS-05 45%	WFS-06 37%	WFS-07 50%	WFS-08 65%	WFS-04 25K or 10%	WFS-05 130K or 16%
1999	88,491	292,112	43,385	537,861	84,866	8,849	46,738
2000	91,340	371,008	47,114	500,323	71,839	9,134	59,361
2001	377,091	933,264	51,617	494,649	91,306	37,709	149,322
2002	274,538	759,312	59,577	512,639	90,299	27,454	121,490
2003	218,928	649,591	63,922	524,201	88,975	21,893	103,935
2004	187,843	572,498	66,031	527,126	87,994	18,784	91,600
2005	170,289	520,142	65,871	528,551	87,782	17,029	83,223
2006	159,891	482,461	66,672	530,220	87,766	15,989	77,194
2007	153,869	455,046	67,823	531,271	87,749	15,387	72,807
2008	150,655	438,522	69,009	531,932	87,741	15,065	70,164
2009	148,957	428,585	70,084	532,349	87,739	14,896	68,574
2010	148,061	422,612	70,994	532,611	87,738	14,806	67,618
2011	147,589	419,021	71,731	532,776	87,737	14,759	67,043
2012	147,339	416,863	72,311	532,880	87,737	14,734	66,698
2013	147,208	415,565	72,759	532,945	87,737	14,721	66,490
2014	147,138	414,785	73,098	532,986	87,737	14,714	66,366
2015	147,102	414,316	73,352	533,012	87,737	14,710	66,291
2016	147,082	414,034	73,540	533,028	87,737	14,708	66,246
2017	147,072	413,865	73,678	533,038	87,737	14,707	66,218
2018	147,067	413,763	73,779	533,045	87,737	14,707	66,202
2019	147,064	413,702	73,852	533,049	87,737	14,706	66,192
2020	147,062	413,665	73,905	533,052	87,737	14,706	66,186

¹ Rule 4 is to increase total mortality on fully vulnerable age class to 65% (Z=1.05) by increasing fishing mortality unless resulting SPR_T (Spawning potential reduction target) is less than 0.20. If SPR_T is less than 0.20, find fishing multiplier that produces SPR = 0.20

Total harvest (lb) for whitefish in Lake Huron whitefish management units (WFMU) for 1999-2020 with target mortality rate used in the unit.

Year and TAM used ¹	Whitefish management unit					
	WFH-01 65%	WFH-02 70%	WFH-03 No calc. done	WFH-04 65%	WFH-05 69%	WFH-06 No calc. done
1999	237,307	315,624		340,484	250,148	
2000	195,682	214,094		228,570	182,076	
2001	285,004	158,729		411,601	617,497	
2002	378,113	248,742		619,347	509,433	
2003	437,870	350,847		761,713	659,455	
2004	463,261	399,800		814,900	760,598	
2005	473,617	417,069		839,083	804,087	
2006	480,374	425,623		849,366	821,098	
2007	484,221	429,558		854,654	829,495	
2008	486,605	431,799		857,813	834,510	
2009	488,126	433,219		859,812	837,768	
2010	489,158	434,199		861,181	840,039	
2011	489,908	434,930		862,198	841,732	
2012	490,444	435,461		862,930	842,962	
2013	490,810	435,829		863,429	843,820	
2014	491,033	436,053		863,727	844,350	
2015	491,153	436,170		863,878	844,634	
2016	491,210	436,223		863,944	844,767	
2017	491,236	436,244		863,971	844,822	
2018	491,247	436,252		863,981	844,843	
2019	491,253	436,254		863,985	844,850	
2020	491,255	436,255		863,986	844,852	

¹ Rule 4 is to increase total mortality on fully vulnerable age class to 65% ($Z=1.05$) by increasing fishing mortality unless resulting SPR_T (Spawning potential reduction target) is less than 0.20. If SPR_T is less than 0.20, find fishing multiplier that produces $SPR = 0.20$