2004 Annual Report on Implementation of 2000 Consent Decree for 1836 Treaty-Ceded Waters of the Great Lakes

Prepared for:

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Table of Contents

Page

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 2003.

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 2004 tribal large-mesh gill-net effort in Lakes Michigan and Huron was approximately 25.1 million feet (Table 1) less than the 1993-1998 average. For all three lakes, approximately 25.3 million feet less effort was fished in 2004 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 2004.

Lake	Management Unit	Effort					
		1993-98	2001	2002	2003	2004	2004 reduction
Michigan	MM-1, 2, 3	17,912	8,089	5,170	4,089	4,289	13,623
	MM-4	1,794	733	835	326	879	915
	MM-5	240	188	63	96	542	-302[a]
Huron	MH-1	16,470	11,517	8,015	6,383	5,615	10,855
	MH-2	6	0	0	0	0	6
Superior	MI-6	780	949	414	1,357	854	-74[a]
	MI-7	2,028	3,119	2,578	2,080	4,182	-2,154[a]
	MI-8	6,578	3,826	3,905	8,027	4,171	2,407
Totals		45,808	28,421	20,980	22,358	20,532	25,276

[a] 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 2003, with recommended yield and effort levels for 2004" (referred to as 2004 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 2004 harvest limits were developed and describes the parameters used in the 2004 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 in the first year of life that is beyond the initial catastrophic 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 2004 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 10, 2004. The 2004 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 2004, there were four fully-phased management units where the model recommendation represented a change of greater than 15% above the 2003 harvest limit; MI-5, MI-6, MI-7, and MH-2. The TFC agreed to adopt the model recommendations in these units either because lake trout stocks have increased or the models were adjusted to more accurately reflect the stocks.

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 2004 fishing season.

		Model-output TACs		Final TACs		
Lake	Unit	State	Tribal	State	Tribal	Tribal TAE
Michigan	MM-1,2,3	25,000	453,000	25,000	453,000	9,360,000
	MM-4	46,000	79,000	46,000	79,000	1,030,000
	MM-5	58,900	39,200	58,900	39,200	349,000
	MM-6,7	389,000	43,200	389,000	43,200	NA
Huron	MH-1	14,500	166,700	14,500	166,700	11,054,000
	MH-2[a]	137,100	7,200	137,100	7,200	NA
Superior	MI-5[a]	138,700	7,300	138,700	7,300	NA
	MI-6[a]	39,400	39,400	39,400	39,400	5,144,000
	MI-7[a]	44,000	103,600	44,000	103,600	8,230,000

[a] TFC agreed to adopt model recommendation that exceeded +15% deviations from 2003 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 15, 2003. The 2004 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 two management units. In unit 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 reflects the previous 3-year average (2000-2003) commercial harvest, and for WFM-07 the HRG is the approximate average of the model-generated harvest limits from adjacent units. The TFC reached consensus on harvest limits for all shared whitefish management units. The tribes accepted model-generated output for HRGs in all but one unit. Tribes established a HRG for WFH-04 that was reflective of the average commercial harvest for the previous three years.

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 2004 fishing season.

Lake	Unit	Final State TAC	Model output Tribal TAC	Final Tribal TAC or HRG
Michigan	WFM-01	120,000	1,077,000	1,077,000
	WFM-02	0	520,000	520,000
	WFM-03	0	1,938,000	1,938,000
	WFM-04	0	752,000	752,000
	WFM-05	0	298,000	298,000
	WFM-06	65,000	290,000	290,000
	WFM-07[a]	0	-	500,000
	WFM-08	500,000	914,000	914,000
Huron	WFH-01	0	232,000	232,000
	WFH-02	0	261,000	261,000
	WFH-03[b]	0	-	305,502
	WFH-04[c]	0	343,000	518,000
	WFH-05	0	1,076,000	1,076,000
Superior	WFS-04	9,000	82,000	82,000
	WFS-05	55,000	289,000	289,000
	WFS-06	0	210,000	210,000
	WFS-07	0	585,000	585,000
	WFS-08[a]	0	184,000	184,000

[a] No model output - HRG reflects average of model-generated harvest limits from WFM-06 and WFM-08
[b] No reliable model output – HRG reflects average harvest from previous 3 years.
[c] HRG reflects average commercial harvest from previous 3 years.

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 2004 was below harvest limits in all management units. 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 2004. In Lake Superior management unit MI-6 the season was changed from being open during the periods January 1 - April 30 and May 24 - September 1 to being open all year.

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. Fairport harbor (MM-1) was estimates separately for the first time and represented significantly higher Chinook harvest and angler effort. It is noted that harvest of yellow perch and walleye in MH-1 appear larger in 2004 compared to years previous to 2003 which is due to both the addition of the Drummond Island site to this unit, and a change in estimation methods.

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 2004 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	698,878	0	0	42,976	98,844	59,656	11,931	11,801	143,972	304	1,216
	MM-2	12,645	26	159	284	652	0	0	1,023	12,481	36	144
	MM-3	76,773	1,110	6,438	0	0	673	269	8,761	115,645	2	8
	MM-4	182,849	5,033	23,655	121	278	36,905	15,131	7,963	121,038	589	2,356
	MM-5	270,437	765	3,749	0	0	0	0	38,860	516,843	3,963	15,850
	MM-6	818,360	7,917	39,585	69	159	5,477	3,122	137,012	1,712,645	13,719	96,035
	MM-7	537,805	3,601	14,404	112	258	55,060	26,429	90,251	992,757	8,039	53,056
Totals		2,597,747	18,452	87,990	43,562	100,191	157,771	56,882	295,671	3,615,381	26,652	168,665
Huron	MH-1	225,553	916	3,582	6,240	20,591	9,397	2,819	19,055	209,610	98	419
	MH-2	133,810	6,941	37,065	760	4,332	135	34	17,320	181,860	83	415
Totals		359,363	7,189	39,181	7,000	24,923	9,532	2,853	36,375	391,470	181	834
Superior	MI-5[c]	39,073	9,544	32,642	4	12	0	0	311	1,089	1,811	3,459
	MI-6	48,622	5,011	16,437	0	0	141	75	604	2,374	2,795	7,239
	MI-7[d]	19,593	2,044	2,090	0	0	16	8	88	257	873	1,598
Totals		107,288	16,599	51,169	4	12	157	83	1003	3,720	5,479	12,296
Grand totals		3,064,398	42,240	178,340	50,566	125,126	167,460	59,818	333,049	4,010,571	32,312	181,795

[a] Lake Superior lake trout number and weight do not include Siscowets; number of Siscowet harvested were estimated at 365, 19, and 910 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] Used average weight for yellow perch from MI-6.

2. Lake Whitefish

Whitefish harvest by state-licensed commercial fishers was below harvest limits in all, but one whitefish management unit. The State harvest in WFS-04 exceeded the harvest limit by 360 pounds. This deviation (4%) from the harvest limit is not high enough to trigger an overharvest penalty as stated in the Consent Decree (Section VIII.A.1.g.4. 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 2 pounds for 2004.

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 5,632 pounds in 2004. 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 518, 2,023, and 7,177 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 2004 fishing season.

Lake	Unit	Harvest	Effort
Michigan	WFM-01	80,187	75
	WFM-06	497	5
	WFM-08	204,389	236
Lake totals		285,073	316
Superior	WFS-04	9,360	18
	WFS-05	46,509	432
Lake totals		55,869	450
Grand totals		340,942	766

B. Tribal commercial and subsistence fishing

The Chippewa Ottawa Resource Authority had not finalized harvest data for 2004 by the time it was needed for this report, and considered the following numbers preliminary. However, final harvest will likely not differ greatly from these preliminary numbers.

1. Lake trout

Lake trout harvest by tribal commercial fishers was below harvest limits in all management units in 2004. 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 2004 fishing season.

Lake	Unit	Trap-net harvest	Gill-net harvest	Total harvest
Michigan	MM-1,2,3	6,128	96,737	102,865
	MM-4	2,082	36,446	38,528
	MM-5	3,646	22,822	26,468
	MM-6,7	115	0	115
Lake total		11,971	156,005	167,976
Huron	MH-1	0	70,210	70,210
	MH-2	0	0	0
Lake total		0	70,210	70,210
Superior	MI-5	0	0	0
	MI-6	0	11,171	11,171
	MI-7	13	55,340	55,353
	MI-8	15,568	17,921	33,489
Lake total		15,581	84,432	100,013
Grand total		27,552	310,647	338,199

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 3,000 pounds, which represents an overharvest of about 1.2%. 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 2004 fishing season. Minor harvest from small-mesh gill nets is also included in gill-net harvest.

		Trap nets		Gill nets		Total
Lake	Unit	Harvest	Effort	Harvest	Effort	harvest
Michigan	WFM-01	615,122	1,417	0	0	615,122
	WFM-02	0	0	113,395	1,458	113,395
	WFM-03	454,296	857	52,560	476	506,856
	WFM-04	85,742	673	39,332	543	125,074
	WFM-05	8,866	49	117,998	1,519	126,864
	WFM-06	32,693	153	59,887	542	92,580
	WFM-07	176,847	83	0	0	176,847
	WFM-08	0	0	0	0	0
Lake totals		1,373,566	3,232	383,172	4,538	1,756,738
Huron	WFH-01	147,458	608	87,398	932	234,856
	WFH-02	204,416	732	51,177	1,041	255,593
	WFH-03	146,618	489	4,017	37	150,635
	WFH-04	79,470	291	106,634	2,300	186,104
	WFH-05	502,305	492	0	0	502,305
Lake totals		1,080,267	2,612	249,226	4,310	1,329,493
Superior	WFS-04	0	0	0	0	0
	WFS-05	23,592	134	46,759	854	70,351
	WFS-06	1,215	3	26,638	1,132	27,853
	WFS-07	180,971	711	396,501	6,462	577,472
	WFS-08	122,019	413	31,536	597	153,555
Lake totals		327,797	1,261	501,434	9,045	829,231
Grand totals		2,781,630	7,105	1,133,832	17,893	3,915,462

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 2004 occurred in Lake Michigan management unit MM-1,2,3 (16,872 pounds) and in Lake Huron management unit MH-1 (14,198 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 2004 fishing season.

		Trap nets		Gill nets		Total
Lake	Unit	Harvest	Effort	Harvest	Effort	harvest
Michigan	MM-1,2,3	458	0	16,414	94	16,872
	MM-4	681	1	4,297	31	4,978
Lake totals		1,139	0	20,711	125	21,850
Huron	MH-1	0	0	14,198	408	14,198
Lake totals		0	0	14,198	408	14,198
Superior	MI-7	0	0	6	0	6
	MI-8	45	0	1,059	215	1,104
Lake totals		45	0	1,065	215	1,110
Grand totals		1,184	1	35,974	748	37,158

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 were in Lake Michigan unit MM-5 and Lake Superior unit MI-8, where harvests were 291 and 174 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 2004 fishing season.

		Trap nets		Gill nets		Total
Lake		Harvest	Effort	Harvest	Effort	Harvest
Michigan	MM-1,2,3	0	0	78	0	78
	MM-4	2	0	107	8	109
	MM-5	0	0	291	1	291
Lake totals		2	0	476	9	478
Huron	MH-1	0	0	74	0	74
Lake totals		0	0	74	0	74
Superior	MI-7	0	0	97	0	97
	MI-8	0	0	174	25	174
Lake totals		0	0	271	25	271
Grand totals		2	0	821	34	823

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 occurred in Lake Huron unit MH-1 (141,857 pounds; Table 10). Coho salmon were mainly 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 2004 fishing season.

		Trap nets		Gill nets		Total
Lake		Harvest	Effort	Harvest	Effort	harvest
Michigan	MM-1,2,3	170	0	229	0	399
	MM-4	0	0	837	0	837
	MM-5	0	0	60	0	60
Lake totals		170	0	1,126	0	1,296
Huron	MH-1	0	0	141,857	812	141,857
Lake totals		0	0	141,857	812	141,857
Superior	MI-7	0	0	50	0	50
	MI-8	44	0	3	0	47
Lake totals		44	0	53	0	97
Grand totals		214	0	143,036	812	143,250

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 2004 fishing season.

		Trap nets		Gill nets		Total
Lake		Harvest	Effort	Harvest	Effort	harvest
Michigan	MM-1,2,3	0	0	5	0	5
Lake totals		0	0	5	0	5
Huron	MH-1	0	0	5	0	5
Lake totals		0	0	5	0	5
Superior	MI-7	0	0	466	0	466
	MI-8	168	0	190	0	358
Lake totals		168	0	656	0	824
Grand totals		168	0	666	0	834

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 2004, whitefish and walleye made up the majority of tribal subsistence harvest with 4,014 and 2,965 pounds, respectively from Treaty-ceded waters of the Great Lakes (Table 12).

Table 12. Summary of tribal subsistence harvest (pounds) by species in 1836 Treaty-ceded waters of the Great Lakes for the 2004 fishing season.

Lake	Management Unit	Lake trout	Whitefish	Walleye	Yellow perch	Chinook & Coho salmon
Michigan	MM-1	9	925	2,802	200	40
	MM-2	7	85	41	0	10
	MM-3	186	872	0	0	87
	MM-6	24	9	20	0	0
	MM-7	0	0	0	0	0
Lake total		226	1,891	2,863	200	137
Huron	St.Marys River	4	29	100	30	35
	MH-1	8	1,349	2	0	20
Lake total		12	1,378	102	30	55
Superior	MI-5	6	86	0	0	0
	MI-6	116	136	0	0	134
	MI-7	0	66	0	0	142
	MI-8	72	457	0	0	241
Lake total		194	745	0	0	517
Grand total		432	4,014	2,965	230	709

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 2004. 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 2004 calendar year with seven 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 the1836 Treaty-Ceded Area. Two specialists are stationed in Grand Traverse County, one specialist and the section 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, an eighth, 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 established late in the year 2001. The detective provided assistance to local CFS and monitored the wholesale industry. 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 will once again be able 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 2004.

Table 1. 2004 officer hours worked to address Consent Decree issues. LED represents hours worked by other MDNR Law Enforcement Division personnel to address commercial fish issues.

Enforcement Effort	CFS (hrs)	Overtime(CFS)	LED (hrs)	Total (hrs)
Consent Decree	6511.4	827	426.7	7765.1

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 however accomplished by the boats assigned to the CFS Unit.

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.

On August 13, 2004 we replaced the "M.W. Neal", the boat originally assigned to Leland, with the newly acquired vessel the "Rick Asher". The "Asher" is a 36' Dauntless Class SeaArk powered by twin 440Hp Yanmar diesel engines. The "Neal" proved to be slightly undersized for the conditions encountered on the open waters of Lake Michigan but should prove to be better suited for the more protected waters of Saginaw Bay where it has been re-assigned. The upgrade of the boat assigned to Leland will result in an expansion of the conditions in which the Grand Traverse Specialists are able to operate and thus increase both their range and season. A unique feature of the "Asher" is the presence of dual system inflatable collar around the entire perimeter of the boat. The collar will not only provide a built in protection system for both the boat and personnel, but will also help to facilitate boardings and on water inspections. The "Asher" is equipped with Raymarine radar, DGPS chart plotter and color display fishfinder.

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.

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. During the year repeated electrical problems resulted in the loss of several days worth of patrol opportunities while repairs were undertaken. The boat's captain was also sidelined as a result of 6 weeks worth of instructor and training section needs. In spite of the downtime, 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 2004 season, CFS Ken Johnson moved PB-7 to Marquette and spent a good portion of the year working out of that location.

The "Neal" which replaced the "Skoglund", formerly assigned to Caseville, is equipped in a similar fashion as the four vessels above. The "Neal" is now responsible for a primary patrol area that 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 "Emil Skoglund" A 23-foot commander series SeaArk was reassigned to other division personnel for use during general law enforcement patrols.

Sea service hours for the season are shown in Table 2 below.

Table 2. MDNR Commercial Fish Enforcement Section vessel service hours. Hours accumulated on non-unit boats are also shown (other vessels).

VESSEL	1836-TREATY WATERS	STATE FISHERY	1842-TREATY WATERS	TOTALS
WILLIAM ALDEN SMITH	210	35	N/A	245
PATROL BOAT No. 5	144	N/A	N/A	144
PATROL BOAT No. 7	80	63	29	172
M.W. NEAL	118	68	N/A	186
EMIL SKOGLUND	12	220	N/A	232
RICK ASHER	151.8	N/A	N/A	151.8
OTHER VESSELS	15.5	8.5	11	35
TOTALS	731.3	394.5	40	1165.8

During the 2004 season, the MDNR Commercial Fish Enforcement Unit conducted a total of 228 patrols on board the Unit's assigned and supplemental vessels. CFS section boats consumed a total of 10266.11 gallons of fuel at a cost of $ 20696.49 (Table 3.).

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

VESSEL	PATROLS	FUEL (GALS.)	COST ($)
WILLIAM ALDEN SMITH	37	1,960.00	2,940.00
PATROL BOAT No. 5	26	2,377.95	5,578.46
PATROL BOAT No. 7	31	2,974.50	6,786.21
M.W. NEAL	33	1,215.9	2,307.90
RICK ASHER	23	1,466.9	2,544.77
EMIL SKOGLUND	92	270.86	539.15
OTHER VESSELS (est.)	9	N/A	N/A
TOTALS	228	10,266.11	20,696.49

B. Enforcement

1. Complaints

MDNR commercial fish specialists received approximately 128 complaints (Table 4) related to commercial fisheries activity during the year. The complaints were submitted from a variety of sources. Fifty-One (51) complaints were assigned to CFS through the State's "Report All Poaching" system. Seventy-Seven (77) 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 (73) were related to tribal nets in1836 Treaty-ceded waters. The primary reason for net complaints was concern about net markings. Additional concerns pertaining to nets in treaty waters revolved around nets being fished in closed areas, and complaints regarding abandoned or unattended nets. Gill nets discovered in closed waters, or gill nets deemed to be abandoned, were pulled by CFS. Gill nets suspected of being unattended were tagged according to the requirements of the CORA Code, and were either subsequently removed by MDNR CFS or were referred to tribal authorities.

Of the 73 net related complaints in the1836 Treaty-ceded waters, 30 concerned nets set in the waters off of Ludington in Mason County. Many of these complaints were valid, insufficient marking or wholly unmarked nets were encountered and monitored throughout the 2004 season. Of particular concern were the wholly unmarked and abandoned trap nets set south of the Ludington Pier head. 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. An account of the specific details will be outlined in the "Violations" section. A breakdown of additional complaints is available in Table 4.

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.

Table 4. 2004 Commercial fish related complaints investigated by MDNR Commercial Fish Specialists.

COMPLAINTS	1836-TREATY FISHERY	STATE-LICENSED	1842-TREATY FISHERY	TOTALS
NETS	73	6	1	80
LICENSING	6	1	N/A	7
ACCESS	3	N/A	N/A	3
WHOLESALE	9	1	N/A	10
CLOSED / AREA SEASON	12	1	N/A	13
SPECIES / LIMITS	5	1	N/A	6
OTHER	4	5	N/A	9
TOTALS	112	15	1	128

2. Inspections

A total of 1067 inspections were conducted by MDNR Commercial Fish Specialists statewide (Table 5). There were 371 inspections of 1836 tribal fishers or their gear in the treaty-ceded waters. 294 involved inspections of nets, 77 involved inspections of tribal fishing vessels either at the dock or on the water.

Inspections of state licensed wholesale fish dealers increased from 137 in 2003 to approximately 248 in 2004 as the MDNR Commercial Fisheries Enforcement Unit completed a 2 year effort to improve compliance and accuracy of the Department's wholesale reporting system.

Early in 2004 record reviews indicated that approximately 40 wholesale fish dealers had to varying degrees, failed to report purchases as prescribed by law during 2003. Delinquent wholesalers were sent notices providing them with 30 days to comply with reporting requirements or face potential prosecution. Thirty-six of the 40 submitted the missing reports

within the required time frame. Incident reports were written and submitted to prosecutors for the remaining 4. Two dealers supplied missing reports prior to cases being filed and the issue was dropped. The remaining 2 dealers were charged in district court, 1 dealer paid the assessed fine, the other has been out of state and a warrant has been issued for his arrest.

Table 5. 2004 MDNR CFS commercial fish enforcement inspections.

INSPECTIONS	1836-TREATY FISHERY	STATE-LICENSED	1842-TREATY FISHERY	TOTALS
NETS	294	300	15	609
BOARDINGS	24	30	5	59
DOCKSIDES	53	98	0	151
STATE WHOLESALE	N/A	248	N/A	248
TOTALS	371	676	20	1067

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 23 cases to various tribal courts for prosecution. In addition, MDNR CFS referred 18 instances of violations of the CORA Code to various tribal law enforcement agencies. 14 verbal warnings were also issued. Several of the submitted and referred cases remain open or have resulted in unknown dispositions.

Seven citations were submitted to the Little River Band of Ottawa Indians (LRB) Natural Resource Commission for action. Six of the Seven were for net marking violations (Unmarked and Improperly marked nets). Routine patrols, and the results of investigations initiated in response to complaints of sportfishers becoming entangled in unmarked or poorly marked nets,

confirmed the existence of a number of abandoned trap nets south of the Ludington Pier head and off of the Ludington Pump Storage facility. Additional net marking insufficiencies were encountered during inspection of nets near Grand Sable Point north of Ludington.

On December 8, 2004 the LRB Natural Resources Commission held a hearing to address the allegations of net marking irregularities. MDNR CFS and the accused fisher provided testimony before the Commission. Upon conclusion of the testimony the Commission found that the fisher had "admitted facts sufficient to find him responsible" for 5 of the 6 citations. The 6th citation was dismissed.

The 7th citation was issued to a LRB fisher charging him with fishing during the closed season for whitefish and lake trout. In addition to the citation, approximately 3700 lbs. of whitefish and 125 lbs. of lake trout were seized. A hearing was held on January 12, 2005 before the LRB Natural Resources Commission, the Commission's findings are pending at the time of this report.

Eleven citations were submitted to Sault Ste. Marie Tribe of Chippewa Indians Tribal Court. Five citations were for net marking violations (Unmarked nets, Improperly marked nets).

Two SSM fishers were charged with allowing unlicensed individuals on board their fishing vessels. One of the fishers was charged twice, once for allowing an unlicensed tribal helper on board, and once for allowing a non-tribal member on board. In both cases the helpers were also charged, the tribal member in Sault Court and the non-tribal member in State Court.

One additional ticket was written to SSM tribal helper after he failed to comply with a verbal warning and obtain a helper's license. The helper was given a verbal warning in March but had still not secured a helpers license when contacted on board a fishing vessel in May.

One SSM fisher was charged with fishing during the closed season. The fishers catch was seized after an investigation revealed that he had began fishing 3 days prior to the whitefish season reopening on November 29th.

The final citation submitted to the SSM Court was to a fisher who failed to tend a salmon net that had been left in the water well past the close of the 2004 salmon season. Efforts to have the net removed were pursued throughout the fall but proved unsuccessful. During early December MDNR CFS executed a patrol to remove as much of the nets as possible. The confiscated nets were turned over to SSM Law Enforcement and a ticket was issued to the appropriate fisher.

One citation was issued to a Grand Traverse Band of Ottawa and Chippewa Indian fisher. The fisher had been given a warning to correct net marking insufficiencies. Officers returned to inspect the net approximately 2 weeks later and discovered that the fisher had not corrected the insufficiencies. The fisher was issued a citation charging him for failure to properly mark his net. The disposition is pending.

Three Bay Mills Indian Community fishers were cited into their tribal court. One fisher received 2 citations, 1 for a net marking violation, the other was for failing to tend a gill net. One fisher received a citation for allowing an unlicensed helper on board his fishing vessel. The remaining citation went to the unlicensed helper.

Of the 18 referrals 5 were for net marking violations. Four involved access site use issues. There were 3 for failing to tend nets and 4 for fishing during the closed season. Two of the closed season referrals involved trap net fishers fishing during the November whitefish and lake trout closure. The third involved a gill net fisher who landed 2000 lbs of fish a mere 2 hours after the whitefish and lake trout season re-opened. The fourth involved a salmon fisher who

failed to remove his nets at the close of the salmon season. There was 1 referral for each of the following, no subsistence fishing license, violation of maximum net depth limitations, and a trap net conversion captain illegally participating in a large mesh gill net operation.

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

VIOLATIONS	1836 TREATY	STATE	1842 TREATY	TOTALS
ARRESTS	23	5	N/A	28
REFERRALS	18	N/A	2	20
WARNINGS	14	4	1	19
TOTALS	55	9	3	67

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 21 joint patrols with tribal law enforcement officers. MDNR CFS and Little Traverse Bay Band (LTBB) conservation officers combined efforts on 12 of the 21 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 9 group patrols at the January 29, 2004 meeting. MDNR CFS acted as lead workers on 4 of the 6 LEC scheduled group patrols during the 2003 calendar year, as a result, tribal agency members assumed the majority of the lead worker responsibilities during 2004.

Due to unforeseen circumstances not all obligations were meet. While some very good work was accomplished, summary reports were not completed for all of the scheduled group patrols. The LEC must ensure that an adequate record of accomplishments is kept. In addition, full participation by all agencies remains the exception rather than the rule. While it is understood that unforeseen circumstances will arise, it is hoped that the committee will recommit itself to the spirit of mutual enforcement that is a hallmark of the group patrol process.

MDNR CFS John Morey was assigned as the lone state representative to act as a lead worker on an LEC group patrol during 2004 (summary report attached). Officer Morey was assigned to act as lead worker for the August 6-7, 2004 group patrol of Northern Lake Huron. Written notification of patrol plans was provided to the 5 Tribal Law Enforcement agencies. Representatives from the MDNR, Little Traverse Bay Band of Odawas, Bay Mills Indian Community, Little River Band of Ottawa Indians, and the Sault Ste. Marie Tribe of Chippewa Indians participated. Personnel from the United States Coast Guard accompanied MDNR

officers on board the MDNR boat on August 6th. The MDNR Airplane and pilot were utilized to locate activity and to direct officers to locations so that inspections could be conducted.

A total of 44 nets were inspected during the 2 day patrol effort. Nine violations relating to net marking requirements were encountered. Little River Band (LRB) officers reported issuing 5 citations while Little Traverse Bay Band (LTBB) officers reported issuing 2. The remaining violations involved an abandoned trap net and a minor net marking discrepancy for which a verbal warning was given.

Two abandoned trap nets were located and were subsequently ear marked for removal by a fisher contracted by CORA.

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.

During 2004 the vast majority of extensive unit patrols were directed at the Ludington area in an effort to address the large number of complaints from the area. In all, 6 separate multi-day patrols were conducted using 4 of the Unit's 5 Great Lakes patrol boats. Patrols were undertaken in May, June, July, September, and October. The information gleaned from these efforts was shared with LRB Tribal Law Enforcement, 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. An open dialog was maintained and updates were provided as information developed. Six citations were written to a lone fisher who was eventually found responsible for 5 of the 6 by the LRB Natural

Resources Commission. In addition to fines and costs, the Commission imposed stringent requirements upon the fisher in an effort to limit the likelihood of a re-occurrence of the problems of 2004.

On June 27th and 28th CFS combined efforts with local conservation officers and conducted a patrol of the Beaver Island Chain in northern Lake Michigan. Three boats and 6 officers inspected 15 nets, boarded 2 tribal fishing vessels and removed several feet of free floating anchor line.

On September 20th and 22nd CFS conducted a 3 day patrol of northern Lake Huron. On the 20th officers began in Rogers City and worked south to conduct a net inventory and to monitor the fishery at Rockport and the Disputed Zone. Eleven trap nets were inspected. On the 21st and 22nd the patrol effort focused on northern Lake Huron around Drummond Island, the St. Mary's River, the Michigan waters of Lake George and briefly ventured into the waters in and around Whitefish Bay of Lake Superior. Complaints of nets in closed waters and of Canadian fishers fishing in Michigan waters proved to be unfounded during this trip.

On September 27th and 28th the Unit's 40ft. patrol boat the "William Alden Smith" was used to conduct a patrol that began in Charlevoix, inspected nets in northern Lake Michigan, the Straits, and northern Lake Huron around Bois Blanc and the Les Cheneaux Islands. Eighteen net inspections were conducted and 3 complaints were investigated. Two of the complaints were unfounded and involved legally set and marked nets. The 3rd complaint involved a balled up trap net floating on the surface southwest of St. Martin Island. The complaint was valid and the information was turned over to the northern Lake Huron CFS for follow-up.

On November 6th and 7th in an effort to more closely monitor the closed season for whitefish and lake trout, MDNR CFS were assigned to 2 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. Seven commercial fishers were inspected at dockside as were 5 wholesale fish dealers on the 6th. Follow-up inspections of additional wholesale dealers were accomplished on the 7th and during the remainder of the month of November. One of the 7 fishers did not leave port until well after the noon closure and was ticketed for fishing during the closed season and his catch was seized (See 3. Violations). Several known ports were also checked and the presence or absence of commercial tugs was noted. Activity was monitored during the remainder of the month.

On November 29th the CFS teams were reassembled and the re-opening of the season was again monitored. The location of vessels and their continued presence at ports were again documented. On the 29th one fisher was investigated for fishing during the closure when he landed 2000 lbs of whitefish and lake trout just 2 hours after the season re-opened. The case is pending. On the 30th an additional fisher admitted fishing during the closed season after being questioned during an inspection. He has been charged in tribal court and his catch was of 1400 lbs of whitefish and lake trout was seized. An additional case was submitted to tribal court requesting charges against a third fisher for fishing during the closed season, that case is also pending.

An additional 11 wholesale inspections were also conducted during the 29th and 30th. In summary, 2 fishers were charged with fishing/retention of fish during the closed season and 2

fishers have cases pending upon review of tribal prosecutors. Approximately 5, 500 lbs of fish was seized and another 4,000 lbs was involved in the 2 cases pending before the courts.

C. Law Enforcement Committee

The Law Enforcement Committee accomplished a great deal during 2004. Much of the credit goes to committee chairman Kevin Willis. Through his leadership and efforts as liaison to CORA, LTBB Chief Conservation Law Officer Willis was able to facilitate the adoption of new regulations addressing a variety of problematic trap net issues. In addition, Kevin provided the leadership that was necessary to affect the removal of several abandoned trap nets. CORA funding of abandoned trap net removal and Kevin's efforts allowed for a great deal of progress to be made in an area of particular concern to the LEC.

During the year the committee also finalized the approval of a series of 3 standardized reports; an Annual Summary, Commercial Fish Activity Report Form and a Group Patrol Summary Report. While the development of these forms and their acceptance by the committee have taken place over a period of time, some of the longstanding requirements they are intended to address have not been undertaken.

For the last two years (2002, 2003) two committee member agencies have failed to submit annual summary reports, and only three of the six have completed group patrol summary reports. As a result, an adequate record of the efforts directed toward the mutually shared law enforcement responsibilities does not exist.

Documentation is designed to insure accountability and standardization is intended to facilitate the compilation of information into a cohesive record. Accountability helps to

maintain high standards and the formal sharing of information can only help to broaden the hard won open channels of communication that have been facilitated by the establishment of the LEC.

A better job must be done to adhere to the requirements that are mandated by the Consent Decree. All agencies need to re-dedicate themselves to fulfilling those reporting and information sharing directives as outlined in the Law Enforcement Committee duties.

MDNR representatives look forward to working with LEC members to address these and additional objectives during the coming year.

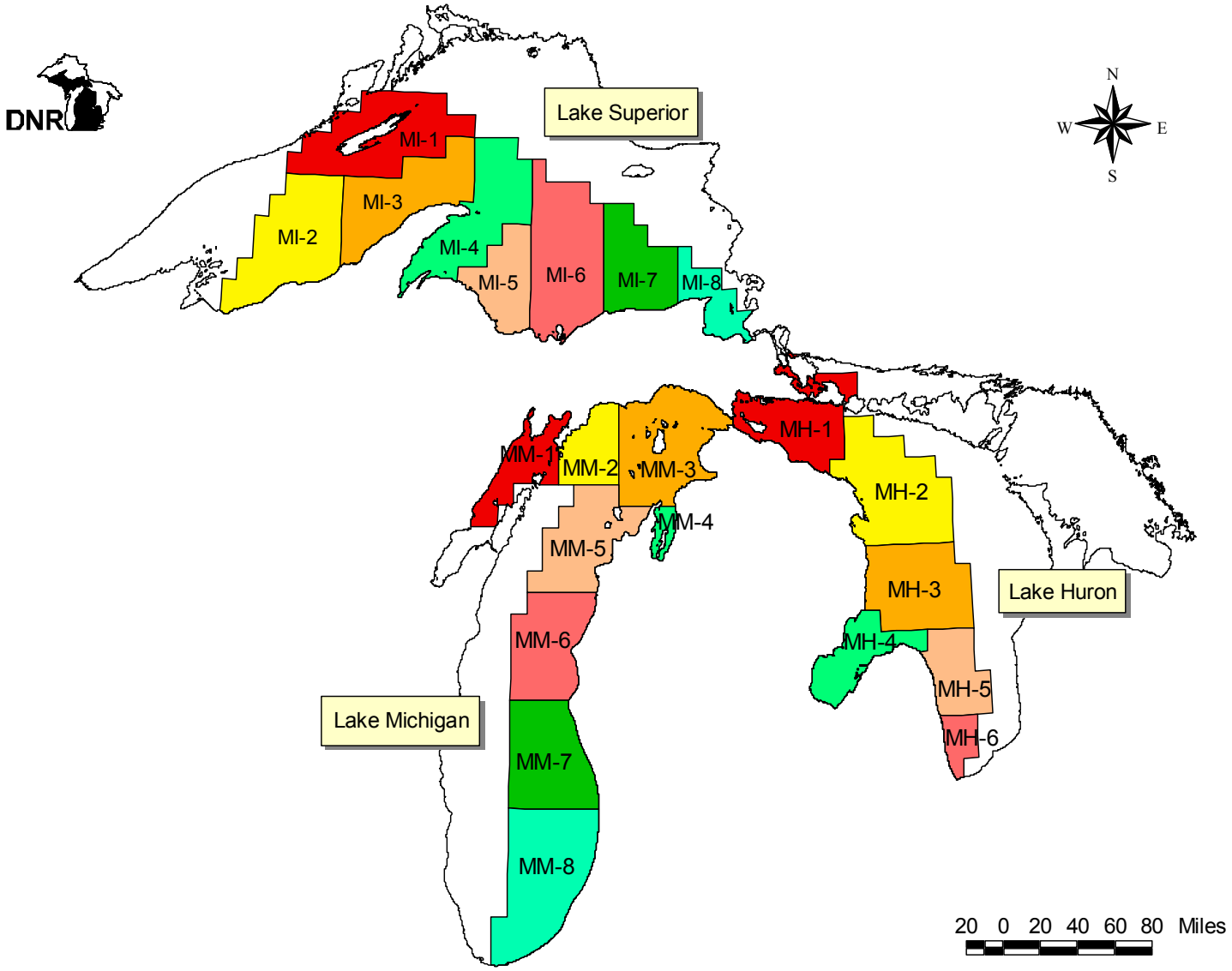

Figure 1. Lake trout management units for Lakes Superior, Michigan and Huron.

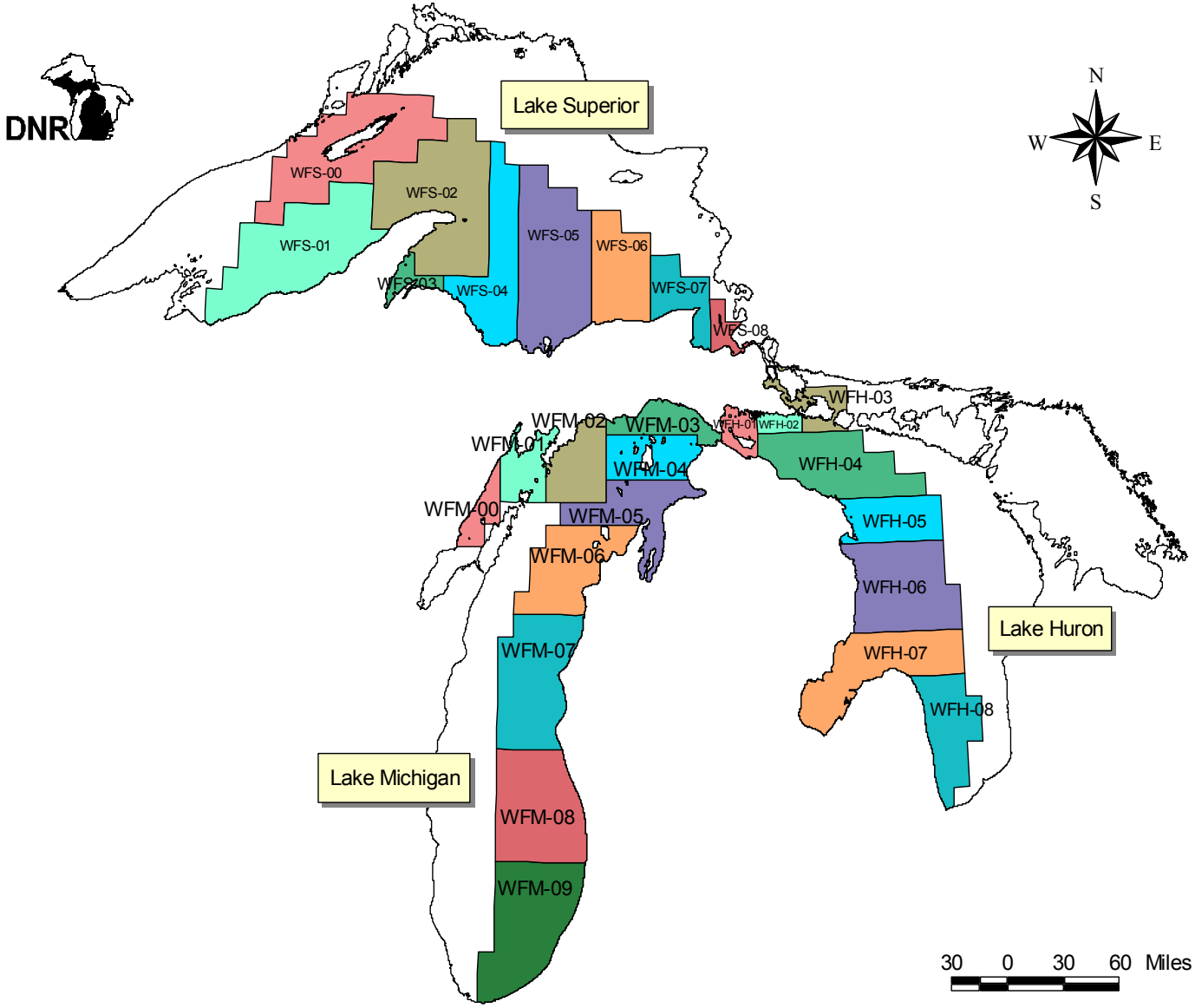

Figure 2. Lake whitefish management units for Lakes Superior, Michigan and Huron.

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.

Apppendix 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. 47% SSBR = 0.11
Extended phase-in of allocation percentages at 47% TAM from 2006 through 2011. Rehabiltation period at 45% TAM from 2012 through 2020. 45% SSBR = 0.13
Starting in 2002, stock 0.6 per acre of federal yearlings plus 100,000 MDNR yearlings. No change in Canadian commercial effort.

	Commercial (Tribal)				Recreational (State)							Lake trout population	
Year	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

	Commercial (Tribal)				Recreational (State)							Lake trout population	
Year	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

	Commercial (Tribal)				Recreational (State)							Lake trout population	
Year	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

	Commercial (Tribal)				Recreational (State)							Lake trout population	
Year	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

	Commercial (Tribal)				Recreational (State)							Lake trout population	
Year	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

	Commercial (Tribal)				Recreational (State)							Lake trout population	
Year	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

	Commercial (Tribal)				Recreational (State)							Lake trout population	
Year	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

	Commercial (Tribal)				Recreational (State)							Lake trout population	
Year	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 commercia effort and sport effort increases by 20%.

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

	Commercial (Tribal)				Recreational (State)							Lake trout population	
Year	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.

	Whitefish management unit								State share		
Year and TAM used[1]	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.

	Whitefish management unit					State share	
Year and TAM used[1]	WFS-04 55%	WFS-05 45%	WFS-06 37%	WFS-07 50%	WFS-08 65%	WFS-04 25K or 10%	WFS-05 130K or16%
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 us 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.

	Whitefish management unit					
Year and TAM used[1]	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