

**2007 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 2007.

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 2007 tribal large-mesh gill-net effort in Lakes Michigan and Huron was approximately 24.1 million feet (Table 1) less than the 1993-1998 average. For all three lakes, approximately 29.0 million feet less effort was fished in 2007 compared to the 1993-1998 average.

Table 1. Amount of large-mesh gill-net effort (1,000 ft) in the 1836 Treaty-ceded waters of the Great Lakes during base years 1993 to 1998 and preliminary effort in 2007.

Lake	Management Unit	Effort		2007 reduction ^b
		1993-98 ^a	2007	
Michigan	MM-1, 2, 3	17,912	4,546	13,366
	MM-4	1,794	613	1,181
	MM-5	240	95	145
Huron	MH-1	16,470	7,105	9,365
	MH-2	6	0	6
Superior	MI-6	780	217	563
	MI-7	2,028	240	1,788
	MI-8	6,578	3,956	2,622
Totals		45,808	16,772	29,036

^a Average annual effort during base years.

^b The reduction relative to 2007 (average effort in base years minus effort in current year).

^c 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) prepares an annual report entitled “Technical Fisheries Committee Administrative Report 2007: Status of Lake Trout and Lake Whitefish Populations in the 1836 Treaty-Ceded Waters of Lakes Superior, Huron and Michigan in 2006, with recommended yield and effort levels for 2007” (referred to as the 2007 Status of the Stocks Report). This report will be provided as a separate document when it becomes available. It documents the status of lake trout and lake whitefish stocks at the time the 2007 harvest limits were developed and describes the parameters used in the 2007 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 2007 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 management units (Figure 1) 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. In 2007, there was considerable delay in providing these figures to the parties due to the lack of consensus on harvest limits. The TFC reached consensus on harvest limits for 6 lake trout management units, and these figures were sent to the parties on June 15, 2007 (Table 2). For MH-1, the Executive Council of the Parties agreed to harvest limits in October of 2007. For the remaining two management units, negotiations are ongoing for stipulations to the Consent Decree. When finalized, these stipulations will result in court orders that amend the Consent Decree, and therefore 2007 harvest limits.

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 2007, there were four fully-phased management units where the model recommendations represented a change of greater than 15% above the 2006 harvest limits; MI-6, MI-7, MM-6,7, and MH-2. In management units MI-6 and MI-7, the model recommendation resulted in a higher harvest limit than allowed by the 15% rule, and the TFC agreed to adopt the model recommendation. In management units MM-6,7 and MH-2, the model recommendation was lower than allowed by the 15% rule, and the TFC invoked the 15% rule to restrict the harvest limit to 15% less than the 2006 harvest limits.

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 2007 fishing season.

Lake	Unit	Model-output TACs		Final TACs		Tribal TAE
		State	Tribal	State	Tribal	
Michigan	MM-1,2,3 ^a	900	7,500	50,000	453,000	9,360,000
	MM-4 ^b	38,800	58,100	-	-	533,000
	MM-5 ^b	81,300	54,100	-	-	605,000
	MM-6,7 ^c	237,200	26,400	238,895	26,530	NA
Huron	MH-1 ^d	15,300	175,600	20,000	210,000	7,649,000
	MH-2 ^c	87,930	3,887	95,876	5,058	NA
Superior	MI-5	168,200	7,500	168,200	7,500	NA
	MI-6	53,000	53,000	53,000	53,000	4,426,000
	MI-7	46,300	108,000	46,300	108,000	23,290,000

^a Final TAC resulted from an order to amend the Consent Decree (dated 4-4-07)

^b No consensus on harvest limits. Stipulations under negotiation.

^c TFC invoked the 15% rule, limiting the TAC to -15% deviation from the 2006 harvest limit.

^d Per October 2007 Executive Council agreement.

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. The TFC reached consensus on harvest limits for all shared whitefish management units (Table 3), and these figures were sent to the parties on January 3, 2007. 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 were insufficient series of data, thus the models were not reliable for estimating harvest limits. The HRG for WFH-03 is consistent with the HRG used in the past three years (2004-2006), which were based on a 3-year average (2001-2003) of commercial harvest. The HRG for WFM-07 is also consistent with the HRG used in 2005 and 2006, which represented the approximate average of the model-generated harvest limits from adjacent units WFM-06 and WFM-08 in 2004. In unit

WFS-06 a lack of commercial catch sampling resulted in poor model performance; thus, the 2007 HRG was set consistent with the 2005 and 2006 HRG, which was based on the 2004 model output. Additionally, as a result of low model quality in unit WFM-03 the 2007 HRG was set consistent with the 2006 HRG, which was based on the 2005 model. The tribes accepted model-generated recommendations for HRGs in all other units.

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 2007 fishing season.

Lake	Unit	Final	Model output	Final Tribal
		State TAC	Tribal TAC	TAC or HRG
Michigan	WFM-01	152,000	1,366,000	1,518,000
	WFM-02	0	849,000	849,000
	WFM-03 ^a	0	4,145,000	1,970,000
	WFM-04	0	695,000	695,000
	WFM-05	0	429,000	429,000
	WFM-06	57,000	134,000	191,000
	WFM-07 ^b	0	–	500,000
	WFM-08	500,000	631,000	1,131,000
Huron	WFH-01	0	394,000	394,000
	WFH-02	0	410,000	410,000
	WFH-03 ^c	0	–	306,000
	WFH-04	0	597,000	597,000
	WFH-05	0	889,000	889,000
Superior	WFS-04	12,000	107,000	119,000
	WFS-05	64,000	339,000	403,000
	WFS-06 ^d	0	–	210,000
	WFS-07	0	551,000	551,000
	WFS-08	0	177,000	177,000

^a Due to low model quality, the HRG was set equal to the HRG used in 2005 and 2006, which was based on the model output in 2005.

^b No model output - HRG is consistent with the 2005 and 2006 HRG, which represented the approximate average of the model-generated harvest limits from adjacent units WFM-06 and WFM-08 in 2004.

^c No model output - HRG is consistent with the 2004 - 2006 HRGs, which were based on the 3-year average (2001-2003) commercial harvest.

^d No model output - HRG is consistent with 2004 - 2006 HRGs, which were based on the 2004 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 2007 was below the final harvest limits in all management units; however, harvest exceeded the model-generated recommendations in three management units (MM-1,2,3, MM-4, and MH-1). 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. These fish were added to the number and weight of lake trout harvested in the recreational fishery (Table 4). There were no lake trout regulation changes for the State recreational fishery in 2007 – regulations were identical to 2006.

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 2007 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	724,871	5	35	37,194	195,966	109,981	21,996	12,700	91,440	9	48
	MM-2	36,774	19	123	385	821	0	0	4,896	51,457	52	302
	MM-3	66,360	1,920	12,649	70	161	61	24	6,018	68,003	14	74
	MM-4	195,267	10,678	48,363	158	411	8,372	3,349	10,210	107,205	1,246	6,604
	MM-5	200,415	4,069	18,697	0	0	0	0	38,152	373,890	4,031	19,752
	MM-6	592,954	3,774	20,797	41	107	2,667	1,600	121,524	1,336,764	10,458	57,519
	MM-7	441,991	2,612	14,397	298	775	36,810	18,405	75,711	757,110	6,680	36,740
Totals		2,258,632	23,077	115,061	38,146	198,241	157,891	45,374	269,211	2,785,869	22,490	121,039
Huron	MH-1	331,440	2,983	17,061	11,986	26,369	139,799	48,930	7,614	55,582	61	384
	MH-2	79,244	4,965	28,934	2,128	7,235	0	0	658	4,869	19	104
Totals		410,684	7,948	45,995	14,114	33,604	139,799	48,930	8,272	60,451	80	488
Superior	MI-5 ^c	37,490	5,630	19,744	0	0	0	0	321	899	1,438	1,927
	MI-6	41,883	4,192	14,637	0	0	408	286	194	795	2,018	3,431
	MI-7	18,141	1,286	5,928	0	0	89	22	47	376	1,023	1,535
Totals		97,514	11,108	40,309	0	0	497	308	562	2,070	4,479	6,893
Grand totals		2,766,830	42,133	201,365	52,260	231,845	298,187	94,612	278,045	2,848,390	27,049	128,420

^a Lake Superior lake trout number and weight do not include Siscowets; number of Siscowet harvested were estimated at 379, 540, and 430 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.

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 2007.

There are a few sport fisheries for whitefish in the Treaty-ceded area of the Great Lakes. In whitefish management unit WFM-05 (Grand Traverse Bay area) of Lake Michigan, the recreational harvest of whitefish was 7,678 pounds in 2007. 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 205, 2,555, and 7,564 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 2007 fishing season.

Lake	Unit	Harvest	Effort
Michigan	WFM-01	121,580	99
	WFM-06	0	0
	WFM-08	291,893	376
Lake totals		413,473	475
Superior	WFS-04	3,050	34
	WFS-05	31,300	225
Lake totals		34,350	259
Grand totals		447,823	734

B. Tribal commercial and subsistence fishing

The Chippewa Ottawa Resource Authority had not finalized harvest data for 2007 by the time this report was compiled; thus, all reported numbers are considered preliminary. We are unaware of how substantial the differences between preliminary and final harvest will be, though we anticipate that differences will be small in most management units.

1. Lake trout

Lake trout harvest by tribal commercial fishers was below harvest limits in all, but one management unit in 2007. In Lake Huron management unit MH-1, the harvest limit was exceeded by 7,213 pounds (3%); however, this deviation was not large enough to incur a penalty. Overharvest penalties are incurred when a party exceeds the harvest limit by greater than 15%. 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).

Table 6. Summary of preliminary tribal commercial lake trout harvest (pounds) by management unit in 1836 Treaty-ceded waters of the Great Lakes for the 2007 fishing season. Gill-net harvest includes that from small-mesh and large-mesh gill nets.

Lake	Unit	Trap-net harvest	Gill-net harvest	Total harvest
Michigan	MM-1,2,3	7,130	141,546	148,676
	MM-4	20,054	74,334	94,388
	MM-5	4,710	6,350	11,060
	MM-6,7	10,163	8,243	18,406
Lake total		42,057	230,473	272,530
Huron	MH-1	10,069	207,144	217,213
	MH-2	324	0	324
Lake total		10,393	207,144	217,537
Superior	MI-5	0	0	0
	MI-6	0	1,150	1,150
	MI-7	0	2,289	2,289
	MI-8	19,235	55,143	74,378
Lake total		19,235	58,582	77,817
Grand total		71,685	496,199	567,884

2. Lake Whitefish

Whitefish harvest by tribal commercial fishers was below harvest limits and HRGs in all management units. 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 preliminary 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 2007 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	838,833	1,324	0	0	838,833
	WFM-02	19,689	88	228,760	2,253	248,449
	WFM-03	416,371	726	22,613	324	438,984
	WFM-04	75,279	319	28,475	398	103,754
	WFM-05	85,591	284	77,135	1,699	162,726
	WFM-06	24,671	84	7,720	75	32,391
	WFM-07	366,067	601	111	0	366,178
	WFM-08	49,190	95	0	0	49,190
Lake totals		1,875,691	3,521	364,814	4,749	2,240,505
Huron	WFH-01	207,199	520	105,827	1,765	313,026
	WFH-02	189,981	540	24,112	732	214,093
	WFH-03	56,228	214	388	9	56,616
	WFH-04	9,350	128	170,752	3,162	180,102
	WFH-05	814,481	1,072	0	0	814,481
Lake totals		1,277,239	2,474	301,079	5,668	1,578,318
Superior	WFS-04	0	0	0	0	0
	WFS-05	0	0	14,204	217	14,204
	WFS-06	0	0	0	0	0
	WFS-07	95,594	531	151,272	3,722	246,866
	WFS-08	114,584	414	11,052	392	125,636
Lake totals		210,178	945	176,528	4,331	386,706
Grand totals		3,363,108	6,940	842,421	14,748	4,205,529

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 2007 occurred in Lake Huron management unit MH-1 (18,520 pounds), followed by MM-1,2,3 (15,148 pounds). 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 2007 fishing season. Units not listed had no harvest.

Lake	Unit	Trap nets		Gill nets		Total harvest
		Harvest	Effort	Harvest	Effort	
Michigan	MM-1,2,3	926	0	14,222	54	15,148
	MM-4	355	0	4,451	91	4,806
	MM-5	144	0	290	19	434
Lake totals		1,425	0	18,963	164	20,388
Huron	MH-1	383	0	18,137	240	18,520
Lake totals		383	0	18,137	240	18,520
Superior	MI-7	0	0	132	0	132
	MI-8	12	0	2,454	79	2,466
Lake totals		12	0	2,586	79	2,598
Grand totals		1,820	0	39,686	483	41,506

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 harvest in 2007 was in Lake Huron unit MH-1, where harvest was 3,987 pounds (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 2007 fishing season. Units not listed had no harvest.

Lake		Trap nets		Gill nets		Total Harvest
		Harvest	Effort	Harvest	Effort	
Michigan	MM-1,2,3	1	0	1,934	143	1,935
	MM-4	0	0	2,071	47	2,071
	MM-5	2	0	40	0	42
Lake totals		3	0	4,045	190	4,048
Huron	MH-1	0	0	3,987	112	3,987
Lake totals		0	0	3,987	112	3,987
Superior	MI-8	0	0	42	3	42
Lake totals		0	0	42	3	42
Grand totals		3	0	8,074	305	8,077

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 2007 occurred in Lake Huron unit MH-1 (79,671 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 2007 fishing season. Units not listed had no harvest.

Lake		Trap nets		Gill nets		Total harvest
		Harvest	Effort	Harvest	Effort	
Michigan	MM-1,2,3	1,237	0	267	0	1,504
	MM-7	8	0	2,341	6	2,349
Lake totals		1,245	0	2,608	6	3,853
Huron	MH-1	213	0	79,458	1,158	79,671
Lake totals		213	0	79,458	1,158	79,671
Superior	MI-8	24	0	192	0	216
Lake totals		24	0	192	0	216
Grand totals		1,482	0	82,258	1,164	83,740

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 2007 fishing season. Units not listed had no harvest.

Lake		Trap nets		Gill nets		Total harvest
		Harvest	Effort	Harvest	Effort	
Superior	MI-7	0	0	9	0	9
	MI-8	638	0	2,173	0	2,811
Lake totals		638	0	2,182	0	2,820

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. At the time this report was compiled, we had not received data on tribal subsistence harvest or effort for 2007.

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 2007. Information is also provided in the tables regarding other commercial fisheries enforcement activities that the Unit has performed in the year 2007.

A. General Information

The Consent Decree requires that the State maintain adequate staffing and equipment to allow for implementation of enforcement activities, and monitor commercial fishing activity on the Great lakes.

1. Staffing

Staffing shortage problems have been the norm for operations both in 2006 and yet even worse in 2007; we hope that in fiscal year 2007/2008 we may be able to refill at least one of the vacant positions. In this past year of 2007, we operated the Unit with three boat captains (the CFS positions), along with one investigator (the CFI position), in addition to the Unit supervisor position. Each of those three boat captains hold a United States Coast Guard Great Lakes Master Captains License. Now only two of those CFS positions are assigned to locations within the 1836 Treaty-Ceded area.

In April of 2007, CFS John Casto retired from State service and left the Charlevoix position open and the boat, William Alden Smith (our Unit's largest vessel) without a captain. CFS Steve Huff was forced by John's retirement to increase his patrol area to include all of Lake Michigan, and now doing so without a partner, a position that I held for the years before. John Casto's very steady mood and temper will be missed by not only the Unit and the Section but also by those that he had served for twenty five years.

To assist in the patrolling of Northern Lake Michigan, our Commercial Fish Investigator, Shannon Van Patten was requested to exchange the computer key board for the wheel of a District 3 boat to check net locations and netting complaints from time to time. Shannon, as an investigator does not hold a Great Lakes Master Captains License but none the less produced some of the Units best cases in the 2007 season: I just might put her at the wheel more often for 2008. The Unit also relies on this investigator for much of our Units background information on the Commercial and Wholesale Fish Business reporting activity; also, she was a primary source of information on Michigan's Bait Industry; much of that information and paperwork was used to draft the States Order with regard to the VHS disease of which she worked closely with the DNR Fish Division. CFS John Morey is stationed in the Port at Rogers City, charged with patrolling Northern Lake Huron, the St. Marys River and on occasion Lake Superior.

As it now stands, the Unit has one vacant position in Traverse City, one in Charlevoix, one more vacant position in Delta County (CFS Ken Johnson's old position), and the second position that use to be in Presque Isle County is still open. CFS Larry Deslover is assigned to the State-Licensed fishery that exists in Southern Lake Huron and Lake Erie, working out of the Saginaw Bay area. In 2007, Larry was often called up to the Treaty-Ceded waters to assist on

our State patrol vessels with Group Patrols, Joint Patrols, and to work some complaints when the other CFS Officers were on vacation or extended assignments.

Table 1. 2007 officer hours worked 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. (Complete at the time of report).

Enforcement Effort	CFS (hrs)	Overtime(CFS)	LED (hrs)	Total (hrs)
Consent Decree	3,496*	64	259**	3,819
State Commercial	2,175*	48	47	2,111
Totals	5,671*	112	306**	6,089

Footnote * Table 1: Hours also reflect 50% of the CFS assigned marine time as they used the time for net inspections and safety checks

Footnote ** Table 1: Hours reflect the Unit getting more help from the District Conservation Officers.

From (Table 1) it is evident that the State of Michigan and the Department of Natural Resources has been going through a budget reduction by looking at the amount of overtime hours allocated to the CFS Officers, in 2006, 565.5 overtime hours were used. In 2007 the total overtime hours used was reduced to 112 hours; a reduction of 453.5 hours.

2. Equipment

As in 2006, change in the Units equipment inventory was noted; now in 2007 even greater changes in the equipment inventory took place. In 2006, both 1994 Commercial grade Whalers were pulled out of service due to deteriorating hulls. This year those Whalers were put up for sale by bid (sold as is, with disclosure of information as to the condition of the vessels); they sold for only a fraction of the original purchase price. In the spring of 2007, SeaArk Marine completed the new 37 foot Dauntless-class vessel that will be replacing one of the Whalers. Delays in the delivery due to a miscommunication of design that had to be corrected by SeaArk resulted in the vessel arriving a month late at the facility that was going to install the electronic equipment. This delay did not fit into their schedule so they didn't start on installations of the electronic gear for an additional month; we were now two months behind our intended launch date. Then it was discovered that SeaArk had left off important wiring work. This set us back yet another month. Finally, the boat was put into full service, now in Rogers City, and was named

the “RANSOM HILL”. The vessel is equipped with the most up to date Furuno navigation gear in the form of chart plotters, radar, and bottom graph along with a complete line of communication via VHF radio, 800 MHz radio, and high band radio. Sea service hours for CFEU vessels are shown in Table 2 below.

Table 2. 2007 MDNR CFEU vessel service hours. Hours accumulated on non-unit boats are also shown (other vessels).

<i>VESSEL</i>	1836	STATE FISHERY	1842	TOTALS
	TREATY-WATERS		TREATY-WATERS	
<i>WILLIAM ALDEN SMITH</i>	79.1	N/A	N/A	79.1
<i>RANSOM HILL</i>	39.7	4	N/A	43.7
<i>VACANT</i>	N/A	N/A	N/A	N/A
<i>M.W. NEAL</i>	N/A	302.7	N/A	302.7
<i>RICK ASHER</i>	151	20.9	N/A	171.9
<i>OTHER VESSELS</i>	114	10	12	136
TOTALS	383.8	337.6	12	733.4

During the 2007 season, the MDNR Commercial Fish Enforcement Unit conducted a total of 137 patrols on board the Unit’s assigned vessels and also utilized local District patrol boats due to no boat being stationed in northern Lake Michigan, Escanaba. CFEU boats consumed a total of 4,582.2 gallons of fuel. That was down 4,829.3 gallons from 2006, a 55% drop in fuel consumption due to both the reduction in CFS positions and the Governors spending order, making the Unit more reactive than proactive. As a result, in 2007 with a fuel expenditure of \$13,383.67, it was down \$16,601.12 from 2006. Break down by vessel in 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>	15	1,069.3	\$3,311.29
<i>RANSOM HILL</i>	6	156.6	\$402.36
<i>Vacant</i>	N/A	N/A	N/A
<i>M.W. NEAL</i>	66	679.8*	\$1,488.88*
<i>RICK ASHER</i>	28	2,676.5	\$8,381.14
<i>OTHER VESSELS (est.)</i>	22	N/A**	N/A**
TOTALS	137	4,582.2*	\$13,583.67*

Footnote * Table 3; totals can not be calculated as some fuel fills were from USCG Stations that did not charge for the fuel nor note amount of fuel delivered.

Footnote ** Table 3; fuel for "OTHER VESSELS" was picked up by local Districts.

B. Enforcement

1. Complaints

At the start of the 2007 season, both the Manistee sport/charter fishing community and the Stone Smith Fishery anticipated that there may be problems as experienced the years before in the Ludington area. The two sides along with DNR Law Division and Fish Division conducted numerous face to face meetings to handle complainants, fears and concerns that the sport fishing community may have. The meetings were very successful in getting information out and avoiding potential problems. Throughout the course of the summer the Stone Fishery posted and updated the GPS locations of the trap nets set both to the south and north of Manistee Harbor. Two large, potentially problematic complaints were investigated and turned out to be unfounded. The first, the Stone Fishery suspected that dirt was placed into the fuel tanks of their fishing tugs: investigation found the cause was agitation of fuel in old tanks resulting in tank scale clogging filters and lines. The second was the suspected vandalism of 16 trap nets of which most were missing the net staffs and floats: investigation by both LRB Wardens and CFS Steve Huff found that the nets had been improperly set and during a storm most of the net markings were pulled under the surface.

MDNR commercial fish specialists received approximately 29 complaints (Table 4) related to commercial fisheries activity during the year. This is down 50% from the previous year due to the reduced number of Commercial Fish Specialist working the water; improved

Tribal/State relations in the Manistee Ludington area. Additionally, there now is an excellent working agreement between State permitted Tribal fishermen and the Brown Trout Assoc. in the Disputed Zone. As a result of that penciled out signed agreement between the fishers and the sport fishing community, only one minor complaint that was nothing more than a misunderstanding; it was corrected within 24 hours. The complaints were submitted from a variety of sources. Fourteen (14) complaints were assigned to CFS through the State's "Report All Poaching" system. Fifteen (15) 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. This does not count the numerous netting complaints that the Unit received this past year from Lake Erie: a result of a new commercial State License issued for that basin and handled by CFS Deslover.

All complaints were investigated, some proved to be unfounded, and others resulted in (7) verbal warnings, (18) citations from CFS Officers, or were referred to the proper tribal law enforcement agency.

In 2007, an alarming and interesting trend was noticed: the Unit issued (7) separate citations to non-native Americans that were fishing aboard Tribal fishing tugs. This number is double of what the Unit has issued for this charge over all the past seven years combined. The individuals were charged into State court for "make use of illegal gear" under state law with fines and cost being in the area of \$400.00 for each violation.

As in past years, most of the Unit's complaints in the 1836 Treaty-ceded waters are related to nets being not marked to Code, left unattended, or abandoned. CFS Van Patten investigated a total of five complaints in the 1842 Treaty-ceded area, all concerning placement and marking of commercial fishing nets. Two complaints were generated in the 1842 Treaty-ceded waters both involved netting complaints that were reported to be set over the line into the 1836 Treaty-ceded waters. CFI Shannon Van Patten investigated both complaints along with the assistance of local Conservation Officers and their boat; both complaints were unfounded. A breakdown of additional complaints is available in Table 4.

Table 4) 2007 Commercial fish related complaints investigated by MDNR Commercial Fish Specialists.

COMPLAINTS	1836 TREATY FISHERY	STATE-LICENSED	1842 TREATY FISHERY	TOTALS
<i>NETS</i>	27	9	2	38
<i>LICENSING</i>	2	1	N/A	3
<i>ACCESS</i>	N/A	N/A	N/A	0
<i>WHOLESALE</i>	N/A	29	N/A	29
<i>CLOSED AREA / SEASON</i>	1	3	N/A	4
<i>OTHER</i>	1	9	N/A	6
TOTALS	31	50	2	83

2. Inspections

A total of 700 inspections were conducted by MDNR Commercial Fish Specialists statewide: see (Table 5) for the break down of the inspections completed. There were 353 inspections of 1836 tribal fishers or their gear in the Treaty-ceded waters.

Table 5. 2007 MDNR CFS Commercial Fish Enforcement Unit inspections.

INSPECTIONS	1836 TREATY FISHERY	STATE-LICENSED	1842 TREATY FISHERY	TOTALS
<i>NETS</i>	225	244	5	474
<i>BOARDINGS</i>	16	9	N/A	25
<i>DOCKSIDES</i>	108	63	N/A	171
<i>STATE WHOLESALE</i>	4	26	N/A	30
TOTALS	353	342	5	700

3. Violations

The number of complaints (83) investigated in 2007 was higher than last year (60). This increase, even with the reduction in the number of CFS Officers working the water and the Unit being more “reactive” to complaints verses proactive only displays the Units ability to overcome short falls in the States budgetary and hiring problems and continue to do a good job.

As we have experienced in the past four years, most of the complaints in 2007 were related to net marking infractions as regulated in the CORA Code. Noted in the hours worked by the CFS Officers, improper net marking violations gave the Unit the justification to use a fraction of the assigned marine safety hours toward the protection of Great Lakes boaters in the 1836 Treaty waters. An interesting trend in violation in 2007 were the (8) citations issued to non-native Americans aboard Tribal fishing vessels. This number is well over double as to what has been issued in the past seven years combined. Two of the cases were related to consultant fisherman not having paperwork filed with either the Tribe or CORA. The other five cases, when questioned the Tribal boat captain stated that he could not find tribal members that wanted to work on the boat; the final case the Tribal boat captain felt that there was some agreement in the 2000 Consent Decree that permitted his non-native helper aboard. No evidence was ever found to substantiate this claim.

The Tribal fishers permitted to fish in the “Disputed Zone” do so under a State Issued permit and as mentioned before; an agreement between all parties with both sport fishing and commercial fishing concerns. That agreement I feel was the reason that neither the Unit nor Tribal Game Wardens received any complaints from either side this past season.

Table 6. MDNR CFS 2007 summary of commercial fisheries related violations.

VIOLATIONS	1836 TREATY FISHERY	STATE- LICENSED	1842 TREATY FISHERY	TOTALS
<i>ARRESTS</i>	18	5	N/A	23
<i>REFERRALS</i>	18	N/A	N/A	18
<i>WARNINGS</i>	6	4	N/A	10
TOTALS	42	9	0	51

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 Officers Steve Huff and John Morey conducted numerous joint patrols with tribal law enforcement officers. Steve was invited to ride along several times with the LRB Wardens on the new Tribal patrol vessel. One of the trips included a patrol from Ludington down to Whitehall and back. Later in the summer Steve was requested to ride along with Tribal Wardens when LRB commercial fishermen reported that their tribal nets were all vandalized. In the course of that investigation it was determined by the Wardens and CFS Huff that the nets were not indeed vandalized but instead was the result of poor fishing practices. The invitation for our CFS Officers to ride along with the LRB Wardens saves much in response time and fuel costs if we had to run the Asher down each time. CFS John Morey on the other hand has several times taken Tribal Wardens out of the port of Rogers City to look at Hammond Bay and run down into the Disputed Zone.

5. Group Patrols

The Decree requires the LEC to schedule a minimum of eight group patrols during the year [Section XVII (B) (f) (1)]. This past year eight (8) separate group patrols were set up, the dates were selected at LEC meetings. As with every year weather is always a major factor with hopes that it will be favorable for those patrols to take place. The MDNR Commercial Fish Enforcement Unit participated in (7) of the (8) pre-set group patrols; of those the last patrol to the Manistee, Ludington area had to called off due to weather and sea conditions; the reset date was also cancelled due to the same reason. As mentioned above in the Joint Patrol paragraph, that area did not go without attention, but the extra law enforcement visibility would have been good. The Group Patrol to Big Bay de Noc (July 18th and 19th) experienced weather conditions that affected the Group Patrol. The first day of the patrol the fog was so thick and lasted most of the day that nothing could be inspected even though the seas were flat. The second day was hampered by building seas which cut the patrol short as the vessels had to leave early to make the lengthy return trip. The one benefit of that patrol was the participation of USCG LCDR Don Lajavic Jr., both on the water and off the water. Such partnerships are beneficial to all parties

with the various resources that we as an organization can draw from. Just as an added footnote; the second day of that patrol for LCDR Lajavic was what we all termed “a weight loss“ program - I wonder why this man still goes to sea!

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. On May 1st of this past year, Unit Officers moved the Asher south to the Indiana-Michigan State Line to work a multi-day patrol with District 7 Conservation Officers and the State of Indiana Conservation Officers. For weeks prior to moving the boat south, meetings between the two states were conducted and sport fishing activity was monitored from both sides of the line. The day the patrol was set to take place, almost 30 Officers from both States gathered at Warren Dunes State Park only to hear that the patrol was cancelled due to something that we in the Unit are all too familiar with, rough sea conditions. The Asher and the entire Unit returned north.

As in the years past, the Unit participated with Conservation Officers from District three and the UP District two in a patrol of the Beaver Island archipelago chain of islands. Due to budgetary constraints the patrol was greatly scaled back on both personnel and duration but still identified many net locations and conducted several boarding's.

In the summer of 2007, the DEA and MSP requested the Unit to participate in a joint patrol operation, “Operation Island Hopper” to locate marijuana growing operations on the many islands in northern Lake Michigan. The patrol was conducted in September of 07, a little late for successfully finding a marijuana growing operation. Conservation Officers from Districts 2, 3, and District 4 along with the Patrol vessel Asher captained by CFS Steve Huff were joined by the three various northern drug enforcement teams, MSP, the USCG Air Station Traverse City and DEA to conduct the patrols. Conservation Officers were used as they had the on the ground knowledge of the islands in their perspective patrol areas, and the Asher along with helicopters from MSP and the USCG were used to get ground teams on the islands. Only one plant was removed, but the exercise provided working knowledge and got the bugs out in case of future operations.

CFI Shannon Van Patten conducted several MDNR patrols with District 2 Officers on both northern Lake Michigan and Lake Superior; two of those patrols I would like to expand on. The first was conducted in early August of 2007 in Lake Michigan, Big Bay de Noc, Garden Township. CFI Shannon Van Patten and Conservation Officer John Wenzel responded to a net complaint to discover and remove four subsistence nets, each of which exceeded 560 feet, which is twice that allowed in the CODE. Two SSM Tribal subsistence fishermen were issued citations as a result of that case and a total of 2,407 feet of net was removed from the water. The second case occurred in November of 2007 in response to a citizen's complaint. CFI Shannon Van Patten and Conservation Officers Sgt Wally Bender and Kyle Publiski removed three unmarked and abandoned commercial gill nets from the lower St. Marys River. The three nets were all in bad shape, and totaled more than and estimated 2,500 feet. The nets were TOT to SSM Tribal Wardens and a citation was issued to a SSM commercial fisherman.

7. ADDITIONAL INFORMATION

It should be noted by CORA and all the members of the LEC Committee the great job that LTBB Chief Warden Kevin Willis has done with the "Abandoned Trap Net" project, including the detailed chart he has developed, and his continued inventory of the nets removed through the project. These abandoned trap nets have been a haunting problem that the Committee has been plagued with over the past seven years as we all well know.

On September 9th 2007, I was invited by the Director Rebecca Humphries of the Department of Natural Resources to receive an award on behalf of the MDNR Commercial Fish Enforcement Unit. Director Humphries nominated the Unit for the National Award of Law Enforcement Excellence with the National Association of Fish and Wildlife Agencies. On October 11th, before the Natural Resources Commission in Lansing, the Director presented the award to the entire Unit, both on-duty and retired. The award was bestowed to the Unit for the work performed over the past seven years on the Great Lakes, and was received with honor from all the Commercial Fish Specialist, both working and retired.

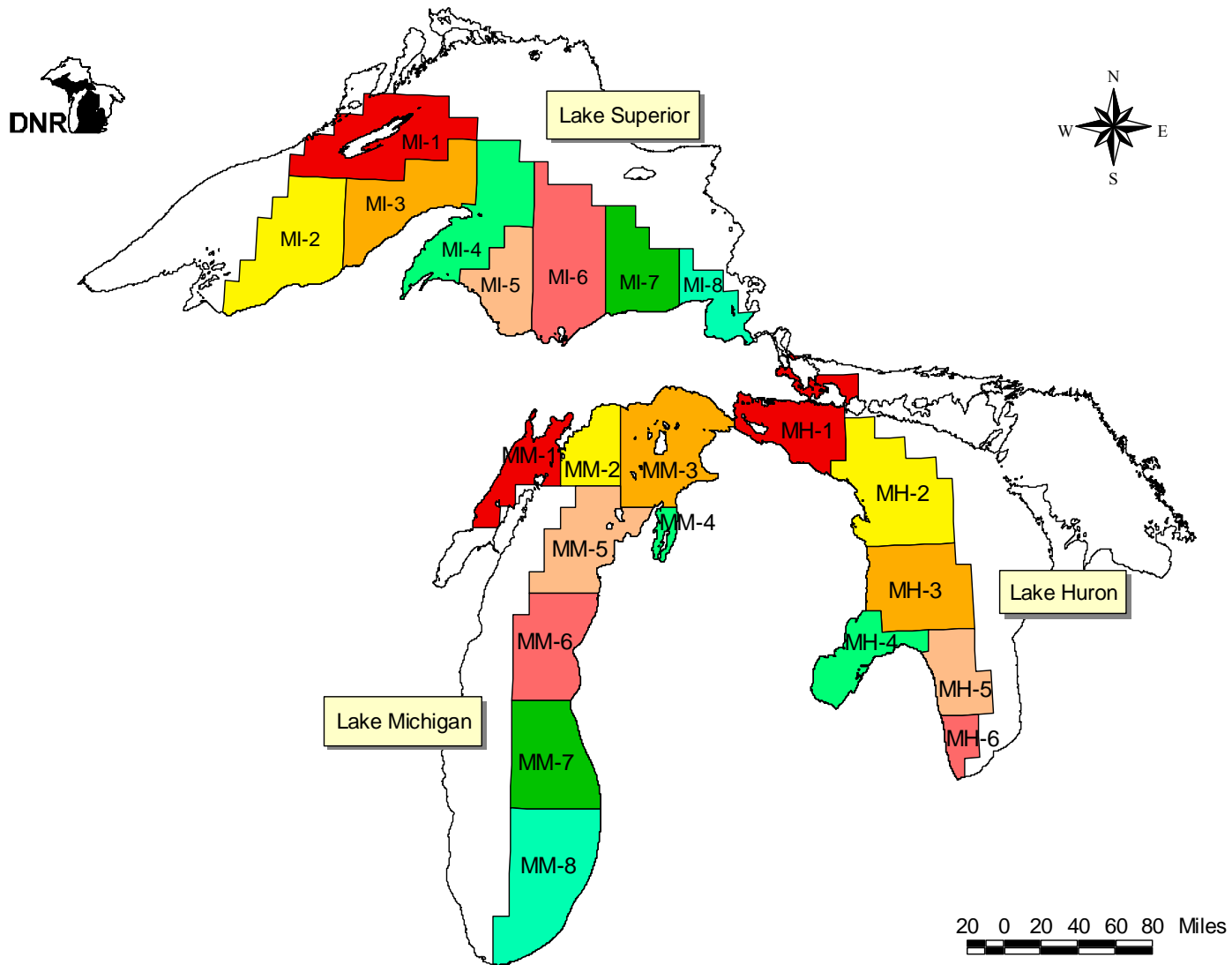


Figure 1. Lake trout management units for Lakes Superior, Michigan and Huron.

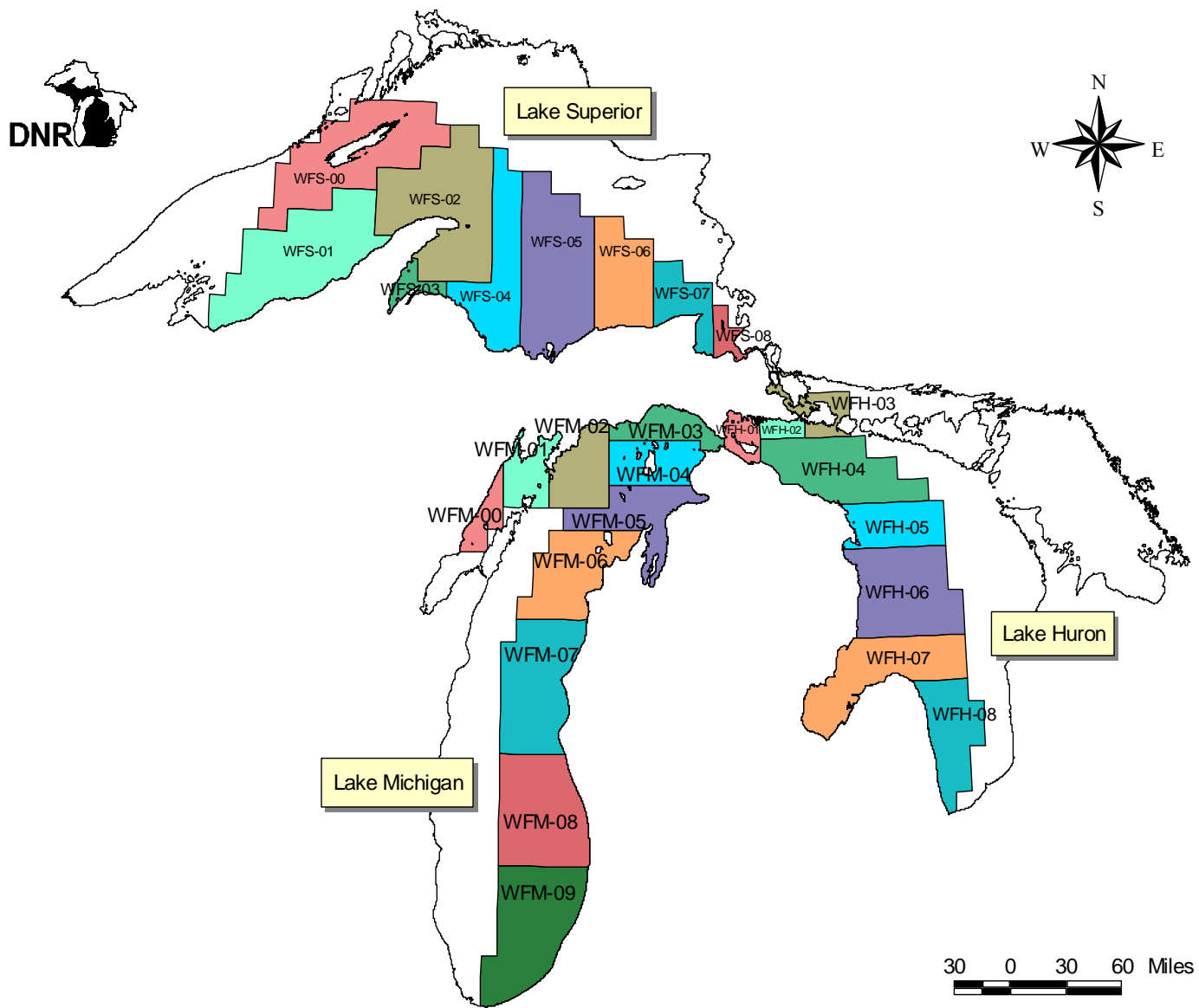


Figure 2. Lake whitefish management units for Lakes Superior, Michigan and Huron.

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.

47% SSBR = 0.11

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

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.

45% SSBR = 0.40

Forty-five percent TAM and 60/40 split from 2006 through 2009. Forty-five percent TAM and 55/45 split from 2010 through 2020.

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 10%	WFM-06 or 65 K 30%	WFM-08 or 500 K 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