2010 Annual Report on Implementation of the 2000 Consent Decree for 1836 Treaty-Ceded Waters of the Great Lakes

Prepared for:

Michigan United Conservation Clubs, Inc.

Michigan Fisheries Resource Conservation Coalition

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By:
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Preface

This report provides detailed information regarding the implementation of the 2000 Consent Decree in the 1836 Treaty-ceded waters of the Great Lakes during 2010, as required by the September 27, 2001 Memorandum of Understanding between the State of Michigan, Department of Natural Resources (MDNR) and the Michigan United Conservation Clubs, Inc., Michigan Fisheries Resource Conservation Coalition, and Bay de Noc Great Lakes Sportfishermen, Inc.

FISHERIES

I. General Information

A. Large-mesh gill net retirement

In an effort to reduce the amount of large-mesh gill net fished by tribal fishers, the Consent Decree called for the Sault Ste. Marie 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 has been 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 2010 tribal large-mesh gill-net effort in lakes Michigan and Huron was approximately 18.5 million feet less than the 1993-1998 average (Table 1). For all three lakes, approximately 24.4 million feet less effort was fished in 2010 compared to the 1993-1998 average.

Table 1. Amount of large-mesh gill-net effort (1,000s ft) in the 1836 Treaty-ceded waters of the Great Lakes during base years 1993 to 1998 and preliminary effort in 2010.

Lake	Management Unit	Effort		2010 reduction[b]
		1993-98[a]	2010	
Michigan	MM-123	17,912	9,645	8,267
	MM-4	1,794	1,105	689
	MM-5	240	134	106
Huron	MH-1	16,470	7,053	9,417
	MH-2	6	0	6
Superior	MI-6	780	39	741
	MI-7	2,028	1,344	684
	MI-8	6,578	2,075	4,503
Totals		45,808	21,395	24,413

[a] Average annual effort during base years.
[b] The relative reduction in 2010 (average effort in base years minus effort in current year).

B. Report from Modeling Subcommittee and modeling process description

The Modeling Subcommittee (MSC) of the Technical Fisheries Committee (TFC) prepares an annual report entitled "Status of Lake Trout and Lake Whitefish Populations in the 1836 Treaty-ceded waters of Lakes Superior, Huron, and Michigan, with Recommended Yield and Effort Levels" (referred to as the Status of the Stocks Report). The report detailing populations and harvest limits for fishing year 2010 was completed in January 2011. This and all previous versions are available on the 2000 Consent Decree page of the MDNR's Tribal Coordination Unit website: http://www.michigan.gov/greatlakesconsentdecree**.**

Statistical catch-at-age (SCAA) models are used to describe populations of lake trout and lake whitefish and to recommend the respective harvest limits. The modeling process begins by estimating parameters that describe each of the lake trout and lake whitefish stocks over time. Models are developed for the stocks in each defined Management Unit with data from both standard assessments and commercial and recreational fisheries. Age-specific abundance and mortality rates are estimated for each year that data are available. All models are 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 stock biomass, set forth in the Consent Decree.

All fish populations are regulated by three key rates: growth, mortality, and recruitment. These are each estimated in the first stage of the modeling process and then incorporated into the projection models. Growth is described using mean length at age, which is fit to a nonlinear regression model based on the fact 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% of released fish) for lake trout derived from a controlled study on the Great Lakes. Natural mortality is comprised of losses due to old age, disease, and predation. Natural mortality is estimated from an equation that relates the growth parameters of lake trout and lake whitefish to water temperature. 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 initial period of 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 (e.g., lake trout in Lake Michigan), 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. Currently, 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. However,

natural reproduction of lake trout in Lake Huron has increased in recent years, and that recruitment will need to be specifically accounted for in the coming years. For wild lake trout (Lake Superior) and lake whitefish (all management units), 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 that produced them.

After parameters have been estimated, the next step is the short-term projection of total allowable catches (TACs). 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. A more extensive description of the entire modeling process is contained in the *Stock Assessment Models* section of the Status of the Stocks Reports.

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 MSC calculates annual harvest and effort limits for lake trout and provides these recommendations to the TFC. After reviewing the recommendations, the TFC must approve harvest and effort limits by April 30 of each year to be submitted to the Parties for final approval. In lake trout management unit MH-1, the TFC could not reach agreement on harvest limits for 2010. Poor performance of the stock assessment model eroded confidence in its ability to accurately reflect the true population of the unit. The Parties convened a special meeting of the Executive Council in June 2010 and came to an agreement that set harvest limits for 2010 and 2011 in MH-1. The harvest limits for each year were set at 220,000 lb for CORA and 25,000 lb for the State. As a result of the State recreational fishery overharvesting lake trout in 2009, a penalty was applied for the 2010 fishing season and the respective harvest limits for the parties were adjusted (see Table 2). The MSC was tasked with improving the MH-1 model before it is again called upon for a harvest limit in 2012. A map of the lake trout management units is provided at the end of this document (Figure 1), and the 2010 lake trout harvest and effort limits for each management unit are below in Table 2.

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 all the Parties agree a greater change is appropriate. In 2010, there were three fully-phased management units where the model recommendations represented a change of greater than 15% from the 2009 harvest limits: MI-5, MI-6, and MI-7. The TFC invoked the 15% rule in each of these units, keeping the 2010 TAC within 15% of the 2009 TAC. In all of these units, the model recommendations were lower than 2009 levels.

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 2010 fishing season.

		Model-output TACs		Final TACs		
Lake	Unit	State	Tribal	State	Tribal	Tribal TAE
Michigan	MM-123[a]	0	0	50,000	453,000	15,621,000
	MM-4[a]	36,188	44,230	77,200	124,018	990,800
	MM-5[a]	103,016	68,627	103,016	68,627	911,000
	MM-67	357,141	39,682	357,141	39,682	NA
Huron	MH-1[b]	20,591	185,322	19,696	225,304	7,339,000
	MH-2	75,885	3,944	75,885	3,944	NA
Superior	MI-5[c]	82,515	3,648	103,296	4,606	NA
	MI-6[c]	59,225	59,225	62,890	62,890	4,624,000
	MI-7[c]	24,682	57,591	28,865	66,325	2,764,000

[a] Final TACs resulted from orders to amend the Consent Decree.
[b] Final TAC per June 2010 Executive Council agreement, after penalty applied due to State overharvest in 2009.
[c] TFC invoked the 15% rule, limiting the TAC to a 15% deviation from the 2009 harvest limit.

B. Lake Whitefish

As required by the Consent Decree, the MSC 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 MSC also generates recommendations for HRGs that are considered by each Tribe. After reviewing and discussing recommended harvest limits for lake whitefish, the TFC submits these harvest limits to the Parties for final approval by December 1 for the subsequent year. The TFC reached consensus on harvest limits for all shared whitefish management units, and these figures were sent to the Parties in December 2009. A map of lake whitefish management units is provided at the end of this document (Figure 2), and the 2010 lake whitefish harvest limits for each management unit are below in Table 3.

The MSC was able to generate model recommended harvest limits in all shared units, except for WFM-06. This unit (Leland/Frankfort area) has lacked fishery data in recent years, and a model could not be completed. The MSC recommended (and the TFC approved) a one-year extension of the prior year's harvest limit for WFM-06. For non-shared units with HRGs, the modeling process slightly changed in 2010. In Northern Lake Huron, the MSC examined

data that suggested the whitefish management units WFH-01 through WFH-04 did not include discrete stocks, but in fact, substantial movement occurred across management unit boundaries. As a result, the MSC combined these four non-shared units into one unit for modeling purposes. The model recommended a harvest level for these four units combined, rather than running separate models for each unit, as had been the practice. Individual HRGs were still set for each of these units in 2010, although the the MSC will move forward treating these units as one for modeling purposes. In two other non-shared management units, the MSC could not calculate a recommended harvest limit using SCAA models. In WFM-07 there continues to be an insufficient time series of data. In 2004, the HRG for WFM-07 was set at 500,000 lb., which represented the approximate average of the model-generated harvest limits from adjacent units WFM-06 and WFM-08, and no changes have been made since. In unit WFS-06 a lack of commercial catch sampling has resulted in poor model performance; thus, the 2010 HRG was again set at 210,000 lb, the same level it has been since 2004. In WFM-02 the 2010 HRG was set at peak historical harvest, which is lower than the model output. In WFS-07 low model performance resulted in a HRG that was set at 535,000 lb, which was lower than the model recommendation. The Tribes accepted model-generated recommendations for HRGs in other units.

Table 3. Model estimates for total allowable catch (TAC; pounds) or harvest regulation guidelines (HRG; pounds) for lake whitefish by management unit in 1836 Treaty-ceded waters of the Great Lakes for the 2010 fishing season.

Lake	Unit	Final State TAC	Model output Tribal TAC	Final Tribal TAC or HRG
Michigan	WFM-01	200,000	3,176,000	3,176,000
	WFM-02	-	792,000	558,000
	WFM-03	-	3,400,000	2,820,000
	WFM-04	-	768,000	768,000
	WFM-05	-	299,000	299,000
	WFM-06	62,000	145,000	145,000
	WFM-07[a]	-	-	500,000
	WFM-08	374,000	457,000	457,000
Huron	(H01-H04 Combined) [b]		2,800,000	
	WFH-01	-	-	467,000
	WFH-02	-	-	500,000
	WFH-03	-	-	150,000
	WFH-04	-	-	546,000
	WFH-05	-	1,075,000	962,000
Superior	WFS-04	8,000	73,000	73,000
	WFS-05	65,300	342,700	346,000
	WFS-06[a]	-	-	210,000
	WFS-07	-	685,000	535,000
	WFS-08	-	170,000	170,000

[a] No model output

[b] When this model was being updated for 2011, an error was found in the 2010 data, as a result this 2010 model recommendation is an overestimate of available harvest.

III. Harvest and Effort Reporting

A. State-licensed commercial and recreational fishing

1. Lake Trout

Lake trout harvest by the State of Michigan consists entirely of harvest by sport anglers. The harvest limits 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 that are returned to the water and 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). Lake trout harvest by state-licensed recreational fishers in 2010 was below harvest limits in all management units, except MH-1. The 2010 state lake trout harvest limit in MH-1

was 19,696 lb, and final State harvest was 24,803 lb, representing a 26% deviation above the harvest limit. As a result of this over harvest, the state's final harvest limit for 2011 was reduced by 5,107 lb as a penalty. A regulation adjustment was made for MH-1, which took effect in May 2011, with the goal of reducing total lake trout harvest below the harvest limit.

In addition to the changes in MH-1, regulations for recreational harvest of lake trout were also adjusted on Lake Michigan in 2010 and took effect in 2011. Public meetings were held and an online public comment period was open before decisions were made about adjusting regulations to provide more opportunity for state-licensed anglers, while still observing the harvest limits set through the Consent Decree process. The new regulations for Lake Michigan are printed in the 2011 Michigan Fishing Guide.

Estimated State-licensed recreational harvest of walleye, yellow perch, and Chinook and Coho salmon are also listed in Table 4. Total effort is indicated for all species combined. The Consent Decree does not require harvest limits to be set for these species.

Table 4. Total effort, number, and weight (pounds) of estimated State-licensed recreational harvest for both creel and charter anglers, by management unit in 1836 Treaty-ceded waters of the Great Lakes for the 2010 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	211,135	0	0	9,299	21,388	49,402	15,315	385	2,356	0	0
	MM-2	3,780	12	74	23	53	0	0	456	4,460	10	65
	MM-3	55,413	2,243	13,750	9	21	15	5	4,165	40,734	10	65
	MM-4	136,120	8,229	34,068	32	74	8,649	2,941	3,864	47,334	171	1,108
	MM-5	221,633	4,019	23,672	0	0	16	5	38,871	450,904	1,853	12,007
	MM-6	386,859	3,515	19,543	0	0	4,025	886	75,019	814,706	4,486	26,288
	MM-7	167,514	2,688	15,994	76	176	30,119	6,626	24,882	229,163	1,282	6,346
Totals		1,182,454	20,706	107,101	9,439	21,712	92,226	25,778	147,642	1,589,657	7,812	45,879
Huron	MH-1	277,569	5,390	24,803	403	1,963	89,556	22,389	5,098	32,066	267	1,068
	MH-2	61,713	3,502	22,588	6,155	19,573	320	80	631	4,322	58	219
Totals		339,282	8,892	47,391	6,558	21,536	89,876	22,469	5,729	36,388	325	1,287
Superior	MI-5[c]	28,579	5,628	25,833	0	0	0	0	24	87	1,817	3,598
	MI-6	46,397	3,443	14,598	0	0	204	51	197	887	4,591	9,687
	MI-7	20,195	2,308	7,639	0	0	0	0	10	69	946	1,693
Totals		95,171	11,379	48,070	0	0	204	51	231	1,043	7,354	14,978
Grand totals		1,616,907	40,977	202,562	15,997	43,248	182,306	48,298	153,602	1,627,088	15,491	62,144

[a] Lake Superior lake trout number and weight do not include Siscowets; number of Siscowet harvested was estimated at 10, 146, and 1,500 fish, for MI-5, MI-6, and MI-7, respectively.

[b] Lake trout harvest in management unit MH-1 does not include throwback mortality.

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

2. Lake Whitefish

Lake whitefish harvest by state-licensed commercial fishers was below harvest limits in all whitefish management units, except WFM-06. The quota for this unit was exceeded by 3,241 pounds. This deviation was not large enough to invoke a penalty under Consent Decree rules, and the 2011 quota will not be reduced as a result. 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 2010.

The largest monitored recreational fishery for whitefish occurs in unit WFM-05 (Grand Traverse Bay area). Recreational harvest of whitefish in Grand Traverse Bay was estimated to be 11,264 pounds in 2010. 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 13, 2,468, and 7,179 pounds, respectively. The State does not estimate targeted recreational effort for lake whitefish in these management units.

Table 5. Summary of state-licensed commercial lake whitefish harvest (pounds) and effort (trap-net lifts) by lake whitefish management unit in 1836 Treaty-ceded waters of the Great Lakes for the 2010 fishing season.

Lake	Unit	Harvest	Effort
Michigan	WFM-01	168,406	98
	WFM-06	65,241	152
	WFM-08	238,713	313
Lake totals		472,360	563
Superior	WFS-04	510	4
	WFS-05	56,807	313
Lake totals		57,317	317
Grand totals		529,677	880

B. Tribal commercial and subsistence fishing

Data in this section are as reported to the MDNR from the Chippewa Ottawa Resource Authority (CORA). At the time this report was completed, CORA had not finalized harvest data for 2010; thus, all reported numbers are considered preliminary. It is unknown how much these

preliminary numbers will change when they are made final, though the differences should be minor in most management units.

1. Lake trout

In 2010, lake trout harvest by tribal commercial fishers was below established harvest limits in all management units. 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 throwback mortality from trap and gill nets in MH-1 where special interim regulations apply. As a result of the June 2010 Executive Council agreement, it is stipulated that in 2010 and 2011, the estimated pounds of trap and gill-net throwback lake trout killed do not count against the Tribal harvest limit in MH-1.

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 2010 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-123	11,407	283,975	295,382
	MM-4	3,818	85,814	89,632
	MM-5	5,038	15,443	20,481
	MM-67	2,784	206	2,990
Lake total		23,047	385,438	408,485
Huron	MH-1[a]	0	202,995	202,995
	MH-2	0	0	0
Lake total		0	202,995	202,995
Superior	MI-5	0	0	
	MI-6	0	1,331	1,331
	MI-7	0	31,616	31,616
	MI-8	3,825	14,273	18,098
Lake total		3,825	47,220	51,045
Grand total		26,872	635,653	662,525

[a] Does not include estimated throwback mortality of 5,260 lb.

2. Lake Whitefish

Lake whitefish harvest by Tribal commercial fishers was below the approved 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 lake 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 2010 fishing season. Minor harvest from small-mesh gill nets is also included in gill-net harvest, but not effort.

		Trap nets		Gill nets		Total
Lake	Unit	Harvest	Effort	Harvest	Effort	harvest
Michigan	WFM-01	688,264	1,394	0	0	688,264
	WFM-02	220,622	539	273,391	2,282	494,013
	WFM-03	460,296	2,027	263,492	3,240	723,788
	WFM-04	202,543	1,192	191,634	2,734	394,177
	WFM-05	20,623	132	82,640	2,059	103,263
	WFM-06	85,605	163	7,685	114	93,290
	WFM-07	129,242	166	0	0	129,242
	WFM-08	0	0	0	0	0
Lake totals		1,807,195	5,613	818,842	10,429	2,626,037
Huron	WFH-01	125,545	656	80,969	1,368	206,514
	WFH-02	97,216	496	17,112	572	114,328
	WFH-03	78,850	384	610	10	79,460
	WFH-04	47,995	305	272,721	4,563	320,716
	WFH-05	461,865	568	0	0	461,865
Lake totals		811,471	2,409	371,412	6,513	1,182,883
Superior	WFS-04	0	0	0	0	0
	WFS-05	0	0	2,980	38	2,980
	WFS-06	0	0	2,386	45	2,386
	WFS-07	194,590	926	214,881	3,138	409,471
	WFS-08	99,123	593	14,933	190	114,056
Lake totals		293,713	1,519	235,180	3,411	528,893
Grand totals		2,912,379	9,541	1,425,434	20,353	4,337,813

3. Walleye

Commercial fishing for walleye is permitted in and around Grand Traverse Bay and the Manitou Islands, in northeastern Lake Michigan (Naubinway to Gros Cap), and around St. Martin's Bay and 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. 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. The largest reported walleye harvest in 2010 occurred in Lake Huron unit MH-1 (21,908 pounds).

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 2010 fishing season.

		Trap nets		Gill nets		Total
Lake	Unit	Harvest	Effort	Harvest	Effort	harvest
Michigan	MM-123	414	0	5,184	10	5,598
	MM-4	1,289	0	1,521	0	2,810
	MM-5	0	0	132	0	132
Lake totals		1,703	0	6,837	10	8,540
Huron	MH-1	33	0	21,875	288	21,908
Superior	MI-7	0	0	43	0	43
	MI-8	0	0	234	0	234
Lake totals		0	0	277	0	277
Grand totals		1,736	0	28,989	298	30,725

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 2010 was in northern Lake Michigan (MM-123), where 153 pounds were harvested (Table 9). This represented a 79% decline from

the 2009 peak harvest which occurred in Grand Traverse Bay. Yellow perch are occasionally harvested as incidental catch, which is why often 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 2010 fishing season.

		Trap nets		Gill nets		Total
Lake		Harvest	Effort	Harvest	Effort	Harvest
Michigan	MM-123	0	0	153	0	153
	MM-4	0	0	77	0	77
	MM-5	0	0	5	0	5
Lake totals				235		235
Huron	MH-1	0	0	19	0	19
Superior	MI-8	0	0	52	0	52
Grand totals		0	0	306	0	306

5. Chinook and Coho salmon

Tribal commercial fisheries for salmon exist in northeastern Lake Michigan near shore 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 near shore from Cordwood Point to Hammond Bay Harbor light. There is no target fishery for salmon in Lake Superior, but fishers are allowed to harvest these species as incidental catch. Fishing is restricted by season, gear, depth, and area; though no harvest limits are set. As in most years, the largest Chinook salmon harvest in 2010 occurred in Lake Huron unit MH-1 (Table 10). The 146,894 lb harvested in MH-1 represents a 23% decline from the 2009 take of Chinook salmon. Coho salmon were mostly 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 2010 fishing season.

		Trap nets		Gill nets		Total
Lake	Unit	Harvest	Effort	Harvest	Effort	harvest
Michigan	MM-123	262	0	1,219	0	1,481
	MM-4	0	0	832	0	832
Lake totals		262	0	2,051	0	2,313
Huron	MH-1	0	0	146,894	1,505	146,894
Superior	MI-7	0	0	34	0	34
	MI-8	5	0	89	0	94
Lake totals		5	0	123	0	128
Grand totals		267	0	149,068	1,505	149,335

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 2010 fishing season.

		Trap nets		Gill nets		Total
Lake	Unit	Harvest	Effort	Harvest	Effort	harvest
Michigan	MM-123	0	0	7	0	7
Superior	MI-6	0	0	170	0	170
	MI-7	0	0	101	0	101
	MI-8	384	0	1,225	0	1,609
Grand Totals		384	0	1,503	0	2,402

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

certain 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 from their respective Tribe, and must abide by provisions of the Tribal Code. Additionally, subsistence fishing with gill or trap net requires a Tribal permit that may be limited in duration and by area. The MDNR is to be provided with copies of all subsistence licenses and permits. The Consent Decree states that data from the subsistence harvest reports of Tribal fishers shall be compiled by CORA and provided to the Parties within six (6) months. Preliminary subsistence gill-net harvest and effort for 2010 is included below in Table 12. Subsistence harvest by other means (hook and line, tip-ups, spears) is listed in Table 13.

Table 12. Summary of preliminary tribal subsistence harvest (round pounds) with gill nets for each management unit by species for the 2010 fishing season.

Gear	Unit	Burbot	Carp	Freshwater drum	Lake herring	Lake trout	Menominee	Northern pike	Rainbow trout
Gill Net	MH-1	50	0	0	255	307	20	26	0
	MH-2	0	0	0	0	126	1	0	0
	MI-6	0	0	0	0	67	0	0	0
	MI-7	0	0	0	12	0	15	0	35
	MI-8	3	0	0	879	35	58	3	18
	MM-1	126	0	0	0	109	0	214	11
	MM-2	5	0	0	0	357	0	0	0
	MM-3	0	110	18	0	401	0	0	1,355
	MM-7	6	0	0	0	18	0	0	490
	St. Marys River	0	0	0	0	0	0	6	41
	Totals	190	110	18	1,146	1,420	94	249	1,950

Gear	Unit	Salmon	Smelt	Sucker	Walleye	Whitefish	Yellow perch	Total Gill-Net Effort
Gill Net	MH-1	9	0	72	569	115	4	8,700
	MH-2	0	0	0	51	0	0	2,400
	MI-6	52	0	0	0	2	0	150
	MI-7	335	0	36	0	0	0	1,500
	MI-8	947	474	280	93	746	4	31,980
	MM-1	0	0	126	2,434	225	11	27,530
	MM-2	0	0	40	170	0	0	3,300
	MM-3	181	0	12	100	34	2	8,000
	MM-7	0	0	0	15	0	0	2,100
	St. Marys River	237	32	30	12	0	0	1,000
	Totals	1,761	506	596	3,444	1,120	21	86,660

Table 13. Summary of preliminary Tribal subsistence harvest (round pounds) with hook and line, tip-ups, and spears (combined) for each management unit by species for the 2010 fishing season.

Gear	Unit	Brown trout	Burbot	Lake herring	Lake trout	Musky	Northern pike	Rainbow trout
Hook and Line, Tip-up, and Spear	MH-1	0	0	12	7	0	29	7
	MI-6	0	21	0	7	0	6	27
	MI-7	0	0	0	0	0	0	213
	MI-8	0	0	0	0	0	0	0
	MM-1	0	0	0	0	0	3	71
	MM-2	0	0	0	0	0	0	18
	MM-3	0	0	0	0	0	0	0
	MM-7	24	0	0	0	0	0	233
	St. Marys River	0	168	15	11	6	460	33
	Totals	24	189	27	25	6	498	602

Gear	Unit	Rock Bass	Salmon	Smelt	Splake	Walleye	Whitefish	Yellow Perch
Hook and Line, Tip-up, and Spear	MH-1	0	0	0	2	0	0	547
	MI-6	0	101	1	0	0	0	2
	MI-7	0	219	0	0	0	0	0
	MI-8	0	9	0	0	10	102	51
	MM-1	2	0	0	0	120	2	398
	MM-2	0	0	0	0	0	0	0
	MM-3	0	0	0	0	0	0	0
	MM-7	0	0	0	0	0	0	0
	St. Marys River	1	13	0	0	414	28	1,912
	Totals	3	342	1	2	544	132	2,910

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LAW ENFORCEMENT

I. Introduction

The 2000 Consent Decree established 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.

The Consent Decree also requires that the state and the tribes maintain adequate staffing and equipment to allow for implementation of enforcement activities, and monitor commercial fishing activity on the Great Lakes. This report provides a summary of 1836 Treaty fishery enforcement activity for the MDNR Commercial Fish Enforcement Unit (CFEU) in 2010.

A. General Information

1. Staffing

At the present time, the CFEU is manned by three Commercial Fish Boat Captains and one Commercial Fish Investigator (CFI). Steven Huff was appointed to the vacant 2nd/Lt. unit supervisor position in late 2010. There are four vacant Commercial Fish Specialist (CFS) positions. The CFS vacancies are in Leland (2), Charlevoix (1), and Rogers City (1).

As in years past, the CFEU had CFS Larry Desloover come north from his responsibilities with the state-licensed commercial fishery in Saginaw Bay to assist with CORA Group Patrols conducted in the 1836 Treaty waters.

Table 14. 2010 officer hours worked for Consent Decree and state commercial fish issues.

Enforcement Effort	CFEU (hrs)	LED* (hrs)	Total (hrs)
Consent Decree	3,951	532	4,483
State Commercial	1,659	39	1,698
Wholesale Fish	172	9	181
Totals	5,782	580	6,362

*LED represents hours worked by other MDNR Law Enforcement Division personnel to address commercial fish issues.

2. Equipment

During the 2010 season, the CFEU conducted a total of 118 patrols on board the unit's assigned vessels and also utilized local district patrol boats for 126 patrols. The CFEU boats consumed 4,379.29 gallons of fuel with a fuel expenditure of $13,778.32.

Table 15. 2010 CFEU vessel service hours.

Vessel	1836 Treaty Fishery	State Fishery	1842 Treaty Fishery	Totals
William Alden Smith	68.6	17	N/A	85.6
Ransom Hill	96	24	N/A	120
Shaffer	0	10	N/A	10
M.W. Neal	0	280	N/A	280
Rick Asher	67	17	N/A	84
Other Vessels *	14	11	N/A	25
Totals	245.6	359	0	604.6

* The hours accumulated on non-unit vessels are from patrol logs.

Table 16. Patrols, fuel consumption & fuel costs.

Vessel	Patrols	Fuel (Gal)	Cost ($)
William Alden Smith	18	1,023.50	$3,256.97
Ransom Hill	24	1,639.34	$5,161.57
Shaffer	5	30	N/A
M.W. Neal	55	773.75	$2,629.80
Rick Asher	16	912.70	$2,729.98
Other Vessels*	8	N/A	N/A
Totals	126	4379.29	$13,778.32

*Fuel for "Other Vessels" was paid for by the CFEU but a dollar amount was not available.

B. Enforcement

1. Complaints and Violations

In 2010, the CFEU investigated a total of 76 complaints, with 26 related to 1836 and four to 1842 Tribal commercial fishing; 13 complaints were received for the state commercial fishery, and 33 complaints were received related to the wholesale fish business (most for failure to report). Some of these complaints were unfounded, and the others resulted in a total of 236 citations being issued. Most of these were related to the Bay de Noc Walleye case. Lastly, a total of nine verbal warnings were issued, eight referrals were made to the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) and to 2000 Consent Decree tribal law enforcement agencies.

Table 17. 2010 commercial fish complaints investigated by the CFEU.

Complaints	1836 Treaty Fishery	State Fishery*	1842 Treaty Fishery	Totals
Nets	25	8	4	37
Licensing	0	2	0	2
Access	0	0	0	0
Wholesale	0	33	0	33
Closed area / season	0	1	0	1
Other	1	2	0	3
Totals	26	46	4	76

* Includes netting complaints received on non-Tribal/non-State licensed individuals

Table 18. 2010 summary of commercial fisheries related violations

Violations	1836 Treaty Fishery	State Fishery*	1842 Treaty Fishery	Totals
Arrests	229	7	N/A	236
Referrals	5	0	3	8
Warnings	7	2	N/A	9
Totals	239	9	3	253

* Includes netting violations for non-Tribal/non-State licensed individuals

Complaints and Violations of note include the following:

- CFS Craig Milkowski removed approximately 600’ of old gill net off Bois Blanc Island, but was unable to identify the fisher.

- CFS Huff received information of a floats/staff in disarray near Whitehall. The coordinates are close to a former LRB fisher member net location in 2009. CFS Huff, CO Patton and a LRB officer located two nets and removed approximately 300 feet of excess line floating on the surface. LRB secured funding to have the nets removed.

- Cpl. Huff worked with LRB officers near Ludington where unattended trap nets where located and the fisher identified. LRB officers issued tickets to the fisher.

- CFS Huff and LRB officers investigated a non-tribal consultant who has been assisting on a vessel that he is not assigned to assist on.

- CFI VanPatten and CFS Huff worked with SSM Law Enforcement in identifying the fisher responsible for miles of abandoned gill net in northern Lake Michigan full of rotten fish. A SSM officer interviewed and obtained a confession from the fisherman in question. SSM officers issued citations for improperly marked nets and for failure to attend the nets.

- CFS Terry Short received a complaint of a subject netting planted brown trout. The complainant was able to provide a Wisconsin license plate. CFS Short contacted Wisconsin Conservation Officer and made contact with the subject in Marinette. Officers were shown emerald shiners that the subject stated he had taken in Michigan. Officers were unable to locate any trout and were informed that the subject used the minnows to feed his dog. The Wisconsin officer cited the subject for importing live fish into Wisconsin.

- CFS Milkowski investigated a complaint from SSM fisher that his nets had fish removed and tampered with by another fisherman. A suspect was contacted and the activity stopped.

- CFS Craig Milkowski and SSM officers monitored fishing activity by five members of the Sault Tribe near Cheboygan. He had received information that one of the fishermen who was licensed by the Sault Tribe for subsistence fishing was going to be taking out four others who were also Mackinaw Band members. The four others were going to be exercising their

subsistence rights under the Mackinaw Band authority. The SSM officers ticketed the four for subsistence fishing without a permit.

- CFI VanPatten and CFS Short observed a SSM subsistence fisher engage in subsistence fishing while his license was revoked. Officers contacted the fishers and seized 112 lb of fish over limit of the legally permitted subsistence fisher. The case is currently being reviewed by the SSM prosecutor.

- The trial involving the illegal harvest of walleye in Bay de Noc by subsistence fishers was concluded during the summer of 2010. The fishers were found responsible for 79 of the 105 violations. They were sentenced to a total of $13,175 fines and costs plus over $15,000 in restitution. Four snowmobiles and the gill nets used were forfeited by the court. The defendant's subsistence fishing licenses were also permanently revoked. The decision was appealed by the defendants on January 20, 2011 and heard by a panel of five Sault Ste. Marie tribal judges. The fishers did not appeal the findings where they were found responsible for 37 violations for ganging their nets together and using in excess of 300' of net. They did not appeal the forfeiture of the nets involved in the fishing operation. They did however appeal 42 violations where they had been found responsible for selling subsistence caught fish, over limit of fish, falcifying catch reports, and allowing assistance by a non-native individual. In addition, they also appealed the forfeiture of the four snowmobiles, the lifetime fishing revocation, and the "reimbursement" of the market value of the fish sold.

  The decision came back on April 13, 2011. Of the 42 appealed violations, 24 were reversed and 18 were upheld. Three of the six sale violations were reversed, this in turn automatically reversed two of the five over limit charges. All three of the charges of allowing non-native assistance were reversed. The three violations for falcifying a catch report were upheld. The lifetime revocation was changed to a one year suspension starting on the date of the appelate court's decision. The reimbursement was upheld, but because three of the six sales were reversed, the reimbursement was reduced from $15,214.60 to $3,348.66. Fines and costs were reduced from a total of $13,175 down to $8,525.

- State charges for conspiracy were authorized for a non-native individual that assisted the subsistence fishers in the Bay de Noc walleye case as well as the two tribal commercial fishers conspiring to market the subsistence caught fish. The cases were consolidated and a trial scheduled for May 10, 2011. The Sault Ste. Marie Tribe of Chippewa Indians retained counsel for the defense of their fishers. A motion was filed in district court by the attorney for the commercial fishermen claiming that the state has no jurisdiction in the case as the fishermen were engaged in treaty activity. A motion on jurisdiction was also filed in Federal Court by the Sault Ste. Marie Tribe about the same time and was scheduled for a hearing on May 5, 2011. The district court judge heard the first motion on April 21 and made a ruling the following week that the fishermen's actions were outside of their treaty rights and the state court did indeed have jurisdiction. The tribe withdrew their motion from federal court on April 29, and the trial in state court will begin as scheduled on May 10, 2011.

- During the course of the Bay de Noc investigation numerous other violations committed by the same commercial fishermen over a three-year period were uncovered. These violations included fishing while unlicensed, filing false catch reports, and retaining illegal species from a closed grid. As a result, these fishers were charged with a total of 139 counts of these violations. The Sault Ste. Marie Tribe requested that the prosecutor dismiss all but 12 of these violations (6 counts for each fisher). There have been five adjournments for this trial on the 12 counts and the latest one is scheduled for May 18, 2011.

2. Inspections

A total of 483 inspections of State and Tribal Fisheries were conducted by the CFEU in 2010.

- CFS Desloover and CFS Milkowski coordinated a group patrol at the Sault St. Marie International Border with Michigan State Police Motor Carrier Division, US Fish and Wildlife service, US Customs and US Border Patrol. The goal of the patrol was to monitor the movement of minnows/fish, attempt to intercept prohibited species, identify violations and determine destinations in Michigan.

Table 19. 2010 CFEU inspections (from vessel log books & inspection forms).

Inspections	1836 Treaty Fishery	State Fishery	1842 Treaty Fishery	Totals
Nets	127	89	0	216
Boardings	20	12	0	32
Docksides	98	92	0	190
State Wholesale	N/A	45	N/A	45
Totals	245	238	0	483

C. Patrols

1. Joint Patrols

Officers from the CFEU conducted joint patrols with officers from the five signatory tribes. Joint patrols consisted of routine patrols with one or more tribal law enforcement officers, but did not include LEC sponsored group patrols which are summarized in part 2 below.

- CFS Huff and GTB Captain Bailey conducted an on water patrol from Leland to East Platte Bay to South Manitou. Officers inspected several nets and conducted one boarding. During the boarding of the GTB fisher officers were informed that one of the fishers trap nets had approximately 2,000 lb of lake trout in the pot. The fisher stated that an estimated 200 lb of trout were killed due to the abnormally high water temperature. (Surface temperatures were observed at 79 degrees). The fisher removed the pot that day and relocated the remainder of net the following week.

- MDNR Fisheries Biologist Dave Caroffino and CFS Huff conducted a joint patrol with LRB Conservation Enforcement on Lake Michigan during the Manistee Disabled Veterans of America fishing Tournament.

- CFS Huff conducted a joint patrol on Lake Michigan from Ludington to Manistee with LRB officers. Twelve nets were located and inspected. Two trap nets had no markings and a total of 22 violations were identified by officers. One gill net was located in 397’ of water that appeared not to have been attended for a long period of time.

- CFS Short conducted a patrol with GLIFWC Officers in the Marquette area addressing some abandoned net complaints.

2. LEC Sponsored Group Patrols

Bays de Noc Patrol Feb. 19-21

Cpl. Terry Short and Cpl. Shannon Van Patten from the MDNR and officers from Little Traverse Bay and Little River Bands were involved in the patrol. Patrols were conducted on the ice of Little and Big Bay de Noc. Several tribal subsistence nets and sport fishermen were checked. No tickets issued.

Little Bay de Noc Patrol April 10-11

Cpl. Terry Short from MDNR and Sgt. Bobby Robles from Little River Band involved in the patrol. Patrol originally scheduled for April 15-16 was moved up one week due to fish run activity. Officers patrolled the shoreline of Little Bay de Noc at night and inspected two tribal subsistence nets and contacted eight tribal subsistence fishermen. No violations observed.

Muskegon/Ludington/Manistee April 19-20

Cpl. Huff, C.O. Patten, and Fisheries Division Biologist Dave Caroffino from MDNR worked on the LEC patrol from Muskegon to the Manistee area of Lake Michigan. Officers conducted three boarding's and inspected eight nets. No violations were observed at the time.

Beaver Island/Sturgeon Bay Patrol May 24-25

MDNR Cpl. Craig Milkowski and Little Traverse Bay Band Tribal officers Willis and McCreery patrolled on PB 25-5. Officers inspected 10 tribal trap nets and conducted two tribal tug boardings.

Whitefish Point/St. Mary's River Patrol July 15-16

Cpl. Craig Milkowski, Cpl. Larry Desloover, and CO Michael Feagan from the MDNR patrolled on PB 25-5. Officers inspected three tribal trap nets and conducted two tribal tug boardings.

Northern Lake Huron August 18-19

Cpl. Milkowski / Desloover / PCO Panich / FTO Chuck McPherson from the MDNR along with LTBB officer Roger Willis patrolled the straights area of Lake Huron. On August 18 high winds prevented vessels from patrolling into open waters and patrol activities were limited to near shore. On day two vessels were able to patrol the open waters of Lake Huron and conducted numerous inspections.

Patrol Activity:

1 Compliant of improperly marked net (LTB handled the complaint.)

7 Net inspections

1 Wholesale inspection

2 Dockside inspections

Bays de Noc Patrol September 28-29

Cpl. Terry Short and Cpl. Shannon VanPatten from MDNR and officers from Sault Ste. Marie Band, Little Traverse Bay Band, Little River Bay Band, and the Great Lakes Indian Fish and Wildlife Commission participated in the patrol. MDNR patrol vessel PB 25-1 and two tribal patrol vessels were utilized. MDNR officers boarded and inspected 3 tribal commercial fishing vessels and inspected 8 tribal trap nets. MDNR officers found an illegal subsistence net in Garden Bay. Officers pulled the net and ticketed the owner for fishing without a valid subsistence license. The net was turned over to Sault Ste. Marie tribal officers.

Bays de Noc Patrol October 26-27

Both patrol days were cancelled due to storm force winds producing 10-12’ seas on the bays and up to 20’ seas on open Lake Michigan.

1836 Treaty Area Fishing Closure November 6

All MDNR Commercial Fish Enforcement Unit officers were involved in patrol efforts. MDNR Cpl. Terry Short and Cpl. Shannon VanPatten patrolled the ports and shoreline of Big Bay de Noc, Garden Peninsula, and Manistique area. Officers inspected three tribal tugs with two of the tugs arriving at port after the noon closure. Officers were advised and later confirmed that permission had been granted by the Sault Tribe for an extension to certain fishermen.

Cpl. Short and Cpl. VanPatten observed and contacted three tribal subsistence fishermen on Garden Bay lifting a net. One of the subjects had previously had his tribal fishing rights revoked and was observed to be actively involved in fishing. The subjects had 112 pounds of whitefish over the limit. The case was submitted to the Sault Ste. Marie Tribe for review and prosecution.

Cpl. Craig Milkowski and Cpl. Larry Desloover patrolled the ports and shoreline along Lake Huron from Rockport to Alpena. Officers contacted and inspected three tribal tugs.

Cpl. Huff patrolled the Leland and Suttons Bay area shoreline. He conducted two dockside inspections and one wholesale inspection. No violations were observed.

3. MDNR Patrols

In addition to the LEC Group Patrols and the joint patrols conducted with tribal law enforcement officers, officers from the MDNR Commercial Fish Enforcement Unit organized and executed numerous additional patrols with local district conservation officers to address complaints that were received in specific areas during the year.

4. Law Enforcement Contacts

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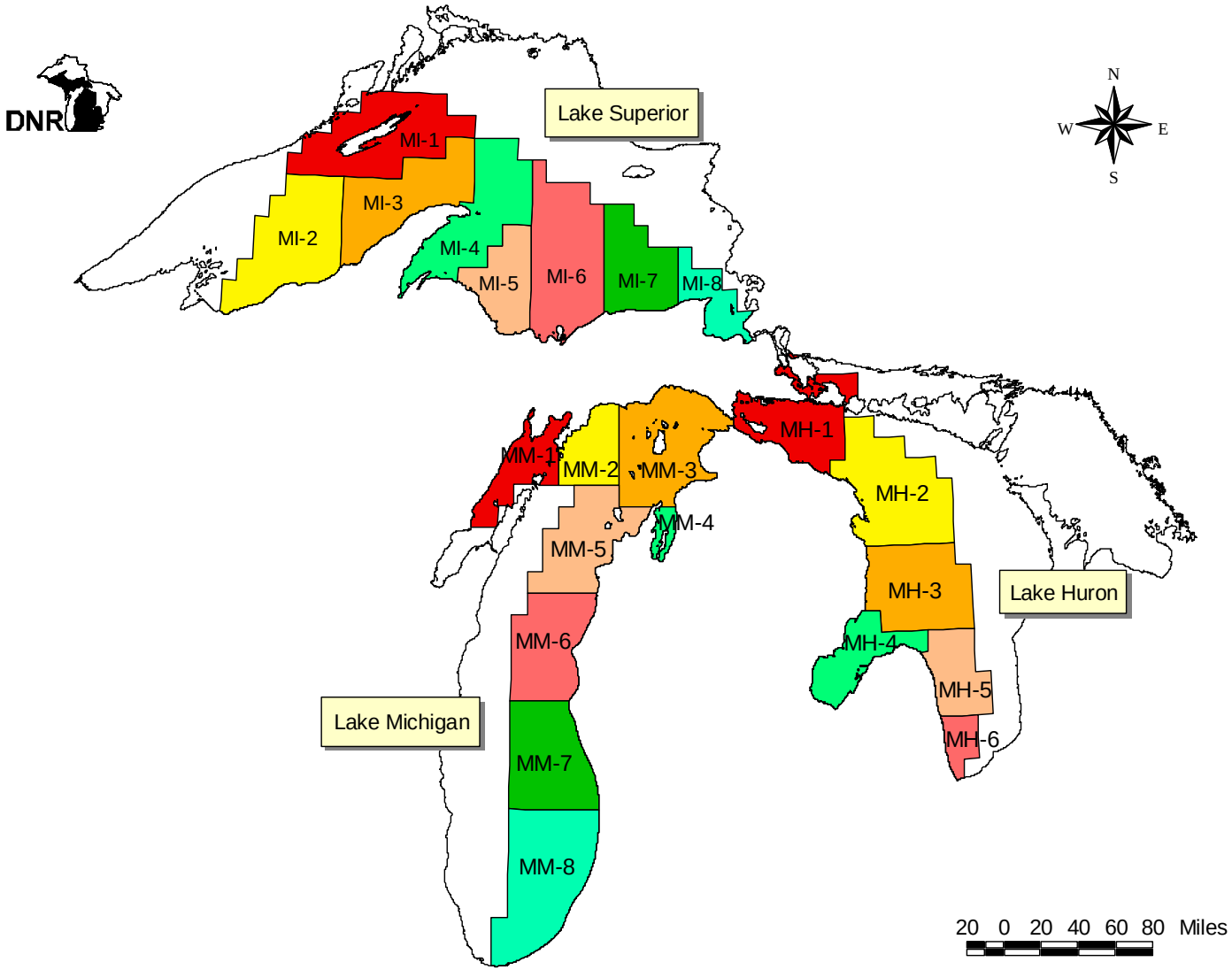

Figure 1. Lake Trout Management Units for Lakes Superior, Michigan and Huron.

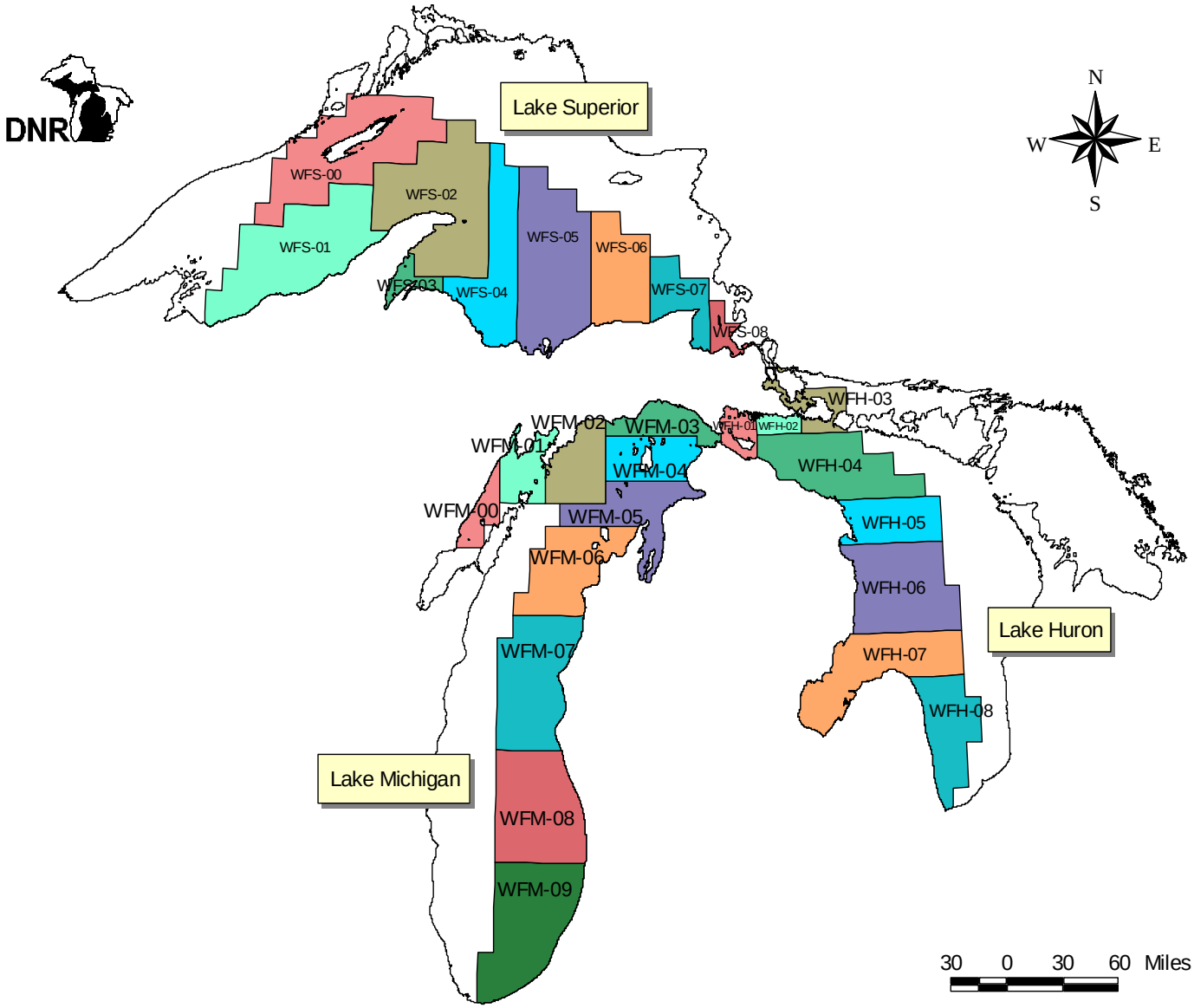

Figure 2. Lake Whitefish Management Units for Lakes Superior, Michigan and Huron.

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	WFS-04	WFS-05	WFS-06	WFS-07	WFS-08	WFS-04	WFS-05
TAM used[1]	55%	45%	37%	50%	65%	25K or 10%	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	WFH-01	WFH-02	WFH-03	WFH-04	WFH-05	WFH-06
TAM used[1]	65%	70%	No calc. done	65%	69%	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