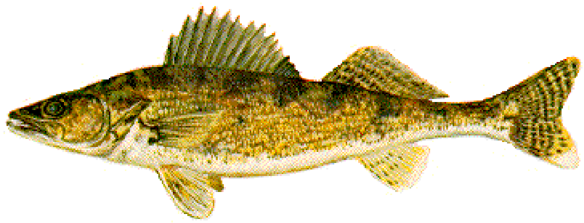
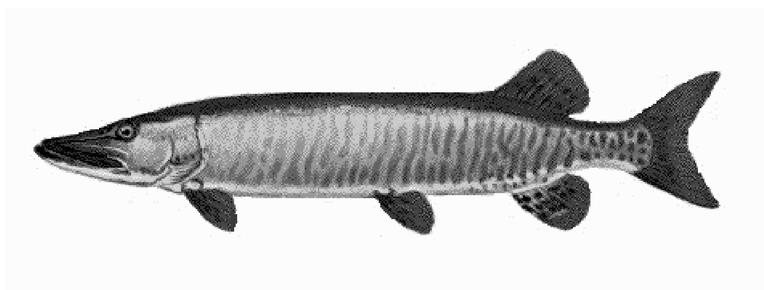


Wisconsin Department of Natural Resources 2008-2009 Ceded Territory Fishery Assessment Report



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Administrative Report # 68

Treaty Fisheries Assessment Unit
Bureau of Fisheries Management
Madison, Wisconsin

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Walleye illustration Virgil Beck

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INTRODUCTION

The northern portion of Wisconsin, encompassing 22,400 square miles and including all or parts of 30 counties, was ceded by the Lake Superior Chippewa Tribes to the United States in the Treaties of 1837 and 1842 (Figure 1). Although the lands were ceded to the United States, the Chippewa Tribes retained hunting, fishing, and gathering rights throughout this area (USDI 1991). The Wisconsin Ceded Territory contains 77% of Wisconsin's lakes accounting for 53% of the total inland lake surface acreage in Wisconsin (Staggs et al. 1990). Of lakes within the Ceded Territory, over 900 contain walleye (*Sander vitreus*) and more than 600 contain musky (*Esox masquinongy*), and the vast majority of naturally reproducing walleye and musky populations are found within the Ceded Territory.

Figure 1. Map of Wisconsin showing the Ceded Territory (shaded).

Walleye and muskellunge are tremendously popular with Wisconsin anglers and are important economically. Chippewa tribal members rely on these same fisheries for preservation of their cultural heritage and as a food source. In 1983, the United States Court of Appeals for the Seventh Circuit affirmed the rights of six Wisconsin Chippewa Bands (Bad River, Lac Courte Oreilles, Lac du Flambeau, Sokaogon, Red Cliff, and St. Croix) to fish off-reservation waters in the Wisconsin Ceded Territory. Tribal fishing uses traditional methods (e.g. spearing and netting) as determined by Treaties of 1837 and 1842 between the Bands and the United States government. Since affirmation of tribal fishing rights in 1983 the Wisconsin Department of Natural Resources (WDNR) has worked to integrate tribal harvest opportunities with sport fisheries in the Ceded Territory.

To facilitate and manage shared tribal and recreational angler harvest, an intensive data collection and analysis effort began in 1987. The program evolved as knowledge of unique aspects of the Ceded Territory shared fisheries increased, and developed into the current program in 1990. The primary goal is to collect information essential to protecting Ceded Territory fish populations from over-exploitation by the combined tribal and recreational fisheries.

As part of this effort WDNR works with the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) to establish safe harvest quotas for walleye and muskellunge and to monitor the shared fisheries throughout the Ceded Territory. The majority of tribal harvest occurs during spring while walleye and muskellunge are congregated in shallow water to spawn and are readily taken by spear. A smaller number are harvested throughout the remainder of the year with a variety of capture methods including spearing, gill netting, fyke netting, set-lining, and angling. Netting and spearing are highly efficient methods and, unlike low efficiency methods such as angling, are not self-regulating (Beard et al. 1997, Hansen et al. 2000). Based on the inclusion of high efficiency tribal harvest in these fisheries, over-exploitation is a strong possibility in the absence of intensive management and could result in long-lasting and potentially irreversible damage.

Wisconsin DNR gathers data from a representative sample of lakes throughout the Ceded Territory each year in order to assess abundance and stability of walleye populations. Walleye populations are evaluated by WDNR using three primary methods: spring adult and total population estimates, fall age-0 (young-of-year) relative abundance estimates, and creel surveys of angler catch and harvest. When combined, these methods provide information on the current harvestable population, an indication of the future harvestable population, and the degree of exploitation in the walleye fishery. Wisconsin DNR also conducts muskellunge and black bass *Micropterus* spp. population estimates each year and estimates harvest of these species via creel surveys; WDNR does not quantify recruitment of these species via young-of-year (YOY) surveys.

Population estimates are critical to the management of Ceded Territory fisheries. Accurate population estimates allow calculation of "safe harvest" levels that allow harvest while minimizing the potential of jeopardizing a species' future abundance or persistence.

Creel surveys provide vital information about the use of fisheries by recreational anglers, including angling effort, catch, and harvest; Estimates from surveyed lakes can be extrapolated across larger areas (e.g. Ceded Territory). When coupled with population estimates, creel harvest data can be used to estimate angler exploitation for individual species. The WDNR treaty fisheries program focuses primarily on game species (walleye, muskellunge, largemouth *Micropterus salmoides* and smallmouth *Micropterus dolomieui* bass, and northern pike *Esox lucius*), but creel information on all species is recorded.

In support of this effort, data is collected and provided by GLIFWC and the United States Fish and Wildlife Service (USFWS) which conduct spring adult population estimates and fall age-0 surveys on additional lakes each year. Tribal harvest data is made available by GLIFWC which censuses open-water tribal harvest of all species and conducts periodic creel surveys to assess harvest of muskellunge through ice.

This annual report summarizes WDNR efforts related to management of the shared Ceded Territory fishery from early 2008 through early 2009. In doing so, it reports on one 'annual cycle' of work related to management of these fisheries. The typical annual cycle begins with establishment of safe harvest levels prior to spring spearing activities, includes conducting creel surveys, population estimates, and YOY walleye surveys on selected lakes, and results in summarization of tribal and angler exploitation rates for Ceded Territory lakes[1].

[1] For the purposes of this report 'Tribal' refers to catch and harvest by traditional methods used by tribal fishers (e.g. spearing and netting); 'Angler' indicates catch and harvest by hook and line, and may include tribal members angling during open seasons if interviewed during creel surveys.

METHODS

Estimation of Population Size

With more than 900 walleye lakes and 600 muskellunge lakes in the Wisconsin Ceded Territory it is logistically impossible to obtain precise population estimates from all lakes in a single year. In addition fish populations in general and walleye populations in particular are extremely variable and can change dramatically from year to year. Therefore, WDNR selects a number of lakes each year for walleye population estimates and corresponding nine-month creel surveys[2]. The lakes sampled by the WDNR within the Ceded Territory during 2008-09 were chosen using a stratified random design considering size, historic level of tribal harvest, and primary walleye recruitment source. Of the lakes sampled each year, four are 'trend lakes' which are evaluated every three years to provide meaningful data on temporal trends within walleye populations; trend lakes sampled in 2008 were Balsam (Polk Co.), Pine (Iron Co.), Big Arbor Vitae (Vilas Co.) and Two Sisters (Oneida Co.) lakes. In addition, at least one large lake or lake chain is chosen to be surveyed each year; in 2008 no lake chains were sampled but numerous large (e.g. >1,000 acres) lakes were surveyed.

The continuing randomized survey of lakes throughout the history of this program (Appendix A) provides data necessary for successful management of the shared fisheries. Data from lake surveys is used to estimate walleye population size and derive safe harvest levels, estimate tribal and angler harvest and exploitation rates, examine temporal and spatial trends in walleye populations and angler effort, and maintain up to date characterizations of population status for each lake.

Walleye

Walleye spawning population estimates[3] for various lakes in the Ceded Territory were made using a standard mark-recapture methodology. Walleyes were initially captured for marking using fyke nets shortly after ice out. Each fish was measured (total length; inches and tenths) and marked with one

[2] Creel surveys are conducted from the first Saturday in May through early March and correspond to the Wisconsin open season for game fish species. The month of November was excluded from analyses due to poor ice conditions and low angler effort.

[3] Spawning population estimates may be less than adult population sizes if all adults do not spawn in every year. The degree to which this occurs in Wisconsin is currently unknown and may vary by lake.

of two lake specific fin clip; two clips were used in each lake to classify fish as either ‘adult’ or ‘juvenile’. Adult (mature) walleyes were defined as all fish 15” or longer and all fish for which sex could be determined (regardless of length). Walleye of unknown sex less than 15” long were classified as juvenile (immature). In lakes where previous estimates of walleye spawner abundance were available, the goal was to mark 10% of the anticipated spawning population. Where no preliminary abundance estimate was available, at least one walleye per acre of lake surface area was targeted for marking. Marking continued until the target number was reached or spent females began appearing in the fyke nets.

Two electrofishing recapture runs were conducted in each lake and the data used to estimate abundance of the spawning or total walleye population. Due to rapid dispersal and decreased vulnerability of adult walleye following spawning, only mark-recapture results from the first electrofishing recapture run were used to estimate spawning walleye abundance; results from the second electrofishing recapture run were used to augment those results when estimating total walleye population abundance.

Walleyes were initially recaptured with AC electrofishing gear within one week (typically 1-4 days) after netting and marking were completed. In each lake the entire shoreline (including islands) was sampled to ensure equal vulnerability of marked and unmarked walleyes to capture. All walleyes in the captured were measured and examined for marks; in most lakes any unmarked walleyes collected in the first electrofishing run were fin clipped accordingly for the lake and fish maturity. A second whole-shore electrofishing recapture run was conducted approximately 1-4 weeks after the first electrofishing run.

Based on electrofishing recapture data, population estimates were calculated with the Chapman (1951) modification of the Petersen Estimator as:

$$N = \frac{(M+1)(C+1)}{(R+1)}$$

where N was the population estimate, M was the number of fish marked and released, C was the total number of fish captured and examined for marks in the recapture sample, and R was the total number of marked fish observed in C.

The Chapman Modification method was used because it provides more accurate population estimates in cases when R is relatively small (Ricker 1975). Walleye population and variance estimates were calculated by length-class (≤ 11.9”, 12-14.9”, 15-19.9”, and ≥ 20.0”) and summed accordingly to estimate adult and total walleye abundance.

Fish population size structure is described using proportional stock density (PSD) and relative stock density (RSD) as reviewed by Anderson et al. (1996). Walleye size data were analyzed to compare proportions of both quality (PSD) and preferred (RSD) length fish gathered in spring surveys (April and May); data were limited to spring surveys to minimize bias associated with fish growth throughout the year and to best characterize the size structure of walleye populations near the outset of the harvest seasons. For the purpose of this report stock, quality and preferred walleye lengths were set at 12, 15 and 18 inches, respectively. Walleye length data were taken from WDNR statewide PSD/RSD database. Proportional stock density (PSD) is calculated as:

$$PSD = \frac{\text{number of fish} \geq 15\,\text{inches}}{\text{number of fish} \geq 12\,\text{inches}} X\,100$$

Relative stock density (RSD) is calculated as:

$$RSD = \frac{\text{number of fish} \geq 18\,\text{inches}}{\text{number of fish} \geq 12\,\text{inches}} X\,100$$

Muskellunge

Muskellunge population estimates were conducted over a two-year period, with marking in year-1 and recapture in year-2. In year-1, muskellunge were marked during fyke netting and electrofishing efforts throughout the sampling season. All muskellunge 20” and larger were given a primary fin clip (the same clip given to adult walleye and bass). Muskellunge less than 20” long were given an alternate fin-clip (generally top caudal). In year-2, muskellunge were recaptured using fyke nets in mid-May, to coincide with the muskellunge spawning season. Adult muskellunge population estimates (considered all sexable fish of any size, plus all fish of unknown sex ≥30” at the time of marking) were made using Chapman modification of the Petersen estimate:

$$N = \frac{(M+1)(C+1)}{(R+1)}$$

Where N is the estimated adult population size; M is the total number of muskellunge marked in the lake in year-1 equal to or larger in length than the smallest sexable fish; C is the number of muskellunge re-captured in year-2, excluding fish smaller than the minimum length counted in year-1 plus 2 inches; and R is the number of marked fish recaptured (Wisconsin Technical Working Group 1999; Margenau and AveLallemant 2000).

Largemouth and Smallmouth Bass

In a subset of sampled lakes designated as "comprehensive survey" lakes, largemouth *Micropterus salmoides* and smallmouth *Micropterus dolomieu* bass encountered during fish surveys were marked by fin clips. Bass larger than 12.0" were given the same primary (adult) fin-clip as was given to walleye in the same lake; bass 8.0- 11.9" were given the secondary (juvenile) fin-clip for the lake. In these lakes, fyke nets were set just after ice-out in the spring and again after the first electrofishing recapture run. A total of four electrofishing surveys were conducted in each lake. The first electrofishing run was conducted within a week of pulling the early fyke nets. The second run was conducted approximately two weeks after the first electrofishing run. Third and fourth electrofishing runs were conducted at approximately weekly intervals thereafter between mid-late May and mid-June. The entire shoreline of the lake (including islands) was sampled. Bass populations were estimated after both the third and fourth runs. For each bass species population estimates were calculated for various size classes (8.0-13.9", 14.0-17.9" and ≥18.0") using the same Chapman modification of the Petersen estimator as described for walleyes. The recapture run yielding the population estimate with the lowest coefficient of variation is reported.

Establishment of Safe Harvest

The Wisconsin joint fishery is managed by calculating total allowable catch for walleye and muskellunge on a lake-by-lake basis. Angler bag limits ranging between 1 and 5 walleye/day in the Ceded Territory are set on an annual basis using a "sliding bag-limit" system in which bags are determined based upon tribal declarations and harvest (Appendix B). "Safe harvest" is set such that the risk of exceeding 35% exploitation for walleye or 27% for muskellunge is less than 1-in-40 (Hansen 1989;

Hansen et al. 1991). This risk-management system differs from a quota system, which would potentially close fisheries once a harvest cap was reached.

Safe harvest levels are set on all Ceded Territory walleye and muskellunge lakes using the most accurate population estimates available. The most reliable estimates are clearly taken from mark-recapture estimates performed in the same year for which safe harvest is calculated. However, because the temporal overlap of the spearing season and spring population estimate sampling make this logistically impossible, these population estimates are used to estimate abundance for the following two years. In addition, given the year-to-year variability associated with fish populations, safety factors are incorporated to account for the largest potential decrease between years (Hansen et al. 1991).

Population estimates older than two years are not considered to accurately represent a lake's current population and are not directly used to set safe harvest. In this case, an estimate is calculated from a regression model using lake acreage as a predictor of population abundance (Hansen 1989). Each year new population estimates are incorporated into the regression model but no estimates are removed. Lakes with multiple population estimates are averaged before being entered into the regression model.

Three regression models are used depending on the primary source of walleye recruitment in the lake (Nate et al. 2000). Separate models are used for: (A) lakes sustained primarily by natural reproduction (NR; Figure 2), (B) lakes sustained primarily through stocking efforts (ST; Figure 3), and (C) lakes with low density populations maintained through intermittent natural reproduction (REM; Figure 4). Refer to Appendix C for a complete description of recruitment code designations used for lakes throughout the Wisconsin Ceded Territory. These models are used to set safe harvest yearly for the majority of the walleye lakes in the Ceded Territory.

A similar method is employed to set safe harvest for muskellunge. Because muskellunge mark-recapture surveys are conducted over a two year period, a population estimate for a given lake is employed to directly set safe harvest only once. In the absence of a recent population estimate, a regression model is used to make an estimate of muskellunge abundance. As with walleye, population predictions in this model are based on lake acreage, but a single model is used for all muskellunge waters in the Ceded Territory (Figure 5).

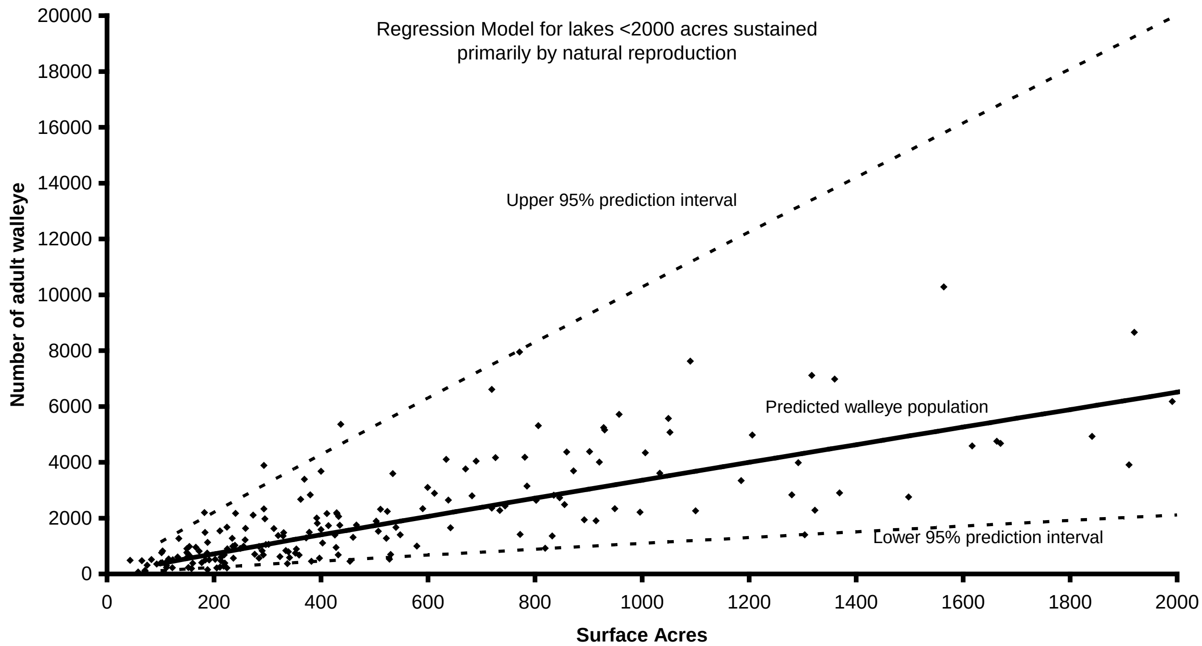

Figure 2. Regression model used to set 2008 safe harvest levels for lakes sustained primarily by natural reproduction (applies to all lake sizes; only lakes <2000 acres are shown for illustrative clarity).

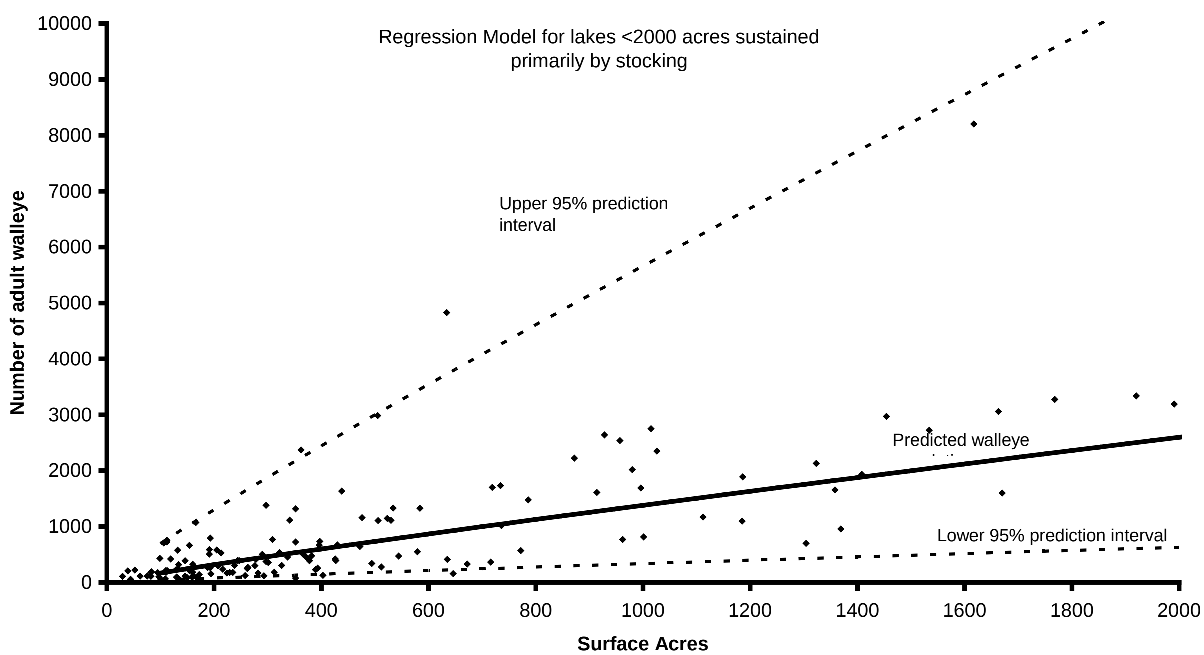

Figure 3. Regression model used to set 2008 safe harvest levels for lakes <2000 acres sustained primarily by stocking (applies to all lakes; only lakes <2000 ac. are shown for illustrative clarity).

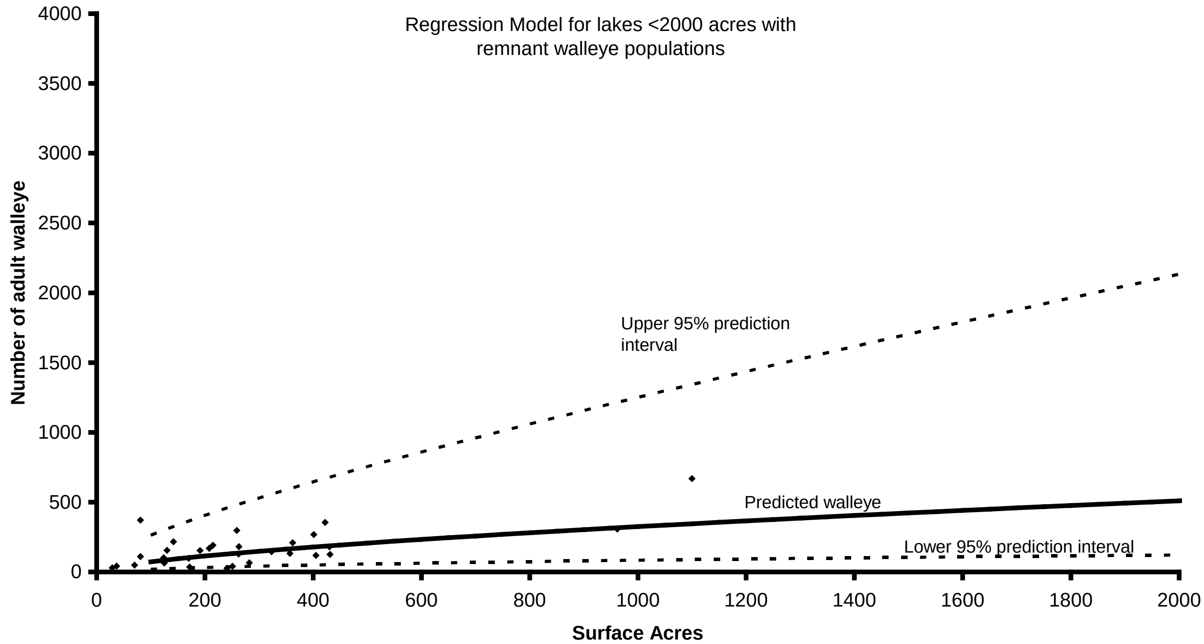

Figure 4. Regression model used to set 2008 safe harvest levels for lakes <2000 acres with remnant walleye populations (applies to all lakes; only lakes <2000 acres are shown for illustrative clarity).

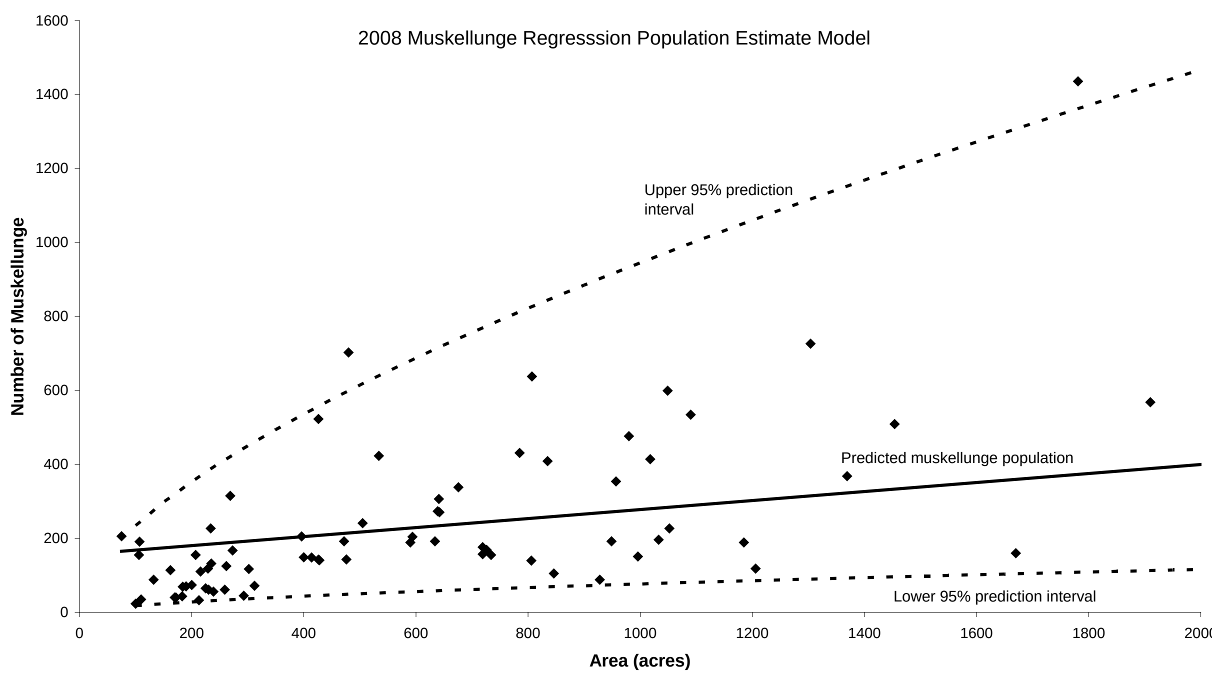

Figure 5. Regression model used to set 2008 safe harvest levels for muskellunge populations in lakes <2000 acres (applies to all lakes; only lakes <2000 acres are shown for illustrative clarity).

Estimating Fishing Effort and Harvest

Tribal Harvest and Exploitation

In lakes where current walleye population estimates are available, tribal harvest numbers are used in conjunction with population estimates to estimate tribal exploitation of walleye populations. Tribal harvest numbers for individual lakes are supplied to WDNR by GLIFWC and encompass all tribal harvest methods used (e.g. spring or winter spearing, netting). Tribal exploitation is estimated by dividing the total tribal walleye harvest within each lake by the estimated adult walleye population size for that same lake.

Angler Harvest and Exploitation - Creel Surveys

Creel surveys are generally conducted each year in the same lakes in which a walleye population estimate is done. Coordinating efforts in this way allows for year-long recovery in the creel of fish marked during spring population estimates, and subsequently allows for estimation angler exploitation of walleye.

WDNR creel surveys use a random stratified roving access design (Beard et al. 1997; Rasmussen et al. 1998). The surveys were stratified by month and day-type (weekend / holiday or weekday), and creel clerks conducted their interviews at random within these strata. Surveys were conducted on all weekends and holidays, and two to three randomly chosen weekdays per week. Angler effort was recorded twice daily based on instantaneous counts of angler activity.

Clerks counted the number of anglers and recorded effort, catch, harvest, and targeted species from anglers completing their fishing trip. Clerks also measured harvested fish and recorded any fin-clips observed. Only completed-trip interview information was used for analyses. Information from interviews was expanded over the appropriate stratum to provide an estimate of total effort, catch, and harvest of each species in each lake for the year. Creel data were summarized according to lake size, population recruitment source and current state regulations[4] (Appendix D). In cases where lakes were connected (as either defined or undefined chains), creel clerks were not necessarily present at each individual lake on a given day; however, during the interview clerks collected information specific to lakes within the chain thereby enabling creel related estimates to be determined for individual lakes.

Angling effort was estimated for each stratum and summed across all strata to estimate total angler effort for each lake (angler hours/lake). Angler catch and harvest (hours/fish) rates were calculated for each gamefish species encountered, giving an indication of average angler success and providing an index of the relative abundance of each species. Species-specific catch and harvest rates were calculated using only species-specific fishing effort. General catch and harvest rates were calculated using total angler effort, regardless of the species targeted.

Tribal and angler walleye exploitation rates were calculated in lakes where adult population estimates and creel surveys were conducted. Angler exploitation rates for adult walleye were calculated by dividing the estimated number of marked fish harvested by the total number of marked fish present in the lake (R/M; Ricker 1975). Although anglers are able to harvest immature walleye in some waters, only adult walleye exploitation rates were calculated. Tribal exploitation was calculated as the total number of adult walleyes harvested divided by the adult population estimate (C/N; Ricker 1975). Total adult walleye exploitation rates were calculated by summing angling and tribal exploitation.

Young-of-Year Walleye Surveys

Electrofishing for YOY walleyes was done after sunset in early autumn, beginning when water temperatures had fallen below 70° F. In most cases, the entire shoreline of a lake was electrofished and all sub-adult walleyes were examined and measured. Two-sample t-tests were used to test various hypotheses: that YOY density (fish/mile shocked) observed in natural and stocked model lakes was equal during 2008, that within each recruitment model the YOY density observed in 2008 did not differ from the average over the previous 18 years (1990-2007), and that in stocked model lakes YOY density did not differ between those lakes that were stocked and those that were not stocked during 2008. A general linear model was used to evaluate the effects of recruitment model (natural or stocked), year, and the

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[4] Lake size classes are small (<500 ac.) or large (≥500 ac.); Population recruitment source is either natural, stocked, or remnant; 2008 state regulations for surveyed lakes included a 15" minimum size limit and a no minimum size with one fish larger than 14" regulation.

year*model interaction on YOY walleye/mile over time. The interaction term was evaluated as indicative of significant trends over time in YOY walleye/mile for lakes within one or both recruitment models.

Hansen et al. (2004) updated a previous analysis by Serns (1982) to establish a relationship between the number of YOY walleyes collected per mile of shoreline electrofished and their lake-wide density (#/acre) where:

$$\textit{Density} = 0.0345 * (\textit{Catch per mile})^{1.564}$$

The Hansen et al. (2004) metric of YOY density is used in evaluation of differences between various lake classes (e.g. Natural or Stocked recruitment model lakes). Use of the Hansen et al. metric for this purpose began with the 2006-2007 annual report; In years prior to 2006 the Serns index was used for the same purpose.

To assess any potential for natural reproduction, a portion of lakes classified as 'stocked', 'remnant', or where the primary component of year class strength is uncertain are selected to receive fish with an internal oxytetracycline (OTC) otolith mark. A proportion of the YOY fish sampled from these lakes in the fall were sacrificed to assess the relevant contribution of stocking to the number of surviving YOY fish and to provide evidence of any contribution by natural reproduction.

Due to corresponding water level declines in seepage lakes across much of northern Wisconsin, we compared differences in mean YOY walleye density between drainage and seepage lakes under both pre-drought and drought conditions. The objective was characterize any difference in YOY abundance in seepage lakes due to drought conditions; data from drainages lakes where water levels have not changed appreciably under drought conditions were used as a pseudo-control for comparative purposes. A GLM Anova was used to evaluate differences in YOY abundance (mean YOY/mile shocked) tied to hydrologic class (drainage/seepage), time period (pre-drought or drought) and the interaction of these terms.

Evaluation of Mixed Harvest Walleye Management System

Analysis was conducted to determine if adult walleye exploitation rates in the Wisconsin Ceded Territory are effectively managed to prevent exceedance of an established benchmark incorporating both a management objective and a prescribed risk criterion; total adult walleye exploitation should not exceed

35% more than 1 time in 40 (2.5% of the time; Staggs et al. 1990). This analysis examined walleye exploitation from 1990 through 2007 and was in some manners an extension of similar analyses of data from 1990 through 1998 conducted by Beard et al. (2003). Methods used in the current assessment were similar but not identical to those used by Beard et al. (2003).

The management system in place to balance spearing and angling harvest was summarized well by Beard et al. (2003) as follows:

> "The management of joint spearing and angling harvest is accomplished by a two-phase allocation process similar to many mixed commercial fisheries (Berkes and Pocock 1987; Hatch et al. 1987; Milliman et al. 1987; Kope 1999; Legault 1999; Li 1999). Tribal harvest is accomplished mainly by the spearing of spawning adult walleye stocks and is managed directly with nightly quotas that are calculated from estimates of total allowable catch (TAC) for each lake (Staggs et al. 1990; Hansen et al. 1991). The management of anglers is accomplished by lowering bag limits (via a sliding bag limit system) in response to tribal quotas (declarations) each year. This system attempts to balance the harvest between spearing and angling within the prescribed risk level".

For this assessment, any interconnected systems that exhibited movement of marked fish were treated as single systems; this included both designated and non-designated lake chains. Nine designated lake chains or systems are defined within the treaty fisheries program and these systems have historically been managed as single systems rather than individual lakes. However, numerous other connected lake systems exist throughout the ceded territory, and these systems have historically been managed as individual lakes rather than single/combined systems. Our preliminary analyses showed that doing so produced statistically and biologically questionable results related to walleye exploitation, leading us to the conclusion that they were best viewed as single systems.

Methods used in calculation of tribal and angler exploitation rates were previously described in this report. We assessed the exploitation data in two ways. The first relied on empirical data alone and did not account for any uncertainty associated with variables estimated in field surveys (population estimates, proportions of marked fish observed in creel surveys, and angler harvest estimates). We conducted a general linear model analysis of variance on the empirical data to examine the potential impact of various factors on total walleye exploitation rates[5]. Factors included in the model were year, size/harvest regulation, bag limit[6], and primary walleye recruitment source

Since field survey data (population estimates, proportions of marked fish observed in creel surveys, and angler harvest estimates) are each estimated with uncertainty, we then utilized Monte Carlo simulations as a means to incorporate measurement error (uncertainty) associated with each variable into our analyses. We generated 10,000 estimates of walleye harvest, proportions of marked fish observed in creel surveys, and the adult walleye population in each lake. Harvest and population estimates were simulated based on a normal distribution accounting for the calculated variance associated with each estimate. Proportions of marked fish observed in the creel were simulated based on a binomial distribution around the estimated value. The 10,000 simulated values were randomly re-combined and used to estimate a 'new' tribal or angler exploitation rate, and subsequently a corresponding total exploitation rate.

The benchmark that total walleye exploitation should not exceed 35% more than 1 time in 40 (2.5% of the time) is stated in a variety of documents and in none does it specify that this applies to anything other than 'the whole'. It does not specify that this applies to lakes, years, bag limits, or any other specific factor. Monte Carlo simulation results were however examined across years, bag limits, walleye harvest/size regulations, and walleye recruitment source.

[5] A preferred analysis would have involved logistic regression with the dependent variable being total exploitation over or under 35%. However, with only 4 instances over 18 years in which total walleye exploitation was estimated to exceed that level, this preferred analysis was not feasible.

[6] Bag limit refers to initial bag limit established at the outset of the angling season. No consideration was given to 'revised' bag limits published later in the season since they were not done in all years and have not been published at the same time each year.

RESULTS AND DISCUSSION

Population Estimates and Densities

In 2008, spawning walleye populations were estimated in 28 lakes, ranging in size from 191 to 6,306 acres and representing a range of walleye recruitment categorizations and angler regulations (Table 1). Due to sample size restrictions, separate analyses were conducted to evaluate differences in spawner population size across (1) primary recruitment source (natural, stocked, or remnant; refer to Appendix C) and (2) restrictive angling regulations in 2008[4]. Statistical comparisons were made for spawner density (fish/acre) which provides a better comparative measure across lakes of varying size (relative to spawner abundance).

All population estimates were reviewed by a Technical Working Group (TWG) for reliability. Factors considered in determining reliability of estimates included numbers of fish marked and/or recaptured by sex and in total and coefficients of variation associated with derived estimates. In cases where population estimates are not deemed reliable by the TWG, estimates are rejected for use in setting safe harvest levels. For consistency across data groups, any population estimates rejected by the TWG for other purposes were also excluded from comparative statistical analyses.

Table 1. Lakes surveyed by WDNR sampling crews in spring 2008 with corresponding information on adult and total walleye populations abundance and density.

WBIC[1]	County	Lake	Acres	Size Limit (in)[2]	Recruitment code	Recruitment Model	Adult Pop. Estimate	Adult Density (#/Acre)
2403200	Ashland	Bear	204	15	NR	Natural	171	0.84
2882300	Bayfield	Siskiwit	330	15	NR	Natural	856	2.59
2674800	Burnett	Little Yellow	348	15	C-	Natural	182	0.52
2675200	Burnett	Yellow	2,287	15	C-NR	Natural	10,464	4.58
2351400	Chippewa	Long	1,052	14-18 Slot; 1>18	NR	Natural	7,083	6.73
2949200	Iron	Pine	312	No min., 1>14	NR	Natural	2,752	8.82
1588200	Oneida	Two Sisters	719	15	C-NR	Natural	1,976	2.75
1528300	Oneida	Willow Flowage	6,306	15	NR	Natural	26,566	4.21
2963800	Vilas	Big (Mi)	771	15	NR	Natural	10,562	13.70
1545600	Vilas	Big Arbor Vitae	1,090	No min., 1>14	NR	Natural	6,290	5.77
2338800	Vilas	Big Crooked	682	none	NR	Natural	1,898	2.78
2339900	Vilas	Escanaba	293	28	NR	Natural	2,335	7.97
2964100	Vilas	Mamie	400	15	NR	Natural	4,439	11.10
2954800	Vilas	Oxbow	511	No min., 1>14	NR	Natural	2,238	4.38
2336100	Vilas	Wolf	393	15	NR	Natural	2,492	6.34
2105100	Barron	Bear	1,358	15	ST	Stocked	661	0.49
2079000	Barron	Big Moon	191	15	C-ST	Stocked	107	0.56
2631200	Barron	Staples	305	15	C-ST	Stocked	172	0.56
683000	Forest	Stevens	297	15	C-ST	Stocked	1,100	3.70
399200	Langlade	Upper Post	757	15	C-ST	Stocked	807	1.07
1590400	Oneida	Pickerel	736	15	ST	Stocked	305	0.41
1605800	Oneida	Sevenmile	503	No min., 1>14	C-ST	Stocked	647	1.29
2620600	Polk	Balsam	2,054	15	C-ST	Stocked	1,956	0.95
2704200	Sawyer	Nelson	2,503	15	C-ST	Stocked	1,411	0.56
2435700	Sawyer	Spider	1,454	15	ST	Stocked	2,123	1.46
1630100	Vilas	Black Oak	584	15	C-ST	Stocked	890	1.52
2693700	Douglas	Bond	293	15	NR-2	Remnant	521	1.78
439800	Oconto	Wheeler	293	15	NR-2	Remnant	811	2.77

1 - WBIC is a Water Body Identification Code unique to each lake.
2 - Size limits reflect 2008-2009 minimum and slot length harvest regulations for each lake.

Spawning Adult Walleye Abundance

Spawning adult walleye abundance was estimable in each of the 28 Ceded Territory lakes in which walleye population estimates were attempted during 2005 (Table 1). Adult spawning walleye abundance estimates averaged 3,117 walleye (3.3/acre) across all lakes surveyed during 2008. Average abundance estimates for natural-model lakes (Avg. 5,354, range 171-26,566) were greater than in stocked- (Avg. 1,636, range 107-11,905) or remnant-model (Avg. 557, range 225-822) lakes during 2008 (Appendix E). Spawning walleye abundance was lowest (107 adult walleye) in Big Moon Lake, Barron County, and highest in the Willow Flowage, Oneida County (26,566 adult walleye; Table 1).

Spawning walleye density (walleye/acre) estimates averaged 3.3 adults/acre across all lakes surveyed during 2008. Average density estimates for natural-model lakes (Avg. 5.54, range 0.5-13.7) were greater than in stocked- (Avg. 1.29, range 0.4-3.7) or remnant-model (Avg. 1.89, range 0.8-2.8) lakes during 2008. Adult walleye density was lowest (0.4/acre) in Pickerel Lake, Oneida County, and highest in Big Lake, Vilas County (13.7/acre; Table 1).

As in most previous years, differences observed during 2008 in walleye spawner density between lakes in different recruitment classes (natural, stocked, or remnant) were significant (General Linear Model, $P<0.001$). Spawner densities observed in 2008 were greater in lakes dominated by natural recruitment than in stocked lakes; no significant difference was found between remnant-model lakes and either natural or stocked-model lakes (Figure 8). Natural-model lakes had a significantly higher population densities than stocked -model lakes (Tukey-Kramer LS Means, $P<0.001$). Remnant-model lakes had average spawning adult walleye densities comparable to but slightly higher than stocked-model lakes in 2008 (Figure 8) although this value did not differ significantly from either natural or stocked-model waters ($P=0.14$ and 0.19, respectively).

No significant differences were found in walleye spawner densities between lakes with differing harvest regulations during 2008 (GLM, $P=0.395$); this is consistent with most previous years examined (Cichosz 2009, 2010). In 2008 the majority of lakes included in analyses had 15” minimum regulations in place (15 lakes), with only five “exempt” regulation classifications, one 14-18” protected slot and one 28” minimum. There have been no statistically significant trends in walleye spawner density in natural- (GLM, P=0.083) or stocked-model (P=0.100) walleye waters in the Ceded Territory since 1995[7] (Figure 6 and Figure 7).

Excluding the three WDNR research lakes (Escanaba, Big Crooked, and Wolf, Vilas Co.), 15 lakes sampled in 2008 had at least one historic WDNR adult walleye population estimate (Table 2). Of the 9 lakes or chains sampled in 2008 with historic population estimates in the natural recruitment model, six had increased in populations whereas three had decreased populations. Mamie Lake (Vilas Co.) showed the most marked population increase of 179 percent since 1999; Big Arbor Vitae Lake (Vilas Co.) showed the most marked population decrease of 8 percent since 2005. Of six lakes or chains sampled in 2008 with historic population estimates in the stocked recruitment model, one had increased in population and five had decreased populations since the previous survey. Balsam Lake (Polk Co.) saw a population increase of 13 percent since the prior survey in 2005; Bear Lake (Barron Co.) showed the most marked population decrease of 60 percent since 2000. No remnant-model lakes sampled during 2008 had prior population estimates available for comparison.

Information in Table 2 is intended to present current walleye population levels concurrently with past observations, but is not suitable (nor intended) for defining or illustrating trends in walleye populations. Fish populations in general and walleye populations in particular are extremely variable and can change dramatically from year to year making interpretation of values in Table 2 difficult at best. This inherent variability in walleye populations is readily evident in Table 2 where most of the lakes with more than two estimates show both positive and negative changes in population levels over time; Long, Pine, Two Sisters, Big Arbor Vitae, Big and Black Oak lakes each show increases and decreases through time.

[7] Data prior to 1995 was excluded due to a difference in the protocol used to select lakes for assessment (Hewett No Date)

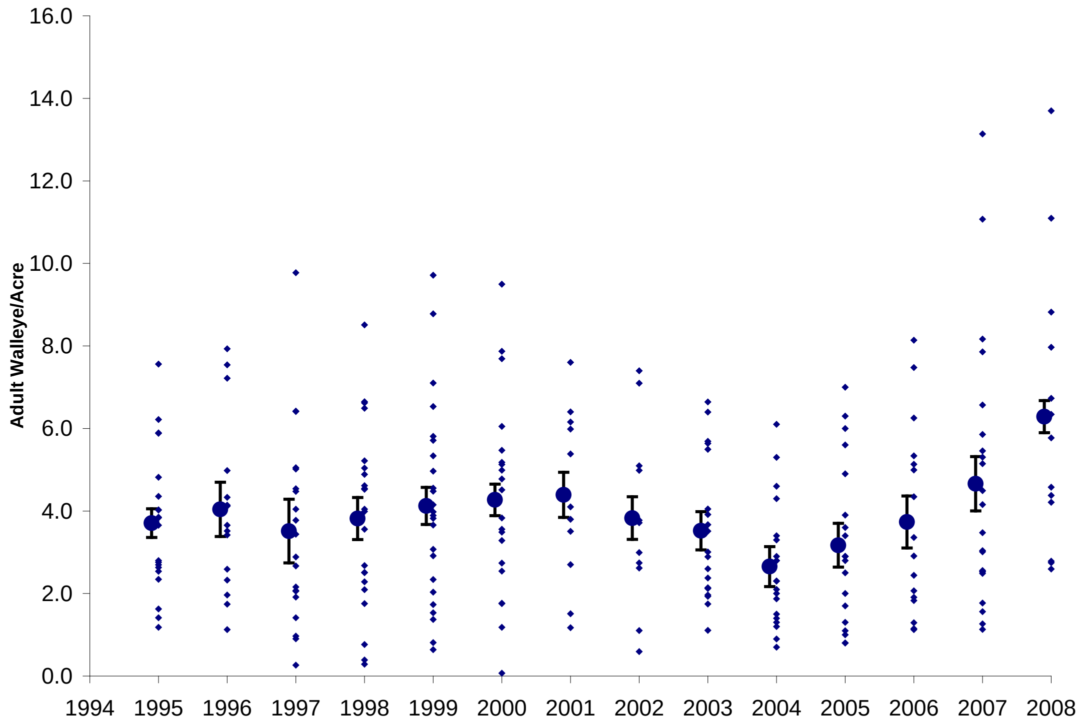

Figure 6. Adult walleye population density estimates recorded in Wisconsin Ceded Territory Lakes with populations sustained primarily by natural reproduction, 1990 – 2008. Small circles represent individual lakes; Large circles represent yearly means (±SE).

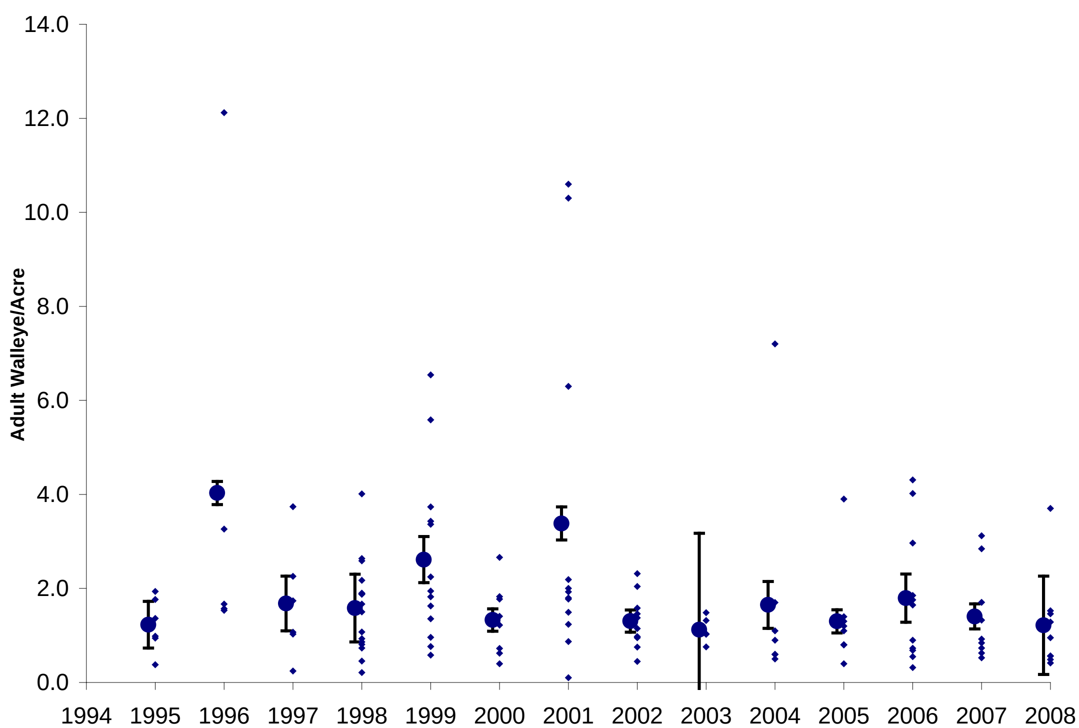

Figure 7. Adult walleye population density estimates recorded in Wisconsin Ceded Territory Lakes with populations sustained primarily by stocking, 1995 – 2008. Small circles represent individual lakes; Large circles represent yearly means (±SE).

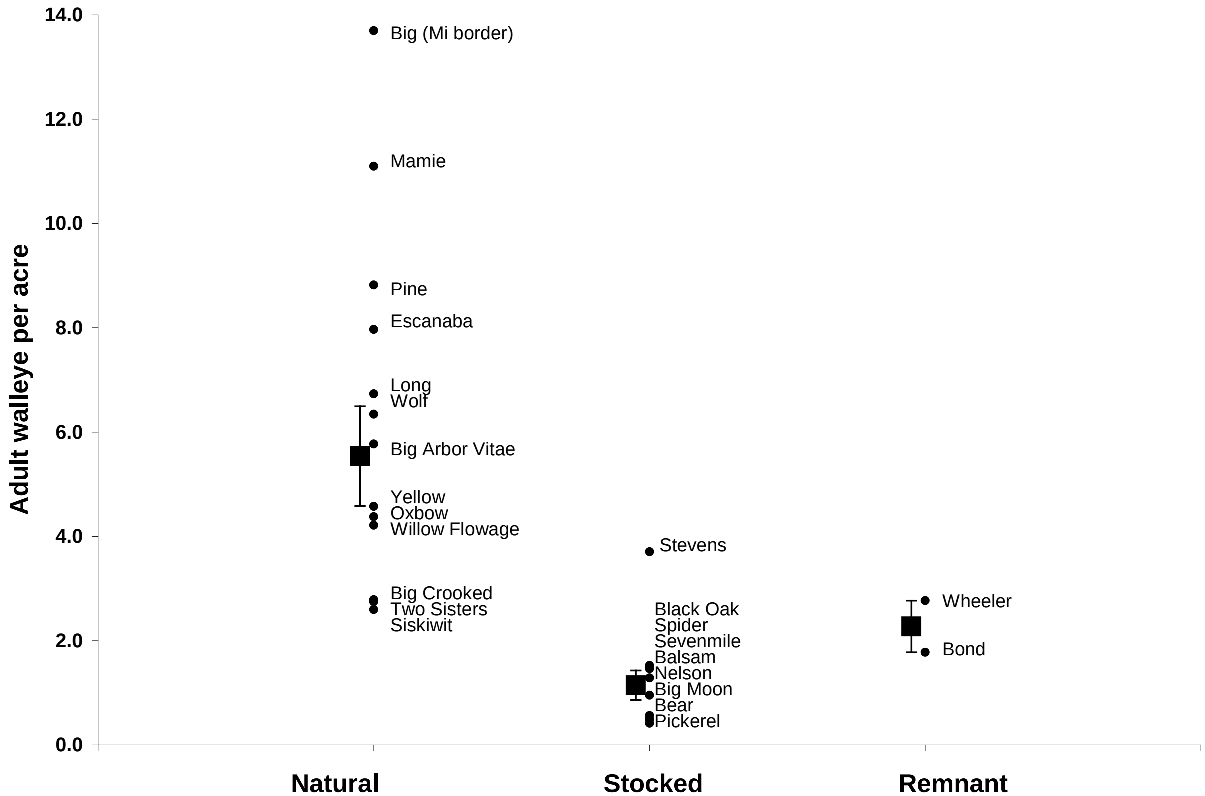

Figure 8. Adult walleye density estimates for lakes sampled by WDNR in spring 2008 based on primary population recruitment source.

Table 2. Comparison of current and historic walleye population estimates and percent change by recruitment model for lakes surveyed during 2008.

County	Lake	Acres	Year	Recruit. Code	Adult PE	Density (#/acre)	Percent Change
Natural Recruitment Lakes							
Burnett	Yellow	2,287	2008	C-NR	10,464	4.6	13
			1992	C-	9,222	4.0	
Chippewa	Long	1,052	2008	NR	7,083	6.7	31
			2000	NR	5,397	5.1	-17
			1995	NR	6,541	6.2	
Iron	Pine	312	2008	NR	2,752	8.8	58
			2005	NR	1,738	5.6	12
			2002	NR	1,555	5.0	10
			1998	NR	1,412	4.5	-36
			1992	NR	2,196	7.0	
Oneida	Willow Flowage	6,306	2008	NR	26,566	4.2	99
		5,135*	1994	NR	13,324	2.6	
Oneida	Two Sisters	719	2008	C-NR	1,976	2.8	-1
			2005	C-NR	2,004	2.8	-26
			2002	C-NR	2,714	3.8	99
			1998	ST	1,367	1.9	-39
			1992	ST	2,245	3.2	
Vilas	Big Arbor Vitae	1,090	2008	NR	6,290	5.8	-8
			2005	C-NR	6,860	6.3	29
			1998	NR	5,329	4.9	-46
			1993	NR	9,864	9.1	
Vilas	Oxbow	511	2008	NR	2,238	4.4	-4
			1994	NR	2,320	4.5	
Vilas	Big	771	2008	NR	10,562	13.7	136
			1999	NR	4,480	5.8	-61
			1991	NR	11,428	14.8	
Vilas	Mamie	400	2008	NR	4,439	11.1	179
			1999	NR	1,591	4.0	
Stocked Recruitment Lakes							
Barron	Bear	1,358	2008	ST	661	0.5	-60
			2000	C-ST	1,655	1.2	-21
			1996	C-ST	2,082	1.5	
Forest	Stevens	297	2008	C-ST	1,100	3.7	-34
			1999	C-ST	1,659	5.6	
Langlade	Upper Post	757	2008	C-ST	807	1.1	-44
			1998	C-ST	1,430	1.9	
Polk	Balsam	2,054	2008	C-ST	1,956	1.0	13
			2005	C-ST	1,738	0.8	-42
			2002	C-ST	3,000	1.5	-3
			1998	C-ST	3,081	1.5	
Sawyer	Spider	1,454	2008	ST	2,123	1.5	-29
			2002	ST	,2971	2.0	
Vilas	Black Oak	584	2008	C-ST	890	1.5	-55
			1999	ST	1,965	3.4	185
			1993	ST	689	1.2	

* Reported lake areas differ by year

Spawning Adult walleye size structure

Spawning adult walleye populations were estimated for each lake by length class in both natural (Figure 9) and stocked (Figure 10) production model lakes. Natural model lakes generally had higher walleye spawner densities than stocked model lakes, although the size structure sampled in stocked lakes tended to be larger relative to that in natural model lakes.

In natural model lakes spawning walleye abundance and size structures were highly variable (Figure 9). The majority of natural model lakes sampled had overall densities between 2 and 7 fish/acre. Ten of 13 sampled lakes had walleye densities exceeding 4 fish/acre; of those 4 have specialized harvest regulations in place (Escanaba Lake=28" minimum; Pine, Big Arbor Vitae and Wolf = no minimum size and only 1 fish>14"). Walleye spawning in the 7-11.9 inch category were very limited in relative abundance in most natural production lakes sampled. Lakes that had substantial proportions of the overall walleye population made up of smaller fish tended to be those with specialized regulations although it is unclear if this is directly related to the harvest regulations or other factors (e.g. sporadic recruitment).

In stocked model lakes spawning walleye abundance and size structures were less variable than that observed in natural model lakes (Figure 10). With the exception of Stevens Lake (Forest Co.) where the walleye spawner density approached 4 fish/acre, walleye densities observed in stocked model lakes were less than 1.6 fish/acre. Despite lower fish densities than those observed in natural model lakes, stocked model lakes generally had a high percentage (e.g. >50%) of the spawning population made up of relatively large fish (>15") available for angler harvest under general statewide regulations.

Data were available for calculation of PSD and RSD-18 for 28 natural, 15 stocked, and three remnant model lakes sampled in 2008 (Table 3). In lakes where walleye regulations involve a 15" minimum size limit, calculating PSD as the percent of stock sized fish over 15" essentially makes this value a comparative tool to evaluate the percentage of harvestable fish across lakes.

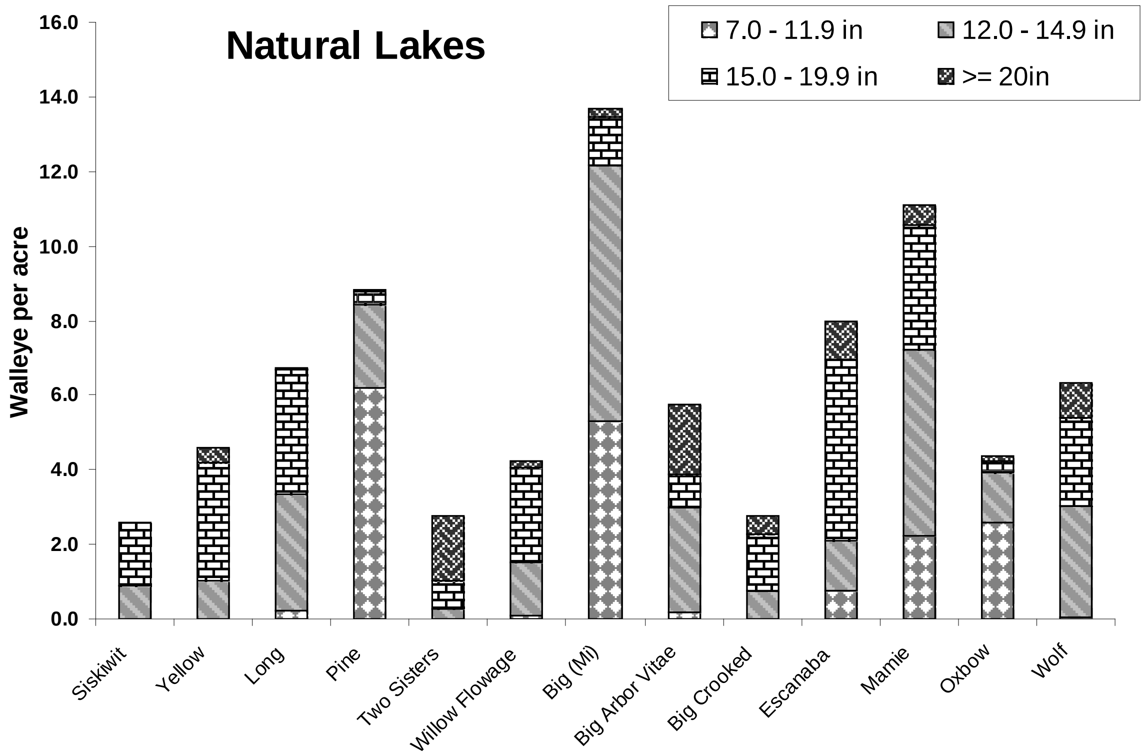

Figure 9. Size distribution of spawning walleye sampled in natural production model lakes during 2008.

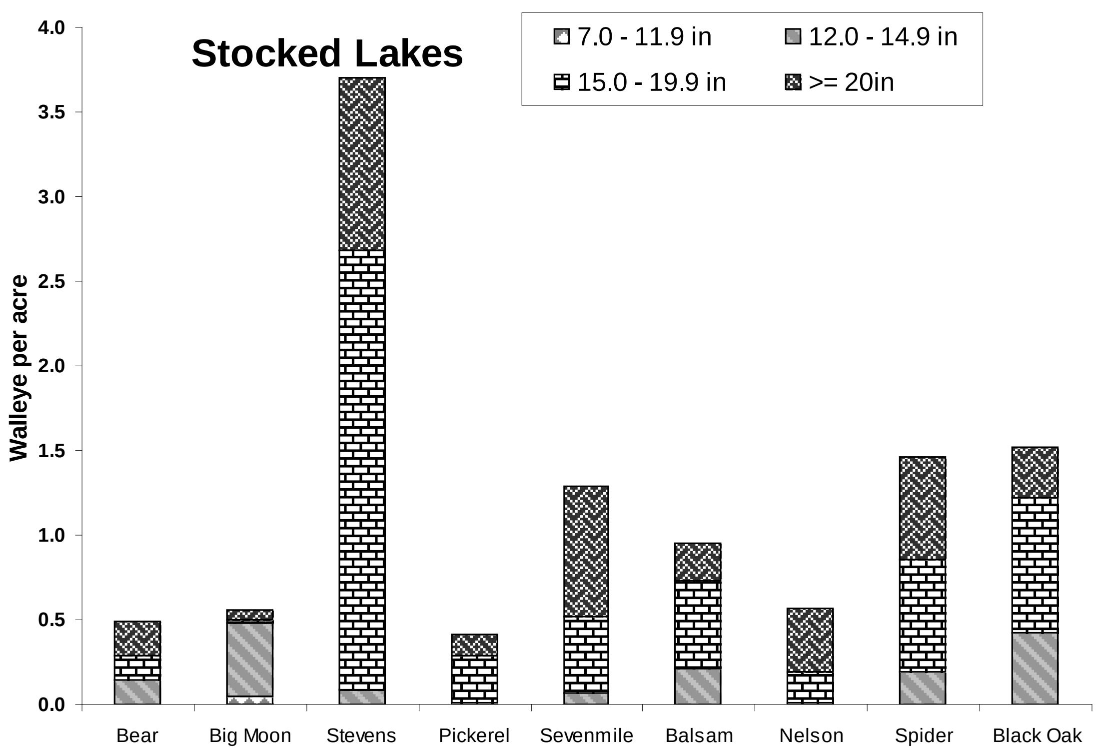

Figure 10. Size distribution of spawning walleye sampled in stocked production model lakes during 2008.

Table 3. Walleye Proportional and Relative Stock Density values for lakes surveyed in spring, 2008.

County	Lake	Acres	Recruitment Code	Walleye Regulation	PSD	RSD-18
Natural Recruitment Lakes						
Bayfield	Middle Eau Claire	902	C-NR	No Min.; 1>14	75	22
Bayfield	Siskiwit	330	NR	15	62	1
Burnett	Little Yellow	348	C-	15	67	27
Burnett	Yellow	2287	C-NR	15	74	30
Chippewa	Long	1052	NR	14-18 Slot; 1>18	62	10
Eau Claire	Altoona	840	NR	15	65	47
Eau Claire	Eau Claire	860	NR	15	75	38
Iron	Gile Fl.	3384	NR	No Min.; 1>14	44	10
Iron	Pine	312	NR	No Min.; 1>14	11	3
Oconto	Bass	149	C-NR	15	93	39
Oconto	Boot	235	C-NR	15	63	20
Oneida	Buckskin	634	C-NR	No Min.; 1>14	2	0
Oneida	Buffalo	104	NR	No Min.; 1>14	65	12
Oneida	Hat Rapid Fl.	650	NR	15	56	27
Oneida	Two Sisters	719	C-NR	15	90	64
Oneida	Willow Fl.	5135	NR	15	62	15
Price	Duroy	379	C-NR	No Min.	47	14
Price	Elk	88	C-NR	No Min.	21	6
Price	Long	418	C-NR	No Min.	35	1
Price	Solberg	859	NR	No Min.	13	1
Price	Wilson	351	C-NR	No Min.	35	4
Sawyer	Lac Courte Orielles	5039	C-NR	15	93	38
Sawyer	L Chippewa	15300	C-NR	No Min.	41	13
Taylor	Rib	320	C-NR	15	68	21
Vilas	Big Arbor Vitae	1090	NR	No Min.; 1>14	30	12
Vilas	Big	771	NR	15	24	7
Vilas	Mamie	400	NR	15	39	10
Vilas	Oxbow	511	NR	No Min.; 1>14	23	10
Stocked Recruitment Lakes						
Barron	Bear	1358	ST	15	57	29
Barron	Big Moon	191	C-ST	15	15	13
Barron	Staples	305	C-ST	15	100	100
Forest	Stevens	297	C-ST	15	98	50
Iron	Fisher	452	ST	No Min.; 1>14	92	63
Iron	Island	352	C-ST	No Min.; 1>14	50	2
Langlade	Upper Post	757	C-ST	15	79	62
Marathon	Pike	205	ST	15	95	82
Oneida	Pickerel	736	ST	15	90	63
Oneida	Sevenmile	503	C-ST	No Min.; 1>14	90	66
Polk	Balsam	2054	C-ST	15	77	34
Sawyer	Nelson	2503	C-ST	15	97	81
Sawyer	Spider	1454	ST	15	79	53
Sawyer	Whitefish	786	ST	15	95	63
Vilas	Black Oak	584	C-ST	15	64	42
Remnant Population Lakes						
Douglas	Bond	292	NR-2	15	100	96
Lincoln	Alexander	677	NR-2	15	64	21
Oconto	Wheeler	293	NR-2	15	95	15

In natural model lakes observed PSD and RSD-18 values were highly variable, with PSDs ranging from 2 to 93 percent and RSD-18s ranging from 0 to 64 percent. In both stocked and remnant model lakes observed PSD values showed less variability than was noted in natural model lakes although RSDs in these lakes were more variable than PSDs. PSDs in stocked model lakes typically exceeded 50 percent with a single exception (15 in Big Moon Lake, Barron Co.). PSDs in remnant model lakes exceeded 60 percent in all surveyed lakes. RSD-18s in stocked and remnant model lakes ranged from 13-63 and 32-66 percent, respectively.

In 2008, average size structure was generally largest in remnant model lakes, intermediate in stocked lakes, and smallest in natural model lakes (Figure 11). Mean PSDs for stocked, remnant and natural model lakes were 73, 90 and 48, respectively. Mean RSD-18s for stocked, remnant and natural model lakes were 49, 48 and 17, respectively. Differences in PSD and RSD-18 values across lakes in various recruitment models could be caused by an increase in the relative abundance of quality (PSD, ≥15”) or preferred (RSD, ≥18”) sized fish, a decrease in the relative abundance of stock sized fish (≥ 12”), or some combination of these two factors.

Mean annual PSD values have increased over time in natural model lakes [8] (Figure 12). Observed PSD and RSD-18 values were found to be highly correlated over time for both natural (r^2=0.83) and stocked (r^2=0.69) lakes, so only PSD values are discussed here. The observed trend in PSD in natural recruitment lakes shows suggestive significance and indicates an average annual increase of approximately 1 percent/year (Linear Regression, slope 0.99, $P<0.052$). In stocked recruitment lakes no significant trend in PSD was noted since 1995 (Linear Regression, slope 0.39, $P=0.40$). The trend in PSD within natural model lakes illustrates an apparent increase in the overall walleye population size structure since 1995 that could be caused by an increase in the relative abundance of quality sized fish (≥15”), a decrease in the relative abundance of stock sized fish (≥ 12”), or some combination of these two factors.

[8] Only data points with a minimum of three associated lake observations were included in this analysis. This precluded inclusion of earlier (pre-1995) data and that from remnant model lakes.

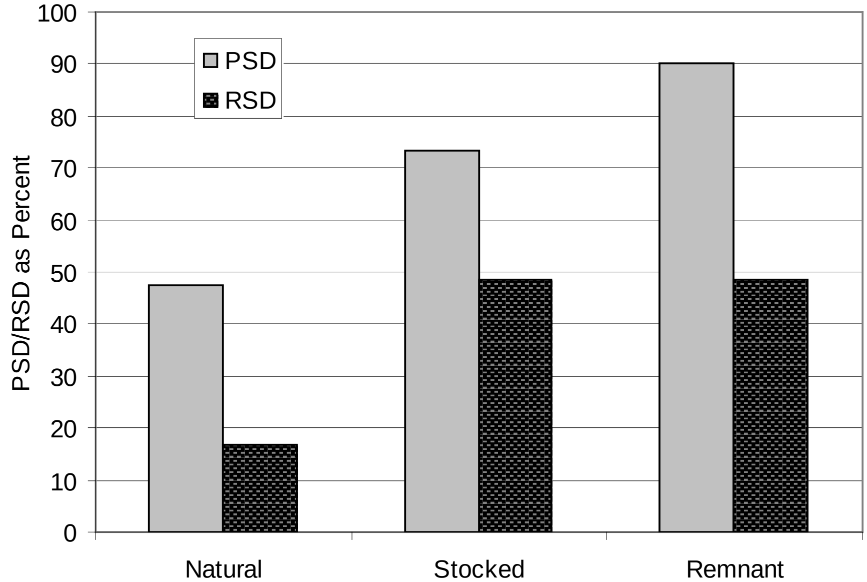

Figure 11. Comparison of mean PSD and RSD-18 values across lakes in various walleye recruitment models for lakes sampled in 2008.

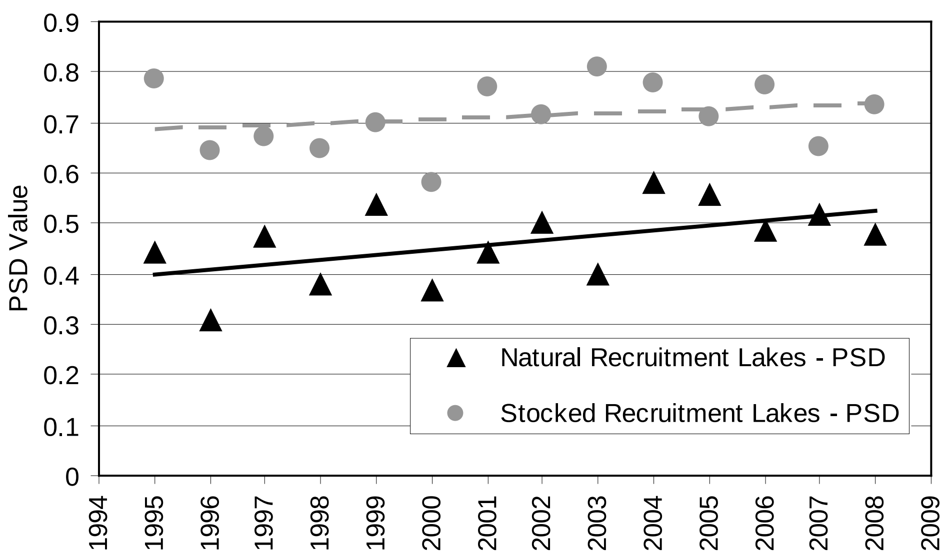

Figure 12. Trends in PSD values observed for walleye in Ceded Territory lakes since 1995.

Muskellunge Abundance

Adult muskellunge population and density estimates were completed in six Ceded Territory lakes, and for the Moen Chain of Lakes as a whole during spring 2008 (Table 4, Appendix F). The estimate for the Moen Chain of Lakes was rejected by the Technical Working Group due to a lack of adequate recaptures in some size classes, and the information is therefore not presented here. Population estimates completed in 2008 reflect 2007 population numbers because of the two-year mark-recapture time span used to derive estimates. Muskellunge densities ranged between 0.06 and 0.57 adult fish/ acre and did not appear to be related to lake size or angler regulations (Table 4).

Table 4. Adult muskellunge population estimates completed in 2008 in the Wisconsin Ceded Territory. Regulations presented are for 2008.

County	Lake	Angler Regulation (inches)	Acres	Minimum length in PE (inches)		Adult PE	CV(%)	Total per acre
				Male	Female			
Barron	Rice	40	859	26.0	28.0	161	17.1	0.19
Bayfield	Middle Eau Claire	40	902	23.0	26.0	154	17.3	0.17
Vilas	Kentuck	40	957	24.0	34.0	247	31.6	0.26
Vilas	Little Arbor Vitae	34	534	27.0	29.5	306	13.4	0.57
Vilas	Little St. Germain	45	980	27.5	31.0	229	16.9	0.23
Vilas	Trout	45	3,816	25.5	27.0	226	15.2	0.06

Comparison of TWG and WDNR methods of estimating Muskellunge Abundance

Given an ongoing discussion about differences in two commonly used estimates of adult muskellunge abundance in northern Wisconsin, we conducted a comparison to evaluate the degree of difference in estimates derived by the two methods. The Treaty Technical Working Group (TWG) estimates abundance of all fish over 30 inches in length at the time of marking, plus all mature (sexable) fish less than 30 inches. TWG estimates of muskellunge abundance are presented in this, and all past, annual Ceded Territory Fishery Assessment Reports. TWG derived muskellunge population estimates are calculated using the Chapman modification of the Petersen Index:

$$N = (M+1) \times (C + 1) / (R +1)$$

For non-treaty purposes, Wisconsin Department of Natural Resources (WDNR) surveys typically estimate abundance of all muskellunge equal to or greater than 30 inches in length at the time of marking, with no consideration given to any mature fish less than that size. WDNR derived muskellunge population estimates are calculated using Bailey's (1951) modification of the Peterson Index:

$$N = M \times (C + 1) / (R + 1)$$

Logically, the TWG method typically results in higher estimates of muskellunge abundance or density because it includes smaller fish (<30") if those fish are mature (Figure 13). Although very uncommon, it is possible for WDNR estimates to be higher than TWG estimates in places where sub-30" fish are not mature due to the differences in calculations used for each method; when this happens, the difference between estimates is typically relatively small.

For this comparison population estimates (PEs) from 1998 through 2007 were used; earlier data were excluded due to lack of readily accessible printed or electronic copies of necessary data. Any PEs that were rejected for use in treaty fisheries assessments (most commonly due to low numbers of recaps and/or high coefficients of variation) were excluded from this assessment for the same reasons. Sixty-five paired population estimates (TWG and WDNR method) representing a range of lake sizes and lake musky classes were available and were standardized by lake size (adult fish/acre) prior to analysis.

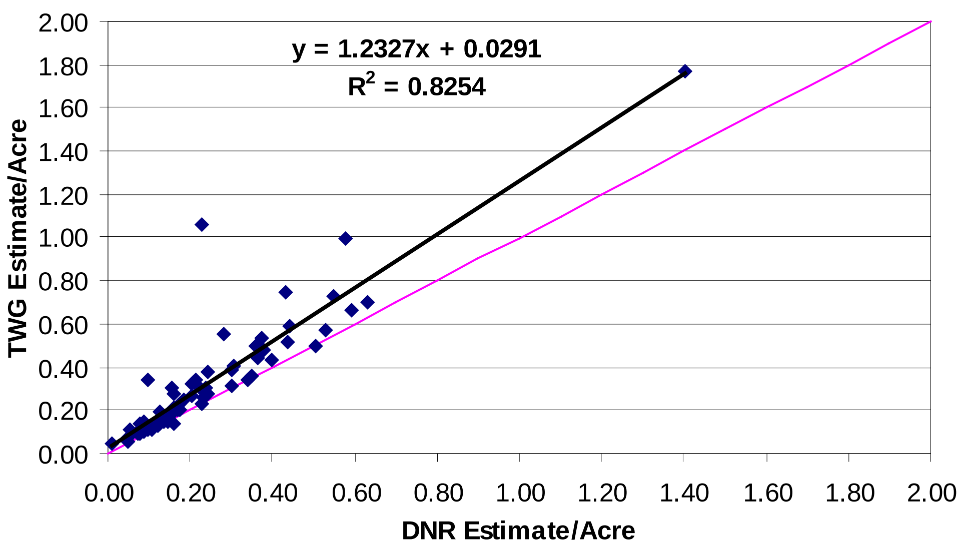

Figure 13. Relationship between DNR and TWG population estimates per lake acre.

In an absolute sense, the difference between TWG and WDNR density estimates increases with increasing density (Figure 13; r^2=..83, $p<0.001$). In a relative sense, that difference decreases with increasing density; the relative disparity between estimates developed using the two methods is greatest at lower densities, and lower at higher densities (Figure 14). TWG estimates are about 25% higher, on average, than WDNR estimates across a wide range of observed densities, although that percentage is greater for low density populations (<0.5 fish/acre).

A general linear model was used to assess the relative impact of lake size and musky class on the difference in muskellunge density estimated using the two methods. Lake sizes were subjectively classified as Small (<500 acres), Medium (500-1000 acres), Large (1001-2000 acres), or Extra-Large (>2000 acres). Musky classes are defined by WDNR as A1 (Premiere trophy water), A2 (Premier action water), B (Intermediate water), or C (Fishable population but not of major importance). No PEs from class C musky waters existed in the dataset analyzed.

Relative lake size was included in general linear models because maximum musky size (and potentially size at maturity) are often believed to be related to lake size and, if there is a relationship between lake size and size of maturity in muskies, then differences between the TWG and DNR methods of estimating musky population size would be expected to vary with lake size (e.g. a higher proportion of fish <30" could potentially be mature in smaller water bodies).

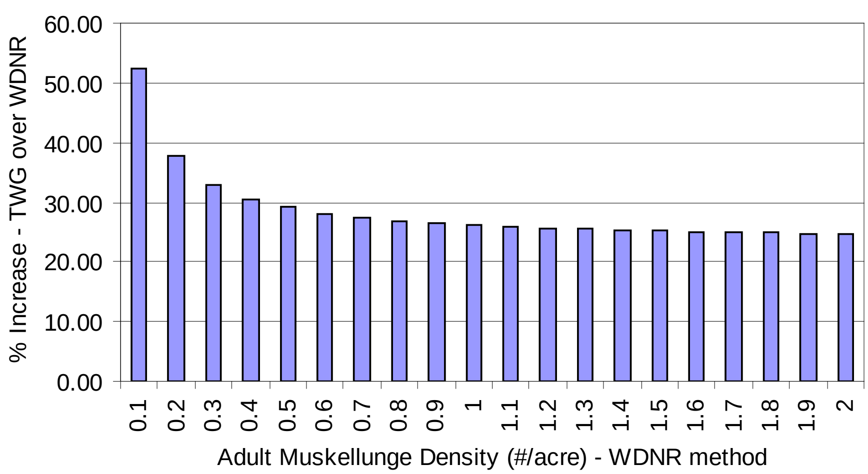

Figure 14. Mean percent increase in adult muskellunge density estimates when using the TWG method, relative to the WDNR method, across a range of density estimates.

Musky class was included in the general linear models to account for variations in musky potential and/or management strategies across waterbodies. Class A1 waters are considered and/or managed as trophy waters with relatively high percentages of large fish. Class A2 waters are considered 'action' waters, and when compared to A1 waters, are managed for higher numbers/densities of musky and typically have lower percentages of large fish. Class B waters are intermediate musky waters with good fishing but typically fewer fish than either class A1 or A2 waters.

The GLM was significant (p=0.0172) and showed that the difference in TWG and WDNR muskellunge PEs is driven about equally by lake size (p=0.0343) and musky class (p=0.0310). Post hoc tests to evaluate differences between lake sizes showed no significant differences between lake size classes (despite the significance of the factor in the model). Post hoc tests evaluating differences between lake musky classes show only that musky density in class A2 (action) lakes is significantly greater than that in class B (Intermediate) lakes; this makes intuitive sense in that class A2 waters are defined as having higher density populations often comprised of smaller sized fish.

Bass Abundance

Smallmouth bass population estimates were made in three lakes and largemouth bass population estimates in six lakes in 2008 (Table 5). Smallmouth bass densities ranged from 0.97–8.2 fish per acre and were greatest in Clear and Mildred lakes in Oneida County (5.9 and 8.2 fish/acre, respectively). The smallmouth bass density estimate in Two Sisters Lake (Oneida Co.) was 0.97 fish/acre (Table 5).

Largemouth bass density ranged from 0.8–21.2 fish per acre with the greatest densities observed in Staples (21.2) and Big Moon (19.9) lakes in Barron County. Largemouth bass densities in other lakes surveyed were all less than 3 fish/acre (Table 5).

The size structure of both largemouth and smallmouth bass was dominated by 8.0-14" fish in nearly all lakes sampled (Figure 15 and Figure 16). Larger fish (>14") however did make up substantial portions of the largemouth bass populations in Staples and Pickerel lakes.

Table 5. Bass population estimates for lakes sampled in the Wisconsin Ceded Territory in spring 2008.

County	Lake	Acres	Angler Regulation	Total PE	CV	Total /acre	8.0-13.9" /acre	14.0-17.9" /acre	18.0"+ /acre
Smallmouth Bass									
Oneida	Clear	846	14"	4,987	0.14	5.90	5.29	0.61	0.00
Oneida	Mildred	191	14"	1,569	0.27	8.23	7.76	0.46	0.01
Oneida	Two Sisters	719	14"	701	0.19	0.97	0.86	0.11	0.01
Largemouth Bass									
Barron	Big Moon	191	14"	3,793	0.19	19.86	17.59	2.20	0.06
Barron	Staples	305	14"	6,477	0.11	21.24	13.71	7.22	0.30
Oneida	Clear	846	14"	2,492	0.17	2.95	2.89	0.05	0.00
Oneida	Mildred	191	14"	544	0.25	2.86	2.39	0.45	0.01
Oneida	Pickerel	736	14"	1,560	0.26	2.12	1.40	0.70	0.01
Vilas	Black Oak	584	14"	464	0.33	0.79	0.68	0.11	0.00

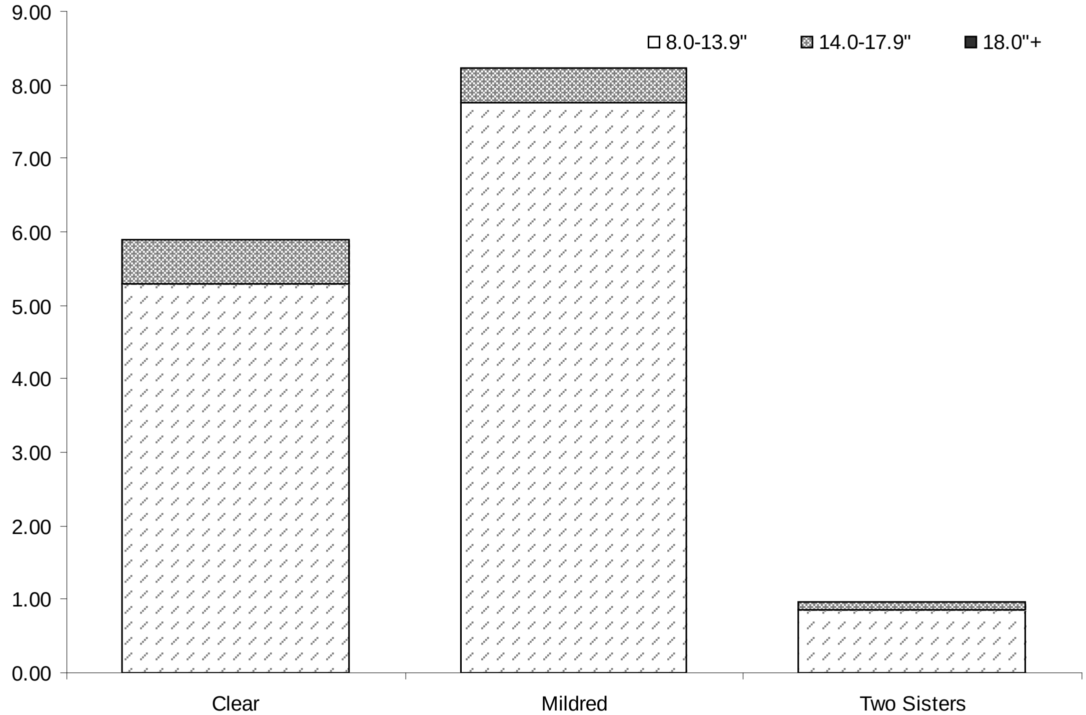

Figure 15. Smallmouth bass population densities (fish ≥ 8.0”) by size range for lakes sampled in the Wisconsin Ceded Territory in spring 2008.

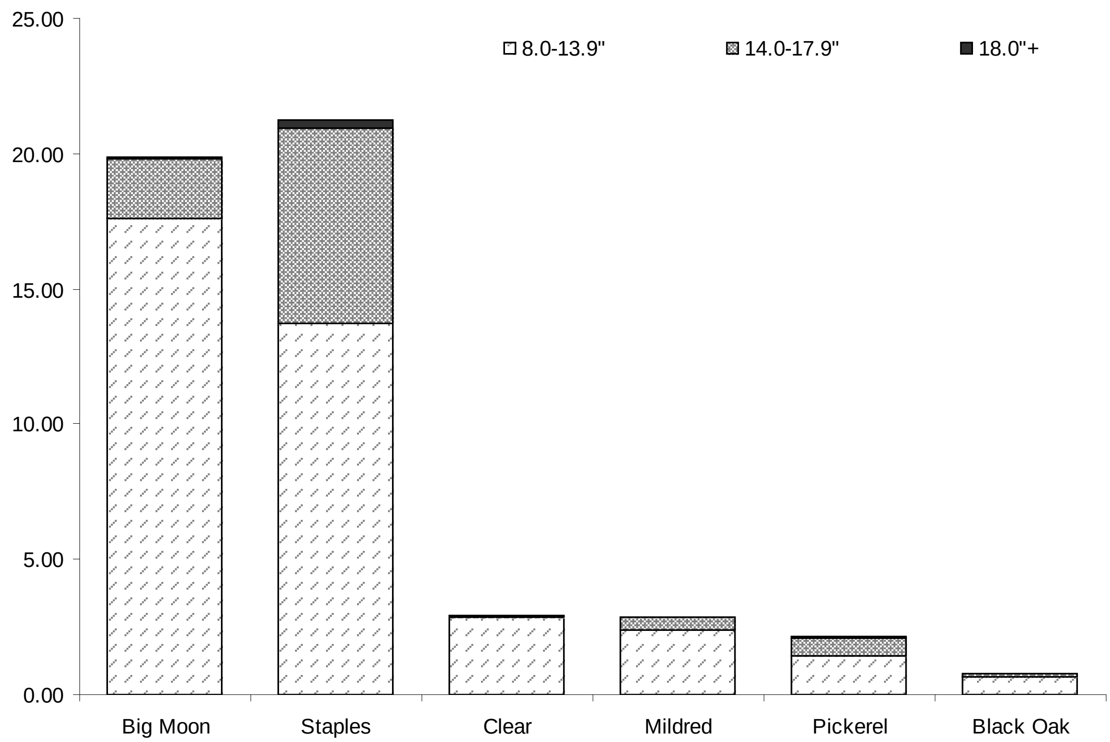

Figure 16. Largemouth bass population densities (fish ≥ 8.0”) by size range for lakes sampled in the Wisconsin Ceded Territory in spring 2008.

Creel Surveys

In 2008-2009 (May through March), creel surveys were conducted for 18 lakes in which walleye population estimates were made during spring 2008 (Appendix D). Creel surveyed lakes ranged in size from 293 to 5,135 acres (Bond Lake-Douglas Co. and Willow Flowage-Oneida Co., respectively) and were located across 11 counties within the Ceded Territory.

Overall Angler Effort

The mean total angler effort per acre in lakes 500 acres and larger (28.4 hours/acre) did not statistically differ from the effort recorded on lakes smaller than 500 acres (27.0 hours/acre) in 2008-2009 (t-test (equal variances) $t = 0.20$, $df = 15$, $P = 0.85$). Since 1995 when random lake selection began, mean total angler effort has been significantly lower in large lakes (26.3 hours/ acre) than in small lakes (37.0 hours/ acre; t-test (unequal variances) $t = -3.51$, $df = 184$, $P < 0.01$). No trend in total angler effort has been observed since 1995 across all lakes [$F(1; 274) = 0.02$, $P = 0.89$]. This finding is consistent with other studies and evaluations on angling pressure in Ceded Territory lakes (Cichosz 2009, Hansen 2008, Deroba et al. 2007, Hennessy 2005; Figure 17).

Walleye Effort, Catch and Exploitation

Directed effort for walleye averaged 9.8 hours per acre in surveyed lakes during the 2008-09 angling season; Directed effort is defined as hours reported by anglers fishing for a specific species. Directed walleye fishing pressure in surveyed lakes was highly variable, so although directed effort in lakes sustained by natural reproduction (11.8 hours/ acre) appeared to be higher than in those lakes sustained by stocking (6.3 hours/ acre), the observed difference was not statistically significant (t-test-equal variances, $t = 1.69$, $df = 15$, $P = 0.11$). Directed effort was also comparable in large (≥500 ac., 9.24 hours/ acre) and small lakes (<500 ac., 10.95 hours/ acre; t-test (equal variances) $t = -0.48$, $df = 15$, $P = 0.64$) surveyed during the 2008-09 angling season. Overall directed angler effort (hours/acre) for walleye has declined since 1995 [Slope = -0.29, $F(1;274) = 7.52$, $P < 0.01$; Figure 18).

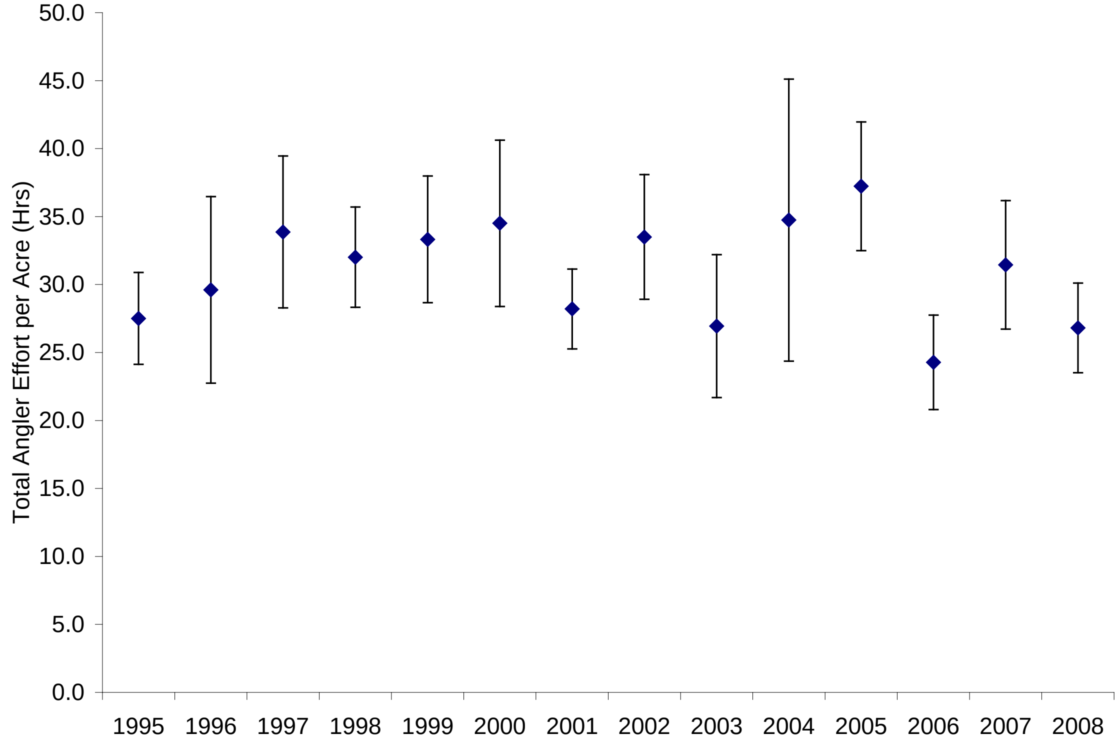

Figure 17. Average total angler effort per acre (±SE) in Wisconsin Ceded Territory lakes where WDNR conducted creel surveys, 1995-2008.

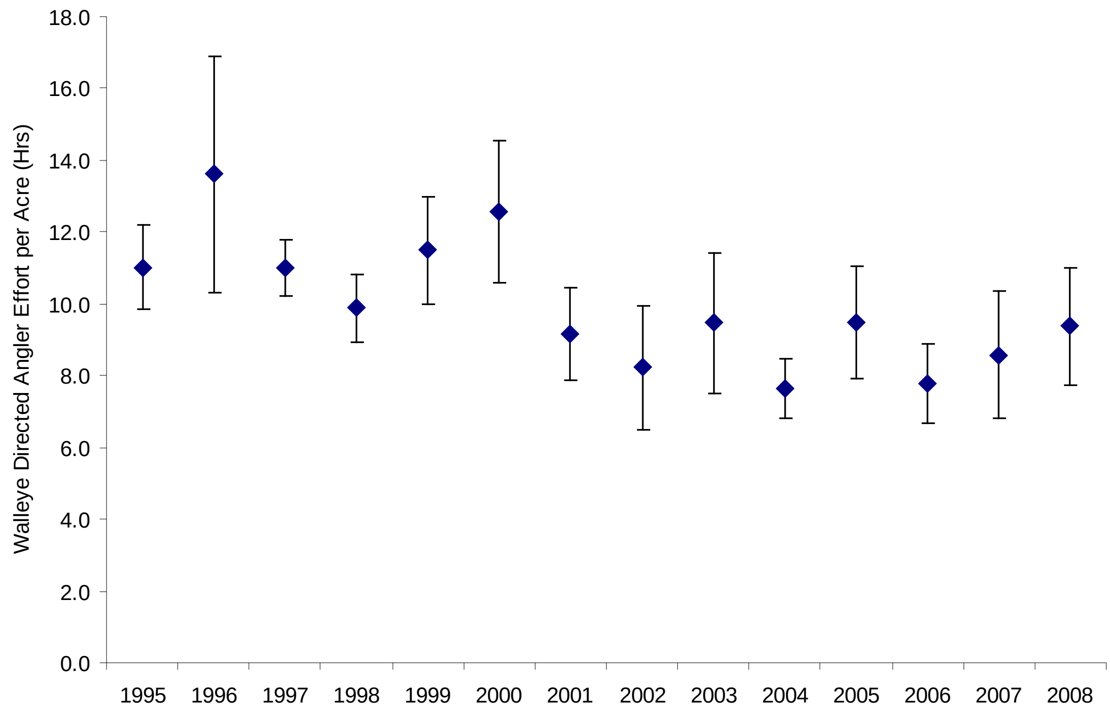

Figure 18. Directed angler effort per acre (±SE) for walleye in Wisconsin Ceded Territory lakes where WDNR conducted creel surveys, 1995-2008.

In 2008-09 the mean specific catch rates (SCR) was 0.22 walleye/hour of directed effort (1 fish per 4.5 hours). In lakes with naturally sustained or stocked populations, respectively, mean SCRs were 0.29 walleye per hour (3.4 hours directed effort/ walleye caught) and 0.10 walleye/ hour (1 fish per 10 hours of directed effort). Specific harvest rates averaged 0.078walleye/hour of directed effort (12.8 hours directed effort/walleye harvested) and ranged between 0.00 and 0.83 walleye/hour for individual lakes surveyed (Appendix D). Based on creel survey results, anglers harvested approximately 28% of all walleye caught during the 2008-09 season; this is very near the average annual percentage estimated between 1995 and 2007 (29%).

Between 1995 and 2008 a statistically relevant downward trend in SCR was observed [Figure 19; Slope = -0.0096, $F(1, 274) = 6.65$, $P = 0.01$]. Although statistically relevant this trend appears driven by relatively high catch rates estimated in 1996 and 1997; with a slope very near zero, there is likely no biological or other relevance to this trend. No discernable trend was noted for specific harvest rate by year since 1995 [$F(1, 274) = 0.57$, $P = 0.45$] for walleye in the Wisconsin Ceded Territory (Figure 19).

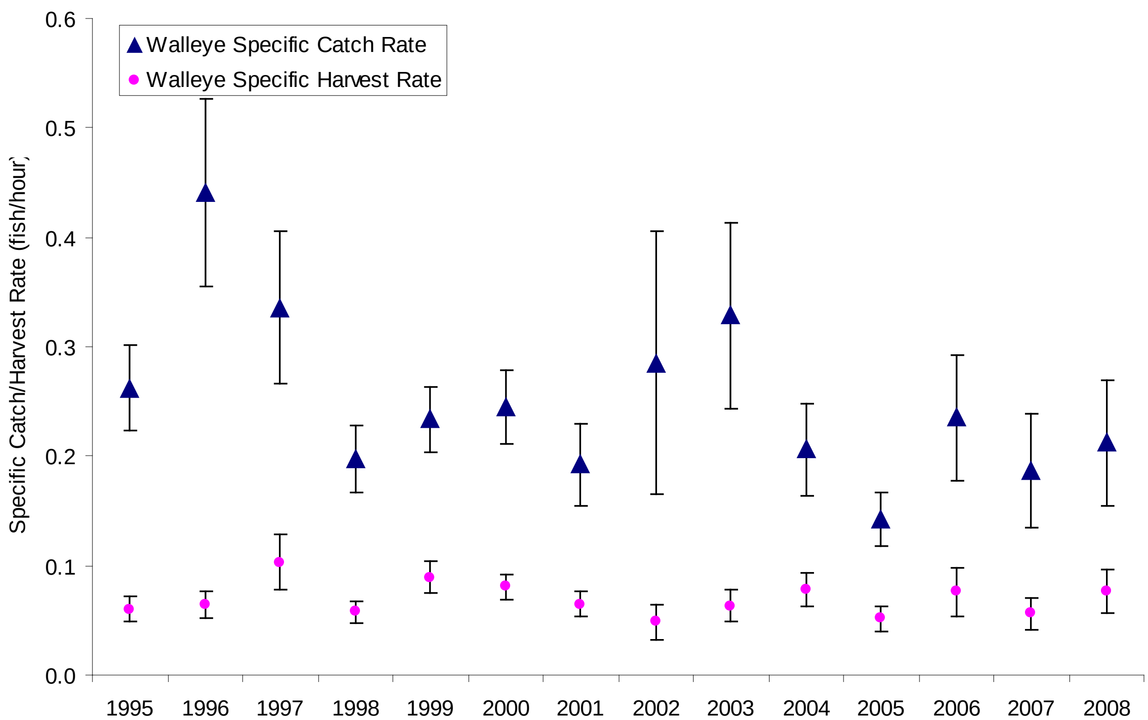

Figure 19. Specific catch and harvest rates (±SE) for walleye in surveyed lakes in the Wisconsin Ceded Territory, 1995-2008. Specific catch or harvest rate is number of walleye caught or harvested divided by time spent fishing specifically for walleye.

Walleye exploitation rates were estimated for 17 lakes during 2008-09 (Table 6; Appendix H). Estimated total (angler + tribal) exploitation of walleye ranged from 0% to 30.6%. Angler exploitation of walleyes in various size classes showed a slightly broader range with exploitation of walleye 14" or longer ranging from 0% to 38.5% whereas that of walleyes 20" or longer ranged from 0.0% to 34.9%. Tribal exploitation of walleyes ranged from 0.0% to 8.3% across all lakes and were exceeded the estimates of angler exploitation in all surveyed lakes. Based on 2005-06 survey results angler exploitation of walleye populations was estimated as zero in two of 17 lakes surveyed; Three of the 21 lakes surveyed incurred no tribal exploitation of walleye.

Safe harvest limits are set so that over time there is less than a 1-in-40 chance that exploitation will exceed 35% in any given year on any single lake. In 2008-09 total walleye exploitation was below 35% in all lakes evaluated.

Table 6. Adult walleye exploitation rates by lake and harvest type for 2008, with comparison to 1995-2007 mean exploitation rates.

Lake	County	Acres	Angler exploitation	Angler expl. ≥14"	Angler expl. ≥20"	Tribal expl.[1]	Total adult exploitation
Bear	Barron	1358	0.0790	0.0991	0.3485	0.0605	0.1396
Siskiwit	Bayfield	330	0.0894	0.1025	0.0000	0.0000	0.0894
Yellow	Burnett	2287	0.1100	0.1162	0.1833	0.0329	0.1429
Bond	Douglas	293	0.0000	0.0000	0.0000	0.0000	0.0000
Pine	Iron	312	0.1087	0.2626	0.0000	0.0098	0.1185
Balsam	Polk	2054	0.0908	0.1009	0.2444	0.0731	0.1639
Nelson	Sawyer	2503	0.0129	0.0130	0.0000	0.0716	0.0845
Spider	Sawyer	1454	0.0808	0.0860	0.0000	0.0462	0.1269
Stevens	Forest	297	0.2057	0.2057	0.1621	0.0736	0.2793
Oxbow	Vilas	511	0.1268	0.3846	0.0000	0.0487	0.1756
Big	Vilas	771	0.0459	0.1535	0.0000	0.0744	0.1203
Big Arbor Vitae	Vilas	1090	0.1531	0.1527	0.0000	0.0490	0.2021
Mamie	Vilas	400	0.0000	0.0000	0.0000	0.0000	0.0000
Sevenmile	Oneida	503	0.0742	0.0757	0.0238	0.0696	0.1438
Two Sisters	Oneida	719	0.0942	0.0949	0.1340	0.0486	0.1427
Wheeler	Oconto	293	0.2229	0.2236	0.0000	0.0826	0.3055
Willow Fl.	Oneida	5135	0.0134	0.0166	0.0652	0.0161	0.0294
		2008 mean	**0.0887**	**0.1228**	**0.0683**	**0.0445**	**0.1332**
		1995-2007 mean	**0.0839**	**0.1029**	**0.1295**	**0.0465**	**0.1303**

1 Tribal harvest data used to calculate tribal exploitation provided by the Great Lakes Indian Fish and Wildlife Commission (Ngu 1995 and 1996, Krueger 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007 and 2008).

Muskellunge Effort and Catch

Of the 18 lakes and chains surveyed in 2008, 12 are classified as musky waters. Creel clerks recorded at least one musky caught from 10 of the 18 lakes surveyed; no musky were reported as caught from any non-classified musky waters (Appendix D). For the purpose of analyses and summarization of catch and effort, lakes not classified as musky waters and those without directed fishing effort were excluded even if limited numbers of musky were reported in creel surveys.

In general, the “action classification” assigned to lakes (WDNR 1996) is a better predictor of musky catch and effort than recruitment source or lake size to describe variability in catch and effort (Simonson and Hewett 1999). In most cases the 2008 estimates of angler catch, catch rate, and directed effort were not significantly different than the prior 10 year averages for each lake classification (Analysis of variance, Proc GLM; Table 7). The single exception was directed fishing effort in Class B waters which was significantly less in 2008 than in the ten previous years ($P < 0.05$) although the 2008 sample included only two lakes (Table 7).

Trends in directed effort and catch rates of muskellunge were evaluated since 1995; Trend evaluations were not done independently for each muskellunge ‘action class’ since limited or no data was available for some year/action class categories. There has been no observed trend in muskellunge directed effort [GLM; $F(1, 208) = 1.63$, $P = 0.20$] or catch rates [$F(1, 208) = 0.05$, $P = 0.82$] in the Ceded Territory since 1995 (Figure 20).

Table 7. Comparison of muskellunge catch and effort rates in 2008 and average values from 1998-2007, by musky lake classification.

Class	Class Description	Lakes sampled	Angler catch/ acre	Specific catch rate (fish/ hour)	Directed effort (hours/ acre)
2008					
A1	Trophy waters	4	0.20	0.03	4.68
A2	Action waters	4	0.54	0.04	10.11
B	Intermediate action/ size	2	0.24	0.02	2.52**
C	Low importance	0	--	--	--
Total		10	0.34	0.03	6.42
1998-2007 Averages (Prior 10 years)					
A1	Trophy waters	59	0.24	0.03	7.25
A2	Action waters	69	0.67	0.04	12.67
B	Intermediate action/ size	20	0.19	0.04	4.74
C	Low importance	11	0.03	0.01	1.07
Total		161	0.41	0.03	8.96

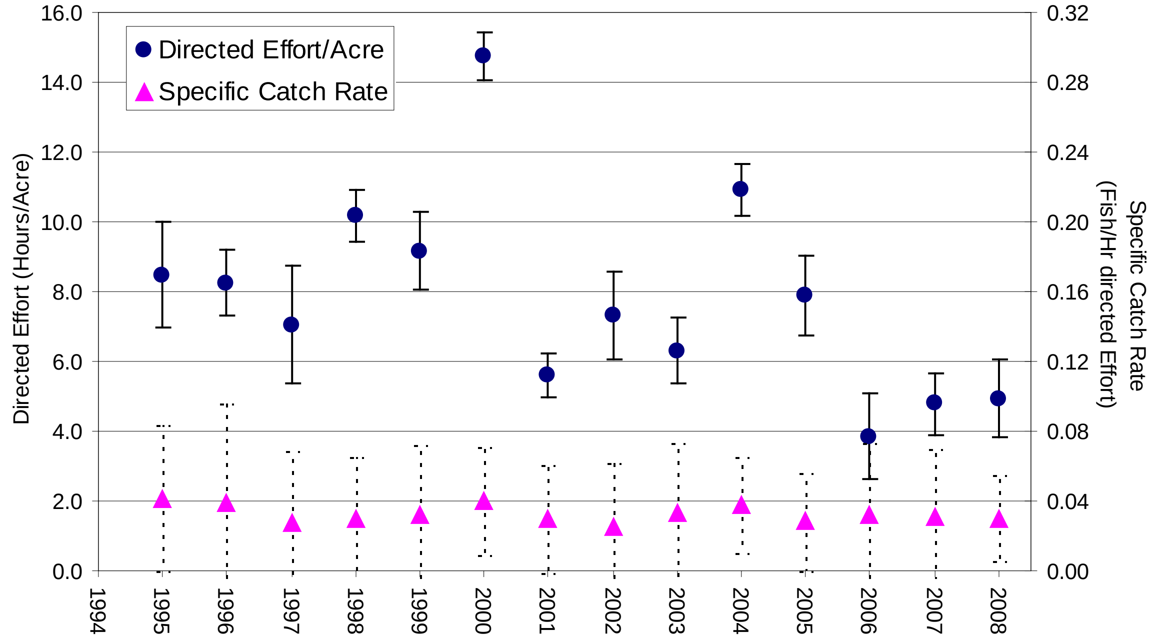

Figure 20. Directed angler effort per lake surface acre and specific catch rate (±SE) for muskellunge in surveyed lakes in the Wisconsin Ceded Territory, 1995-2008.

Northern Pike Effort and Catch

Catches of northern pike were recorded for all of the 18 lakes surveyed in 2008 although there was directed effort for northern pike on only 16 of those lakes. No specific angling effort was directed at northern pike in Pine (Iron County) or Spider (Sawyer Co.) lakes (Appendix D). Of the 18 lakes with northern pike recorded, seven were smaller than 500 acres and eleven were 500 acres or larger (Table 8). Although differences in mean values appeared substantial for some variables, there were no significant differences between large and small lakes with regard to directed angler effort, specific catch rate, angler catch per acre, or specific harvest rate of northern pike during the 2008-09 angling season (Table 8). For northern pike no significant differences were found between 2008 creel values and the corresponding prior 10 year averages (1998 -2007) for any of the variables evaluated in Table 8.

Estimates of angler effort directed toward northern pike have been highly variable across years (Figure 21), and since 1995 there has not been a statistically detectable trend in directed angler effort for northern pike [$F(1, 256) = 0.57$, $P = 0.45$]. Similarly, specific catch rates of northern pike show no significant trend since 1995 [F(1, 256) = 2.73, P = 0.10]; the trend in specific catch rates was reported to be significantly declining through 2006 (Cichosz 2009) although recent increases in northern pike catch rates have negated that significance.

Table 8. Mean estimates calculated from 2008 and 1998-2007 northern pike creel survey data.

Year	Lake Size	N	Catch/ Acre	Angler Harvest/ Acre	Specific Catch Rate	Specific Harvest Rate	Directed Effort/ Acre
2008*							
	< 500 acres	7	2.10	0.42	0.20	0.06	5.80
	> 500 acres	11	1.60	0.23	0.19	0.05	2.49
	All lakes	18	1.79	0.31	0.19	0.05	3.78
1998-2007**							
	< 500 acres	94	2.35	0.39	0.18	0.05	5.08
	> 500 acres	103	1.84	0.27	0.17	0.04	3.24
	All lakes	197	2.08	0.33	0.18	0.05	4.12

* No significant differences exist between large and small lakes for any parameter for the 2008-09 angling season (T-test, p>0.05).
** No 2008 values differ significantly (T-test, p≥0.05) from corresponding 10 yr. averages.

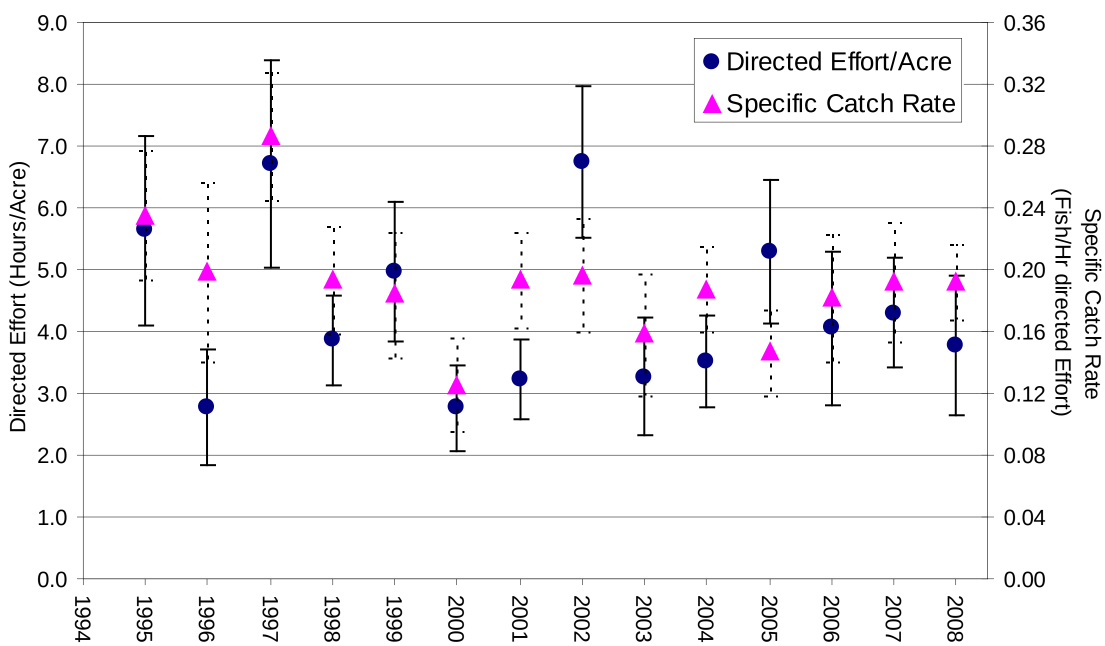

Figure 21. Directed angler effort per lake surface acre and specific catch rate (±SE) for northern pike in surveyed lakes in the Wisconsin Ceded Territory, 1995-2008.

Largemouth Bass Effort and Catch

Catches of largemouth bass were reported for 17 of the 18 lakes surveyed in 2008 although there was directed effort for largemouth bass on only 15 of the surveyed lakes (Appendix D). No specific angling effort was directed at largemouth bass in Pine (Iron County) or Siskiwit (Bayfield Co.) lakes; In Willow Flowage (Oneida Co.) no specific angling effort was directed at largemouth bass although the creel survey occurred only during winter months (Appendix D). Of surveyed lakes with largemouth bass catch, six were smaller than 500 acres and eleven were 500 acres or larger (Table 9). In 2008, there were no significant differences between large and small lakes with regard to directed (toward largemouth bass) angler effort, nor angler catch or harvest numbers or rates (T-tests, equal variance, $P > 0.05$). Of creel metrics evaluated, only specific catch rate of largemouth bass in 2008-09 differed from the average value over the prior 10 years; this applied to small lakes and all lakes combined, but not to large lakes.

During the 2008-09 angling season specific catch rate for largemouth bass in Ceded Territory lakes was the highest observed since 1995; the same was not true for of directed effort for largemouth bass which was approximately average compared to other years since 1995 (Figure 22). Since 1995 there has been a statistically detectable increase in specific catch rates [Slope = 0.029, $F(1, 248) = 24.44$, $P < 0.01$] in largemouth bass fishing in Wisconsin Ceded Territory lakes. Over the same time period directed angler effort appears to be increasing as well although the relationship shows only suggestive statistical significance [Slope = 0.175, $F(1, 248) = 3.86$, $P = 0.051$; Figure 22].

Table 9. Mean estimates calculated from 2008 and 1998-2007 largemouth bass creel survey data.

Year	Lake Size	N	Catch/ Acre	Angler Harvest/ Acre	Specific Catch Rate	Specific Harvest Rate	Directed Effort/ Acre
2008*							
Small	< 500 acres	6	3.87	0.32	0.72**	0.07	5.11
Large	> 500 acres	11	5.62	0.29	0.56	0.04	4.41
	All lakes	17	5.00	0.30	0.61**	0.05	4.63
1998-2007							
Small	< 500 acres	94	4.06	0.13	0.35	0.01	4.79
Large	> 500 acres	100	4.01	0.20	0.34	0.02	3.88
	All lakes	194	4.03	0.17	0.34	0.02	4.33

* No significant differences exist between large and small lakes for any parameter for the 2008-09 angling season (T-test, $p>0.05$).
** 2008 values differ significantly (T-test, $p \leq 0.05$) from corresponding 10 yr. averages.

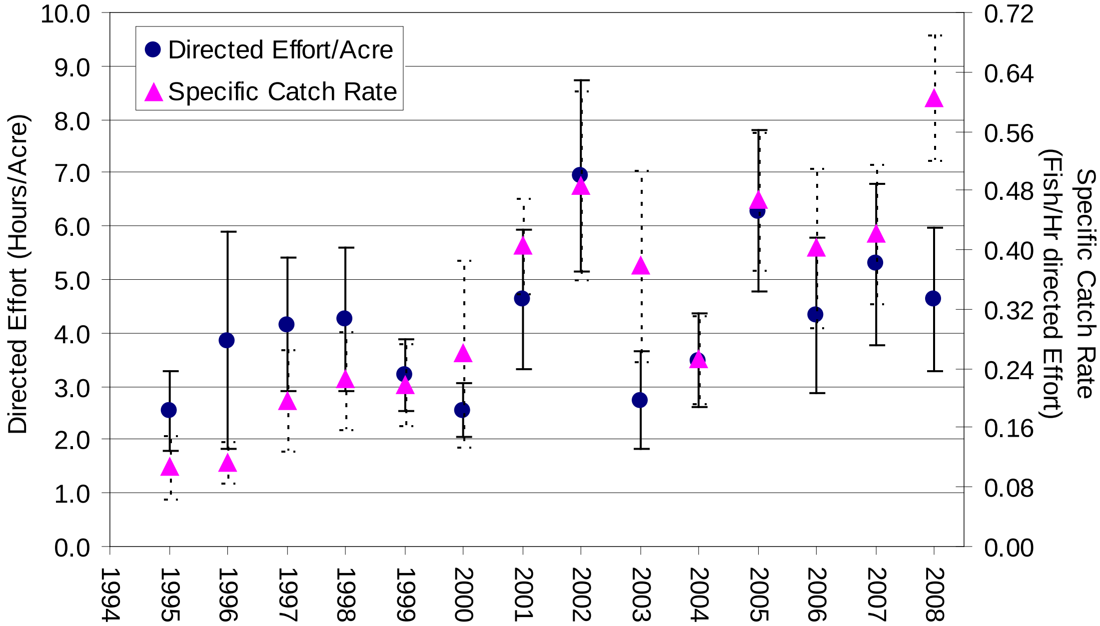

Figure 22. Directed angler effort per lake surface acre and specific catch rate (±SE) for largemouth bass in surveyed lakes in the Wisconsin Ceded Territory, 1995-2008.

Smallmouth Bass Effort and Catch

Catches of smallmouth bass were reported in each of the 18 lakes surveyed in 2008 although only 16 of the lakes had at least some level of directed effort for smallmouth bass (Appendix D). Of the lakes with smallmouth bass catch in 2008, seven were classified as 'small' (<500 ac.) and eleven as 'large' (≥500 ac.; Table 10). There were no significant differences in directed angler effort, catch/acre, harvest/acre, specific catch rate or specific harvest rate (T-test, P>0.05) between large or small lakes in 2008 (Table 10). In large lakes, directed effort and harvest/acre of smallmouth bass observed during 2008 were both significantly less than the 10 year averages; In small lakes specific harvest rates were significantly greater than the 10 year average (T-test, P<0.05; Table 10).

Both directed effort and specific catch rates of smallmouth bass anglers in the Ceded Territory have been variable over time. The average specific catch rate in surveyed lakes during 2008-09 was generally similar to values in most other years since 1995; directed effort for smallmouth bass during the 2008-09 fishing season was lower than that observed in any year since 1995 (Figure 23). However, since

1995 when a randomized lake selection process was instituted there have been no statistically detectable trends in directed angler effort/acre [$F(1, 247) = 0.10$, $P = 0.75$] or specific catch rates [$F(1, 247) = 2.38$, $P = 0.12$ in smallmouth bass fishing in Wisconsin Ceded Territory lakes (Figure 23).

Table 10. Mean estimates calculated from 2008 and 1998-2007 smallmouth bass creel survey data.

Year	Lake Size	N	Catch/ Acre	Angler Harvest/ Acre	Specific Catch Rate	Specific Harvest Rate	Directed Effort/ Acre
2008*							
Small	< 500 acres	7	1.25	0.12	0.34	0.04**	1.49
Large	> 500 acres	11	1.40	0.03**	0.33	0.02	2.26**
	All lakes	18	1.34**	0.07	0.33	0.03	1.79
1998-2007							
Small	< 500 acres	89	2.27	0.06	0.31	0.01	3.94
Large	> 500 acres	100	1.96	0.07	0.35	0.02	3.04
	All lakes	189	2.11	0.06	0.33	0.02	3.47

* No significant differences exist between large and small lakes for any parameter for the 2008-09 angling season (T-test, $p>0.05$).

** 2008 values differ significantly (T-test, $p \leq 0.05$) from corresponding 10 yr. averages.

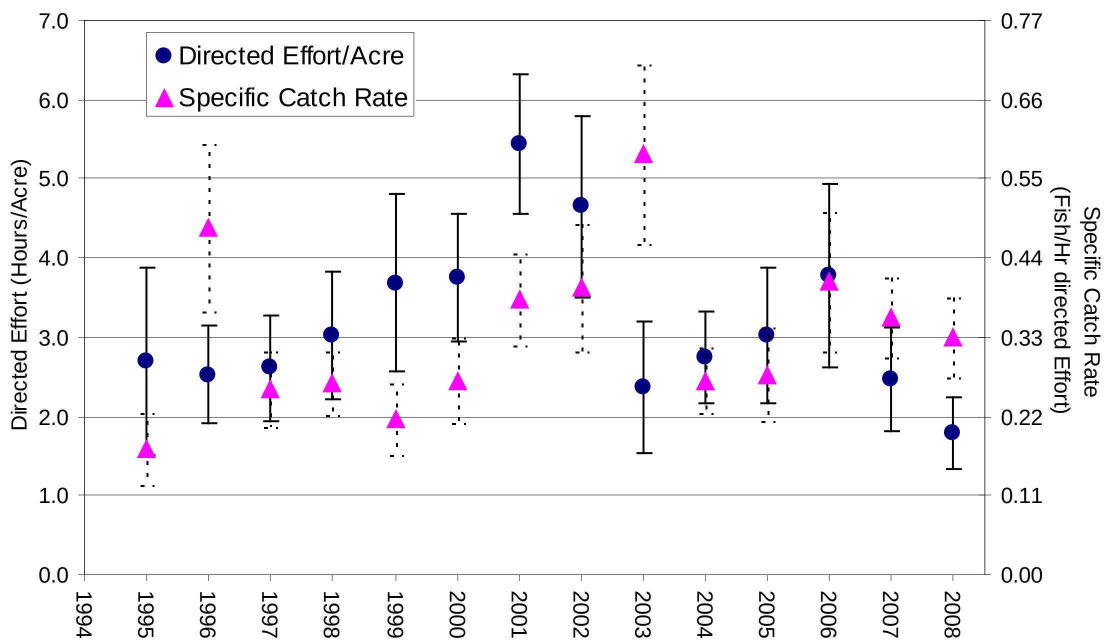

Figure 23. Directed angler effort per lake surface acre and specific catch rate (±SE) for smallmouth bass in surveyed lakes in the Wisconsin Ceded Territory, 1995-2008.

Safe Harvest

Safe harvest calculated for the 2008 harvest season was 96,315 walleye and 5,376 musky across the entire Wisconsin Ceded Territory (Table 11). Safe harvest of both walleye and musky has been shown to be highly correlated to the surface acreage of water found in each county (Linear regression, $r^2>0.9$; Cichosz 2009). For both walleye and musky the greatest total safe harvest numbers for individual counties were observed in Vilas (23,012 walleye, 1,489 musky), Oneida (18,850 walleye, 1,076 musky), Sawyer (10,594 walleye, 623 musky) and Iron (7,671 walleye, 385 musky) counties, respectively. When totaled, safe harvest from these four counties accounted for 62 percent of overall walleye and 66 percent of overall musky safe harvest for the Wisconsin Ceded Territory during 2008. Safe harvest numbers for individual lakes are listed in Appendix I.

Table 11. Walleye and musky safe harvest levels and ranks by county for the 2008 harvest season.

County	**Lake Acreage***	**Total Calculated Safe Harvest**		**Ranks (1 = Greatest #)**	
		Walleye	**Musky**	**Walleye**	**Musky**
Ashland	2,861	435	96	21	21
Barron	12,665	2,282	42	9	10
Bayfield	12,885	3,844	155	8	7
Burnett	11,389	1,666	119	10	14
Chippewa	14,418	4,054	191	7	6
Clark	320	21	5	26	26
Douglas	6,116	1,877	120	15	12
Dunn	1,752	654	0	23	18
Eau Claire	2,571	636	35	22	19
Florence	1,748	287	0	24	24
Forest	10,897	1,825	59	12	13
Iron	24,722	7,671	385	**4**	**4**
Langlade	4,816	600	43	17	20
Lincoln	15,564	5,210	220	5	5
Marathon	9,442	2,019	60	13	11
Marinette	3,178	748	21	19	17
Oconto	3,070	383	25	20	23
Oneida	60,215	18,850	1,076	**2**	**2**
Polk	11,202	1,322	63	11	16
Portage	74	6	0	27	27
Price	9,117	2,726	263	14	9
Rusk	5,633	1,576	137	16	15
Sawyer	47,787	10,594	623	**3**	**3**
St. Croix	1,100	420	22	25	22
Taylor	3,935	268	25	18	25
Vilas	70,725	23,012	1,489	**1**	**1**
Washburn	15,136	3,329	102	6	8
Grand Total	**363,338**	**96,315**	**5,376**	**---**	**---**

* Sum of acreage for lakes declared for potential harvest of one or both species; does not include total county-wide lake acreage.

Walleye Young-of-Year Surveys

Young of the year (YOY) surveys provide an index of the abundance and survival of the current year class of walleyes from hatching or stocking to their first fall. These surveys provide fisheries managers with insight into potential adult population changes in the near future. Early indication of these potential changes allows fisheries managers to develop management strategies to accommodate expected changes in adult populations. Although YOY relative abundance gives some indication of possible future adult abundance it does not necessarily correspond directly, as survival to adulthood varies (Hansen et al. 1998).

During 2008 WDNR completed 104 fall surveys encompassing 103 different lakes in the Wisconsin Ceded Territory; one lake had multiple fall surveys conducted (Appendix G). Of the lakes sampled, 47 had walleye populations classified as sustained by naturally reproduction (recruitment codes NR, C-NR, or C-), and 34 as sustained by stocking (ST or C-ST), 13 as remnant or newly established populations (REM, O-ST, NR-2; Appendix C). Ten lakes were classified as having no known walleye population (NONE/0). Water temperatures during 2008 YOY walleye surveys ranged from 48 - 71° F; mean and median water temperatures during YOY surveys were 61° and 62° F, respectively. Young-of-year walleye lengths ranged from 3.1 to 8.6 inches across all lakes and dates surveyed in 2008 (Appendix G).

Differences in mean YOY walleye density between natural and stocked recruitment categories was highly significant during 2008 (t-test-unequal variance, $t = 4.55$, $df = 46.6$, $P < 0.0001$). Consistent with all previous years since 1990, lakes sustained primarily by natural reproduction had higher mean walleye YOY density (mean = 25.1/mile of shoreline shocked, range = 0.0–133.3) than lakes sustained by stocking (mean = 1.7/mile, range = 0.0–14.9) during 2008 (Figure 24). The mean YOY walleye density observed in natural recruitment lakes during 2008 (25.1/mile) was slightly below the average across the previous 18 years studied (33.0/mile from 1990-2007) although this difference was not significant (t-test unequal variance, $t = -1.48$, $df = 53.8$, $P = 0.14$). In contrast, the mean YOY walleye density observed in stocked lakes during 2008 (1.7/mile) was less than all previous 18 years studied since 1990 and was significantly less than the long term average (6.1/mile from 1990-2007; t-test-unequal variance, $t = -4.61$, $df = 117$, $P < 0.0001$; Figure 24).

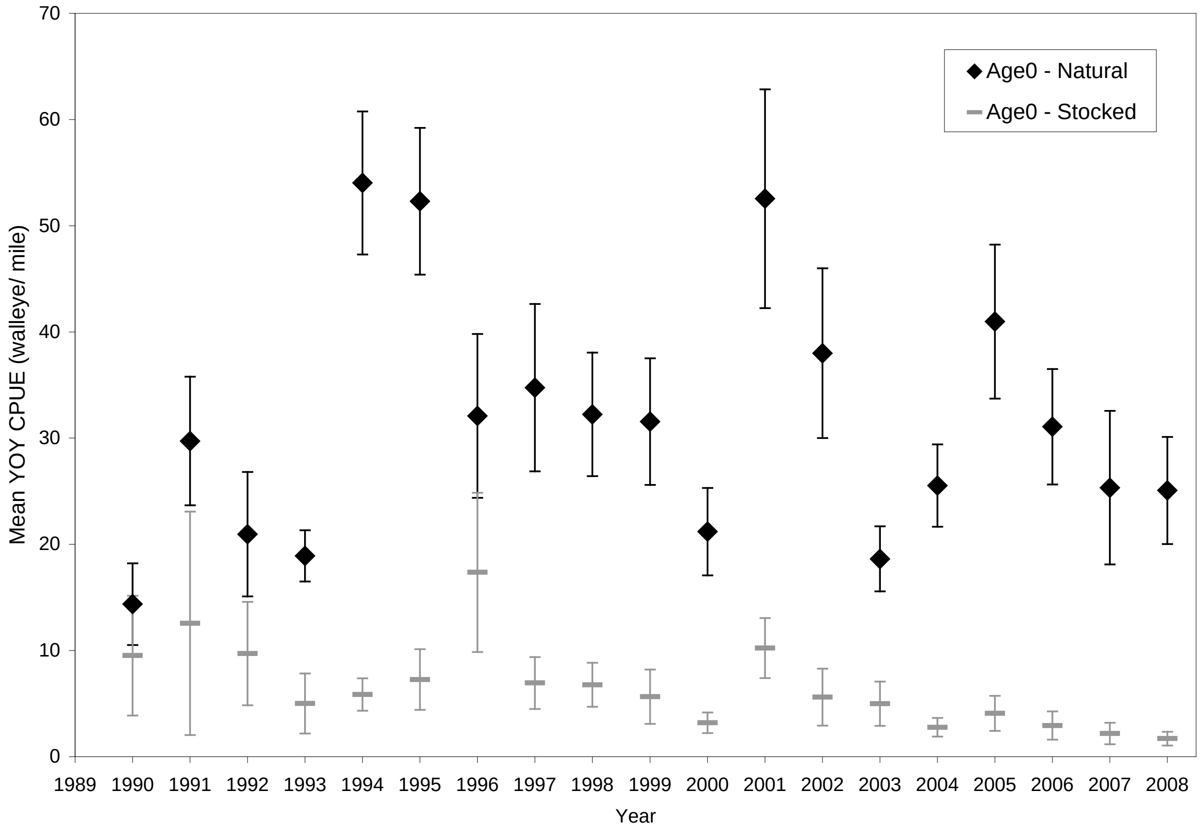

Figure 24. Comparison of mean YOY walleye density (± SE) observed in fall electrofishing surveys since 1990 in lakes dominated by natural recruitment or stocking.

It appears that within the Wisconsin Ceded Territory there may be region-wide annual effects on walleye recruitment since mean recruitment varies dramatically from year to year when data from all lakes are combined (Figure 24); In the absence of an annual regional effect one might expect annual percentages to be similar across years. Lack of recruitment in a given lake for one or more years is natural and not necessarily alarming. Sporadic recruitment is common for walleye populations both within and among individual lakes. It is common to have almost complete lack of recruitment in 25% or more of lakes with natural reproduction, and year class failures are even more common in lakes with populations maintained by stocking. Generally, successful recruitment occurs in a given lake every 3-4 years a fact that may reduce competition between year classes of walleye (Li et al. 1996).

A general linear model used to assess the impact of year and/or recruitment model on YOY walleye density was significant (p<0.0001; Table 12). The significance of the model was driven by differences in YOY density between years (p=0.0011), recruitment models (natural or stocked; p<0.0001) and the interaction of year*recruitment model (p=0.0426). Based on the significance of the year*recruitment model interaction term, regressions were done to evaluate trends independently for natural and stocked model lakes. No significant trend was noted for YOY densities over time in natural model lakes (p=0.40; see Figure 24). YOY walleye densities have declined significantly over time in stocked model lakes since 1990 (slope=-0.49, p=0.0005; see Figure 24).

Table 12. GLM results comparing YOY walleye density across years and primary walleye recruitment source.

Source	**DF**	**Sum of Squares**	**Mean Square**	**F Value**	**Pr > F**
Model	37	416057	11244	7.99	<0.0001
Error	1,592	2241271	1407		
		Type III SS	**Mean Square**	**F Value**	**Pr > F**
Year	18	59795	3322	2.36	0.0011
Recruitment Model[a]	1	194375	194375	138.07	<0.0001
Year x Recruitment Model	18	41713	2317	1.65	0.0426

a –Recruitment Models compared are 'natural' and 'stocked'.

The percentages of natural-model lakes with greater than 25 YOY walleye per mile and greater than 100 YOY walleye per mile are also used to indicate strong annual year classes in the Wisconsin Ceded Territory. These values are less affected by large values for individual lakes than the mean number of YOY walleye caught per mile. In 2008, 14/46 natural model lakes (30%) had YOY indices > 25 per mile, and three NR lakes (7%) had YOY walleye indices > 100 per mile (Appendix G). Overall, the proportion of lakes with YOY catch rates greater than 25 and 100 fish per mile in 2008 was comparable to the mean proportion of lakes observed with the same catch rates between 1990-2007 (mean percentage > 25 YOY/mi = 37%; >100/mi = 8%) illustrating the presence of average natural walleye year classes in the fall of 2008.

In lakes categorized as being sustained primarily by stocking, differences in the mean number of YOY walleye captured per mile in lakes that were stocked (3.7 YOY/ mile) with fry or small fingerlings and those that were not stocked (0.5 YOY/ mile) in 2008 showed suggestive significance (t-test unequal variance, t = 2.02, df = 12.3, P = 0.07; Table 13). These findings illustrate that, amongst stocked-model lakes, those that were stocked during 2008 generally had stronger fall recruitment than those that were not stocked.

Table 13. Young-of-the-year indices in lakes categorized as being sustained primarily by stocking (ST or C-ST), separated by whether or not the lake was stocked in 2008.

	Stocked in 2008	**Not Stocked in 2008**
No. Lakes	12	20
Mean YOY walleye/ mile	3.7	0.5
Q1/Median/Q3	0.2 / 0.7 / 7.0	0.0 / 0.0 / 0.0
Lakes with 0 YOY/ mile	3 (25%)	17 (85%)
Lakes with <5 YOY/ mile	8 (67%)	19 (95%)
Lakes with <10 YOY/ mile	10 (83%)	20 (100%)

The Hansen et al (2004) index of lake-wide YOY walleye density (fish/acre) for natural-model lakes ranged from 0.0–72.7 with a mean of 11.5 during 2008. In stocked-model lakes, the same index ranged from 0.0–2.4 YOY walleye/acre with a mean of 0.28. Within stocked-model lakes, those stocked prior to fall surveys logically had a greater average Serns' value than lakes that were not stocked (0.63 Vs. 0.01, respectively). This is consistent with findings based on counts of YOY/mile observed in surveys and discussed above and generally indicates greater levels of recruitment in natural model lakes relative to stocked model lakes, and greater within the stocked model lakes greater recruitment in stocked versus un-stocked waters.

Fall surveys were conducted on 9 lakes that were previously stocked with oxytetracycline marked walleyes in 2008 (Table 14). Most stocking events took place in the month of June. In general, the percent of marked fish tends to align well with and support recruitment code designations for lakes monitored during 2008, with higher values in ST lakes, and lower values in C-ST and C-NR lakes. Sweeny Lake (Oneida Co.) is a potential exception to this with no natural reproduction noted despite a C-NR designation, although the number of fish sampled (8) was very low. It is important to note that since numbers of fish examined for OTC marks from any individual lake during any year is often limited, the percent contribution of marked fish observed does not always appear to align completely with a designated recruitment code. Therefore OTC sampling itself is not indicative of recruitment code designations, and is not considered in the designation process unless a minimum of 30 individual fish are sampled from the water body in question.

Table 14. Lakes stocked with oxytetracycline (OTC) marked fish sampled in 2008, number of sampled fish where OTC marks were noted on the otolith, and percent contribution of stocked fish to the total sample.

County	Lake	Recruit Code*	WBIC	With OTC	Without OTC	Total	% Contrib.
Oneida	Tomahawk L	C-ST	1542700	6	3	9	66.7
Oneida	Pickerel L	ST	1590400	9	0	9	100.0
Oneida	Sevenmile L	C-ST	1605800	50	0	50	100.0
Oneida	Sweeney L	C-NR	1589600	8	0	8	100.0
Vilas	Arrowhead L	C-ST	1541500	10	0	10	100.0
Vilas	Little John L	C-NR	2332300	13	35	48	27.1
Vilas	Muskellunge L	ST	1596600	3	0	3	100.0
Vilas	White Sand L	C-ST	2339100	36	2	38	94.7
Vilas	Wildcat L	ST	2336800	55	0	55	100.0

* Recruitment codes C-ST & ST are lakes in the stocked model. Recruitment code C-NR is in the natural model (Appendix C).

Comparison of YOY Density in Drainage Vs. Seepage Lakes

Comparison of YOY collected per mile of shoreline electrofished was significantly greater in drainage lakes (36.1) than seepage lakes (17.2; ANOVA, F=15.21, df=1, p<0.0001) since 1990. The same model indicated that YOY abundance did not differ significantly (p=0.30) between pre-drought (35.0) and drought (29.14) years although mean values were notably lower in drought years in both hydrologic lake classes (Table 15). Northern Wisconsin has been in a drought condition since 2002.

The interaction of hydrologic lake class and drought period was not significant (ANOVA, F=0.10, df=1, p=0.75). If present, statistically relevant interactions between hydrologic class and drought period would have suggested that declining water levels are a driving factor of walleye recruitment in seepage lakes across the Wisconsin Ceded Territory. Although not statistically significant, the similar and coincidental decline in YOY abundance under drought conditions in both drainage and seepage lakes does suggest a possible climatic or environmental factor influencing walleye reproduction in all lakes across northern Wisconsin. This influence however appears not to be limited to seepage lakes so that water level itself is not likely the causative factor.

Table 15. Comparison of mean number of YOY walleye collected per mile of shocked shoreline in drainage and seepage lakes throughout the ceded territory

Year	Average of Age0/Mile	
	Drainage	**Seepage**
1990	13.3	25.8
1991	30.1	28.2
1992	21.9	No Data
1993	20.4	8.3
1994	57.6	32.3
1995	59.3	21.5
1996	36.7	6.1
1997	38.9	2.8
1998	34.9	20.0
1999	32.3	28.6
2000	28.1	6.7
2001	59.3	12.8
2002	42.2	13.9
2003	20.5	6.1
2004	27.6	12.5
2005	53.1	17.7
2006	32.1	5.8
2007	26.9	46.2
2008	24.9	14.3
Avg. 90-01 (Pre-drought)	**38.6**	**18.5**
Avg. 02-08 (Drought)	**32.2**	**15.1**
% Change	**-16.6**	**-18.2**

Evaluation of Mixed Harvest Walleye Management System

We evaluated management efforts in the mixed (spearing/angling) walleye fishery in the Wisconsin Ceded Territory to see if a management benchmark stating that total adult walleye exploitation should not exceed 35% more than 1 time in 40 (2.5% of the time; Staggs et al. 1990) was being met. We assessed walleye exploitation from 1990-2007, and this work was in some manners an extension of work conducted by Beard et al. (2003) who conducted a similar analysis using data from 1990 through 1998. Methods used to estimate tribal and angler exploitation rates were previously described in this report.

Methods used in this assessment were similar but not identical to those used by Beard et al. (2003). For the purposes of this evaluation, if marked fish showed movement between connected lakes, those systems were considered as a single entity; this included both designated and non-designated lake chains. Nine designated lake chain systems are defined within the treaty fisheries program and these systems have historically been managed as single systems rather than individual lakes. However, numerous other connected lake systems exist throughout the ceded territory, and these systems have historically been managed as individual lakes rather than single/combined systems. Preliminary analyses showed that doing so produced statistically and biologically questionable results related to walleye exploitation[9], leading us to conclude that they were best viewed as single systems for this assessment.

We first assessed the empirical exploitation data alone, without accounting for uncertainty in values estimated in field surveys and subsequently used to estimate walleye exploitation rates (population estimates, proportions of marked fish observed in creel surveys, and angler harvest estimates). Since each of these variables is estimated with uncertainty, we then utilized Monte Carlo simulations to incorporate measurement error (uncertainty) into our analysis. We generated 10,000 estimates of walleye harvest, proportions of marked fish observed in creel surveys, and the adult walleye population in each lake. Harvest and population estimates were simulated based on a normal distribution accounting for the calculated variance associated with each estimate. Proportions of marked fish observed in the creel were simulated based on a binomial distribution around the estimated value. The

[9] Exploitation estimates in small waters with limited numbers of fish marked regularly exceeded 70% when marked fish moved to, and were harvested from, adjacent connected waters with more abundant and heavily targeted walleye populations. In most cases, little or no harvest was observed in the original water body.

10,000 simulated values were randomly re-combined and used to estimate a 'new' tribal or angler exploitation rate, and subsequently a corresponding total exploitation rate.

Empirical Data

Our evaluation encompassed 266 individual lakes or lake systems monitored for adult walleye exploitation between 1990 and 2007 (Table 16). In 30 (of 266) instances angler exploitation was estimated to be zero; In 80 instances tribal exploitation was found to be zero. There were 20 total instances in which total (combined angler and tribal) adult exploitation was estimated to be zero.

Between 1990 and 2007, 4 instances were observed in which the estimate of total adult walleye exploitation exceeded 35% (Table 17). This occurred one time in each of 4 separate years – 1992, 1995, 2003 and 2007. The proportion of lakes or lake systems which exceeded 35% total adult exploitation varied by year. For the four years in which total adult walleye exploitation rates greater than 35% were observed, exceedance probabilities ranged from 4.4 – 8.3% and were dependent on the number of lakes monitored. Exceedance probabilities did not statistically differ from 2.5% in any individual year examined.

Table 16. Overview of the number of lakes or lake systems monitored for adult walleye exploitation from 1990-2007.

	Lakes or Lake Systems			
Year	**Total # Sampled**	**# w/ zero Tribal Exploitation**	**# w/ zero Angler Exploitation**	**# w/ zero Total Exploitation**
1990	20	3	1	1
1991	22	7	1	1
1992	23	4	1	0
1993	16	7	4	3
1994	16	6	1	1
1995	13	2	0	0
1996	10	3	1	0
1997	15	2	0	0
1998	13	5	3	3
1999	14	3	0	0
2000	13	1	2	0
2001	14	6	1	1
2002	12	9	4	3
2003	12	3	1	0
2004	14	4	1	1
2005	12	5	3	2
2006	15	3	1	0
2007	12	7	5	4
Total	**266**	**80**	**30**	**20**

Table 17. Comparison of direct count and Monte Carlo simulation results for total adult walleye exploitation values greater than 35% for surveyed lakes from 1990-2007.

		Direct Counts				**Monte Carlo Simulations**		
Year	**Lakes**	**Number over 35%**	**Exceedance Probability (%)**	**95%CI**		**Number over 35%**	**Exceedance Probability (%)**	**95%CI**
1990	20	0	0.00	0.00-16.84		5,109	2.55	2.49-2.62
1991	22	0	0.00	0.00-15.44		4,513	2.05	2.00-2.11
1992	23	1	4.35	0.11-21.95		7,758	3.37*	3.31-3.44
1993	16	0	0.00	0.00-20.59		3,654	2.28	2.22-2.35
1994	16	0	0.00	0.00-20.59		1,619	1.01	0.97-1.06
1995	13	1	7.69	0.19-36.03		8,036	6.18*	6.10-6.27
1996	10	0	0.00	0.00-30.85		742	0.74	0.69-0.80
1997	15	0	0.00	0.00-21.80		1,174	0.78	0.74-0.83
1998	13	0	0.00	0.00-24.71		0	0.00	0.00-0.00
1999	14	0	0.00	0.00-23.16		220	0.16	0.14-0.18
2000	13	0	0.00	0.00-24.71		2,174	1.67	1.61-1.74
2001	14	0	0.00	0.00-23.16		37	0.03	0.02-0.04
2002	12	0	0.00	0.00-26.46		4,565	3.80*	3.72-3.89
2003	12	1	8.33	0.21-38.48		5,619	4.68*	4.59-4.77
2004	14	0	0.00	0.00-23.16		5,996	4.28*	4.20-4.37
2005	12	0	0.00	0.00-26.46		5,315	4.43*	4.34-4.52
2006	15	0	0.00	0.00-21.80		2,502	1.67	1.61-1.73
2007	12	1	8.33	0.21-38.48		3,750	3.13*	3.04-3.21
Overall	**266**	**4**	**1.50**	**0.41-3.81**		62,783	**2.36**	**2.34-2.38**

* Probabilities are significantly (p<0.05) greater than 2.5%

Since 1990, the overall proportion of monitored lakes where total adult walleye exploitation exceeded 35% was 1.50% (95% confidence interval 0.41-3.81%; Table 17). This value is well under the 2.5% exceedance rate allowed by the benchmark being evaluated, although it is not statistically different from that benchmark level. These results suggest that the current management strategy for combined walleye harvest in the Wisconsin ceded territory may be working effectively although uncertainty in the data precludes any definitive answer to that question.

We conducted a general linear model analysis of variance to examine the potential impact of various factors on total adult walleye exploitation rates[10]. Factors included in the model were year, size/harvest regulation, bag limit[11], and primary walleye recruitment source (Table 18). The overall model was highly significant (p=0.0032) and was driven by walleye bag limits (p<0.01). Other factors evaluated in the model were not statistically relevant (p>0.05) in describing total adult walleye exploitation rates.

Based on the analysis of variance results, we further evaluated the probabilities of exceeding 35% total adult walleye exploitation under differing bag limit scenarios (Table 19). It should be noted that, although bag limits are directly linked only to angler harvest, they are also indirectly linked to the tribal declarations (and therefore presumably to tribal harvest levels) used to determine the angler bag limits.

Table 18. Analysis of variance results for a model examining factor impacts on total adult walleye exploitation rates.

Source	DF	Sum of Squares[1]	Mean Square	F Value	Prob. > F
Model	**29**	**.33077**	**0.0114**	**1.97**	**0.0032**
Year	17	0.1478	0.0087		0.0946
Size Regulation	4	0.0385	0.0096		0.1589
Bag Limit	4	0.0859	0.0215		**0.0060**[2]
Recruitment Source	3	0.0085	0.0028		0.6903
Error	236	1.3659	0.0058		
Total	265	1.6967			

1 – Type III Sum of Squares used to assess class variables.
2 – P value in reduced model <0.0001.

[10] A preferred analysis would have involved logistic regression with the dependent variable being total exploitation over or under 35%. However, with only 4 instances over 18 years in which total walleye exploitation was estimated to exceed that level, this preferred analysis was not feasible.

[11] Bag limit refers to initial bag limit established at the outset of the angling season. No consideration was given to 'revised' bag limits published later in the season since they were not done in all years and have not been published at the same time each year.

Table 19. Overview of the number of lakes or lake systems exceeding 35% exploitation, by bag limit, from 1990-2007.

Bag Limit	n	# of Lakes Exceeding 35% Total Adult Walleye Exploitation	Probability (%)	95% CI
1	1	0	0	0.00-97.50
2	74	1	1.35	0.03-7.30
3	158	3	1.90	0.39-5.45
4	2	0	0	0.00-84.19
5	17	0	0	0.00-19.51
Multiple	14	0	0	0.00-23.16
Total	**266**	**4**	**1.50**	**0.41-3.81**

Lakes with either 2 or 3 fish bag limits are, by far, most prevalent throughout the ceded territory with 82 and 163 surveyed lakes in the two categories, respectively (Table 19). One and four fish bag limits are comparatively rare; five fish bag limits are moderately common. In some instances where lakes were combined into a single system for analysis a multiple bag limit scenario was created since not all lakes in these systems necessarily had the same bag limit.

Of the four instances in which total adult walleye exploitation was estimated to exceed 35%, three of those instances were noted in lakes with a 3 walleye bag limit and the other instance was observed under a 2 fish bag limit (Table 19). Based on this empirical data, the probability of exceeding 35% exploitation of adult walleye in 2 and 3 bag limit lakes, respectively, is 1.4 and 1.9%. Under all bag limit scenarios the estimated exceedance rates are below the mandated threshold of 2.5% although none of the estimated exceedance rates differ significantly from 2.5%. Again, these findings suggest that the current management strategy for combined walleye harvest in the Wisconsin ceded territory may be working effectively although uncertainty in the data precludes any definitive answer to that question.

Monte Carlo Simulations

Monte Carlo simulations show that total adult walleye exploitation of 35% is exceeded 2.36% of the time (95% confidence interval 2.34-2.38%; Table 17) when all (266) waterbodies were considered. This value is considerably greater than the 1.35% exceedance rate estimated from the empirical data alone. Importantly, the simulation result of 2.36% is significantly ($p<0.05$) less than the established 2.5% benchmark level. These results illustrate that the current management strategy for combined walleye harvest in the Wisconsin ceded territory is working effectively as planned.

The benchmark that total adult walleye exploitation should not exceed 35% more than 1 time in 40 (2.5% of the time) is stated in a variety of documents and in none does it specify that this applies to anything other than 'the whole'. It does not specify that this applies to lakes, years, bag limits, or any other specific factor. Given that, the aforementioned result that 35% total adult exploitation has been exceeded 2.36% of the time since 1990 is most relevant. Subsequent evaluations of this benchmark across year, bag limit, etc. are relevant to stimulate management discussions, but may not be relevant from a legal or regulatory standpoint at this time.

When Monte Carlo simulations are evaluated by year (Table 17; Figure 25), exceedance rates of the 35% total adult exploitation benchmark are variable ranging from 0-6.18 percent in 1998 and 1995, respectively. Proportions of simulations that exceeded 35% total adult exploitation were significantly ($p<0.05$) greater than 2.5% in 7 of 18 years evaluated, statistically less than 2.5% in 10 years, and statistically indistinguishable from 2.5% in one year (1990). Simulation results in the last 10 years are split, with half less and half greater than 2.5%. There is no apparent pattern over time in the percent exceedance of the 35% total adult walleye exploitation benchmark.

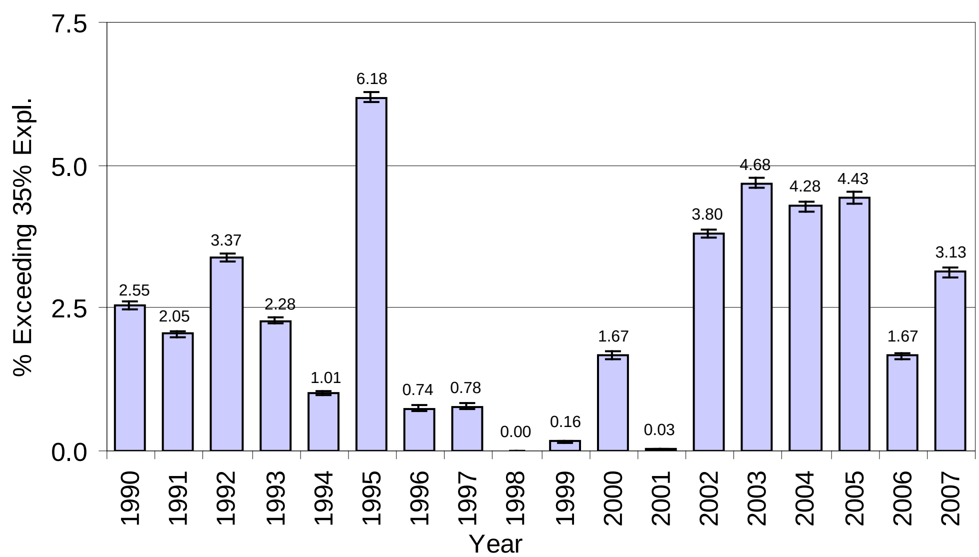

Figure 25. Percent of Monte Carlo simulated total adult walleye exploitation rates exceeding the established 35% benchmark, by year, from 1990-2007. Error bars represent 95% confidence intervals.

When Monte Carlo simulations are evaluated by bag limit (Figure 26), exceedance rates of the 35% total adult exploitation benchmark range from 0-2.86 percent in lakes with single bag limit scenarios; in combined lake systems having multiple bag limits the 35% total adult exploitation level was exceeded 3.83% of the time. In 2, 3 and 5 bag limit scenarios the percent of simulations in which total adult walleye exploitation exceeded 35% was below the prescribed 2.5% benchmark (1.63 and 0.04% respectively). The benchmark was exceeded in lakes with 3-bag (2.86%) or multiple bag limits.

These findings make intuitive sense in that lakes with 3 fish daily bag limits allow greater harvest/exploitation than those with 2 fish/day daily bag limits and because reduced bag limits are put in place due to substantial tribal declarations and/or harvest. Lakes with 5 fish daily bag limits theoretically allow for greater harvest, but generally retain a high bag limit only because walleye populations are very low density and these lakes are therefore not declared by tribes for spearing activity; exceptions may exist in lakes with highly stained waters which limit spearing activity when walleye densities are higher, although these instances are not considered widespread. Angler harvest is therefore most commonly limited by low walleye abundance in lakes with 5 fish daily bag limits, and estimates of adult abundance (and exceedance of the 35% benchmark) are understandably lower than in lakes with reduced bag limits.

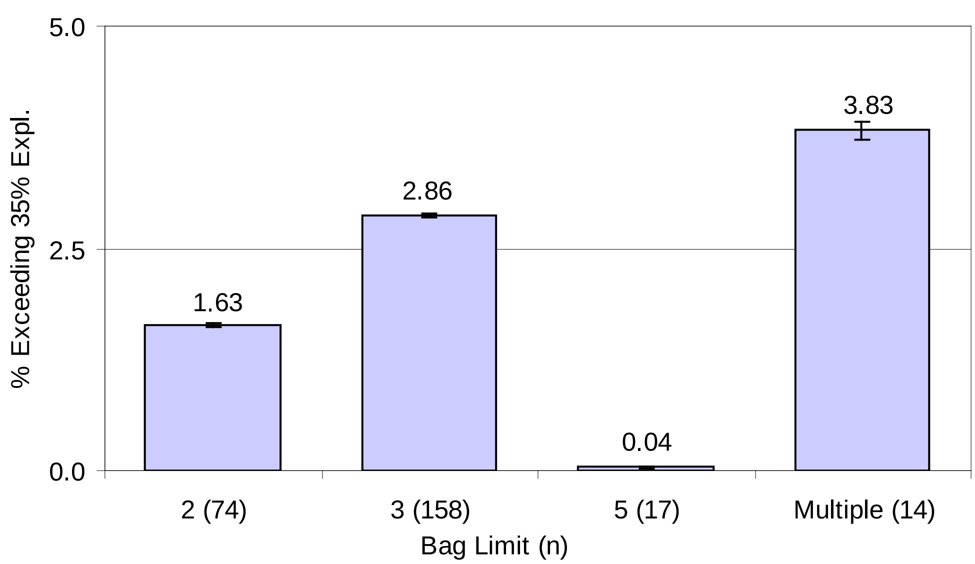

Figure 26. Percent of Monte Carlo simulated total adult walleye exploitation rates exceeding the established 35% benchmark, by bag limit. Error bars represent 95% confidence intervals.

Monte Carlo simulation exceedance rates of the 35% total adult walleye exploitation benchmark are significantly less than 2.5% in both natural (2.18%) and stocked (2.34%) recruitment model lakes (Figure 27). The exceedance rates in lakes with remnant populations (3.50%) and those combined lake systems with multiple recruitment classes (11.60%) are significantly greater than the 2.5% benchmark although it is important to note that these classes make up a small percentage of the total lakes evaluated (3.4% for both classes combined).

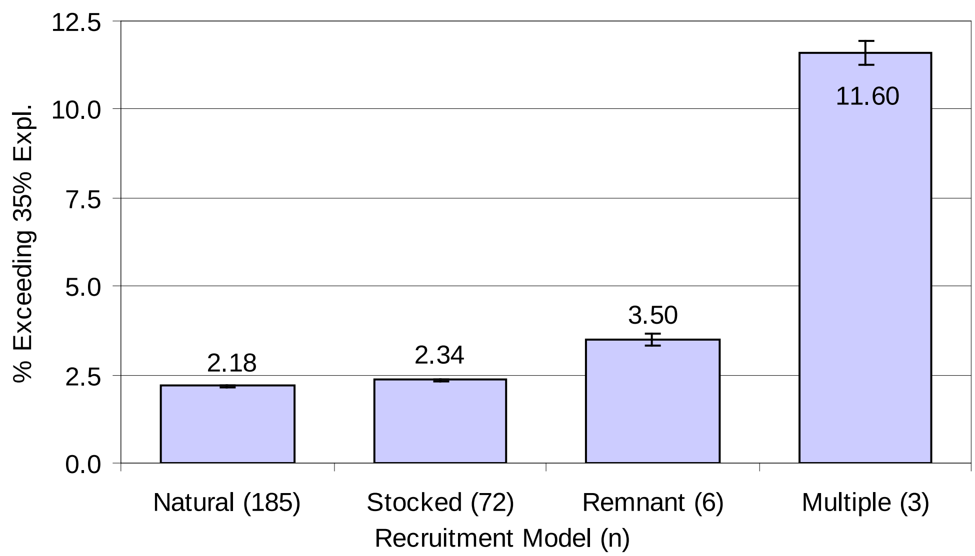

Figure 27. Percent of Monte Carlo simulated total adult exploitation rates exceeding the established 35% benchmark, by walleye recruitment model. Error bars represent 95% confidence intervals.

Lakes from the natural recruitment model were used to evaluate how often lakes with different harvest/size regulations exceeded 35% adult walleye exploitation. Lakes in other recruitment models were omitted from this portion of the analysis due to limited variation in harvest size regulations. In natural model lakes, 35% adult walleye exploitation was exceeded significantly more than 2.5% of the time in lakes with ‘no minimum size’ (3.31%) and ’15 inch minimum’ (2.79%) size restrictions (Figure 28). In contrast, exploitation of adult walleye exceeded 35% significantly less than 2.5% of the time in lakes with ‘no minimum, 1>14 inches’ and ’14-18 inch exclusionary slot’ regulations (35% adult exploitation was exceeded 0.81 and 0.11%, respectively under these regulations).

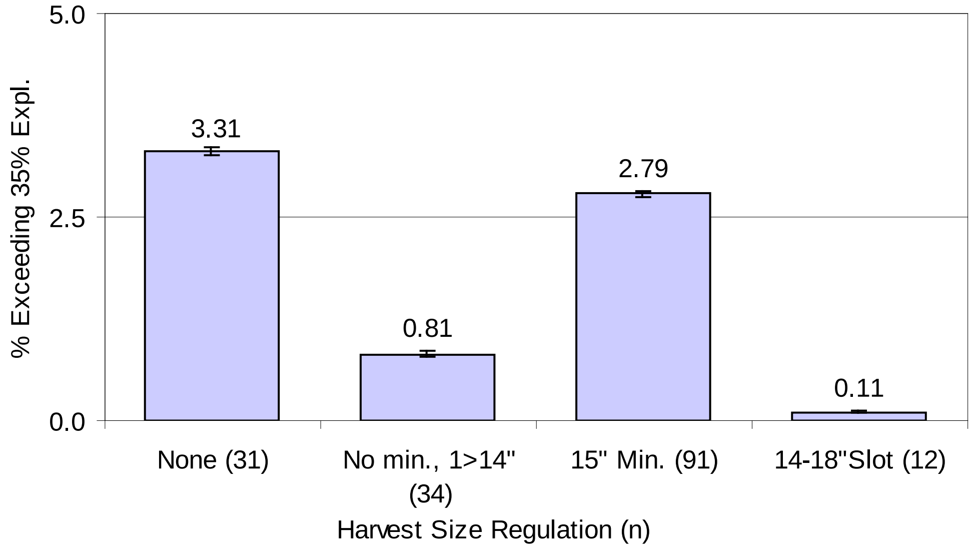

Figure 28. Percent of Monte Carlo simulated total adult walleye exploitation rates exceeding the established 35% benchmark, by walleye harvest size regulation. Error bars represent 95% confidence intervals.

It is interesting to note the discrepancy in the exceedance rates under ‘no minimum size’ and ‘no minimum, 1>14 inch’ regulations. Both regulations are applied to waters with high walleye recruitment where high harvest of small (young) fish is not thought to be detrimental to the population. Small walleye harvested in these waters should include young adult males. Intuitively we expected the impact of these two regulations on adult exploitation rates to be similar since both have no minimum size restriction on harvest and because walleye anglers tend to be consumptive in nature and are often thought to keep any legal fish landed. The discrepancy between these two regulations in controlling adult walleye exploitation suggests this is not always the case. We suspect that under the ‘no minimum size’ regulation anglers are actively selecting for larger (adult) walleye and releasing abundant smaller walleye, resulting in higher adult exploitation relative to lakes with a ‘no minimum, 1>14 inch’ regulations (where the harvest of adults is limited by the ‘1>14 inch’ component of the regulation).

Compare Muskellunge Survey/spear harvest length frequencies

To evaluate potential size selectivity of muskellunge by tribal spearers we compared length frequency distributions from spring population surveys and tribal spear harvest. Selection for larger fish by spearers could potentially result in overharvest of females over time, and may conflict with WDNR goals to accommodate an increasing angler desire for trophy muskellunge fisheries.

A preliminary analysis showed no size selection or bias in WDNR population survey data due to fish collection methods. During WDNR mark-recap surveys, the vast majority (average ~90%) of muskellunge are captured in fyke nets. Although mobile, cover oriented species like escocids are considered susceptible to capture by fyke-nets (Hubert 1983), use of individual gears (or in this case, surveys dominated by a single gear) can complicate attempts to obtain a representative length frequency distribution for a given species (Ney 1993).

Size restrictions for tribal muskellunge spearing have little or no impact on the harvest size structure. Spearing restrictions allow the first muskellunge speared to be of any size and at least one-half of fish speared thereafter must be at least 32 inches in total length, so no impact of the regulation is realized until at least 3 fish are speared by a single spearer under a single permit. In the vast majority of cases successful musky spearers harvest two muskellunge or less under a single permit.

Construction of Length Frequencies

Collection methods for WDNR muskellunge surveys are detailed earlier in this report. Length frequencies for individual lakes were defined using all adult fish marked during year-1 and all unmarked adult fish captured in year-2 of the survey; combining data across two years increased sample sizes for defining length frequency distributions (Table 20). In lakes where multiple population surveys were conducted in a relatively short timeframe (e.g. 3-6 years; Big Arbor Vitae and Trout lakes) we combined length frequency data using all available years to define a single length frequency for the population at large.

Numbers of muskellunge speared from individual lakes in a single year are often low (<12). We therefore combined spearing data from each lake over a 5 year period surrounding a corresponding population survey (marking year ± 2 years) for construction of spearing length frequency distributions, and limited analysis to those lakes with a minimum of 50 muskellunge speared during this time (Table 20).

Table 20. Survey years and numbers of adult muskellunge represented in length frequencies for individual lakes assessed.

		Population Survey Data		Spearing Data	
Lake	**County**	**Years Included***	**Total # Fish**	**Years Included**	**Total # Fish**
Tomahawk	Oneida	2005	121	2003-2007	58
Shell Lake	Washburn	2002	74	2000-2004	59
Deer Lake	Polk	2003	257	2001-2005	51
Bone Lake	Polk	2005	547	2003-2007	74
Big Arbor Vitae	Vilas	2005, 2008	612	2003-2009	120
Trout Lake	Vilas	2001, 2004, 2007	379	2000-2008	139
Totals			**1,990**		**501**

* Year indicates that in which population size was estimated; Data used to delineate population structure includes both the mark year (shown) and recapture year (one year later).

Evaluation of Bias in WDNR Survey Data

To investigate potential bias in length frequencies derived from WDNR surveys, we estimated selectivity within 5-inch size classes as the number of marks recaptured (R) divided by the number of marks applied (M); the R/M ratio for each length class is a relative index of size selectivity (Laarman and Ryckman 1982). We standardized R/M ratios within each lake to a maximum value of one prior to analysis (Figure 29) because differing angler harvest regulations between lakes may otherwise lead to differences in the R/M ratio between lakes. Size classes within a lake having less than five marked muskellunge were excluded from the analysis[12]; this predominantly affected size classes at the extremes of the distribution (<25 or >45 inches).

To account for non-linear fish growth between the marking and recapture periods we assumed a 2 inch annual growth increment at small sizes (up to 30") consistent with TWG methods. Growth

[12] The cutoff of five fish was used because the overall recapture rate across all lakes and fish sizes was approximately 20%, suggesting that lake/size class combinations having less than 5 marked fish may produce erroneous results.

increments for larger fish were subjectively assigned to account for non-linear asymptotic growth (Table 21) and were comparable to those from other northern Wisconsin lakes with available growth data.

Analysis of variance (Proc GLM; SAS 2004) shows no significant differences between mean selectivity (standardized # recaptures/#marks available) across size classes of adult muskellunge between 25 and 44.99 inches in length (F=1.22, 3 DF, p=0.3186; Table 22). WDNR sampling methods show no size selection in their capture of adult muskellunge over 25" and up to 45" in length. Given the low number of fish marked and few resulting selectivity estimates, it is difficult to determine definitively if sampling methods are or are not size selective in their capture of adult muskellunge ≥45" in length. We do not believe, given the lack of size selectivity of our sampling protocol for other size classes, that there is any size selectivity (bias) in the estimates of adult muskellunge relative abundance or size structure at larger sizes.

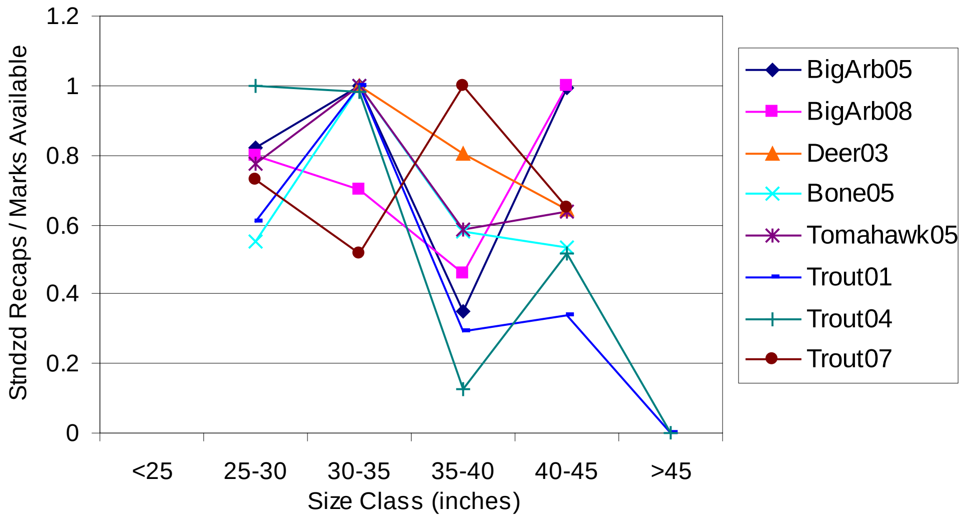

Figure 29. Estimates of sampling selectivity calculated for various lakes and years.

Table 21. Comparison of size at marking and corresponding size at recapture intended to account for non-linear growth of fish between fyke netting periods.

Size at Marking (inches)	Size at Recapture (inches)	Growth Increment (inches)
<25	<27.00	2.0
25-29.99	27-31.99	2.0
30-34.99	32-36.49	1.5
35-39.99	36.5-40.99	1.0
40-44.99	41.0-45.49	0.5
45+	45.5+	0.5

Table 22. Comparison of mean selectivity (standardized # recaptures/#marks available) for various size classes of adult muskellunge.

Size Class (Inches)	N	Mean	Std Dev	Lower 95%CL	Upper 95% CL
< 25	0	.	.	.	.
25-29.99	8	0.526	0.317	0.260	0.791
30-34.99	9	0.306	0.335	0.048	0.563
35-39.99	9	0.394	0.340	0.133	0.656
40-44.99	8	0.577	0.308	0.320	0.835
45+	2	0	.	.	.

Comparison of Population Survey and Tribal Spearing Length Frequencies

There are highly significant differences in the length frequency distributions of the adult muskellunge population at large and that of fish taken by tribal spear fishing (Kolmogorov-Smirnov (KS) test, $p<0.005$, Table 23). Differences exist in individual lakes and for all lakes combined. Relative to their abundance in the overall population, spearing tends to avoid adult muskellunge less than approximately 35-36" in length and select for fish greater than that size. Selection for larger (and against smaller) muskellunge is visually evident when length frequency histograms are compared for all lakes combined or for individual lakes (Figure 30), with all lakes evaluated show a similar discrepancy in length frequencies between lake surveys and tribal spearing.

The 'size of fish at the maximum difference' between the two distributions (Table 23) corresponds to the minimum size at which spearing selectivity for adult muskellunge begins to occur. Muskellunge below that size are avoided (selected against) by tribal spearers whereas muskellunge over that size are selected for. This length ranges between about 34 inches in Big Arbor Vitae Lake and 39 inches in Shell Lake, averaging approximately 36 inches across all waters evaluated. The size at which spearing selection occurs does not appear to be a function of the size structure of the population being speared (e.g. Deer and Tomahawk lakes have the largest population size structures of lakes evaluated, but not the largest sizes at which positive spearing selectivity begins).

Table 23. Kolmogorov-Smirnov test results for differences in the size distributions of adult musky observed in spring surveys and those harvested by tribal spearfishing.

Lake	County or Area	Size (inches) at Maximum Difference*	KS p-value**
All Combined	**Ceded Territory**	**35.75**	**0.0000**
Tomahawk Lake	Oneida	35.25	0.0013
Shell Lake	Washburn	38.75	0.0000
Deer Lake	Polk	37.75	0.0041
Bone Lake	Polk	36.25	0.0000
Big Arbor Vitae	Vilas	33.75	0.0000
Trout Lake	Vilas	35.75	0.0000

* Size at maximum divergence is determined from cumulative frequency distributions
**P-values are Monte Carlo estimates of exact p-values.

Further discussion and evaluation needs to occur about any potential population management implications of size selective spearing. This evaluation showed that size selection favoring the harvest of larger muskellunge does occur amongst tribal spearers. This evaluation does not show that there are or are not any negative consequences of that size selective harvest, either from a population sustainability standpoint or from a trophy management standpoint. Any potential impacts, if they exist, may differ between lakes with smaller size structures (e.g. Shell, Bone, Big Arbor Vitae) and those with larger size structures (e.g. Deer, Tomahawk). Implications may also be dependent on the specific population dynamics found within an individual lake.

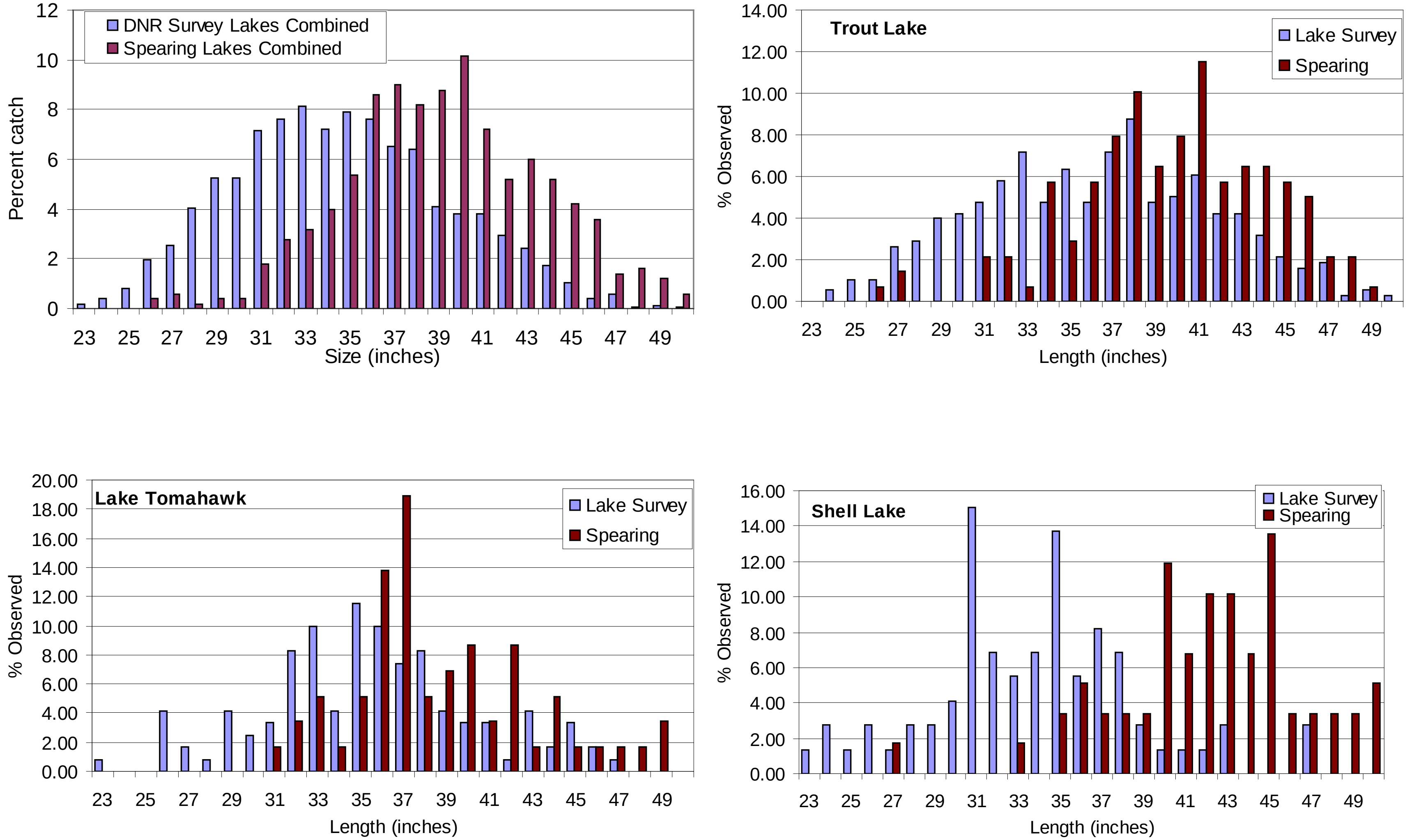

Figure 30. Length frequency distributions for adult muskellunge collected by DNR spring surveys and tribal spearfishing in all study lakes combined and in individual lakes.

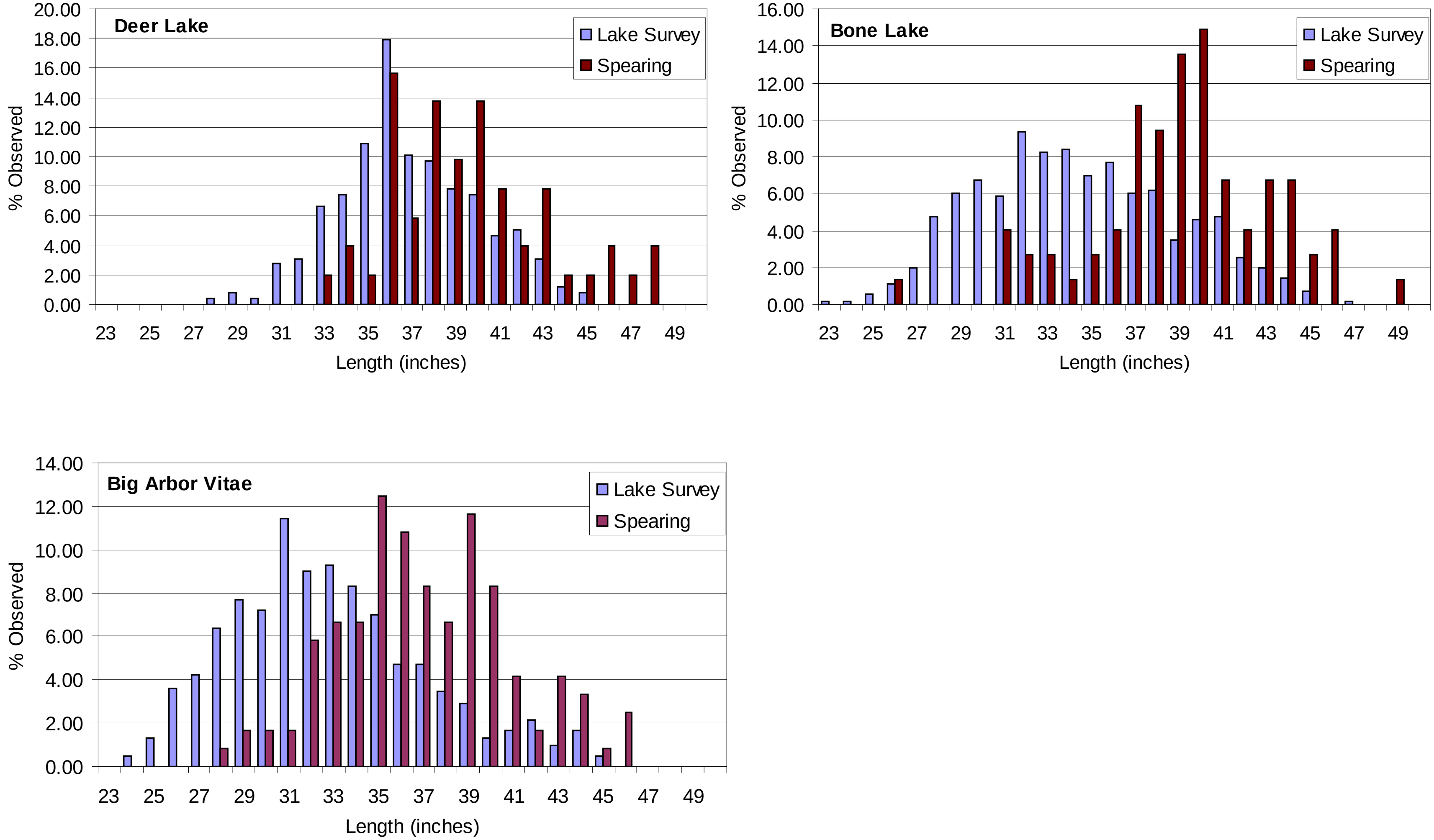

Figure 30 (continued). Length frequency distributions for adult muskellunge collected by DNR spring surveys and tribal spearfishing in all study lakes combined and in individual lakes.

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APPENDICES

Appendix A. WDNR Lake Sampling Rotation 2008-2013.

YEAR	TREATY UNIT	MWBC	COUNTY	LAKE	AREA	CURRENT MODEL	# LAKES	ROTATION
2008	Spooner	2949200	IRON	PINE	312	N	1	TREND
2008	Spooner	2620600	POLK	BALSAM	2,054	S	1	TREND
2008	Spooner		Burnett	Yellow/Little Yellow	2,635	**N**	2	Spatial
2008	Spooner	2704200	Sawyer	Nelson	2,503	**S**	1	Spatial
2008	Spooner	2105100	Barron	Bear	1,358	S	1	Spatial
2008	Spooner	2882300	Bayfield	Siskiwit	330	N	1	Spatial
2008	Spooner	2693700	Douglas	Bond	292	N	1	Spatial
2008	Spooner	2435700	Sawyer	Spider	1,454	S	1	Spatial
TOTAL	***Spooner***				***10,938***		***9***	
2008	Woodruff	1588200	ONEIDA	TWO SISTERS	719	N	1	TREND
2008	Woodruff		VILAS	BIG ARBOR VITAE	1,090	N	1	TREND
2008	Woodruff	1528300	Oneida	Willow Fl	5,135	N	1	Spatial
2008	Woodruff	1605800	Oneida	Sevenmile	503	**S**	1	Spatial
2008	Woodruff	2954800	Vilas	Oxbow	511	N	1	Spatial
2008	Woodruff		Vilas	Cisco Chain	1,539	N	3	Spatial
2008	Woodruff	683000	Forest	Stevens	297	S	1	Spatial
2008	Woodruff	439800	Oconto	Wheeler	293	N	1	Spatial
TOTAL	***Woodruff***				***10,087***		***10***	
2008	**TOTAL**				**21,025**		**19**	
2009	Spooner	2897100	BAYFIELD	DIAMOND	341	S	1	TREND
2009	Spooner	2391200	SAWYER	GRINDSTONE	3,111	N	1	TREND
2009	Spooner	2294900	Iron	Turtle-Flambeau	13,545	N	1	Spatial
2009	Spooner	2295200	Iron	Trude	781	N	1	Spatial
2009	Spooner	2676800	Burnett	Big Sand	1,400	0-ST	1	Spatial
2009	Spooner	1881100	Barron	Silver	337	N	1	Spatial
2009	Spooner	2747300	Douglas	Upper St. Croix	855	N	1	Spatial
TOTAL	***Spooner***				***20,370***		***7.0***	
2009	Woodruff	1018500	VILAS	SNIPE	239	N	1	TREND
2009	Woodruff	1592400	VILAS	PLUM	1,033	N	1	TREND
2009	Woodruff		Oneida	Tomahawk/Minocqua Chain	5,805	S	5	Spatial
2009	Woodruff		Vilas	Palmer/Tenderfoot	1,072	S / N	2	Spatial
2009	Woodruff	1515400	Lincoln	L Mohawksin	1,910	N	1	Spatial
TOTAL	***Woodruff***				***10,059***		***10***	
2009	**TOTAL**				**30,429**		**17**	

YEAR	TREATY UNIT	MWBC	COUNTY	LAKE	AREA	CURRENT MODEL	# LAKES	ROTATION
2010	Spooner	2678100	BURNETT	LIPSETT	393	S	1	TREND
2010	Spooner	2742100	BAYFIELD	MIDDLE EAU CLAIRE	902	N	1	TREND
2010	Spooner		Bayfield	Pike Lake Chain	714	N	4	Spatial
2010	Spooner		Sawyer	Round/Little Round	3,283	N	2	Spatial
2010	Spooner	2492100	Douglas	Red	258	**0-ST**	1	Spatial
2010	Spooner	2382300	Sawyer	Barber	238	S	1	Spatial
2010	Spooner	2393500	Sawyer	Sissabagama	719	N	1	Spatial
2010	Spooner	2303500	Iron	Long	396	S	1	Spatial
2010	Spooner	1884100	Washburn	Stone	523	**N**	1	Spatial
TOTAL	***Spooner***				***7,426***		***13***	
2010	Woodruff	394400	FOREST	L METONGA	1,991	S	1	TREND
2010	Woodruff	2331600	VILAS	TROUT	3,816	S	1	TREND
2010	Woodruff	1595300	Oneida	Rainbow Fl	2,035	N	1	Spatial
2010	Woodruff		Vilas	Turtle Chain	945	N	2	Spatial
2010	Woodruff	1855900	Vilas	Jag	158	N	1	Spatial
2010	Woodruff	1569600	Oneida	George	435	N	1	Spatial
2010	Woodruff	1564200	Oneida	Crescent	612	N	1	Spatial
TOTAL	***Woodruff***				***9,992***		***8***	
2010	**TOTAL**				**17,418**		**21**	
2011	Spooner	2949200	IRON	PINE	312	N	1	TREND
2011	Spooner	2620600	POLK	BALSAM	2,054	S	1	TREND
2011	Spooner	2399700	Sawyer	L Chippewa	15,300	N	1	Spatial
2011	Spooner	1841300	Sawyer	Clear	77	0-ST	1	Spatial
2011	Spooner	2046500	Sawyer	Windfall	102	N	1	Spatial
2011	Spooner	2767100	Bayfield	Long	263	S	1	Spatial
2011	Spooner	2914800	Ashland	English	244	S	1	Spatial
TOTAL	***Spooner***				***18,352***		***7***	
2011	Woodruff	1588200	ONEIDA	TWO SISTERS	719	N	1	TREND
2011	Woodruff		VILAS	BIG ARBOR VITAE	1,090	N	1	TREND
2011	Woodruff	1579900	Oneida	Pelican	3,585	**N**	1	Spatial
2011	Woodruff		Oneida	Rhinelander Chain	2,059	N	4	Spatial
2011	Woodruff	1591100	Vilas	Big St. Germain	1,617	**S**	1	Spatial
2011	Woodruff		Vilas	Ballard Chain	1,025	**N**	3	Spatial
2011	Woodruff	417400	Oconto	Archibald	430	**S**	1	Spatial
2011	Woodruff	1630100	Vilas	Black Oak	584	S	1	Spatial
TOTAL	***Woodruff***				***11,109***		***13***	
2011	**TOTAL**				**29,461**		**20**	

YEAR	TREATY UNIT	MWBC	COUNTY	LAKE	AREA	CURRENT MODEL	# LAKES	ROTATION
2012	Spooner	2897100	BAYFIELD	DIAMOND	341	S	1	TREND
2012	Spooner	2391200	SAWYER	GRINDSTONE	3,111	N	1	TREND
2012	Spooner		Barron	L Chetek Chain	3,763	S	4	Spatial
2012	Spooner	2627400	Polk	Big Round	1,015	S	1	Spatial
2012	Spooner		Rusk	Island Lake Chain	1,222	N	4	Spatial
2012	Spooner	2691500	Washburn	L Nancy	772	**S**	1	Spatial
2012	Spooner	2351400	Chippewa	Long	1,052	N	1	Spatial
2012	Spooner	2856400	Douglas	Lyman	403	**NR-2**	1	Spatial
2012	Spooner	2661100	Barron	Sand	322	S	1	Spatial
TOTAL	***Spooner***				***12,001***		***15***	
2012	Woodruff	1018500	VILAS	SNIPE	239	N	1	TREND
2012	Woodruff	1592400	VILAS	PLUM	1,033	N	1	TREND
2012	Woodruff		Lincoln/Oneida	Nokomis/Rice Chain	3,916	N	3	Spatial
2012	Woodruff	1595600	Oneida	Muskellunge	284	N	1	Spatial
2012	Woodruff	1623400	Vilas	Pioneer	427	**S**	1	Spatial
2012	Woodruff		Vilas	Presque Isle Chain	1,571	N	3	Spatial
2012	Woodruff		Vilas	Upper/Lower Buckatabon	846	S	2	Spatial
2012	Woodruff	2328700	Vilas	Papoose	428	N	1	Spatial
TOTAL	***Woodruff***				***8,744***		***13***	
2012	**TOTAL**				**20,745**		**28**	
2013	Spooner	2678100	BURNETT	LIPSETT	393	S	1	TREND
2013	Spooner	2742100	BAYFIELD	MIDDLE EAU CLAIRE	902	N	1	TREND
2013	Spooner	2496300	Washburn	Shell	2,580	N	1	Spatial
2013	Spooner	1764500	Taylor	Sackett	63	S	1	Spatial
2013	Spooner	2461100	Burnett	Devils	1,001	S	1	Spatial
2013	Spooner	2133200	Eau Claire	L Eau Claire	860	N	1	Spatial
2013	Spooner		Sawyer	Connors/L of the Pines	702	N	2	Spatial
2013	Spooner	2469800	Barron	Horseshoe	115	**S**	1	Spatial
2013	Spooner	1875900	Rusk	Pulaski	126	N	1	Spatial
TOTAL	***Spooner***				***6,742***		***10***	
2013	Woodruff	394400	FOREST	L METONGA	1,991	S	1	TREND
2013	Woodruff	2331600	VILAS	TROUT	3,816	S	1	TREND
2013	Woodruff		Vilas	Eagle Chain	4,174	N	10	Spatial
2013	Woodruff	1586600	Oneida	Spider	118	N	1	Spatial
2013	Woodruff	377900	Forest	Jungle	182	N	1	Spatial
TOTAL	***Woodruff***				***10,281***		***14***	
2013	**TOTAL**				**17,023**		**24**	

Appendix B. Reduced daily bag limits for walleye angling, based on Tribal Declarations as percentage of safe harvest. Reprinted from Wisconsin Administrative Code (NR 20.36).

Daily bag limit	Current population estimate	Population estimate made 1-2 years ago	Population estimate made 3 years ago or more or regression model
4	1-7	1-14	1-20
3	8-18	15-39	21-54
2	19-36	40-76	55-84
1	37-68	77-94	85-94
0	69 or more	95 or more	95 or more

Appendix C. Walleye Recruitment Code Descriptions (primary source of walleye recruitment; U.S. Department of the Interior, 1991).

Recruitment Code[1]	Recruitment Model[2]	Description
blank	None	unknown
NONE/ O	None	No walleye are present
REM	Remnant	Stocking provides the only source of recruitment but was discontinued. The stock is expected to disappear at some time in the future.
0-ST	Remnant	Stocking provides the only source of recruitment but was initiated only recently and has not yet resulted in a harvestable population of adults.
ST	Stocked	Stocking provides the only source of recruitment and is consistent enough to result in a multi-year class adult population.
C-ST	Stocked	Stocking provides the primary source of recruitment but some natural reproduction occurs and may augment the adult population.
C-	Natural	Natural reproduction and stocking provide more or less equal recruitment to the adult population.
C-NR	Natural	Natural reproduction is adequate to sustain the population even though the lake is being stocked.
NR	Natural	Natural reproduction only; consistent enough to result in multi-year class adult populations.
NR-2	Remnant	Natural reproduction only; inconsistent, results in missing year classes.

1 Recruitment Code = Designation of the *primary* recruitment source and done by a technical working group.

2 Recruitment Model is used for data analysis and groups various recruitment codes into one of three categories.

Appendix D. Creel Survey Summaries.

Walleye

County	Lake	MWBIC	Acres	WAE Recruit Code	Initial WEBag	Final WEBag	WESz	Adult PE	Adult PE/ Acre	Angler Catch	Angler Catch/ Acre	Angler Harvest	Angler Harvest/ Acre	Specific Catch Rate	Specific Harvest Rate	# Fish Measured	Mean Length	General Catch Rate	General Harvest Rate
Barron	Bear	2105100	1,358	ST	2	2	15	661	0.49	1,322	0.97	209	0.15	0.14	0.03	28	19.2	0.03	0.00
Bayfield	Siskiwit	2882300	330	NR	2	5	15	856	2.59	557	1.69	144	0.44	0.22	0.06	47	15.8	0.15	0.04
Burnett	Little Yellow	2674800	348	C-	2	3	15	182	0.52	124	0.36	110	0.32	0.00	0.00	1	15.3	0.02	0.01
Burnett	Yellow	2675200	2,287	C-NR	2	3	15	10,464	4.58	8,629	3.77	3,188	1.39	0.18	0.07	252	17.6	0.13	0.05
Douglas	Bond	2693700	293	NR-2	2	5	15	521	1.78	16	0.05	16	0.05	0.03	0.03	5	21.6	0.01	0.01
Iron	Pine	2949200	312	NR	2	3	1>14	2,752	8.82	1,764	5.65	985	3.16	0.59	0.33	174	11.9	0.35	0.20
Polk	Balsam	2620600	2,054	C-ST	2	2	15	1,956	0.95	2,482	1.21	274	0.13	0.08	0.02	15	17.2	0.03	0.00
Sawyer	Nelson	2704200	2,503	C-ST	2	2	15	1,411	0.56	2,218	0.89	189	0.08	0.18	0.02	16	18.5	0.03	0.00
Sawyer	Spider	2435700	1,454	ST	2	2	15	2,123	1.46	348	0.24	200	0.14	0.05	0.03	15	19.8	0.01	0.01
Forest	Stevens Lake	683000	297	C-ST	2	3	15	1,100	3.70	427	1.44	317	1.07	0.08	0.06	111	18.21	0.04	0.03
Vilas	Oxbow Lake	2954800	511	NR	3	3	1>14	2,238	4.38	4,308	8.43	1,327	2.60	0.83	0.25	248	12.50	0.32	0.10
Vilas	Big	2963800	771	NR	3	3	15	10,562	13.70	11,121	14.42	817	1.06	0.70	0.15	109	16.62	0.39	0.03
Vilas	Big Arbor Vitae	1545600	1,090	NR	3	3	1>14	6,290	5.77	2,983	2.74	2,002	1.84	0.13	0.09	246	14.05	0.05	0.03
Vilas	Mamie Lake	2964100	400	NR	2	3	15	4,439	11.10	1,662	4.16	262	0.66	0.35	0.06	50	17.68	0.20	0.03
Oneida	Sevenmile Lake	1605800	503	C-ST	2	3	1>14	647	1.29	313	0.62	230	0.46	0.09	0.07	67	15.92	0.03	0.02
Oneida	Two Sisters Lake	1588200	719	C-NR	3	3	15	1,976	2.75	312	0.43	190	0.26	0.06	0.04	52	20.44	0.04	0.02
Oconto	Wheeler Lake	439800	293	NR	2	3	15	811	2.77	192	0.66	153	0.52	0.04	0.03	29	17.07	0.02	0.01
Oneida	Willow Flowage*	1528300	5,135	NR	3	3	15	26,566	5.17	1,113	0.22	495	0.10	0.07	0.03	89	16.85	0.06	0.03

* Winter Creel Only (December-March)

Musky

County	Lake	MWBIC	Acres	Musky Recruit Code	Size Limit	Angler Catch	Angler Catch/ Acre	Angler Harvest	Angler Harvest/ Acre	Specific Catch Rate	Specific Harvest Rate	# Fish Measured	Mean Length	General Catch Rate	General Harvest Rate
Barron	Bear	2105100	1358	NONE	34										
Bayfield	Siskiwit	2882300	330	NONE	34										
Burnett	Little Yellow	2674800	348	ST	34	0	0.00	0	0.00	0.00	0.00	0		0.00	0.00
Burnett	Yellow	2675200	2287	ST	34	132	0.06	0	0.00	0.01	0.00	0		0.00	0.00
Douglas	Bond	2693700	293	NONE	34										
Iron	Pine	2949200	312	NR	40	93	0.30	0	0.00	0.04	0.00	0		0.02	0.00
Polk	Balsam	2620600	2054	NONE	34	0	0.00	0	0.00	0.00	0.00	0		0.00	0.00
Sawyer	Nelson	2704200	2503	REM	34										
Sawyer	Spider	2435700	1454	C-NR	34	1172	0.81	0	0.00	0.06	0.00	0		0.04	0.00
Forest	Stevens Lake	683000	297	NONE	34										
Vilas	Oxbow Lake	2954800	511	NR	34	314	0.61	0	0.00	0.05	0	0		0.02	0
Vilas	Big	2963800	771	C-	40	230	0.30	0	0.00	0.03	0	0		0.01	0
Vilas	Big Arbor Vitae	1545600	1090	C-	34	734	0.67	11	0.01	0.04	0	1	36.00	0.02	0
Vilas	Mamie Lake	2964100	400	NR	40	46	0.12	0	0.00	0.03	0	0		0.01	0
Oneida	Sevenmile Lake	1605800	503	NR	34	241	0.48	5	0.01	0.04	0	1	34.8	0.02	0
Oneida	Two Sisters Lake	1588200	719	C-	40	49	0.07	8	0.01	0.0300	0.0000	1	45.30	0.0100	0.0000
Oconto	Wheeler Lake	439800	293	NONE	34										
Oneida	Willow Flowage*	1528300	5135	C-ST	34	4									

* Winter Creel Only (December-March)

Northern Pike

County	Lake	MWBIC	Acres	Angler Catch	Angler Catch/ Acre	Angler Harvest	Angler Harvest/ Acre	Specific Catch Rate	Specific Harvest Rate	# Fish Measured	Mean Length	General Catch Rate	General Harvest Rate
Barron	Bear	2105100	1,358	10,310	7.59	1,400	1.03	0.40	0.08	169	21.90	0.22	0.03
Bayfield	Siskiwit	2882300	330	253	0.77	26	0.08	0.15	0.04	5	21.9	0.07	0.01
Burnett	Little Yellow	2674800	348	1,924	5.53	116	0.33	0.39	0.02	9	21.4	0.19	0.01
Burnett	Yellow	2675200	2,287	7,775	3.40	1,562	0.68	0.21	0.08	252	24.0	0.12	0.02
Douglas	Bond	2693700	293	8	0.03	0	0.00	0.01	0.00	0		0.00	0.00
Iron	Pine	2949200	312	10	0.03	0	0.00			0		0.02	
Polk	Balsam	2620600	2,054	4,556	2.22	260	0.13	0.18	0.02	27	27.7	0.05	0.00
Sawyer	Nelson	2704200	2,503	2,373	0.95	111	0.04	0.23	0.02	15	27.6	0.04	0.00
Sawyer	Spider	2435700	1,454	6	0.00	0	0.00			0		0.00	
Forest	Stevens Lake	683000	297	1,155	3.89	162	0.55	0.24	0.05	50	27.6	0.11	0.02
Vilas	Oxbow Lake	2954800	511	263	0.51	45	0.09	0.13	0.04	7	18.2	0.02	0.00
Vilas	Big	2963800	771	834	1.08	64	0.08	0.13	0.01	18	24.8	0.03	0.00
Vilas	Big Arbor Vitae	1545600	1,090	57	0.05	22	0.02	0.03	0.03	2	24.0	0.00	0.00
Vilas	Mamie Lake	2964100	400	548	1.37	245	0.61	0.25	0.14	52	23.7	0.07	0.03
Oneida	Sevenmile Lake	1605800	503	440	0.87	135	0.27	0.17	0.14	42	23.8	0.04	0.01
Oneida	Two Sisters Lake	1588200	719	235	0.33	30	0.04	0.17	0.04	14	29.2	0.04	0.00
Oconto	Wheeler Lake	439800	293	897	3.06	404	1.38	0.16	0.08	95	20.8	0.07	0.03
Oneida	Willow Flowage*	1528300	5,135	2,954	0.58	883	0.17	0.23	0.07	124	20.4	0.16	0.05

* Winter Creel Only (December-March)

Smallmouth Bass

County	Lake	MWBIC	Acres	Angler Catch	Angler Catch/ Acre	Angler Harvest	Angler Harvest/ Acre	Specific Catch Rate	Specific Harvest Rate	# Fish Measured	Mean Length	General Catch Rate	General Harvest Rate
Barron	Bear	2105100	1,358	355	0.26	12	0.01	0.09	0.00	1	14.10	0.01	0.00
Bayfield	Siskiwit	2882300	330	950	2.88	125	0.38	0.41	0.06	33	15.77	0.26	0.03
Burnett	Little Yellow	2674800	348	89	0.26	24	0.07	0.29	0.10	1	12.50	0.02	0.01
Burnett	Yellow	2675200	2,287	225	0.10	19	0.01	0.15	0.07	1	15.30	0.01	0.00
Douglas	Bond	2693700	293	317	1.08	68	0.23	0.26	0.03	13	16.42	0.15	0.03
Iron	Pine	2949200	312	252	0.81	9	0.03	0.30	0.02	2	16.35	0.06	0.00
Polk	Balsam	2620600	2,054	170	0.08	0	0.00	0.00	0.00	0		0.01	0.00
Sawyer	Nelson	2704200	2,503	52	0.02	0	0.00			0		0.01	0.00
Sawyer	Spider	2435700	1,454	1,090	0.75	37	0.03	0.09	0.00	1	17.00	0.04	0.00
Forest	Stevens Lake	683000	297	12	0.04	12	0.04			0		0.01	0.01
Vilas	Oxbow Lake	2954800	511	1,811	3.54	34	0.07	0.89	0.02	5	14.76	0.14	0.00
Vilas	Big	2963800	771	4,642	6.02	71	0.09	0.55	0.02	9	15.18	0.19	0.00
Vilas	Big Arbor Vitae	1545600	1,090	626	0.57	11	0.01	0.39	0.01	2	14.90	0.02	0.00
Vilas	Mamie Lake	2964100	400	363	0.91	25	0.06	0.23	0.04	1	17.50	0.06	0.00
Oneida	Sevenmile Lake	1605800	503	586	1.17	20	0.04	0.39	0.02	6	17.70	0.06	0.00
Oneida	Two Sisters Lake	1588200	719	2,062	2.87	87	0.12	0.64	0.03	17	15.69	0.28	0.01
Oconto	Wheeler Lake	439800	293	818	2.79	11	0.04	0.52	0.01	3	15.77	0.11	0.00
Oneida	Willow Flowage*	1528300	5,135	47	0.01	5	0.00	0.07	0.00	2	15.10	0.01	0.00

* Winter Creel Only (December-March)

Largemouth Bass

County	Lake	MWBIC	Acres	Angler Catch	Angler Catch/ Acre	Angler Harvest	Angler Harvest/ Acre	Specific Catch Rate	Specific Harvest Rate	# Fish Measured	Mean Length	General Catch Rate	General Harvest Rate
Barron	Bear	2105100	1,358	6,550	4.82	650	0.48	0.37	0.04	66	15.66	0.14	0.01
Bayfield	Siskiwit	2882300	330	4	0.01	0	0.00					0.01	0.00
Burnett	Little Yellow	2674800	348	1,320	3.79	145	0.42	0.70	0.02	6	15.80	0.15	0.02
Burnett	Yellow	2675200	2,287	1,719	0.75	278	0.12	0.57	0.08	16	15.89	0.03	0.01
Douglas	Bond	2693700	293	2,152	7.34	270	0.92	1.34	0.18	50	15.31	0.94	0.12
Iron	Pine	2949200	312	*	*	*	*	*	*	*	*	*	*
Polk	Balsam	2620600	2,054	68,993	33.59	2389	1.16	1.29	0.04	176	14.09	0.73	0.03
Sawyer	Nelson	2704200	2,503	18,763	7.50	2700	1.08	0.77	0.12	180	13.77	0.29	0.04
Sawyer	Spider	2435700	1,454	10,816	7.44	424	0.29	0.70	0.03	24	14.35	0.38	0.01
Forest	Stevens Lake	683000	297	145	0.49	32	0.11	0.27	0.05	7	17.66	0.02	0.00
Vilas	Oxbow Lake	2954800	511	308	0.60	9	0.02	0.19	0.02	1	12.00	0.04	0.00
Vilas	Big	2963800	771	273	0.35	0	0.00	0.30	0.00	0		0.02	0.00
Vilas	Big Arbor Vitae	1545600	1,090	5,135	4.71	16	0.01	0.73	0.00	2	14.90	0.09	0.00
Vilas	Mamie Lake	2964100	400	3	0.01	0	0.00	0.00	0.00	0		0.00	0.00
Oneida	Sevenmile Lake	1605800	503	183	0.36	13	0.03	0.15	0.01	3	15.03	0.02	0.00
Oneida	Two Sisters Lake	1588200	719	1,217	1.69	11	0.02	0.53	0.01	4	14.83	0.20	0.00
Oconto	Wheeler Lake	439800	293	3,390	11.57	134	0.46	0.57	0.03	38	15.63	0.27	0.01
Oneida	Willow Flowage*	1528300	5,135	47	0.01	5	0.00			0		0.01	0.00

* Winter Creel Only (December-March)

Appendix E. Walleye Population Estimates.

MWBC	County	Lake	Acres	Angler Reg	Recruit Code	PE - Males	CV Male PE	PE - Females	CV Female PE	M:F Ratio	Adult PE
683000	Forest	Stevens	297	15	C-ST	479	0.12	1206	0.41	0.40	1100
439800	Oconto	Wheeler	293	15	NR-2	713	0.29	144	0.31	4.95	811
1590400	Oneida	Pickerel	736	15	ST	66	0.21	175	0.35	0.38	305
1605800	Oneida	Sevenmile	503	1>14	C-ST	171	0.26	460	0.30	0.37	647
1588200	Oneida	Two Sisters	719	15	C-NR	745	0.14	1202	0.37	0.62	1976
1528300	Oneida	Willow Flowage	6,306	15	NR	18208	0.08	8663	0.26	2.10	26566
2963800	Vilas	Big (Mi)	771	15	NR	9418	0.12	794	0.31	11.86	10562
1545600	Vilas	Big Arbor Vitae	1,090	1>14	NR	3678	0.08	2997	0.50	1.23	6290
2338800	Vilas	Big Crooked	682	none	NR	1074	0.15	995	0.40	1.08	1898
1630100	Vilas	Black Oak	584	15	C-ST	420	0.07	653	0.31	0.64	890
2339900	Vilas	Escanaba	293	28	NR	937	0.14	557	0.27	1.68	2335
2964100	Vilas	Mamie	400	15	NR	3394	0.10	2760	0.64	1.23	4439
2954800	Vilas	Oxbow	511	1>14	NR	1948	0.13	235	0.36	8.29	2238
2336100	Vilas	Wolf	393	15	NR	1688	0.14	263	0.41	6.43	2492
399200	Langlade	Upper Post	757	15	C-ST	91	0.31	533	0.52	0.17	807
2403200	Ashland	Bear	204	15	NR	9	0.39	134	0.52	0.07	171
2105100	Barron	Bear	1,358	15	ST	427	0.12	101	0.42	4.23	661
2079000	Barron	Big Moon	191	15	C-ST	94	0.12	15	0.20	6.27	107
2631200	Barron	Staples	305	15	C-ST	4	0.00	105	0.47	0.04	172
2882300	Bayfield	Siskiwit	330	15	NR	607	0.06	657	0.45	0.92	856
2674800	Burnett	Little Yellow	348	15	C-	46	0.49	34	0.41	1.35	182
2675200	Burnett	Yellow	2,287	15	C-NR	8856	0.07	2353	0.29	3.76	10464
2351400	Chippewa	Long	1,052	Slot14-18	NR	4717	0.16	1505	0.35	3.13	7083
2693700	Douglas	Bond	293	15	NR-2	432	0.45	77	0.39	5.61	521
2949200	Iron	Pine	312	1>14	NR	2504	0.07	353	0.40	7.09	2752
2620600	Polk	Balsam	2,054	15	C-ST	1514	0.06	1283	0.44	1.18	1956
2704200	Sawyer	Nelson	2,503	15	C-ST	560	0.10	1439	0.34	0.39	1411
2435700	Sawyer	Spider	1,454	15	ST	596	0.24	1797	0.32	0.33	2123

Appendix F. Muskellunge Population Estimates.

Muskellunge population estimates were conducted over two years and completed in spring 2008; They represent 2007 population sizes. In year one, all sexable fish plus unknowns ≥ 30” are counted. In year two, all sexable fish plus unknowns ≥ 32” are counted, except take the lesser of 30” or the smallest half-inch group observed for each sex in the first year; for the second year, do not count sexable fish less than this minimum length plus 2”, or plus a different growth correction derived from the data for the lake. No stratification by length or sex is used, and the Chapman correction of the Petersen estimator is used, (M+1)(C+1)/(R+1).

MWBC	County	Lake	Acres	Angler Regulation (Min Size)	Recruit Code	Adult PE	CV of PE	Density #/Acre
2103900	Barron	Rice	859	40	ST	161	17.1	0.19
2742100	Bayfield	Middle Eau Claire	902	40	C-	154	17.3	0.17
716800	Vilas	Kentuck	957	40	NR	247	31.6	0.26
1545300	Vilas	Little Arbor Vitae	534	34	C-	306	13.4	0.57
1596300	Vilas	Little St. Germain	980	45	C-	229	16.9	0.23
2331600	Vilas	Trout	3,816	45	C-ST	226	15.2	0.06

Appendix G. YOY Walleye Survey Summaries.

Lake	County	WBIC	Acres	Walleye Recruit Code	Model	Date	Temp	Totshore	ShockMi	PerShock	ShockHr	Age0	Age0MinL	Age0MaxL	Age0Mod	Age0Hr	Age0/Mi	Serns	Hansen	Age1	Age1MinL	Age1MaxL	Age1Mod	Age1Hr	Age1/Mi
BEAR	ASHLAND	2403200	204	NR	natural	09/23/2008	69	6.0	2.9	48	1.0	3	5.0	6.1	NONE	3.00	1.03	N/A	N/A	2	9.4	9.5	NONE	2.00	0.69
MINERAL	ASHLAND	2916900	225	C-NR	natural	10/09/2008	54	5.3	5.3	100	1.8	65	4.4	6.6	5.5	36.11	12.26	2.87	1.74	144	7.8	9.8	9.0	80.00	27.17
SPILLERBERG	ASHLAND	2936200	75	NR	natural	10/06/2008	55	1.5	1.5	100	0.6	68	3.7	4.8	4.3	113.33	45.33	10.61	13.44	15	8.7	10.3	9.0	25.00	10.00
SILVER	BARRON	1881100	337	C-NR	natural	10/06/2008	59	4.4	4.4	100	2.6	7	5.0	6.4	NONE	2.69	1.59	0.37	0.07	2	7.5	9.4	NONE	0.77	0.45
BLADDER	BAYFIELD	2756200	81	NR	natural	09/22/2008	67	2.2	0.8	36	0.4	0				0.00	0.00	N/A	N/A	0				0.00	0.00
CRYSTAL	BAYFIELD	2897300	111	C-NR	natural	10/08/2008	58	2.5	2.5	100	1.1	11	5.5	7.9	5.5-5.9	10.00	4.40	N/A	N/A	0				0.00	0.00
DIAMOND	BAYFIELD	2897100	341	C-NR	natural	09/17/2008	64	5.0	5.0	100	1.4	0				0.00	0.00	0.00	0.00	24	7.9	10.5	8.4	17.14	4.80
MIDDLE EAU CLAIRE	BAYFIELD	2742100	902	C-NR	natural	10/01/2008	55-61	11.0	7.7	70	3.3	302	3.6	6.3	4.4	91.52	39.22	N/A	N/A	200	6.5	10.8	8.1	60.61	25.97
SISKIWIT	BAYFIELD	2882300	330	NR	natural	09/30/2008	60	4.0	4.0	100	1.7	116	3.7	7.6	4.2	68.24	29.00	6.79	6.68	5	10.3	11.1	11.1	2.94	1.25
YELLOW	BURNETT	2675200	2287	C-NR	natural	09/24/2008	64-67	7.9	7.9	100	2.7	56	4.2	8.3	4.4,7.6	20.74	7.09	N/A	N/A	5	9.1	10.9	NONE	1.85	0.63
LONG	CHIPPEWA	2351400	1052	NR	natural	10/13,14/2008	56	14.0	14.0	100	9.8	292	4.0	8.0	5.2	29.80	20.86	4.88	3.99	0				0.00	0.00
TAINTER	DUNN	2068000	1752	NR	natural	10/14/2008	55	25.7	3.6	14	2.5	385	4.0	5.9	5.0	154.00	106.94	N/A	N/A	42	7.0	9.2	7.6	16.80	11.67
ALTOONA	EAU CLAIRE	2128100	840	NR	natural	10/06/2008	57	9.4	10.0	106	3.7	40	5.1	7.8	6.8	10.81	4.00	N/A	N/A	295	8.1	11.8	9.7	79.73	29.50
L EAU CLAIRE	EAU CLAIRE	2133200	860	NR	natural	10/07/2008	57	24.3	8.2	34	4.6	167	6.2	8.4	7.4	36.30	20.37	N/A	N/A	29	10.1	11.9	11.3	6.30	3.54
PIKE	IRON	2299900	165	NR	natural	09/22/2008	60	2.7	2.7	100	1.4	20	5.5	6.9	5.5-5.9	14.29	7.41	1.73	0.79	18	8.5	10.9	9.5-9.9	12.86	6.67
PINE	IRON	2949200	312	NR	natural	09/25/2008	60-64	6.0	6.0	100	2.5	118	3.5	6.9	5.5-5.9	47.20	19.67	4.60	3.64	--->					
SPIRIT RESERVOIR	LINCOLN	1506800	1664	C-NR	natural	09/30/2008	58	50.3	4.1	8	2.0	50	4.5	6.8	5.7, 6.2	25.00	12.20	N/A	N/A	12	9.3	11.2		6.00	2.93
BASS	OCONTO	417900	142	C-NR	natural	10/22/2008	50	2.7	2.7	100	1.9	0				0.00	0.00	0.00	0.00	0				0.00	0.00
BOOT	OCONTO	418700	235	C-NR	natural	10/20/2008	52	3.8	3.8	100	2.7	0				0.00	0.00	0.00	0.00	0				0.00	0.00
BOLGER	ONEIDA	973000	119	C-NR	natural	09/08/2008	67	3.1	3.1	100	1.5	19	4.8	6.3	5.5	12.67	6.13	N/A	N/A	6	8.7	9.9		4.00	1.94
BUCKSKIN	ONEIDA	2272600	634	C-NR	natural	09/09/2008	62	6.3	6.2	98	3.3	52	4.5	6.9	5.7	15.76	8.39	1.96	0.96	0				0.00	0.00
MANSON	ONEIDA	1517200	236	C-NR	natural	09/26/2008	71	3.6	3.6	100	2.4	3	5.6	6.1		1.25	0.83	N/A	N/A	7	8.5	10.1		2.92	1.94
PELICAN	ONEIDA	1579900	3585	C-NR	natural	09/29/2008	61	16.7	16.7	100	8.7	106	3.9	7.9	6.1	12.18	6.35	N/A	N/A	107	8.2	10.7	9.4	12.30	6.41
RAINBOW FLOWAGE	ONEIDA	1595300	2035	C-NR	natural	09/30/2008	58	22.3	9.3	42	3.9	331	3.5	7.6	4.6	84.87	35.59	N/A	N/A	0				0.00	0.00
SWEENY	ONEIDA	1589600	187	C-NR	natural	09/16/2008	63	3.3	3.3	100	1.9	8	4.5	6.9	4.7	4.21	2.42	0.57	0.14	0				0.00	0.00
TWO SISTERS	ONEIDA	1588200	719	C-NR	natural	09/16/2008	65	9.3	9.3	100	3.9	26	5.1	6.7	6.3	6.67	2.80	0.65	0.17	0				0.00	0.00
WILLOW FLOWAGE	ONEIDA	1528300	6306	NR	natural	09/23/2008	66	98.4	23.9	24	11.2	496	3.1	6.9	4.2, 5.7	44.29	20.75	N/A	N/A	0				0.00	0.00
PIPE	POLK	2490500	284	C-NR	natural	09/30/2008	62	5.0	5.0	100	2.2	2	6.0	6.4	NONE	0.91	0.40	0.09	0.01	0				0.00	0.00
TURNER	PRICE	2268500	149	C-	natural	10/01/2008	57	2.6	2.6	100	1.1	1	6.0	6.0	NONE	0.91	0.38	0.09	0.01	4	8.5	9.7	NONE	3.64	1.54
BARKER	SAWYER	2400000	238	NR	natural	09/24/2008	66	6.3	4.8	76	1.1	4	5.0	6.4	NONE	3.64	0.83	N/A	N/A	7	8.0	9.4	NONE	6.36	1.46
GRINDSTONE	SAWYER	2391200	3111	C-NR	natural	09/18/2008	64-69	10.5	10.5	100	4.1	465	3.5	7.3	5.8	113.41	44.29	N/A	N/A	102	7.5	10.4	NONE	24.88	9.71
L CHIPPEWA	SAWYER	2399700	15300	C-NR	natural	09/16,17/2008	65-68	232.9	11.3	5	4.7	20	5.0	6.9	5.5-5.9	4.26	1.77	N/A	N/A	4	9.5	9.9	NONE	0.85	0.35
MOOSE	SAWYER	2420600	1670	NR	natural	09/9,10/2008	64-65	35.2	10.6	30	3.5	14	4.0	5.9	4.0-4.4	4.00	1.32	N/A	N/A	--->					
TEAL	SAWYER	2417000	1049	NR	natural	10/22/2008	50	11.8	2.8	24	1.5														
CEDAR	ST. CROIX	2615100	1100	NR	natural	10/15/2008	58	6.3	4.3	68	2.9	421	4.9	7.6	6.0	145.17	97.91	N/A	N/A						
ANNABELLE	VILAS	2953800	213	NR	natural	09/22/2008	63	4.2	3.4	81	2.4	126	4.3	6.3	5.2	52.50	37.06	N/A	N/A	41	7.7	9.7	8.8	17.08	12.06
BIG (MI)	VILAS	2963800	771	NR	natural	09/18/2008	63	13.8	9.5	69	4.0	49	4.0	6.0	4.5	12.25	5.16	N/A	N/A	0				0.00	0.00
BIG ARBOR VITAE	VILAS	1545600	1090	NR	natural	10/09/2008	54	7.8	7.8	100	3.5	74	5.2	7.1	6.3	21.14	9.49	2.22	1.16	39	7.4	10.5		11.14	5.00
BIG CROOKED	VILAS	2338800	682	NR	natural	09/10/2008	63	5.0	5.0	100	2.8	226	4.9	7.0	6.0	80.71	45.20	10.58	13.38	7	9.8	12.4		2.50	1.40
ESCANABA	VILAS	2339900	293	NR	natural	09/09/2008	62	5.2	5.2	100	2.8	451	4.1	6.0	4.7	161.07	86.73	20.30	37.08	40	7.3	9.6	8.2	14.29	7.69
LAC VIEUX DESERT	VILAS	1631900	4300	C-NR	natural	10/01/2008	53	16.5	6.5	39	3.0	0				0.00	0.00	N/A	N/A	3	9.3	10.8		1.00	0.46
LITTLE JOHN	VILAS	2332300	166	C-NR	natural	09/25/2008	64	3.3	3.0	91	1.2	400	4.1	8.2	6.6	333.33	133.33	31.20	72.65	0				0.00	0.00
MAMIE	VILAS	2964100	400	NR	natural	09/18/2008	62	5.9	5.9	100	2.0	82	3.7	6.1	5.6	41.00	13.90	N/A	N/A	0				0.00	0.00
OXBOW	VILAS	2954800	511	NR	natural	09/15/2008	62	13.5	13.5	100	6.8	222	4.2	5.7	4.6	32.65	16.44	3.85	2.75	0				0.00	0.00
PLUM	VILAS	1592400	1033	C-NR	natural	09/25/2008	65	14.5	14.5	100	7.3	1594	3.3	7.4	3.9, 5.7	218.36	109.93	25.72	53.72	0				0.00	0.00
SNIPE	VILAS	1018500	239	NR	natural	09/10/2008	63	3.5	3.5	100	1.8	322	3.4	6.9	5.5	178.89	92.00	21.53	40.66	0				0.00	0.00
WOLF	VILAS	2336100	393	NR	natural	10/06/2008	55	4.4	4.4	100	2.2	187	5.0	7.2	6.0	85.00	42.50	9.95	12.15	29	8.9	10.7	10.3	13.18	6.59

Lake	County	WBIC	Acres	Walleye Recruit Code	Model	Date	Temp	Totshore	ShockMi	PerShock	ShockHr	Age0	Age0MinL	Age0MaxL	Age0Mod	Age0Hr	Age0/Mi	Serns	Hansen	Age1	Age1MinL	Age1MaxL	Age1Mod	Age1Hr	Age1/Mi
RICHARDSON	FOREST	479700	47	O	none	09/25/2008	65	1.4	1.0	71	0.6	0				0.00	0.00	N/A	N/A	0				0.00	0.00
GLADE	LANGLADE	421200	26	O	none	09/25/2008	66	1.0	1.0	100	0.4	0				0.00	0.00	N/A	N/A	0				0.00	0.00
LOWER POST	LANGLADE	397100	378	O	none	09/25/2008	65	8.4	8.4	100	4.7	0				0.00	0.00	N/A	N/A	1	9.2	9.2		0.21	0.12
TURTLE	LANGLADE	379300	61	NONE	none	09/18/2008	59	2.1	2.1	100	0.7	0				0.00	0.00	N/A	N/A	0				0.00	0.00
EAST	POLK	2616900	246	NONE	none	09/25/2008	65	3.3	3.3	100	1.1	0				0.00	0.00	N/A	N/A	0				0.00	0.00
LAC DU LUNE	VILAS	2766200	426	NONE	none	10/13/2008	59	7.7	6.6	86	3.0	2	5.0	6.4		0.67	0.30	N/A	N/A	6	8.0	10.4		2.00	0.91
SMOKY	VILAS	1018300	610	NONE	none	10/20/2008	52	7.0	6.2	89	2.8	0				0.00	0.00	0.00	0.00	0				0.00	0.00
MOQUAH	ASHLAND	2918200	50	REM	remnant	10/02/2008	54	2.7	1.5	56	0.6	0				0.00	0.00	N/A	N/A	0				0.00	0.00
SPIDER	ASHLAND	2918600	103	0-ST	remnant	10/02/2008	57	2.7	2.7	100	1.0	0				0.00	0.00	N/A	N/A	0				0.00	0.00
BIG SAND	BURNETT	2676800	1400	0-ST	remnant	10/01/2008	54	7.6	5.7	75	2.0	0				0.00	0.00	0.00	0.00	0				0.00	0.00
DES MOINES	BURNETT	2674200	229	0-ST	remnant	09/22/2008	66	3.2	3.2	100	1.1	0				0.00	0.00	N/A	N/A	0				0.00	0.00
BOND	DOUGLAS	2693700	293	NR-2	remnant	09/30/2008	63	3.8	3.8	100	1.3	4	5.0	7.1	NONE	3.08	1.05	0.25	0.04	0				0.00	0.00
SUMMIT	LANGLADE	1445600	282	O-ST	remnant	09/17/2008	64	3.3	3.3	100	1.9	13	5.7	7.3		6.84	3.94	0.92	0.29	36	7.0	9.2	8.9	18.95	10.91
TOWNSEND FLOWAGE	OCONTO	465000	476	O-ST	remnant	10/15/2008	53	11.6	5.1	44	3.0	0				0.00	0.00	N/A	N/A	0				0.00	0.00
WHEELER	OCONTO	439800	293	NR-2	remnant	10/13/2008	58	4.6	4.6	100	3.1	3	6.4	7.1		0.97	0.65	0.15	0.02	0				0.00	0.00
THOMPSON	PRICE	2265900	111	NR-2	remnant	09/24/2008	65	1.9	1.9	100	0.8	0				0.00	0.00	N/A	N/A	0				0.00	0.00
BLAISDELL	SAWYER	2402200	356	NR-2	remnant	09/15/2008	62	7.6	4.9	64	2.0	0				0.00	0.00	N/A	N/A	1	9.0	9.4	NONE	0.50	0.20
KNUTESON	SAWYER	2114300	70	REM	remnant	09/08/2008	67	1.5	1.5	100	0.8	0				0.00	0.00	N/A	N/A	0				0.00	0.00
SPECTACLE	VILAS	717400	171	NR-2	remnant	09/18/2008	64	3.9	3.9	100	1.6	0				0.00	0.00	N/A	N/A	0				0.00	0.00
TAMBLING	VILAS	1603600	169	REM	remnant	09/24/2008	63	2.1	2.1	100	1.0	0				0.00	0.00	N/A	N/A	1	10.3	10.3		1.00	0.48
ENGLISH	ASHLAND	2914800	244	ST	stocked	10/07/2008	57	4.1	3.8	93	1.6	0				0.00	0.00	0.00	0.00	0				0.00	0.00
POTTER	ASHLAND	2917200	29	ST	stocked	10/06/2008	55	0.9	0.9	100	0.4	0				0.00	0.00	N/A	N/A	0				0.00	0.00
BEAR	BARRON	2105100	1358	ST	stocked	10/02/2008	54-61	14.9	12.0	81	3.6	0				0.00	0.00	0.00	0.00	1	11.0	11.0	NONE	0.28	0.08
BEAVER DAM	BARRON	2081200	1112	C-ST	stocked	10/01/2008	63	18.0	9.9	55	3.7	0				0.00	0.00	N/A	N/A	--->					
DRUMMOND	BAYFIELD	2899400	99	C-ST	stocked	09/22/2008	66	3.1	2.1	68	1.0	0				0.00	0.00	N/A	N/A	1	10.0	10.4	NONE	1.00	0.48
LIPSETT	BURNETT	2678100	393	ST	stocked	09/25/2008	63-67	3.5	3.5	100	1.2	2	6.5	6.9	NONE	1.67	0.57	N/A	N/A	0				0.00	0.00
STEVENS	FOREST	683000	297	C-ST	stocked	09/10/2008	63	3.3	3.0	91	1.3	1	5.9	5.9		0.77	0.33	0.08	0.01	0				0.00	0.00
BEARSKULL	IRON	2265100	75	C-ST	stocked	09/08/2008	54	2.2	2.2	100	0.9	0				0.00	0.00	0.00	0.00	0				0.00	0.00
UPPER POST	LANGLADE	399200	757	C-ST	stocked	09/25/2008	64	7.6	7.6	100	3.7	0				0.00	0.00	0.00	0.00	17	7.1	9.0	8.2	4.59	2.24
PESABIC	LINCOLN	1481600	146	ST	stocked	09/22/2008	66	2.3	2.1	91	0.9	0				0.00	0.00	0.00	0.00	0				0.00	0.00
PINE	LINCOLN	1012100	134	ST	stocked	09/15/2008	62	2.7	2.7	100	1.0	0				0.00	0.00	N/A	N/A	0				0.00	0.00
SEVEN ISLAND	LINCOLN	1490300	132	C-ST	stocked	09/16/2008	64	4.0	4.0	100	2.2	0				0.00	0.00	0.00	0.00	1	9.8	9.8		0.45	0.25
SOMO	LINCOLN	1547700	472	C-ST	stocked	09/24/2008	66	14.2	6.0	42	3.1	0				0.00	0.00	N/A	N/A	0				0.00	0.00
SQUAW	LINCOLN	1564400	79	ST	stocked	09/29/2008	62	2.3	2.3	100	1.2	0				0.00	0.00	0.00	0.00	0				0.00	0.00
PICKEREL	ONEIDA	1590400	736	ST	stocked	09/17/2008	65	7.7	7.7	100	3.8	9	4.9	6.8		2.37	1.17	N/A	N/A	0				0.00	0.00
SEVENMILE	ONEIDA	1605800	503	C-ST	stocked	09/22/2008	64	6.1	6.1	100	1.4	91	6.0	7.7	6.7	65.00	14.92	3.49	2.36	0				0.00	0.00
BALSAM	POLK	2620600	2054	C-ST	stocked	09/29/2008	61-65	22.7	22.7	100	7.4	0				0.00	0.00	0.00	0.00	10	10.1	11.9	NONE	1.35	0.44
BIG BUTTERNUT	POLK	2641000	378	C-ST	stocked	09/16/2008	65	3.4	3.4	100	1.3	0				0.00	0.00	N/A	N/A	21	9.5	11.4	9.5-9.9	16.15	6.18
HALF MOON	POLK	2621100	579	ST	stocked	09/15/2008	65	7.1	7.1	100	2.2	0				0.00	0.00	0.00	0.00	0				0.00	0.00
WARD	POLK	2599400	91	ST	stocked	09/17/2008	68	2.3	2.3	100	1.0	0				0.00	0.00	N/A	N/A	0				0.00	0.00
LOST LAND	SAWYER	2418600	1304	C-ST	stocked	10/08/2008	57	11.3	8.8	78	4.1														
LOST LAND	SAWYER	2418600	1304	C-ST	stocked	10/22/2008	48	11.3	3.6	32	1.1														
NELSON	SAWYER	2704200	2503	C-ST	stocked	09/30/2008	57-62	31.4	31.4	100	9.6	11	6.0	8.6	NONE	1.15	0.35	N/A	N/A	14	9.2	11.8	NONE	1.46	0.45
SPIDER	SAWYER	2435700	1454	ST	stocked	10/01/2008	54-60	20.8	20.8	100	6.5	0				0.00	0.00	0.00	0.00	84	6.8	10.4	8.7	12.92	4.04
ARROWHEAD	VILAS	1541500	99	C-ST	stocked	10/22/2008	51	2.0	2.0	100	1.1	10	6.8	8.0		9.09	5.00	1.17	0.43	0				0.00	0.00
BLACK OAK	VILAS	1630100	584	C-ST	stocked	10/06/2008	62	7.4	7.0	95	2.3	13	5.1	6.9		5.65	1.86	0.43	0.09	1	9.5	9.9		0.43	0.14
DEAD PIKE	VILAS	2316600	297	ST	stocked	09/15/2008	64	3.8	3.1	81	1.2	0				0.00	0.00	0.00	0.00	0				0.00	0.00
MOON	VILAS	1005800	131	C-ST	stocked	09/17/2008	63	2.0	2.0	100	0.8	1	6.2	6.2		1.25	0.50	0.12	0.01	11	9.3	10.5		13.75	5.50
MUSKELLUNGE	VILAS	1596600	272	ST	stocked	09/29/2008	61	3.6	3.4	94	1.8	3	5.9	6.3		1.67	0.88	0.21	0.03	0				0.00	0.00
SPARKLING	VILAS	1881900	154	C-ST	stocked	09/10/2008	65	2.4	2.4	100	1.0	0				0.00	0.00	0.00	0.00	2	9.7	10.0		2.00	0.83
TROUT	VILAS	2331600	3816	C-ST	stocked	10/08/2008	58	17.9	7.0	39	3.1	52	3.9	6.9	5.6	16.77	7.43	N/A	N/A	6	7.8	9.6		1.94	0.86
WHITE SAND	VILAS	2339100	734	C-ST	stocked	10/02/2008	59	5.5	4.3	79	2.2	39	5.5	7.1	6.4	17.73	9.07	2.12	1.09	0				0.00	0.00
WILDCAT	VILAS	2336800	505	ST	stocked	10/08/2008	56	5.0	4.5	90	2.1	56	5.3	7.6	7.2	26.67	12.44	2.91	1.78	0				0.00	0.00
SILVER	WASHBURN	2496900	188	ST	stocked	09/29/2008	60	3.2	3.2	100	1.1	0				0.00	0.00	0.00	0.00	0				0.00	0.00
BUTTERNUT	BARRON	2105800	141		#N/A	09/22/2008	66	2.6	2.6	100	1.2	0				0.00	0.00	N/A	N/A	0				0.00	0.00
CHIPPEWA	BAYFIELD	2431300	274		#N/A	09/17/2008	62	4.3	2.3	53	0.9	0				0.00	0.00	N/A	N/A	0				0.00	0.00
BONER	BURNETT	2454500	89		#N/A	10/06/2008	57	1.8	1.8	100	0.8	0				0.00	0.00	N/A	N/A	0				0.00	0.00

Appendix H. Walleye Exploitation Rates.

H-1. Information on fin clipped fish in population (prior to creel) and those observed in angler creels used to estimate angler harvest and exploitation rates.

							Clips Given Prior to Creel				Clips Observed in Creel					
Year	**WBIC**	**County**	**Lake**	**Acres**	**Recruit. Code**	**Size Limit**	**Clip Given**	**# Clips Given**	**#Clips ≥14”**	**#Clips ≥20”**	**# Clips Observed**	**# Clips Projected**	**# Clips Obs. ≥14”**	**# Clips Proj. ≥14”**	**# Clips Obs. ≥20”**	**# Clips Proj. ≥20”**
2008	2105100	Barron	Bear	1358	ST	15	LP	291	232	66	4	23	4	23	4	23
2008	2882300	Bayfield	Siskiwit	330	NR	15	LP	593	517	0	17	53	17	53	0	0
2008	2675200	Burnett	Yellow	2287	C-NR	15	RP, LV	2,745	2,599	206	32	302	32	302	4	38
2008	2693700	Douglas	Bond	293	NR-2	15	LP	151	151	70	0	0	0	0	0	0
2008	2949200	Iron	Pine	312	NR	1>14	LP	1,196	99	9	20	130	4	26	0	0
2008	2620600	Polk	Balsam	2054	C-ST	15	AN	958	862	178	2	87	2	87	1	44
2008	2704200	Sawyer	Nelson	2503	C-ST	15	LP	542	540	299	1	7	1	7	0	0
2008	2435700	Sawyer	Spider	1454	ST	15	LP	458	430	168	2	37	2	37	0	0
2008	683000	Forest	Stevens Lake	297	C-ST	15	LV	457	457	100	29	94	29	94	5	16
2008	2954800	Vilas	Oxbow Lake	511	NR	1>14	RV	473	65	10	12	60	5	25	0	0
2008	2963800	Vilas	Big	771	NR	15	RP	1,524	456	45	13	70	13	70	0	0
2008	1545600	Vilas	Big Arbor Vitae	1090	NR	1>14	RP	1,626	761	171	30	249	14	116	0	0
2008	2964100	Vilas	Mamie Lake	400	NR	15	LP	954	488	40	0	0	0	0	0	0
2008	1605800	Oneida	Sevenmile Lake	503	C-ST	1>14	LV	256	251	160	5	19	5	19	1	4
2008	1588200	Oneida	Two Sisters Lake	719	C-NR	15	RP	531	527	311	12	50	12	50	10	42
2008	439800	Oconto	Wheeler Lake	293	NR	15	LV	314	313	7	15	70	15	70	0	0
2008	1528300	Oneida	Willow Flowage*	5135	NR	15	LV	3,962	3,185	271	3	53	3	53	1	18

* Winter Creel Only

H-2. Estimated angler and tribal harvest and associated walleye exploitation rates for lakes surveyed during the 2008/2009 fishing season.

County	Lake	Acres	Adult PE	Total PE	Angler Harvest	Tribal Harvest	Total Harvest	Angler Exploitation	Angler Exploitation ≥14”	Angler Exploitation ≥20”	Tribal Exploitation	Total Exploitation
Barron	Bear	1,358	661	--	209	40	249	0.0790	0.0991	0.3485	0.0605	0.1396
Bayfield	Siskiwit	330	856	--	144	0	144	0.0894	0.1025	0.0000	0.0000	0.0894
Burnett	Yellow	2,287	10,464	--	3,188	344	3,532	0.1100	0.1162	0.1833	0.0329	0.1429
Douglas	Bond	293	521	--	16	0	16	0.0000	0.0000	0.0000	0.0000	0.0000
Iron	Pine	312	2,752	--	985	27	1,012	0.1087	0.2626	0.0000	0.0098	0.1185
Polk	Balsam	2,054	1,956	--	274	143	417	0.0908	0.1009	0.2444	0.0731	0.1639
Sawyer	Nelson	2,503	1,411	--	189	101	290	0.0129	0.0130	0.0000	0.0716	0.0845
Sawyer	Spider	1,454	2,123	--	200	98	298	0.0808	0.0860	0.0000	0.0462	0.1269
Forest	Stevens Lake	297	1,100	--	317	81	398	0.2057	0.2057	0.1621	0.0736	0.2793
Vilas	Oxbow Lake	511	2,238	--	1,327	109	1,436	0.1268	0.3846	0.0000	0.0487	0.1756
Vilas	Big	771	10,562	--	817	786	1,603	0.0459	0.1535	0.0000	0.0744	0.1203
Vilas	Big Arbor Vitae	1,090	6,290	--	2,002	308	2,310	0.1531	0.1527	0.0000	0.0490	0.2021
Vilas	Mamie Lake	400	4,439	--	262	0	262	0.0000	0.0000	0.0000	0.0000	0.0000
Oneida	Sevenmile Lake	503	647	--	230	45	275	0.0742	0.0757	0.0238	0.0696	0.1438
Oneida	Two Sisters Lake	719	1,976	--	190	96	286	0.0942	0.0949	0.1340	0.0486	0.1427
Oconto	Wheeler Lake	293	811	--	153	67	220	0.2229	0.2236	0.0000	0.0826	0.3055
Oneida	Willow Flowage	5,135	26,566	--	495	427	922	0.0134	0.0166	0.0652	0.0161	0.0294

Appendix I. Safe harvest of walleye and musky calculated for individual lakes within the Wisconsin Ceded Territory during 2008.

County	Lake Name	WBIC Code	Area (acres)	Walleye Method	Walleye SH	Musky Method	Musky SH
Ashland	Augustine L	2410400	166			Other	6
Ashland	Bear L	2403200	204	Other	85	Other	7
Ashland	Beaver Dam L	2916700	118			Other	5
Ashland	Beaver L	2935400	25			Other	2
Ashland	Cub L	1842600	31			Other	2
Ashland	Day L	2430300	641			Other	14
Ashland	E Twin L	2429000	110			Other	5
Ashland	English L	2914800	244	Other	33	Other	8
Ashland	Eureka L	2935600	39			Other	2
Ashland	Gordon L	2406500	142	Other	60	Other	5
Ashland	L Galilee	2935500	213	Other	12	Other	7
Ashland	Meder L	2935300	135	Other	19		
Ashland	Mineral L	2916900	225	1-2 Year Pe	111	Other	7
Ashland	Moquah L	2918200	50			Other	3
Ashland	Pelican L	2404800	46	Other	20	Other	3
Ashland	Potter L	2917200	29	Other	5		
Ashland	Spider L	2918600	103	Other	7	Other	4
Ashland	Spillerberg L	2936200	75	Other	32	Other	4
Ashland	Tea L	2922700	50	Other	22		
Ashland	Torrey L	2406700	29			Other	2
Ashland	Upper Clam L	2429600	165	Other	23	Other	6
Ashland	Zielke L	2406900	21	Other	9		
Barron	Bass L	1832800	118	Other	8		
Barron	Bear L	2105100	1358	Other	153		
Barron	Beaver Dam L	2081200	1112	1-2 Year Pe	93		
Barron	Big Dummy L	1835100	111	Other	16		
Barron	Big Moon L	2079000	191	Other	27	Other	7
Barron	Duck L	2100300	100	Other	43		
Barron	Echo L	2630200	161	Other	10		
Barron	Granite L	2100800	154	1-2 Year Pe	64		
Barron	Horseshoe L	2469800	115	Other	17		
Barron	Horseshoe L	2630100	377	Other	17		
Barron	L Chetek	2094000	770	Other	93		
Barron	L Montanis	2103200	200	Other	28		
Barron	Little Sand L	2661600	101			Other	4
Barron	Loon L	2478600	94	Other	14		
Barron	Lower Devils L	1864000	162	Other	68		
Barron	Lower Turtle L	2079700	276	Other	37		
Barron	Lower Vermillion L	2098200	208	Other	29		
Barron	Mud L	2094600	577	Other	72		
Barron	Pokegama L	2094300	506	Other	64		
Barron	Poskin L	2098000	150	Other	21		
Barron	Prairie L	2094100	1534	Other	171		
Barron	Red Cedar L	2109600	1841	1-2 Year Pe	392		
Barron	Rice L	2103900	939			Other	18
Barron	Sand L	2661100	322	Other	43	Other	9
Barron	Scott L	2630700	81	Other	12		
Barron	Silver L	1881100	337	Other	137		
Barron	Spring L	1882800	60	Other	26		
Barron	Staples L	2631200	305	Other	41		
Barron	Tenmile L	2089500	376	Other	17		
Barron	Upper Devils L	2043500	86	Other	6		
Barron	Upper Turtle L	2079800	438	Other	176		
Bayfield	Armstrong L	2754600	48	Other	21		
Bayfield	Atkins L	2734000	176	Other	73		
Bayfield	Bellevue L	2755800	65	Other	5		
Bayfield	Bladder L	2756200	81	Other	35		
Bayfield	Bony L	2742500	191	Other	79	Other	7
Bayfield	Buffalo L	1837700	190	Other	11	Other	7
Bayfield	Buskey Bay	2903800	100	Other	43	Other	4
Bayfield	Camp One L	2965700	37	Other	16		
Bayfield	Chippewa L	2431300	319			Other	9

County	Lake Name	WBIC Code	Area (acres)	Walleye Method	Walleye SH	Musky Method	Musky SH
Bayfield	Cisco L	2899200	95	Other	14		
Bayfield	Cranberry L	2732800	58	Other	5		
Bayfield	Crystal L	2874700	94	Other	7		
Bayfield	Crystal L	2897300	111	1-2 Year Pe	25		
Bayfield	Deep L	2760100	125	Other	8		
Bayfield	Diamond L	2897100	341	1-2 Year Pe	48		
Bayfield	Drummond L	2899400	130	Other	19		
Bayfield	Eagle L	2902900	170	Other	10	Other	6
Bayfield	Everett L	2761600	34	Other	3		
Bayfield	Finger L	2965500	76	Other	6		
Bayfield	Flynn L	2902800	29	Other	3	Other	2
Bayfield	Ghost L	2423900	142			Other	5
Bayfield	Hammil L	2467900	83	Other	6		
Bayfield	Hart L	2903200	259	Other	106	Other	8
Bayfield	Hildur L	2902600	67			Other	3
Bayfield	Iron L	2877000	248	Other	13		
Bayfield	Jackson L	2734200	142	Other	9		
Bayfield	Kelly L	2472000	56	Other	5		
Bayfield	Kern L	2900500	91	Other	39		
Bayfield	L Millicent	2903700	183	Other	76	Other	6
Bayfield	L Owen	2900200	1323	Other	504		
Bayfield	L Ruth	2765900	66	Other	5		
Bayfield	L Tahkodah	2473500	152	Other	9		
Bayfield	Little Siskiwit L	2882200	37	Other	16		
Bayfield	Long L	2767100	263	Other	35		
Bayfield	Marengo L	2921100	99	Other	42		
Bayfield	Mccarry L	2903400	32			Other	2
Bayfield	Middle Eau Claire L	2742100	902	Other	350	Other	17
Bayfield	Mill Pond L	2899700	62	Other	27		
Bayfield	Mullenhoff L	2876500	69	Other	5		
Bayfield	Muskellunge L	2903600	45	Other	4		
Bayfield	Namekagon L	2732600	3227	Other	1175	Other	37
Bayfield	Perch L	2770800	25	Other	11		
Bayfield	Pigeon L	2489400	213	Other	12		
Bayfield	Samoset L	2494800	46	Other	4		
Bayfield	Siskiwit L	2882300	330	1-2 Year Pe	121		
Bayfield	Spider L	2774200	75	Other	6		
Bayfield	Spider L	2876200	124	Other	8		
Bayfield	Swett L	2743700	88	Other	38		
Bayfield	Trapper L	2734500	84	Other	36		
Bayfield	Twin Bear L	2903100	172	Other	72	Other	6
Bayfield	Upper Eau Claire L	2742700	996	Other	385	Other	18
Burnett	Big Bear L	2705700	189	Other	11		
Burnett	Big Mckenzie L	2706800	1185	Other	136	Other	21
Burnett	Big Sand L	2676800	1400	Other	36		
Burnett	Big Trade L	2638700	304			Other	9
Burnett	Clam R Fl	2654500	359	Other	145		
Burnett	Clear L	2457600	115	Other	8		
Burnett	Danbury Fl	2674500	256			Other	8
Burnett	Des Moines L	2674200	229	Other	12	Other	7
Burnett	Devils L	2461100	1001	Other	117		
Burnett	Dunham L	2651800	243	Other	33		
Burnett	Elbow L	2463100	233	Other	12		
Burnett	Lipsett L	2678100	393	Other	51		
Burnett	Little Mcgraw L	2477000	55	Other	9		
Burnett	Little Trade L	2639300	130			Other	5
Burnett	Little Yellow L	2674800	348	Other	141	Other	10
Burnett	Long L	2674100	251	Other	13		
Burnett	Lower Twin L	2480000	123	Other	8		
Burnett	Poquettes L	2491100	97	Other	14		
Burnett	Rice L	2677900	311			Other	9
Burnett	Rooney L	2493100	322	Other	43		
Burnett	Round L	2640100	204	Other	28		
Burnett	Sand L	2495100	962	1-2 Year Pe	38		

County	Lake Name	WBIC Code	Area (acres)	Walleye Method	Walleye SH	Musky Method	Musky SH
Burnett	Twenty-Six L	2672500	230			Other	7
Burnett	Viola L	2598600	285	Other	14		
Burnett	Yellow L	2675200	2287	Other	848	Other	30
Chippewa	Axhandle L	2092500	84	Other	6		
Chippewa	Chippewa Falls Fl	2152600	282	Other	115		
Chippewa	Cornell Fl	2181400	577	Other	229	Other	13
Chippewa	Cornell L	2171000	194	Other	11		
Chippewa	Holcombe Fl	2184900	3890	Other	1402	Other	42
Chippewa	L Wissota	2152800	6300	1-2 Year Pe	1595	Other	55
Chippewa	Long L	2351400	1052	1-2 Year Pe	362	Other	19
Chippewa	Old Abe L	2174700	1072	Other	413	Other	19
Chippewa	Otter L	2157000	661	Other	81		
Chippewa	Popple L	2173900	90	Other	13		
Chippewa	Round L	2169200	216	Other	30	Other	7
Clark	Mead L	2143900	320	Other	21	Other	5
Douglas	Amnicon L	2858100	426	1-2 Year Pe	152	Other	11
Douglas	Bass L	2451700	126	Other	53		
Douglas	Bear L	2857700	49	Other	21	Other	3
Douglas	Beauregard L	2452400	93	Other	40		
Douglas	Bond L	2693700	292	Other	14		
Douglas	Clear L	2457700	36	Other	16		
Douglas	Dowling L	2858300	154	Other	65	Other	6
Douglas	Hoodoo L	2763900	32	Other	3		
Douglas	L Minnesuing	2866200	432	Other	173		
Douglas	L Nebagamon	2865000	914	1-2 Year Pe	121		
Douglas	Leader L	2693800	165	Other	69		
Douglas	Lower Eau Claire L	2741600	802	Other	313	Other	16
Douglas	Lund L	2480300	75	Other	6		
Douglas	Lyman L	2856400	403	Other	18	Other	11
Douglas	Person L	2488600	172	Other	10		
Douglas	Red L	2492100	258	Other	13		
Douglas	Upper St Croix L	2747300	855	Other	333		
Douglas	Whitefish L	2694000	832	1-2 Year Pe	92		
Dunn	Tainter L	2068000	1752	Other	659		
Eau Claire	Altoona L	2128100	840	Other	164	Other	8
Eau Claire	Dells Pond	2149900	739	Other	290	Other	15
Eau Claire	Halfmoon L	2125400	132	Other	19		
Eau Claire	L Eau Claire	2133200	860	Other	167	Other	8
Florence	Emily L	651600	191	Other	27		
Florence	Fay L	677100	247	Other	13		
Florence	Fisher L	704200	54	Other	4		
Florence	Halsey L	679300	512	Other	20		
Florence	Keyes L	672900	202	Other	84		
Florence	Patten L	653700	255	Other	105		
Florence	Pine R Fl	651300	127	Other	54		
Florence	Sea Lion L	672300	125	1-2 Year Pe	6		
Forest	Arbutus L	181400	161	Other	23		
Forest	Birch L	555500	468	Other	187		
Forest	Butternut L	692400	1292	1-2 Year Pe	131		
Forest	Crane L	388500	337	1-2 Year Pe	30		
Forest	Franklin L	692900	892	Other	347		
Forest	Ground Hemlock L	395900	88	Other	13		
Forest	Howell L	691800	177	Other	10		
Forest	Jungle L	377900	182	Other	76		
Forest	King L	501700	33	Other	15		
Forest	L Lucerne	396500	1026	1-2 Year Pe	111		
Forest	L Metonga	394400	1991	Other	215		
Forest	Lily L	376900	211	1-2 Year Pe	210	Other	7
Forest	Little Long L	190500	102	Other	7		
Forest	Mole L	390600	73	Other	6		
Forest	Pine L	406900	1670	Other	184		
Forest	Quartz L	591000	47			Other	3
Forest	Range Line L	478200	82	Other	12		
Forest	Riley L	557100	213			Other	7

County	Lake Name	WBIC Code	Area (acres)	Walleye Method	Walleye SH	Musky Method	Musky SH
Forest	Roberts L	378400	414	Other	53	Other	11
Forest	Silver L	555700	320	Other	15	Other	9
Forest	Stevens L	683000	297	Other	40		
Forest	Trump L	479300	172	Other	24		
Forest	Wabikon L	556900	594			Other	13
Forest	Windfall L	373500	55			Other	3
Iron	Bearskull L	2265100	75	Other	11		
Iron	Big Pine L	2270700	632	Other	249	Other	14
Iron	Boot L	2297800	180	Other	25	Other	6
Iron	Catherine L	2309100	118	Other	17		
Iron	Cedar L	2309700	193	Other	27	Other	7
Iron	Charnley L	1840400	71	Other	5		
Iron	Clear L	2303700	67	Other	5	Other	3
Iron	Echo L	2301800	220	Other	91	Other	7
Iron	Fisher L	2307300	452	Other	58	Other	11
Iron	French L	1849600	92	Other	7	Other	4
Iron	Gile Fl	2942300	3384	Other	1229	Other	38
Iron	Grand Portage L	2314100	144	Other	21	Other	5
Iron	Grant L	2312500	107	Other	7	Other	4
Iron	Hewitt L	2763300	78			Other	4
Iron	Island L	2945500	352	Other	46	Other	10
Iron	L Of The Falls	2298300	338	Other	137	Other	9
Iron	L Tahoe	2314000	37	Other	3	Other	2
Iron	Little Martha L	2314700	35	Other	3	Other	2
Iron	Long L	2303500	396	Other	51	Other	10
Iron	Lower Springstead L	2267000	95	Other	41	Other	4
Iron	Martha L	2314300	146	Other	61		
Iron	Mcdermott L	2296500	84	Other	6		
Iron	Mercer L	2313600	184	Other	26	Other	6
Iron	Moose L	2299300	269			Other	8
Iron	Mud L	2316400	56	Other	24		
Iron	Muskie L	2266800	81	Other	35	Other	4
Iron	N Bass L	1868900	180	Other	10	Other	6
Iron	Owl L	2307600	129	Other	19	Other	5
Iron	Oxbow L	2302300	80	Other	34	Other	4
Iron	Pardee L	2308000	206	Other	85	Other	7
Iron	Pike L	2299900	194	Other	81	Other	7
Iron	Pine L	2949200	312	1-2 Year Pe	182	Other	9
Iron	Plunkett L	2325200	48	Other	4		
Iron	Randall L	2318500	115	Other	49	Other	5
Iron	Rice L	2300600	125	Other	53	Other	5
Iron	Sandy Beach L	2316100	111	Other	47		
Iron	Saxon Falls Fl	2941100	41	Other	18	Other	2
Iron	Second Black L	2298600	60	Other	26		
Iron	Spider L	2306300	352	Other	143	Other	10
Iron	Stone L	2267200	82	Other	6	Other	4
Iron	Third Black L	2298800	68	Other	29		
Iron	Trude L	2295200	781	Other	305	Other	16
Iron	Turtle-Flambeau Fl	2294900	13545	Other	4547	Other	86
Iron	Upper Springstead L	2267100	126	Other	53	Other	5
Iron	Virgin L	2304500	119			Other	5
Iron	Wilson L	2297000	162			Other	6
Langlade	Big Twin L	182200	60	Other	5		
Langlade	Deep Wood L	1445100	72			Other	3
Langlade	Duck L	981500	123	Other	8		
Langlade	Enterprise L	1579700	505	1-2 Year Pe	45	1-2 Year Pe	25
Langlade	Goto L	348700	28	Other	3		
Langlade	Greater Bass L	1445500	246			Other	8
Langlade	Jessie L	188700	35	Other	3		
Langlade	Lawrence L	997300	50	Other	8		
Langlade	Moccasin L	1005600	110	1-2 Year Pe	9	1-2 Year Pe	4
Langlade	Mueller L	194000	88	Other	13		
Langlade	Otter L	387200	83	1-2 Year Pe	54		
Langlade	Pickerel L	388100	1299	Other	34		

County	Lake Name	WBIC Code	Area (acres)	Walleye Method	Walleye SH	Musky Method	Musky SH
Langlade	Rolling Stone L	389300	672	Other	82		
Langlade	Rose L	494200	112	Other	16		
Langlade	Sawyer L	198100	149	Other	62		
Langlade	Summit L	1445600	282	Other	14	Other	8
Langlade	Upper Post L	399200	757	Other	91		
Langlade	Water Power L	1445400	22			Other	2
Langlade	White L	365500	166	Other	10		
Lincoln	Alexander L	1494600	677	Other	24	Other	15
Lincoln	Bass L	969600	100	Other	15		
Lincoln	Crystal L	979100	109	Other	16		
Lincoln	Deer L	1519600	152	Other	64	Other	6
Lincoln	Grandfather Fl	1502400	223	Other	12		
Lincoln	Grandmother Fl	1503000	119	Other	8		
Lincoln	Jersey City Fl	1516000	433	Other	174	Other	11
Lincoln	L Alice	1555900	1369	Other	521	Other	22
Lincoln	L Mohawksin	1515400	1910	Other	715	Other	27
Lincoln	L Nokomis	1516500	2433	Other	899	Other	32
Lincoln	Long L	1001000	132	Other	19		
Lincoln	Merrill Fl	1481100	164	Other	69		
Lincoln	Muskellunge L	1555500	167	Other	24		
Lincoln	Pesabic L	1481600	146	Other	21		
Lincoln	Pine L	1012100	134	Other	19	Other	5
Lincoln	Rice R Fl	1516400	920	Other	357	Other	18
Lincoln	Seven Island L	1490300	132	1-2 Year Pe	27	Other	5
Lincoln	Silver L	1017400	82	Other	35		
Lincoln	Somo L	1547700	472	1-2 Year Pe	102	Other	12
Lincoln	Spirit R Fl	1506800	1663	1-2 Year Pe	499	Other	25
Lincoln	Squaw L	1564400	82	Other	12	Other	4
Lincoln	Thompson L	1022200	30			Other	2
Lincoln	Tug L	1482400	151	Other	63	Other	6
Marathon	Big Eau Pleine Reserv	1427400	6830	Other	1909	Other	46
Marathon	L Wausau	1437500	1918	Other	72	Other	3
Marathon	Mayflower L	310500	98	Other	15		
Marathon	Mission L	1005400	107			Other	4
Marathon	Pike L	1406300	205	Other	28		
Marathon	Wausau Dam L	1469700	284	Other	11		
Marinette	Big Newton L	498800	68	Other	29		
Marinette	Caldron Falls Reservo	545400	1018	Other	30	Other	19
Marinette	High Falls Reservoir	540600	1498	Other	568		
Marinette	Hilbert L	501200	247	Other	34		
Marinette	Johnson Falls Fl	533300	68	Other	29		
Marinette	Little Newton L	502300	60	Other	26		
Marinette	Oneonta L	503300	66	Other	5		
Marinette	Sandstone Fl	531300	153	Other	32		
Oconto	Archibald L	417400	430	Other	55	Other	11
Oconto	Bass L	417900	149	Other	62		
Oconto	Bear L	471200	78	Other	6		
Oconto	Boot L	418700	235	Other	97	Other	7
Oconto	Boulder L	491800	362	Other	16		
Oconto	Boundary L	499000	37	Other	3		
Oconto	Crooked L	462000	143	Other	9		
Oconto	Horn L	467100	132	Other	8		
Oconto	John L	470600	103	Other	7		
Oconto	Maiden L	487500	290	Other	39		
Oconto	Munger L	470900	97	Other	7	Other	4
Oconto	Paya L	425600	121	Other	8		
Oconto	Townsend Fl	465000	476	Other	19		
Oconto	Waubee L	439500	137	Other	9		
Oconto	Wheeler L	439800	293	Other	120		
Oneida	Aldridge L	967400	134	Other	56		
Oneida	Alva L	968100	201	Other	83		
Oneida	Baker L	1546000	42	Other	18		
Oneida	Bass L	1580300	124	Other	52	Other	5
Oneida	Bear L	1527800	312	Other	41		

County	Lake Name	WBIC Code	Area (acres)	Walleye Method	Walleye SH	Musky Method	Musky SH
Oneida	Bearskin L	1523600	400	1-2 Year Pe	464	Other	10
Oneida	Big Carr L	971600	213	Other	88	Other	7
Oneida	Big Fork L	1610700	690	Other	271	Other	15
Oneida	Big L	1613000	865	Other	337	Other	17
Oneida	Big Stone L	1612200	548	Other	218	Other	13
Oneida	Birch L	1523800	180	Other	75		
Oneida	Bird L	972000	99	Other	42		
Oneida	Blue L	1538600	456	Other	183		
Oneida	Bolger L	973000	119	Other	17		
Oneida	Boom L	1580200	437	Other	175	Other	11
Oneida	Booth L	1537800	207	Other	29	Other	7
Oneida	Bridge L	1516800	411	Other	165	Other	11
Oneida	Brown L	973700	98	Other	7		
Oneida	Buckskin L	2272600	634	1-2 Year Pe	340	Other	10
Oneida	Buffalo L	974200	104	Other	44		
Oneida	Burrows L	975000	156	Other	9	Other	6
Oneida	Carrol L	1544800	352	1-2 Year Pe	30	Other	10
Oneida	Chain L	1598000	219	Other	90	Other	7
Oneida	Clear L	977100	36	Other	3		
Oneida	Clear L	977200	30	Other	13	Other	2
Oneida	Clear L	977400	62	Other	27	Other	3
Oneida	Clear L	977500	846	1-2 Year Pe	220	1-2 Year Pe	10
Oneida	Clear L	2272555	212	Other	86	Other	7
Oneida	Clearwater L	1616400	351	Other	142	Other	10
Oneida	Columbus L	1616900	670	Other	264		
Oneida	Crescent L	1564200	612	1-2 Year Pe	275	Other	14
Oneida	Crooked L	1613300	176	Other	10		
Oneida	Cunard L	1590000	43	Other	19		
Oneida	Currie L	979300	96	Other	41		
Oneida	Dam L	1596900	744	1-2 Year Pe	223	Other	15
Oneida	Deer L	1612300	177	Other	74	Other	6
Oneida	Diamond L	1537100	124	Other	52	Other	5
Oneida	Dog L	1590200	37	Other	3		
Oneida	Dog L	1612900	216	Other	89	Other	7
Oneida	E Horsehead L	1523000	184	Other	77	Other	6
Oneida	E Twin L	982400	47	Other	4		
Oneida	Echo L	1597800	107	Other	45	Other	4
Oneida	Emma L	983500	223	Other	31		
Oneida	Fifth L	1571100	240	Other	99	Other	8
Oneida	Fish L	1570600	70	Other	30	Other	3
Oneida	Fourmile L	1610800	218	Other	90	Other	7
Oneida	Fourth L	1572000	258	Other	106	Other	8
Oneida	Franklin L	986000	161	Other	23	Other	6
Oneida	Fuller L	2272000	101	Other	7		
Oneida	Garth L	986600	114	Other	48		
Oneida	George L	1569600	435	Other	175	Other	11
Oneida	Gilmore L	1589300	301	Other	40	Other	9
Oneida	Hancock L	1517900	259	Other	13	Other	8
Oneida	Hasbrook L	1589100	302	Other	123	Other	9
Oneida	Hat Rapids Fl	1567325	650	Other	256		
Oneida	Hemlock L	989200	39	Other	17		
Oneida	Hill L	990200	30	Other	3		
Oneida	Hixon L	1568900	50	Other	4		
Oneida	Hodstradt L	990700	126	Other	18		
Oneida	Indian L	1598900	397	Other	160		
Oneida	Island L	1610500	295	Other	120	Other	9
Oneida	Jennie Webber L	1574300	226	Other	31		
Oneida	Julia L (Three Lakes)	1614300	401	Other	52	Other	10
Oneida	Kate Pier L	1586300	34	Other	15		
Oneida	Kathan L	1598300	189	Other	79		
Oneida	Katherine L	1543300	590	Other	234	Other	13
Oneida	Kawaguesaga L	1542300	670	Other	264	Other	14
Oneida	Killarney L	1520900	421	Other	18		
Oneida	L Creek	1580500	172	Other	72	Other	6

County	Lake Name	WBIC Code	Area (acres)	Walleye Method	Walleye SH	Musky Method	Musky SH
Oneida	L Julia (Rhinelander)	995000	238	Other	98	Other	8
Oneida	L Seventeen	996100	172	Other	24		
Oneida	L Thompson	1569900	382	1-2 Year Pe	46	Other	10
Oneida	Laurel L	1611800	232	Other	96	Other	7
Oneida	Little Bearskin L	1523500	164	Other	23		
Oneida	Little Carr L	998800	52	Other	4		
Oneida	Little Fork L	1610600	354	Other	143	Other	10
Oneida	Little Tomahawk L	1543900	160	Other	23	Other	6
Oneida	Lone Stone L	1605600	172	Other	10	Other	6
Oneida	Long L	1001300	113	Other	48	Other	5
Oneida	Long L	1609000	620	Other	245	Other	14
Oneida	Long L	1618300	56	Other	24	Other	3
Oneida	Lost L	1575100	155	Other	65		
Oneida	Lower Kaubashine L	1534800	187	Other	26	Other	6
Oneida	Lumen L	1002800	49	Other	21		
Oneida	Madeline L	1544700	159			Other	6
Oneida	Manson L	1517200	236	1-2 Year Pe	37	Other	7
Oneida	Maple L	1609900	144	Other	9		
Oneida	Margaret L	1615900	88	Other	38		
Oneida	Marion L	1003100	62	Other	5		
Oneida	Mars L	1577100	41	Other	18		
Oneida	Mccormick L	1526600	118	Other	8		
Oneida	Medicine L	1611700	372	Other	150	Other	10
Oneida	Mercer L	1538900	257	Other	105	Other	8
Oneida	Mid L	1542600	215	Other	12	Other	7
Oneida	Mildred L	1004600	191	1-2 Year Pe	16		
Oneida	Minocqua L	1542400	1360	Other	518	Other	22
Oneida	Moccasin L	1612100	95	Other	41	Other	4
Oneida	Moen L	1573800	460	Other	19	Other	11
Oneida	Mud L	1544000	41	Other	18		
Oneida	Mud L	1612500	124	Other	8	Other	5
Oneida	Muskellunge L	1595600	284	Other	116	Other	8
Oneida	Muskie L	1524300	43	Other	4		
Oneida	N Nokomis L	1595800	476	1-2 Year Pe	173	Other	12
Oneida	N Two L	1007500	146	Other	61		
Oneida	Oatmeal L	1597300	97	Other	7		
Oneida	Oneida L	1518200	255	Other	105	Other	8
Oneida	Paradise L	1009400	89	Other	13		
Oneida	Pelican L	1579900	3585	Other	1298	Other	40
Oneida	Pickerel L	1583000	49	Other	4		
Oneida	Pickerel L	1590400	736	Other	89	Other	15
Oneida	Pier L	1529700	257	Other	35		
Oneida	Pine L	1012200	203	Other	84		
Oneida	Pine L	1581700	240	Other	99	Other	8
Oneida	Planting Ground L	1609100	1012	Other	391	Other	19
Oneida	Prairie L	1013000	58	Other	25		
Oneida	Rainbow Fl	1595300	2035	Other	759	Other	28
Oneida	Range Line L	1610300	123	Other	52	Other	5
Oneida	Rhinelander Fl	1580100	1326	Other	505	Other	22
Oneida	Rocky Run Fl	1525500	96	Other	41		
Oneida	Round L	1610400	150	Other	63	Other	6
Oneida	S Pine L	1580700	77	Other	33		
Oneida	S Two L	1015500	214	Other	88		
Oneida	Sand L	1597000	540	1-2 Year Pe	214	Other	13
Oneida	Scotchman L	1016200	33	Other	3		
Oneida	Second L	1572300	111	Other	47	Other	5
Oneida	Sevenmile L	1605800	503	Other	63	Other	12
Oneida	Shepard L	1576100	179	Other	10	Other	6
Oneida	Shishebogama L	1539600	716	Other	43	Other	8
Oneida	Skunk L	1533200	130	Other	55		
Oneida	Soo L	1018900	135	Other	57	Other	5
Oneida	Spider L	1586600	118	Other	50	Other	5
Oneida	Spirit L	1612000	368	Other	149	Other	10
Oneida	Squash L	1019500	392	Other	17		

County	Lake Name	WBIC Code	Area (acres)	Walleye Method	Walleye SH	Musky Method	Musky SH
Oneida	Squirrel L	1536300	1317	1-2 Year Pe	844	Other	22
Oneida	Stella L	1575700	405	Other	18	Other	11
Oneida	Stone L	1597600	188			Other	6
Oneida	Stone L	2272700	248	Other	102		
Oneida	Sunday L	1020600	88	Other	6		
Oneida	Sunset L	1572500	33	Other	15	Other	2
Oneida	Swamp L	1522400	296	Other	39		
Oneida	Swamsauger L	1528700	141	Other	59		
Oneida	Sweeney L	1589600	187	Other	78	Other	6
Oneida	Tamarack L	1582200	99	Other	42		
Oneida	Third L	1572200	103	Other	44	Other	4
Oneida	Thunder L	1580400	172	Other	72	Other	6
Oneida	Thunder L	1618100	1768	1-2 Year Pe	401		
Oneida	Tim Lynn L	1597400	84	Other	36		
Oneida	Tom Doyle L	1586800	102	Other	15	Other	4
Oneida	Tomahawk L	1542700	3392	Other	342	1-2 Year Pe	43
Oneida	Townline L	1609600	152	Other	64	Other	6
Oneida	Turtle L	1587400	53	Other	4		
Oneida	Two Sisters L	1588200	719	1-2 Year Pe	210	1-2 Year Pe	11
Oneida	Upper Kaubashine L	1535000	190	Other	79	Other	7
Oneida	Venus L	1577000	65	Other	28		
Oneida	Virgin L	1614100	276	Other	113	Other	8
Oneida	W Horsehead L	1522900	145	Other	9	Other	5
Oneida	W Twin L	1177400	28	Other	3		
Oneida	Walters L	1582800	61	Other	26		
Oneida	Whitefish L	1613500	205	Other	11	Other	7
Oneida	Wildwood L	1178600	28	Other	5		
Oneida	Willow Fl	1528300	5135	Other	1823	Other	49
Oneida	Willow L	1529500	395	Other	17	Other	10
Polk	Antler L	2449400	101	Other	7		
Polk	Apple R Fl	2624200	639			Other	14
Polk	Balsam L	2620600	2054	1-2 Year Pe	182		
Polk	Bear L	2452200	155	Other	65		
Polk	Big Blake L	2627000	217	Other	12		
Polk	Big Butternut L	2641000	378	Other	49		
Polk	Big Round L	2627400	1015	Other	118		
Polk	Bone L	2628100	1781			1-2 Year Pe	137
Polk	Church Pine L	2616100	107	Other	7		
Polk	Clear L	2623500	30	Other	3		
Polk	Deer L	2619400	807			Other	16
Polk	Half Moon L	2621100	579	1-2 Year Pe	39		
Polk	Indianhead Fl	2634400	776	Other	303		
Polk	Little Butternut L	2640700	189	Other	26		
Polk	Magnor L	2624600	224	Other	31		
Polk	Mckeith L	2481500	72	Other	6		
Polk	N Pipe L	2485700	58	Other	25		
Polk	N Twin L	2623900	135	Other	9		
Polk	Pike L	2624000	159	Other	10		
Polk	Pipe L	2490500	284	Other	116		
Polk	Poplar L	2491000	125	Other	8		
Polk	Sand L	2495000	187	Other	26		
Polk	Vincent L	2598500	70	Other	5		
Polk	Wapogasset L	2618000	1186	Other	136		
Polk	Ward L	2599400	91	Other	14		
Portage	Tree L	289400	74	Other	6		
Price	Amik L	2268600	224			Other	7
Price	Bass L	2282200	58	Other	25	Other	3
Price	Big Dardis L	2244200	144	Other	21	Other	5
Price	Butternut L	2283300	1006	Other	389	Other	19
Price	Crane + Chase L	2237500	86	Other	37	Other	4
Price	Crowley Fl	2287200	422	Other	18	Other	11
Price	Deer L	2239100	145			Other	5
Price	Duroy L	2240100	379	Other	153	Other	10
Price	Elk L	2240000	88	Other	38	Other	4

County	Lake Name	WBIC Code	Area (acres)	Walleye Method	Walleye SH	Musky Method	Musky SH
Price	Grassy L	2238100	81	Other	35	Other	4
Price	Island L	2260900	29	Other	3		
Price	Lac Sault Dore	2236800	561	Other	223	Other	13
Price	Long L	2239300	418	Other	168	Other	11
Price	Long L	2282000	241	Other	99	Other	8
Price	Lower Park Falls Fl	2290100	71	Other	31	Other	3
Price	Miles L	2271100	32			Other	2
Price	Musser L	2245100	563	Other	70	Other	13
Price	N Spirit L	1515200	213	Other	29	Other	7
Price	Pike L	2268300	806	1-2 Year Pe	244	1-2 Year Pe	12
Price	Pixley Fl	2288900	334	Other	136	Other	9
Price	Round L	2267800	726	1-2 Year Pe	370	1-2 Year Pe	16
Price	Schnur L	2284000	158	Other	66	Other	6
Price	Solberg L	2242500	859	Other	334	Other	17
Price	Spirit L	1513000	126			Other	5
Price	Thompson L	2265900	111	Other	8	Other	5
Price	Tucker L	2269000	118	Other	8		
Price	Turner L	2268500	149	1-2 Year Pe	27	Other	6
Price	Upper Park Falls Fl	2290500	431			Other	11
Price	Upper Price L	2235300	43			Other	2
Price	Whitcomb L	2266100	44	Other	7	Other	2
Price	Wilson L	2239400	351	Other	142	Other	10
Price	Worcester L	2210900	100	Other	43		
Rusk	Amacoy L	2359700	278	Other	37	Other	8
Rusk	Audie L	2368700	128			Other	5
Rusk	Bass L	2090900	88	Other	6		
Rusk	Big Falls Fl	2230100	369	Other	149	Other	10
Rusk	Chain L	2350500	468	Other	59	Other	12
Rusk	Clear L	2350600	95	Other	14	Other	4
Rusk	Dairyland Reservoir	2229200	1745	Other	656	Other	26
Rusk	Fireside Lakes	2349500	302	Other	123		
Rusk	Island L	2350200	526	Other	66	Other	12
Rusk	Ladysmith Fl	2228700	288	Other	118	Other	9
Rusk	Mccann L	2350400	133	Other	19	Other	5
Rusk	Perch L	2368500	23			Other	2
Rusk	Potato L	2355300	534	Other	67	Other	13
Rusk	Pulaski L	1875900	126	Other	53		
Rusk	Sand L	2353600	262	Other	35	Other	8
Rusk	Thornapple Fl	2227500	268	Other	110	Other	8
St. Croix	Cedar L	2615100	1100	Other	423	Other	20
Sawyer	Barber L	2382300	238	Other	32	Other	8
Sawyer	Barker L	2400000	238	Other	98	Other	8
Sawyer	Beverly L	2387200	9			Other	1
Sawyer	Black Dan L	2381900	128	Other	8	Other	5
Sawyer	Black L	2401300	129	Other	8	Other	5
Sawyer	Blaisdell L	2402200	356	Other	16	Other	10
Sawyer	Boos L	2425000	37	Other	16	Other	2
Sawyer	Burns L	2436400	37	Other	3	Other	2
Sawyer	Callahan L	2434700	106			Other	4
Sawyer	Clear L	1841300	77			Other	4
Sawyer	Connors L	2275100	429	Other	172	Other	11
Sawyer	Durphee L	2396800	193	Other	80		
Sawyer	Evergreen L	2277600	200	Other	83	Other	7
Sawyer	Fawn L	2435900	23	Other	2		
Sawyer	Fishtrap L	2401100	216			Other	7
Sawyer	Ghost L	2423000	372	1-2 Year Pe	47	Other	10
Sawyer	Grimh Fl	2385100	86	Other	6	Other	4
Sawyer	Grindstone L	2391200	3111	1-2 Year Pe	210	Other	18
Sawyer	Ham L	1852300	100	Other	43		
Sawyer	Hayward L	2725500	247	Other	102	Other	8
Sawyer	Holmes L	2419600	62			Other	3
Sawyer	Hunter L	2400600	126	Other	53	Other	5
Sawyer	Island L	2381800	67	Other	5	Other	3
Sawyer	L Chetac	2113300	1920	1-2 Year Pe	909		

County	Lake Name	WBIC Code	Area (acres)	Walleye Method	Walleye SH	Musky Method	Musky SH
Sawyer	L Chippewa	2399700	15300	Other	3390	Other	61
Sawyer	L Of The Pines	2275300	273	Other	112	Other	8
Sawyer	L Placid	2436500	160	Other	10	Other	6
Sawyer	L Winter	2381100	676	Other	24	Other	15
Sawyer	Lac Courte Oreilles	2390800	5039	Other	1169	Other	32
Sawyer	Lewis L	1860200	52	Other	4		
Sawyer	Little Round L	2395500	229	Other	76		
Sawyer	Little Sissabagama L	2394100	299			Other	9
Sawyer	Loretta L	2382700	126			Other	5
Sawyer	Lost Land L	2418600	1304	Other	148	Other	22
Sawyer	Lovejoy L	2395900	76	Other	33		
Sawyer	Lower Clam L	2429300	229	Other	31	Other	7
Sawyer	Mason L	2277200	190	Other	79	Other	7
Sawyer	Meadow L	2424800	39	Other	17	Other	2
Sawyer	Mirror L	1866900	38	Other	3		
Sawyer	Moose L	2420600	1670	Other	629	Other	25
Sawyer	Mud L	2434800	480	Other	19	Other	12
Sawyer	Nelson L	2704200	2503	Other	262		
Sawyer	North L	2436000	129	Other	8	Other	5
Sawyer	Partridge Crop L	2424600	45	Other	20	Other	3
Sawyer	Perch L	1873600	129	Other	8	Other	5
Sawyer	Radisson Fl	2397400	255	Other	105	Other	8
Sawyer	Round L	2395600	3054	Other	1115	Other	36
Sawyer	Sand L	2393200	928	Other	109	Other	18
Sawyer	Sissabagama L	2393500	719	Other	282	Other	15
Sawyer	Smith L	2726100	323	Other	15		
Sawyer	Spider L	2435700	1454	Other	163	Other	23
Sawyer	Squaw L	2395100	208	Other	14		
Sawyer	Teal L	2417000	1049	Other	404	Other	19
Sawyer	Teal R Fl	2416900	75	Other	32	Other	4
Sawyer	Tiger Cat Fl	2435000	819	Other	98	Other	16
Sawyer	Whitefish L	2392000	786	Other	94	Other	16
Sawyer	Windfall L	2046500	102	1-2 Year Pe	93		
Sawyer	Windigo L	2046600	522	Other	208		
Taylor	Anderson L	2165700	43	Other	4		
Taylor	Diamond L	1757200	49	Other	21		
Taylor	Esadore L	1764000	46	Other	4		
Taylor	Hulls L	1762700	67	Other	5		
Taylor	Kathryn L	2166100	62	Other	10		
Taylor	Mondeaux Fl	2193300	416			Other	11
Taylor	N Harper L	2204000	54	Other	23	Other	3
Taylor	Rib L	1469100	320	Other	130	Other	9
Taylor	S Harper L	2204100	80	Other	12		
Taylor	Sackett L	1764500	63	Other	10		
Taylor	Shearer L	2197600	21	Other	2		
Vilas	Alder L	2329600	274	Other	112	Other	8
Vilas	Allequash L	2332400	426	Other	55	Other	11
Vilas	Alma L	967900	55	Other	9	Other	3
Vilas	Annabelle L	2953800	213	Other	88	Other	7
Vilas	Anvil L	968800	380	1-2 Year Pe	230		
Vilas	Apeekwa L	2269400	188	Other	78	Other	6
Vilas	Armour L	2953200	320	Other	130	Other	9
Vilas	Arrowhead L	1541500	99	Other	15	Other	4
Vilas	Averill L	2956700	71	1-2 Year Pe	11	Other	3
Vilas	Ballard L	2340700	505	Other	201	Other	12
Vilas	Bass L	1604200	266	Other	13	Other	8
Vilas	Bear L	2335400	76	Other	12	Other	4
Vilas	Beaver L	2960600	68	Other	5		
Vilas	Belle L	2955700	53	Other	23	Other	3
Vilas	Benson L	2327100	28	Other	12	Other	2
Vilas	Big Arbor Vitae L	1545600	1090	1-2 Year Pe	720	1-2 Year Pe	68
Vilas	Big Crooked L	2338800	682	1-2 Year Pe	159	Other	15
Vilas	Big Donahue L	971700	92	Other	7		
Vilas	Big Gibson L	1835200	116	Other	49	Other	5

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Vilas	Big Hurst L	2756000	48	Other	4		
Vilas	Big Kitten L	2336700	55	Other	5	Other	3
Vilas	Big L (Boulder Jct)	2334700	835	1-2 Year Pe	297	Other	17
Vilas	Big L (Mi Border)	2963800	771	Other	239	Other	13
Vilas	Big Muskellunge L	1835300	930	1-2 Year Pe	343	Other	18
Vilas	Big Portage L	1629500	638	1-2 Year Pe	390		
Vilas	Big Sand L	1602600	1408	Other	158	Other	23
Vilas	Big St Germain L	1591100	1617	1-2 Year Pe	1005	Other	25
Vilas	Bills L	1835500	37			Other	0
Vilas	Birch L	2311100	528	Other	210	Other	12
Vilas	Black Oak L	1630100	584	Other	72		
Vilas	Boot L	1619100	284	Other	38	Other	8
Vilas	Boot L	2756400	29	Other	3	Other	2
Vilas	Boulder L	2338300	524	1-2 Year Pe	276	Other	12
Vilas	Brandy L	1541300	110	Other	16	Other	5
Vilas	Carpenter L	976100	333	Other	16		
Vilas	Catfish L	1603700	1012	Other	391	Other	19
Vilas	Circle Lily L	2326700	223	Other	31	Other	7
Vilas	Clear L	2329000	555	Other	220	Other	13
Vilas	Cleveland L	2758600	32	Other	3		
Vilas	Cochran L	2963500	126	Other	8	Other	5
Vilas	Crab L	2953500	949	Other	368	Other	18
Vilas	Crampton L	2759000	59	Other	5		
Vilas	Cranberry L	1603800	956	Other	370	Other	18
Vilas	Crystal L	1842400	88	Other	6		
Vilas	Dead Pike L	2316600	297	1-2 Year Pe	39	Other	9
Vilas	Deer L	980600	65	Other	5		
Vilas	Deer L	2311500	37	Other	3		
Vilas	Deerskin L	1601300	309	Other	41	Other	9
Vilas	Diamond L	1844700	122	Other	8	Other	5
Vilas	Dorothy Dunn L	1845600	70	Other	11	Other	3
Vilas	Duck L	1599900	108	Other	46	Other	5
Vilas	E Ellerson L	2331300	136	Other	57	Other	5
Vilas	E Witches L	982500	34	Other	3		
Vilas	Eagle L	1600200	572	Other	227	Other	13
Vilas	Eleanore L	1631500	28	Other	12	Other	2
Vilas	Erickson L	983600	106	Other	16		
Vilas	Escanaba L	2339900	293	1-2 Year Pe	268	Other	9
Vilas	Fawn L	1591000	22	Other	10	Other	2
Vilas	Fawn L	2328900	74	Other	32	Other	4
Vilas	Finger L	984700	90	Other	6		
Vilas	Fishtrap L	2343200	329	Other	15	Other	9
Vilas	Forest L	2762200	466	1-2 Year Pe	305		
Vilas	Found L	1593800	326	Other	43	Other	9
Vilas	Frank L	985900	141	Other	9		
Vilas	Harmony L	988300	88	Other	6		
Vilas	Harris L	2958500	507	1-2 Year Pe	149	Other	12
Vilas	Helen L	2964400	111	Other	47	Other	5
Vilas	Hiawatha L	2328400	36	Other	6		
Vilas	High L	2344000	734	1-2 Year Pe	158	Other	15
Vilas	Horsehead L	2953100	234	Other	96	Other	7
Vilas	Hunter L	991700	184	Other	26		
Vilas	Imogene L	586800	66	Other	5		
Vilas	Indian L	2764400	68			Other	3
Vilas	Irving L	2340900	403			Other	11
Vilas	Island L	2334400	1023	Other	395	Other	19
Vilas	Jag L	1855900	158	Other	66	Other	6
Vilas	Jenny L	1856400	59	Other	26		
Vilas	Johnson L	1541100	78	Other	12	Other	4
Vilas	Jute L	1857400	194			Other	7
Vilas	Katinka L	2957000	172	Other	72		
Vilas	Kentuck L	716800	957	1-2 Year Pe	1530	Other	18
Vilas	Kenu L	1629800	73	Other	6		
Vilas	Kildare L	1631700	54	Other	4	Other	3

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Vilas	L Content	1592000	244	Other	100	Other	8
Vilas	L Laura	995200	599	1-2 Year Pe	139	Other	13
Vilas	Lac Des Fleurs	1630900	49	Other	4		
Vilas	Lac Vieux Desert	1631900	4300	1-2 Year Pe	832	Other	29
Vilas	Little Arbor Vitae L	1545300	534	Other	212	Other	13
Vilas	Little Crooked L	2335500	153	Other	22	Other	6
Vilas	Little Horsehead L	2953000	52	Other	23		
Vilas	Little John L	2332300	166	Other	69	Other	6
Vilas	Little Papoose L	2328200	46	Other	4	Other	3
Vilas	Little Portage L	1629200	170	Other	71	Other	6
Vilas	Little Presque Isle L	2959700	85			Other	3
Vilas	Little Rice L	2338900	59	Other	5	Other	3
Vilas	Little Spider L	1540400	235	Other	32	Other	7
Vilas	Little St Germain L	1596300	980	Other	115	Other	18
Vilas	Little Star L	2334300	244	Other	100	Other	8
Vilas	Little Trout L	2321600	978	Other	113	Other	5
Vilas	Lone Pine L	2961600	142	Other	20	Other	5
Vilas	Long L	1602300	872	Other	103	Other	17
Vilas	Loon L	1001600	31	Other	3		
Vilas	Lost Canoe L	2339800	249	1-2 Year Pe	76		
Vilas	Lost L	1593400	544	Other	68	Other	13
Vilas	Lower Aimer L	2955000	34	Other	3		
Vilas	Lower Buckatabon L	1621000	352	Other	46	Other	10
Vilas	Lower Gresham L	2330300	149			Other	6
Vilas	Lynx L	1600000	22	Other	10	Other	2
Vilas	Lynx L	2954500	339	Other	138	Other	9
Vilas	Mamie L	2964100	400	Other	155	Other	10
Vilas	Manitowish L	2329400	506	Other	202	Other	12
Vilas	Mann L	2332000	261	Other	13		
Vilas	Marshall L	1626600	87	Other	6	Other	4
Vilas	Mccullough L	2960400	216	Other	12	Other	7
Vilas	Mermaid L	2768100	60	Other	5		
Vilas	Meta L	1004400	175	Other	10		
Vilas	Middle Ellerson L	1866100	60			Other	2
Vilas	Middle Gresham L	2330700	53	Other	4	Other	3
Vilas	Moccasin L	1005700	83	Other	6	Other	4
Vilas	Moon L	1005800	124	Other	18	Other	5
Vilas	Morton L	2960300	163	Other	10	Other	6
Vilas	Murphy L	2769700	81	Other	6	Other	4
Vilas	Muskellunge L	1596600	272	Other	37	Other	8
Vilas	N Crab L	2953400	56	Other	24	Other	3
Vilas	N Turtle L	2310400	369	Other	149	Other	10
Vilas	N Twin L	1623800	2788	Other	1023	Other	34
Vilas	Nelson L	1007600	104	Other	7	Other	4
Vilas	Nelson L	1869900	27			Other	2
Vilas	Nixon L	2341200	110	Other	7	Other	5
Vilas	No Mans L	2312100	225	Other	93	Other	7
Vilas	Norwood L	1008100	125	Other	14		
Vilas	Oswego L	1871800	66			Other	3
Vilas	Otter L	1600100	196	Other	81	Other	7
Vilas	Oxbow L	2954800	511	Other	204	Other	12
Vilas	Pallette L	1872100	173			Other	6
Vilas	Palmer L	2962900	635	Other	78	Other	14
Vilas	Papoose L	2328700	428	Other	172	Other	11
Vilas	Partridge L	2341500	228	Other	12	Other	7
Vilas	Pickerel L	1619700	293	Other	14	Other	9
Vilas	Pine Island L	1011900	79	Other	6	Other	4
Vilas	Pioneer L	1623400	427	Other	55	Other	11
Vilas	Plum L	1592400	1033	1-2 Year Pe	550	Other	19
Vilas	Plum L	2963200	100	Other	11		
Vilas	Presque Isle L	2956500	1280	1-2 Year Pe	203	Other	21
Vilas	Rainbow L	2310800	146	Other	61	Other	5
Vilas	Razorback L	1013800	362	Other	146	Other	10
Vilas	Rest L	2327500	608	Other	240	Other	14

County	Lake Name	WBIC Code	Area (acres)	Walleye Method	Walleye SH	Musky Method	Musky SH
Vilas	Rice L	1618600	71	Other	31	Other	3
Vilas	Roach L	1014000	51	Other	22	Other	3
Vilas	Roach L	2772500	125	Other	2		
Vilas	Rock L	2311700	122	Other	52	Other	5
Vilas	Rosalind L	1877900	43			Other	2
Vilas	Round L	2334900	116	Other	8	Other	5
Vilas	Rudolph L	2954300	79			Other	4
Vilas	Rush L	2343600	44	Other	19	Other	2
Vilas	S Turtle L	2310200	454	Other	182	Other	11
Vilas	S Twin L	1623700	642	Other	253	Other	14
Vilas	Sanford L	2335300	88	Other	38	Other	4
Vilas	Scattering Rice L	1600300	267	Other	109	Other	8
Vilas	Sherman L	1880700	123	1-2 Year Pe	37	Other	5
Vilas	Snipe L	1018500	239	1-2 Year Pe	150	Other	8
Vilas	Sparkling L	1881900	154	1-2 Year Pe	81	Other	6
Vilas	Spectacle L	717400	171	Other	10		
Vilas	Spider L	2329300	272	Other	111	Other	8
Vilas	Spring L	2964800	205	Other	85		
Vilas	Squaw L	2271600	785	1-2 Year Pe	521	Other	16
Vilas	Star L	1593100	1206	1-2 Year Pe	451	1-2 Year Pe	12
Vilas	Starrett L	1019800	66	Other	5		
Vilas	Stateline L	2952100	199	Other	3		
Vilas	Stewart L	1020000	39	Other	17		
Vilas	Stone L	2328800	139	Other	58	Other	5
Vilas	Sturgeon L	2327200	32	Other	14	Other	2
Vilas	Sumach L	1020500	60	Other	5	Other	3
Vilas	Sunset L	1020900	185	Other	11	Other	6
Vilas	Tenderfoot L	2962400	437	Other	154	Other	10
Vilas	Towanda L	1022900	146	Other	21	Other	5
Vilas	Trout L	2331600	3816	Other	379	Other	41
Vilas	Twin Island L	2959300	205			Other	7
Vilas	Upper Aimer L	2955100	33	Other	3		
Vilas	Upper Buckatabon L	1621800	494	Other	62	Other	12
Vilas	Upper Gresham L	2330800	366	Other	48	Other	10
Vilas	Van Vliet L	2956800	220	1-2 Year Pe	35	Other	7
Vilas	Vance L	2327300	30	Other	13	Other	2
Vilas	Verna L	1540300	77			Other	4
Vilas	Voyageur L	1603400	130	Other	55	Other	5
Vilas	W Bay L	2964000	368	Other	70	Other	5
Vilas	W Plum L	1592500	75	Other	32	Other	4
Vilas	W Witches L	1177500	30	Other	3		
Vilas	Watersmeet L	1599400	100	Other	43	Other	4
Vilas	White Birch L	2340500	112	Other	47	Other	5
Vilas	White Sand L	2339100	734	1-2 Year Pe	108	1-2 Year Pe	16
Vilas	Wild Rice L	2329800	379	Other	122	Other	8
Vilas	Wildcat L	2336800	305	Other	41	Other	9
Vilas	Wolf L	2336100	393	1-2 Year Pe	162	Other	10
Vilas	Yellow Birch L	1599600	202	Other	84	Other	7
Washburn	Balsam L	2112800	295	1-2 Year Pe	105		
Washburn	Bass L	1833300	130	Other	55		
Washburn	Bass L	2451300	144	Other	21		
Washburn	Bass L	2451900	188	1-2 Year Pe	88	Other	6
Washburn	Bean L	2718500	100	Other	7		
Washburn	Beartrack North Lake	2452399	33	Other	15		
Washburn	Beartrack South Lake	2452300	65	Other	28		
Washburn	Big Bass L	2453300	203	Other	28		
Washburn	Birch L	2113000	368	Other	48		
Washburn	Cable L	2456100	185	Other	26		
Washburn	Chippanazie L	2722800	58	Other	25		
Washburn	Colton Fl	2702100	58	Other	25		
Washburn	Cranberry Fl	2722400	201	Other	11		
Washburn	Deep L	1844000	43	Other	19		
Washburn	Dunn L	2709800	193	Other	80		
Washburn	Gilmore L	2695800	389	1-2 Year Pe	15		

County	Lake Name	WBIC Code	Area (acres)	Walleye Method	Walleye SH	Musky Method	Musky SH
Washburn	Horseshoe L	2470000	194	Other	27		
Washburn	Island L	2470600	276	Other	37		
Washburn	L Nancy	2691500	772	Other	93	Other	16
Washburn	Leach L	2474400	30	Other	13		
Washburn	Leisure L	2475000	75			Other	4
Washburn	Little Long L	2664500	112	Other	8		
Washburn	Little Mud L	2107100	71	Other	31		
Washburn	Little Sand L	2477700	74	Other	11		
Washburn	Little Stone L	1862400	27	Other	3		
Washburn	Long L	2106800	3290	Other	333		
Washburn	Matthews L	2710800	263	Other	35	Other	8
Washburn	Mclain L	2481600	150	Other	21		
Washburn	Middle Mckenzie L	2706500	530	Other	66	Other	12
Washburn	Minong Fl	2692900	1564	1-2 Year Pe	1150		
Washburn	Mud L	2107700	103	Other	7		
Washburn	Pavlas L	2488100	44	Other	4		
Washburn	Rice L	2696000	132	Other	56		
Washburn	Ripley L	2492600	190	Other	26		
Washburn	S Twin L	2494500	115	Other	17		
Washburn	Shell L	2496300	2580	Other	951	Other	33
Washburn	Silver L	2496900	188	Other	26		
Washburn	Slim L	2109300	224	Other	31		
Washburn	Spider L # 5	1882500	177	Other	10		
Washburn	Spring L	1882900	42	Other	4		
Washburn	Spring L	2498600	211	Other	29		
Washburn	Stone L	1884000	39	Other	3		
Washburn	Stone L	1884100	523	Other	208		
Washburn	Tozer L	2502000	36	Other	6		
Washburn	Trego L	2712000	451	Other	58	Other	11
Bayfield	Pike L Chain	2902701	714	Other	297		
Lincoln	Rice R Fl Chain	1516401	3764	Other	1421		
Oneida	Tomahawk L Chain	1542701	3552	Other	365		
Vilas	Presque Isle L C	2956501	1571	1-2 Year Pe	249		
Vilas	Twin L Chain	1623801	3430	Other	1276		