

# Fishery



## Status Update

In the Wisconsin Treaty Ceded Waters



## Casting Light Upon the Waters

A Joint Fishery Assessment of the Wisconsin Ceded Territory



## Acknowledgments



Many special thanks go to Sen. Daniel Inouye (D-Hawaii), former Chairman of the Senate Committee on Indian Affairs, who, in 1990, led the way towards a cooperative endeavor that would benefit the Wisconsin fishery and all user groups. His leadership was instrumental in uniting tribal, state and federal resource managers and gaining the necessary Congressional support for the ongoing joint fishery assessments in northern Wisconsin's lakes. This report is dedicated to his memory.

The significant tasks of the Joint Assessment Steering Committee have required the continuing participation and commitment of its members over the past twenty-eight years. Planning, coordination and implementation of the assessment as well as data analysis has truly been a positive cooperative effort, thanks to the representatives from the federal, state, and tribal governments who have made the committee successful.

### Members of the Joint Assessment Steering Committee include:

- ✿ U.S. Bureau of Indian Affairs ~ the federal agency that administers the appropriation and chairs the committee
- ✿ U.S. Fish and Wildlife Service ~ the federal agency for technical fishery matters
- ✿ Wisconsin Department of Natural Resources ~ the state agency responsible for managing the Wisconsin fishery and administering committed state funds
- ✿ Great Lakes Indian Fish & Wildlife Commission ~ the intertribal agency on technical fishery matters
- ✿ Ojibwe tribal governments:
  - Bad River Band of Lake Superior Ojibwe*
  - Lac Courte Oreilles Band of Lake Superior Ojibwe*
  - Lac du Flambeau Band of Lake Superior Ojibwe*
  - Red Cliff Band of Lake Superior Ojibwe*
  - St. Croix Band of Lake Superior Ojibwe*
  - Sokaogon (Mole Lake Band) Chippewa Community of Wisconsin*

### Special Acknowledgment to:

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## Fishery Status Update in the Wisconsin Treaty Ceded Waters

U.S. Department of the Interior  
Bureau of Indian Affairs, Minneapolis, MN

*Seventh Edition, 2019*

*Cover: Walleyes are a highly-valued resource, shared between state-licensed anglers and Ojibwe harvesters. In treaty negotiations with the United States government, the Ojibwe reserved natural resource harvest rights in a vast region of northern Wisconsin known as the Ceded Territory. Today, Ojibwe tribes co-manage Ceded Territory natural resources with the state of Wisconsin.*

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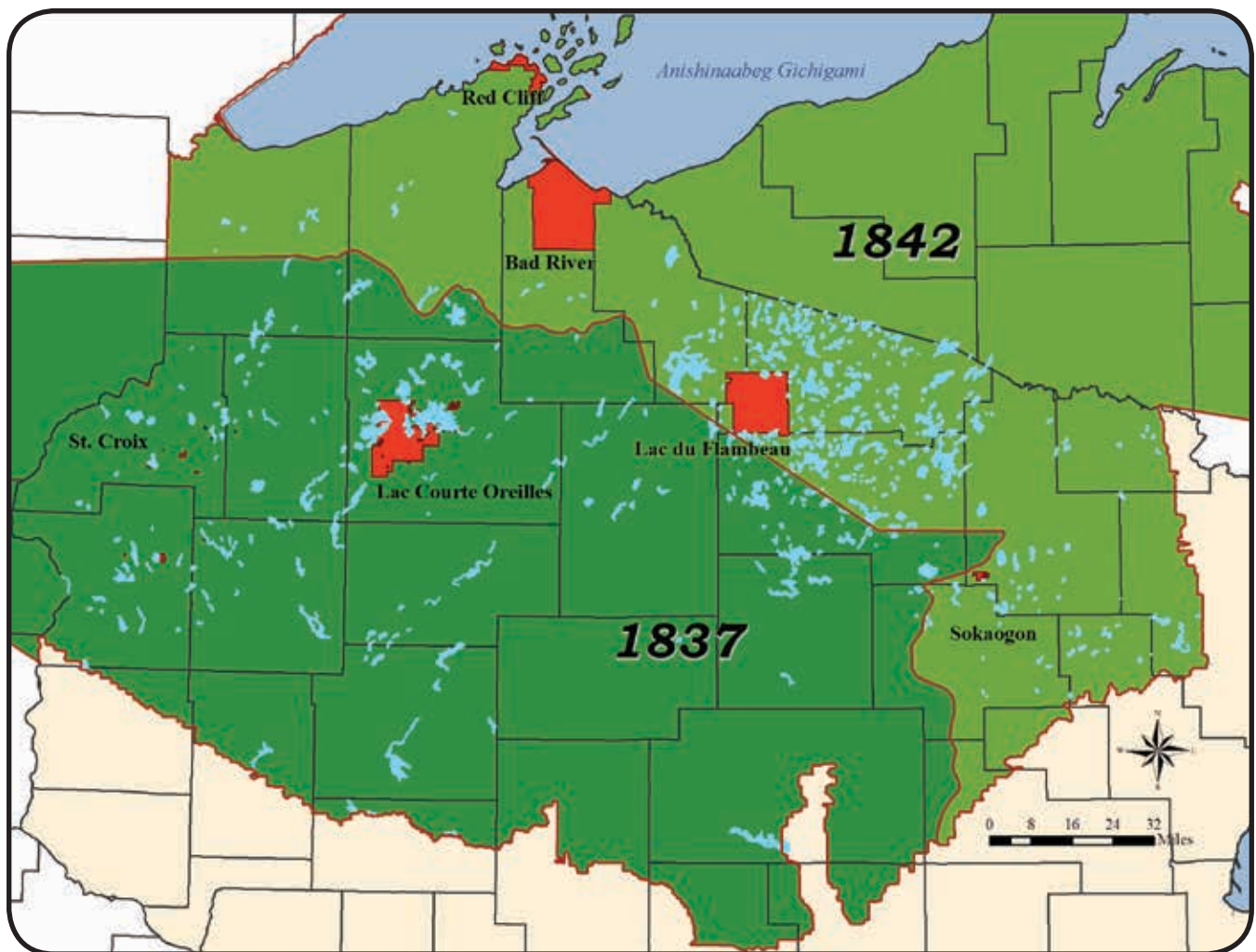
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# Introduction



Walleye (*Stizostedion vitreum*) or ogaawag have been a mainstay in Wisconsin's fish communities for centuries. Their original range spans the entire state from the Mississippi River to the Great Lakes. The unmistakable glow of their light-gathering eyes makes them an efficient low-light predator, and helps Tribal communities sustain themselves after a long winter by reflecting the light of birch bark torches and now modern-day headlamps for harvesters. Walleye are secretive fish, rarely viewed in shallow water during daylight hours. The mysteries of their daylight haunts, their statewide range, and their flaky, mild flavor have made them among the most popular fish in Wisconsin.

Like many of the swimmers, oga is highly respected in Ojibwe culture. Oga features prominently in many traditional stories and personal memory illustrating how Ojibwe people have depended on fishing as a means of survival. Traditional stories of oga depict its interconnectedness with other species. A tribal member from Red Cliff remembered her mother from the Bad River Tribe describing how the frogs would make noise to indicate the start of the oga season (Taken from GLIFWC Climate Change Vulnerability Assessment Version 1 April 2018. Integrating Scientific and Traditional Ecological Knowledge).



Map 1. The Wisconsin portion of the 1837 and 1842 Ceded Territories with location of the walleye lakes and tribal reservations.

The reaffirmation of Ojibwe Treaty Rights in the 1980s brought the return of off-reservation spearing harvest of ogaa in the Ceded Territory (Map 1). Concerns about the status of the walleye population, and social unrest over spearing as a harvest method made the need for more information on the walleye resource apparent. In 1990, D Inouye (D-Hawaii) established the Joint Assessment Steering Committee, a committee comprising federal, state, and tribal partners, to monitor the Ceded Territory walleye populations. Population assessments and harvest monitoring have shown that the combined harvests of spearing and angling have not resulted in over-harvest of adults and that both angling and spearing fisheries could thrive with sound harvest management. The Joint Assessment Steering Committee reported on these findings in the original 1991 report **‘Casting Light Upon the Waters,’** and in 1992, 1995, 1999, 2003, 2007, 2010, 2013 and 2019 updates.

The long-term study of Ceded Territory walleye waters by the Steering Committee has brought new knowledge and new methods for walleye management. State, tribal and federal partners have recognized distinctions between walleye populations in different lakes and have begun to adapt their management strategies to be more lake-specific. Unfortunately, population declines have been identified in some waters, providing new challenges for the partners. Shared concerns for the walleye populations have brought the partners together to work on specific management plans for several lakes.

While some lakes have stable and a few have increasing walleye populations, the Steering Committee has identified a regional downward trend in walleye populations. Modern lake ecosystems face many challenges (some of which have been around for a long time but have recently increased in severity) in the form of increased riparian development, land use changes in their watersheds, sedimentation, invasive species, altered fish communities, harvest of juvenile walleye, and changing climate. Several lakes that had strong naturally reproducing walleye populations in the past have experienced poor natural reproduction in recent years, and many of these lakes have shifted to bass and panfish dominated communities.

Thermal-optical (temperature and light) habitat are thought to be the primary drivers of walleye distribution within a lake and across the Ceded Territories. Walleye gain a competitive advantage over other species in turbid or stained, low-light water bodies with limited plant growth. The thermal niche for walleye, a cool-water species, depends on the life stage. For eggs, the optimum temperature is 9–15 °C, 15 °C for fry, ~21–25 °C for juvenile walleye, and ~18–22 °C for adult fish. Water temperature is predicted to increase as the climate changes, potentially reducing thermal habitat for walleye by 10–40% and resulting in negative consequences for growth and survival of this species. Invasive species, specifically zebra mussels increase water clarity in lakes. This, in turn, can increase light penetration, plant growth, and water temperature. Again, these changes in habitat can have negative consequences for walleye populations.

Although these challenges for the walleye fisheries are daunting, the partners have developed a long record of successfully working together to collect data, monitor populations, and manage harvest. In the future, coordinated efforts to manage fisheries, habitat, and landscapes on a lake-by-lake basis will provide healthy fish communities in natural environments. These efforts will allow northern Wisconsin’s fisheries to continue to flourish, and for that mysterious predator with the glowing eyes to continue to hunt the depths of lakes and rivers in the region.



*“Preparation of the report **Casting Light Upon the Waters**, 1991 yielded one very clear conclusion: The fishery of the Ceded Territory faces increasing pressures from all factors. The managers must continue to monitor populations and harvest levels and evaluate assessment methods and management strategies. The pressures on the fishery require a continuation and further expansion of the joint monitoring and assessment work.”*

excerpted from  
**Casting Light Upon the Waters**, 1991 report

In 1991 the Joint Assessment Committee prepared a list of recommendations based on their initial assessment. These recommendations encompassed a wide variety of needs to effectively accomplish a cooperative assessment and management of the fishery in northern Wisconsin waters. Some examples are given below.

## 1) **Assessment and harvest monitoring**

- \* This is an ongoing activity that takes a large amount of time among the partners, and is the primary focus of this report.

## 2) **Research**

- \* **Comparative Walleye Recruitment Study.** GLIFWC biologists continue working in collaboration with WDNR and University of Wisconsin biologists on a cooperative study to investigate declines in walleye recruitment that have been observed in a growing number of Ceded Territory lakes. This study uses a comparative experimental design to test for patterns in key abiotic and biotic variables in walleye populations in lakes with stable natural walleye recruitment and those with declining natural walleye recruitment. Any emerging patterns will be examined for the potential to inform management actions to improve recruitment in walleye populations.

- \* **Comparative Walleye Diet Study.** Across the Ceded Territories in the Midwest, many walleye (ogaa) populations are declining. In many lakes, fewer young walleye are surviving to age-1. Warmer water may be causing shifts in fish communities and habitat throughout the region. GLIFWC biologists are comparing the relative condition and stomach contents of age-1 walleye in a lake with declining recruitment to a lake with stable recruitment during the growing season. The outcomes of this

study will indicate if changes in the fish community affect the diet, condition, and ultimately survival of age-1 walleye.

- \* **Exploitation Study.** WDNR and GLIFWC researchers have evaluated exploitation rates from 0-50% on a set of study lakes to determine whether a 35% maximum exploitation rate is sustainable. While some of the study results are still being analyzed, initial results suggest that high exploitation rates change many walleye population characteristics (i.e. growth, maturity, and reproduction rates). Maximum sustainable exploitation rates are likely related to the habitat availability for walleye, and the cumulative effects of other stressors in each lake ecosystem.
- \* **Walleye-Centrarchid interactions study.** Some walleye declines have been accompanied by an increase in Centrarchids (bass and sunfish species). A University of Wisconsin study is testing whether experimental removal of Centrarchids from a lake will improve walleye recruitment.
- \* **Genetic Analysis of Wisconsin Walleye.** The genetics lab at the University of Wisconsin Stevens Point Cooperative Fisheries Research Unit has sampled fish from Minnesota and Wisconsin and are currently developing a genetic panel that can be used to quickly and affordably assign genetic stock and conduct parentage analysis. This will facilitate research projects such as analyses of population structure, investigation of stocking survival using parentage, and pedigree analysis in wild populations. A second project will leverage this newly created panel to track reproductive success in two northern Wisconsin lakes, Sanford and Escanaba, using pedigree analysis.



*Electrofishing boats help biologists access adult walleyes to examine for age, health and other info.*

The DNR has captured adults and fall young-of-year walleye for at least three years on both of these lakes, and will be able to estimate the number of offspring each parent produced using these data. The project will help answer important questions related to spawning dynamics and recruitment such as whether big fish produce more offspring and what spawning habitats produce the most fish.

✿ **Identifying Recruitment Bottlenecks for Age-0 Walleye in Northern Wisconsin Lakes**

Walleye recruitment has declined in some northern Wisconsin lakes and lack of age-0 fish in fall electrofishing surveys suggest that recruitment bottlenecks are occurring in the first year of life. In conjunction with WDNR and GLIFWC, the Wisconsin Cooperative Fishery Research Unit implemented an intensive sampling protocol for age-0 walleye at multiple life stages on 13 lakes to demonstrate that a recruitment bottleneck is occurring before mid-July. Walleye larvae were collected on some lakes with declining recruitment; but age-0 walleye were not collected beyond the

larval stage. Conversely, age-0 walleye were usually collected at all life stages in lakes with sustained walleye recruitment. The factors responsible for this bottleneck remain unknown and ongoing research aims to identify these factors.

3) **Public involvement**

✿ **Minocqua-Chain rehabilitation.** The Headwaters Chapter of Walleyes for Tomorrow (WFT) approached WDNR, Lac du Flambeau Band, and GLIFWC about taking a more aggressive approach to walleye rehabilitation in this high-profile Oneida County chain of lakes. In addition to stocking 20,000–36,000 fall fingerling walleye into the chain annually since 2012, WDNR agreed to impose a no-harvest rule for walleye anglers from 2015–2019, and GLIFWC member tribes agreed to self-impose a harvest moratorium for the same time period. In 2019, GLIFWC, WDNR, WFT, and Wisconsin Valley Improvement Company collaborated on a walleye population estimate in the chain.

#### 4) Public education and information

- \* Biologists communicate frequently with Lake Associations, fishing clubs and media outlets. Walleye population status, Safe Harvest and harvest monitoring are often discussed.
- \* WDNR has increased its use of social media like Facebook, Twitter and YouTube. Walleye monitoring and population status are popular topics.
- \* GLIFWC and WDNR post survey reports on the internet. They also collaborate on informational brochures and publications, including this Joint Assessment document.

#### 5) Interagency cooperation/communication

- \* State and tribal biologists coordinate the monitoring of fish populations, exchange harvest data and assessment results, and discuss a wide range of issues regarding the status and cooperative management of shared fishery resources at semi-annual meetings of the Wisconsin Inland Fisheries Technical Working Group (TWG).
- \* Interagency communications also occur within the WDNR species subcommittees, and through government-to-government interactions between state and tribal fishery managers.

#### 6) Resource planning

- \* Working through the TWG, GLIFWC, WDNR and tribal biologists have collaborated on management strategies and increased monitoring to address issues on large-profile waters like Kentuck Lake, Lac Vieux Desert, Minocqua Chain and several Minocqua-area lakes.

#### 7) Enforcement and compliance

- \* GLIFWC and WDNR cooperate on enforcement activities within the Ceded Territory.

#### 8) Workloads/staffing

- \* A Technical Working Group (TWG) was established during the LCO trial. This TWG jointly plans for assessment activities and shares the results. This cooperation increases the quantity and quality of the information collected in order to best manage the walleye fishery.

Over the last twenty-nine years, emphasis has been placed on accomplishing the extensive population assessments and harvest monitoring which provide the information critical to a thorough understanding of the fishery. The data collected to date are only the beginning in the development of a long-term portrait of trends in the fishery. The following report describes assessment activities and reports findings through graphs to provide readers with a glimpse of the emerging picture of the fishery.



*Electrical shock-booms temporarily stun fish in shallow water allowing biologists to conduct a physical examination of walleye.*



# Population Estimates



With the beginning of off-reservation spearing in 1985, the number of mark-recapture population estimates being done every year has grown (Figure 1). The methods used to sample and mark fish during spring and to calculate the estimates have been jointly developed and agreed on by the TWG biologists. Mark-recapture estimates are labor intensive and relatively costly, averaging about \$2,000–4,000 each for lakes under 10,000 acres, but the data produced are more accurate than other types of alternative information (e.g. relative abundance) that might be collected.

For the past twenty-nine years, estimating the number of adult walleye in lakes has been an objective of spring assessments. The initial overall goal was to conduct at least one such estimate in every mixed fishery (tribal-state) lake. Of the 313 speared lakes where walleye have been harvested, 276 (86%) have had at least one adult population estimate.

In order to track annual variation in walleye populations, long-term study lakes were established by both WDNR and GLIFWC (Appendix 1A, WDNR long-term lakes, Appendix 1B, GLIFWC long-term lakes). Annual population estimates were conducted

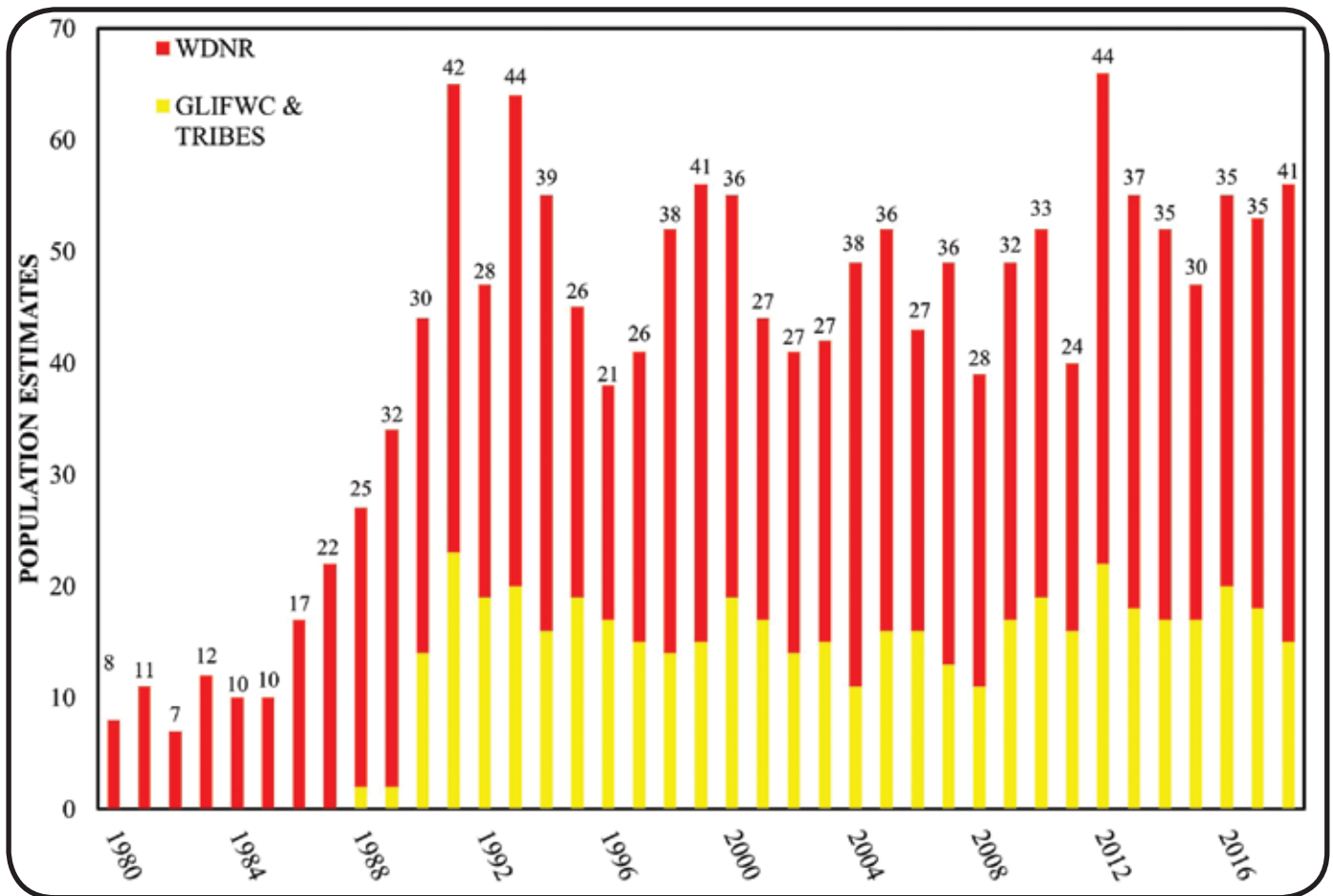


Figure 1. Number of adult walleye population estimates conducted in Ceded Territory lakes by GLIFWC, the Tribes, and WDNR from 1980–2018. Numbers above the bar represent the total number of population estimates conducted in a given year.

to study long-term trends in the number of adult walleye. GLIFWC long-term lakes include nine lakes: four over 500 acres and five under 500 acres. The DNR established 12 long-term study lakes. In addition, walleye population estimates, multispecies comprehensive surveys, and creel surveys have been conducted every 3 years on a set of trend lakes since 2002.

For the lakes where trend information is developing, population estimates have generally exhibited both relatively large increases and large decreases from one year to the next (Appendix 1A and B). Overall, population estimates in both trend lakes and throughout the Ceded Territory have shown a declining trend in recent years (Figure 2).

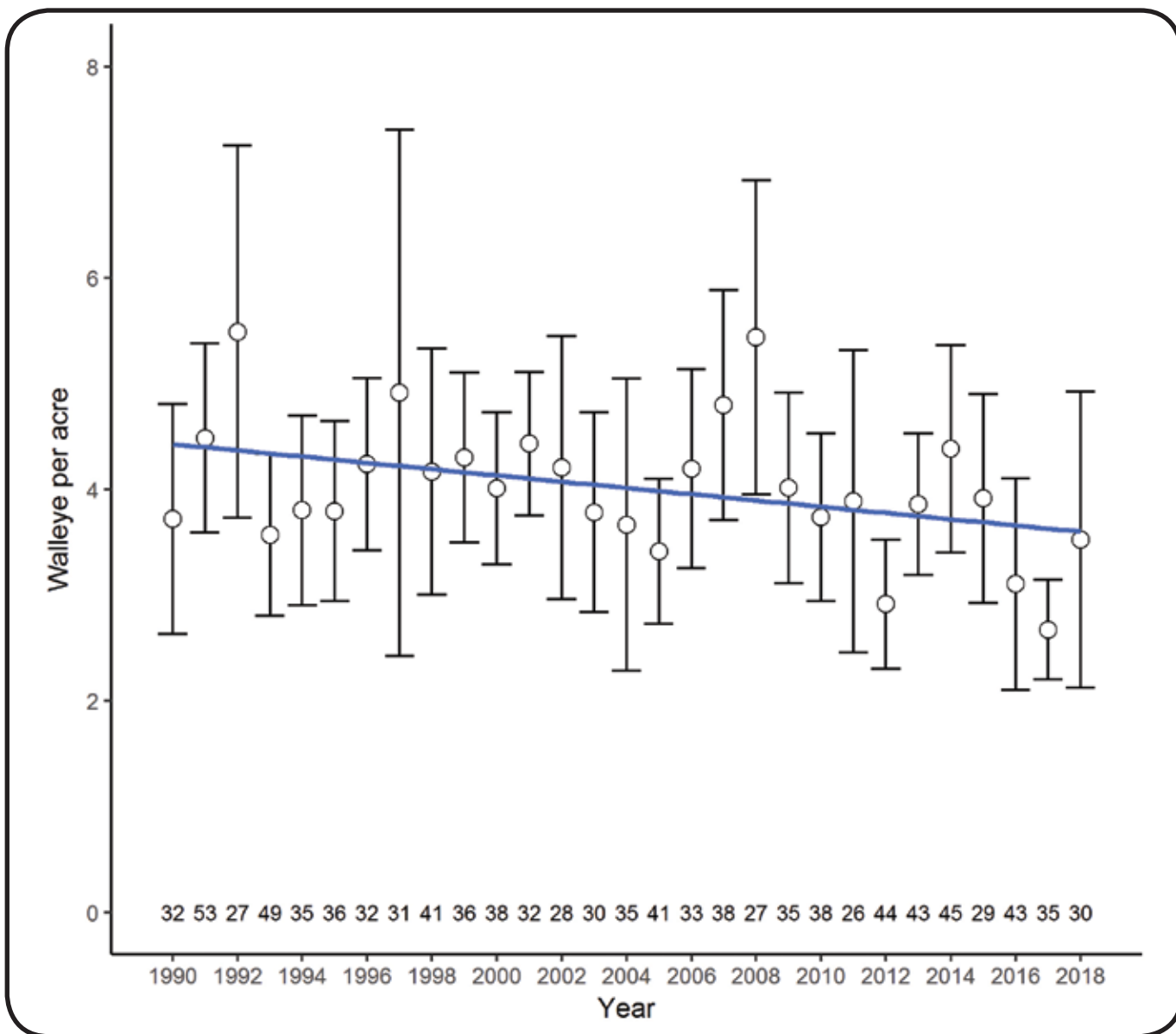


Figure 2. Adult population estimates in naturally reproducing walleye populations from 1990–2018. The circle represents the average density of all the population estimates in a given year, and the error bars are 95% confidence intervals. The numbers in the graph are the number of lakes surveyed each year. The blue line is a linear trend fit to the averages for each year.



## Population Estimates

Mark-recapture estimates are used to calculate the number of harvestable walleye for the two years following an estimate (Figure 3). For example, assuming that a population estimate for Lake A in 2019 was 10,000 adult walleye, then in 2020 the harvestable surplus or total allowable catch (TAC) would be 35% of that number or, 3,500 walleye. However, because a year has passed and because the population may have changed over that year, an adjustment or safety factor is applied to calculate the safe harvest level. This safety factor is based on observed declines from one year to the next in Ceded Territory lakes. The safety factor for a one-year old estimate is 41%, and for a two-year old estimate is 33%. So, if the population estimate in Lake A was one year old, the safe harvest level would be 1,435 adults (41% of the TAC). If the population estimate in Lake A was two years old, the safe harvest level would be 1,155 adults (33% of the TAC). The original safety factors used in management of the joint fishery were 35% and 30%, respec-

tively, but were revised by the TWG in 2010 based on data collected between 1990-2009.

## Safe Harvest Models

Beyond two years, mark-recapture population estimates are no longer directly used to calculate the safe harvest level. However, they are indirectly used because each estimate is entered into one of three population estimation models. In 2015, new models (e.g. mixed effects models) were developed to make the models lake-specific. The old models were simply plots of individual population estimates (y axis) versus the area of the lake where the estimate occurred (x axis) (Figure 4a). In general, the larger a lake, the more walleye it supports. However, the population estimate data showed that individual lakes may be more or less productive than the average. The new mixed effects models use the lake size, and where available, the individual lake population estimate history to estimate population size (Figure 4b). Separate models have been created for walleye lakes based

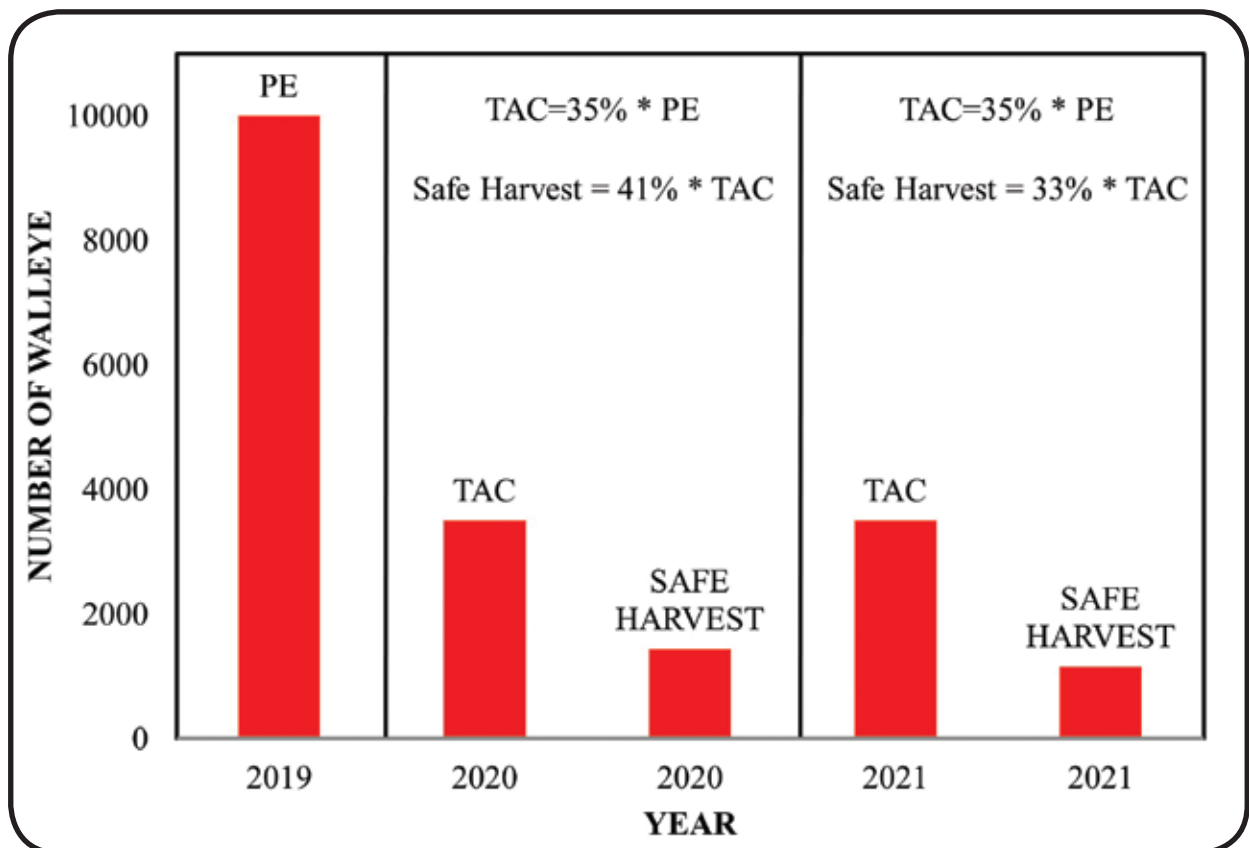


Figure 3. Hypothetical population estimate for Lake A and the resulting TAC and Safe Harvest values in the next two years.

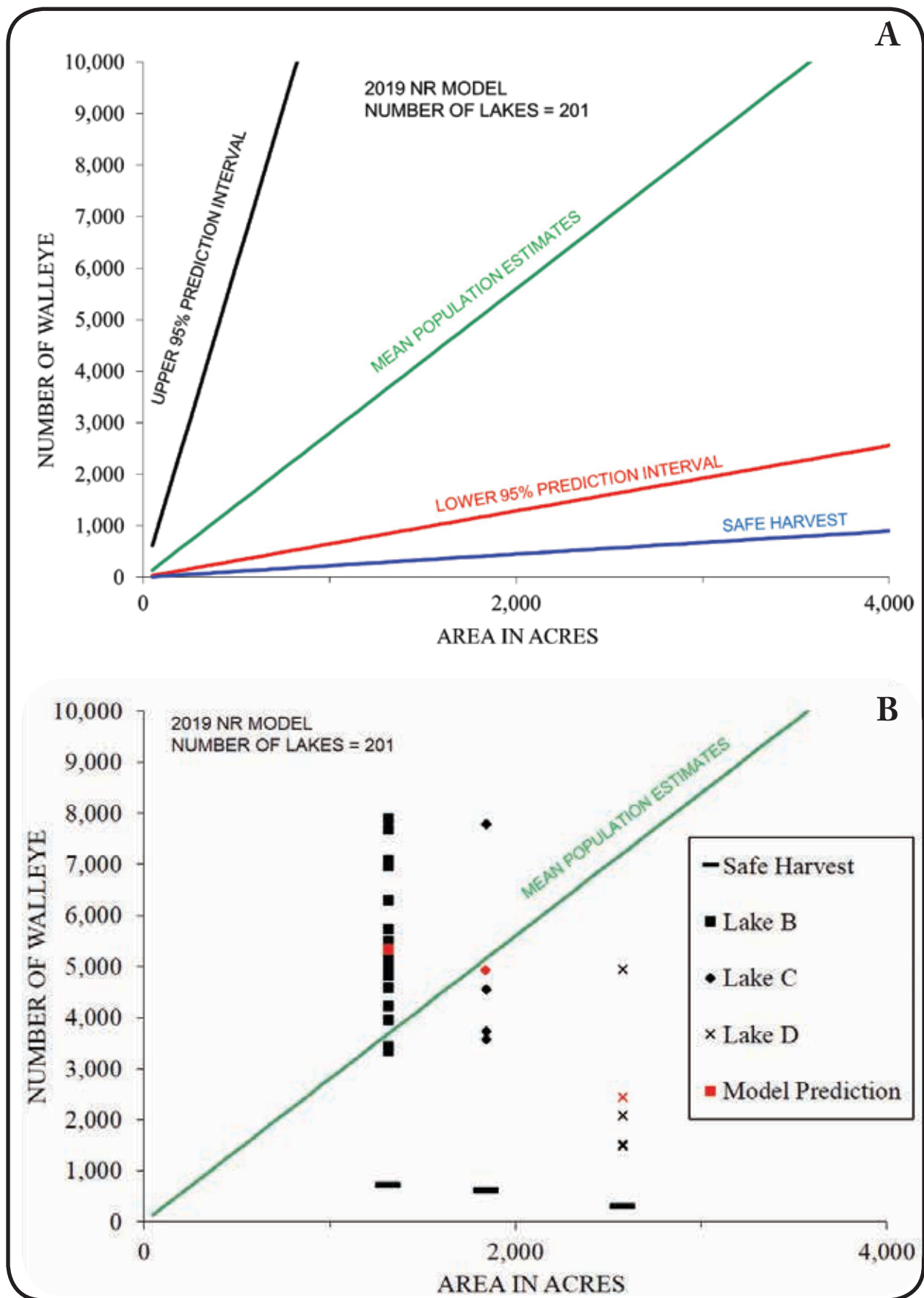


Figure 4. Two examples of how the number of walleye are estimated by area: A) shows the relationship for all lakes, and is used to set safe harvest for lakes with no population estimates in the last 20 years. B) shows how the mixed effects model incorporates population estimate data for individual lakes, where it is available.

on whether the walleye population is dependent on: 1) natural reproduction with normal year classes produced (NR model); 2) natural reproduction with irregular and weak year classes (NR2 model); or 3) stocking (ST model).

As the number of population estimates has increased over the past twenty-eight years, so too has the number of estimates available to improve the three mixed effects models. The new methods use data from the past twenty years so that the models reflect recent population status while still maintaining a large enough sample size for good model fitting. Currently there are 201 lakes with population estimates (637 estimates) in the NR model, 133 lakes with population estimates (233 estimates) in the ST model, and 42 lakes with population estimates (50 estimates) in the NR2 model. In general, for lakes of the same size, walleye populations dependent on natural reproduction (NR) have more fish than lakes dependent on stocking (ST) and both have more adult walleye than in lakes with weak and irregular natural reproduction (NR2). Average density (number of adult walleye per acre) is approximately 4.0 for NR lakes, 1.8 for ST lakes, and 0.5 for NR2 lakes.

## Estimates Based on Models

A total of 720 lakes have a harvestable walleye population. Of these, 396 lakes (some with population estimates and others without) are in the NR (natural reproducing) model, 198 lakes (some with population estimates and others without) are in the ST (stocked) model, and 126 lakes (some with estimates and others without) are in the NR2 (natural reproduction with weak/irregular year classes) model. A sum of the estimated population in each of the 720 lakes gives a total adult walleye resource at approximately seven hundred thousand (Figure 5). With total allowable catch (TAC) at 35% of this figure, around 250,000 adult walleye could be harvested annually. However, the sustainable exploitation rate of 35% may vary because each lake has its own unique carrying capacity, fish community, and disturbances that affect the level of sustainable exploitation. The safe harvest is around 30–35% of the TAC and has ranged from 78,000–120,000 annually since 1989. Safe harvest is set so that if 100% of the safe harvest were taken, then the chance of actually exceeding the TAC would be 1 in 40.

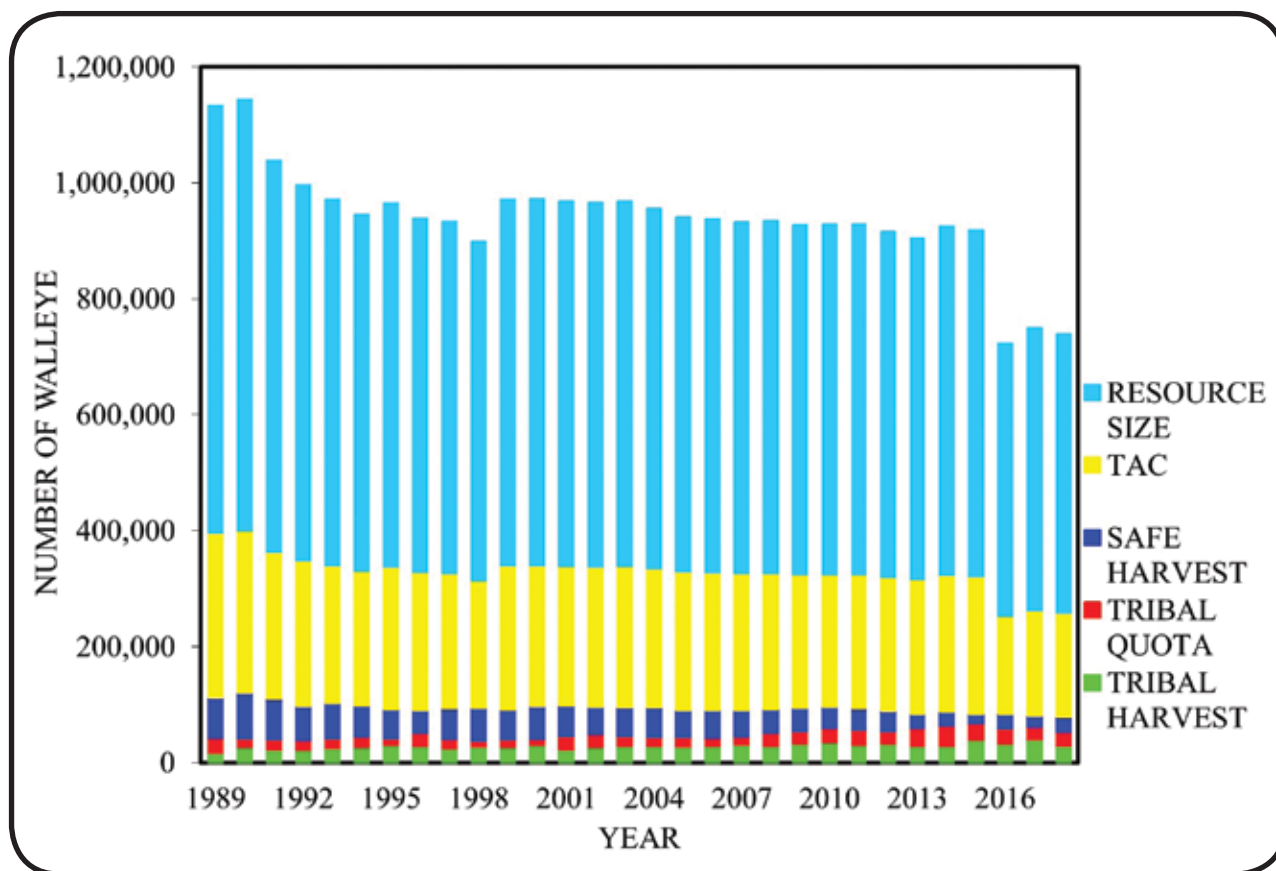


Figure 5. Estimated overall size of the Ceded Territory walleye resource using models, plus TAC and safe harvest levels from 1989-2018. Also shown are the tribal quotas selected and the number harvested during open-water spearing and netting during this same period. Note that the Mixed Effects Model was used starting in 2016.

## Tribal Declarations



Each year, by March 15, the six Wisconsin Ojibwe Tribes declare a percentage of the safe harvest to be taken by spearing and netting from various lakes during the upcoming year. Since 1989 the number of walleye being declared, or tribal quota, has ranged from 38,000-68,000 (Figure 5) in 178-539 lakes. Tribal declarations typically have not been at 100% of the safe harvest because, according to state biologists, the walleye bag limit for hook-and-line anglers would be dropped to zero. In the past, the bag limit for hook-and-line anglers was adjusted based on the percentage of safe harvest that the tribes declared. Since 2015, the bag limit has been set at 3 per day for lakes with tribal declarations up to 95% of safe harvest,

and length regulations play a more important role in regulating angling harvest.

The tribes must also consider the effect of the “pulse fishing” rule when setting quotas. This rule states that if the tribal harvest is 60% or more of the safe harvest for two consecutive years, then the third year the lake must be closed to tribal harvest using efficient methods. The 60% figure for defining “pulse fishing” was initially agreed to by state and tribal representatives with the understanding that the percentage would be evaluated after two years, in 1991. Such an evaluation was attempted but biologists could not reach agreement and thus, the percentage remains at 60%.



*During the walleye harvest declaration process in late winter, tribal representatives discuss community needs and other considerations before selecting lakes to fish for the upcoming season.*

# Tribal Harvest



The primary off-reservation tribal fishery is the spring spearing of walleye. Because open-water spearing is classified as a highly efficient harvest method, this fishery is highly regulated and controlled with individual lake quotas, a nightly permitting system, a requirement that only specified boat landings be used, and the stationing of tribal creel clerks and wardens at every landing each night during the spring season to count all fish taken. Quotas are adjusted daily based on the previous night's harvest to ensure that they are not exceeded. With such a system, a wealth of information for describing the tribal fishery and the impact of that fishery on individual walleye populations has been collected.

For the thirty-year period 1989–2018, a total of 842,423 walleye have been speared, including less than 500 that were netted (Table 1). The majority have been males (84%), and a lesser percent females (9%) or unknown sex (7%). Walleye have been the most harvested gamefish in the tribal fishery, followed by muskellunge, large and smallmouth bass, and northern pike. Since 1989, the number of walleye taken has ranged from 16,054 to 39,028 and averaged 28,081 annually (Figure 6A). During the past thirty years the number of spearers has ranged from 271 to 580 and averaged 446 (Figure 6B) with the number of lakes speared ranging from 102 to 195 and averaging 149 (Figure 6C).



*Table 1. Harvest, average length, and number measured for the tribal spear-fishery from 1989-2018.*

Species	Number Harvested	Average Length	Number Measured
Walleye	842,423	15.4	701,332
Muskellunge	7,582	38.1	7,486
Bass	6,146	15.5	5,943
Northern Pike	1,217	27.3	1,150

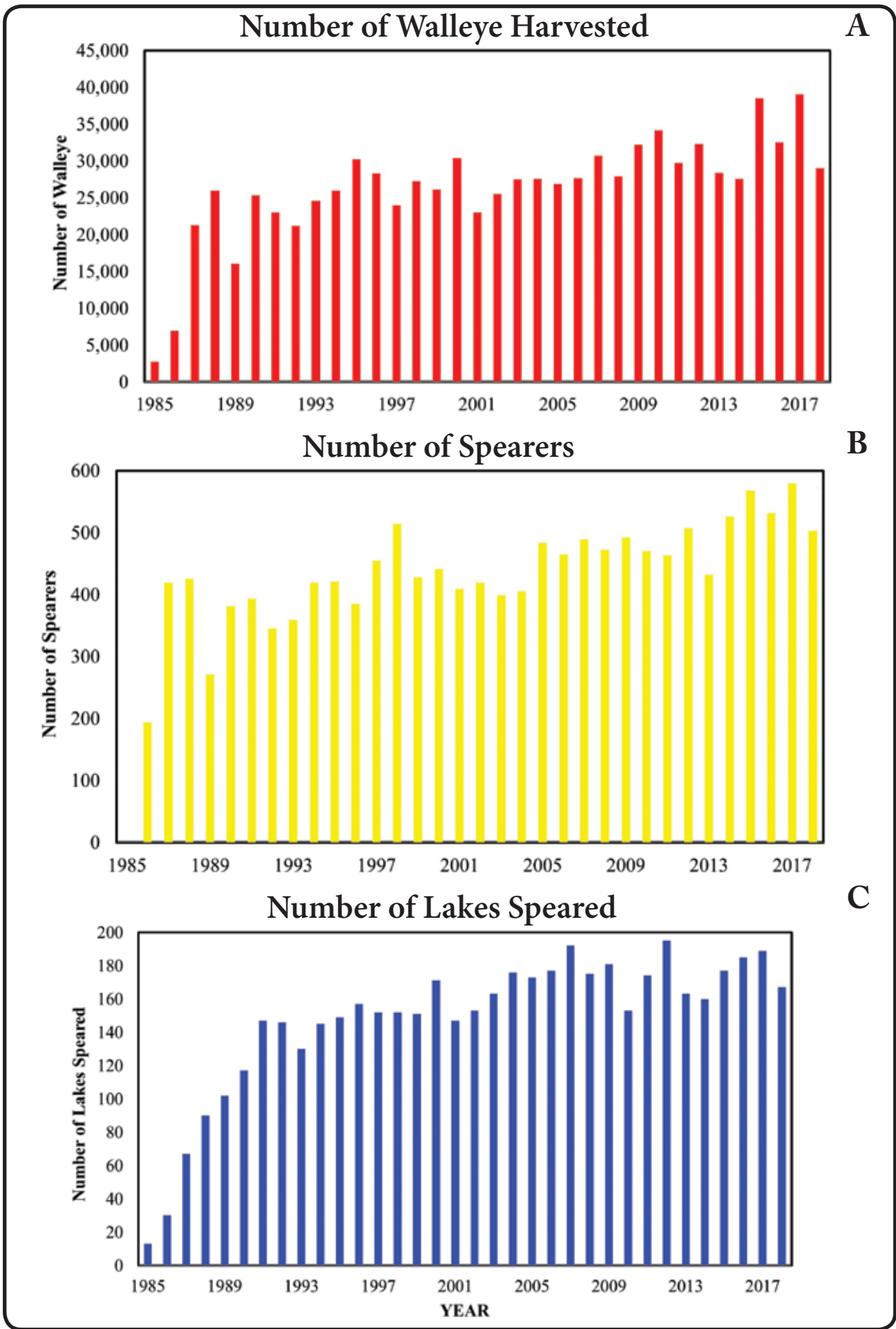


Figure 6. A) Number of walleye harvested by tribal spearers, B) number of tribal spearers, and C) number of lakes speared by tribes from 1985–2018. Use of safe harvest levels was initiated in 1989.



# Angler Harvest



Creel surveys conducted by the Wisconsin DNR from 1980-1989 in the Ceded Territory for all lakes classified as having walleye at the time (355,183 acres in 859 lakes) project average angler catch (including walleye released back to the water in addition to fish harvested) of 912,000 walleye per year and an angler harvest of 624,000 walleye (Table 2). Since 1990, the Wisconsin DNR has monitored angler harvest in the

Ceded Territory through between 16 and 25 creel surveys annually. In 1990, a 15-inch minimum size limit was enacted statewide on walleye waters, with some lakes allowed an exemption because of either slow growth or high contaminants in the larger sized fish. From 1990–2011, creel surveys project an average annual catch that increased to 983,000 and an average angler harvest of 245,000 walleye per year.

**Table 2. Angler exploitation rates as determined by Wisconsin DNR during creel surveys in lakes located in the Ceded Territories. Exploitation is the portion of the adult population removed by harvest in a year.**

Season	Mean Rate of Exploitation	Minimum Rate	Maximum Rate	Projected Catch	Projected Harvest
1980-89				912,000	624,000
1990-91	11.0%	1.6%	25.9%	1,506,000	302,000
1991-92	9.9%	0.8%	35.0%	1,299,000	244,000
1992-93	7.1%	1.6%	26.1%	1,011,000	265,000
1993-94	7.0%	1.6%	17.5%	1,188,000	296,000
1994-95	9.9%	0.5%	22.8%	591,000	178,000
1995-96	10.6%	1.4%	34.2%	936,000	184,000
1996-97	7.4%	1.3%	20.4%	2,206,000	237,000
1997-98	11.9%	1.6%	23.2%	1,348,000	385,000
1998-99	6.2%	0.0%	15.0%	761,000	214,000
1999-2000	7.5%	0.0%	20.9%	997,000	309,000
2000-01	7.4%	0.0%	24.1%	933,000	336,000
2001-02	5.9%	1.2%	12.2%	695,000	219,000
2002-03	6.5%	0.0%	31.3%	530,000	132,000
2003-04	9.4%	0.0%	21.9%	1,195,000	261,000
2004-05	11.3%	0.0%	39.4%	548,000	187,000
2005-06	14.4%	0.0%	60.0%	735,000	274,000
2006-07	7.1%	0.0%	14.7%	872,000	280,000
2007-08	6.9%	0.0%	19.0%	722,000	262,000
2008-09	8.9%	0.0%	22.3%	1,141,000	311,000
2009-10	10.5%	0.0%	33.0%	969,000	216,000
2010-11	9.1%	0.0%	25.1%	656,000	313,000
2011-12	11.1%	0.0%	56.5%	904,000	366,000
2012-13	11.9%	0.0%	84.0%	548,000	88,000
2013-14	4.3%	0.0%	13.8%	787,000	172,000
2014-15	10.7%	0.0%	20.0%	1,179,000	308,000
2015-16	5.7%	0.0%	24.1%	850,000	188,000
2016-17	6.6%	0.0%	24.0%	366,000	135,000
2017-18	7.5%	0.5%	27.0%	592,000	181,000

From 2012–2018 average angler catch declined to approximately 720,000 walleye per year and angler harvest was estimated below 200,000 walleye.

From 1990 through 2014, the state used a system of sliding bag limits to minimize the likelihood of total harvest of more than 35% of the adult walleye population in any given lake. As the angling season for walleye typically opened after most, or all, of the annual tribal spear harvest had occurred, the state would respond to the tribal declarations by setting angler bag limits for walleye on the sliding scale. If the entire tribal declaration was not harvested and enough fish were available, the state could then increase the daily bag limit for the remainder of the year. These changing bag limits were considered unpopular and confusing by some of the angling public. The system also did not account for the 15-inch, 18-inch, or “no-minimum but only 1 walleye over 14 inches” regulations that had been established over much of the Ceded Territory between 1992 and 1995. Public input from both anglers and business interests suggested that a stable daily bag limit of three walleye would be preferable for walleye harvest management, even if it meant more restrictive size limits would be needed to achieve the same level of angling harvest reduction.



*Partners in Fishing at the Chippewa Flowage, 2018. Hosted annually in June by a GLIFWC member tribe, Partners in Fishing is an informal one-day event that brings together members of the Joint Assessment Fisheries Steering Committee, Ojibwe treaty tribe representatives, federal authorities, professional fishing guides, and other guests. Since 1998, Green Bay Packer players have participated in Partners and shared lessons of how teamwork and goal-setting produce good results.*

In 2015, the Wisconsin DNR reduced the daily bag limit for walleye in all Ceded Territory waters from 5 fish/day to 3 fish/day. The DNR investigated the potential impact of various harvest size restrictions in conjunction with a 3-walleye daily bag limit using creel survey data collected from anglers from 1990-2014. Creel survey data allowed for determination of the proportion of walleye that would be excluded from harvest if a more restrictive length regulation were put in place. Upon transitioning to a 3-fish daily bag limit for walleye in most Ceded Territory waters the state used one of four length limit regulations as its primary harvest management tool. The length limit regulations for those waters are: 15-inch minimum with a 20–24 inch protected slot; no minimum length limit but only 1 walleye larger than 14 inches allowed; no minimum length limit but with a 14–18 inches protected slot; and an 18-inch minimum length limit.

## Walleye angling regulations currently in use in the Ceded Territory

### ***15-inch minimum, 20-24” protected slot/ 3 walleye bag limit***

In lakes with a 15-inch minimum, creel survey data suggested that harvest was approximately 7.5% greater with a 3-fish bag limit than with a 2-fish bag limit. By further examining the lengths of fish harvested, the State estimated that implementation of a 20-24” protected slot limit in lakes with a 15-inch minimum would result in a maximum potential 13% reduction in harvest. Therefore, in lakes with a 15” minimum size limit, a 20–24” protected slot limit was implemented as an effective substitution for a 2-walleye bag limit. This regulation also precludes the angler harvest of juvenile walleyes.

***No minimum length limit, only 1 walleye larger than 14” allowed/3 walleye bag limit***

Creel survey data suggested that the difference in harvest between those lakes with 3-walleye bag limit was 13.5% greater than no minimum length limit and a 2-walleye bag limit. The data also show that use of a 1-over-14 restriction reduced harvest of adult walleye approximately 11% as compared to a “no minimum,” but some additional harvest of juvenile walleye occurs. This harvest-oriented regulation is designed primarily for use in waters with very strong natural recruitment, slow-growing walleye, and sometimes those waters with fish with high levels of mercury contamination (to allow harvest of smaller, less-contaminated fish). Since 2015, Wisconsin DNR fishery managers have become increasingly cautious with this regulation because of observations of declines in year class strength across the Ceded Territory.

***No minimum length limit, harvest of walleye between 14-18 inches prohibited/3 walleye bag limit***

This is another harvest-oriented regulation that has been used by DNR fishery managers in some plac-

es since 1998. It is less liberal than the “1-over-14” regulation and works best in lakes with above average growth. It provides control on adult walleye exploitation, but is still only used in lakes where natural recruitment is strong.

***18-inch minimum/3 walleye bag limit***

In the Ceded Territory, this regulation is predominantly used as a tool to help walleye populations recover. In southern Wisconsin, where walleye growth is much faster, the regulation is used more frequently. In Ceded Territory lakes with an 18-inch minimum for walleye, creel survey data show that fewer than 5% of anglers successfully harvest a walleye, and the occurrences of anglers harvesting more than one walleye larger than 18 inches from one of these lakes was statistically undetectable. This regulation also precludes the angler harvest of juvenile walleyes.

***No harvest***

In place starting in 2015 on the Minocqua Chain as part of a joint rehabilitation effort between the state, Lac du Flambeau Band, and the Headwaters Chapter of Walleyes for Tomorrow.



# Exploitation Rates



## Spearing

Because spearing is completely monitored, it is possible to calculate spearing exploitation rates for any lake with both spearing and an adult walleye population estimate. During the period 1989–2018, exploitation rates have been calculated in 777 such cases (Figure 7A and B). For lakes with good natural reproduction of walleye (633 cases), the annual spearing exploitation rate has averaged 7.2% (range: 0.03%–49%). For lakes dependent on stocking (144 cases), the annual spearing exploitation has averaged 5.2% (range: 0.03%–27%).

## Angling

Angling exploitation rates have been calculated using creel survey data from 545 lakes and lake chains surveyed between 1990 and 2018. In general, angling exploitation rates of adult walleye populations are lower than they were before the shared angler-tribal fishery. Both the sliding bag limit system used between 1990–2014, the current 3-walleye angler daily bag limit (a reduction from a base 5 walleye daily bag limit), and various harvest length restrictions act to reduce angler harvest.

Angler exploitation is measured during DNR creel surveys, as creel clerks examine each fish harvested by interviewed anglers for a fin clip or tag given

during the spring spawning season. The ratio of the estimated number of marked fish harvested to the number of marked fish in the population generates the adult walleye exploitation rate.

Exploitation by anglers on adult walleye populations has averaged 8.6% based on the creel data collected 1990–2014. Since implementation of the fixed 3-walleye daily bag limit and adjustment of minimum harvest length restrictions, angler exploitation has averaged 6.6% in 51 surveys conducted between 2015–2018 (Table 2). Those lakes exempt from the 15-inch minimum size limit experience exploitation rates averaging 9.8% while those having an 18-inch minimum have averaged 3.3%. Since 2015, mean angler exploitation of walleye has been 6.1% in lakes with a 15-inch minimum and 20-24 inch protected slot limit.

In the one long-term study lake, Escanaba Lake, Vilas County, with annual angling exploitation data, the percent of the adult population taken during the sixteen-year period 1988–2003 ranged from 10–62% and averaged 37%. No walleye spearing has occurred in Escanaba Lake, which had no closed season and no bag limit for angling until May of 2003, when a bag limit of one and a 28-inch minimum length took effect. Fewer than five walleye have been harvested from Escanaba Lake since 2003.



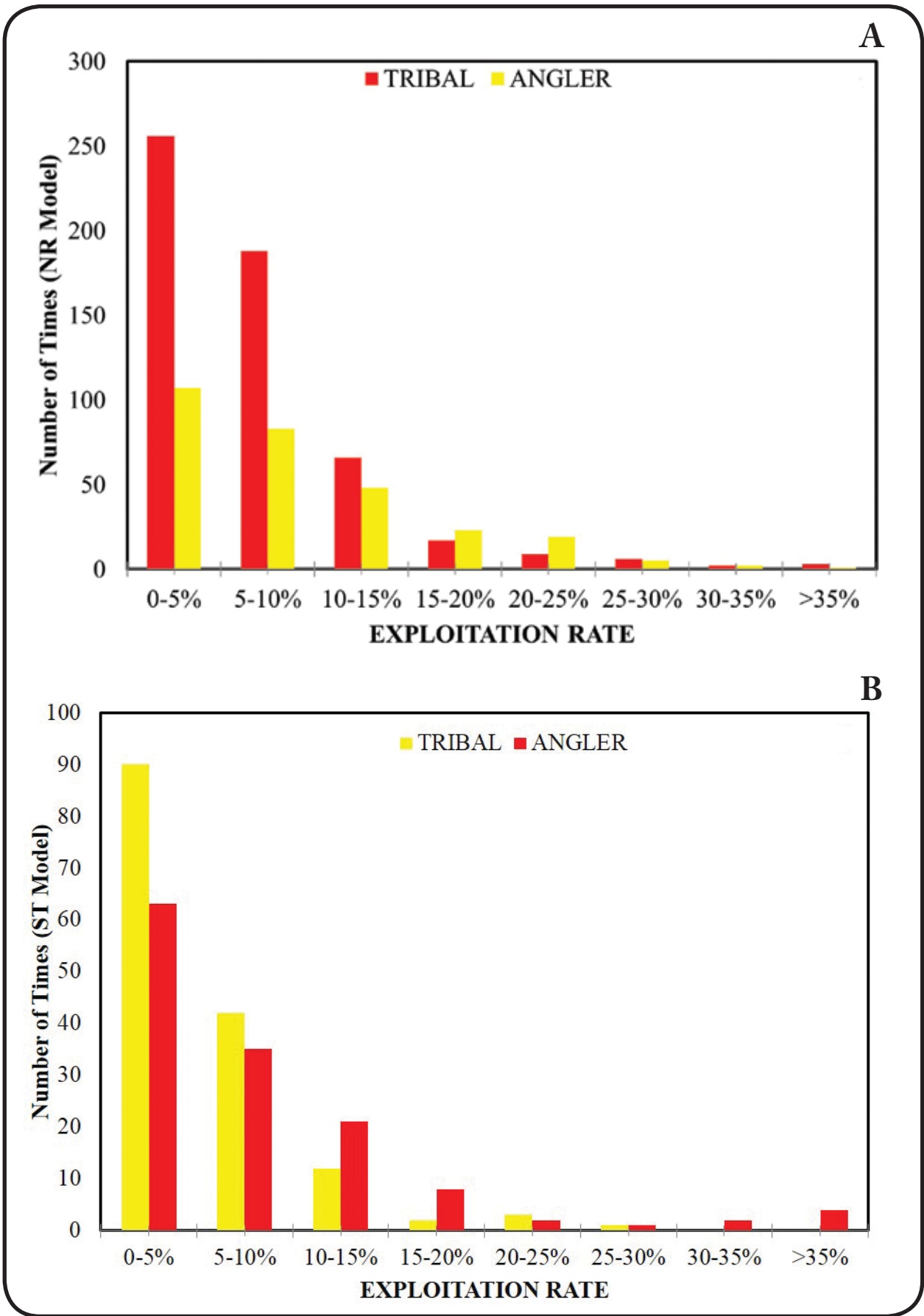


Figure 7. Distribution of State and Tribal exploitation rates for A) NR (naturally reproducing) and B) ST (stocked) lakes from 1989 to 2018.

# Juvenile Surveys



A population of walleye changes from year to year due to births and deaths from both natural causes and harvest. The relative number of walleye born in spring that survive to fall can be determined by electrofishing surveys. Typically, the entire shoreline of a lake is surveyed in one night during late summer or fall and both fingerling (age 0) and yearling (age 1) walleye are collected. The number of fall surveys conducted annually has grown to well over 150 (Figure 8).

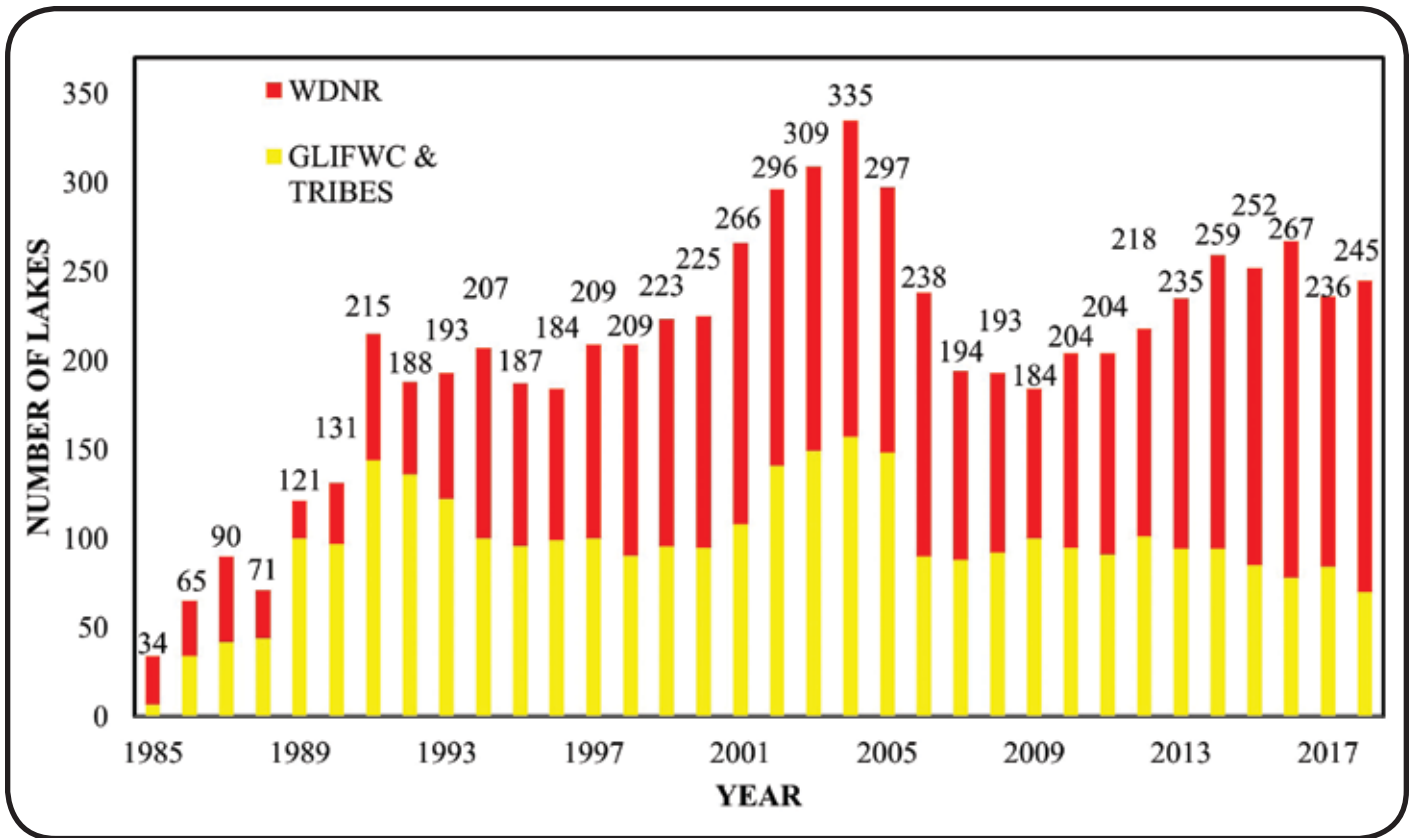


Figure 8. Number of fall electrofishing surveys for juvenile walleye conducted annually between 1985–2018.

## Walleye Year Classes



The number of fingerling walleye that survive varies from lake to lake and from year to year within a lake (Appendix 2A, DNR long-term lakes; 2B GLIFWC long-term lakes). For the 4,193 surveys conducted in lakes supported by natural reproduction since 1985, the median fingerling catch rate was 12.1 per mile of shoreline surveyed. Using this value of 12 as a gauge, the long-term study lakes for both DNR and GLIFWC show that strong year-classes occur periodically and on an irregular basis.

With the large number of fall surveys being conducted across the entire Ceded Territory, the pattern for relative strength of walleye year classes over time can be seen. For NR lakes, strong fingerling year classes were formed in 1986, 1987, 1994, 1995, and 2001 (Figure 9A), with catch rates averaging 36 per mile for these five years. Fingerling year classes formed in 1989, 1990, 1992, 1993, 2003, 2007, 2009, 2012, 2013, 2014, 2017, and 2018 were weaker, with catch rates averaging 7 per mile for these eight years (Figure 9b). For the rest of the years, catch rates ranged from 10 to 22 per mile and averaged 15. In recent years, natural reproduction has been particularly poor, with a median of under 11 per mile for the last 7 years.

For ST lakes year class strength of both fingerling and yearling walleye has been relatively stable at a low level (Figure 9B). These data for juvenile fish support the fact that fewer adult walleye are found in populations dependent on stocking compared to lakes with naturally reproducing populations.



*Several months after the spring hatch, young walleye become known as fingerlings.*

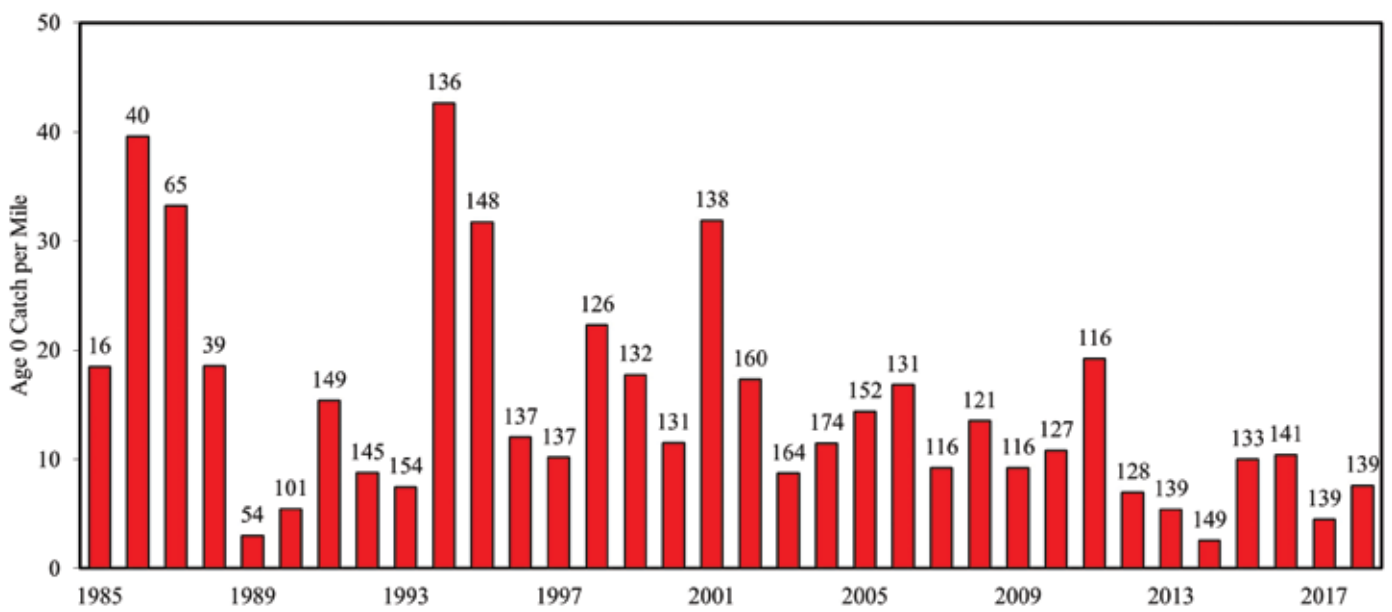
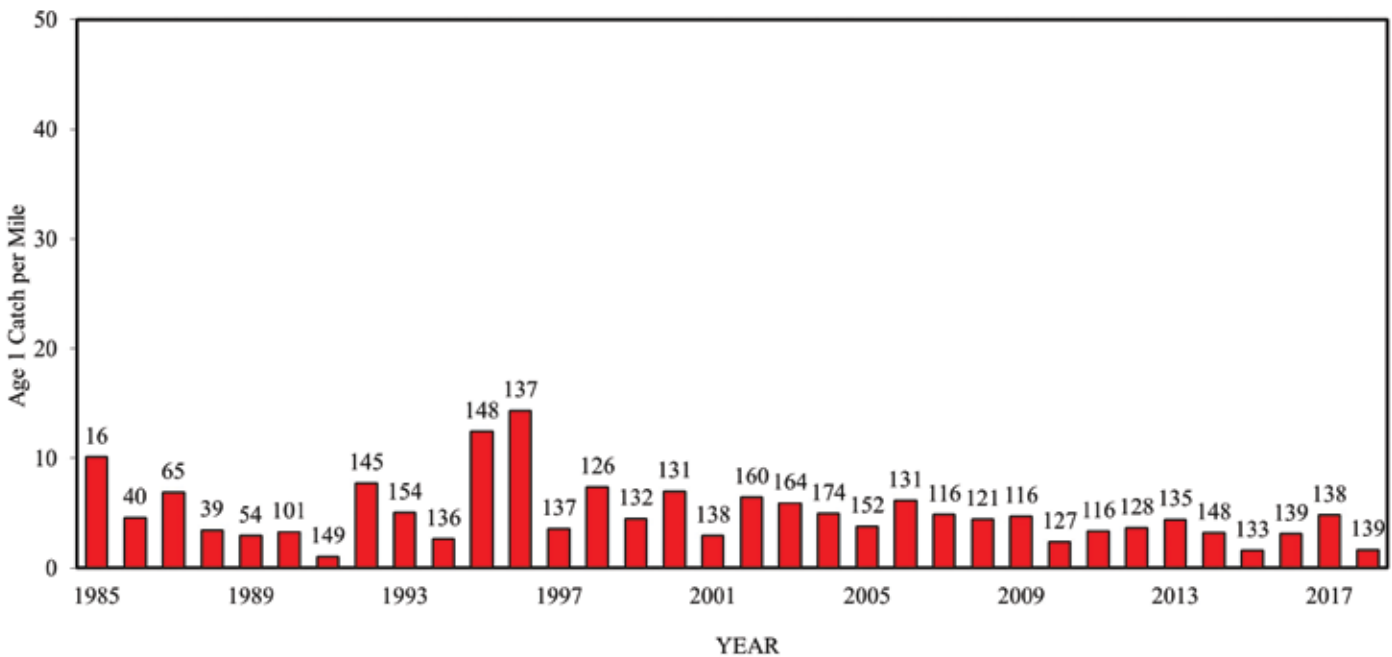
**A****B**

Figure 9. Average catch per mile of a) age 0 and b) age 1 walleye during fall electrofishing surveys for juvenile walleye conducted between 1985 and 2018. Numbers above bars indicates the number of lakes surveyed.



# Walleye Stocking



WDNR and the Tribes have used stocking as a tool to help rehabilitate formerly naturally reproducing populations, and in some instance, provide a fishery in lakes where natural reproduction does not occur. In 2013, after a Wisconsin legislative fiscal initiative, Wisconsin DNR began the Wisconsin Walleye Initiative Stocking program. This program provides substantial funding for stocking of fall fingerling walleye (raised until the first fall and stocked at 6 inches or larger) and this program has resulted in an increase of all fingerling stocking (Figure 10). These funds are

used for enhancing hatchery infrastructure, and to fund WDNR, Tribal and private hatcheries to increase production of fall fingerling walleye. Biologists are evaluating whether larger walleye stocked from the hatchery are more cost effective than the spring fingerlings (stocked in June at 1–1.5 inches) that were the focus of the hatchery system prior to the Walleye Initiative. In addition, biologists will also attempt to determine optimum stocking rates for fall fingerling walleye and in what types of lakes stocking these fish is likely to produce an adult fishery.

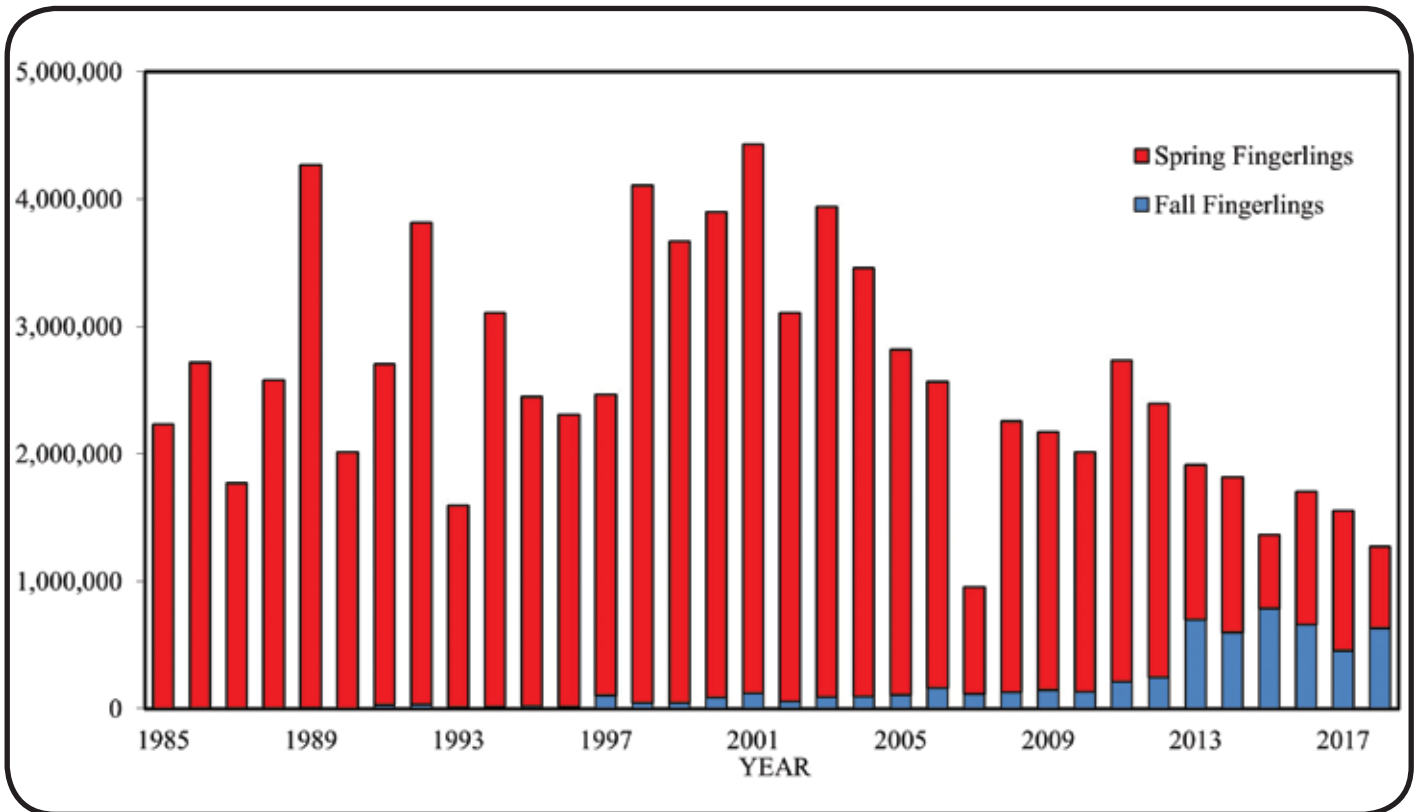


Figure 10. Number of spring fingerling and fall fingerling walleye stocked in Ceded Territory waters from 1985–2018.

# Mercury Testing & Consumption Advisories

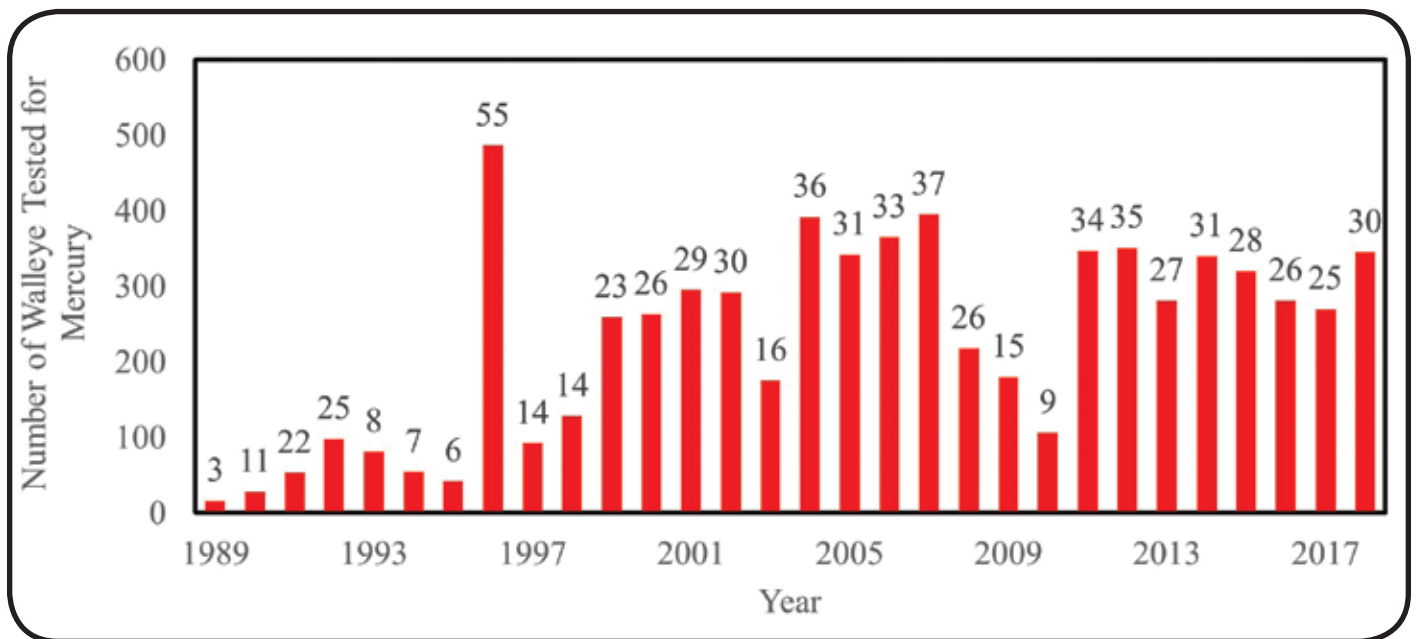


Figure 11. Number of walleye collected by GLIFWC annually from Wisconsin Ceded Territory lakes for mercury testing since the program began in 1989. The number above each bar represents the number of lakes from which walleye were obtained.

Mercury Testing and Fish Consumption Advisories Mercury is a primary contaminant of concern in walleye harvested from Ceded Territory waters, leading to fish consumption advisories in all Wisconsin lakes and rivers. Mercury contamination in fish increases with both fish age and trophic position. Because walleye are a large, long-lived, predatory species, mercury in these fish can reach levels of significant concern for the humans and wildlife that consume them.

Both GLIFWC and WDNR collect fish annually for mercury testing. GLIFWC began collecting fish in 1989 and has since tested for mercury nearly 7,000 walleye from inland lakes within the Wisconsin Ceded Territory (Figure 11). Walleye are collected by GLIFWC or tribal fisheries crews during spring population assessments or are purchased from tribal spearers at boat landings following data collection by the creel teams. Fish collected for the mercury program are counted toward individual permits and overall lake quotas for tribal harvest. GLIFWC targets 12 fish per lake per sampling year. Because mercury increases with fish age and size, the fish are collected across a range of size classes that reflect the walleye lengths harvested and consumed by tribal members.

A number of factors are considered to determine the lakes targeted for mercury sampling each year. There are six lakes in Wisconsin sampled by GLIFWC annually in order to maintain a comprehensive long-term data set for assessing trends in fish mercury concentrations. The top 100 tribal walleye harvest lakes in Wisconsin are sampled on a rotating basis, with sampling frequency (every 1–10 years) correlating to the number of fish harvested by GLIFWC member tribes over the previous 5 years. GLIFWC also targets a subset of lakes each year that have had past tribal harvest of walleye but for which there are low sample numbers, especially those lakes without enough data to issue any consumption guidelines.

Mercury data for walleye and other species are maintained in a GLIFWC database. In addition, through an agreement with the state, GLIFWC and WDNR exchange all fish mercury data they have collected annually. This allows both GLIFWC and WDNR to increase the amount of data available to them for developing their respective mercury-based fish consumption advisories.

Mercury levels in fish vary significantly among lakes in relation to complex interactions between

several lake, watershed, and food web characteristics. Overall, mercury levels have decreased in walleye throughout the region since their peak in the 1950s-70s. But the decline has been slow, with levels relatively stable in recent years. GLIFWC is in the initial stages of reevaluating temporal trends of mercury in walleye to update its previous analysis that found a 0.60% annual decrease in walleye collected by GLIFWC and WDNR from 420 Wisconsin Ceded Territory lakes between 1982-2005.

GLIFWC analyzes the walleye mercury data collected by GLIFWC and WDNR to create its Mercury Maps, which provide GIS-based, lake specific, color-coded walleye consumption advice to its member tribes (Appendix 3A-F). The maps focus on walleye, which are the most important subsistent fish species among GLIFWC's member tribes, and display lakes where the tribes currently or historically harvest walleye. The maps are updated with the newest available data every other year. Currently, the maps display 334 lakes within the Wisconsin Ceded Territory with 274 (82%) lakes having sufficient mercury data available to allow for the issuance of lake-specific walleye consumption guidelines. There are six Wisconsin Mercury Maps, displaying the walleye harvest lakes for each of GLIFWC's six member tribes in the state.



The Mercury Maps provide two sets of consumption advice: one for the sensitive population (children under 15 years and women of childbearing age) and the general population (men 15 years and older and women beyond childbearing age). Because mercury has the most severe impacts on the developing nervous system and can cross the placenta to the fetus, consumption advice for the sensitive population is more conservative than for the general population. Consumption advice is based on methylmercury reference doses established by the U.S. EPA. The Mercury Maps, and other outreach and education materials on mercury and safe fish consumption, are distributed regularly at tribal events, made available on GLIFWC's website and at tribal registration stations, and are advertised to tribal communities via social media and GLIFWC's quarterly newspaper.

WDNR also collects and analyzes samples of fish tissue from Wisconsin's inland and outlying waters, including waters within and bordering the Ceded Territory. In addition to walleye, WDNR analyses multiple species of fish (including panfish) from locations within the Ceded Territory. In addition, the WDNR also analyses fish from specific locations for additional contaminants (PCBs, PFAS) and these data are shared with GLIFWC. All advisories are formulated and reviewed in collaboration with the Wisconsin Department of Health Services.

All fish contaminant advisory information produced by the WDNR, including that from the Ceded Territory, can be found on the WDNR website ([www.dnr.wi.gov](http://www.dnr.wi.gov), keyword "eating your catch"). The WDNR also maintains a query tool on its website where advisory information for specific bodies of water can be found.

*As part of walleye consumption advisory efforts, GLIFWC recommends that tribal spearfishers label packages of fillets from specific lakes.*

## Conclusion



Commitment and cooperation have enabled the Joint Assessment Steering Committee to develop an ongoing database on the walleye fishery. This valuable information helps form a picture which has enabled fishery managers to better understand the dynamics of the fishery and the impact of human activity. Data from the last thirty years have shown that walleye populations in different lakes are unique. Effective management will require lake-specific regulations and population modeling (like the mixed effects model).

In addition, walleye populations are declining in many parts of the Ceded Territory. In many cases, natural recruitment has declined. To reverse this trend and to ensure healthy fish for future generations, the Committee sets the following as priorities:

- ❁ cooperative walleye population recovery strategies for lakes with declining natural reproduction
- ❁ protecting important habitat for walleye spawning and early life stages
- ❁ protecting and restoring walleye lake watersheds and riparian zones
- ❁ preventing the spread of aquatic invasive species
- ❁ continued observation of trends in both adult and juvenile walleye populations
- ❁ continued monitoring of mercury levels in the fishery to assess health risks in the mixed fishery waters and development of trend information
- ❁ continued extensive fall recruitment surveys to develop trend data for individual lakes in the Ceded Territory
- ❁ continued creel surveys to provide a picture of the impact of angling over time
- ❁ use of the information for development lake-specific management strategies
- ❁ inventory, description, and classification of habitat in order to protect it

The inter-agency sharing of expertise, equipment, finances, and workload has been the key to the



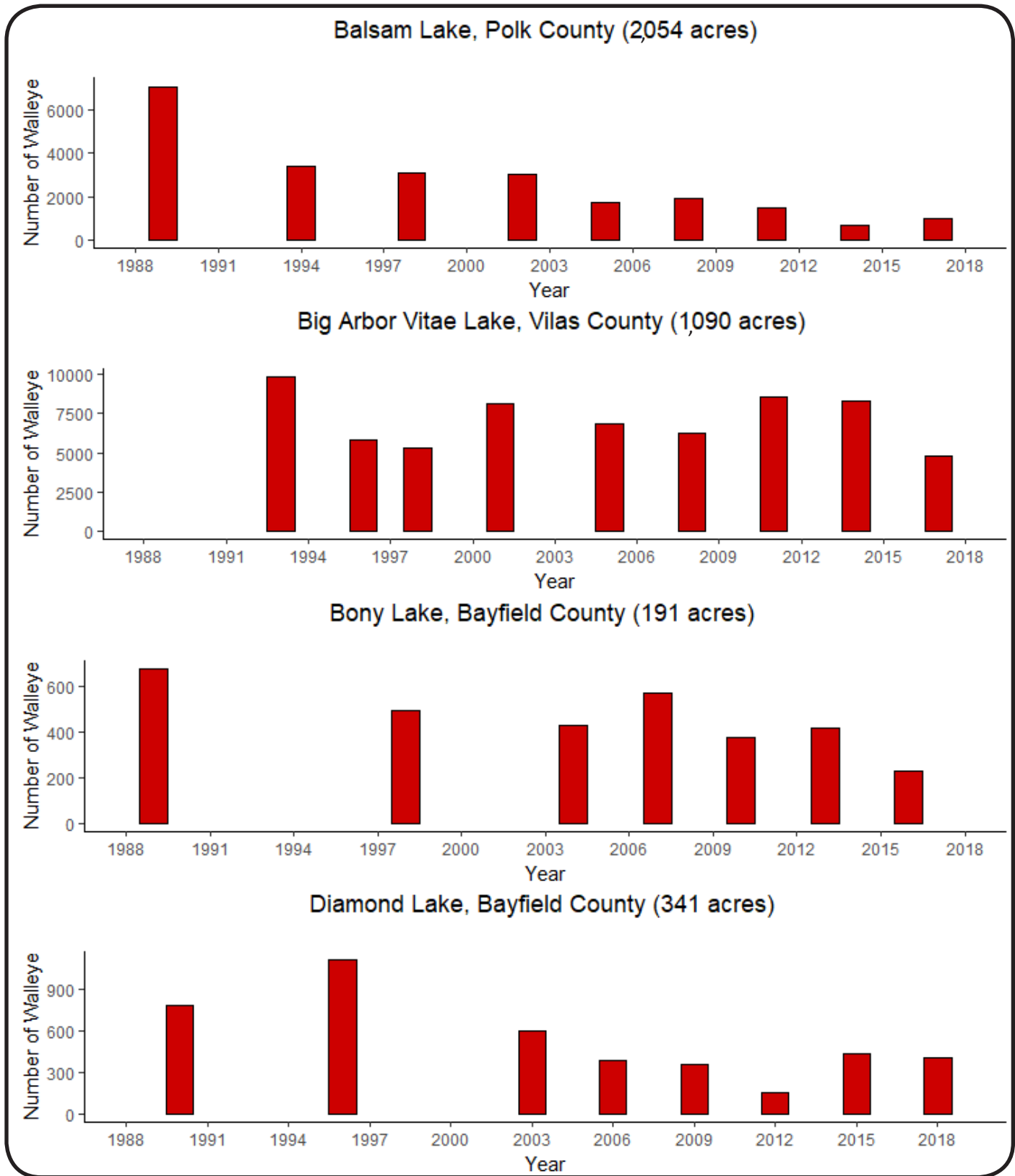
***Along with building relationships between agency staff, the annual Partners in Fishing event brings together tribal representatives and fishing guides.***

development of this database on the walleye fishery in Wisconsin's Ceded Territory. Wisconsin's gift of abundant lakes makes the labor-intensive task of assessment enormous and too costly for one entity to accomplish alone. For this reason the cooperative effort between state, tribal and federal agencies has truly been the key to casting more light on Wisconsin's walleye resource and providing the information necessary to keep it as healthy and wonderful as it has always been.

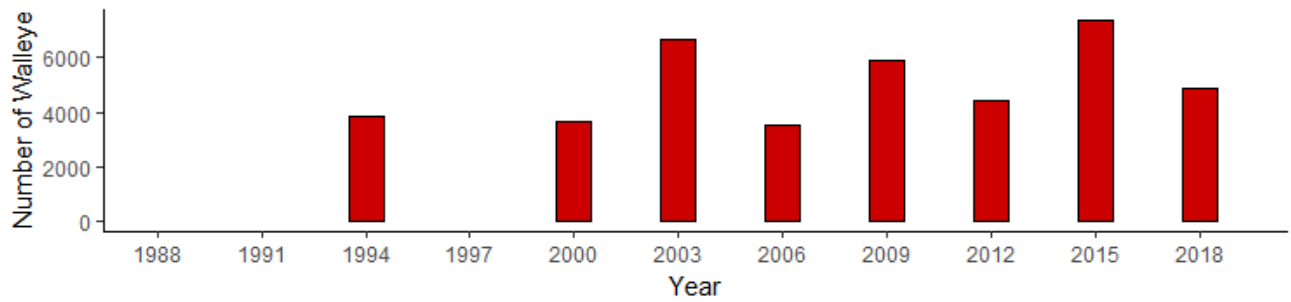
# Appendix 1A



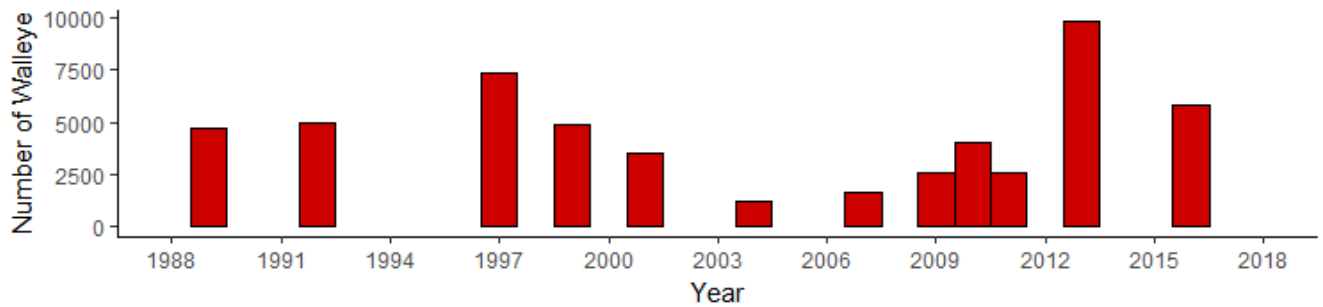
Walleye population estimates conducted by A) Wisconsin DNR and B) GLIFWC in long-term study lakes.



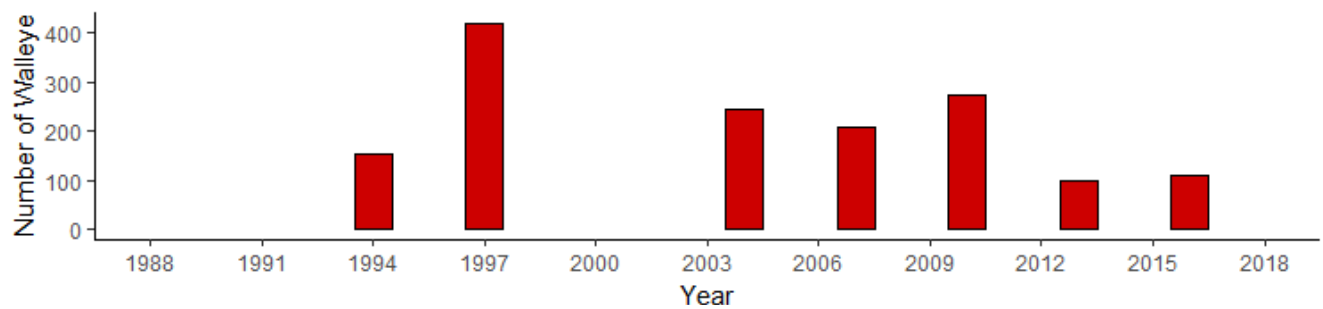
Grindstone Lake, Sawyer County (3,111 acres)



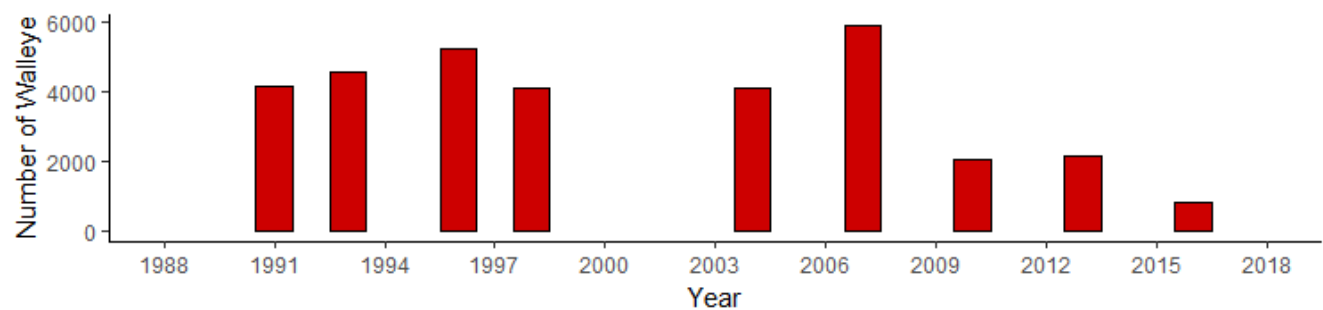
Lake Metonga, Forest County (1,991 acres)



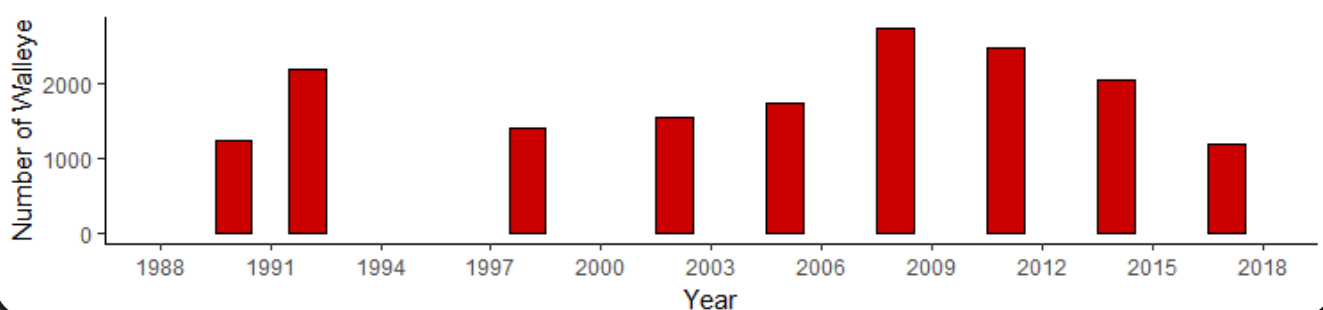
Lipsett Lake, Burnett County (393 acres)



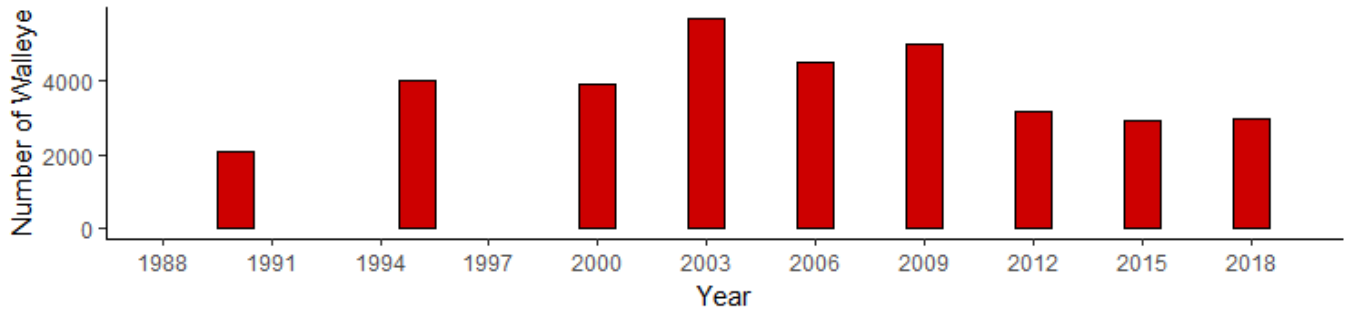
Middle Eau Claire Lake, Bayfield County (902 acres)



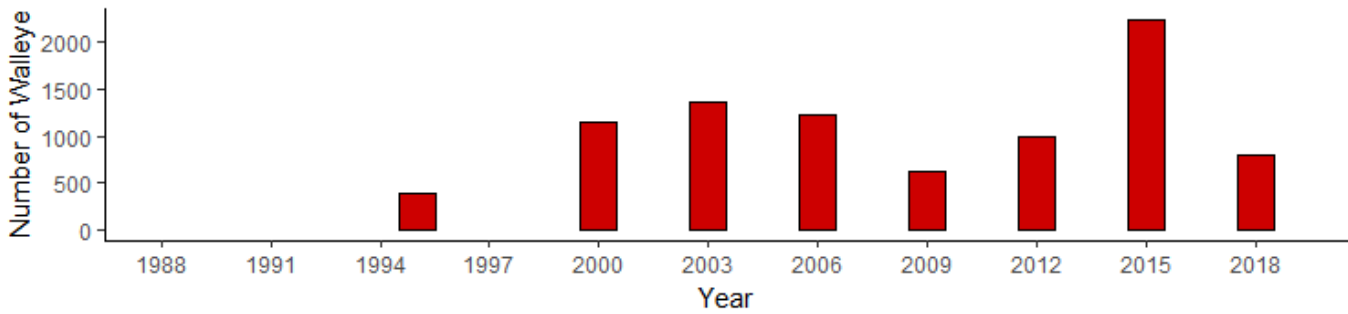
Pine Lake, Iron County (312 acres)



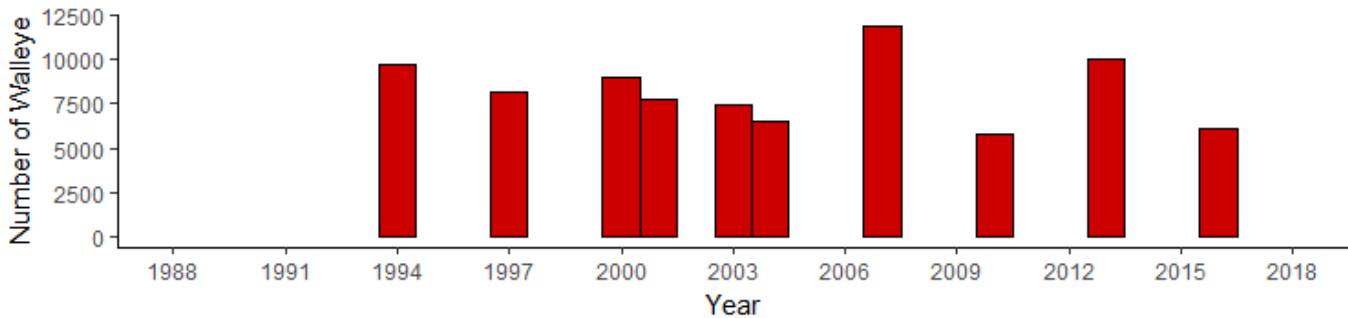
Plum Lake, Vilas County (1,033 acres)



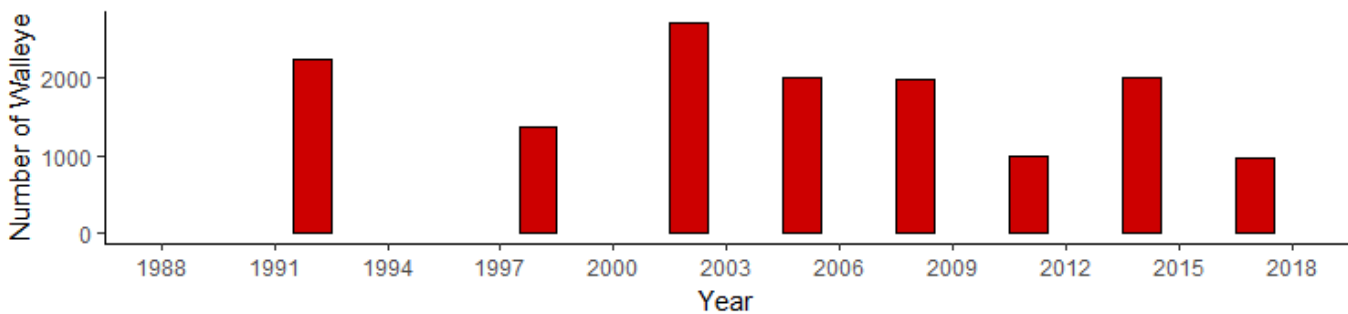
Snipe Lake, Vilas County (239 acres)



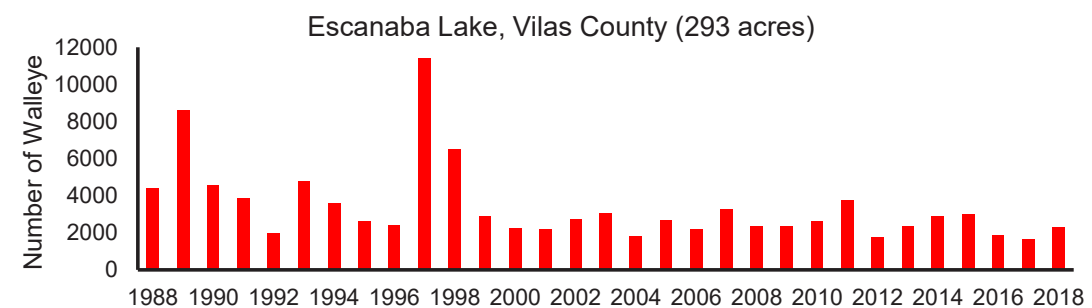
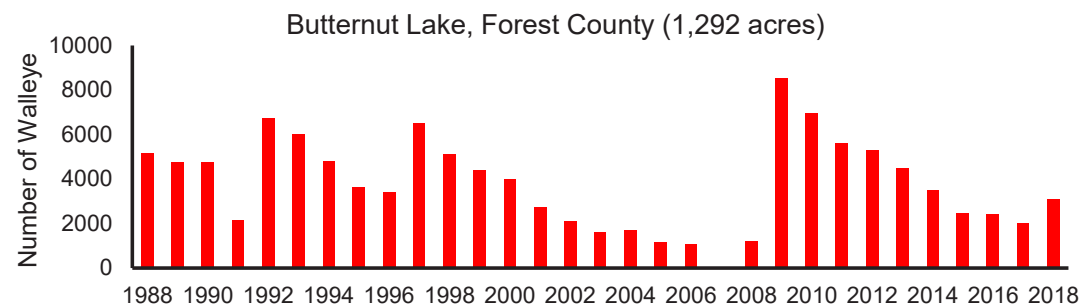
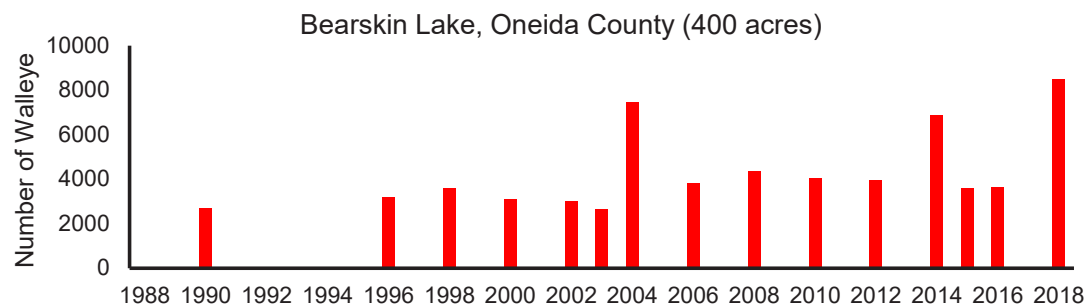
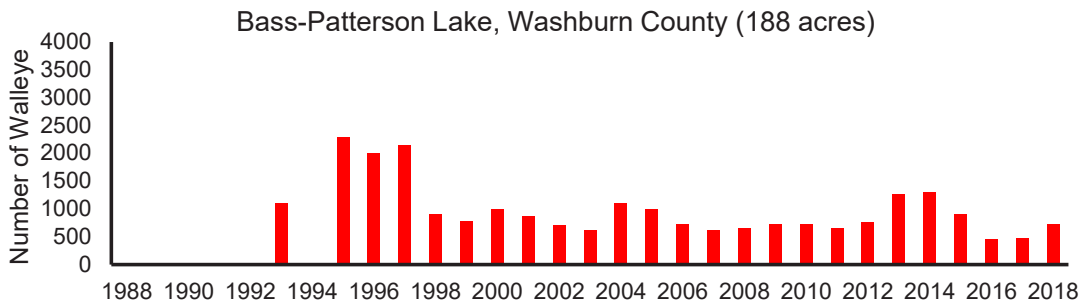
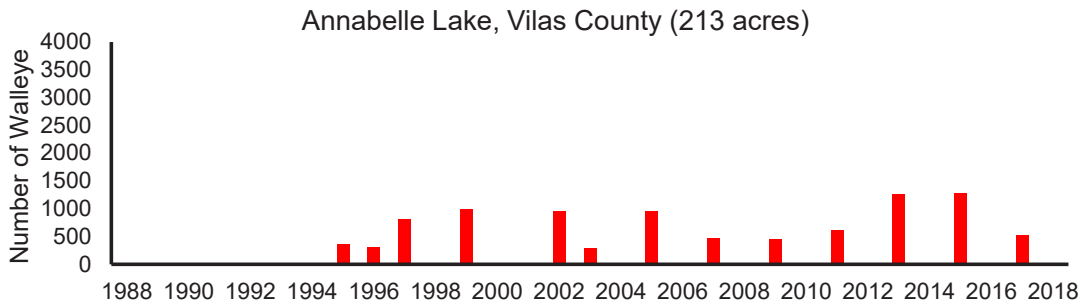
Trout Lake, Vilas County (3,816 acres)



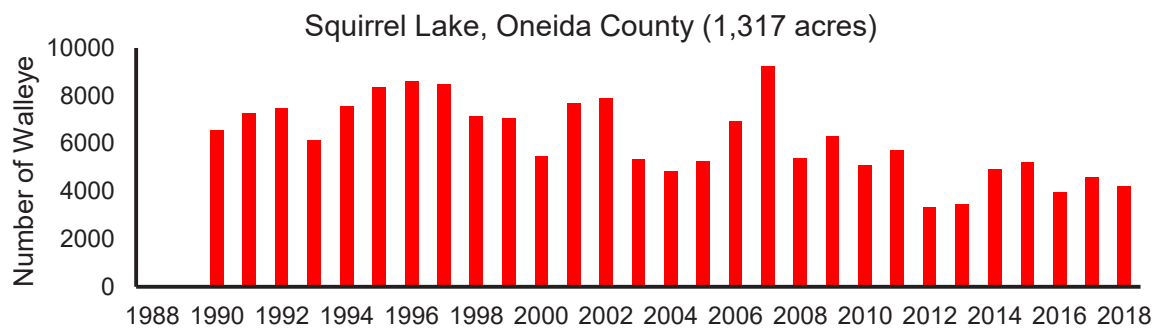
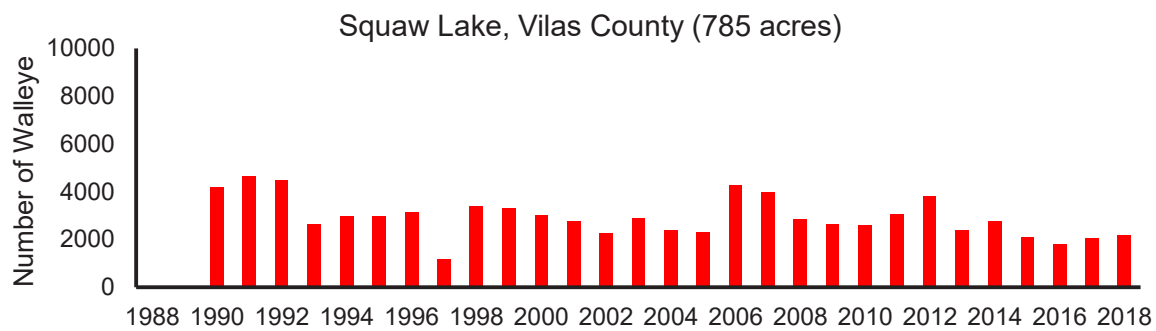
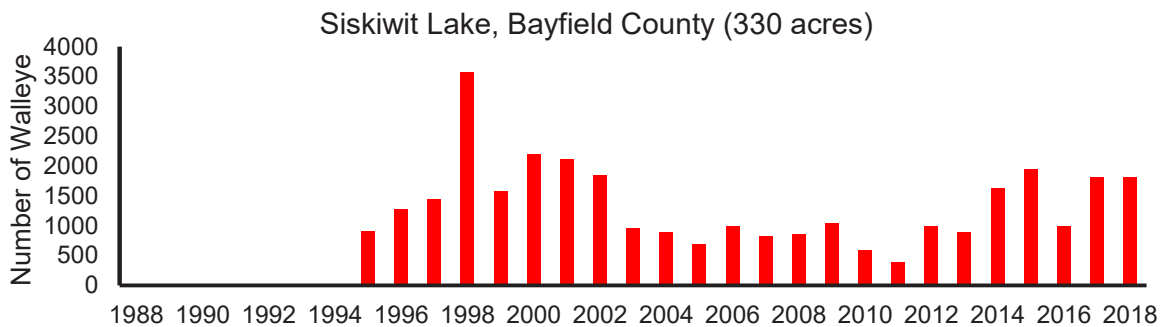
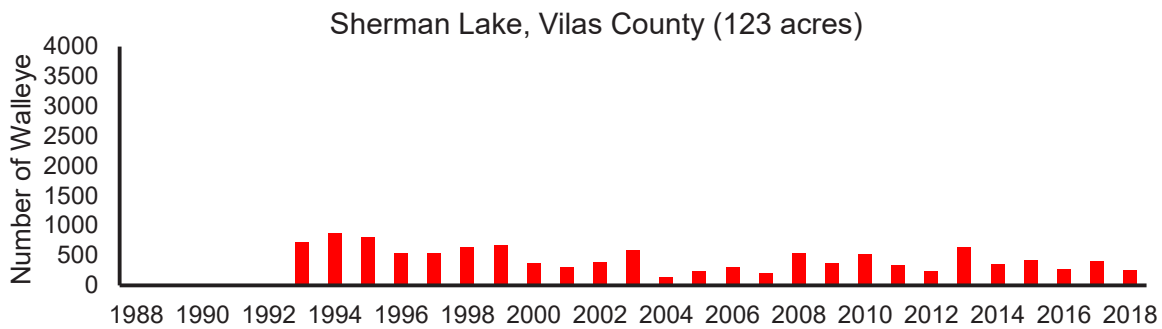
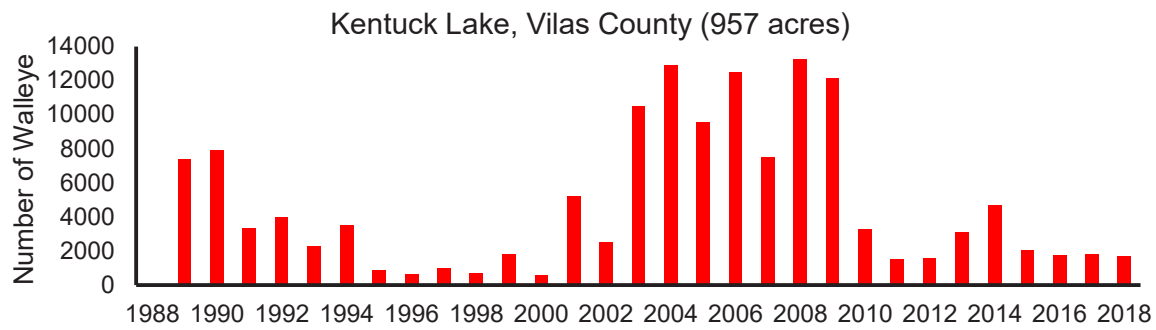
Two Sisters Lake, Oneida County (719 acres)



# Appendix 1B



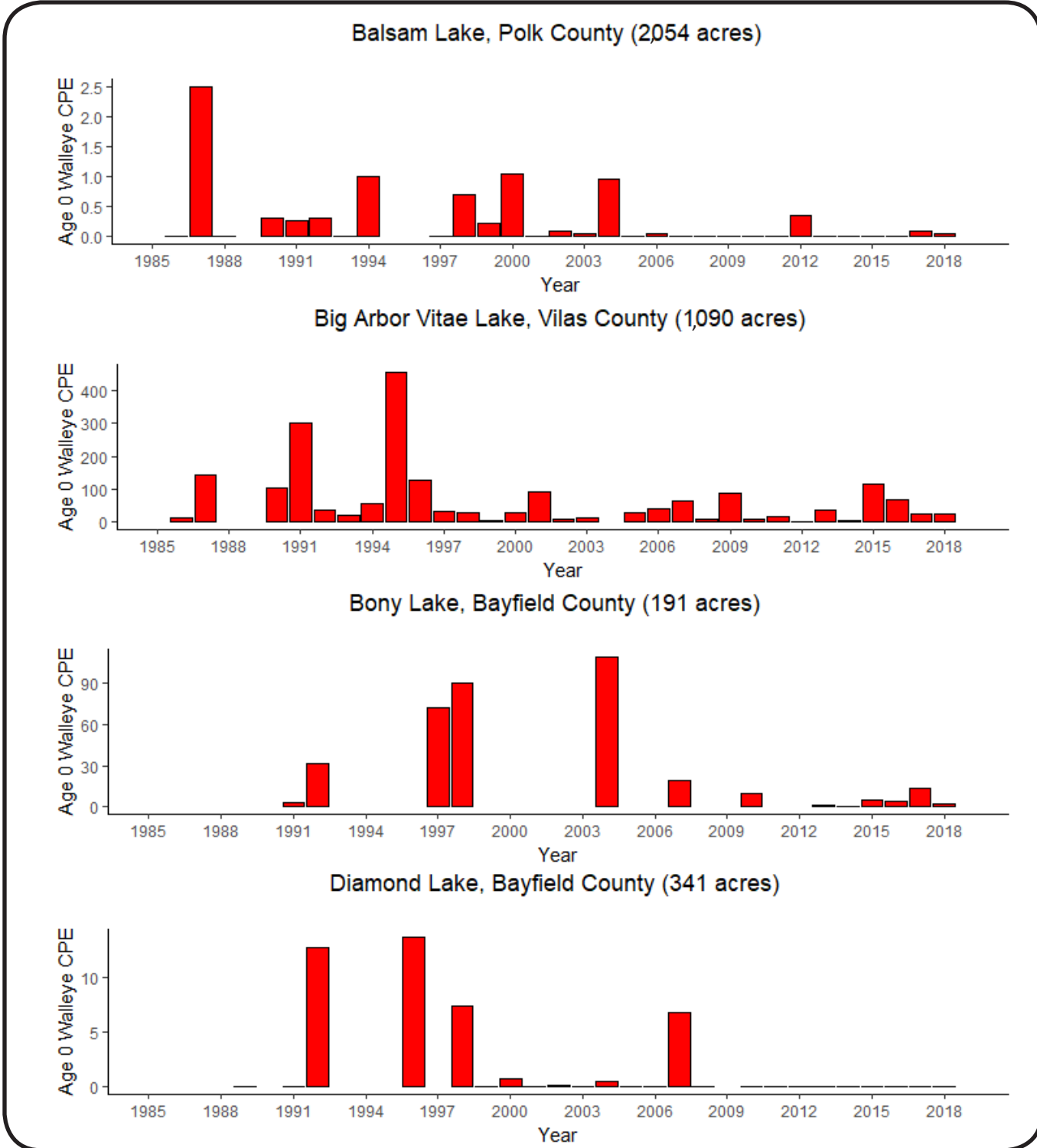




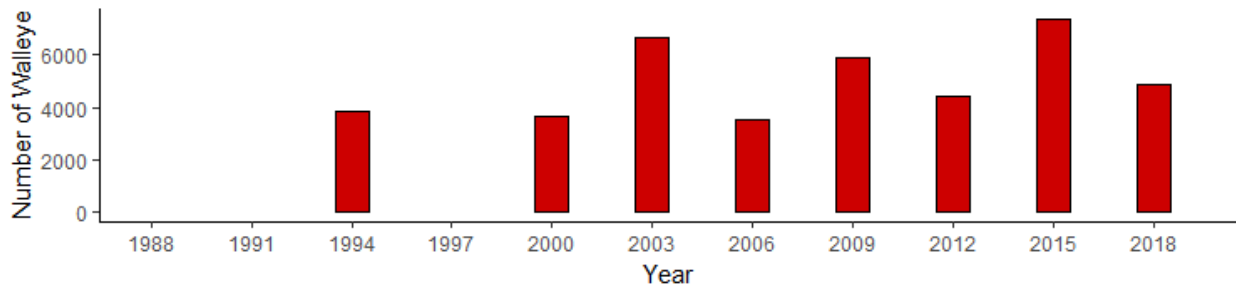
# Appendix 2A



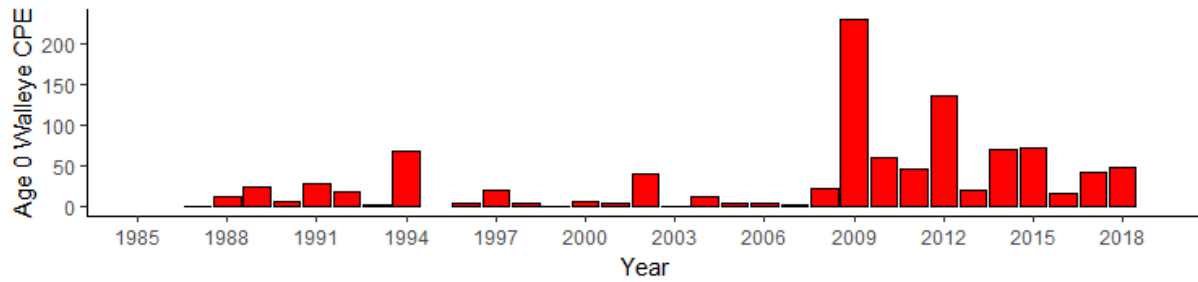
Catch per effort of age 0 walleye per mile of shoreline surveyed during fall surveys of the long-term study lakes conducted by A) DNR and B) GLIFWC from 1985–2018.



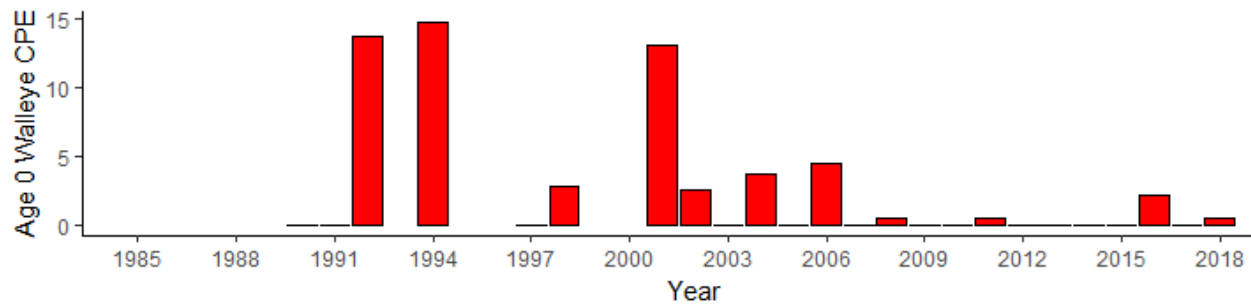
Grindstone Lake, Sawyer County (3,111 acres)



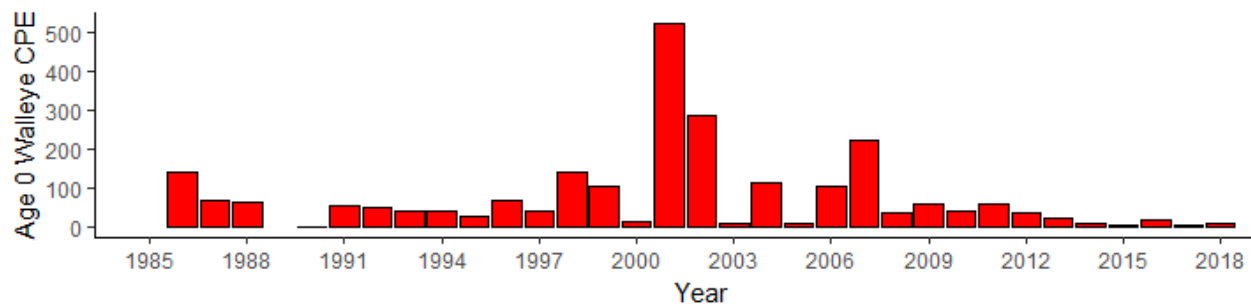
Lake Metonga, Forest County (1,991 acres)



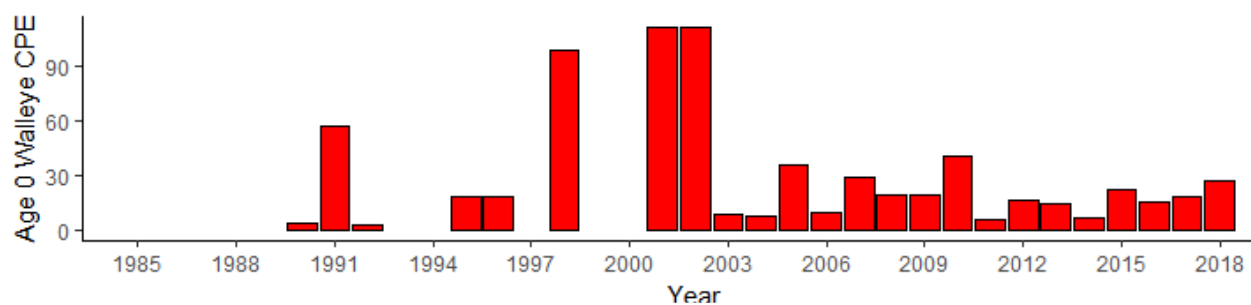
Lipsett Lake, Burnett County (393 acres)



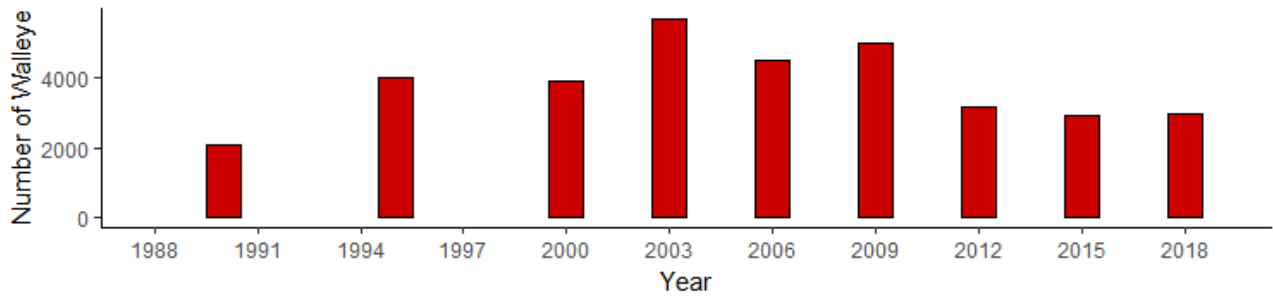
Middle Eau Claire Lake, Bayfield County (902 acres)



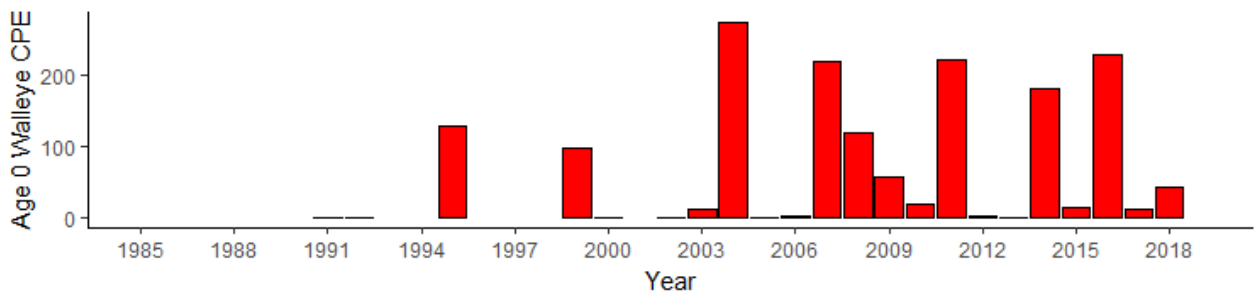
Pine Lake, Iron County (312 acres)



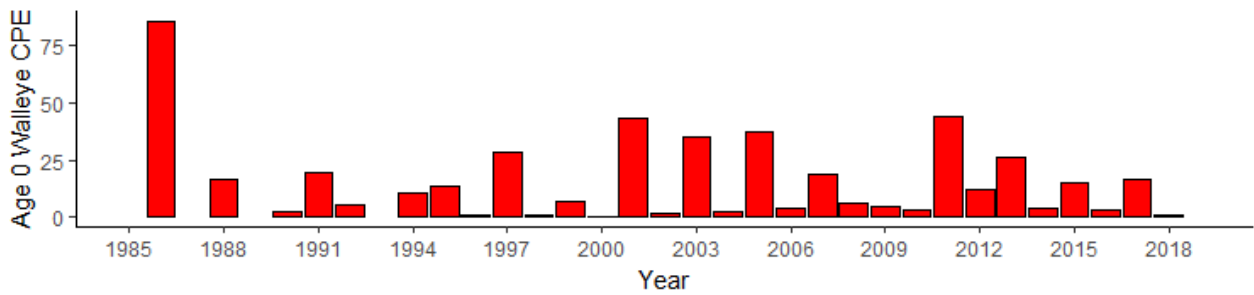
Plum Lake, Vilas County (1,033 acres)



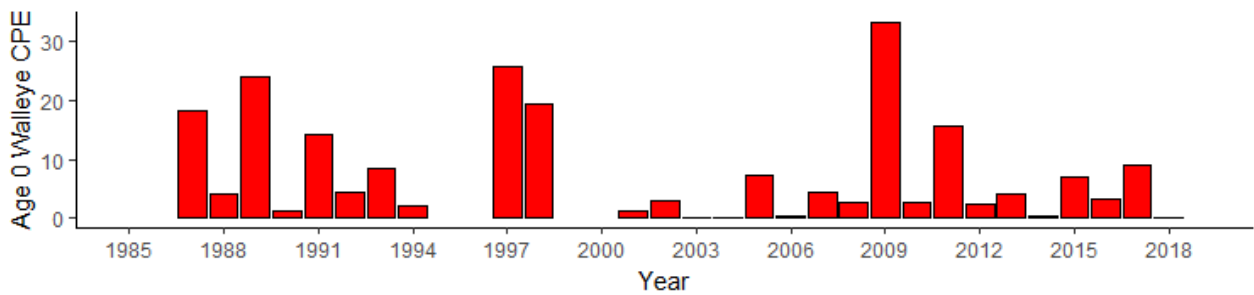
Snipe Lake, Vilas County (239 acres)

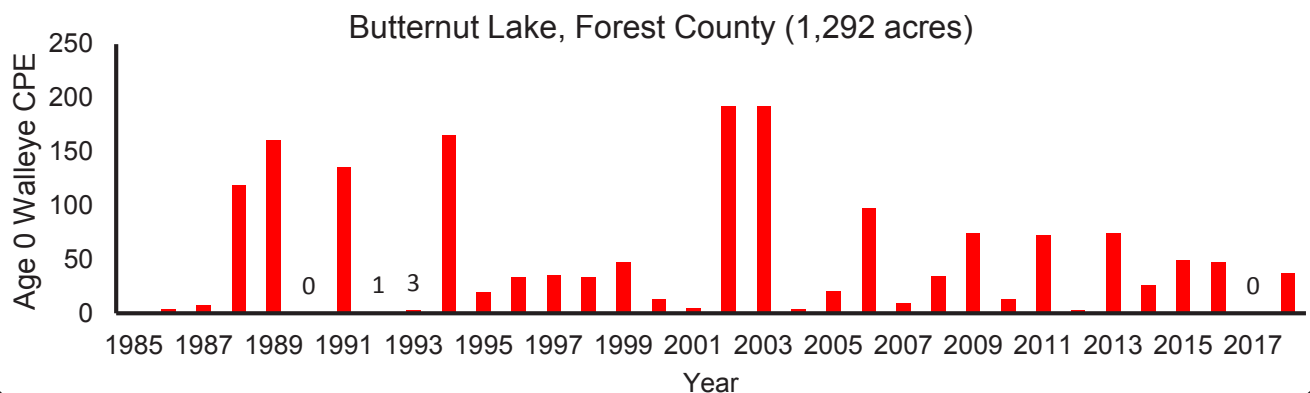
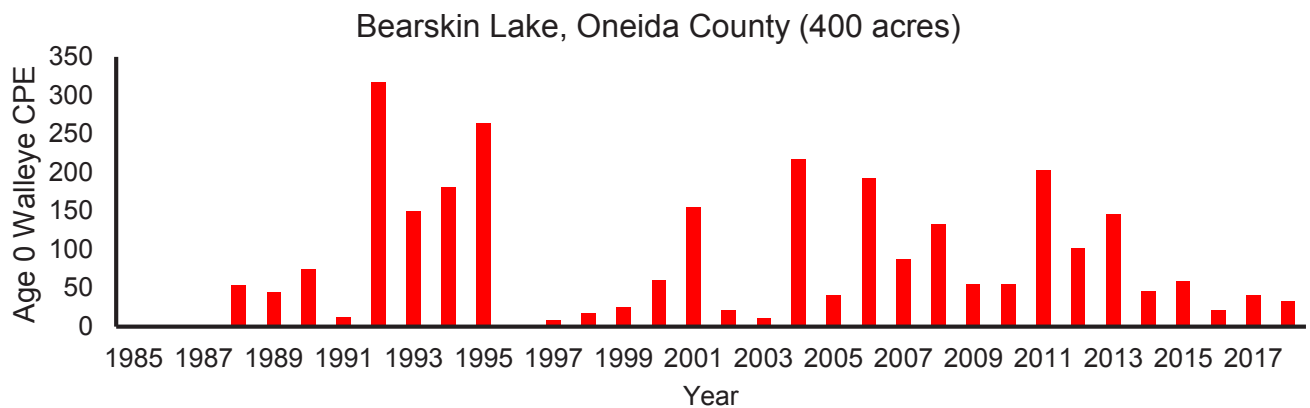
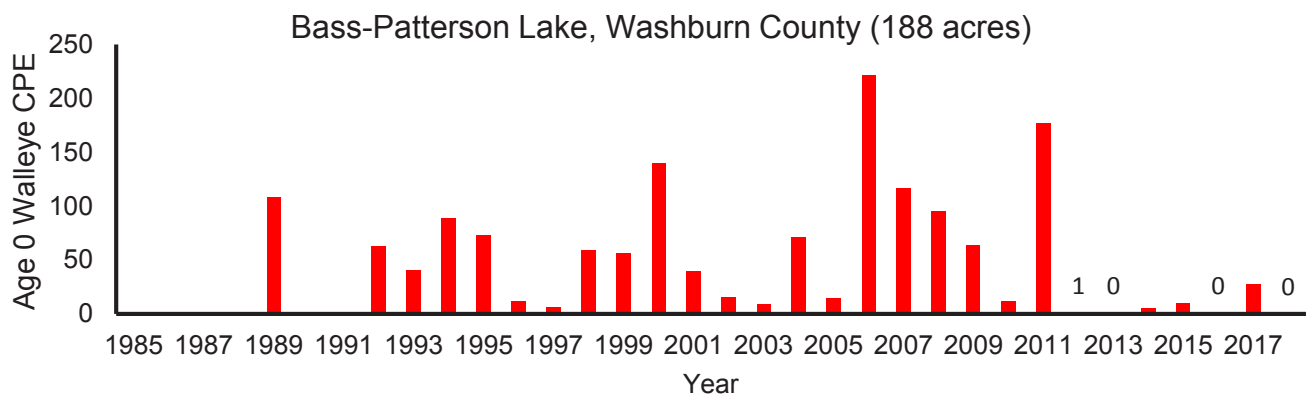
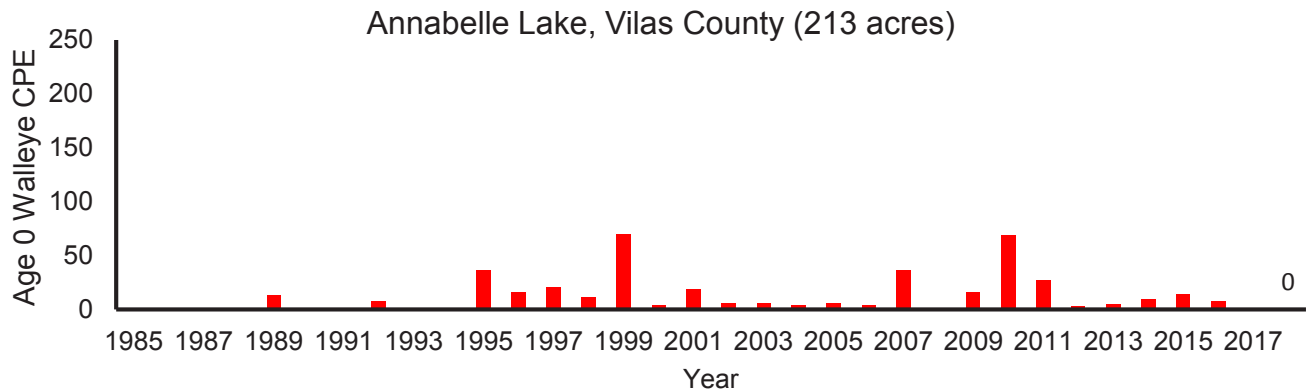


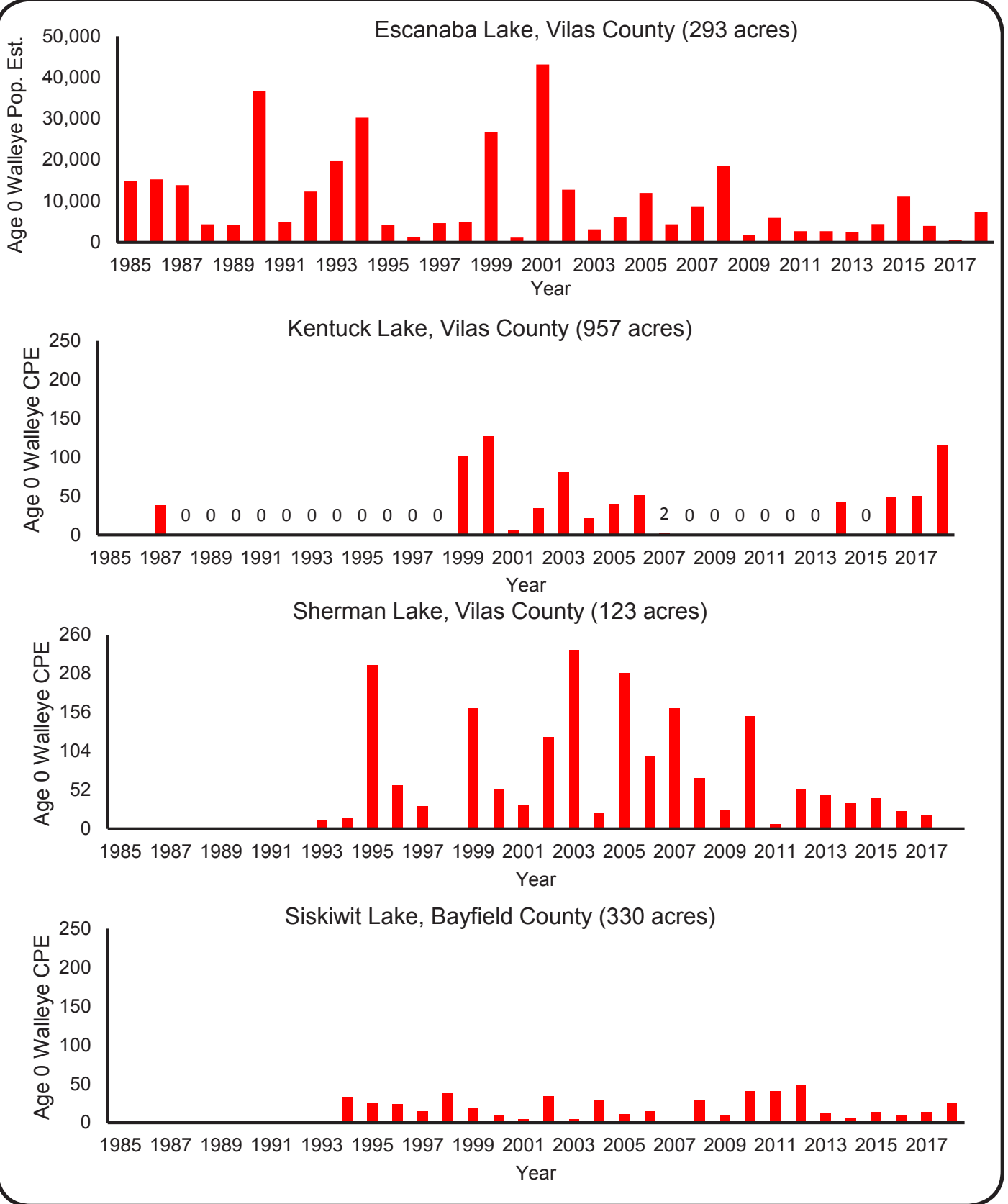
Trout Lake, Vilas County (3,816 acres)

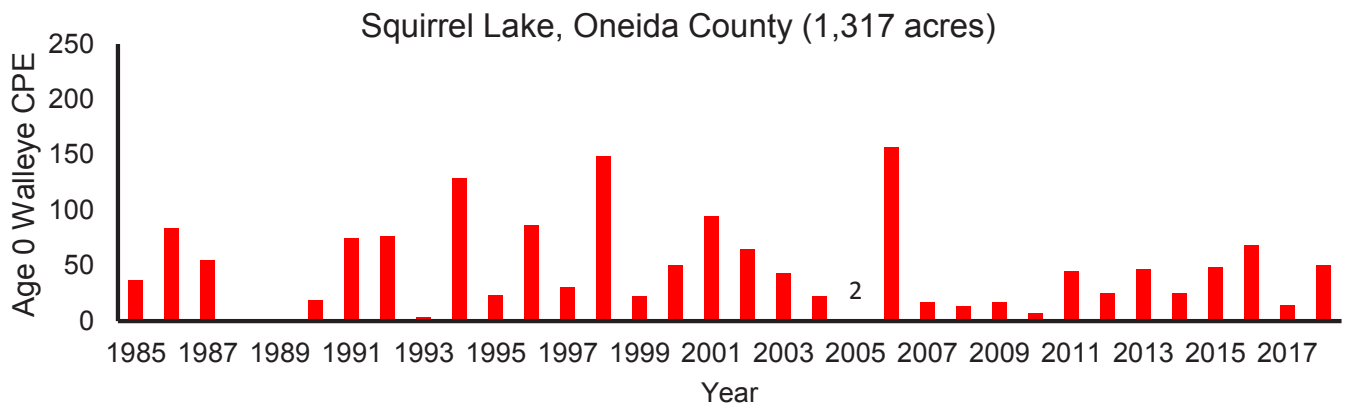
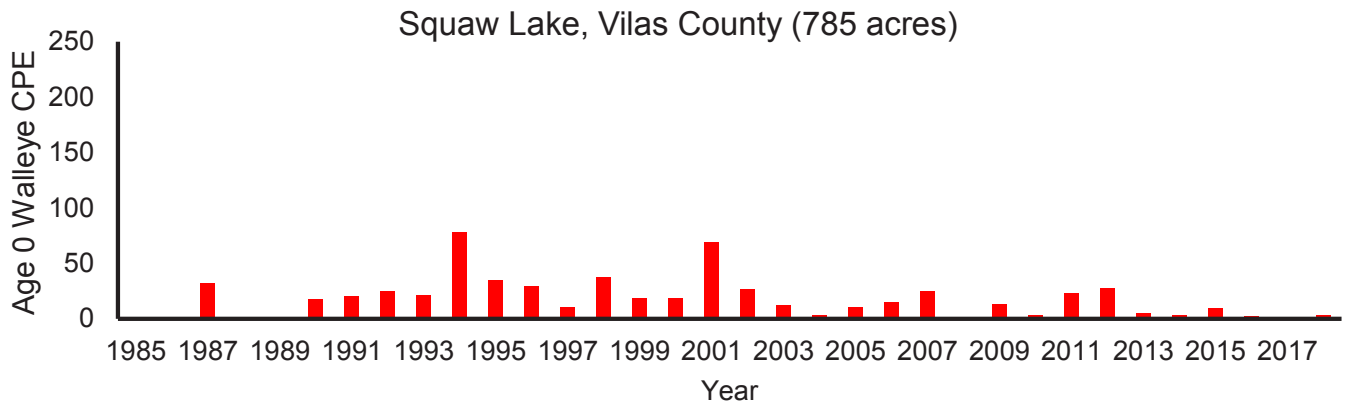


Two Sisters Lake, Oneida County (719 acres)





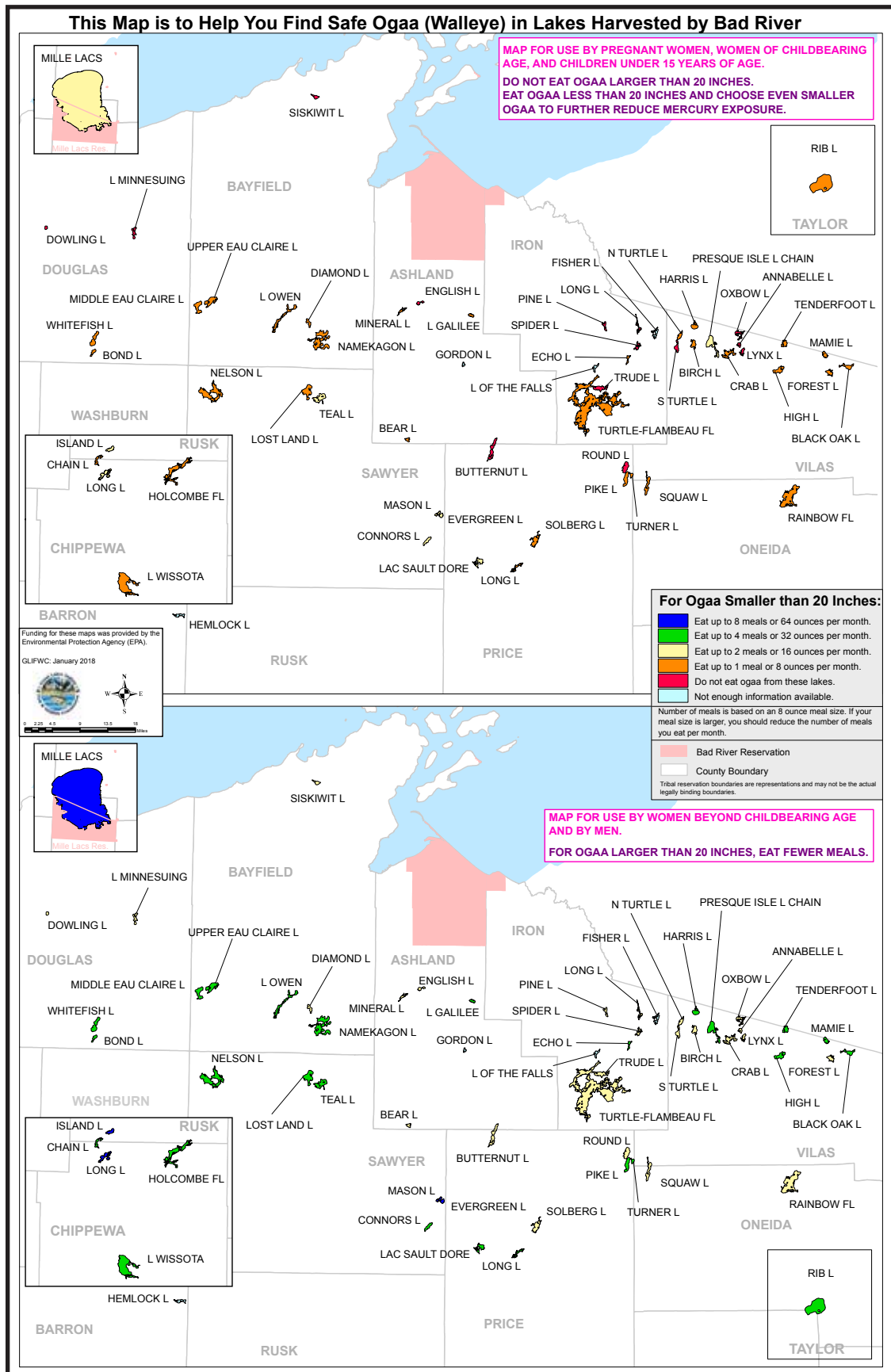




# Appendix 3

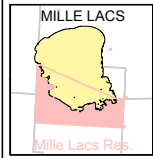
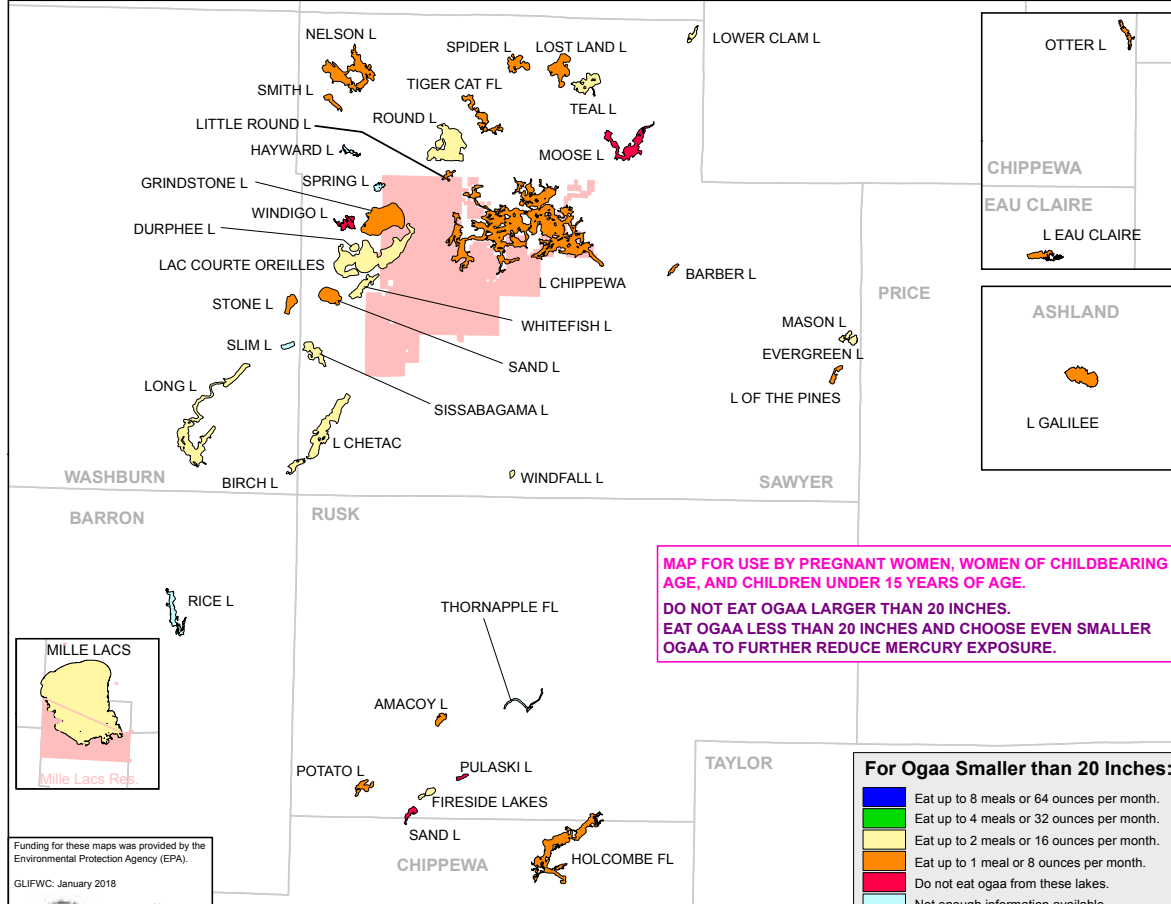


## Maps showing information on mercury contamination and consumption advisories for walleye in lakes harvested by the six Wisconsin Ojibwe Bands.





**This Map is to Help You Find Safe Ogaa (Walleye) in Lakes Harvested by Lac Courte Oreilles**



Funding for these maps was provided by the Environmental Protection Agency (EPA).  
 GLIFWC, January 2018

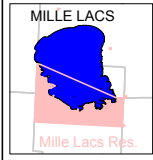
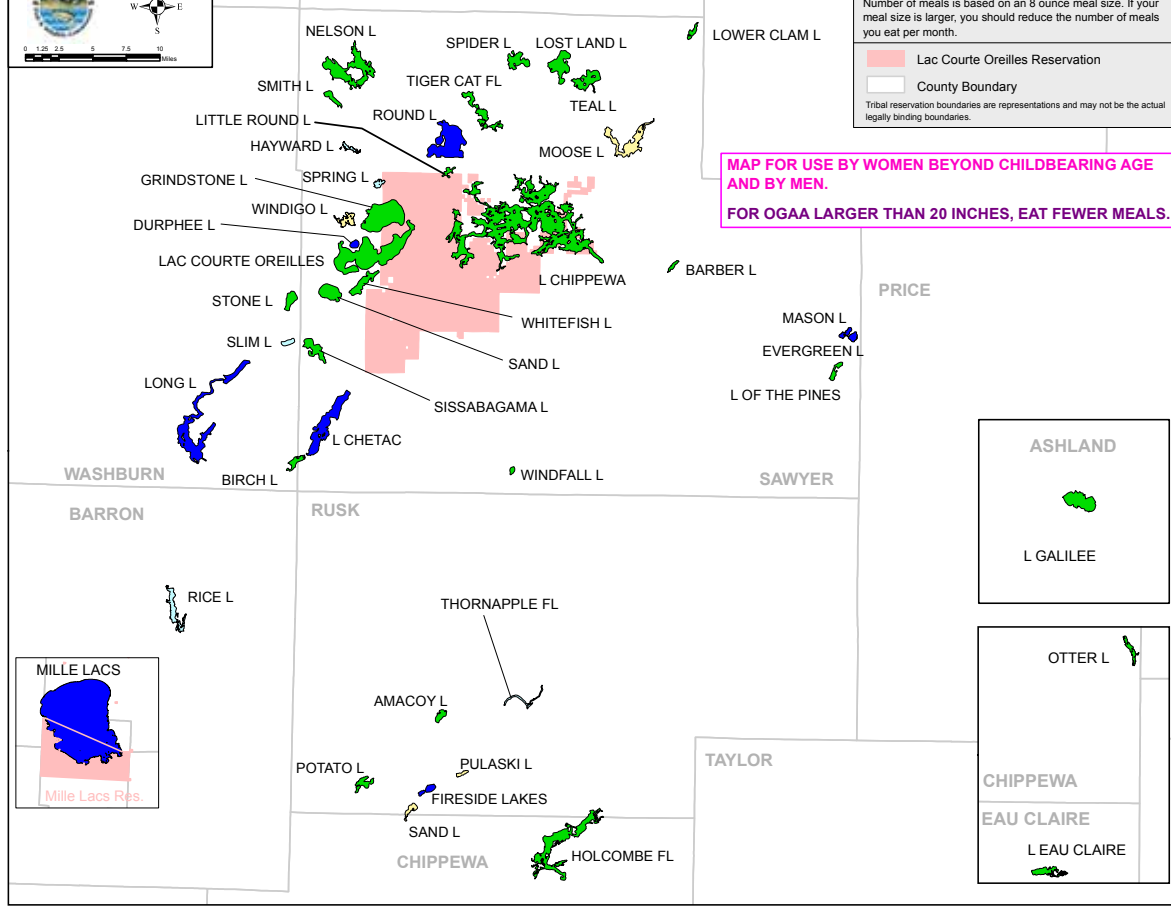
**For Ogaa Smaller than 20 Inches:**

- Eat up to 8 meals or 64 ounces per month.
- Eat up to 4 meals or 32 ounces per month.
- Eat up to 2 meals or 16 ounces per month.
- Eat up to 1 meal or 8 ounces per month.
- Do not eat ogaa from these lakes.
- Not enough information available.

Number of meals is based on an 8 ounce meal size. If your meal size is larger, you should reduce the number of meals you eat per month.

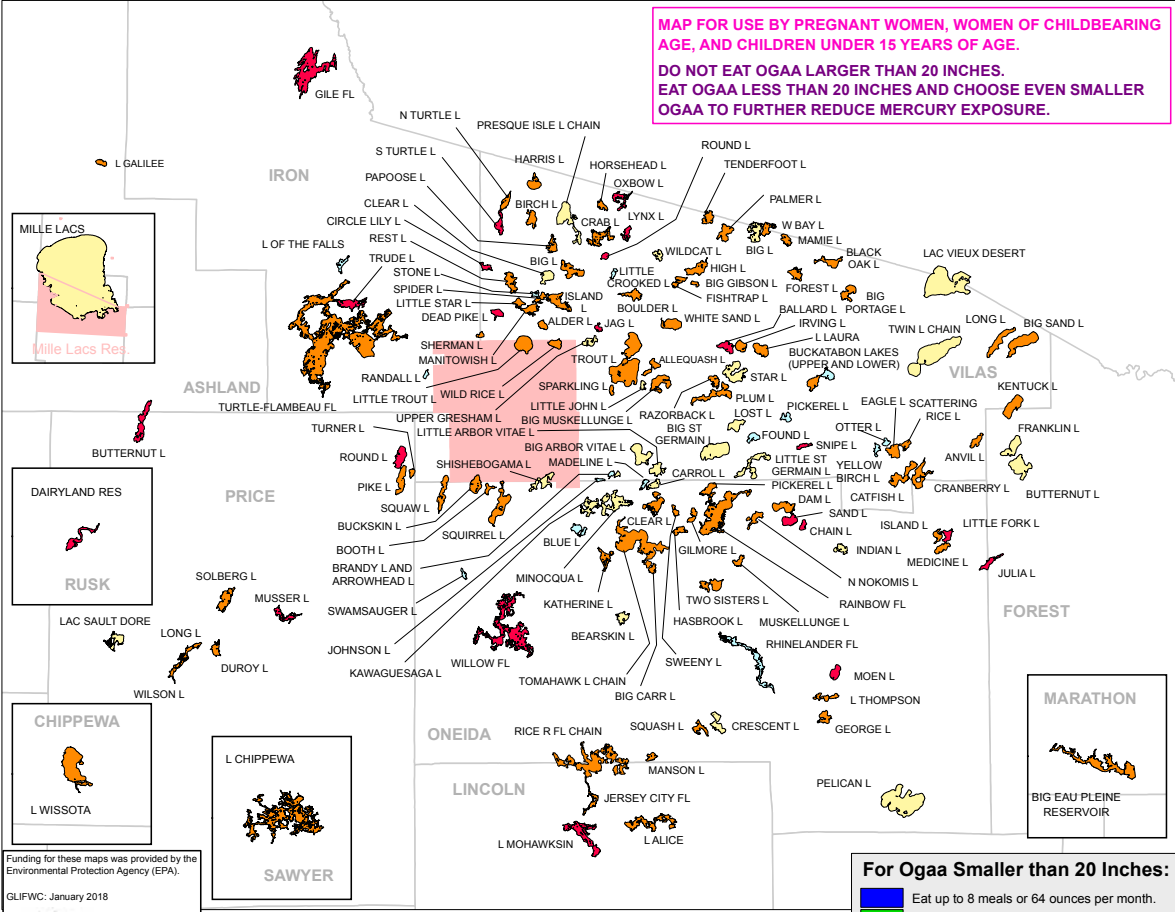
- Lac Courte Oreilles Reservation
- County Boundary

Tribal reservation boundaries are representations and may not be the actual legally binding boundaries.



# This Map is to Help You Find Safe Ogaa (Walleye) in Lakes Harvested by Lac du Flambeau

**MAP FOR USE BY PREGNANT WOMEN, WOMEN OF CHILDBEARING AGE, AND CHILDREN UNDER 15 YEARS OF AGE.**  
**DO NOT EAT OGAA LARGER THAN 20 INCHES.**  
**EAT OGAA LESS THAN 20 INCHES AND CHOOSE EVEN SMALLER OGAA TO FURTHER REDUCE MERCURY EXPOSURE.**



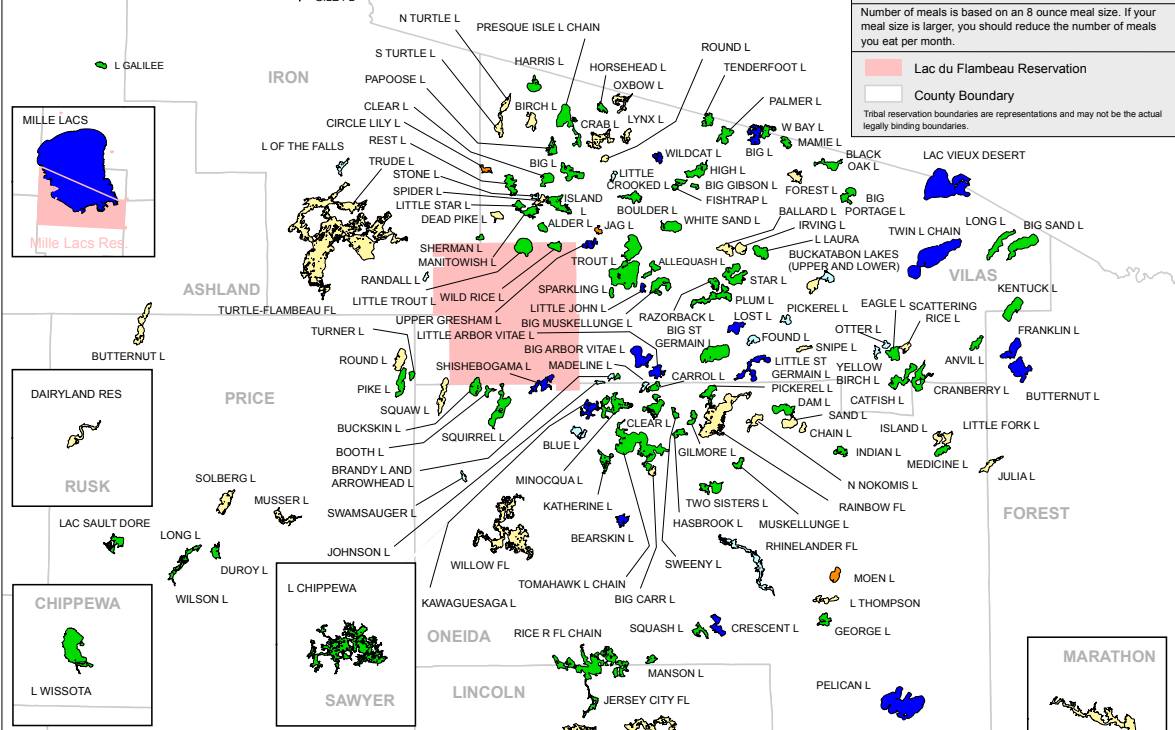
**For Ogaa Smaller than 20 Inches:**

- Blue: Eat up to 8 meals or 64 ounces per month.
- Green: Eat up to 4 meals or 32 ounces per month.
- Yellow: Eat up to 2 meals or 16 ounces per month.
- Orange: Eat up to 1 meal or 8 ounces per month.
- Red: Do not eat ogaa from these lakes.
- Light Blue: Not enough information available.

Number of meals is based on an 8 ounce meal size. If your meal size is larger, you should reduce the number of meals you eat per month.

Lac du Flambeau Reservation  
 County Boundary  
Tribal reservation boundaries are representations and may not be the actual legally binding boundaries.

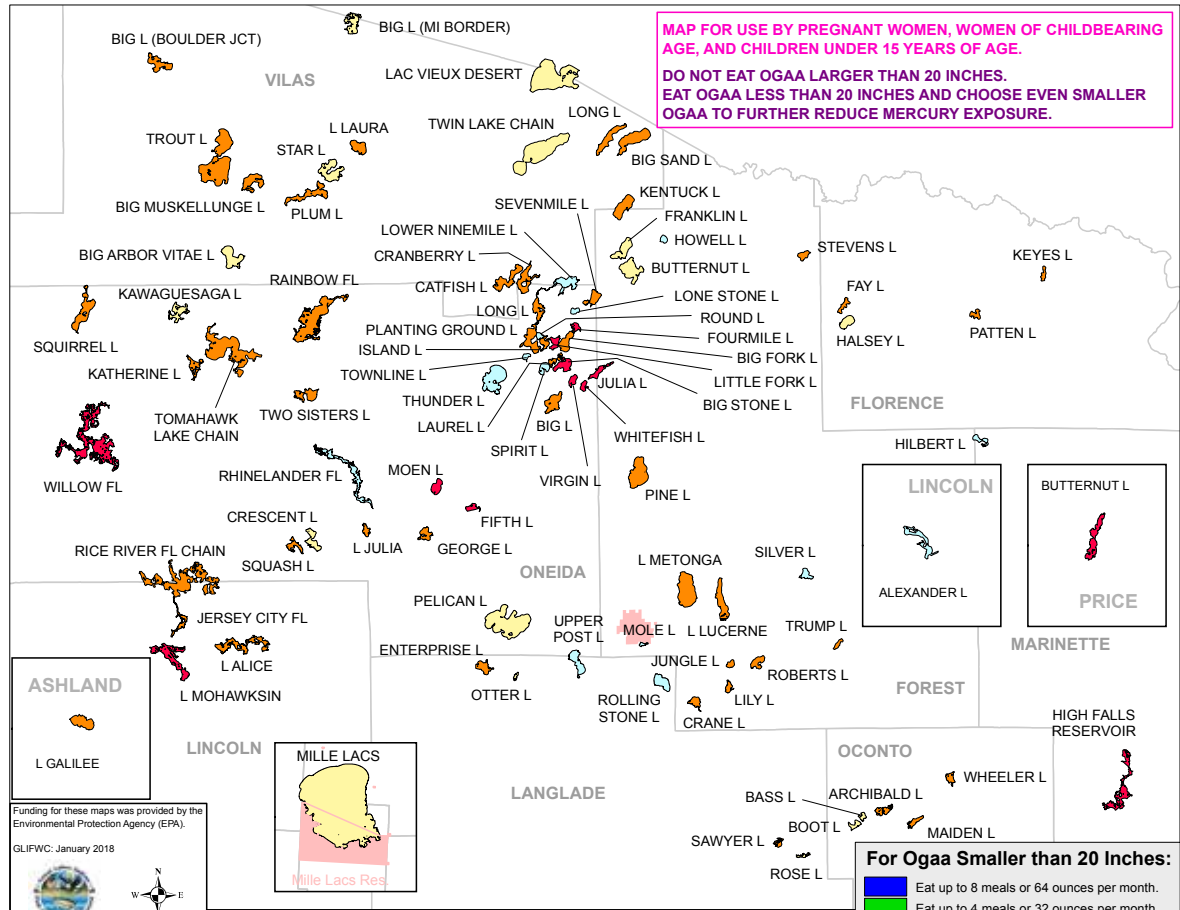
Funding for these maps was provided by the Environmental Protection Agency (EPA).  
 GLIFWC: January 2018



**MAP FOR USE BY WOMEN BEYOND CHILDBEARING AGE AND BY MEN.**  
**FOR OGAA LARGER THAN 20 INCHES, EAT FEWER MEALS.**

**This Map is to Help You Find Safe Ogaa (Walleye) in Lakes Harvested by the Sokaogon Chippewa Community**

**MAP FOR USE BY PREGNANT WOMEN, WOMEN OF CHILDBEARING AGE, AND CHILDREN UNDER 15 YEARS OF AGE.**  
**DO NOT EAT OGAA LARGER THAN 20 INCHES.**  
**EAT OGAA LESS THAN 20 INCHES AND CHOOSE EVEN SMALLER OGAA TO FURTHER REDUCE MERCURY EXPOSURE.**



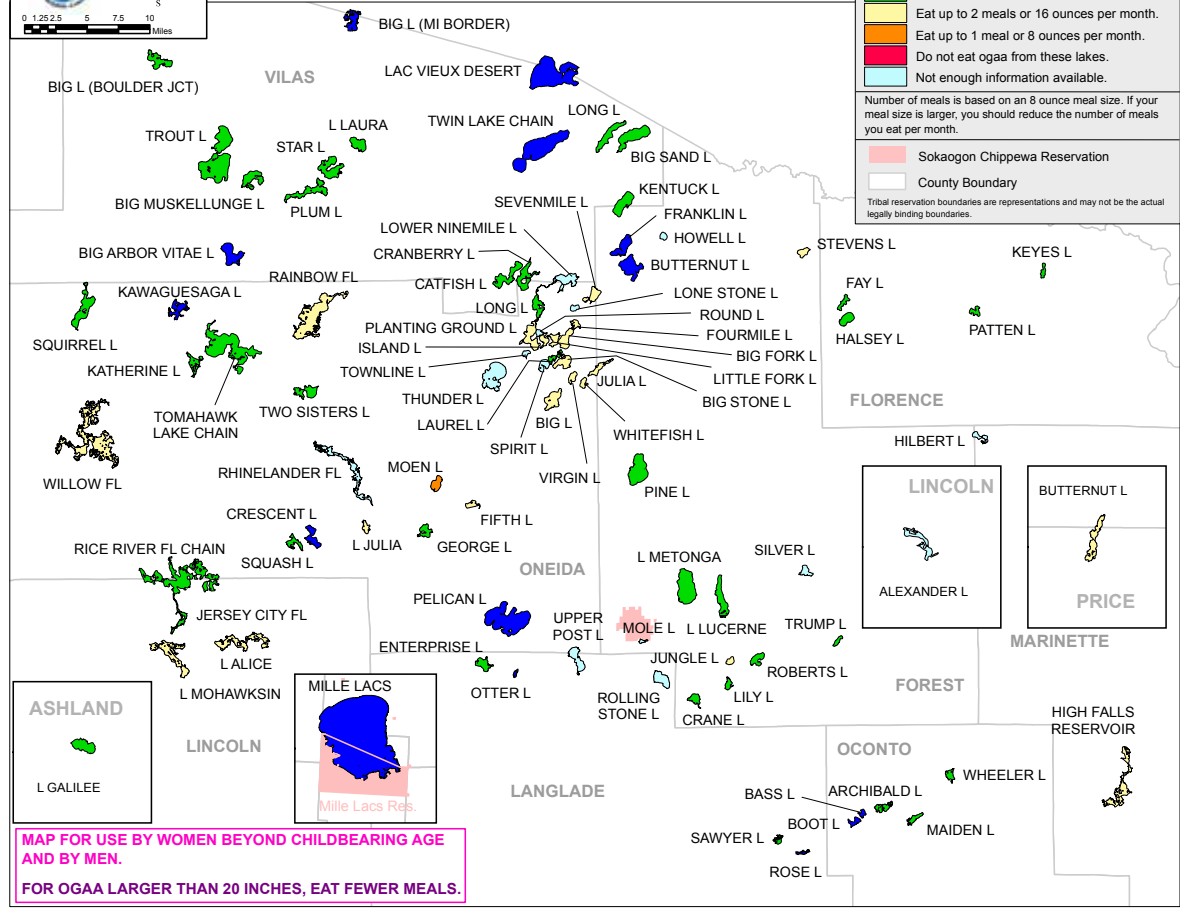
Funding for these maps was provided by the Environmental Protection Agency (EPA).  
 GLIFWC: January 2018

**For Ogaa Smaller than 20 Inches:**

- Blue: Eat up to 8 meals or 64 ounces per month.
- Green: Eat up to 4 meals or 32 ounces per month.
- Yellow: Eat up to 2 meals or 16 ounces per month.
- Orange: Eat up to 1 meal or 8 ounces per month.
- Red: Do not eat ogaa from these lakes.
- Light Blue: Not enough information available.

Number of meals is based on an 8 ounce meal size. If your meal size is larger, you should reduce the number of meals you eat per month.

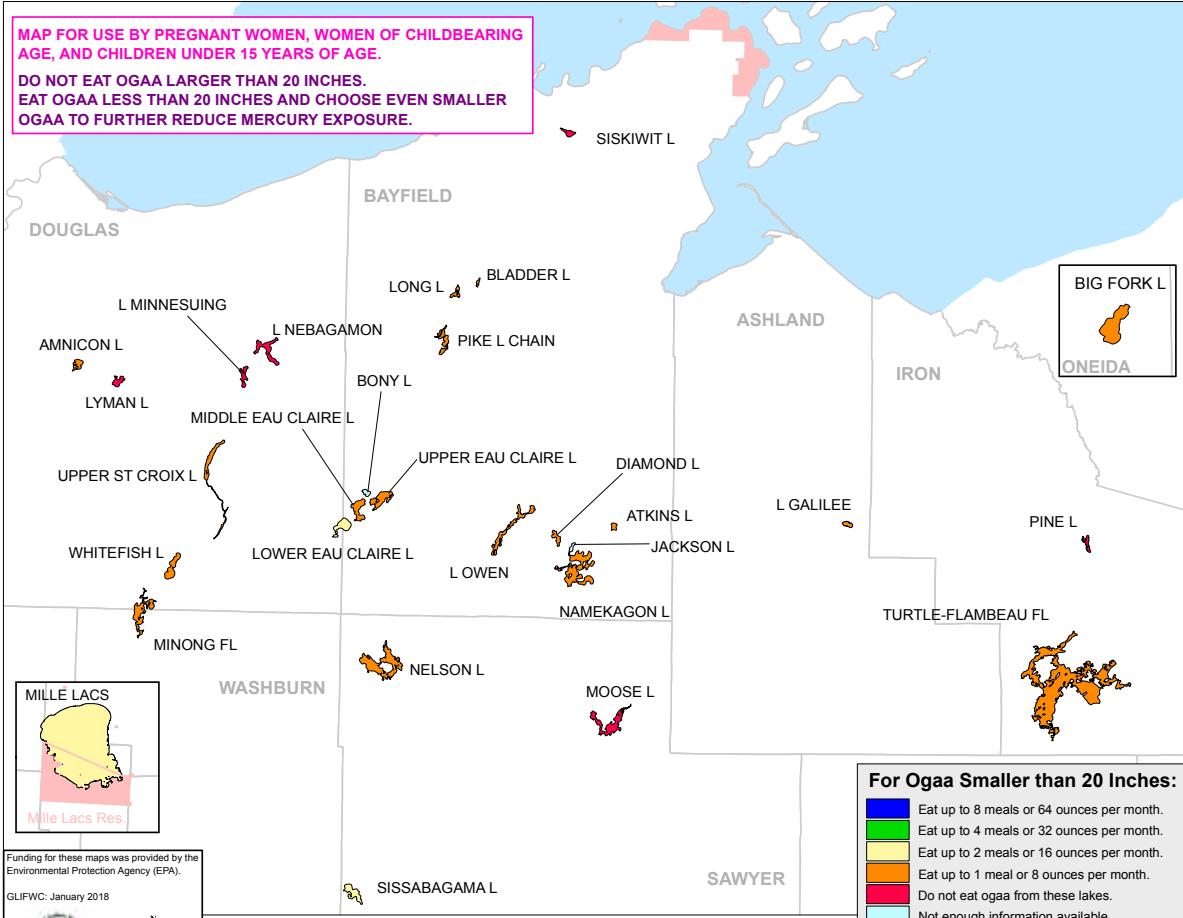
Sokaogon Chippewa Reservation  
 County Boundary  
Tribal reservation boundaries are representations and may not be the actual legally binding boundaries.



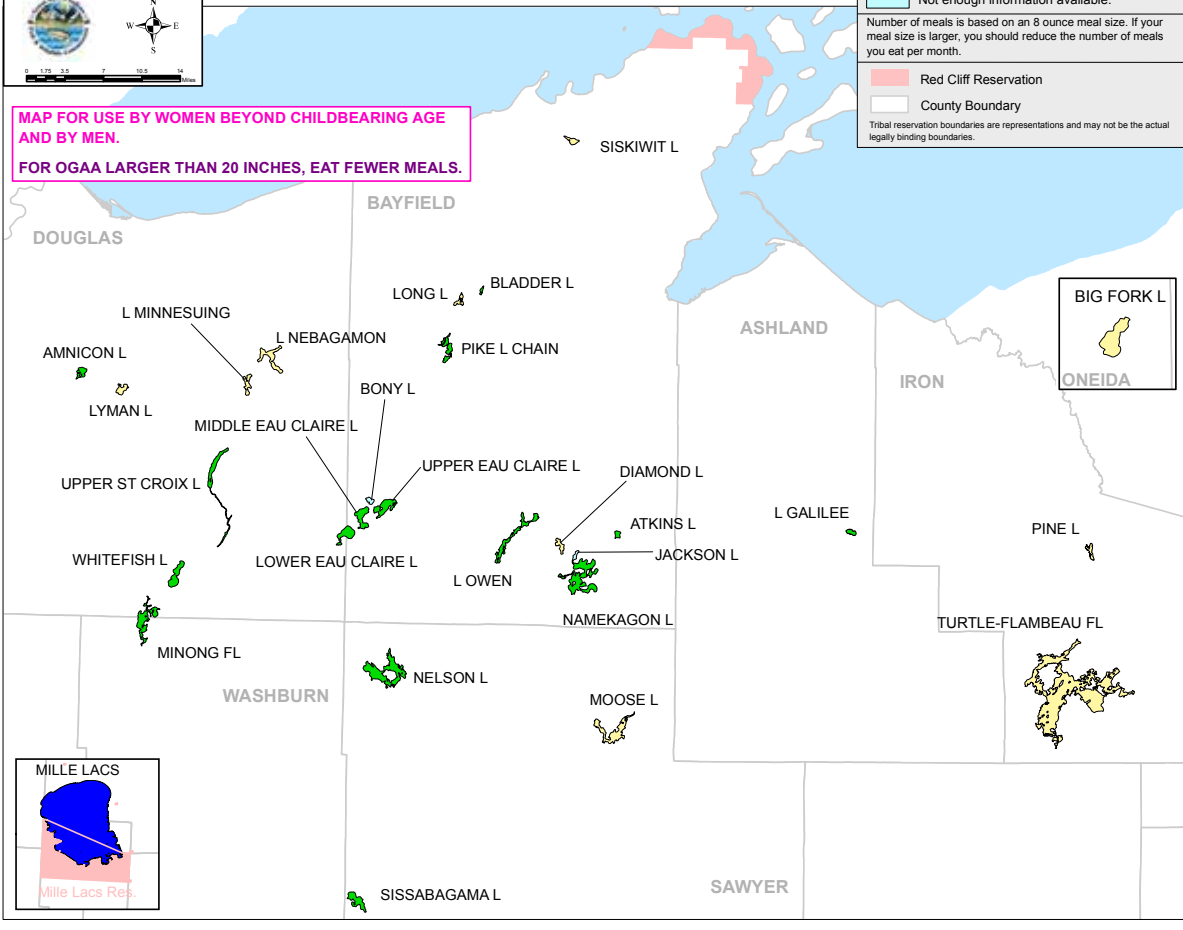
**MAP FOR USE BY WOMEN BEYOND CHILDBEARING AGE AND BY MEN.**  
**FOR OGAA LARGER THAN 20 INCHES, EAT FEWER MEALS.**

**This Map is to Help You Find Safe Ogaa (Walleye) in Lakes Harvested by Red Cliff**

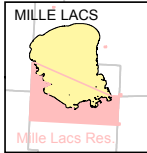
**MAP FOR USE BY PREGNANT WOMEN, WOMEN OF CHILDBEARING AGE, AND CHILDREN UNDER 15 YEARS OF AGE.**  
**DO NOT EAT OGAA LARGER THAN 20 INCHES.**  
**EAT OGAA LESS THAN 20 INCHES AND CHOOSE EVEN SMALLER OGAA TO FURTHER REDUCE MERCURY EXPOSURE.**



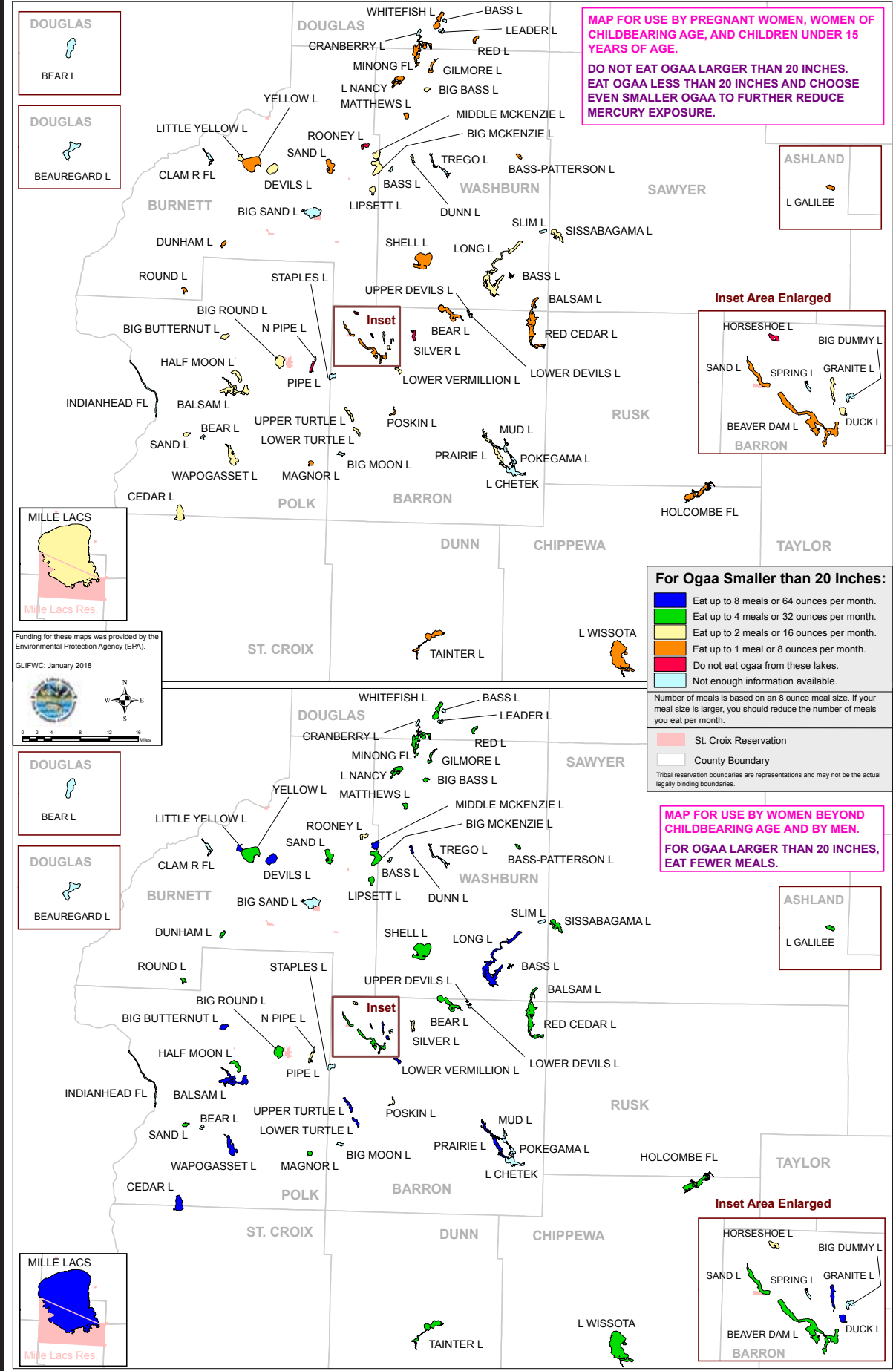
**MAP FOR USE BY WOMEN BEYOND CHILDBEARING AGE AND BY MEN.**  
**FOR OGAA LARGER THAN 20 INCHES, EAT FEWER MEALS.**



Funding for these maps was provided by the Environmental Protection Agency (EPA).  
 GLIFWC: January 2018



**This Map is to Help You Find Safe Ogaa (Walleye) in Lakes Harvested by St. Croix**

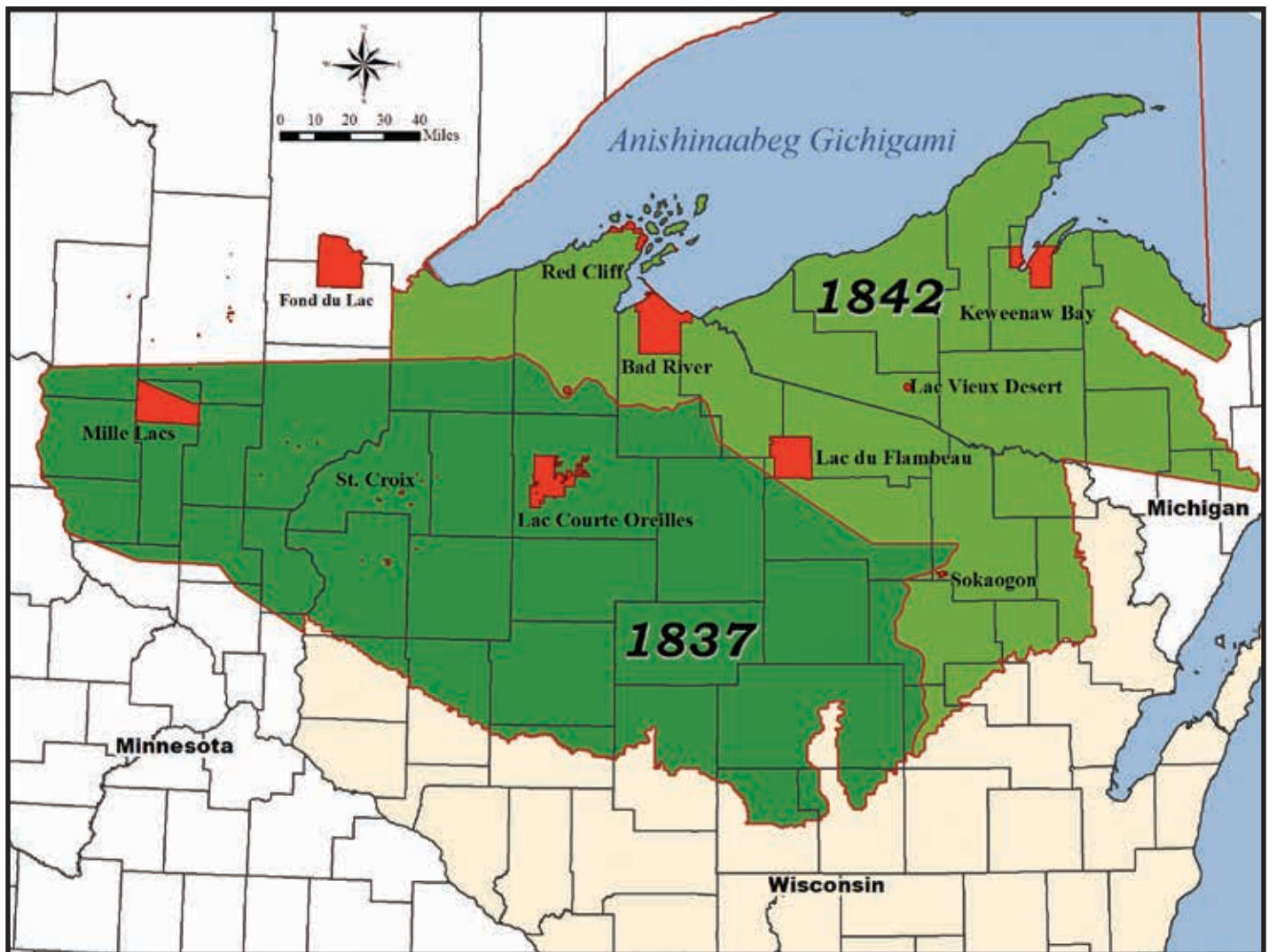




## Description of the Ceded Territory

A substantial amount of land was ceded by the Lake Superior Ojibwe Tribes to the United States in treaties in 1837 and 1842 (Map2). These cession treaties covered land that extends beyond the Wisconsin state boundaries into the Upper Peninsula of Michigan and northeast Minnesota. However this Status Report covers only that portion of the ceded territories found in Wisconsin. The Wisconsin area encompasses 22,400 square miles and includes all or parts of 30 Wisconsin counties.

Six Ojibwe reservations are located within the Ceded Territory within the state of Wisconsin. The reservations and their approximate size are: Bad River (125,000 acres), Lac Courte Oreilles (70,000 acres), Lac du Flambeau (70,000 acres), Mole Lake (2,000 acres), Red Cliff (14,000 acres), and St. Croix (2,000 acres). The larger reservations are “checker-boarded” with privately owned lands (held by Indians and non-Indians) located among tribal land-holdings. The St. Croix Reservation consists of scattered parcels of land in three counties.



Map 2. The extent of the 1837 and 1842 Ceded Territories in Michigan, Minnesota and Wisconsin.

The fishery resources of the reservations are quite diverse. The Lac du Flambeau Reservation has 158 lakes totaling 20,000 acres and 15 rivers and creeks that flow for 34 miles. The Lac Courte Oreilles Reservation encompasses portions of 3 major lakes: the Chippewa Flowage, Lac Courte Oreilles, and Grindstone Lake. The Bad River Reservation has two major rivers that flow into Lake Superior and support anadromous runs of walleye, sturgeon, trout, and salmon. One of the most significant wetlands on Lake Superior is on the Bad River Reservation. The Red Cliff Reservation has a few small streams that flow into Lake Superior which are being restored with coaster brook trout. The parcels of land that make up the St. Croix Reservation adjoin several lakes. The Mole Lake Reservation has one small lake and a connecting stream.

Although northern Wisconsin is characterized as rural and isolated, the population of several counties in the region have increased significantly within the last three decades. The population of the State of Wisconsin increased from 4,417,821 in 1970 to 5,363,675 in 2000, an increase of 21.41%. In comparison, the population of Sawyer, Burnett, Polk, and Washburn counties in northwestern Wisconsin increased from

56,213 in 1970 to 89,225 in 2000, an increase of 58.73%. The population of Oneida and Vilas counties in northeastern Wisconsin increased from 35,385 in 1970 to 57,809, an increase of 63.37%. These counties, known for their abundance of high-quality fresh water lakes, experienced population growth at a rate much higher than that of the state as a whole.

The populations of Wisconsin's six Ojibwe reservations have experienced even more rapid growth. Tribal members residing on or near reservations increased from 2,917 in 1970 to 14,709 in 1999, an increase of 404%. There are no indications that this trend will change in the near future given the return of many families that were moved to cities under BIA relocation programs from the 1940's to the 1960's and the large number of tribal members of child bearing age.

The impact of population growth on Wisconsin's fishery resource is difficult to assess because of the lack of historical habitat inventories. The fact that the human population has increased significantly raises questions about how this growth has affected water quality and aquatic habitats, and how these impacts will be monitored in future years.





### Treaties and Treaty Rights

#### *A. Rights to Fish/Treaty Rights*

To understand the Ojibwe treaty rights that are at issue in Northern Wisconsin, one must understand the nature of Indian tribes and tribal authority. Tribes are distinct political and legal entities recognized by the United States of America in its Constitution, in numerous federal laws and executive orders and by the federal judiciary. Tribes occupy a unique position within the United States Constitutional system. They possess sovereign powers, yet, like the states, they are subject to the dominion of the federal government. At the same time, they are different than the states, enjoying a limited jurisdiction over non-Indians within their territories.

Indian tribes were independent and sovereign nations in their own right before the arrival of Europeans in North America. In fact, the relationship between Indian tribes and European nations was that of one government to another under principles of international law that endure today. Just as the United States has always recognized Great Britain as a sovereign nation, the European nations recognized Indian tribes as sovereign nations in earlier times.

Historically, tribes possessed all of the rights and powers inherent in any sovereign nation. Thus, tribes enjoyed the complete right of self-government, including to make their own rules and laws, and to be governed by them, and to impose their rules and laws on those who entered into their lands.

Today, tribes no longer possess all attributes of sovereignty because of how they fit into the United States constitutional system. The Constitution recognizes, defines, and allocates power among the governments of the United States, the several States, and Indian tribes. Each type of government has those powers that the Constitution allows, as determined by the Supreme Court.

Tribes no longer are independent nations that are separate from and independent of the United States. Indian tribes have been integrated into the United States system of government under the domain of the United States and they enjoy a quasi-sovereign status. Generally, today tribes possess those attributes of full sovereignty they once enjoyed that were not relinquished voluntarily by treaty, that Congress

has not taken away, or that are not inconsistent with the unique status of tribes as “domestic dependent nations.”

#### *B. Treaties*

The United States Constitution also gives the federal government exclusive authority to enter into treaties. As the United States expanded westward and encountered tribes, it was the federal government, not the states, that entered into numerous treaties with Indian tribes. Over 300 treaties were signed with tribes covering many subjects, including peace, removal, land cession, and the establishment of Indian reservations.

These treaties are part of the supreme law of the land, and are binding upon the states and superior to any state law. Treaties remain part of the law of the land unless and until they are modified or terminated by Congress.

“Treaty rights” quite simply are the benefits guaranteed to the parties of a treaty. They are like contract rights. Each party to a contract has certain rights under the contract. One party must honor the benefits that the agreement ensures for the other party. Like rights that endure under the terms of a contract, treaty rights must be honored regardless of when a treaty was made unless Congress chooses to modify or terminate the treaty.

Treaty rights are those rights that a tribe has kept and not given up in a treaty. Through treaties, Indian tribes relinquished some aspects of their sovereignty while holding onto others. Properly speaking, treaties between tribes and the federal government involve the granting of certain rights to the United States by the tribes, not the granting of rights or privileges from the United States to the tribes. Treaties are interpreted through the “cannons of construction,” which require that treaty language is construed in a manner that the Indian treaty signers would understand them and in favor of their protective purposes, with ambiguities resolved in favor of the Indians

Off-reservation treaty rights to hunt, fish, and gather are among the rights reserved by the Ojibwe tribes. These rights were explicitly reserved in the Treaties of 1837 and 1842, and not given up in any subsequent



treaties. This reservation of rights is similar to a case-ment or the retention of mineral rights by a seller of real estate; however with respect to treaty rights, the Supreme Court has determined that only Congress has the authority to abrogate them.

### C. Ojibwe Off-Reservation Rights in Wisconsin

In 1983, in *Lac Courte Oreilles Band v. Voigt*, what is commonly referred to as the “Voigt” or LCO v. Wisconsin case, the United States Court of Appeals for the Seventh Circuit determined that the Ojibwe tribes reservation of off-reservation hunting, fishing, and gathering rights in the territories ceded by the tribes in the Treaty of 1837 and the Treaty of 1842 remained valid and enforceable. The off-reservation hunting, fishing, and gathering rights affirmed in the LCO case are rights that the Ojibwe have always had and that have never been voluntarily given up or extinguished by the federal government.

The treaty provisions at issue in the LCO case were as follows: 1) “*The Privilege of hunting, fishing, and gathering the wild rice, upon the lands, the rivers and the lakes included in the territory ceded, is guaranteed to the Indians, during the pleasure of the President of the United States.*” (Treaty of 1837) 2) “*The Indians stipulate for the right of hunting on the Ceded Territory, with the other usual privileges of occupancy, until required to be removed by the President of the United States.*” (Treaty of 1842)

See the attached map for the land areas that were ceded in the Treaties of 1837 and 1842. The 1842 Ceded Territory also includes portions of Lake Superior itself. However, Lake Superior is not involved in the LCO case by agreement of the parties.

### D. The LCO v Wisconsin Case

The LCO case began in the United States District Court, Western District of Wisconsin, in 1973. It has been the subject of six trials at the District Court level, three appeals to the Seventh Circuit Court of Appeals and one Petition for Review to the United States Supreme Court. Suit was filed by the Lac Courte Oreilles Band of Lake Superior Chippewa Indians against the State of Wisconsin and a number of state officials challenging the power of the State to regulate the off-reservation harvest by tribal members. The Tribe claimed that the imposition of state fish and game laws on tribal members interfered with tribal hunting, fishing, and gathering and was therefore in violation of the guarantees provided in the Treaties of 1837 and 1842.

In 1978, the Federal District Court granted summary judgment in favor of the State of Wisconsin and dismissed the action. It held that all rights under the treaties had been revoked by the Treaty of 1854. The Seventh Circuit Court of Appeals reversed the District Court ruling in its 1983 decision, holding that the rights reserved by the Treaties of 1837 and 1842 had not been revoked or terminated and continue to exist. The appellate court returned the case to the District Court for further proceedings to determine the scope of the treaty rights, the extent to which the State may regulate the exercise of those rights and what damages, if any, tribes may recover as a result of the State’s infringement of the treaty rights.

The District Court then divided the proceedings into three phases:

Phase I: **Declaratory Phase**—determination of the nature and scope of the treaty rights;

Phase II: **Regulatory Phase**—determination of the permissible scope of state regulation; and

Phase III: **Damages Phase**—amount of damages, if any, to which the tribes are entitled for infringement on treaty rights.

Phase I proceedings to determine the nature and scope of the treaty rights were held in December 1985, before Judge James Doyle. Judge Doyle ruled that all resources in the Ceded Territory could be harvested by tribal members, on publically-accessible lands and waters, using all modern methods of harvest. Judge Doyle further ruled that the resources could be personally consumed or be traded or sold to anyone using the modern day market economy. Finally, the judge held that the tribes are entitled to as much of the resources as will ensure them a modest living.

Upon Judge Doyle’s death in 1987, the case was assigned to Judge Barbara Crabb. On August 21, 1987, Judge Crabb reaffirmed the standard principles enunciated in other treaty rights cases from throughout the country: the State may regulate the exercise of treaty rights in the interests of conservation provided that such regulations are reasonable and necessary for the conservation of a particular species or resource in a particular area, that they do not discriminate against Indians, and that they are the least restrictive alternative available. Judge Crabb also ruled that the State may impose such regulations as are reasonable and necessary to protect public health and safety. However, she held that the tribes possess the authority to regulate their members and that effective tribal self-regulation precludes state regulation.

By agreement of all parties and of the court, Phase II was divided into “subphases” intended to address certain discrete regulatory questions or resources. The subphase proceedings that focused on walleye and muskellunge harvests were held in October, 1988. Many of the issues originally scheduled for trial at this subphase were resolved by mutual agreement. On March 3, 1989, Judge Crabb held that, as long as the tribes adopt and enforce regulations incorporating the biologically necessary conditions established by the State at trial, the tribes are self-regulating as to walleye and muskellunge. She ordered the State not to interfere with the tribes’ regulation of the treaty walleye and muskellunge harvest, except as the tribes have otherwise agreed. For walleye and muskellunge, the court ordered that the tribes and the state to cooperate on population estimates and restricted tribal spearfishing and netting to a “safe harvest level,” essentially a quota. As to fish species other than walleye and muskellunge, the tribes and the State have agreed that quotas are not necessary at this time. However, if the harvest increases significantly, a quota system for the species involved may be implemented.

On May 9, 1990, Judge Crabb issued a decision resulting from the deer subphase and from various other issues presented for her resolution. Consistent with her decision on walleye/muskellunge harvests, Judge Crabb enjoined the enforcement of state law provided that the tribes enact a system of regulations consistent with her decision, and effectively enforce those regulations. The most significant aspect of the May 9, 1990, deer decision is Judge Crabb’s ruling that the tribal allocation of treaty resources is a maximum of 50% of the resource available for harvest.

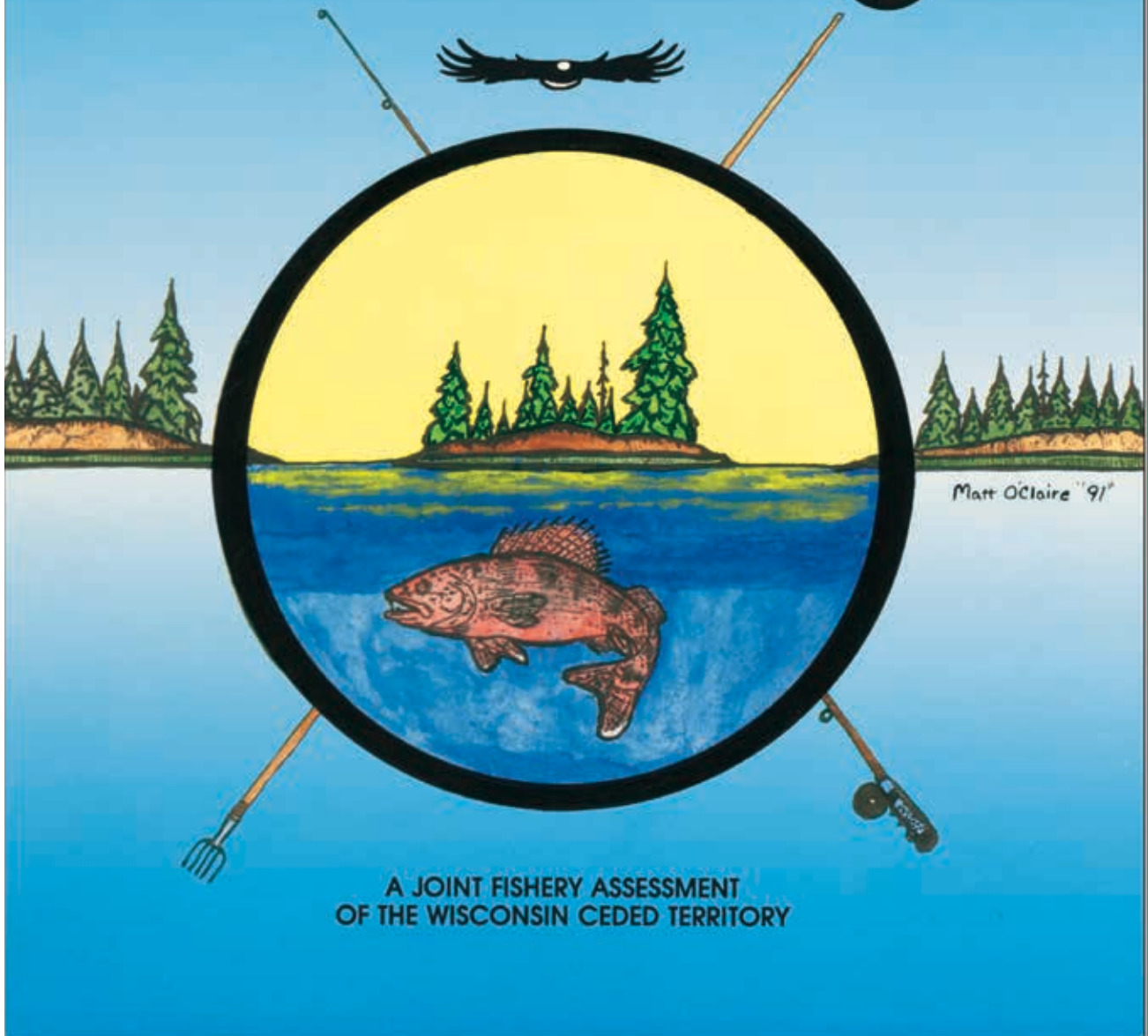
On February 21, 1991, Judge Crabb issued her long-awaited timber decision. She ruled that the Ojibwe tribes did not reserve a treaty right to harvest timber commercially. However, the tribes do have a treaty right to gather miscellaneous forest products, such as maple sap, birch bark, and firewood, subject to nondiscriminatory state and county regulations.

The timber decision represented the conclusion of case at the District Court level. In 1991, the litigation phase of the case finally concluded when the court issued its final judgment, incorporating the court’s decisions, and the parties’ stipulations on the various addressed in the litigation phase. As a result of the court’s decisions, the tribes developed self-regulating mechanisms that include courts, law enforcement personnel, permitting authorities that maintain data on intertribal harvesting, biological services to monitor harvested and non-harvested species within the off-reservation Ceded Territories. Currently, the scope of the tribes’ off-reservation harvested activities extends beyond the boundaries of the State of Wisconsin into the full expanse of the Ceded Territories of 1836, 1837, 1842 and 1854.

In the 2000s, the tribes and the State of Wisconsin began discussions on updating the tribal off-reservation conservation codes. The 1991 judgment cemented the tribal regulatory system in place, notwithstanding changes on the landscape and within harvested species or improvements to natural resources management. The parties agreed that they should have a mechanism to update the tribes’ regulations, especially with respect to areas where states have liberalized their regulation of various harvesting activities.

The mechanism for updates is called the stipulation amendment process, which was approved by the district court, and requires the tribes and the state to engage regularly on species management and quotas, methods of harvest, enforcement issues and other topics pertinent to tribal off-reservation harvesting. Since the first stipulation amendment in 2008, there have been two additional stipulation amendments filed and approved by the district court. Additionally, the parties engaged in renewed litigation in 2012 over the tribes’ ability to regulate the hunting of deer at night. Ultimately, the tribes prevailed on the issue and have been authorizing a night hunting season for deer since the fall of 2015.

# CASTING LIGHT UPON THE WATERS



*Tribal representative from Bad River, Matt O'Claire, hand-drew the first Fishery Status Update cover in 1991.*



## Joint Assessment Steering Committee

Bureau of Indian Affairs

Great Lakes Indian Fish & Wildlife Commission

U.S. Fish & Wildlife Service

Wisconsin Department of Natural Resources

Bad River Band of Lake Superior Chippewa

Lac Courte Oreilles Band of Lake Superior Chippewa

Lac du Flambeau Band of Lake Superior Chippewa

Red Cliff Band of Lake Superior Chippewa

St. Croix Band of Chippewa Indians of Wisconsin

Sokaogon (Mole Lake Band) Chippewa Community of Wisconsin

