



**Fish Population Assessments of Ceded Territory Lakes in
Wisconsin, Michigan and Minnesota During 2005**

by

**Eric Madsen
Data Analyst**

**Joseph D. Rose
Inland Fisheries Section Leader**

**Michele Wheeler
Inland Fisheries Biologist**

and

**Nicholas Milroy
Inland Fisheries Biologist - Minnesota**

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**Great Lakes Indian Fish and Wildlife Commission
P. O. Box 9
Odanah, WI 54861
(715) 682 - 6619
www.glifwc.org**

Abstract

The Inland Fisheries Section of the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) conducted fishery assessment surveys of ceded territory lakes in northern Wisconsin, Minnesota, and the upper peninsula of Michigan. Assessment crews from the U.S. Fish and Wildlife Service and the Fond du Lac, Sokaogon (Mole Lake), and St. Croix Bands assisted with spring and fall surveys. A crew from the Bad River Chippewa Band assisted with fall surveys.

In the spring, adult walleye (*Sander vitreus*) population estimates were conducted on seventeen lakes. A total of 21,203 walleye were sampled from 13,609 acres of water during these surveys. Density of adult walleye averaged 3.87 (SD = 2.47, range: 0.88 to 9.98, n=16) fish per acre in lakes with naturally reproducing populations. In nine of these sixteen lakes, adult walleye population densities were at least 3.0 fish per acre, indicating that walleye populations were healthy. Density of adult walleye averaged 3.76 (SD = 2.43, range: 0.88 to 9.98, n=17) fish per acre for all lakes combined.

On Mille Lacs Lake, Minnesota, assessment crews captured and tagged 2,541 northern pike as part of a tagging study conducted in cooperation with the Minnesota Department of Natural Resources. The total number tagged included 1,698 females, 832 males, and 11 northern pike of unknown sex. The mean length of all northern pike tagged was 28.6 inches. Assessment crews also participated in a summer gill net recapture survey and captured 68 northern pike, 10 of which had been tagged in the spring. A spring juvenile walleye survey was also conducted on Mille Lacs Lake, in which 1,241 walleye were caught, 1,190 of which were estimated to be between the ages of 1 and 4.

A summer fish community survey was conducted in Kentuck Lake, Vilas County, Wisconsin in a continuing effort to try to understand how fish community interactions may affect walleye reproduction and recruitment. A total of 422 fish were collected, identified to species, and catch per effort values determined.

During the fall, electrofishing surveys were conducted on 154 lakes in Wisconsin, 19 lakes in Michigan, and 2 lakes in Minnesota to determine year class strength of age 0 (young of the year) and age 1 (yearling) walleye. Additional surveys were conducted on Bass-Patterson Lake, Washburn County, Wisconsin to obtain fall age 0 and age 1 population estimates. In Wisconsin, a total of 28,999 age 0 and 7,478 age 1 walleye were sampled. In addition, 1,200 gamefish including muskellunge (*Esox masquinongy*), northern pike (*Esox lucius*), largemouth bass (*Micropterus salmoides*) and smallmouth bass (*M. dolomieu*) were sampled. In Michigan, a total of 1,723 age 0 and 360 age 1 walleye plus 2 gamefish were sampled during the fall. In Minnesota, a total of 2,880 age 0 and 327 age 1 walleye were sampled, as well as 9 gamefish.

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Introduction

Fishery assessment surveys of ceded territory lakes were conducted during spring, summer, and fall of 2005 by the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) to continue developing an understanding of spatial and temporal variability of walleye populations in ceded territory waters of northern Wisconsin, Michigan, and Minnesota. These studies add to an extensive body of information describing walleye populations and associated biological parameters. They provide information needed to update recruitment codes, set harvest quotas, and monitor the impacts of a combined tribal and sport angler fishery on the walleye resource.

Since 1989, a Memorandum of Understanding has been in effect between the U.S. Fish and Wildlife Service (USFWS) and GLIFWC. Under the 2005 agreement, USFWS provided technical support and equipment during spring and fall surveys. The St. Croix Chippewa Assessment Unit was initially equipped and funded in 1990 to conduct surveys; assistance in subsequent years was continued through a subcontract with GLIFWC. Assistance by the Bad River Band during the fall and the Sokaogon (Mole Lake) Band during the spring and fall was also provided through subcontracts with GLIFWC. Assistance was provided by the Fond du Lac Band during the spring northern pike tagging and the fall walleye recruitment survey on Mille Lacs Lake.

Methods

Spring Adult Walleye Population Estimates

Seventeen lakes in the ceded territory (Figure A1) of Wisconsin and Michigan were selected to collect current information on adult walleye populations (Table A1). Fifteen of these seventeen lakes had experienced tribal spearing harvest during the previous year.

Nine lakes in Wisconsin are GLIFWC long-term study lakes. Large (greater than 500 acres in area) long-term lakes surveyed in 2005 included Butternut Lake (Forest Co.), Squirrel Lake (Oneida Co.), Kentuck Lake (Vilas Co.), and Squaw Lake (Vilas Co.). Small (less than 500 acres in area) long-term study lakes surveyed in 2005 included Siskiwit Lake (Bayfield Co.), Annabelle Lake (Vilas Co.), Sherman Lake (Vilas Co.), and Bass-Patterson Lake (Washburn Co.). Long-term study lakes are surveyed annually or biannually to collect trend and variability information on adult walleye populations. The continuing goal is to use adult estimates and fall recruitment data from long-term study lakes to develop population models for predicting population size and assessing the accuracy of model predictions.

Mark and recapture data were used to calculate the adult walleye population estimate for each lake following the Peterson formula (Chapman's modification) described in Ricker (1975). A target number of adult walleye to be marked and recaptured was derived from curves that were developed by Robson and Regier (1964). These curves required an initial estimate of population size. This estimate was obtained either from a previous population estimate survey, or when none existed, from a regression formula estimate for a lake of similar size and recruitment code.

Per agreement between Wisconsin Department of Natural Resources (WDNR) and GLIFWC biologists, all unknown sex fish less than 15 inches in total length were assumed to be immature fish and excluded from the calculation of adult population estimates. In lakes where

spearing occurred prior to the recapture survey, an adjustment was made by reducing the marking sample by the number of marked fish speared. Also, the total number of fish speared before the first recapture run (except for walleye of unknown sex less than 15 inches) was added to the estimate.

Marking periods began soon after ice-out and electrofishing was used to capture fish in all lakes except for Kentuck Lake, where most walleye were captured over four days of fyke netting by the Mole Lake tribal assessment crew, as well as one night of electrofishing. Eight electrofishing boats and crews were used during the season, including four from GLIFWC, two from USFWS, one from Mole Lake, and one from St. Croix. All boats in all spring electrofishing surveys conducted during 2005 had an arrangement of six umbrella dropper anodes and used pulsed DC at 60 pps. Electrofishing occurred after sunset.

During the marking period, each crew concentrated on finding and sampling walleye spawning areas. With this concentrated effort crews were able to mark the target number of walleye in one to four nights, depending upon lake size and the number of crews used.

Walleye were measured (total length in inches) and sexed (male, female, or unknown). Crews were instructed to collect a scale or spine sample from ten male fish per half-inch group between 11.0 inches and 16.9 inches, and from five fish per half-inch group for males of other sizes and females. Generally, spines were taken from fish >10 inches and scales from smaller fish. Spines and scales were analyzed at a later date for age determination. On long-term study lakes, fish were tagged with yellow colored numbered Floy tags prior to release. Fish on all other lakes were given a single caudal fin notch. After being tagged or notched, fish were released away from the capture area, typically near the middle of the lake.

Recapture surveys with electrofishing equipment were conducted one or two nights after the marking period ended. Surveys covered the entire shoreline of each lake. For each fish captured, length, sex and mark, if any, were determined.

Northern Pike Tagging Study - Mille Lacs Lake

A cooperative northern pike tagging study was implemented in 2005 on Mille Lacs Lake, Minnesota by GLIFWC, the Fond du Lac Band, and the Minnesota Department of Natural Resources. Data collected by GLIFWC and the Fond du Lac Band are combined in this report. Data from this survey was used to generate northern pike population estimates. A GLIFWC assessment crew used fyke nets set in spawning locations to capture northern pike (Figure A5). Fyke nets were set from April 5 through April 17 to coincide with the northern pike spawning period, which takes place in the early spring, primarily before walleye spawning and while much of the lake is ice-covered. All newly captured northern pike were measured (total length in inches), sexed (male, female, or unknown), and their spawning condition determined. Unmarked northern pike 16 inches and larger were tagged with two individually numbered T-bar anchor tags on the left side of the fish. Northern pike smaller than 16 inches were not tagged. Tag numbers were recorded for any fish captured that had been tagged previously, as well as length, sex, and spawning condition information.

After the tagging phase, tagged and untagged northern pike were allowed to mix for about a month. As part of the recapture phase, a GLIFWC assessment crew used graded mesh gill nets

to capture northern pike from May 17 through May 27. Gill nets were set at a variety of locations throughout Mille Lacs Lake, typically for about one hour, but no longer than two hours. The gill nets measured 300 feet in length by 6 feet deep and consisted of 3 panels of 100 foot graded mesh (1.5, 2.0, and 2.5 inch bar mesh). Captured northern pike were measured (total length in inches) and sexed (male, female, or unknown) by external visual inspection. Northern pike were examined for tags and tag numbers from marked fish were recorded, but no new tags were applied. The proportion of marked to unmarked fish was used to estimate abundance of northern pike in the lake (Schwarz 2005).

Spring Juvenile Walleye Survey

A juvenile walleye survey was conducted in Mille Lacs Lake, Minnesota on May 31 through June 2. The survey began approximately three weeks after the adult spawning period. Electrofishing gear was used to capture fish at night.

The entire shoreline of the lake was covered once over the three nights of the survey. Total length was recorded for each walleye captured. No walleye were tagged or given fin clips. Scale samples for fish under 10 inches in length and spine samples for fish over 10 inches in length were collected for aging from a maximum of ten fish per half-inch group. Age data was used to apportion the catch by age for ages 1 through 4.

Summer Fish Community Survey

A fish community assessment survey was conducted on Kentuck Lake (Vilas Co.) from June 21 through June 24. During the survey period, one fyke net with 1 inch mesh and seven fyke nets with 3/8 inch mesh were set for four nights in the same locations as in previous years. Nets were set at night and lifted each morning. Fish were identified to species and measured. Fish were released away from shore.

Fall Recruitment Surveys

Fall electrofishing surveys were conducted in 175 ceded territory waters including 154 lakes in Wisconsin, 19 lakes in Michigan, and 2 lakes in Minnesota. Fall surveys were conducted to evaluate recruitment of age 0 (young of the year) and age 1 (yearling) walleye, and to develop data to assess whether recruitment codes were appropriate or needed to be changed. Multiple surveys were conducted on Bass-Patterson Lake (Washburn Co.) to conduct an age 0 and age 1 mark and recapture population estimate. A second survey was done on Lake Nebagamom (Douglas Co.) because the first was shortened due to bad weather.

Electrofishing boats sampled lakes four nights per week during the approximately eight-week period from September 6 through October 27. Ten assessment crews were used during the season, including four from GLIFWC, two from USFWS, and crews from the Bad River, Fond du Lac, Sokaogon (Mole Lake), and St. Croix Bands. The number of boats assigned to each lake was based upon the shoreline length to be surveyed, and whether the entire shoreline or index station segments would be surveyed. For planning purposes, it was assumed that one boat was needed for every 5-7 miles of shoreline. Index stations were sampled on 32 of the larger waters.

The primary objective of these surveys was to assess year class strength of stocked or naturally reproduced age 0 and age 1 walleye. Larger walleye and other game fish (e.g., bass,

northern pike and muskellunge) were of secondary priority and collected if this effort did not detract from the collection of juvenile walleye. Panfish and other species were collected as a third priority. Results of surveys were used to determine whether lake recruitment code changes were needed. Other uses included trend analysis of important mixed fishery lakes maintained by natural reproduction, and the development of a regional perspective of annual walleye year class strength.

Electrofishing began at dusk and continued until the entire shoreline or set of index stations was sampled. Exceptions preventing the completion of a survey on a given lake included equipment problems, severe weather, and high waves. All fish collected were identified to species and length measured (total length in inches). For walleye only, a scale sample was collected from five fish per half-inch group between 5.5-12.0 inches to determine the length range and numbers of age 0 and age 1 walleye.

Protocols were adopted by GLIFWC in the fall of 2004 to reduce the likelihood of spreading aquatic nuisance species. All equipment coming in contact with water was checked visually for aquatic nuisance species each night before entering the water and again after leaving the water. Boats and trailers were pressure-washed or steam-cleaned daily. In addition, crew leaders documented any aquatic nuisance species observed, and gathered information regarding signs posted at boat landings pertaining to these species.

Surveys on the following six Wisconsin lakes were conducted jointly by GLIFWC and WDNR, and the results summarized and reported by GLIFWC: Beaver Dam Lake (Barron Co.), Lac Courte Oreilles (Sawyer Co.), Nelson Lake (Sawyer Co.), Round Lake (Sawyer Co.), Lac Vieux Desert (Vilas Co.), and Long Lake (Washburn Co.). Surveys on the following six Wisconsin lakes were conducted jointly by GLIFWC and WDNR, and the results summarized and reported by WDNR: Red Cedar Lake (Barron Co., on October 6), Big McKenzie Lake (Burnett Co.), Pelican Lake (Oneida Co.), Balsam Lake (Polk Co.), Sand Lake (Sawyer Co.), and Lake Nancy (Washburn Co.). All data from these twelve surveys are reflected in this report, regardless of which agency did the actual collection of fish. Several Wisconsin lakes were surveyed by both GLIFWC and WDNR where each agency generated a separate report summarizing their own data.

Fall Age 0 and Age 1 Walleye Population Estimate

A mark-recapture age 0 and age 1 walleye population estimate was conducted during the fall on Bass-Patterson Lake (Washburn Co.). The lake was surveyed using electrofishing gear on three nights, and a temporary fin clip was used to mark all walleye less than 15 inches. Crews were informed that if time permitted, they should return to areas of higher concentrations of walleye to mark additional fish, keeping a separate record of these captures.

Scale samples were collected from ten fish per half-inch group between 5.5 and 11.9 inches, and five per half-inch group between 12.0 and 14.9 inches. Scale samples were aged to determine the number of age 0 and age 1 walleye captured so that the population estimates could be calculated. Population estimates were calculated using the Petersen method.

Results and Discussion

Spring Adult Walleye Population Estimates

A total of 21,203 walleye were sampled from 13,609 acres of water during the spawning adult walleye population estimate period. Adult walleye population estimates for 17 stocks in Wisconsin and Michigan (Table A1) ranged from 227 to 9,549 fish. Estimated population densities ranged from 0.88 per acre for Butternut Lake, Forest Co., to 9.98 walleye per acre for Kentuck Lake, Vilas Co. (mean = 3.76, SD = 2.43) (Figure A2).

The Report on Biological Issues (1988) listed several indicators of healthy reproducing walleye stocks agreed to by state and tribal biologists. Two indicators included: a) population density of three adult walleye per acre; and, b) the presence of five year classes of females in a sample, or three year classes in a sample of 100 females that each contribute at least 15 percent of the sample.

Twelve of 17 lakes surveyed had recruitment codes of NR (Table A1), indicating that natural reproduction was the only source of recruitment. Four lakes had recruitment codes of C-NR, indicating that some stocking occurred even though the population was sustained by natural reproduction. Mean density of walleye in these 16 lakes was 3.87 (SD = 2.47) per acre. Nine of these 16 lakes surveyed had walleye densities of greater than 3.0 per acre.

One lake had a recruitment code of NR-2, indicating that natural reproduction provides the only source of recruitment to the population, but adult density is low. Walleye density in this lake (High Lake, Vilas Co.) was 2.05 fish per acre.

Male-to-female sex ratios (Table A1) were skewed in favor of males in all lakes surveyed. The reliability of these values is questionable in some lakes, however. Electrofishing may bias sampling in favor of males (Shively and Kmiecik, 1991) because males spend more time in shallow water than females during the spawning period, and many females are out of effective capture range except during or after spawning.

A total of 1,151 female, 19,118 male, and 934 unknown sex walleye were measured (Figure A3, Table A2) and a subsample aged (Figure A4). Female lengths ranged from 10.0 to 31.5 inches, male lengths ranged from 7.0 to 25.0 inches, and lengths for walleye of unknown sex ranged from 8.0 to 23.5 inches. Age-length tables were developed for subsets of female, male, and unknown sex walleye in each of the lakes sampled (Tables A3 - A19). These age-length tables by themselves are not necessarily representative of the size and age structure of the population, since spines for aging were collected according to a stratified sampling scheme. However, age-length tables reflective of the population can be developed when coupled with length-frequency data from the population estimates. Also, the age-length tables should be sufficient to detect the presence or absence of year classes. Regarding the second population health criterion, 13 of the 16 NR and C-NR lakes had populations with at least five year classes of females in the aging sample.

Northern Pike Tagging Study - Mille Lacs Lake

A total of 2,541 northern pike were captured with fyke nets and tagged during the spring marking period of the tagging study on Mille Lacs Lake (Table A20, Figure A6). A total of 1,441 northern pike were tagged at the Rum River outlet, more than at any other location. Nets were set at Garrison Bay for only one night, and were set at all other locations for five or more nights.

A total of 1,698 females, 832 males, and 11 northern pike of unknown sex were captured in fyke nets and tagged (Table A20). Females ranged from 17.9 to 43.7 inches in length with an average length of 30.5 inches, males ranged from 16.1 to 35.9 inches in length with an average length of 24.7 inches, and northern pike of unknown sex ranged from 23.5 to 33.4 inches in length with an average length of 29.5 inches (Figure A7). The mean length of all northern pike tagged was 28.6 inches.

A total of 68 northern pike were captured during the gill net recapture surveys, of which 10 had been tagged or observed during the marking period and 58 had not. Of the 68 northern pike captured, 25 were females ranging from 20.8 to 35.8 inches with a mean length of 28.0 inches, 41 were males ranging from 19.1 to 33.8 inches with a mean length of 25.5 inches, and two were of unknown sex of 27.8 and 32.0 inches. The mean length of all northern pike captured in the gill net survey was 26.6 inches.

Spring Juvenile Walleye Survey

During the juvenile walleye survey on Mille Lacs Lake, a total of 1,241 walleye were captured over 78.0 miles of shoreline (Table A21). Lengths of walleye captured ranged from 3.9 inches to 28.0 inches (Figure A8). An age-length table was developed using spines and scales collected from a subset of fish (Table A22), and used to apportion the catch by age. Catch per mile values for age 1 through 4 walleye were 0.9, 7.6, 6.7, and 0.1 per mile, respectively.

Summer Fish Community Survey

An effort to rehabilitate the walleye population of Kentuck Lake (Vilas Co.) began in 1998, and included stocking walleye in 1999 and 2000. GLIFWC has conducted annual monitoring of the fish community in this lake since 1997 (Table B1, Figure B1). These surveys may contribute to a better understanding of the reasons for the lack of natural reproduction of walleye during thirteen consecutive years from 1988 through 2000. The fish community survey conducted in 2005 on Kentuck Lake caught eleven species and 422 fish (Table B2). The most abundant species captured was rock bass (55.5% of the fish), followed by bluegill (20.1%) and walleye (7.3%).

Fall Recruitment Surveys

Fall recruitment surveys were conducted on 175 lakes in the ceded territories of Wisconsin, Michigan and Minnesota (Figure C1, Table C2). Survey effort included 559.6 hours of electrofishing along 1,492.9 miles of shoreline resulting in the collection of 50,317 walleye.

From 157 surveys conducted on 154 lakes in Wisconsin, 485.3 hours of electrofishing along 1,292.4 miles of shoreline resulted in a collection of 44,375 walleye. In Michigan, 19 lakes were surveyed in 44.9 hours along 121.4 miles of shoreline, resulting in the collection of 2,569 walleye. In Minnesota, 2 lakes were surveyed in 29.3 hours along 79.1 miles of shoreline, resulting in the collection of 3,373 walleye (Table C2).

A total of 28,999 age 0 walleye were caught in Wisconsin. Age 0 walleye were caught in 130 of the 154 lakes surveyed. Over all 157 surveys, catch per effort (CPE) for age 0 walleye ranged from 0.0 to 208.2 (mean = 21.7, median = 8.9, SD = 33.8) per mile. A total of 7,478 age 1 (yearling) walleye were caught in 128 of the lakes surveyed. Over all surveys, age 1 CPE ranged from 0.0 to 60.4 (mean = 6.1, median = 2.4, SD = 9.1) yearlings per mile. In Kentuck Lake, Vilas County, 237 age 0 and 142 age 1 walleye were caught, yielding CPEs of 39.5 and 23.7 per mile, respectively. Since Kentuck Lake was not stocked in 2004 or 2005, these walleye were the result of natural reproduction.

In order to gauge the relative strength of the 2005 and 2004 walleye year classes monitored in the 2005 fall surveys as age 0 and age 1 fish, plots of mean and median CPE values were generated for each year from 1986 through 2005 for all Wisconsin lakes with recruitment codes of NR or C-NR with at least 75% of the shoreline surveyed, including lakes surveyed by WDNR and including CPEs of 0.0 (Figures C2 and C3). For 1986 through 2005, the averages of the yearly mean and median age 0 CPEs are 33.0 and 17.9 per mile, respectively, and the averages of the yearly mean and median age 1 CPEs are 10.3 and 5.9 per mile, respectively. For 2005, the mean and median age 0 CPEs were 25.0 and 10.8 respectively, and the mean and median age 1 CPEs were 7.5 and 3.8 respectively.

In Michigan, 1,723 age 0 walleye were caught. Age 0 walleye were caught in 13 of the 19 lakes surveyed. Age 0 CPE ranged from 0.0 to 64.5 (mean = 12.3, median = 3.1, SD = 18.0) per mile. A total of 360 age 1 walleye were caught in 9 lakes. Age 1 CPE ranged from 0.0 to 18.4 (mean = 2.5, median = 0.0, SD = 5.2) yearlings per mile.

In Minnesota, 2,880 age 0 and 327 age 1 walleye were caught in Mille Lacs Lake, yielding CPEs of 36.9 and 4.2 per mile, respectively. Length frequencies from the survey on Mille Lacs Lake are shown in Figure C4, and results from all fall recruitment surveys conducted by GLIFWC on Mille Lacs Lake are shown in Figure C5. Greigs Lake, which is on land owned by the Mille Lacs tribe, was also surveyed, but no walleye were captured.

Data were plotted for each recruitment code in Figures C6 and C7. Summary statistics for NR and C-NR lakes, C- lakes, C-ST and ST lakes, and NR-2 and O-ST lakes in Wisconsin, Michigan and Minnesota are given in Table C3. Statistics include the average CPE, the standard deviation, the number of lakes, and the range of CPE values for all lakes and for lakes where a year class was detected. Table C4 summarizes the number of gamefish captured in these same three lake groupings in the three states. These species include muskellunge, northern pike, largemouth bass, and smallmouth bass. Various panfish and rough fish species were also collected but their numbers are not reported here.

Fall Age 0 and Age 1 Walleye Population Estimate

A total of 235 age 0 and age 1 walleye were marked during the age 0 and age 1 population estimate on Bass-Patterson Lake. Age 0 and age 1 densities obtained from the fall population estimates calculated by the Petersen method were 1.9 and 0.9 per acre respectively (Table C5). Mean age 0 and age 1 catch per effort (CPE) values were 14.4 and 9.2 per mile respectively.

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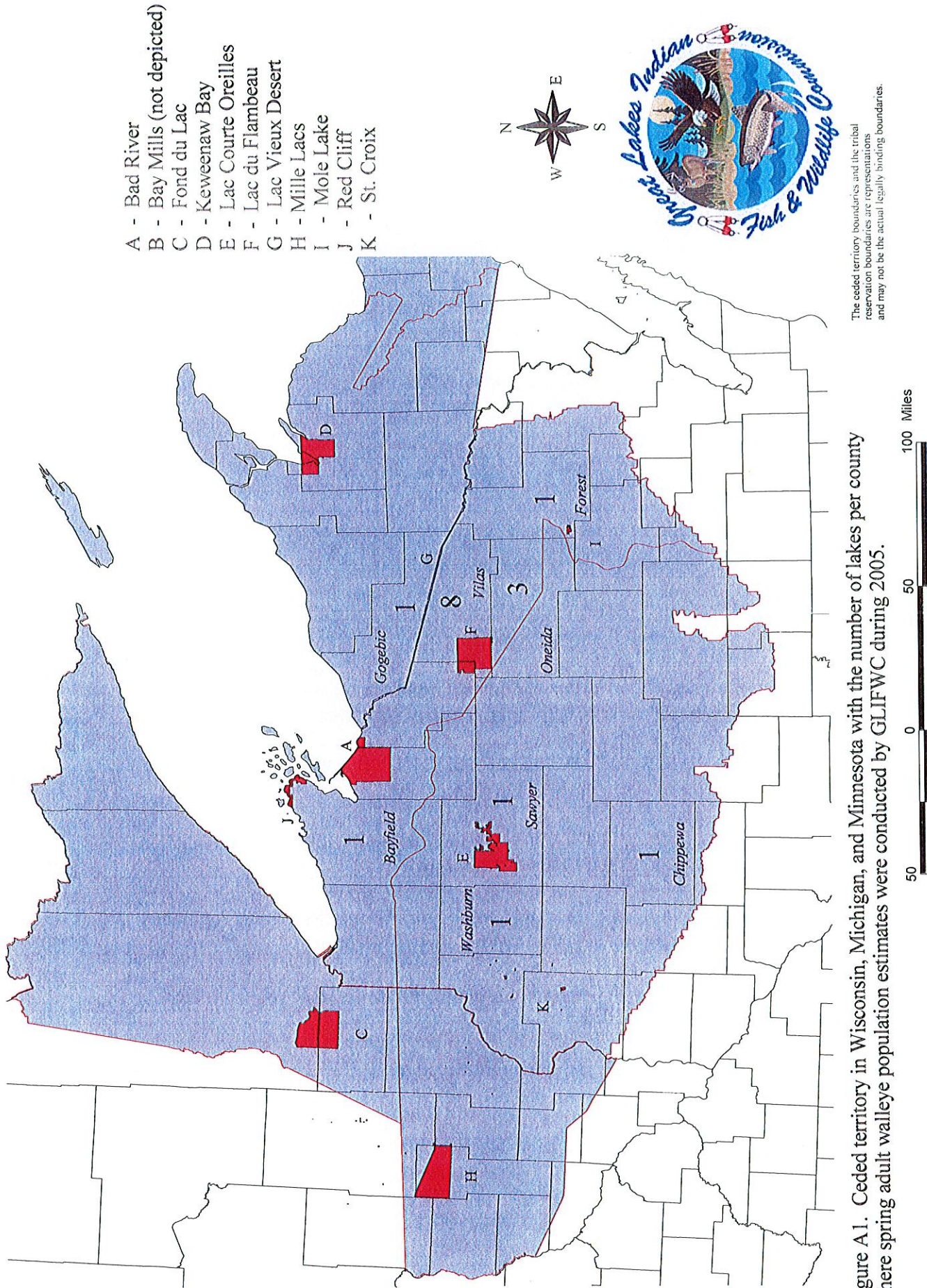


Figure A1. Ceded territory in Wisconsin, Michigan, and Minnesota with the number of lakes per county where spring adult walleye population estimates were conducted by GLIFWC during 2005.

Figure A2: Estimated Adult Walleye Densities by Recruitment Code, Spring 2005

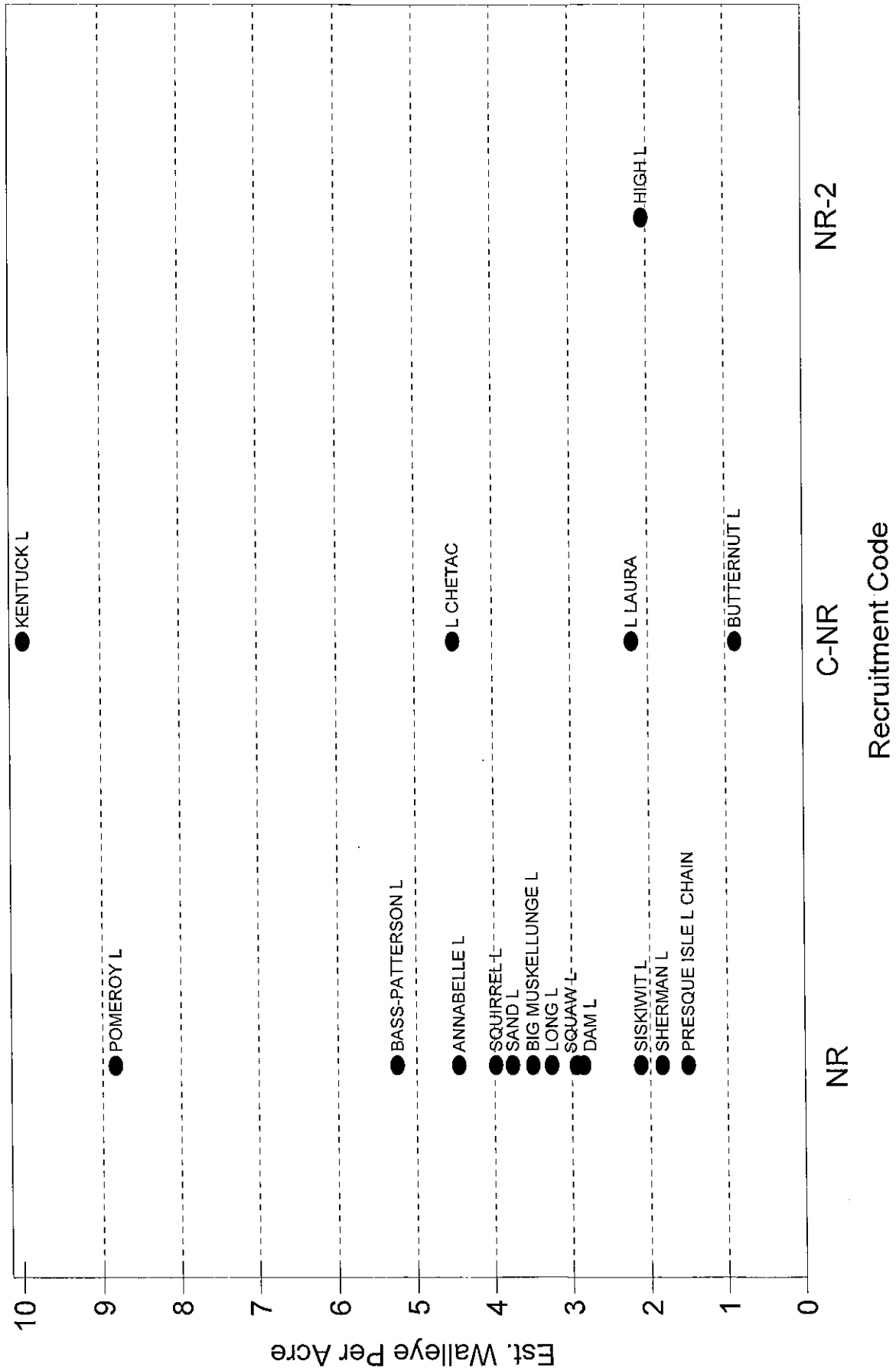


Figure A3. Length Frequency of Adult Walleye Marked
 Adult Walleye Population Estimates, Spring 2005

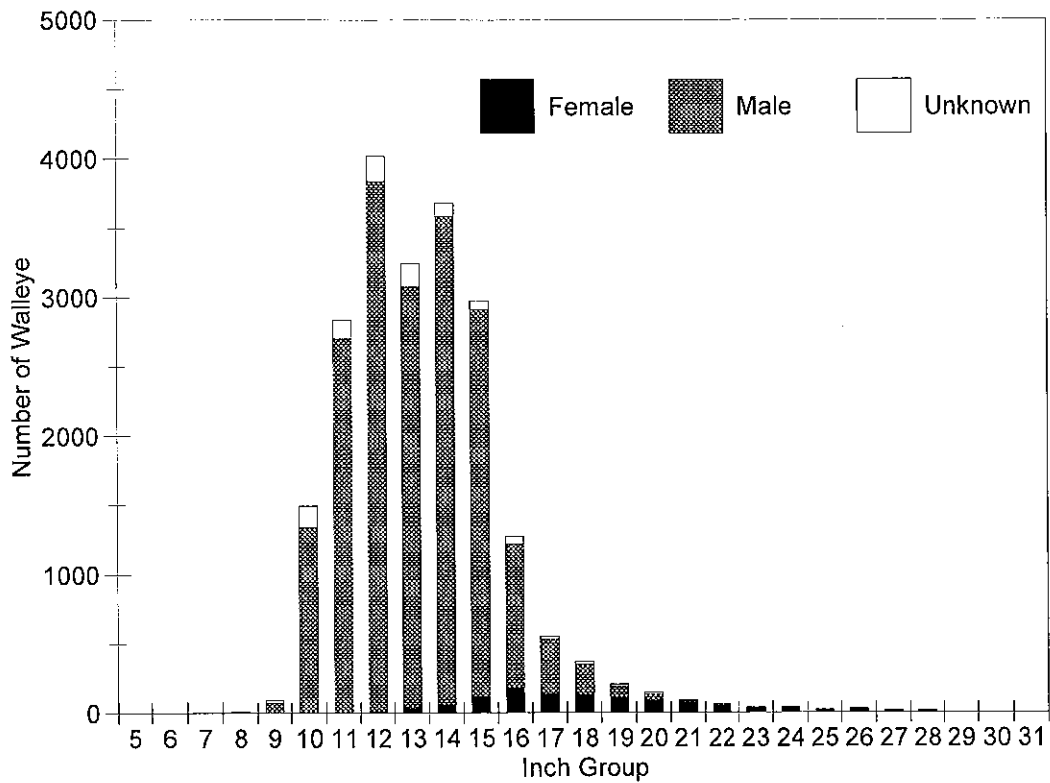


Figure A4. Age Frequency of Adult Walleye Aged
 Adult Walleye Population Estimates, Spring 2005

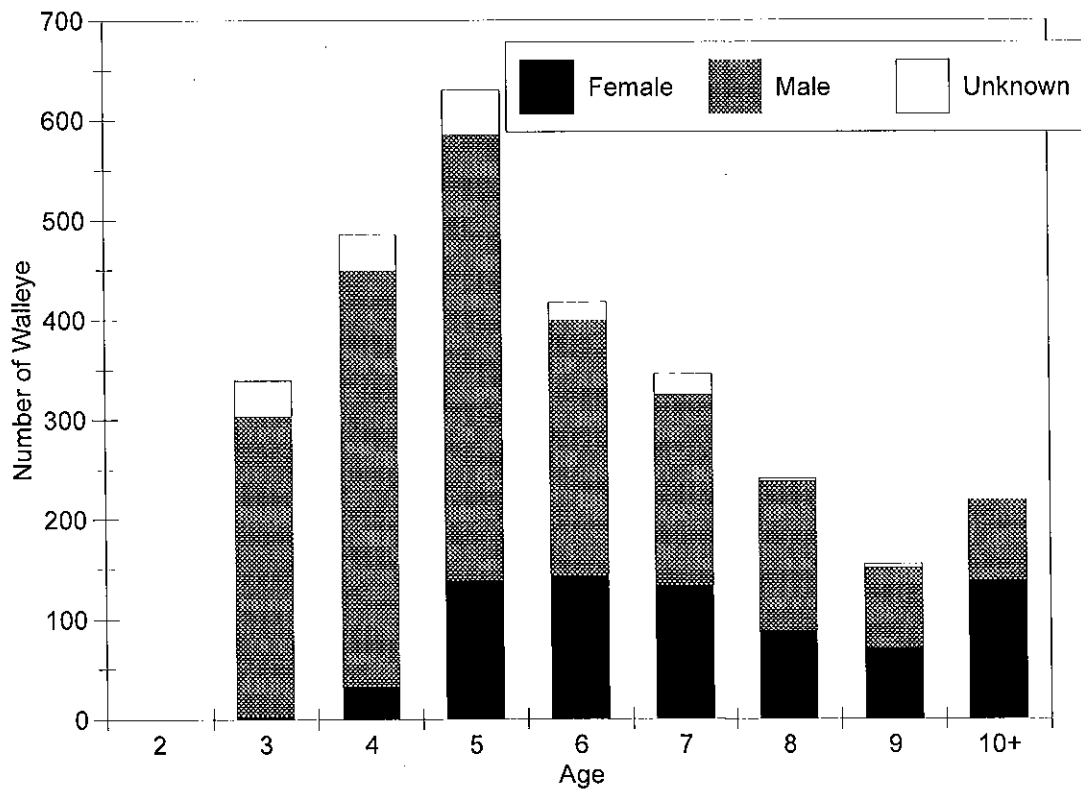


Figure A5

2005 Northern Pike Study Mille Lacs Lake, Minnesota

(Areas sampled by GLIFWC)

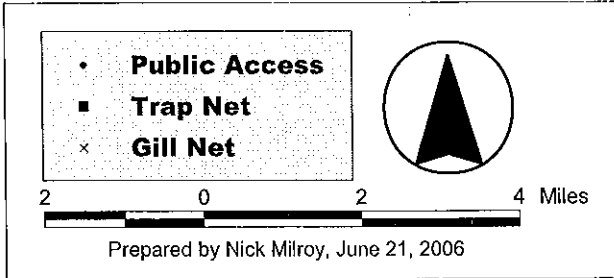
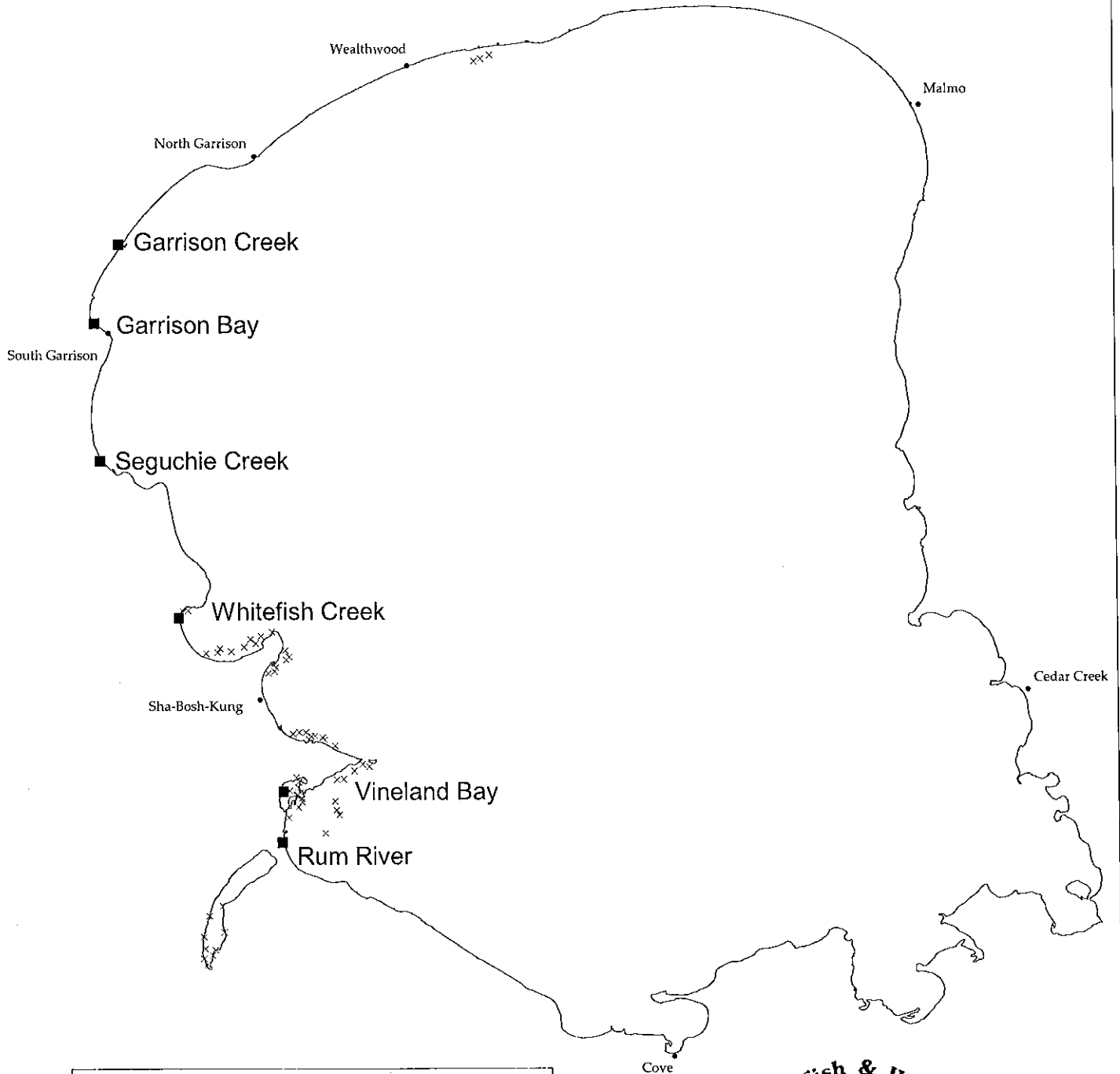


Figure A6.

Northern Pike Tagged and Caught in Recapture Survey
by GLIFWC Crews in 2005 in Mille Lacs Lake
Tagged Fish Shown By Marking Location

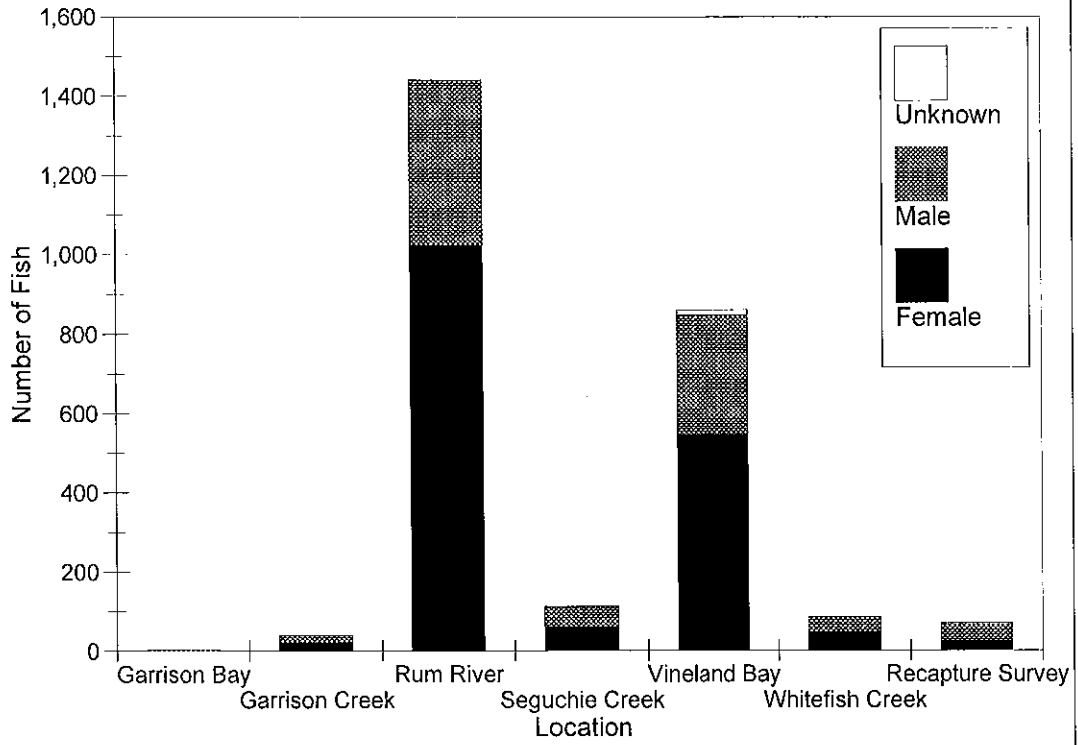


Figure A7.

Northern Pike Tagged and Caught in Recapture Survey
by GLIFWC Crews in 2005 in Mille Lacs Lake
By Inch Group

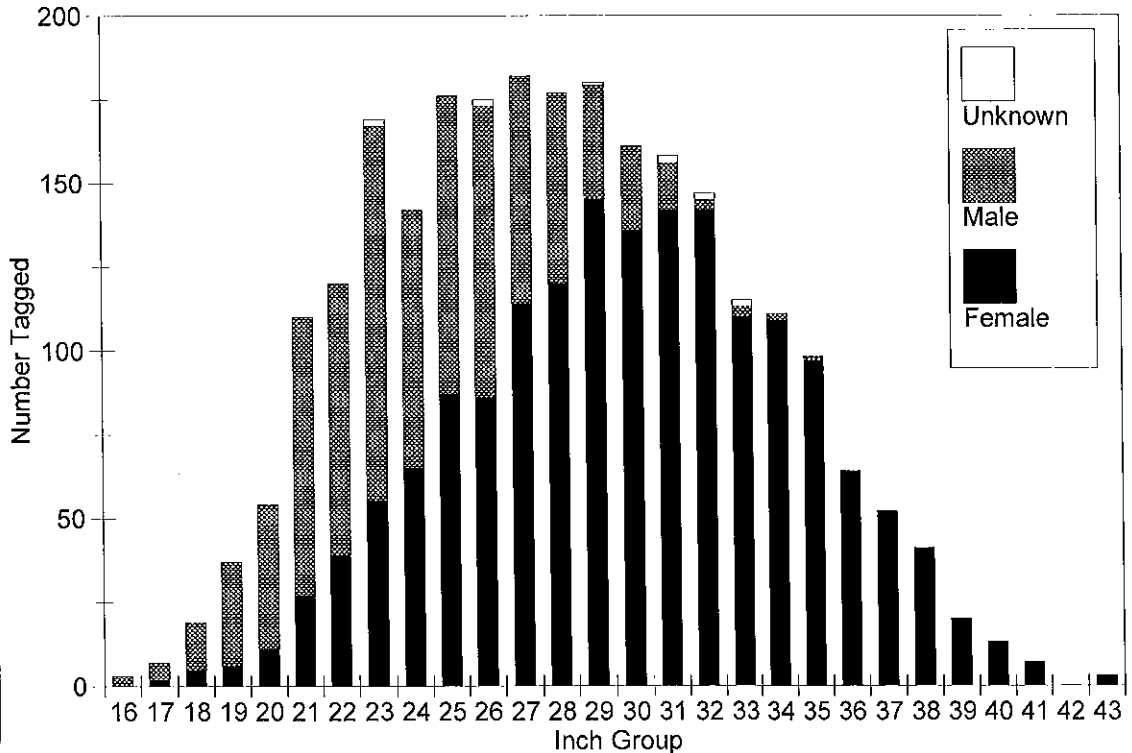


Figure A8. Length Frequency of Walleye Captured
Spring 2005 Juvenile Walleye Survey, Mille Lacs Lake

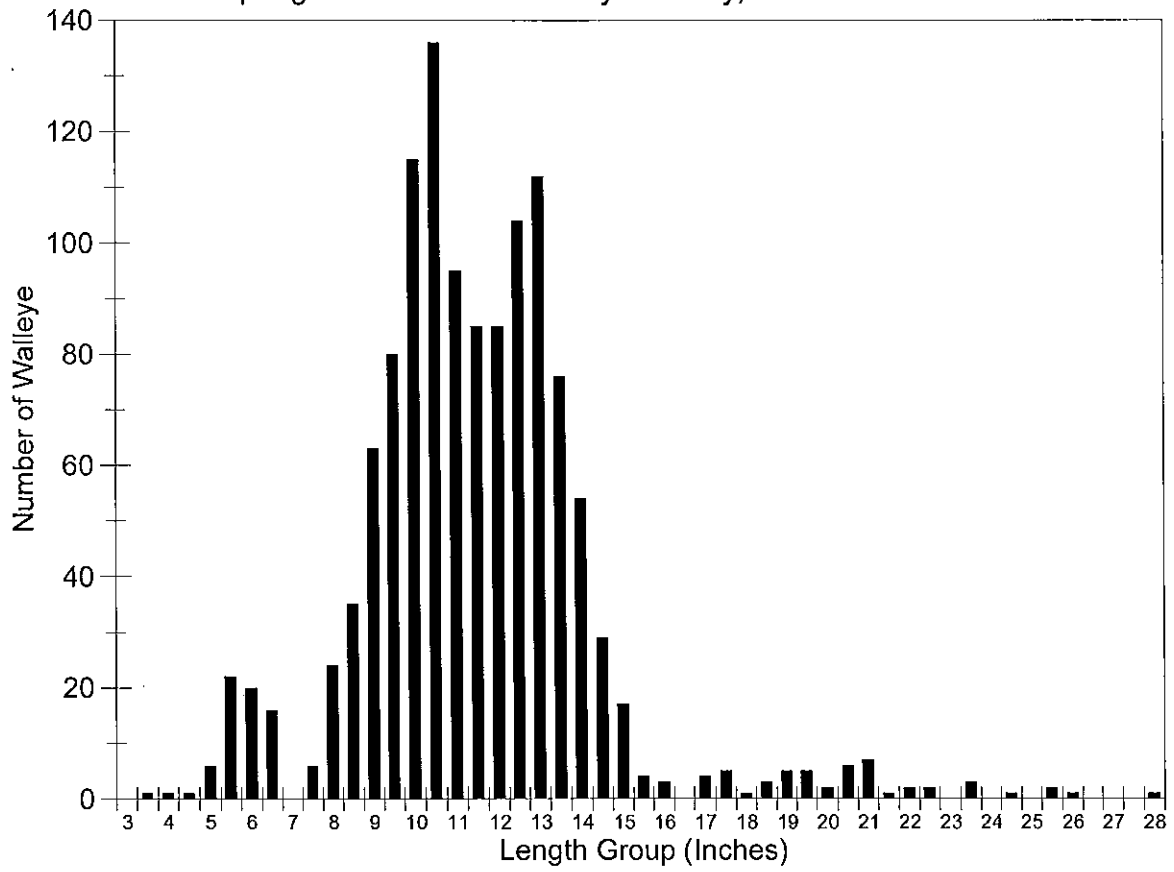


Table A1. Spring 2005 Adult Population Estimates Conducted by GLIFWC

State	County	Lake	Surface Area (Acres)	2005 Walleye Code	Population Estimate	Coefficient of Variation (%)	Density	Marking Gear*	Recapture Gear*	Fin clip applied**	Male: female sex ratio***
MI	GOGEBIC	POMEROY L	314	NR	2,775	8.6	8.84	E	E	TCN	24:1
WI	BAYFIELD	SISKIWI L	330	NR	699	12.0	2.12	E	E	YF	16:1
WI	CHIPPEWA	LONG L	1,052	NR	3,444	6.4	3.27	E	E	TCN	36:1
WI	FOREST	BUTTERNUT L	1,292	C-NR	1,135	31.5	0.88	E	E	YF	5:1
WI	ONEIDA	DAM L	744	NR	2,127	6.8	2.86	E	E	BCN	16:1
WI	ONEIDA	SAND L	540	NR	2,038	14.3	3.77	E	E	TCN	19:1
WI	ONEIDA	SQUIRREL L	1,317	NR	5,249	4.7	3.99	E	E	YF	11:1
WI	SAWYER	L CHETAC	1,920	C-NR	8,654	4.7	4.51	E	E	TCN	48:1
WI	VILAS	ANNABELLE L	213	NR	950	40.9	4.46	E	E	YF	19:1
WI	VILAS	BIG MUSKELLUNGE L	930	NR	3,265	7.9	3.51	E	E	TCN	82:1
WI	VILAS	HIGH L	734	NR-2	1,507	13.1	2.05	E	E	TCN	11:1
WI	VILAS	KENTUCK L	957	C-NR	9,549	4.1	9.98	E/F	E	YF	13:1
WI	VILAS	L LAURA	599	C-NR	1,321	10.6	2.21	E	E	TCN	15:1
WI	VILAS	PRESQUE ISLE L CHAIN	1,571	NR	2,373	7.0	1.51	E	E	TCN	10:1
WI	VILAS	SHERMAN L	123	NR	227	12.4	1.85	E	E	YF	7:1
WI	VILAS	SQUAW L	785	NR	2,309	6.8	2.94	E	E	YF	14:1
WI	WASHBURN	BASS-PATTERSON L	188	NR	987	11.9	5.25	E	E	YF	17:1

*Gear used: E = electrofishing, F = fyke netting

** BCN = bottom caudal notch, TCN = top caudal notch, YF = numbered yellow floy tag

***Sex ratio is calculated for walleye sampled during marking and recapture runs but excludes recaptured fish

Table A2. Lengths of Walleye Collected During Spring 2005 Adult Walleye Population Estimates

STATE	COUNTY	LAKE	NUMBER SAMPLED			FEMALE		MALE		UNKNOWN		
			FEMALE	MALE	UNKNOWN	TOTAL	MINIMUM LENGTH	MAXIMUM LENGTH	MINIMUM LENGTH	MAXIMUM LENGTH	MINIMUM LENGTH	MAXIMUM LENGTH
MI	GOGEBIC	POMEROY L	40	972	140	1,152	12.0	31.5	10.0	18.5	10.5	14.5
WI	BAYFIELD	SISKIWI L	19	299	51	369	14.5	18.5	11.0	18.0	10.5	16.0
WI	CHIPPEWA	LONG L	41	1,475	136	1,652	11.5	25.0	7.0	21.5	8.0	18.0
WI	FOREST	BUTTERNUT L	51	240	15	306	18.5	25.0	10.0	21.0	14.5	23.0
WI	ONEIDA	DAM L	61	974	5	1,040	14.5	25.0	9.0	19.0	10.0	16.5
WI	ONEIDA	SAND L	35	681	20	736	15.0	23.5	9.0	19.5	10.0	19.5
WI	ONEIDA	SQUIRREL L	216	2,446	38	2,700	12.5	26.0	9.5	21.5	10.0	18.0
WI	SAWYER	L CHETAC	66	3,147	66	3,279	15.5	27.5	10.5	25.0	10.5	23.5
WI	VILAS	ANNABELLE L	9	171	40	220	14.0	25.0	10.0	15.0	10.0	16.5
WI	VILAS	BIG MUSKELLUNGE L	14	1,147	7	1,168	15.0	26.0	9.5	19.0	10.0	16.0
WI	VILAS	HIGH L	39	411	68	518	19.5	28.0	10.0	24.0	11.0	20.5
WI	VILAS	KENTUCK L	316	4,069	28	4,413	10.5	29.0	9.0	24.5	9.5	16.5
WI	VILAS	L LAURA	42	640	36	718	15.0	29.0	9.0	19.5	10.0	19.0
WI	VILAS	PRESQUE ISLE L CHAIN	87	889	49	1,025	12.0	29.0	10.0	21.5	10.5	22.0
WI	VILAS	SHERMAN L	18	131	68	217	16.0	26.0	10.0	21.0	10.0	21.0
WI	VILAS	SQUAW L	69	964	119	1,152	10.0	27.0	8.5	25.0	10.0	17.0
WI	VILAS	BASS-PATTERSON L	28	462	48	538	15.0	25.0	11.0	20.5	10.5	19.5
WI	WASHBURN	BASS-PATTERSON L	1,151	19,118	934	21,203	10.0	31.5	7.0	25.0	8.0	23.5

Table A3

Number of Walleye Aged by Sex and Length From Spring 2005 Adult Population Estimate
Pomeroy Lake, Gogebic County, Michigan

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL					
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U
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10								4				1																			5		5			
11								5				13			2																20		20			
12										3	4			1	16															4	20		24			
13										4	1			6	18			1												10	20		30			
14														9	4			15												9	19		28			
15														4	1		2	9			8			1						6	19		25			
16														3			2				7									3	16		19			
17														1										7			2			1	9		10			
18																1							1			1				1	2		3			
19																				1										1			1			
20																																		3		
21																								1							1			1		
22																										1		1			2			2		
23																																				
24																								1							1			1		
25																																				
26																																				
27																																				
28																																				
29																																				
32																															1			1		
TOTALS																															40	130		198		

Table A4

Number of Walleye Aged by Sex and Length From Spring 2005 Adult Population Estimate
Siskiwit Lake, Bayfield County, Wisconsin

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL					
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U
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9																																				
10												3																				3	3			
11								1	2			2	4																		3	6	9			
12													3																			19	1	20		
13															16	1															13	9	22			
14															10	9			3																	
15															4	3			1	8	2									1	14	8	23			
16																															3	14	1	18		
17															2				1	1	1									2	15	1	18			
18																															1	2		3		
19																																				
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29																																				
30																																				
TOTALS												1	5		5	7		32	13	4	13	3	3	20	1					7	80	29	116			

Table A5

Number of Walleye Aged by Sex and Length From Spring 2005 Adult Population Estimate
Long Lake, Chippewa County, Wisconsin

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL					
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U
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11								6	4			1	2																	1	8	4	13			
12												1	9	1			3													1	12	1	14			
13													4				6		2											1	12		13			
14												1	3	1		4	5		2											5	13	1	19			
15											1				4	5														6	14		20			
16															2															4	10		14			
17																		1	1											4	9		13			
18																															4	5		10		
19																															2	3		3		
20																															3	1		3		
21																															2	1		1		
22																																1		2		
23																																2	1		1	
24																																				
25																																1		1		
26																																				
27																																				
28																																				
29																																				
30																																				
TOTALS								1	8	5	4	19	2	11	14	3	8	8	18	6	3	8	3	10	33	91	7	131								

Table A6

Number of Walleye Aged by Sex and Length From Spring 2005 Adult Population Estimate
Butternut Lake, Forest County, Wisconsin

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL			
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	ALL
3																																		
4																																		
5																																		
6																																		
7																																		
8																																		
9																																		
10																															1		1	
11																															2		2	
12																															10		10	
13																															18		18	
14																															16	1	17	
15																															12	1	13	
16																															18	2	20	
17																															23	1	24	
18																															2	16	3	21
19																															6	8	1	15
20																															7	4	1	12
21																															9	1		10
22																															2			2
23																															1			1
24																															2			2
25																																		
26																																		
27																																		
28																																		
29																																		
30																																		
TOTALS								2			9		34	2	1	18	1	6	16	6	9	16	1	4	12	9	22	29	129	10	168			

Table A9

Number of Walleye Aged by Sex and Length From Spring 2005 Adult Population Estimate
Squirrel Lake, Oneida County, Wisconsin

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL						
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	ALL
3																																					
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7																																					
8																																					
9																																					
10								6			3																				9		9				
11								4			12			1																	17		17				
12											12	1		4																	16	1	17				
13														4			5														14		14				
14											1			2	2		4	5													7	11	18				
15																3	2					1	4								5	7	12				
16														4			3					2	2								10	4	14				
17														1			2					3										8		8			
18																						3										1	20	1	21		
19																						8										4		21			
20																						2										3		12		12	
21																																2		5		15	
22																																	8		15		15
23																																	6		6		6
24																																	3		3		3
25																																	2		2		2
26																																					
27																																					
28																																					
29																																					
30																																					
TOTALS								10		1	27	1		7	15		16	12		26	10		17	3		18	1		24	1		109	79	1	189		

Table A10

Number of Walleye Aged by Sex and Length From Spring 2005 Adult Population Estimate
Lake Chetac, Sawyer County, Wisconsin

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL						
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	ALL
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4																																					
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7																																					
8																																					
9																																					
10																																					
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12											21	1		4																			25	1	26		
13											2	1		22	1		3																27	2	29		
14														12	1		19																31	1	32		
15													3	4		2	16	1		6												5	26	1	32		
16													4			7	3	1		7												11	15	1	27		
17																2		1		3													2	15	1	18	
18																2				8													2	20		22	
19																				1													1	5		11	
20																				1													3		8		11
21																				3													4		9		13
22																				1													3		5		5
23																				2													4		10	1	11
24																																		4		7	
25																																		1		2	
26																																		1		2	
27																																		4		4	
28																																	1		1		1
29																																					
30																																					
TOTALS								34	2		7	42	2		13	41	3		5	16		12	15		8	15		6	16		6	10		57	189	7	253

Table A11

Number of Walleye Aged by Sex and Length From Spring 2005 Adult Population Estimate
Annabelle Lake, Vilas County, Wisconsin

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL								
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U
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10								4	2			3																						7	2	9			
11								3	1			11	2		2																			16	3	19			
12												13			8	1																			21	1	22		
13												2	2		8	1			6	1														16	4	20			
14														2	1			4		1	2													3	7	10			
15																1																			1		1		
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TOTALS								7	3			29	4		2	19	2		2	10	1		1	2	1								5	67	11	83			

Table A12

Number of Walleye Aged by Sex and Length From Spring 2005 Adult Population Estimate
Big Muskellunge Lake, Vilas County, Wisconsin

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL						
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	ALL
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11								10				10																							20		20
12												8			12																				20		20
13												2			13			5																	20		20
14														3			15			1			1												20		20
15														2			1	10			9		1					1					3	21		24	
16																	1			1			9											13		13	
17																	1						1			2		1	6				1	10		11	
18																1				1					1			1					2	3		5	
19																								1										1		1	
20																				2														2		2	
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22																																			1		1
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26																																			2		2
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30																																					
TOTALS								18				21			2	28		2	32		3	11			14		1	9		4	4		12	137		149	

Table A13

Number of Walleye Aged by Sex and Length From Spring 2005 Adult Population Estimate
High Lake, Vilas County, Wisconsin

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL					
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U
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30																																				
TOTALS																																				

Table A14

Number of Walleye Aged by Sex and Length From Spring 2005 Adult Population Estimate
Kentuck Lake, Vilas County, Wisconsin*

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL					
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U
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29																																				
30																																				
TOTALS																																				

*Male walleye aged 7 through 10+ could represent fish transferred to Kentuck Lake from Butternut Lake during gamete collection for stocking in 1999 and 2000.

Table A15

Number of Walleye Aged by Sex and Length From Spring 2005 Adult Population Estimate
Lake Laura, Vilas County, Wisconsin

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL					
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U
3																																				
4																																				
5																																				
6																																				
7																																				
8																																				
9																																				
10								12			3																				15		15			
11								7			13			1																	21		21			
12											7			11			2														20		20			
13											5			9			6														20		20			
14													4			14			2												20		20			
15										1				1	2			11			8			1					2	22		24				
16														1	1				9			10		1	1				3	21		24				
17																1					6			1			1		1	8		9				
18																2						2			2			1		4	3		7			
19																7						1					2		8	2		10				
20																2						3								5		5				
21																1								2			1			4		4				
22																						1			2			2		5		5				
23																										4				4		4				
24																						1			1					2		2				
25																											1			1		1				
26																										4				4		4				
27																																				
28																											1			1		1				
29																											1			1		1				
30																																				
TOTALS								19			28			1	25			2	25			14	22			8	24		6	5	14	4	45	152	197	

Table A16

Number of Walleye Aged by Sex and Length From Spring 2005 Adult Population Estimate
Presque Isle Lake Chain, Vilas County, Wisconsin

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL						
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	ALL
3																																					
4																																					
5																																					
6																																					
7																																					
8																																					
9																																					
10								4	1		4																				8	1	9				
11								4	1		20	1		2																1	26	2	28				
12										1	3	1		17	1			1												3	20	3	24				
13													2	17	1	1	4	1												3	21	2	26				
14													3	4		2	11				5									5	20		25				
15													1	1		1	1				1	11								3	18		21				
16															2	1					3	1			1	1				6	12		18				
17																					2			5		3	1	1		3	9		12				
18																1							9			3				6	6		12				
19																					3			4		1				8	1		9				
20																					1			2	1	1			3	3		7	4	11			
21																							2	1		5		3		10	1		11				
22																					1					2		1		4		4					
23																							1			1				5		7		7			
24																														5		5		5			
25																														2		2		2			
26																														7		7		7			
27																														3		3		3			
28																														4		4		4			
29																														3							
30																																					
TOTALS								8	2		1	27	2		6	41	2		7	17	2		13	17			12	23		11	7	37	6	84	146	8	238

Table A17

Number of Walleye Aged by Sex and Length From Spring 2005 Adult Population Estimate
Sherman Lake, Vilas County, Wisconsin

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL					
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U
3																																				
4																																				
5																																				
6																																				
7																																				
8																																				
9																																				
10								5	9																						5	9	14			
11								11	3		5	5																			16	8	24			
12								1			14	6		3	1																18	7	25			
13											4	3		2	1																6	4	10			
14														5	1		2				1										7	2	9			
15										1				4		2						1									8		8			
16														1	1					3	1	1								1	4	2	7			
17																					1											1	1			
18													1			2					1									3		1	4			
19																2									2	1					4	2	1	7		
20																			2		1	1									1		1	2		
21																						1									1			1		
22																																				
23																																				
24																																				
25																																				
26																																				
27																																				
28																																				
29																																				
30																																				
TOTALS								17	12		24	14	1	15	4	4	4		3	3	5	2	1			2	1			10	66	36	112			

Table A18

Number of Walleye Aged by Sex and Length From Spring 2005 Adult Population Estimate
Squaw Lake, Vilas County, Wisconsin

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL					
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U
3																																				
4																																				
5																																				
6																																				
7																																				
8																																				
9																																				
10								1	3	1		5																		1	8	1	10			
11									1		1	4			6															4	11		12			
12											1			3	6	1		4												4	10	1	15			
13														8	3	2		6	2		2	1			1					16	7	2	25			
14														2			6	3	1	4	3			1						12	7	1	20			
15															1				8	1	1	2	1							11	2	1	14			
16															1				2		1	3		1						7			7			
17															1				4			1			1					6		1	7			
18																			1			3			1	1				5			5			
19																				1												2		2		
20																					1					1				1			1			
21																																				
22																																				
23																																				
24																																				
25																															2			2		
26																																				
27																															1			1		
28																																				
29																																				
30																																				
TOTALS								1	4	1	2	9	13	15	3	15	9	1	21	6	1	9	3	3	1	3	1	3	1	67	47	7	121			

Table A19

Number of Walleye Aged by Sex and Length From Spring 2005 Adult Population Estimate
 Bass-Patterson Lake, Washburn County, Wisconsin

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL					
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U
3																																				
4																																				
5																																				
6																																				
7																																				
8																																				
9																																				
10																																				
11								1	1		1																			2	1	3				
12							16	1		2			1																19	1	20					
13							18			2																			20		20					
14							10			5		4		1															20		20					
15							1		3	13	1	6		1														4	21		25					
16									3	4	1	3	5		1													6	10	1	17					
17									1	1		4	1		2													5	4		9					
18									1					1														2			2					
19											2			1		1		1										4	1		5					
20																							1						1		1					
21												2																2			2					
22																		1										1			1					
23																		1										1			1					
24																				1								1			1					
25																																				
26																																				
27																																				
28																																				
29																																				
30																																				
TOTALS							46	2	8	28	1	12	17	1	6	3	2					1	1				27	98	3	128						

Table A21 Spring 2005 Juvenile Walleye Survey Conducted by GLIFWC on Mille Lacs Lake, Minnesota

Miles Surveyed	Hours Surveyed	Total Walleye Caught	Estimated Number of Walleye Caught by Age					Catch per Mile by Age			
			Age 1	Age 2	Age 3	Age 4	Age 5+ / Unaged	Age 1	Age 2	Age 3	Age 4
78.0	27.6	1,241	67	595	521	7	51	0.9	7.6	6.7	0.1

Table A22 Number of Walleye Aged by Sex and Length From Spring 2005 Juvenile Walleye Survey Mille Lacs Lake, Mille Lacs County, Minnesota

INCH GROUP	AGE 1			AGE 2			AGE 3			AGE 4			AGE 5			AGE 6			AGE 7			AGE 8			AGE 9			AGE 10+			TOTAL			
	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	F	M	U	ALL			
3																																		
4																																		
5																																		
6			2																													2	2	
7			1																													4	4	
8																																6	6	
9																																		
10																																	53	
11																																34	34	
12																																19	19	
13																																		
14																																	27	27
15																																	10	10
16																																	1	1
17																																		
18																																		
19																																		
20																																		
21																																		
22																																		
23																																		
24																																		
25																																		
26																																		
27																																		
28																																		
29																																		
30																																		
TOTALS			3																														103	156

Appendix B: Summer Survey Data

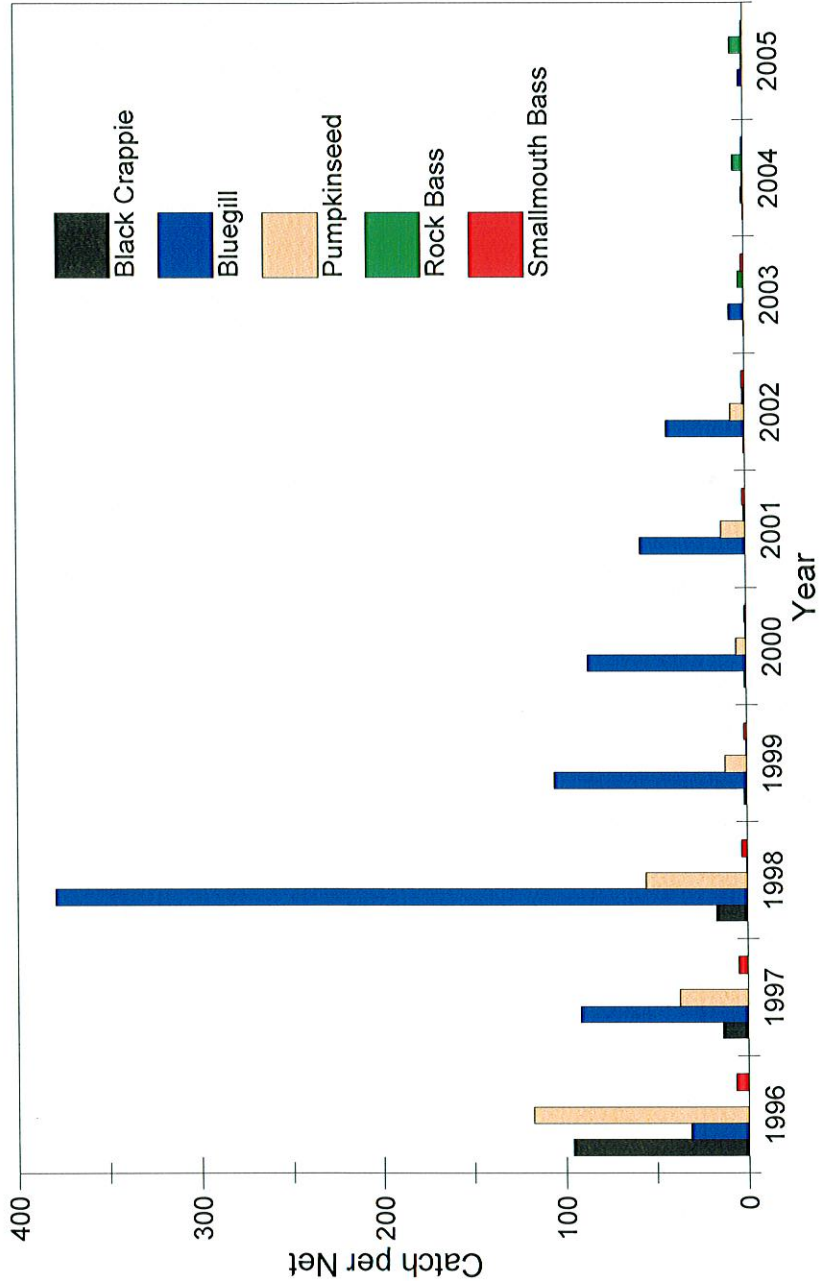
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B1.	Fish Community Surveys, Kentuck Lake, Vilas County, Wisconsin, 1983-2005	33
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Table B1. Fish Community Surveys, Kentuck Lake, Vilas County, Wisconsin, 1989-2005

Year	Summary	Black Crappie	Bluegill	Golden Shiner	Largemouth Bass	Muskellunge	Pumpkinseed	Rock Bass	Smallmouth Bass	Walleye	White Sucker	Yellow Perch
1983	Total	78	2			1	13		24	105		96
	Catch/Net	2.44	0.06			0.03	0.41		0.75	3.28		3.00
1984*	Total	75				3			77	86		8
	Catch/Net	3.12				0.12			3.12	3.50		0.33
1986	Total	3,080	1,014	156		5	3,768	2	215	3	60	90
	Catch/Net	96.25	31.69	4.88		0.16	117.75	0.06	6.72	0.09	1.88	2.81
1987	Total	440	2,836	8		0	1,188	1	161	0	16	56
	Catch/Net	13.75	91.75	0.25		0.00	37.44	0.03	5.03	0.00	0.50	1.75
1988	Total	556	12,142	40		1	1,778	6	101	1	9	32
	Catch/Net	17.38	379.44	1.25		0.16	55.56	0.19	3.16	0.03	0.28	1.00
1989	Total	59	3,379	29		2	385	12	49	0	12	28
	Catch/Net	1.84	105.59	0.91		0.06	12.03	0.38	1.53	0.00	0.22	0.88
2000	Total	36	2,782	33		0	186	8	23	6	16	6
	Catch/Net	1.13	86.94	1.03		0.00	5.81	0.25	0.72	0.19	0.50	0.19
2001	Total	4	1,857	12		0	432	60	22	5	22	6
	Catch/Net	0.13	58.03	0.38		0.00	13.50	0.69	0.69	0.16	0.69	0.19
2002	Total	17	1,348	7		0	250	29	6	6	2	36
	Catch/Net	0.55	43.48	0.23		0.00	8.06	0.94	1.94	0.19	0.78	0.09
2003	Total	10	275	5		1	150	106	7	0.22	1.06	3
	Catch/Net	0.31	8.59	0.16		0.03	4.69	3.31	1.56	0.22	2.38	0.09
2004	Total	5	33	6		2	25	190	24	3	18	2
	Catch/Net	0.16	1.03	0.19		0.06	0.78	5.94	0.75	0.16	0.86	0.06
2005	Total	3	85	15		3	21	14	14	31	8	3
	Catch/Net	0.09	2.66	0.47		0.09	0.66	7.31	0.44	0.97	0.28	0.18

Figure B1
Fish Community Surveys, Kentuck Lake
Five Selected Species, 1996-2005



* Incomplete data available from 1984 survey, which was conducted in June. It appears that 24 or 25 nets were set during this survey. One net did not fish properly during the 2002 survey, so catch/net data was based on 31 successful lifts. 1987 and 1989-2002 surveys were conducted by GLFWC. 1983, 1984, 1996 and 1998 surveys were conducted by the Wisconsin Department of Natural Resources. Some species with minimal catch may not be reported in the summary above.

Area: 957 acres

Net Sets: 8 fyke nets for 4 nights

Inch Group	Black Crappie	Bluegill	Brook Trout	Golden Shiner	Largemouth Bass	Pumpkinseed	Rock Bass	Smallmouth Bass	Walleye	White Sucker	Yellow Perch
2.0-2.4					3			1			
2.5-2.9								12			
3.0-3.4		2						13			
3.5-3.9		3						10			
4.0-4.4		6		4				4			1
4.5-4.9		12		2				12		1	
5.0-5.4		16						21		2	
5.5-5.9		18						24			
6.0-6.4	1	7		2		2		31			
6.5-6.9		5		1		3		19			
7.0-7.4		2		1		6		56			
7.5-7.9		3		1		3		23		1	
8.0-8.4	1	6		4		4		7		1	
8.5-8.9		4						1		4	
9.0-9.4		1						1		3	
9.5-9.9											
10.0-10.4											
10.5-10.9			2								1
11.0-11.4	1										
11.5-11.9											
12.0-12.4											
12.5-12.9											
13.0-13.4											
13.5-13.9											
14.0-14.4											
14.5-14.9											
15.0-15.4											
15.5-15.9											
16.0-16.4											
16.5-16.9											
17.0-17.4											
17.5-17.9											
18.0-18.4											
18.5-18.9											
19.0-19.4											
19.5-19.9											
20.0-20.4											
20.5-20.9											
21.0-21.4											
21.5-21.9											
22.0-22.4											
22.5-22.9											
23.0-23.4											
23.5-23.9											
24.0-24.4											
24.5-24.9											
25.0-25.4											
25.5-25.9											
26.0-26.4											
26.5-26.9											
27.0-27.4											
27.5-27.9											
28.0-28.4											
28.5-28.9											
Unmeasured											
Total	3	85	2	15	3	21	234	14	31	9	5
Catch/Net	0.09	2.66	0.06	0.47	0.09	0.66	7.31	0.44	0.97	0.28	0.16
Perc. of Total	0.7%	20.1%	0.5%	3.6%	0.7%	5.0%	55.5%	3.3%	7.3%	2.1%	1.2%
Mean Length	8.8	5.8	10.7	6.2	2.0	7.5	6.5	10.8	15.3	17.4	8.5

Appendix C: Fall Recruitment Survey Data

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Figure C2. Means of Age 0 and Age 1 Walleye CPEs
Wisconsin Fall Surveys 1986-2005

(Lakes with codes of NR or C-NR with at least 75% of the shoreline surveyed. Includes Wisconsin DNR data and all lakes with CPEs of 0.)

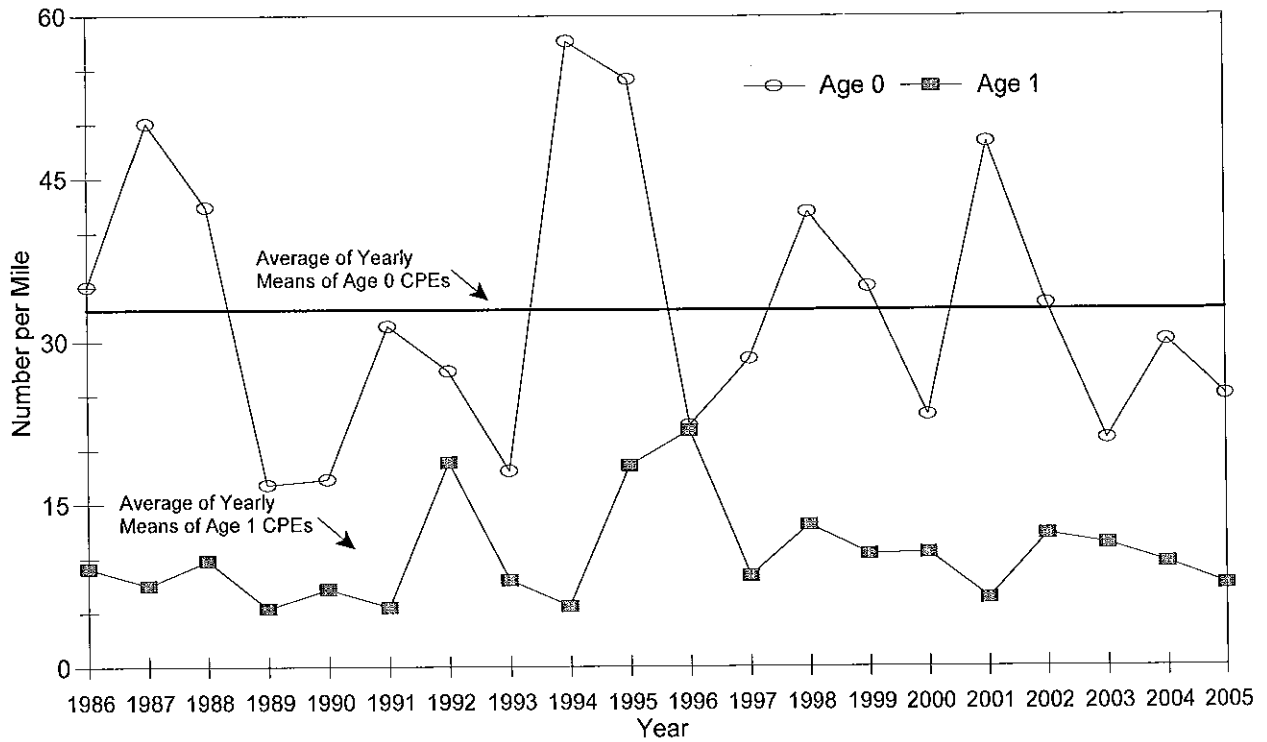


Figure C3. Medians of Age 0 and Age 1 Walleye CPEs
Wisconsin Fall Surveys 1986-2005

(Lakes with codes of NR or C-NR with at least 75% of the shoreline surveyed. Includes Wisconsin DNR data and all lakes with CPEs of 0.)

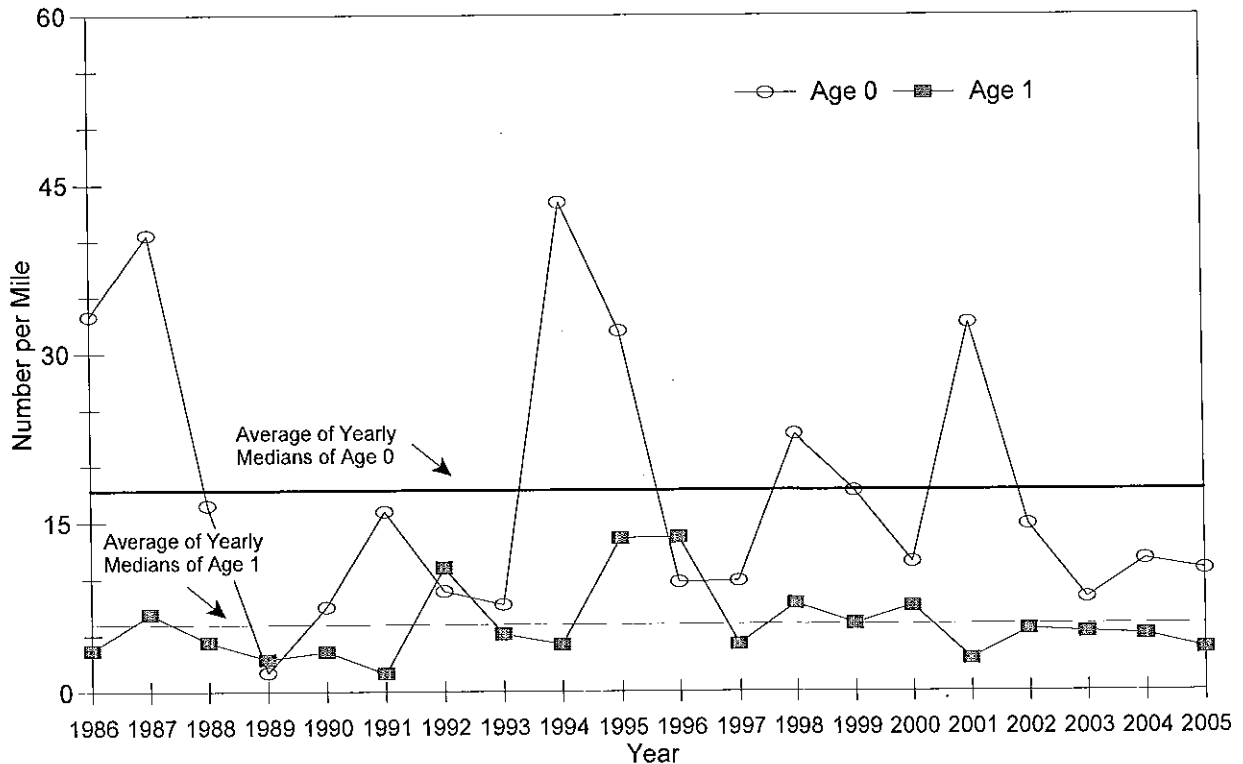


Figure C4.

Length Frequency of Walleye Captured
 Fall 2005 Walleye Recruitment Survey, Mille Lacs Lake

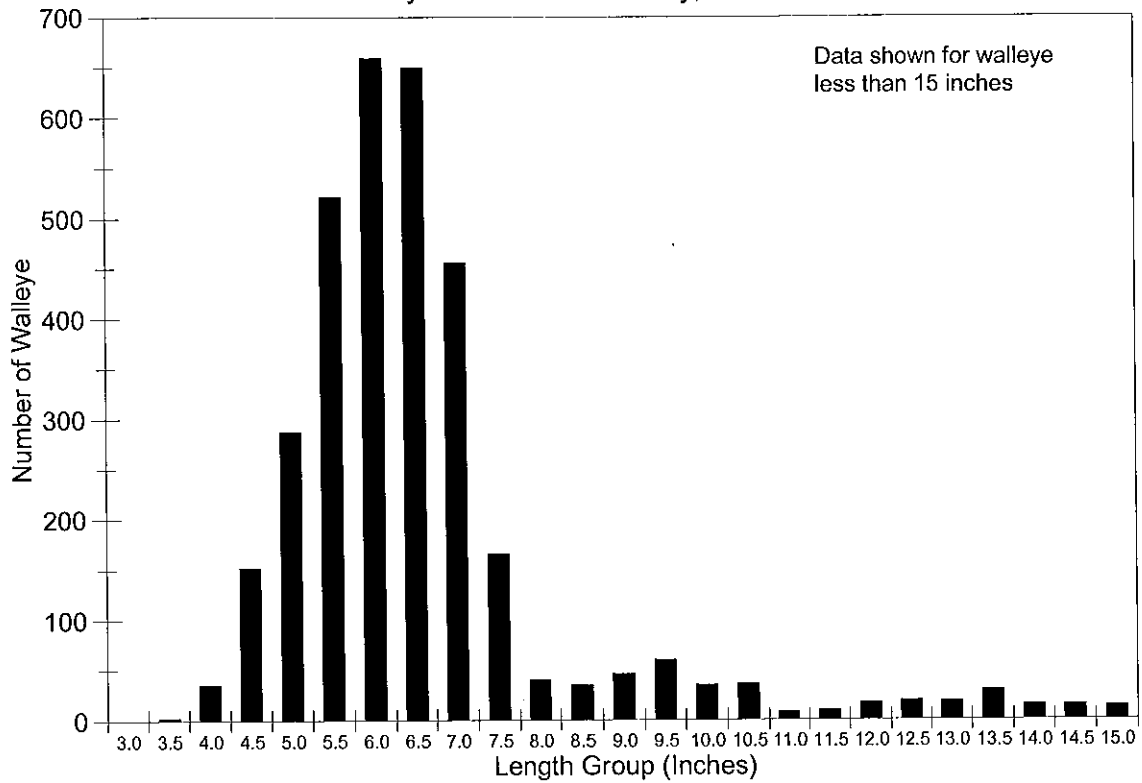


Figure C5.

Mille Lacs Lake Walleye CPEs
 GLIFWC Surveys, 1993 - 2005

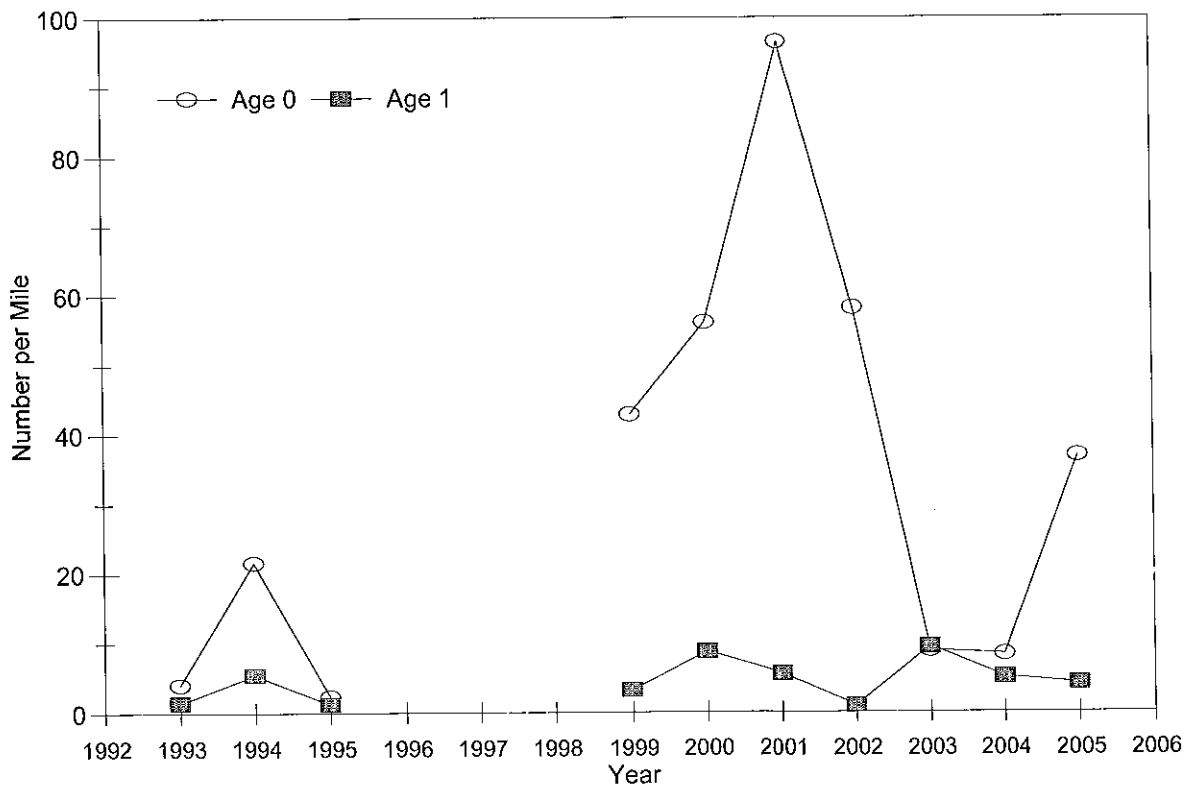


Figure C6. Age 0 CPE By Code for GLIFWC 2005 Recruitment Surveys

(X is the mean for each code, + is the median.)

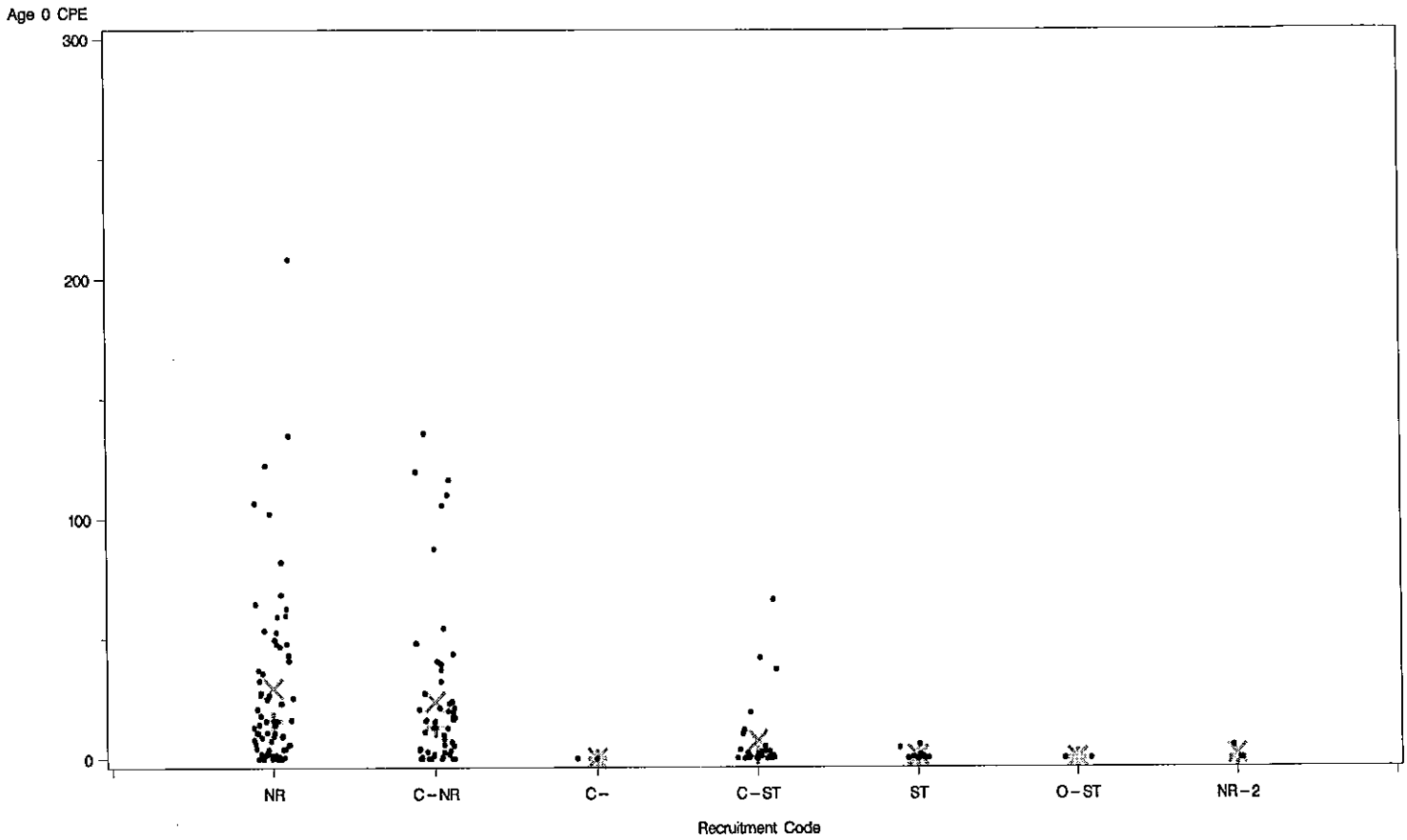


Figure C7. Age 1 CPE By Code for GLIFWC 2005 Recruitment Surveys

(X is the mean for each code, + is the median.)

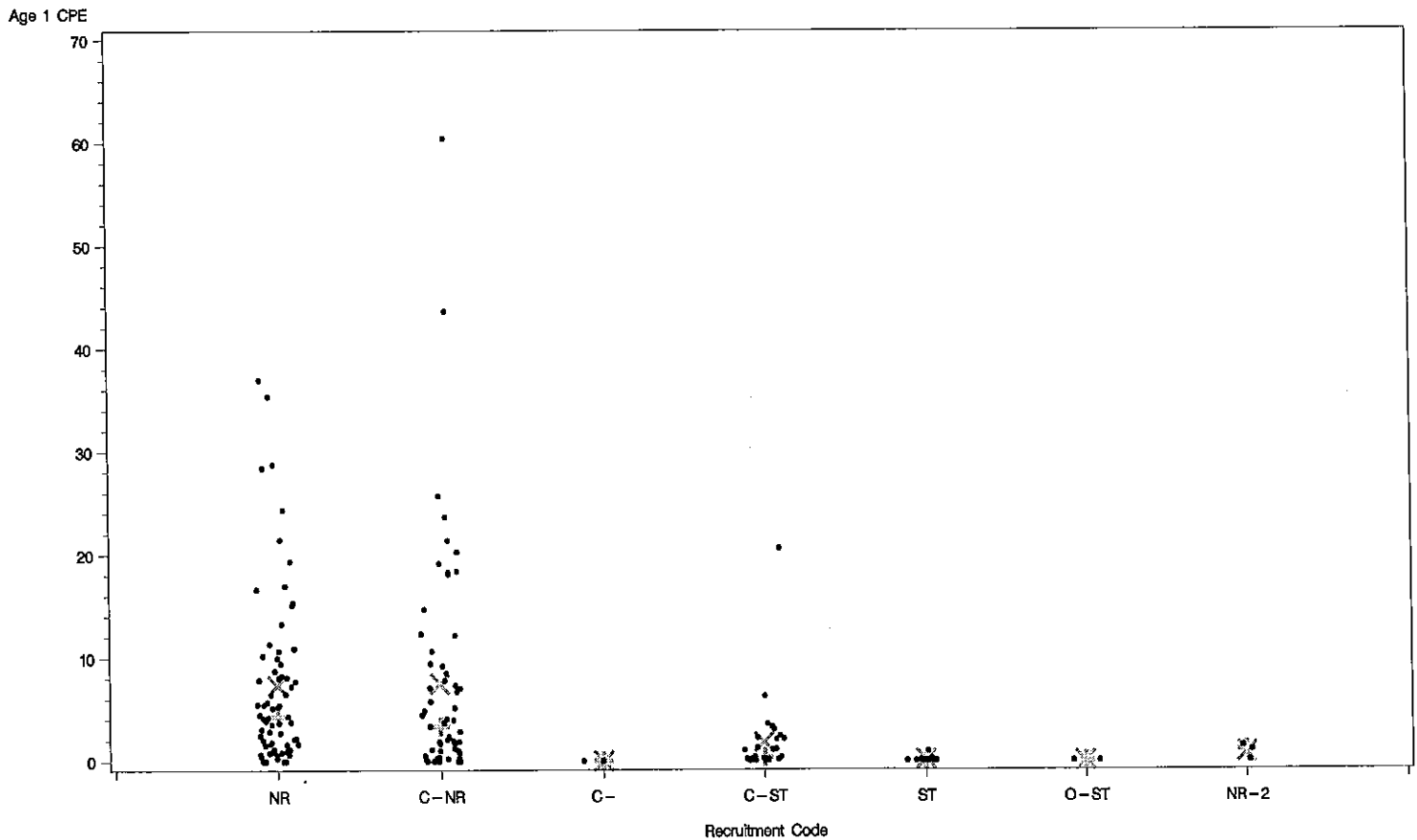


Table C1. Description of Walleye Recruitment Source Codes.

Code	Recruitment Code Description
NR =	Natural reproduction provides the only source of recruitment to the adult population and is consistent enough to result in an adult population with multiple year-classes present.
NR-2 =	Natural reproduction provides the only source of recruitment to the population, but adult density is low, presumably resulting from weak or inconsistent year-classes.
C-NR =	Natural reproduction is sufficient to sustain the adult population, but stocking occurs for non-biological reasons and may or may not augment the adult population (e.g., NR lakes stocked back with fry after spawn collection, NR lakes stocked by lake associations).
C- =	Natural reproduction and stocking provide more or less equal recruitment to the population, or the relative contributions of natural reproduction and stocking are not understood well enough to make an accurate judgement as to the dominant source.
C-ST =	Stocking provides the dominant source of recruitment to the adult population but natural reproduction occurs and may augment the adult population to a lesser extent (e.g., NR-2 lakes that are stocked to produce greater abundance).
ST =	Stocking provides the only source of recruitment to the adult population. If stocking is regular then the adult population may consist of multiple year-classes; if irregular, then the population may consist of one or two year-classes with perhaps only large fish.
REM =	Absence of recruitment to the adult population due to discontinued stocking or habitat changes has resulted in a remnant population of adults; the stock will disappear at some point in the future.
O-ST =	Stocking provides the only source of recruitment to the population in an attempt to establish an adult population, but survey data is either not available or indicates that adult density is less than 0.5 per acre.
O =	Walleye are not present.

Table C2. concluded.

WISCONSIN		Surface Area (Acres)	2005 Walleye Code	Date Surveyed	Age 0 CPE	Age 0 Walleye eye	Age 0 Min Length	Age 0 Max Length	Age 0 Mean Length	Age 1 CPE	Age 1 Walleye eye	Age 1 Min Length	Age 1 Max Length	Age 1 Mean Length	Total Walleye eye	Miles Surveyed	Shore Miles	Hours Surveyed	Temperature	Other Species			
County	Lake																			MUE	NOP	LMB	SMB
VILAS	PLUM L	1,033	C-NR	10/18	135.7	2008	4.0	7.8	5.7	9.5	140	7.9	10.6	9.0	2,260	14.8	15.4	6.15	56				
VILAS	PRESQUE ISLE L	1,280	NR	9/7	7.5	66	4.2	6.8	5.2	8.8	77	7.0	9.0	7.8	237	8.8	8.8	4.25	67				
VILAS	REST L	608	C-NR	10/19	20.7	93	3.6	7.7	6.2	4.9	22	8.1	10.4	9.3	137	4.5	8.1	1.91	53				
VILAS	ROUND L	116	NR-2	10/27	5.2	11	5.2	7.7	6.5	1.4	3	10.5	11.7	11.2	26	2.1	2.1	0.80	48				
VILAS	S TURTLE L	454	NR	10/10	15.8	98	5.2	7.1	6.0	8.1	50	7.3	9.9	8.6	187	6.2	6.2	2.96	53				
VILAS	S TWIN L	642	C-NR	9/19	1.1	4	6.1	6.5	6.4	0.0	0				20	3.7	3.7	1.75	65				
VILAS	SHERMAN L	123	NR	9/19	208.2	458	4.7	8.4	6.8	7.7	17	9.0	11.2	10.0	478	2.2	2.2	1.33	68				
VILAS	SNIPE L	239	NR	10/25	0.0	0				21.5	58	8.9	10.8	9.9	102	2.7	2.7	1.50	48				
VILAS	SQUAW L	785	NR	9/19	9.9	89	5.3	7.2	6.3	8.1	73	8.0	9.8	9.0	366	9.0	9.0	3.12	68				
VILAS	TENDERFOOT L	437	NR	9/14	8.9	58	4.7	7.0	5.7	3.9	26	7.1	10.6	9.1	139	6.6	6.6	3.31	68				
VILAS	TROUT L	3,816	C-ST	10/12	37.2	666	4.7	8.2	6.5	2.1	38	8.4	11.1	10.0	751	17.9	17.9	8.65	58				
VILAS	WHITE SAND L	734	C-ST	10/12	3.0	16	6.0	7.6	6.8	2.1	11	9.3	11.4	10.3	41	5.3	5.5	2.01	58				
WASHBURN	BASS-PATTERSON L	188	NR	9/19	14.1	41	4.5	8.0	5.6	10.7	31	6.9	9.8	8.3	90	2.9	2.9	1.25	69				
WASHBURN	BASS-PATTERSON L	188	NR	9/20	15.9	46	4.2	8.0	5.6	11.4	33	6.9	9.4	8.1	89	2.9	2.9	1.43	69				
WASHBURN	BASS-PATTERSON L	188	NR	9/21	13.1	38	4.4	6.8	5.5	5.5	16	7.1	9.8	8.2	60	2.9	2.9	1.08	69				
WASHBURN	L NANCY	772	C-NR	10/5	0.1	1	7.1			0.0	0			4	7.5	10.9	2.70	60			6	82	
WASHBURN	LONG L	3,290	C-ST	9/29	10.3	290	4.4	8.5	7.0	0.0	0			321	28.2	38.0	11.18	63				7	
WASHBURN	MIDDLE MCKENZIE L	530	C-ST	10/20	2.0	8	5.6	6.0	6.3	6.3	25	6.2	8.1	7.3	38	4.0	4.1	1.62	53				
WASHBURN	MINONG FL	1,564	NR	10/24	134.7	714	4.4	7.9	6.4	10.9	58	8.7	11.7	10.2	898	5.3	24.8	2.13	46				
WASHBURN	SHELL L	2,580	NR	9/27	62.6	639	3.5	7.5	4.9	7.3	74	7.6	11.4	9.0	729	10.2	10.2	4.49	64				

COUNT (WISCONSIN): 157 surveys on 154 lakes
 TOTALS (WISCONSIN): 28,999
 AVERAGES (WISCONSIN): 21.7 185
 6.1 6.1 48
 7.478
 44,375 1,292.4 2,043.8 485.33
 28 249 776 147

MICHIGAN		Surface Area (Acres)	2005 Walleye Code	Date Surveyed	Age 0 CPE	Age 0 Walleye eye	Age 0 Min Length	Age 0 Max Length	Age 0 Mean Length	Age 1 CPE	Age 1 Walleye eye	Age 1 Min Length	Age 1 Max Length	Age 1 Mean Length	Total Walleye eye	Miles Surveyed	Shore Miles	Hours Surveyed	Temperature	Other Species			
County	Lake																			MUE	NOP	LMB	SMB
BARAGA	PARENT L	182	NR	10/26	0.0	0				0.0	0			13	2.3	2.3	0.95	48					
GOGEBIC	BEATONS L	330	ST	10/25	0.0	0				0.0	0			0	6.9	6.9	2.00						
GOGEBIC	CISCO L	506	C-NR	10/3	0.0	0				0.0	0			0	3.2	12.4	1.53	65					
GOGEBIC	DUCK L	616	C-ST	10/18	19.3	164	4.4	7.2	5.8	2.2	19	7.9	9.7	8.8	212	8.5	9.5	2.71	54				
GOGEBIC	L GOGEBIC	13,380	C-NR	10/12	19.4	210	4.2	7.3	5.7	18.4	198	7.4	10.8	9.3	423	10.8	35.0	4.41	54				
GOGEBIC	MARION L	318	C-ST	10/27	1.7	8	6.6	8.1	7.1	0.0	0			10	4.6	4.9	1.89	48					
GOGEBIC	POMEROY L	314	NR	9/20	43.2	160	4.1	7.7	6.5	15.1	56	7.9	10.3	9.4	226	3.7	3.7	2.25	67				
GOGEBIC	TAMARACK L	335	NR	10/26	32.5	130	5.4	8.5	6.9	5.5	22	8.9	10.7	10.1	346	4.0	4.0	1.68	47				
GOGEBIC	THOUSAND ISLAND L	1,020	C-NR	10/3	0.0	0				0.0	0			9	10.7	10.7	5.64	64				2	
HOUGHTON	BOB L	130	C-ST	10/25	0.5	1	9.4	9.4	9.4	0.0	0			11	2.0	2.0	0.88	45					
HOUGHTON	PIKE L	83	C-	10/24	0.0	0				0.0	0			1	1.9	1.9	0.81	49					
HOUGHTON	SANDY L	101	C-	10/24	0.0	0				0.0	0			0	2.6	2.6	1.01	46					
IRON	CHICAGON L	1,100	C-ST	9/19	3.1	32	5.8	7.6	6.7	1.1	11	8.6	10.4	9.4	118	10.4	10.4	3.06	67				
IRON	EMILY L	320	ST	9/12	4.4	14	5.6	7.9	6.6	0.0	0			22	3.2	3.2	1.44	75					
IRON	MICHIGAMME RES	7,000	NR	9/20-21	4.4	72	4.5	6.8	5.2	0.7	11	8.4	9.5	9.0	127	16.5	78.7	4.27	67				
IRON	PERCH L	994	NR	9/22	64.5	516	4.0	7.1	5.2	2.5	20	7.7	10.3	9.3	553	8.0	8.0	2.65	65				
IRON	STANLEY L	310	NR	9/13	15.7	55	4.7	7.9	6.7	1.7	6	8.2	8.7	8.5	118	3.5	3.5	1.38	72				
IRON	STE KATHRYN L	151	C-ST	9/14	0.8	3	7.7	8.4	8.0	0.0	0			3	3.6	3.6	1.35	67					
ONTONAGON	BOND FALLS FL	2,118	C-NR	10/24	23.9	358	3.8	8.0	5.1	1.1	16	8.2	10.4	9.4	377	15.0	15.0	4.90	48				

COUNT (MICHIGAN): 19 surveys on 19 lakes
 TOTALS (MICHIGAN): 1,723
 AVERAGES (MICHIGAN): 12.3 91
 6.5 6.5 2.5 19
 360
 2,569 121.4 218.3 44.91
 9.2 9.2 135

MINNESOTA		Surface Area (Acres)	2005 Walleye Code	Date Surveyed	Age 0 CPE	Age 0 Walleye eye	Age 0 Min Length	Age 0 Max Length	Age 0 Mean Length	Age 1 CPE	Age 1 Walleye eye	Age 1 Min Length	Age 1 Max Length	Age 1 Mean Length	Total Walleye eye	Miles Surveyed	Shore Miles	Hours Surveyed	Temperature	Other Species			
County	Lake																			MUE	NOP	LMB	SMB
MILLE LACS	MILLE LACS L	132,516	NR	9/26-28,10/11-12	36.9	2880	3.6	8.3	6.1	4.2	327	7.4	12.4	8.1	3,373	78.0	78.0	29.00	60				
PINE	GREIGS L	34	O	10/3	0.0	0				0.0	0			0	1.1	1.3	0.32	67					

COUNT (MINNESOTA): 2 surveys on 2 lakes
 TOTALS (MINNESOTA): 2,880
 AVERAGES (MINNESOTA): 18.5 1,440
 6.1 6.1 2.1 164
 327
 3,373 79.1 79.3 29.32
 8.1 8.1 1,687

COUNT (OVERALL): 178 surveys on 175 lakes
 TOTALS (OVERALL): 33,602
 AVERAGES (OVERALL): 20.6 188.8
 6.2 6.2 5.6 45.9
 8,165 50,317 1,492.9 2,341.4 559.56
 28 251 783 149

CPE=catch per unit effort (number of fish divided by shore miles surveyed), MUE=muskellunge, NOP=northern pike, LMB=largemouth bass, SMB=smallmouth bass.

Table C3. Summary of Age 0 and Age 1 Catch per Effort Rates During Fall 2005 Recruitment Surveys Conducted by GLIFWC

NR and C-NR || C-ST and ST || NR-2, O, O-ST, and REM

INCLUDING LAKES WHERE NO YEAR CLASS WAS DETECTED

AGE 0	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE
WISCONSIN	27.3	36.7	117	0.0	208.2			0			5.9	14.3	34	0.0	66.3	0.9	2.1	6	0.0	5.2
MICHIGAN	20.4	21.5	10	0.0	64.5	0.0	0.0	2	0.0	0.0	4.3	6.8	7	0.0	19.3			0		
MINNESOTA	36.9		1	36.9	36.9			0					0			0.0		1	0.0	0.0
POOLED	26.8	35.6	128	0.0	208.2	0.0	0.0	2	0.0	0.0	5.6	13.2	41	0.0	66.3	0.7	2.0	7	0.0	5.2

AGE 1	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE
WISCONSIN	7.7	9.9	117	0.0	60.4			0			1.5	3.7	34	0.0	20.6	0.4	0.6	6	0.0	1.4
MICHIGAN	4.5	6.7	10	0.0	18.4	0.0	0.0	2	0.0	0.0	0.5	0.9	7	0.0	2.2			0		
MINNESOTA	4.2		1	4.2	4.2			0					0			0.0		1	0.0	0.0
POOLED	7.4	9.6	128	0.0	60.4	0.0	0.0	2	0.0	0.0	1.3	3.4	41	0.0	20.6	0.4	0.6	7	0.0	1.4

EXCLUDING LAKES WHERE NO YEAR CLASS WAS DETECTED

AGE 0	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE
WISCONSIN	29.9	37.4	107	0.0	208.2			0			8.0	16.2	25	0.1	66.3	5.2		1	5.2	5.2
MICHIGAN	29.1	19.9	7	4.4	64.5			0			5.0	7.2	6	0.5	19.3			0		
MINNESOTA	36.9		1	36.9	36.9			0					0					0		
POOLED	29.9	36.3	115	0.0	208.2			0			7.4	14.8	31	0.1	66.3	5.2		1	5.2	5.2

AGE 1	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE	MEAN CPE	ST. DEV.	N	MIN. CPE	MAX. CPE
WISCONSIN	8.4	10.0	107	0.0	60.4			0			2.3	4.4	22	0.1	20.6	1.2	0.3	2	1.0	1.4
MICHIGAN	6.4	7.3	7	0.7	18.4			0			1.6	0.8	2	1.1	2.2			0		
MINNESOTA	4.2		1	4.2	4.2			0					0					0		
POOLED	8.3	9.8	115	0.0	60.4			0			2.2	4.2	24	0.1	20.6	1.2	0.3	2	1.0	1.4

Table C4. Summary of Other Gamefish Species Collected During Fall 2005 Recruitment Surveys Conducted by GLIFWC

Species	Wisconsin		Michigan		Minnesota	
	Number of Fish Collected	Number of Lakes	Number of Fish Collected	Number of Lakes	Number of Fish Collected	Number of Lakes
Muskellunge	28	7	0	0	0	0
Northern Pike	249	22	0	0	2	1
Largemouth Bass	776	31	0	0	7	1
Smallmouth Bass	147	18	2	1	0	0

Table C5. Summary of Fall 2005 Age 0 and Age 1 Population Estimate Conducted by GLIFWC

County	Lake	Surface Area (Acres)	2005 Walleye Code	Age 0 Population Estimate	Coefficient of Variation (%)	Age 0 Density Per Acre	Mean Age 0 CPE (#/mile)	Age 1 Population Estimate	Coefficient of Variation (%)	Age 1 Density Per Acre	Mean Age 1 CPE (#/mile)
WASHBURN	BASS-PATTERSON L	188	NR	362	22.0%	1.9	14.4	171	25.0%	0.9	9.2