Fish Population Assessments of Ceded Territory Lakes in Wisconsin, Michigan and Minnesota During 1998

by

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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 St. Croix Chippewa assisted with spring population estimate surveys; crews from the St. Croix and Bad River tribes assisted with fall surveys. In the spring, nineteen adult walleye (*Stizostedion vitreum vitreum*) population estimates were made. A total of 36,471 walleye were sampled from 40,144 acres of water during the spawning adult estimate period. Density of adult walleye averaged 5.15 (SD = 3.15, range: 1.46 to 10.82, N=13) fish per acre in lakes with naturally reproducing populations. In nine of these thirteen lakes, adult walleye population densities were at least 3.0 fish per acre, indicating that walleye populations were healthy. Density of adult walleye averaged 4.07 (SD = 3.06, range: 1.10 to 10.82) fish per acre for all lakes combined. In four of the nineteen lakes surveyed, juvenile walleye population estimates were also conducted. A total of 4,903 juvenile walleye were sampled from 3,132 acres of water. Density of juvenile walleye ranged from 9.1 to 21.8 (mean=15.9, SD=5.4) fish per acre in these lakes.

Summer fish community surveys using gill nets and fyke nets were conducted on three Minnesota lakes. A total of 3,375 fish were collected and identified as to species.

During the fall, electrofishing surveys were conducted on 91 lakes in Wisconsin, 9 lakes in Minnesota, and 8 lakes in Michigan to determine year class strength of age 0 (young of the year) and age 1 (yearling) walleye. Additional surveys were conducted on Siskiwit Lake (Bayfield Co., WI) and Butternut Lake (Forest Co., WI) to obtain fall age 0 and age 1 population estimates. In Wisconsin, a total of 34,623 age 0 and 10,757 age 1 walleye were sampled. In addition, 811 gamefish of other species including muskellunge (*Esox masquinongy)*, northern pike (*Esox lucius*), largemouth bass (*Micropterus salmoides*) and smallmouth bass (*M. dolomieui*) were sampled. In Michigan, a total of 1,474 age 0 and 224 age 1 walleye plus 21 gamefish were sampled during the fall. In Minnesota, a total of 150 age 0 and 193 age 1 walleye plus 34 gamefish were sampled.

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Introduction

Fishery assessment surveys of ceded territory lakes were conducted during spring, summer, and fall of 1998 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 current agreement, USFWS provides technical support and equipment during spring 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 Bad River during the fall was provided through a Memorandum of Understanding between the Band and GLIFWC.

Methods

Spring Adult Walleye Population Estimates

Nineteen lakes in the ceded territory (Figure A1) of Wisconsin, Michigan, and Minnesota were selected to collect current information on adult walleye populations. Fourteen lakes were surveyed in Wisconsin, two lakes were surveyed in Michigan, and three lakes were surveyed in Minnesota (Table A1). Of the fourteen Wisconsin lakes, twelve had experienced tribal spear harvest during the previous year. In Michigan, both lakes surveyed were speared in 1997. None of the lakes surveyed in Minnesota could have been speared in 1997, due to a stay of Judge Davis' order by the Eighth Circuit Court of Appeals.

Nine lakes in Wisconsin are GLIFWC long-term study lakes. Large (greater than 500 acres in area) long-term lakes surveyed in 1998 included Butternut Lake (Forest Co.), Squirrel Lake (Oneida Co.), and Squaw Lake (Vilas Co.). Small (less than 500 acres in area) long-term study lakes surveyed in 1998 included Siskiwit Lake (Bayfield Co.), Bearskin Lake (Oneida Co.), Sherman Lake (Vilas Co.), and Bass-Patterson Lake (Washburn Co.). Long-term study lakes are surveyed annually to collect trend and variability information on adult walleye populations. Continuing efforts are being made 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, a spearing "adjustment" was made. This adjustment reduced the marking sample by the number of marked fish speared. Also, the total number of fish speared before the first recapture run (except for immature fish) was added to the estimate.

Marking periods began soon after ice-out and electrofishing was the primary gear used to capture fish in all lakes. Eight electrofishing boats and crews were used, including four from GLIFWC, three from USFWS, and one from St. Croix. All boats had an arrangement of six umbrella dropper anodes and used pulsed DC at 60 pps. Fyke nets were used by two GLIFWC crews to supplement catch during the marking period on some lakes. Electrofishing occurred after sunset. Fyke nets were set in daylight, fished through the night, and lifted the following morning.

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 1-5 nights, depending upon lake size and the number of crews used. Fyke nets were usually set for 4-5 nights on each lake where they were used. Net catches were low compared to those made by electrofishing, however.

Walleye were measured (total length in inches) and sexed (male, female, or unknown). A scale or spine sample was collected from ten fish per inch group for males and all females and age determined later. Generally, spines were taken from fish >10 inches and scales from smaller fish. Fish were given a single or multiple fin clip or tail notch and released away from the capture area, typically near the middle of the lake. On long-term study lakes, fish were also tagged with yellow colored numbered floy tags prior to release.

Recapture surveys with electrofishing equipment were conducted 1-3 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.

Spring Juvenile Walleye Population Estimates

Juvenile walleye population estimates were made on two small and two large long term study lakes in Wisconsin including Butternut Lake (Forest Co.), Bearskin Lake (Oneida Co.), Squirrel Lake (Oneida Co.), and Sherman Lake (Vilas Co.). For the purposes of these estimates, "juvenile" refers to any walleye less than fifteen inches in total length.

Marking periods began several weeks after the adult spawning period. Electrofishing gear was used to capture fish in all lakes. All electrofishing boats had an arrangement of six umbrella dropper anodes and used pulsed DC at 60 pps. Electrofishing took place after sunset.

Each electrofishing survey was treated as a recapture run, so that the entire shoreline of each lake was covered, except for cases when a survey had to be curtailed due to inclement weather or equipment malfunction. Four marking/recapture surveys were conducted on each lake, except for Sherman Lake, where only three were conducted. For each fish captured, total

length, sex (if known), and mark (if present) were determined. Fish captured during the juvenile surveys were given different fin clips than those that were used during the adult population estimate surveys, and were released away from the capture area, typically near the middle of the lake. Scale or spine samples for aging were collected from a maximum of ten fish per inch group. Spines were collected from fish ten inches or larger in length, and scales were collected from smaller fish.

Juvenile population estimates were calculated using the Schnabel formula, where all surveys except the first were treated as a recapture survey. Data were stratified according to length, with one strata for fish less than 12" in length, and another for fish between 12" and 15". Recaptures of fin clips given during the adult survey were recorded in the field, but only clips given during the juvenile surveys were tallied in calculating the population estimates. Juvenile population estimates were apportioned by age for ages 1, 2, and 3.

Summer Surveys

Fish community assessment surveys were conducted on South Big Pine Lake (Aitkin Co., MN) between July 27 and August 4, on North Big Pine Lake (Pine Co., MN) between July 20 and August 3, and on Little Elk Lake (Sherburne Co., MN) between July 6 and July 8. During the survey period, 7 gill nets were set on South and North Big Pine Lakes, and 5 gill nets were set on Little Elk Lake. Trap nets were also set as follows: 5 on South Big Pine Lake, 6 on North Big Pine Lake, and 8 on Little Elk Lake. The nets were of standard size and set according to Minnesota DNR protocol. The trap nets used 0.75" mesh, and the gill nets were 250' long and 6' deep and consisted of five 50' sections of mesh sizes 0.75", 1", 1.25", 1.5", and 2".

Fall Recruitment Surveys

Fall electrofishing surveys were conducted in 108 ceded territory waters including 91 lakes in Wisconsin, 9 lakes in Michigan, and 8 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 runs were made on Siskiwit Lake (Bayfield Co.) and Butternut Lake (Forest Co.) to conduct age 0 and age 1 mark and recapture population estimates. Up to six electrofishing boats (all DC) sampled lakes four nights per week during the eleven week period from August 31 through October 27, 1998. The number of boats assigned to each lake was based upon shoreline length. For planning purposes, it was assumed that one boat was needed for every 5-7 miles of shoreline. Index stations were sampled on 22 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 walleye juveniles. 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 index station 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 their lengths measured (total length in inches). For walleye only, a scale sample was collected from five fish per 0.5 inch group for fish ranging between 4.5-12.0 inches to determine the length range of age 0 and age 1 walleye.

Fall Age 0 and Age 1 Population Estimates

Mark-recapture age 0 and age 1 walleye population estimates were conducted during the fall on two Wisconsin lakes, Siskiwit Lake (Bayfield Co.), and Butternut Lake (Forest Co.). Electrofishing was used as the capture method, and similar techniques were used as for the fall recruitment surveys. For each survey, the boats made a complete circuit of the lake, and gave a temporary fin clip to all walleye under 15". Each lake was surveyed three times. 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", and five per half-inch group between 12.0" and 14.9". Population estimates were calculated using the Petersen method.

Results and Discussion

Spring Adult Population Estimates

Walleye adult population estimates for 19 adult stocks in Wisconsin, Michigan, and Minnesota (Table A1) ranged from 387 to 28,840 fish (mean = 5,458, SD = 6,560). Population densities ranged from 1.10 to 10.82 walleye per acre (mean = 4.07, SD = 3.06). Little Elk Lake (Sherburne Co., MN) had the lowest density while Siskiwit Lake (Bayfield Co., WI) had the highest.

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 fish that each contribute at least 15 percent to the population.

Ten of 19 lakes surveyed had recruitment codes of NR (Table B1) indicating that natural reproduction was the only source of recruitment. Three 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 thirteen lakes was 5.15 (SD = 3.15) per acre. Nine of these thirteen lakes surveyed had walleye densities of greater than 3.0 per acre.

Three lakes had recruitment codes of C-, indicating that the population seemed to be equally sustained by both natural reproduction and stocking, or that the dominant source of recruitment was unclear. Density of walleye for these lakes averaged 1.73 per acre (SD = 0.73). Two lakes had recruitment codes of C-ST, indicating that the population was sustained by stocking with some natural reproduction occurring. Mean density of walleye in these lakes was 2.09 fish per acre (SD = 0.56).

Male-to-female sex ratios (Table A1) were skewed in favor of males in all of the 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). From personal observation during surveying, it appeared that females preferred deeper water than males, and in some instances, many females were out of effective netting range except during or after spawning.

A total of 1,432 female, 30,898 male, and 4,141 unknown sex walleye were measured (Figure A2, Table A2) and a subsample was aged (Figure A3). Female lengths ranged from 10.0 to 30.5 inches, male lengths ranged from 7.5 to 26.5 inches, and unknown lengths ranged from 5.0 to 27.0 inches. Age-length tables were developed for subsets of female, male, and unknown sex walleye in each of nineteen lakes sampled in Wisconsin, Michigan, and Minnesota (Tables A3 - A22). These age-length tables by themselves are not necessarily representative of the size and age structure of the population, since spines for aging are 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 given should be sufficient to detect the presence or absence of year classes. Regarding the second population health criterion, ten of the thirteen NR and C-NR lakes had populations with at least five year classes of females in the aging sample.

Spring Juvenile Walleye Population Estimates

Juvenile walleye Schnabel population estimates in four Wisconsin lakes (Table A23) ranged from 2,237 to 28,673 for all fish under 15". Population densities ranged from 9.1 to 21.8 walleye per acre (mean=15.9, SD=5.4). A total of 4,903 walleye were sampled during the juvenile population estimate surveys. Lengths of walleye ranged from 3.5 inches to 24.5 inches (mean=8.5, SD=6.4). Age-length tables were developed using spines and scales collected from a subset of fish from both the adult and juvenile surveys (Tables A24-A27), and the data were used to apportion the Schnabel juvenile estimates by age. Mean densities for age 1, age 2, and age 3 walleye were 6.9 per acre, 2.7 per acre, and 3.7 per acre, respectively.

Summer Surveys

The fish community survey on South Pine Lake (Aitkin Co., MN) caught 11 species and 1,220 fish. The most abundant species captured was yellow perch (81.1% of the fish), followed by bluegill (7.0%), black crappie (3.0%), walleye (2.9%), and white suckers (2.4%) (Table B1).

The fish community survey on North Big Pine Lake (Pine Co., MN) caught 10 species and 1,235 fish. The most abundant species captured was yellow perch (79.4% of the fish), followed by black crappie (7.0%), bluegill (6.0%), white sucker (2.6%), and walleye (2.3%) (Table B2).

The fish community survey on Little Elk Lake (Sherburne Co., MN) caught 11 species and 920 fish. The most abundant species captured was bluegill (37.2% of the fish), followed by black crappie (28.2%), walleye (13.6%), bullhead (7.5%), white sucker (5.3%), and yellow perch (3.3%) (Table B3).

Fall Recruitment Surveys

Fall recruitment surveys were conducted on 108 lakes in the ceded territories of Wisconsin, Michigan and Minnesota (Figure C1, Table C2). Survey effort included 380.5 hours of electrofishing along 956.2 miles of shoreline resulting in the collection of 58,751 walleye.

Of 91 lakes surveyed in Wisconsin, 331.1 hours of electrofishing along 823.1 miles of shoreline resulted in a collection of 55,496 walleye. In Michigan, nine surveys were conducted in 28.2 hours along 70.8 miles of shoreline resulting in the collection of 2,519 walleye. In Minnesota, the surveys were conducted in 21.3 hours along 62.3 miles of shoreline resulting in the collection of 736 walleye (Tables C2 and C3).

A total of 34,623 age 0 (young of the year) walleye were caught in 95 surveys in Wisconsin. Age 0 walleye were caught in 88 of 95 fall surveys. Catch per effort (CPE) for age 0 walleye ranged from 0 to 298.0 (mean = 42.1; SD = 51.7) YOYs per mile (Table B2). A total of 10,151 age 1 (yearling) walleye were caught in 92 of 95 surveys. Age 1 CPE ranged from 0 to 94.0 (mean = 12.5; SD = 16.1) yearlings per mile (Table C2).

In Michigan, 1,474 age 0 walleye were caught. Age 0 CPE ranged from 0 to 37.2 (mean = 14.4; SD = 15.3) YOYs per mile. A total of 224 age 1 walleye were caught. Age 1 CPE ranged from 0 to 46.8 (mean = 6.0; SD = 15.3) yearlings per mile (Table C2).

In Minnesota, 150 age 0 walleye were caught (Table C2). Age 0 CPE ranged from 0.3 to 8.0 (mean = 3.1; SD = 3.1) YOYs per mile. A total of 193 age 1 walleye were caught. Age 1 CPE ranged from 0.2 to 12.0 (mean = 3.6; SD = 4.3 yearlings per mile (Table C2).

Summary statistics for NR and C-NR lakes, C- lakes, C-ST and ST lakes, 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 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 Population Estimates

A total of 1,451 age 0 and age 1 walleye were sampled during the age 0 and age 1 population estimates. The mean age 0 and age 1 densities obtained from the fall population estimates were 10.7 per acre and 0.4 per acre, respectively (Table C5). Mean age 0 and age 1 catch per effort (CPE) on these lakes were 36.0 per mile and 4.6 per mile, respectively.

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Appendix A: Spring Population Surveys

Figure A2. Length Frequency of Adult Walleye Marked, Spring 1998

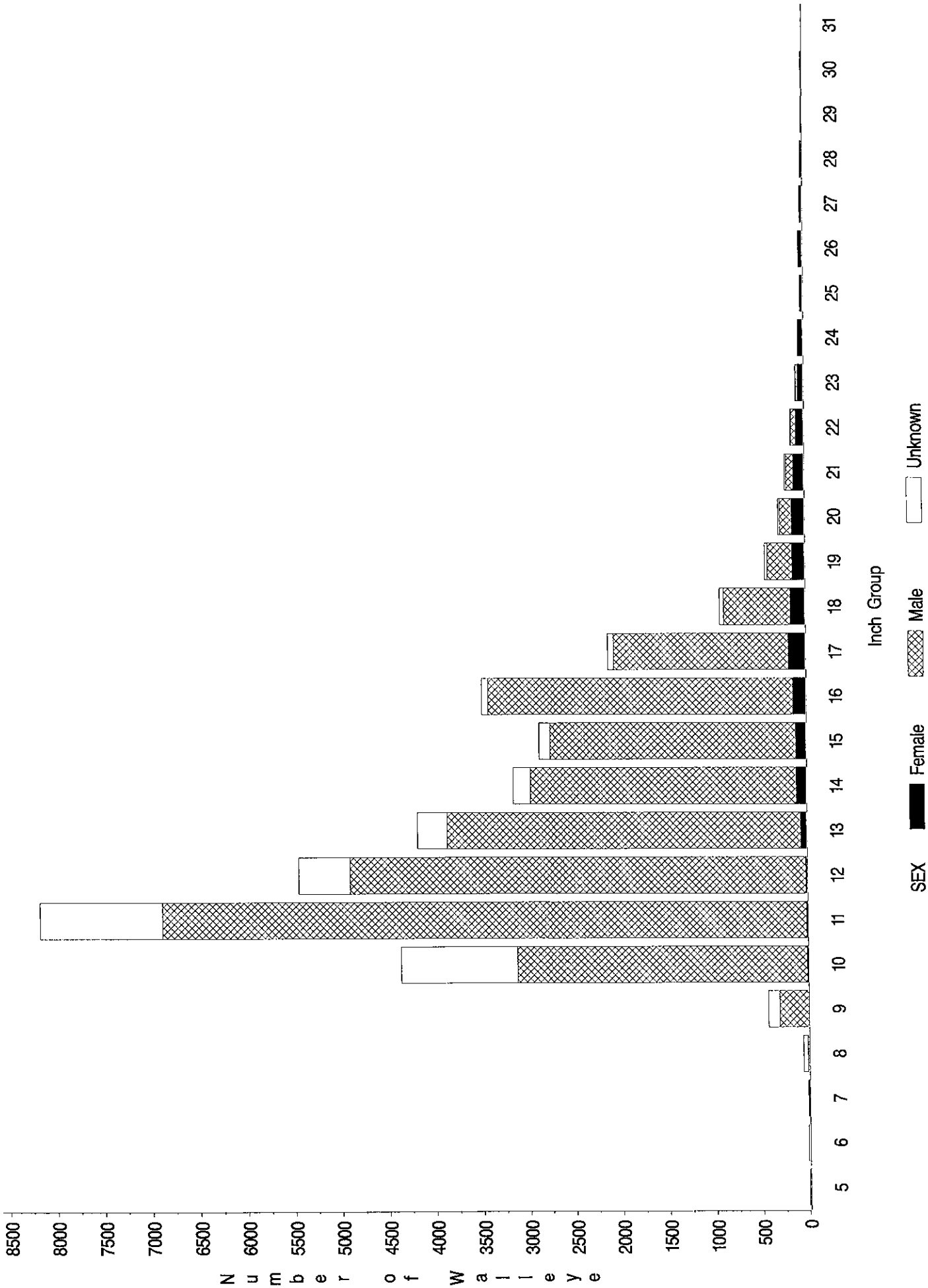

Figure A3. Age Frequency of Adult Walleye Aged, Spring 1998

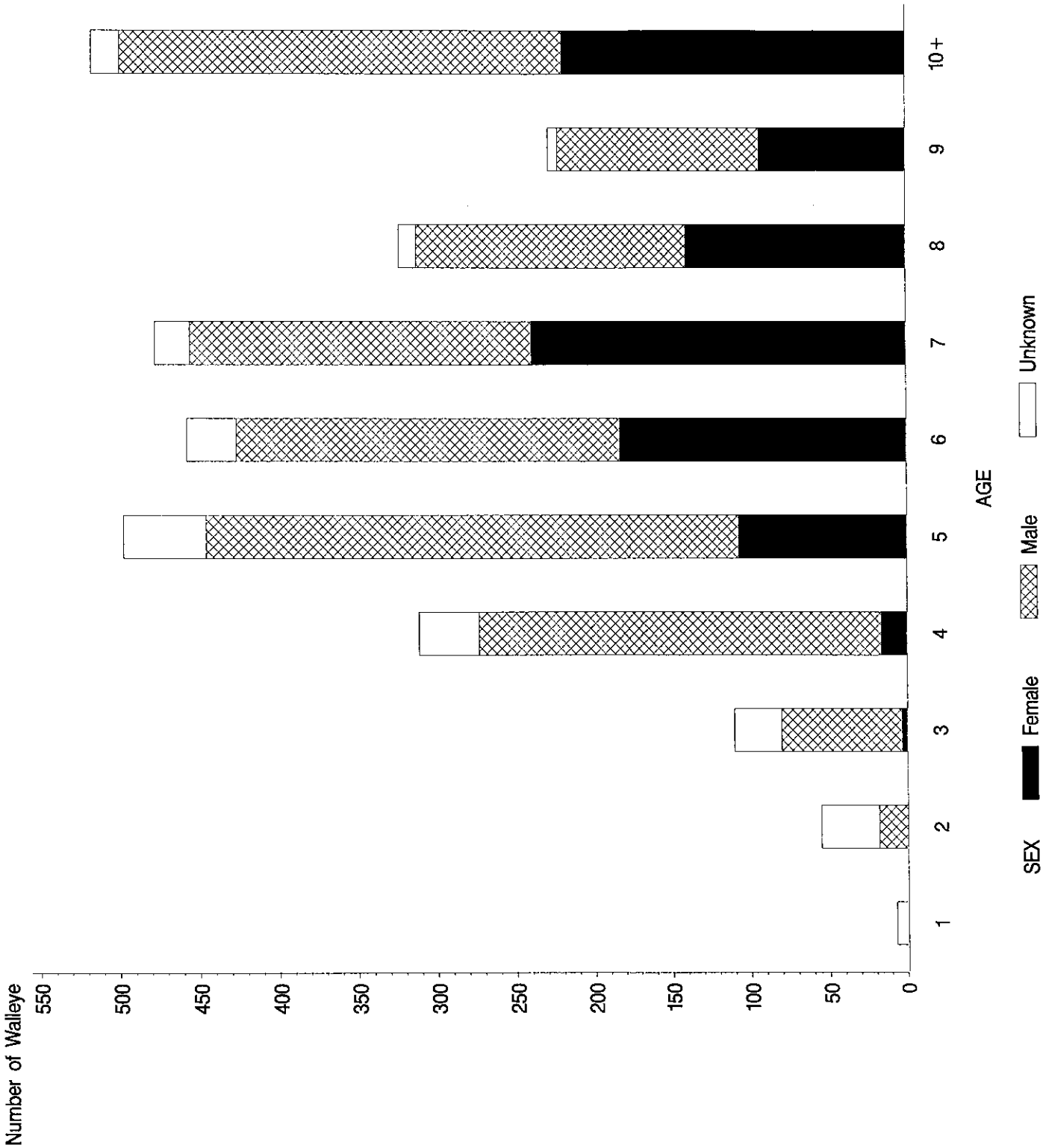

Table A1. Spring 1998 Adult Walleye Population Estimates Conducted by GLIFWC

State	County	Lake	Acres	1998 Walleye Code	Population Estimate	Coefficient of Variation (%)	Density	Marking gear*	Recapture gear*	Fin clip applied**	Male: female sex ratio***	Angling length regulation
MI	BARAGA	PARENT L	182	NR -	1,923	5.5	10.57	E	E	TC	11.3:1	15" minimum
MI	GOGEBIC	L GOGEBIC	13,380	C-NR	28,840	2.5	2.16	E/F	E	TC	49.5:1	15" minimum
MN	AITKIN	SOUTH BIG PINE L	372	C-	480	38.8	1.29	E	E	TC	6.4:1	16" minimum
MN	PINE	NORTH BIG PINE L	387	C-ST	962	35.2	2.49	E	E	BC	4.1:1	16" minimum
MN	SHERBURNE	LITTLE ELK L	353	ST	387	29.4	1.10	E	E	TC	6.4:1	18"-24" slot ¥
WI	BAYFIELD	SISKIWIT L	330	NR -	3,569	25.8	10.82	E	E	RV/YF	8.2:1	15" minimum
WI	FOREST	BUTTERNUT L	1,292	NR -	5,138	5.9	3.98	E/F	E	TCN/YF	30.9:1	14"-18" slot ‡
WI	ONEIDA	BEARSKIN L	400	NR -	3,582	6.0	8.96	E	E	TCN/YF	243.0:1	1 over 14"†
WI	ONEIDA	PELICAN L	3,585	NR -	10,229	10.4	2.85	E	E	TCN	18.3:1	1 over 14"†
WI	ONEIDA	SQUIRREL L	1,317	NR -	7,164	4.9	5.44	E	E	BCN/YF	28.8:1	1 over 14"†
WI	SAWYER	LAC COURTE OREILLES	5,039	C-ST	8,547	18.7	1.70	E/F	E	TC	8.3:1	15" minimum
WI	SAWYER	NELSON L	2,503	C-NR	11,925	19.2	4.76	E	E	TC	11.6:1	15" minimum
WI	VILAS	BIG ST GERMAIN L	1,617	C-	4,167	12.5	2.58	E	E	TC	22.2:1	15" minimum
WI	VILAS	PRESQUE ISLE L CHAIN	1,571	NR -	2,403	5.2	1.53	E	E	TCN	7.5:1	1 over 14"†
WI	VILAS	SHERMAN L	123	NR -	642	9.0	5.22	E	E	BCN/YF	13.2:1	1 over 14"†
WI	VILAS	SQUAW L	785	NR -	3,401	8.8	4.33	E	E	BCN/YF	12.1:1	1 over 14"†
WI	VILAS	TWIN L CHAIN	3,430	C-NR	5,007	11.3	1.46	E	E	TC	13.8:1	15" minimum
WI	WASHBURN	BASS-PATTERSON L	188	NR -	911	19.4	4.85	E	E	BCN/YF	35.6:1	1 over 14"†
WI	WASHBURN	LONG L	3,290	C-	4,420	7.8	1.34	E	E	TC	15.3:1	15" minimum

*Gear used: E = electrofishing, F = fyke nets.
**BC = bottom caudal clip, BCN = bottom caudal notch, RV = right ventral clip, TC = top caudal clip, 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.
¥ Walleye from 18" to 24" may not be kept
‡ No minimum length limit, but walleye from 14" to 18" may not be kept, and only one fish over 18" is allowed
† No minimum length limit, but only 1 walleye over 14" is allowed

Table A2. Lengths of Walleye Collected During Spring 1998 Adult Walleye Population Estimates

STATE	COUNTY	LAKE	NUMBER SAMPLED			FEMALE		MALE		UNKNOWN	
			FEMALE	MALE	UNKNOWN	MINIMUM LENGTH	MAXIMUM LENGTH	MINIMUM LENGTH	MAXIMUM LENGTH	MINIMUM LENGTH	MAXIMUM LENGTH
MI	BARAGA	PARENT L	84	951	147	12.5	22.5	11.0	23.0	11.0	21.5
MI	GOGEBIC	L GOGEBIC	248	12,265	2,386	10.0	30.0	10.0	23.5	10.0	23.0
MN	AITKIN	SOUTH BIG PINE L	12	77	12	17.0	23.0	11.0	25.5	10.0	17.0
MN	PINE	NORTH BIG PINE L	33	135	21	17.5	30.0	10.0	23.0	10.0	21.5
MN	SHERBURNE	LITTLE ELK L	14	90	234	18.5	27.0	12.0	24.0	11.0	18.0
WI	BAYFIELD	SISKIWIT L	47	386	170	12.5	19.0	11.0	18.5	5.0	15.5
WI	FOREST	BUTTERNUT L	61	1,886	84	16.0	23.5	9.5	21.0	10.0	20.0
WI	ONEIDA	BEARSKIN L	6	1,458	88	10.5	20.0	8.5	17.0	9.0	19.5
WI	ONEIDA	PELICAN L	111	2,028	52	14.0	26.5	10.0	22.0	10.0	22.5
WI	ONEIDA	SQUIRREL L	100	2,877	177	12.0	27.5	7.5	20.5	8.5	26.0
WI	SAWYER	LAC COURTE OREILLES	104	862	20	13.0	28.5	12.0	26.5	14.0	21.0
WI	SAWYER	NELSON L	89	1,033	111	12.5	28.0	10.0	21.0	10.5	24.5
WI	VILAS	BIG ST GERMAIN L	54	1,199	84	14.0	27.5	10.0	21.5	10.0	23.5
WI	VILAS	PRESQUE ISLE L CHAIN	156	1,175	21	13.5	28.0	10.0	21.5	10.0	24.5
WI	VILAS	SHERMAN L	27	356	115	14.5	24.5	9.0	18.0	7.5	17.5
WI	VILAS	SQUAW L	92	1,113	110	11.0	27.0	9.0	18.0	5.5	16.5
WI	VILAS	TWIN L CHAIN	91	1,253	132	11.5	28.0	10.0	23.5	10.0	24.0
WI	WASHBURN	BASS-PATTERSON L	9	320	6	12.5	17.5	10.0	16.0	11.0	13.5
WI	WASHBURN	LONG L	94	1,434	171	14.5	30.5	11.0	24.0	11.5	27.0
		OVERALL	1,432	30,898	4,141	10.0	30.5	7.5	26.5	5.0	27.0

Table A3

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=MI COUNTY=BARAGA LAKE=PARENT L

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

Table A4

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=MI COUNTY=GOGEBIC LAKE=L GOGEBIC

INCH GROUP	AGE																														
	1			2			3			4			5			6			7			8			9			10+		
	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
5																															
6																															
7																															
8																															
9																															
10								1			10			1																	
11											16			2																	
12											4			13			1														
13														13	1		1														
14													3	4			10			3			1								
15														2			1		2	11	1		1							1	
16													1			4			4	5		2	11			2					
17																2			17	2		2	7			4		1	5		
18																3			9		1	8	3		1	2			6		
19																			2			3			1	1		2	3		
20																			1			4		1	3			1	3		
21																						1			2						
22																												6			
23																									1						
24																										1		1			
25																												2			
26																												1			
27																															
28																												2			
29																															
30																												1			
TOTAL								1			30		4	35	1	9	13		35	21	2	20	23	1	8	10		17	18		

Table A5

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=MN COUNTY=AITKIN LAKE=SOUTH BIG PINE L

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

Table A6

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=MN COUNTY=PINE LAKE=NORTH BIG PINE L

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

Table A7

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=MN COUNTY=SHERBURNE LAKE=LITTLE ELK L

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

Table A8

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=WI COUNTY=BAYFIELD LAKE=SISKIWIT L

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

Table A9

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=WI COUNTY=FOREST LAKE=BUTTERNUT L

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

Table A10

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=WI COUNTY=ONEIDA LAKE=BEARSKIN L

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

Table A11

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=WI COUNTY=ONEIDA LAKE=PELICAN L

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

Table A12

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=WI COUNTY=ONEIDA LAKE=SQUIRREL L

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

Table A13

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=WI COUNTY=SAWYER LAKE=LAC COURTE OREILLES

	AGE																											
	1			2			3			4			5			6			7			8			9			10+		
	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
INCH GROUP																														
5																														
6																														
7																														
8																														
9																														
10																														
11																														
12														1																
13																														
14														2			2													
15														9			6			1										
16													1	2	1		12			2			2							
17													2	1		3	6			5			7			1			1	
18													1	1		3	2		4	4			10		1	3			1	
19													1			7			4	2			5			2	1	1	4	
20																1			2			5	2	1		5		1	21	
21																1			3			6	1		4	2			26	
22																			1			3			1	1			23	1
23																						3			1			2	9	
24																						1						2	4	
25																												4		
26																												3	1	
27																												7		
28																														
29																														
30																														
TOTAL													5	16	1	15	28		14	14		18	27	1	7	14	1	20	90	1

Table A14

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=WI COUNTY=SAWYER LAKE=NELSON L

	AGE																													
	1			2			3			4			5			6			7			8			9			10+		
	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
INCH GROUP																														
5																														
6																														
7																														
8																														
9																														
10											4						1													
11											6			5																
12												1		11																
13													3	12	1			1												
14													1	2				6												
15																3	1		2	4			3							
16																2	1			4	1		2			2				
17															1	3	1		1			1	4			5	1		5	
18																			3	1		1	3						7	
19																		1	2		1	4				1			10	
20																						2		2	2	1		3	1	
21																						2			2			5	1	
22																												7		3
23																												4		1
24																												5		1
25																												4		
26																												1		
27																												2		
28																														
29																														
30																														
TOTAL											10	1	4	30	2	8	11	1	8	9	2	10	12	2	4	9	1	31	24	5

Table A15

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=WI COUNTY=VILAS LAKE=BIG ST GERMAIN L

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

Table A16

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=WI COUNTY=VILAS LAKE=PRESQUE ISLE L CHAIN

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

Table A17

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=WI COUNTY=VILAS LAKE=SHERMAN L

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

Table A18

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=WI COUNTY=VILAS LAKE=SQUAW L

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

Table A19

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=WI COUNTY=VILAS LAKE=TWIN L CHAIN

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

Table A20

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=WI COUNTY=WASHBURN LAKE=BASS-PATTERSON L

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

Table A21

Number of Walleye Aged by Sex and Length From Spring 1998 Adult Population Estimates

STATE=WI COUNTY=WASHBURN LAKE=LONG L

	AGE																													
	1			2			3			4			5			6			7			8			9			10+		
	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
INCH GROUP																														
5																														
6																														
7																														
8																														
9																														
10																														
11											5			1																
12														8	1															
13											3			6			1	1												
14											1	1	1	3			4			1										
15											3		1	3	1		4													
16											1		1	2	1	1	5			2										
17													2			3	4		1	1			5							
18																4	1		5	3			3			2			1	
19																2			4			4	2			7			2	
20													1			3			8			3	2	1	1	9			16		
21																			4	1		4	1		1	1	1	1	18		
22																1			1			4			3				9	1
23																									2			1	4	
24																												2	1	
25																									1			3		
26																												9		
27																												1		1
28																												1		
29																												3		
30																												2		
TOTAL											13	1	6	23	3	14	19	1	23	8		15	13	1	8	19	1	23	51	2

Table A22. Spring 1998 Juvenile Population Estimates Conducted by GLIFWC

County	Lake	Area	Schnabel PE	St. Dev. of Schnabel PE	Schnabel Density	Age 1 PE	Age 2 PE	Age 3 PE
FOREST	BUTTERNUT L	1292	11,773	2,530	9.11	3,389	3,909	2,658
ONEIDA	BEARSKIN L	400	5,835	1,328	14.59	918	354	2,675
ONEIDA	SQUIRREL L	1317	28,673	3,288	21.77	17,802	5,334	2,275
VILAS	SHERMAN L	123	2,237	382	18.19	1,142	337	556
	MEAN				15.91			

Table A23

Number of Walleye Aged by Sex and Length From Spring 1998 Adult and Juvenile Population Estimates Combined

STATE=WI COUNTY=FOREST LAKE=BUTTERNUT L

	AGE																													
	1			2			3			4			5			6			7			8			9			10+		
	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
INCH GROUP																														
3																														
4			20																											
5			20																											
6			15			3																								
7			1			20																								
8						20																								
9						19			1																					
10						7		4	14		2																			
11						4		1	16		13			1																
12									21		10			3			1													
13									4					10																
14														3			2													
15														1			1			3			2							
16														1						7			2			3			1	
17																				4			8			7			1	
18																				1		1	2			9			2	
19																						1				4			2	
20																			3			1			1					
21																			1			4			5			1		
22																									3			2		
23																									1					
24																														
25																														
26																														
27																														
28																														
TOTAL			56			73		5	56		25			19			4		4	15		7	14		10	23		3	6	

Table A24

Number of Walleye Aged by Sex and Length From Spring 1998 Adult and Juvenile Population Estimates Combined

STATE=WI COUNTY=ONEIDA LAKE=BEARSKIN L

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

Table A25

Number of Walleye Aged by Sex and Length From Spring 1998 Adult and Juvenile Population Estimates Combined

STATE=WI COUNTY=ONEIDA LAKE=SQUIRREL L

	AGE																													
	1			2			3			4			5			6			7			8			9			10+		
	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
INCH GROUP																														
3			2																											
4			10																											
5			20																											
6			18			2																								
7			3			16																								
8						21																								
9						13			7																					
10						1		8	19		3																			
11									11		8	4		2																
12									1		3	14	1	7	2		2													
13								1						5			4													
14													1	2		3	6						1							
15																1	2	1	2	4		2								
16													1			1		1	2		1		1							
17																1					1								1	
18																					1				1					
19																			3		1	1							1	
20																						2						1		
21																									1					
22																									1			1		
23																														1
24																												1		
25																														
26																														1
27																												1		
28																														
TOTAL			53			53		9	38		14	18	3	16	2	6	14	2	7	4	4	5	2		3			4	2	2

Table A26

Number of Walleye Aged by Sex and Length From Spring 1998 Adult and Juvenile Population Estimates Combined

STATE=WI COUNTY=VILAS LAKE=SHERMAN L

	AGE																													
	1			2			3			4			5			6			7			8			9			10+		
	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
INCH GROUP																														
3			2																											
4			17																											
5			23																											
6			20																											
7			6			6																								
8						23																								
9					3	18			1																					
10						2		7	23																					
11								5	18		3	6																		
12								2	8		9	6		2	1															
13								1			5	2		6			1	1												
14													1	3			5			3										
15										1							5		1	4			1							
16																4		1	5	1		1	5			2				
17																1	1		3			1	2			1			1	
18																			2						1				3	
19																						1						1		
20																												2		
21																						1						1		
22																												1		
23																												1		
24																												1		
25																												1		
26																														
27																												1		
28																														
TOTAL			68		3	49		15	50	1	17	14	1	11	1	5	12	2	11	8		4	8		1	3		9	4	

Appendix B: Summer Surveys

Table B1: Fish Community Survey, South Big Pine Lake, Aitkin County, Minnesota Dates: July 27 - August 4, 1998 Net Sets: 7 gill nets and 5 trap nets

Inch Group	Black Crappie		Bluegill		Bullhead		Largemouth Bass		Northern Pike		Pumpkinseed		Redhorse		Rock Bass		Walleye		White Sucker		Yellow Perch	
	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net
1.0-1.4																						
1.5-1.9																						
2.0-2.4																						
2.5-2.9																						
3.0-3.4																						
3.5-3.9			2	2								1										
4.0-4.4		3		5								1				1						1
4.5-4.9		2	2	12				1				1										
5.0-5.4		1		16																	2	1
5.5-5.9		4	7	12								1									76	3
6.0-6.4	1	1	8	8								1				1					114	3
6.5-6.9	2	1	5	1																	30	1
7.0-7.4	1	2	2	1											2						6	1
7.5-7.9		2																			7	
8.0-8.4	6	2	1																			
8.5-8.9	8		2																			
9.0-9.4	1																2		1			
9.5-9.9						1											3					
10.0-10.4																	1		1	1		
10.5-10.9																	2					
11.0-11.4					1								1				3					
11.5-11.9																				1		
12.0-12.4																	5		1	1		
12.5-12.9																	2					
13.0-13.4													1						1	1		
13.5-13.9													2				1		1			
14.0-14.4																	1		2			
14.5-14.9																						
15.0-15.4																	2		1			
15.5-15.9																			1			
16.0-16.4																	1		1			
16.5-16.9													1									
17.0-17.4													4				1		3			
17.5-17.9									1				1						1			
18.0-18.4																	1		5			
18.5-18.9																	1		2			
19.0-19.4																	1		4			
19.5-19.9																	1					
20.0-20.4									2				1				3					
20.5-20.9																	3					
21.0-21.4																						
21.5-21.9									2													
22.0-22.4									2													
22.5-22.9									1													
23.0-23.4									1													
23.5-23.9									1													
24.0-24.4																	1					
24.5-24.9									1													
25.0-25.4									1													
25.5-25.9									1													
26.0-26.4																						
26.5-26.9									1													
27.0-27.4									1													
27.5-27.9																						
28.0-28.4																						
28.5-28.9									2													
29.0-29.4									1													
29.5-29.9																						
30.0-30.4																						
30.5-30.9									1													
31.0-31.4																						
31.5-31.9																						
32.0-32.4																						
32.5-32.9									1													
33.0-33.4																					745	
Unmeasured												5	11		2	2	35		25	4	980	10
Total	19	18	29	57	1	1		1	20			1.00	1.57		0.29	0.40	5.00		3.57	0.80	140.00	2.00
Catch/Net	2.71	3.60	4.14	11.40	0.14	0.20		0.20	2.86													

Table B2: Fish Community Survey, North Big Pine Lake, Pine County, Minnesota Dates: July 20 - August 3, 1998 Net Sets: 7 gill nets and 6 trap nets

Inch Group	Black Crappie		Bluegill		Bullhead		Northern Pike		Pumpkinseed		Redhorse		Rock Bass		Walleye		White Sucker		Yellow Perch	
	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net
1.0-1.4																				
1.5-1.9																				
2.0-2.4																				
2.5-2.9																				
3.0-3.4																				
3.5-3.9				1																
4.0-4.4				5						2									1	2
4.5-4.9		1	1	19					3											3
5.0-5.4		1	1	19															14	2
5.5-5.9	8	5	1	11										1					98	10
6.0-6.4	1	4	2	7						1									90	11
6.5-6.9	1	1	5	2															13	4
7.0-7.4	1	4																	1	1
7.5-7.9	7	6																	1	
8.0-8.4	15	4																		1
8.5-8.9	14	5																	1	
9.0-9.4	3	5																		
9.5-9.9		1													1					
10.0-10.4															1	1				
10.5-10.9						2									1					
11.0-11.4																		1		
11.5-11.9															3					
12.0-12.4						1														
12.5-12.9															1					
13.0-13.4															1					
13.5-13.9															2					
14.0-14.4															1					
14.5-14.9															2			1		
15.0-15.4															3		1			
15.5-15.9															2		5			
16.0-16.4											1				1		4			
16.5-16.9											3				2		2	1		
17.0-17.4											1						2			
17.5-17.9											1				2		1	2		
18.0-18.4											1						1			
18.5-18.9							1								3		3	1		
19.0-19.4							2								1		4			
19.5-19.9																		2		
20.0-20.4							2										1			
20.5-20.9															1					
21.0-21.4																				
21.5-21.9																				
22.0-22.4							1													
22.5-22.9							1													
23.0-23.4																				
23.5-23.9							2													
24.0-24.4																				
24.5-24.9																				
25.0-25.4							1													
25.5-25.9							1													
26.0-26.4																				
26.5-26.9							2													
27.0-27.4																				
27.5-27.9							2													
28.0-28.4							1													
28.5-28.9																				
29.0-29.4																				
29.5-29.9																				
30.0-30.4																				
30.5-30.9																				
31.0-31.4																				
31.5-31.9																				
32.0-32.4																				
32.5-32.9																				
33.0-33.4																			727	
Unmeasured														1	28	1	24	8	946	34
Total	50	37	10	64		3	16		3	3	7			0.17	4.00	0.17	3.43	1.33	135.14	5.67
Catch/Net	7.14	6.17	1.43	10.67		0.50	2.29		0.43	0.50	1.00									

Table B3: Fish Community Survey, Little Elk Lake, Sherburne County, Minnesota Dates: July 6 - July 8, 1998 Net Sets: 5 gill nets and 8 trap nets

Inch Group	Black Crappie		Bluegill		Bullhead		Bowfin		Carp		Largemouth Bass		Northern Pike		Pumpkinseed		Walleye		White Sucker		Yellow Perch	
	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net	Gill Net	Trap Net
1.0-1.4				1																		
1.5-1.9																						
2.0-2.4			4	19																		
2.5-2.9		2	14	24																		1
3.0-3.4			9	16																	2	2
3.5-3.9	1		3	4																		2
4.0-4.4	1	1	2	3																		1
4.5-4.9	64	18		3											1	2						
5.0-5.4	76	24	3	8											1							1
5.5-5.9	23	20	3	16												2					5	
6.0-6.4	1	1	5	14											1	1					3	1
6.5-6.9		1		5	1											2				1	6	1
7.0-7.4		1	1	30															2			1
7.5-7.9	1	3	7	37	1																3	
8.0-8.4	2	12	2	7		1																
8.5-8.9		7		2	4	2													1			
9.0-9.4			1		9																1	
9.5-9.9					12																	
10.0-10.4					8														1			
10.5-10.9					9	1													1			
11.0-11.4					11	2											1		5			
11.5-11.9					5														4	2		
12.0-12.4					2														6			
12.5-12.9																			3			
13.0-13.4																	10			1		
13.5-13.9																	22		2			
14.0-14.4						1											20	1				
14.5-14.9																	18	1				
15.0-15.4																	12					
15.5-15.9																			1	2		
16.0-16.4																	2		6	1		
16.5-16.9													2				1		1			
17.0-17.4																	2		2	2		
17.5-17.9																	3		3			
18.0-18.4													1				6		1	1		
18.5-18.9													2				3					
19.0-19.4												1	2				2					
19.5-19.9													2				2	2				
20.0-20.4													5				6					
20.5-20.9													1				1					
21.0-21.4																	1					
21.5-21.9								1					3				1	1				
22.0-22.4													2				2					
22.5-22.9													1									
23.0-23.4													1									
23.5-23.9																						
24.0-24.4																						
24.5-24.9													2									
25.0-25.4										1							2					
25.5-25.9									1				2									
26.0-26.4																	2	1				
26.5-26.9									1													
27.0-27.4										1												
27.5-27.9																						
28.0-28.4													1									
28.5-28.9													1									
29.0-29.4													1									
29.5-29.9																						
30.0-30.4													1									
30.5-30.9																						
31.0-31.4																						
31.5-31.9																						
32.0-32.4																						
32.5-32.9																						
33.0-33.4																						
Unmeasured				99																		
Total	169	90	54	288	62	7		1	2	2		1	30		3	7	119	6	39	10	20	10
Catch/Net	33.80	11.25	10.80	36.00	12.40	0.88		0.13	0.40	0.25		0.13	6.00		0.60	0.88	23.80	0.75	7.80	1.25	4.00	1.25

Appendix C: Fall Recruitment Surveys

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 densities are 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, but survey data is either not available or indicates that a harvestable population of adults does not yet exist (i.e., the stock may be classified as ST in the future).
O	=	Walleye are not present.

Table C2. Fall 1998 Walleye Recruitment Surveys Conducted by GLIFWC

State	County	Lake	Area (Acres)	1998 Walleye Code	Date Surveyed	Age 0 WAE	Age 0 Min L.	Age 0 Max L.	Age 0 Ave L.	Age 0 CPE	Age 1 WAE	Age 1 Min L.	Age 1 Max L.	Age 1 Ave L.	Age 1 CPE	Total WAE	Miles Surveyed	Shore Miles	Hours Surveyed	Temp	Other Species			
																					MUE	NOP	LMB	SMB
WI	BARRON	RED CEDAR L	1,841	C-NR	9/17	43	4.6	7.2	6.3	8.4	107	7.3	11.3	9.7	21.0	232	5.1	15.9	2.3	74	0	3	1	1
WI	BAYFIELD	BUSKEY BAY	100	NR	8/31	4	5.1	6.0	5.6	1.7	7	7.1	8.1	7.6	2.9	29	2.4	2.4	1.1	76	0	0	0	2
WI	BAYFIELD	HART L	259	NR	8/31	19	3.7	6.9	5.1	5.4	22	7.3	9.6	8.5	6.3	57	3.5	3.5	1.7	74	0	0	0	1
WI	BAYFIELD	L MILLICENT	183	NR	8/31	18	3.9	6.0	5.1	4.7	21	6.9	9.9	8.5	5.5	58	3.8	3.8	1.7	76	0	0	0	0
WI	BAYFIELD	L OWEN	1,323	C-	10/8	100	4.6	8.1	6.5	5.5	43	8.2	9.8	9.0	2.4	178	18.2	24.0	7.3	58	0	6	16	25
WI	BAYFIELD	NAMEKAGON L	3,227	C-NR	9/9	310	4.4	7.8	6.4	10.3	430	7.9	10.6	8.9	14.2	1221	30.2	43.6	11.3	67	0	0	0	0
WI	BAYFIELD	SISKIWIT L	330	NR	10/21	226	5.8	8.8	7.2	56.5	4	9.0	10.4	10.0	1.0	254	4.0	4.0	1.8	48	0	0	0	0
WI	BAYFIELD	SISKIWIT L	330	NR	10/22	104	5.9	8.6	7.2	26.0	2	9.2	10.7	10.3	0.5	157	4.0	4.0	2.2	48	0	0	0	0
WI	BAYFIELD	SISKIWIT L	330	NR	10/23	125	6.0	8.8	7.3	31.3	2	9.9	10.1	9.6	0.5	192	4.0	4.0	1.8	48	0	0	0	0
WI	BAYFIELD	TWIN BEAR L	172	NR	8/31	89	4.1	7.6	5.9	22.8	73	7.8	10.4	9.4	18.7	182	3.9	3.9	1.3	74	0	0	0	4
WI	BAYFIELD	UPPER EAU CLAIRE L	1,030	C-NR	9/3	107	4.6	6.6	5.8	9.7	19	8.2	9.8	9.3	1.7	147	11.0	11.0	4.9	74	0	0	0	0
WI	BURNETT	BIG MCKENZIE L	1,185	C-	9/29	47	7.2	9.1	8.3	6.6	12	12.5	14.9	14.1	1.7	90	7.1	7.1	2.7	65	3	33	43	0
WI	BURNETT	YELLOW L	2,287	C-	9/9	4	5.2	6.8	6.2	0.7	23	7.3	10.3	8.9	4.1	69	5.6	7.9	2.5	70	1	0	10	0
WI	CHIPPEWA	L WISSOTA	6,300	NR	9/21-22	603	5.2	8.1	6.7	28.9	656	8.2	11.3	9.8	31.4	1530	20.9	56.3	4.7	69	0	0	0	0
WI	CHIPPEWA	LONG L	1,052	NR	9/23-24	735	3.8	7.1	5.4	65.6	435	7.2	11.4	9.3	38.8	1538	11.2	14.0	5.0	67	0	0	0	0
WI	DOUGLAS	LOWER EAU CLAIRE L	802	C-NR	9/3	851	3.9	8.4	6.5	177.3	81	8.7	11.7	10.1	16.9	978	4.8	7.8	2.4		0	0	0	0
WI	DOUGLAS	UPPER ST CROIX L	855	C-NR	10/5	51	6.5	8.2	7.6	5.1	28	8.3	10.6	8.8	2.8	146	10.0	10.0	4.0	58	0	0	0	0
WI	DOUGLAS	WHITEFISH L	832	C-NR	9/30	101	4.3	6.2	5.1	14.6	19	6.6	9.9	8.0	2.8	132	6.9	6.9	2.9	63	0	1	0	2
WI	FOREST	BUTTERNUT L	1,292	NR	10/20	367	4.3	7.4	5.8	45.9	119	7.5	9.2	8.4	14.9	717	8.0	8.0	3.5	51	0	0	0	0
WI	FOREST	BUTTERNUT L	1,292	NR	10/21	207	4.2	7.4	5.8	25.9	58	7.5	9.2	8.4	7.3	371	8.0	8.0	3.6	50	0	0	0	0
WI	FOREST	BUTTERNUT L	1,292	NR	10/22	246	4.2	7.3	5.6	30.8	26	7.5	9.2	8.4	3.3	370	8.0	8.0	3.6	51	0	0	0	0
WI	FOREST	FRANKLIN L	892	NR	10/20	663	3.3	6.1	4.3	102.0	6	7.2	9.6	8.6	0.9	682	6.5	6.6	2.9	50	0	0	0	0
WI	FOREST	L LUCERNE	1,026	C-ST	9/15	2	5.7	6.1	5.9	0.2	5	8.2	9.3	8.8	0.5	8	9.1	9.1	4.0	69	0	1	0	43
WI	FOREST	L METONGA	1,991	C-NR	9/14	33	3.8	6.5	5.3	4.2	68	7.1	9.9	8.5	8.6	172	7.9	7.9	3.7	69	0	0	0	6
WI	FOREST	LILY L	211	NR	10/1	17	5.8	7.0	6.5	3.3	78	7.2	10.5	9.2	15.3	144	5.1	5.1	1.2	58	0	0	0	0
WI	FOREST	ROBERTS L	414	NR	9/30	21	5.9	6.8	6.4	4.7	10	7.1	8.9	8.3	2.2	71	4.5	4.5	1.9	59	0	0	0	8
WI	IRON	GILE FL	3,384	NR	9/23	176	4.0	7.4	5.4	27.1	13	7.7	11.0	9.8	2.0	227	6.5	27.2	3.0	58	0	0	0	0
WI	IRON	TURTLE-FLAMBEAU FL	13,545	NR	9/21	1550	3.1	7.6	5.2	60.5	206	7.7	10.1	8.9	8.0	1999	25.6	211.0	8.6	60	0	0	0	2
WI	LANGLADE	ENTERPRISE L	502	NR	9/21	225	4.5	6.7	5.6	37.5	61	6.9	9.5	8.4	10.2	387	6.0	6.0	2.7	62	0	0	0	0
WI	LINCOLN	L MOHAWKSIN	1,910	NR	9/23	212	4.2	7.7	5.2	20.6	95	7.9	10.6	9.3	9.2	421	10.3	35.2	3.3	65	1	1	0	2
WI	ONEIDA	BEARSKIN L	400	NR	9/29	99	6.2	9.1	7.5	17.7	6	9.2	9.4	9.4	1.1	200	5.6	5.6	1.9	65	0	0	0	0
WI	ONEIDA	BIG FORK L	690	NR	10/13	336	3.8	7.0	5.2	62.2	138	7.1	9.4	7.9	25.6	565	5.4	5.4	2.0	54	0	0	0	0
WI	ONEIDA	BIG L	865	NR	9/28	620	3.1	6.3	4.9	92.5	175	6.4	10.2	7.6	26.1	873	6.7	7.1	3.0	60	0	0	0	0
WI	ONEIDA	BIG STONE L	548	NR	10/14	115	4.3	7.0	5.6	24.0	240	7.1	10.5	8.4	50.0	410	4.8	4.8	1.9	54	0	0	0	0
WI	ONEIDA	BUCKSKIN L	634	C-NR	9/29	392	4.7	7.6	6.4	62.2	13	7.7	8.4	8.1	2.1	1156	6.3	6.3	2.8	64	0	0	0	0
WI	ONEIDA	CLEAR L	846	NR	9/30	116	4.5	7.3	5.8	8.4	10	8.2	9.9	9.2	0.7	143	13.8	13.8	5.7	64	0	0	10	51
WI	ONEIDA	CRESCENT L	612	NR	10/19	46	5.2	7.3	6.4	6.2	7	7.4	8.3	7.9	0.9	171	7.4	7.4	2.2	52	0	0	0	0
WI	ONEIDA	DAM L	744	NR	9/12	940	3.4	6.8	4.2	154.1	80	6.9	9.1	8.1	13.1	1190	6.1	7.7	2.3	75	0	0	0	0
WI	ONEIDA	HASBROOK L	302	NR	9/24	738	3.2	6.2	4.6	167.7	88	6.4	9.2	7.8	20.0	839	4.4	4.4	2.0	67	0	0	0	0
WI	ONEIDA	KATHERINE L	590	NR	9/24	647	4.2	7.1	5.7	60.5	150	7.2	10.8	8.6	14.0	874	10.7	10.7	4.8	65	0	0	0	0
WI	ONEIDA	MEDICINE L	372	NR	10/13	52	3.8	6.2	5.1	10.8	64	6.4	9.0	7.7	13.3	198	4.8	4.8	1.4	54	0	0	0	0
WI	ONEIDA	PELICAN L	3,585	NR	9/22-23	1772	4.0	7.0	5.9	136.3	820	7.1	11.3	8.4	63.1	2624	13.0	13.0	8.1	66	0	0	0	0
WI	ONEIDA	PLANTING GROUND L	1,012	NR	9/16	651	3.7	6.1	5.1	63.2	206	6.2	9.0	7.4	20.0	1084	10.3	10.5	4.6	69	0	0	0	3
WI	ONEIDA	SAND L	540	NR	9/16	146	3.0	6.6	4.7	30.4	56	6.9	9.9	8.2	11.7	241	4.8	4.8	1.9	70	0	0	0	0
WI	ONEIDA	SEVENMILE L	503	NR	10/12	119	5.3	7.8	6.9	29.0	5	9.5	9.9	9.7	1.2	185	4.1	6.1	1.5	52	0	0	0	0
WI	ONEIDA	SQUASH L	392	NR	10/20	4	6.3	6.9	6.6	0.6	2	7.2	8.7	8.0	0.3	22	7.0	7.4	2.1	51	0	0	0	20
WI	ONEIDA	SQUIRREL L	1,317	NR	9/24	2071	4.3	6.9	5.8	149.0	243	7.0	8.7	7.9	17.5	2679	13.9	13.9	6.7	58	0	0	0	0
WI	POLK	HALF MOON L	579	C-ST	9/8	25	4.5	6.4	5.7	4.1	1	10.6	10.6	10.6	0.2	38	6.1	7.1	2.4	74	0	5	22	0
WI	RUSK	SAND L	262	C-ST	10/1	0				0.0	5	10.1	11.7	10.8	1.0	5	4.8	4.8	2.0	64	12	5	19	0
WI	SAWYER	CONNORS L	429	NR	8/31	607	4.6	7.6	6.6	121.4	54	8.4	11.6	9.9	10.8	774	5.0	5.0	2.2	75	0	0	0	0
WI	SAWYER	GRINDSTONE L	3,111	NR	10/19	681	4.5	7.9	7.0	64.9	52	8.0	9.9	8.9	5.0	808	10.5	10.5	4.2	51	0	0	0	0
WI	SAWYER	L CHETAC	1,920	C-ST	10/5-6	409	6.0	8.3	7.2	35.3	313	8.4	12.1	10.1	27.0	858	11.6	17.5	5.5	58	0	0	0	0
WI	SAWYER	L CHIPPEWA	15,300	NR	9/14-15	3454	4.1	7.1	5.6	99.5	660	7.2	9.7	8.6	19.0	4865	34.7	232.9	10.3	71	7	9	11	3
WI	SAWYER	LAC COURTE OREILLES	5,039	C-ST	9/1-2	3	6.6	7.1	6.9	0.2	38	9.8	12.4	11.1	3.1	41	12.2	25.4	4.2	72	1	12	2	19
WI	SAWYER	LOST LAND L	1,304	C-NR	9/2	0				0.0	6	7.4	10.0	9.0	1.1	33	5.4	11.3	1.9	68	0	0	2	3
WI	SAWYER	NELSON L	2,503	C-NR	10/7	58	5.9	8.7	7.7	3.0	0				0.0	363	19.1	31.4	7.0	52	0	0	0	0
WI	SAWYER	SAND L	928	NR	10/8	0				0.0	0				0.0	36	5.1	5.1	2.1	0	5	1	3	24
WI	SAWYER	SPIDER L	1,454	ST	9/1	0				0.0	0				0.0	26	4.2	20.8	2.3	75	2	0	11	2
WI	SAWYER	TEAL L	1,049	NR	9/2	120	5.4	7.2	6.4	23.1	158	7.4	9.7	8.8	30.4	456	5.2	11.8	2.3	74	1	0	0	0
WI	VILAS	ANNABELLE L	213	NR	9/1	49	5.9	7.4	6.7	16.9	27	8.4	9.5	8.9	9.3	131	2.9	2.9	1.9	72	0	0	0	0
WI	VILAS	ANVIL L	380	NR	9/17	100	4.9	7.7	6.1	20.8	4	9.1	10.4	9.6	0.8	123	4.8	4.8	1.9	70	0	0	0	0
WI	VILAS	BIG L (BOULDER JCT)	835	NR	9/2	258	3.9	7.0	5.8	31.1	242	7.2	9.8	8.7	29.2	572	8.3	9.6	3.8	72	0	0	0	0
WI	VILAS	BIG L (MI BORDER)	771	NR	10/15	58	5.1	6.8	5.9	4.4	53	7.0	10.7	8.6	4.0	219	13.3	13.8	3.6	51	0	0	0	0
WI	VILAS	BIG MUSKELLUNGE L	930	NR	9/10	79	3.8	7.1	5.9	7.7	30	7.7	9.4	8.7	2.9	212	10.2	10.2	4.7	67	0	0	0	0
WI	VILAS	BIG PORTAGE L	638	NR	9/29	217	4.5	7.5	6.1	31.9	8	7.7	10.2	8.8	1.2	284	6.8	6.8	2.7	60	0	0	0	0
WI	VILAS	BIG SAND L	1,408	ST	10/13	0				0.0	22	9.1	10.3	9.8	3.8	33	5.8	10.6	1.5	50	0	1	0	1
WI	VILAS	BIG ST GERMAIN L	1,617	C-	10/14	651	4.0	6.7	5.5	171.3	25	7.2	10.7	9.0	6.6	679	3.8	7.6	1.5	49	0	0	0	0
WI	VILAS	BOULDER L	524	NR	8/31	321	4.2	7.2	6.0	41.7	171	7.7	10.0	8.8	22.2	624	7.7	7.7	2.6	73	0	0	0	0
WI	VILAS	CATFISH L	1,012	NR	9/15	547	3.9	7.1	5.9	48.4	611	7.2	10.6	8.5	54.1	1493	11.3	11.3	5.8	66	0	0	0	0
WI	VILAS	CLEAR L	555	NR	10/6	476	3.9	7.8	6.5	69.0	32	7.9	9.8	9.1	4.6	564	6.9	6.9	1.9	54	0	0	0	0

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

Table C2, continued

State	County	Lake	Area (Acres)	1998 Walleye Code	Date Surveyed	Age 0 WAE	Age 0 Min L.	Age 0 Max L.	Age 0 Ave L.	Age 0 CPE	Age 1 WAE	Age 1 Min L.	Age 1 Max L.	Age 1 Ave L.	Age 1 CPE	Total WAE	Miles Surveyed	Shore Miles	Hours Surveyed	Temp	Other Species MUE	NOP	LMB	SMB
WI	VILAS	CRAB L	949	NR	10/5	223	3.8	7.6	6.0	14.1	180	7.7	10.6	9.3	11.4	594	15.8	15.8	7.0	55	0	0	0	0
WI	VILAS	CRANBERRY L	956	NR	9/14	997	4.3	6.9	5.7	87.5	205	7.0	9.7	8.0	18.0	1305	11.4	11.4	4.1	68	0	0	0	0
WI	VILAS	EAGLE L	572	NR	9/16	436	4.3	6.7	5.9	90.8	451	6.8	9.6	8.1	94.0	1090	4.8	4.8	2.3	73	0	0	0	0
WI	VILAS	HARRIS L	507	NR	9/9	193	5.0	6.8	5.8	32.2	34	7.3	10.9	8.6	5.7	278	6.0	6.0	3.3	69	0	0	0	0
WI	VILAS	HIGH L	734	NR	9/1	29	5.3	7.2	6.6	5.2	19	8.4	10.2	9.1	3.4	69	5.6	9.4	2.4	70	0	0	0	0
WI	VILAS	ISLAND L	1,023	NR	10/13	675	4.0	8.3	6.7	54.0	212	8.4	10.2	9.2	17.0	1041	12.5	16.8	3.5	49	0	0	0	0
WI	VILAS	LAC VIEUX DESERT	4,300	C-NR	10/12	825	4.0	7.2	5.1	87.8	94	7.3	9.4	8.3	10.0	998	9.4	16.3	4.3	47	0	0	0	0
WI	VILAS	LITTLE ARBOR VITAE L	534	NR	9/23	153	6.2	7.9	7.3	21.5	359	8.0	9.5	8.9	50.6	727	7.1	7.1	3.2	60	0	0	0	0
WI	VILAS	LONG L	872	NR	10/13	0				0.0	1	9.8	9.8	9.8	0.2	19	6.0	8.2	2.0	50	0	0	0	12
WI	VILAS	MANITOWISH L	506	NR	10/22	99	4.7	7.5	6.4	22.5	39	7.6	8.7	8.3	8.9	214	4.4	7.6	1.4	50	0	0	0	0
WI	VILAS	N TWIN L	2,788	C-NR	9/17	3099	3.3	6.9	5.6	298.0	61	7.1	10.6	8.7	5.9	3191	10.4	10.4	5.4	69	0	0	0	0
WI	VILAS	OXBOW L	511	NR	9/10	213	5.1	7.6	6.7	15.8	153	7.9	10.4	9.3	11.3	611	13.5	13.5	5.8	70	0	0	0	0
WI	VILAS	PAPOOSE L	428	C-NR	8/31	85	3.9	6.6	5.3	12.9	71	6.8	9.4	7.9	10.8	230	6.6	6.6	3.6	75	0	0	0	0
WI	VILAS	PLUM L	1,033	C-NR	9/22	340	4.2	7.3	6.1	22.1	369	7.4	10.8	8.6	24.0	837	15.4	15.4	6.3	68	0	0	0	0
WI	VILAS	PRESQUE ISLE L	1,280	NR	9/3	258	4.8	7.5	6.3	29.3	24	7.6	10.2	9.1	2.7	311	8.8	8.8	4.1	73	0	0	0	0
WI	VILAS	REST L	608	NR	10/8	289	4.0	7.4	5.8	64.2	87	7.7	10.4	9.1	19.3	402	4.5	8.1	1.9	54	0	0	0	0
WI	VILAS	S TWIN L	642	C-NR	9/17	637	4.1	7.1	5.9	172.2	28	7.2	10.4	8.8	7.6	668	3.7	3.7	1.6	69	0	0	0	0
WI	VILAS	SQUAW L	785	NR	9/22	332	4.0	7.2	6.1	36.9	295	7.3	9.4	8.5	32.8	947	9.0	9.0	4.4	60	0	0	0	0
WI	VILAS	STAR L	1,206	NR	10/15	699	4.4	7.4	6.1	59.7	158	7.5	8.9	8.3	13.5	1096	11.7	11.7	4.5	52	0	0	0	0
WI	VILAS	TENDERFOOT L	437	NR	10/1	252	5.0	7.4	6.2	38.2	26	7.6	8.9	8.4	3.9	425	6.6	6.6	2.5	60	0	0	0	1
WI	VILAS	TROUT L	3,816	C-ST	9/8	17	5.4	7.4	6.9	1.0	158	7.8	11.2	10.1	9.2	215	17.2	17.9	7.8	68	0	0	0	9
WI	VILAS	UPPER BUCKATABON L	494	ST	10/1	38	6.1	7.9	7.2	6.1	5	8.2	9.7	9.1	0.8	49	6.2	7.4	1.7	61	0	0	0	1
WI	VILAS	WHITE SAND L	728	C-ST	10/12	331	5.1	8.3	6.8	53.4	1	8.6	8.6	8.6	0.2	340	6.2	6.5	1.9	52	0	0	0	0
WI	WASHBURN	BASS-PATTERSON L	188	NR	9/10	170	3.5	6.0	5.1	58.6	166	6.1	8.4	6.9	57.2	356	2.9	2.9	1.6	70	0	0	0	203
WI	WASHBURN	LONG L	3,290	C-	9/28	0				0.0	17	7.1	8.9	7.9	0.8	33	20.5	38.0	7.8	65	0	15	79	8
		COUNT (WI):	95																					
		TOTAL (WI):				34,623					10,757					55,496	823.1	1446.1	331.1		33	93	229	456
		AVERAGE (WI):				364			6.1	42.1	113			8.9	12.5	584								

State	County	Lake	Area (Acres)	1998 Walleye Code	Date Surveyed	Age 0 WAE	Age 0 Min L.	Age 0 Max L.	Age 0 Ave L.	Age 0 CPE	Age 1 WAE	Age 1 Min L.	Age 1 Max L.	Age 1 Ave L.	Age 1 CPE	Total WAE	Miles Surveyed	Shore Miles	Hours Surveyed	Temp	Other Species MUE	NOP	LMB	SMB
MI	BARAGA	PARENT L	182	NR	9/28	0				0.0	3	7.8	8.7	8.3	1.3	45	2.3	2.3	1.1	62	0	0	0	0
MI	GOGEBIC	CISCO L	506	C-NR	9/28	2	5.8	6.5	6.2	0.6	0				0.0	22	3.2	12.4	1.5	60	0	0	0	5
MI	GOGEBIC	DUCK L	616	C-ST	10/21	52	5.7	7.4	6.8	5.5	12	7.7	8.4	8.0	1.3	74	9.5	9.5	2.4	48	0	0	0	9
MI	GOGEBIC	L GOGEBIC	13,380	C-NR	10/6-7	963	4.5	8.1	6.4	37.2	3	8.9	9.0	9.0	0.1	1174	25.9	35.0	9.9	53	0	0	0	0
MI	GOGEBIC	POMEROY L	314	C-ST	10/8	77	6.9	8.3	7.9	20.8	11	8.4	9.0	8.6	3.0	471	3.7	3.7	1.9		0	0	0	0
MI	GOGEBIC	TAMARACK L	335	C-ST	9/29	11	4.7	6.9	6.6	2.8	187	7.0	9.3	7.8	46.8	249	4.0	4.0	1.7	58	0	0	0	1
MI	GOGEBIC	THOUSAND ISLAND L	1,020	C-NR	10/1	13	6.0	7.1	6.7	1.2	3	7.3	7.9	7.6	0.3	19	10.7	10.7	5.4	59	0	0	4	2
MI	IRON	PERCH L	994	NR	9/29	252	5.0	7.5	6.2	31.5	3	7.9	9.0	8.6	0.4	321	8.0	8.0	2.9	64	0	0	0	0
MI	IRON	STANLEY L	310	C-	9/30	104	6.1	8.0	7.2	29.7	2	8.2	9.3	8.8	0.6	144	3.5	3.5	1.4	56	0	0	0	0
		COUNT (MI):	9																					
		TOTAL (MI):				1,474					224					2,519	70.8	89.1	28.2		0	0	4	17
		AVERAGE (MI):				164			6.8	14.4	25			8.3	6.0	280								

State	County	Lake	Area (Acres)	1998 Walleye Code	Date Surveyed	Age 0 WAE	Age 0 Min L.	Age 0 Max L.	Age 0 Ave L.	Age 0 CPE	Age 1 WAE	Age 1 Min L.	Age 1 Max L.	Age 1 Ave L.	Age 1 CPE	Total WAE	Miles Surveyed	Shore Miles	Hours Surveyed	Temp	Other Species MUE	NOP	LMB	SMB
MN	AITKIN	SOUTH BIG PINE L	372	C-	10/27	39	6.3	9.6	7.6	8.0	41	9.6	14.4	12.2	8.4	104	4.9	4.9	1.8	55	0	0	0	0
MN	BENTON	LITTLE ROCK L	1,450	C-	10/12	11	5.0	6.1	5.6	0.7	47	6.3	8.1	7.4	3.0	138	15.7	15.7	3.8	52	0	0	0	0
MN	CHISAGO	GREEN L	1,714	C-ST	10/26	25	4.1	5.4	4.5	2.5	12	8.9	9.6	9.2	1.2	85	10.0	12.0	2.8	55	0	0	0	0
MN	CHISAGO	RUSH L (WEST)	1,464	C-	10/27-28	11	4.4	6.1	5.5	1.3	4	7.8	9.4	8.6	0.5	41	8.8	16.0	4.1	54	0	0	0	0
MN	KANABEC	ANN L	653	C-	10/13	2	5.1	5.6	5.4	0.3	18	6.0	7.5	6.7	2.8	144	6.4	10.0	3.0	50	0	8	7	0
MN	MORRISON	SULLIVAN L	1,221	C-NR	10/20	4	7.4	8.3	7.8	0.7	1	13.8	13.8	13.8	0.2	6	6.0	8.3	2.1	52	0	19	0	0
MN	PINE	NORTH BIG PINE L	387	C-ST	10/26	21	6.8	9.4	8.3	3.8	66	9.5	12.5	11.6	12.0	137	5.5	5.5	1.9	55	0	0	0	0
MN	SHERBURNE	LITTLE ELK L	353	ST	10/21	37	4.6	7.8	5.9	7.4	4	13.5	14.4	14.0	0.8	81	5.0	5.0	1.7	52	0	0	0	0
		COUNT (MN):	8																					
		TOTAL (MN):				150					193					736	62.3	77.4	21.3		0	27	7	0
		AVERAGE (MN):				19			6.3	3.1	24			10.4	3.6	92								
		COUNT (OVERALL):	112																					
		TOTAL (OVERALL):				36,247					11,174					58,751	956.2	1,612.6	380.5		33	120	240	473
		AVERAGE (OVERALL):				324			6.1	37.1	100			9.0	11.4	525								

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