

Lake Survey Report for Mission Lake, Marathon County, WI

Final Report
July 2006

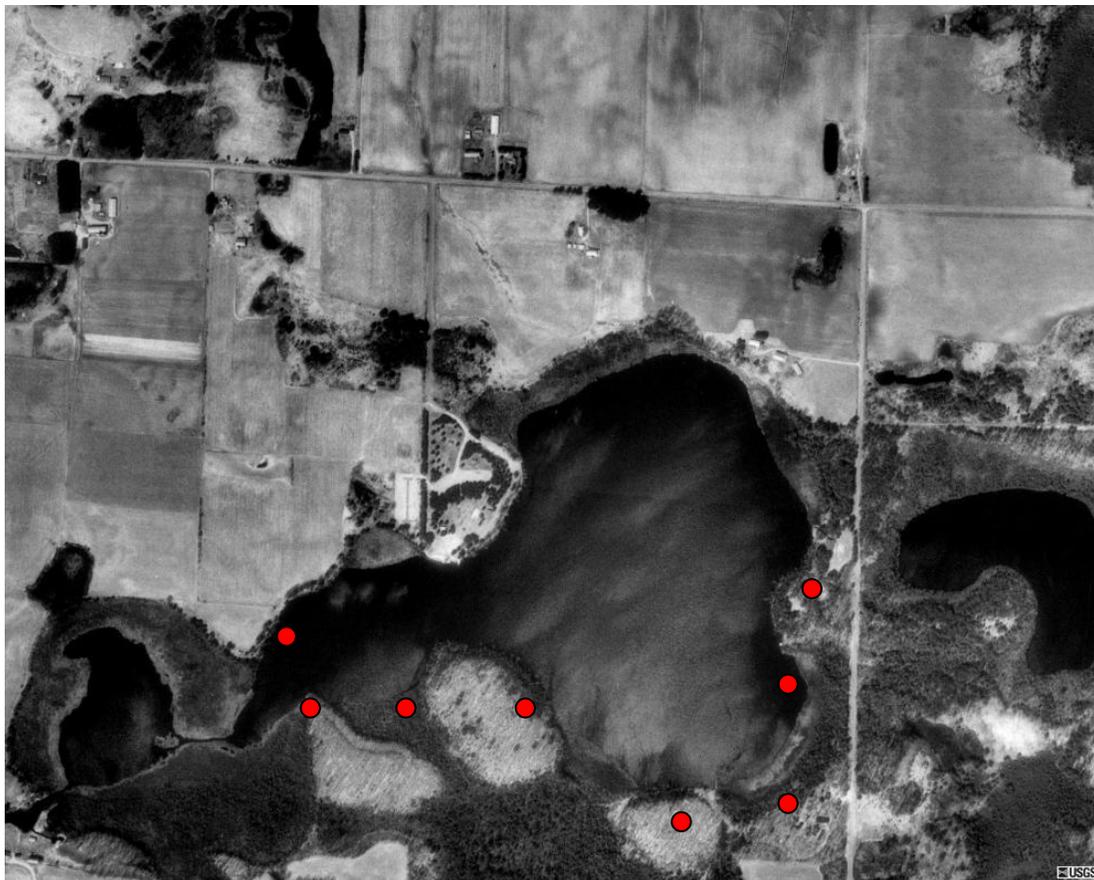


Figure 1: Aerial Photo of Mission Lake Taken in 1992, with fyke net locations* from the Spring 2004 survey.

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*See Appendix A (page 24) for fyke net GPS locations

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Executive Summary:

Recent fishery surveys were completed in Mission Lake during 2004 and 2003. In 2004, a fyke net survey was performed during late April and a single electrofishing run was performed in late June of 2004. The spring fyke net survey targeted adult gamefish and panfish and resulted in catches of black crappie, bluegill, pumpkinseed, yellow perch, largemouth bass, northern pike and muskellunge. The summer electrofishing run that encompassed the entire shoreline turned up largemouth bass, northern pike and muskellunge. A single fall electrofishing run was completed and summer mini-fyke nets were set during 2003. Adult and Young of Year (YOY) gamefish were targeted during the fall electrofishing run while only YOY were targeted during the summer mini-fyke net survey.

Previous surveys conducted in 1983 (Hauber) and 1971 (Johnson) were used to evaluate trends in the fishery, specifically the muskellunge and panfish population. Muskellunge, which are mostly sustained through stocking, were used in attempt to alter the panfish population which was slow growing and stunted. Management recommendations have been suggested to correct the various problems in the fishery.

Lake and Location:

Mission Lake, WBIC 1005400

SE Marathon County, T27N, R9E, Section 36, N 44° 46.65 W -89° 43.318, near the town of Bevent.

Physical, Chemical Characteristics

Morphometry: 106.7 acres; max depth 26 feet; shoreline 2.11 miles.

Lake Type: Seepage.

^tWater Chemistry: phosphorus =9 ug/l; chlorophyll =3.1 ug/l; Secchi disk =10 ft; Hardness 55mg/l; Trophic status =oligotrophic.

*Littoral Substrate: Muck 60%, 40% sand.

^tAquatic Vegetation: Dense submergent, moderate emergent; species listed in Table 1.

*Shoreline: wetland/bog 20%, upland 70%; SDF 1.45; Watershed 1.0 sq. mi.

Winterkill: none recorded

Other features: Connecting channel between Mission Lake and Unknown Lake 36-10.

*Information provided by Surface Water Resource of Marathon County, 1977

^tInformation provided by The Aquatic Plant Community of Mission Lake, 2004; Table 1

Fishing Regulations

Current fishing regulations on Mission Lake as of 2004 follow the general state regulations: panfish- 25 total daily bag limit; largemouth bass- 5 total daily bag limit; northern pike- 5 total daily bag limit; muskellunge- 1 total daily bag limit, minimum length 34", season open last Saturday in May until November 30.

Fishing regulations in 1983 for muskellunge limited anglers to one fish greater than 32 inches. Prior to 1983 the minimum size limit was 30 inches.

Background:

Past Surveys

In 1971, six fyke nets were fished for four days during May 25-28. In 1983, five fyke nets were set for five nights during April 28 through May 6, followed up by an electrofishing run in June. All fish captured in the fyke nets were measured, marked and

scales removed for age estimation. Only muskellunge yielded a population estimate (PE; Bailey's modification of the Peterson method) during the 1983 survey. Other fish captured during both fyke net surveys included largemouth bass, yellow perch, bluegill, walleye and black crappie.

Methods:

Spring Fyke Netting

Personnel with the Wisconsin Department of Natural Resources (WDNR) fished eight fyke nets (Figure 1) from April 20 to April 24, 2004 to target panfish and gamefish. Each net had 4' x 4' frames with black nylon 0.5" bar mesh. Lead length varied between 35 and 75 feet. Nets were set in varying habitat types (i.e. substrate and vegetation type/density) and depths of water. Individual net data and daily water temperature was recorded separately.

All captured gamefish were given a top caudal (TC) temporary fin clip and all recaptures fish were recorded. A sub-sample of 5 males and 5 females per ½ inch group had age structures collected (scales anterior to the dorsal fin and above the lateral line for esocids and scales and/or dorsal spines for bass) and weight (kg and g) estimated. After the sub-sample of age was completed for a species only lengths were collected (except for muskellunge for which scales and weight was taken for every individual).

Length was recorded individually for all panfish captured. A sample of 5 fish per ½ inch group had an age structure removed and weight (g) recorded.

Summer Electrofishing

Electrofishing was conducted on June 22, 2005 at night using an AC electrofishing boat operating at an output of 220 Volts and 6.0 Amps. The effort was used to gather length and CPE data for largemouth bass. Electrofishing effort was recorded as pedal time (0.88) in tenths of hours and distance shocked (2.0) in miles. Water temperature was recorded at 69°F.

▪ *Summer Mini-fyke Netting*

On July 7, 2003 four mini-fyke nets were set for one night targeting young-of-year (YOY) gamefish and panfish. Each net had 3' x 3' frames with white nylon 3/16" bar mesh with turtle exclusions on the rear frame. Each lead was 30 feet long. Nets were set in varying habitat types (i.e. substrate and vegetation type/density) and depths of water. Individual net data were recorded separately. Length (nearest 0.1 inch) was recorded for all panfish and gamefish captured. No weights or age structures were taken for fish captured during this survey.

▪ *Fall Electrofishing*

Electrofishing was conducted on September 23, 2003 at night using an AC electrofishing boat. The effort was used to gather length, CPE and age/growth data (age was estimated by using scales removed from bluegill, muskellunge, yellow perch and black crappie; largemouth bass ages were estimated from the second anal fin spine). The entire shoreline was shocked targeting only gamefish species and a ½ mile index station was selected to collect gamefish and panfish species. Electrofishing catch per unit effort (CPUE) was recorded in tenths of hours.

Results:

Spring Fyke Netting

Fyke nets were fished for a total of 32 net/nights during late April. Eight species of fish were captured in the fyke nets (Table 2) including: bluegill, black crappie, pumpkinseed, yellow perch, yellow bullhead, largemouth bass, northern pike and muskellunge. Bluegill was the most common species (n=369; 11.5 net/night) and muskellunge was the largest (42.0”).

Proportional Stock Density (PSD, or the percentage of fish longer than quality length) and Relative Stock Density (RSD_{length} ; percentage of fish longer than a certain length) values were calculated for all species except yellow bullhead for surveys completed in 1983 and 2004 (Table 4). Length frequency and relative weight graphs were also calculated. Length at age of fish captured in Mission Lake was compared to the state wide average (Table 3). A muskellunge PE was calculated using the Schnable Multiple Census Modification of the Petersen method, which combined the netting and shocking surveys.

Black Crappie

A total of 114 black crappies were captured in the fyke nets at a rate of 3.6 black crappies per net/night which is less than the 29.4 per net/night captured in 1983 (Table 2, 5). The average length of fish captured in 2004 was 8.25 inches long ranging from 8.25 to 10.4 inches (Table 2, Figure 2) compared to an average 7.5 inches in 1983 (Table 5). The PSD value was 64 and the RSD_{10} value was 6 for black crappie captured in 2004, compared to a PSD value of 32 and RSD_{10} value of 14 (Table 4). Relative weight (W_r) values averaged 83 and most black crappies fell below the bench mark value of 100 (Figure 8). The average length at age of a black crappie captured in Mission Lake in 2004 was similar to those captured in 1983 (Figure 14). Both surveys indicate that black crappies in Mission Lake are slower growing than the state wide average for fish under 9 years of age (Figure 14). The only two fish that happened to reached 9 and 11 years of age were longer than the state average.

Bluegill

Bluegills were captured at a rate of 11.5 per net/night for a total of 369 in 2004 (Table 2) compared to a rate of 43.0 in 1983 (Table 5). The lengths ranged from 3.2 to 6.8 inches and averaged 5.1 inches in 2004 (Figure 3) and 4.6 in 1983 (Table 5). The PSD value was 8 and the RSD_8 value was zero in 2004 which is similar to a PSD value of 6 and RSD_8 value also zero in 1983 (Table 4). W_r values of bluegill in Mission Lake were all below the benchmark of 100 and averaged 75 (Figure 9). Length at age values, while similar for bluegills captured in 2004 and 1983 surveys, were below the state wide average (Figure 15).

Pumpkinseed

A total of 151 pumpkinseeds were captured in the 2004 fyke nets at a rate of 4.7 per net/night (table 2) compared to 24.8 per net night in 1983 (Table 5). The average pumpkinseed in 2004 was 4.7 inches long ranging from 3.3 to 6.8 inches (Table 2, Figure 4), which is longer than the 1983 average of 4.2 (Table 5). The PSD value was 7 and the RSD_8 value was 0 for bluegills captured in 2004 versus a PSD value of 3 and RSD_8 value of zero in 1983 (Table 4). Age and weight data was insufficient to yield any age length or length weight graphs.

Yellow Perch

A total of 30 yellow perch were captured in the fyke nets at a rate of 0.9 per net/night (Table 2), which was less than the 4.8 yellow perch per net/night captured in 1983 (Table 5). The average fish was 5.9 inches long while ranging from 5.1 to 7.6 (Table 2, Figure 5) inches which is equal to the average yellow perch captured in 1983 (Table 5). Both PSD and RSD_{10} values were 0 for yellow perch captured during both the 2004 and 1983 surveys (Table 4). Relative weight values averaged 71 and all yellow perch caught had Wr values below the benchmark of 100 (Figure 10). There was insufficient age data to estimate growth rates.

Largemouth Bass

A total of 17 largemouth bass were captured in the fyke nets at a rate of 0.5 per net/night (Table 2), which is similar to the 0.6 per net/night captured in 1983 (Table 5). The average length of fish captured in both 1983 and 2004 surveys was 11.5 inches long and ranging from 5.5 to 20.4 inches (Table 5). Relative weight values averaged 99 and most largemouth bass caught had Wr values hovering around the benchmark of 100 (Figure 11). Growth rates of largemouth bass captured the 2004 survey were below both the state wide and 1983 average (Figure 16).

Northern Pike

A total of 13 northern pike were captured in the fyke nets at a rate of 0.4 per net/night (Table 2), which is greater than the 1983 survey which turned up zero pike (Table 5). The average fish was 26.6 inches long while ranging from 22.2 to 30.3 inches (Table 2; Figure 6). The northern pike PSD value was 100 and RSD_{28} value was 21 (Table 3). Relative weight values averaged 89 and most northern pike caught had Wr values slightly below the benchmark of 100 (Figure 12). The growth rate for northern pike captured in Mission Lake younger than 6 years was slightly above the state wide average, whereas northern pike in Mission Lake older than 7 year were slightly below the state wide average (Figure 17).

Muskellunge

A total of 75 muskellunge were captured in the fyke nets at a rate of 2.3 per net/night (Table 2), which is less than the 2.5 muskellunge per net/night in 1985 (Table 5). The 2004 PE was 136 (95% CI=81-254) which is higher than an estimated 101 (95% CI 56-146) in 1984. Densities ranged from 1.27 muskellunge/acre in 2004 to .94 muskellunge/acre in 1984. The average muskellunge in 2004 was 30.7 inches long while ranging from 12.5 to 42.0 inches (Table 2, Figure 7), compared to the 1983 average of 26.6 inches with a range of 10.5 to 33.4 inches (Table 5). The muskellunge PSD value was 63 and RSD_{38} and RSD_{42} value was 1 in 2004 which was greater than the PSD value of 10 and RSD_{38} and RSD_{42} value of 0 (Table 4). Relative weight values averaged 79 and all muskellunge caught had Wr values below the benchmark of 100 (Figure 13). Growth rates were similar for muskellunge in Mission Lake during both 2004 and 1983, yet below the state wide average (Figure 18).

Summer Electrofishing

The entire shoreline (2.0 miles) took 53 minutes (0.88 hours) to shock. Three species of fish were captured while electrofishing, largemouth bass being the most common while only 1 northern pike and muskellunge were caught (Table 6). The 1983 electrofishing run turned up the same species and similar numbers. Largemouth bass

averaged 10.4 inches and ranged from 5.3 to 19.9 inches in the 2004 survey, which was larger than the average 9.5 inches and range of 5.3 to 16.4 inches in 1982 (Figure 19). Largemouth bass captured in 2004 had PSD and RSD₁₅ values of 25 and 6 respectively (Table 4). By comparison, the 1983 survey showed largemouth bass PSD and RSD₁₅ values of 35 and 12 (Table 4).

Summer Fyke-Netting

Mini-fyke nets were fished a total of four (4) net nights and captured 7 species of fish. Black crappie, bluegill, central mudminnow, Iowa darter, pumpkinseed, tadpole madtom and yellow perch were capture, bluegill being the most numerous (N=40; Table 6). No past mini-fyke net survey was completed.

Fall Electrofishing

The entire shoreline (2.0 miles) was shocked in 0.72 hours and the ½ mile index station took 0.17 hours. In the index station; black crappie, bluegill, central mudminnow, largemouth bass, muskellunge, pumpkinseed, white sucker and yellow perch were captured (Table 7). Bluegill was the most common (N= 26) species captured and muskellunge the largest (22.9"). No past fall electrofishing survey was completed.

Stocking Report

Stocking has occurred in Mission Lake for the past several decades (Table 8). Muskellunge were the only species known to be stocked. Since 1972 almost 3600 muskellunge fingerlings (8-13" long) have been stocked.

Discussion:

Spring Fyke netting

Panfish

Panfish captured in Mission Lake displayed the same catch rate pattern over the past three surveys (Table 5). The 1983 survey produced the greatest catch rates for all fish (except northern pike) in all surveys. Black crappie and bluegill showed higher catch rates in 1971 than in 2004, while pumpkinseed and yellow perch exhibited opposite trends. The decrease in all panfish catch rates since the 1983 survey indicates that management actions have had limited success in controlling the panfish stunting problem, albeit slowly. And although the average length of panfish appear to have increased since the 1983 survey, similar growth rates indicate that overall the panfish size structure has remained the same (yellow perch and pumpkinseed could not be compared however). The lack of change in slow growth rates is mirrored by relative weight values that consistently fall below the benchmark value.

Altering fishing regulations would appear to do little to increase the size structure or growth of the bluegill population since the slow growth trait appears to be dominant, which is exhibited by the current population (Beard et. al., 1997). Introducing faster growing panfish in conjunction with removing existing fish and altering fishing regulations may improve the panfish population.

The stocking of large fingerling walleyes was found to have long term affects on increasing bluegill size structure and growth rates (Schneider and Lockwood, 2002). Snow and Staggs (1994) also found a direct correlation between bluegill growth and walleye CPE. Walleye will prey on smaller bluegills, there by reducing slow growing

adults and trigger faster growth and larger size in the population. However this contradicts Beard et. al.'s conclusion which is based on a modeling approach.

Largemouth bass

The largemouth bass in Mission Lake remain slow growing and the population level has remained relatively static over the last couple decades. One noticeable trend is the slow growth and “bottle necking” that is exhibited by the growth curve. Because of the abundant panfish population in Mission Lake, stunting due to lack of forage seems unlikely. The problem may just be a remnant of historically slow growth coupled with the lack of older fish due to high harvest rates which have been cited in the past (Hauber, 1983). An introduction of different native strain of largemouth bass or even the introduction of localized smallmouth bass may increase the overall bass size structure and growth rates in addition to combating the panfish stunting problem.

Northern pike

The lack of northern pike captured in all surveys indicates low abundance. Northern pike are continuing to reproduce, but are not a major predator such as muskellunge and largemouth bass. Factors such as poor forage choices and limited lake nutrients (i.e. oligotrophy) may prevent the northern pike from establishing themselves as an abundant predator.

Muskellunge

The Mission Lake muskellunge population has slowly changed over the last decades. Even though the growth rates have remained unchanged and below the state wide average, the size structure and population has increased. Muskellunge are historically a low density predator (0.25-0.5/acre) yet occupy Mission Lake in relatively high numbers (1.27/acre). Continued stocking events and increased minimum length regulations appear to be the reason for such high densities.

Mission Lake muskellunge below par condition, as evidence of W_r values averaging 79, still remains an issue that plagues muskellunge in Mission Lake. Centrarcids (i.e. bluegill, pumpkinseed, black crappie and basses) traditionally serve as a secondary food source for muskellunge who generally prefer non-spiny rayed cylindrical fishes such as yellow perch and white suckers (Bozek, 1999).

Continued stocking of Muskellunge over the past 30 years has established a stable yet slow growing population that has failed to curb the problem of stunted panfish. The discontinuation of muskellunge stocking may decrease abundance and allow a more efficient predator to target panfish. Altering the fishing regulations (i.e. higher size limits or protective slot limit) may allow for increased growth. Also, establishing a high abundance of a more preferred forage species, such as white sucker, could improve growth rates.

Fall Electrofishing and Mini-fyke netting:

Future surveys should be completed so comparisons and trends can be evaluated. Also, taking age structures from mini-fyke net fish will help estimated length ranges of YOY fish and aid in recruitment estimates.

Conclusions and Recommendations:

The Mission Lake fish community continues to be a diverse yet undersized fishery. The low trophic status of Mission Lake possibly equates to slow growth of almost every fish species in the lake. While the lake offers an excellent angling opportunity to catch numbers of muskellunge and panfish, problems with both

populations hint at the conclusion that some management actions need to be taken. The need to “thin out” the panfish population to overcome years of stunting should be considered. This should be accomplished by angler participation, predator (re)introduction or both. Continuation of stocking muskellunge; an abundant, undersized, slow growing and non-effective panfish control method, should be stopped. Primary muskellunge forage species should be increased. Changing the bass fishing regulation (i.e. protected slot or minimum length limit) to promote faster growing bass will potentially solve both the panfish stunting and slow growing bass problems.

Current Management:

After this survey was written a Largemouth bass slot limit was proposed and accepted. A slot limit protecting largemouth bass from 14”-18” went into effect in 2008.

Acknowledgements:

Dale Kufalk, Jason Spaeth and Jason Folstad completed the electrofishing survey and fyke net survey. Past surveys completed in 2003 were completed by Dale Kufalk and . The 1983 survey was completed and written by Al Hauber, with help from L. Smith. The 1971 survey was completed and written by Max Johnson, also with help from L. Smith.

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Table 1. Mission Lake Aquatic Plant Species (Common Name).

Emergent Species	Floating-leaf Species	Submergent Species
Tag Alder	Watershield	Water marigold
Bog rosemary	Bull-head pond lily	Coontail
Black chokecherry	White water lily	Muskgrass
Swamp milkweed	Smartweed	Needle spikerush
Bristly sedge	Great duck weed	Common waterweed
Sedge		Spiny-spored quillwort
Leatherleaf		Brown-fruited rush
Silky dogwood		Common water milfoil
Creeping spikerush		Slender water-nymph
Water horsetail		Nitella
Winterberry		Leafy pondweed
Spotted jewelweed		Variable-leaf pondweed
Northern blue flag		Illinois pondweed
Sensitive fern		Floating-leaf pondweed
Pickerelweed		Small pondweed
Marsh cinquefoil		Clasping-leaf pondweed
Common arrowhead		Common water nymph
Arrowhead		Pondweed
Pitcher plant		Flatstem pondweed
Softstem bulrush		Twin-stemmed bladderwort
Marsh fern		Small bladderwort
Marsh St. John's-wort		Purple bladderwort
Common cattail		Great bladderwort
Small cranberry		Water celery
Marsh bellflower		Water stargrass
Bluejoint grass		

Table 2. Total Number of Fish, CPE and Fish Length of Fish Captured using Fyke Nets Set in Mission Lake during April, 2004.

Species	Number of Fish (total)	CPE (net/night)	Average Length of Fish (inches)	Minimum Length of Fish (inches)	Maximum Length of Fish (inches)
Black Crappie	114	3.6	8.25	5.2	10.40
Bluegill	369	11.5	5.10	3.2	6.8
Pumpkinseed	151	4.7	4.73	3.3	6.8
Yellow Bullhead	4	0.1	11.37	9.5	12.0
Yellow Perch	30	0.9	5.91	5.1	7.6
Largemouth bass	17	0.5	11.46	8.2	20.0
Northern Pike	13	0.4	26.66	22.2	30.3
Muskellunge	75	2.3	30.67	12.5	42.0

Table 3: Average Length at Age of Fish Captured in Wisconsin, and number of Fish, Average Length and Length Range of Fish Captured in Mission Lake using Fyke Nets During the Spring of 2004.

Species	State-wide Average		Number of Fish in Mission Lake	Mission Lake	
	Age (Complete Years)	Length (Inches)		Average Length (Inches)	Length Range (Inches)
Black Crappie	2	5.4	3	4.83	4.6-5.0
Black Crappie	3	7.2	11	6.36	5.5-6.6
Black Crappie	4	8.6	32	7.10	5.4-7.8
Black Crappie	5	9.5	11	8.35	8.0-8.7
Black Crappie	6	10.5	16	9.01	8.7-9.6
Black Crappie	7	11.2	19	9.82	8.8-10.5
Black Crappie	8	12.0	2	10.50	9.8-11.2
Black Crappie	9	12.1	1	12.70	12.7
Black Crappie	11	-	1	13.50	13.5
Bluegill	3	4.8	7	3.71	3.2-4.4
Bluegill	4	5.8	8	4.46	4.0-4.8
Bluegill	5	6.6	19	5.19	4.7-5.8
Bluegill	6	7.2	15	5.91	5.5-6.3
Bluegill	7	7.7	3	6.60	6.5-6.7
Largemouth Bass	2	6.5	5	5.72	5.3-6.3
Largemouth Bass	3	9.0	2	7.45	7.2-7.7
Largemouth Bass	5	13.3	1	9.00	9
Largemouth Bass	6	15.1	13	9.79	9-12.4
Muskellunge	1	11.8	1	12.50	12.5
Muskellunge	4	25.9	1	22.90	22.9
Muskellunge	5	29.4	4	27.10	25.2-30.6
Muskellunge	6	31.8	26	30.32	27.2-34.1
Muskellunge	7	34.5	20	30.42	28.1-35.1
Muskellunge	8	37.0	10	34.67	30.2-36.7
Muskellunge	11	42.0	1	42.00	42
Northern Pike	4	20.4	1	22.10	22.1
Northern Pike	5	22.8	3	23.87	22.2-25.2
Northern Pike	6	25.0	2	25.95	25.9-26.0
Northern Pike	7	27.8	3	27.07	26.5-27.4
Northern Pike	8	29.9	1	27.90	27.9
Northern Pike	9	31.9	2	29.00	28.6-29.4
Northern Pike	10	35.2	1	30.30	30.3
Yellow Perch	3	6.0	1	5.50	5.5
Yellow Perch	4	7.1	1	5.50	5.5
Yellow Perch	5	8.1	4	6.20	6.10-6.3
Yellow Perch	6	8.9	3	6.67	6.5-6.8

Table 4. Length Categories and Values for Proportional Stock Density and Relative Stock Density Preferred of Fish Species Captured in Fyke Nets set in Mission Lake during April 20-24, 2004.

Species	Length Categories (Inches) (Stock/Quality/Preferred)	1983		2004	
		PSD	RSDp	PSD	RSDp
Black Crappie	5/8/10	32	14	64	6
Bluegill	3/6/8	6	0	8	0
Pumpkinseed	3/6/8	3	0	7	0
Yellow Bullhead	6/9/-	N/A	N/A	N/A	N/A
Yellow Perch	5/8/10	0	0	0	0
*Largemouth bass	8/12/15	35	12	25	6
Northern Pike	14/21/28	N/A	N/A	100	21
Muskellunge	20/30/38	10	0	63	1

*Largemouth bass captured using AC electrofishing boat June 22, 1983 and June 22, 2004.

Table 5. Comparison of Catch Rates and Average Length of Fish Captured in Fyke Nets during the spring of 1971, 1983 and 2004 in Mission Lake.

Species	1971		1983		2004		CPE Change (%) '83-'04	Length Change (inches) '83-'04
	Catch (net/night)	Ave Length (inches)	Catch (net/night)	Ave Length (inches)	Catch (net/night)	Ave Length (inches)		
Black Crappie	16.8	6.5	29.4	7.5	3.6	8.25	256% decrease	10% increase
Bluegill	28.3	6.0	43.0	4.6	11.5	5.10	274% decrease	11% increase
Pumpkinseed	1.8	6.0	24.8	4.2	4.7	4.7	427% decrease	12% increase
Yellow Bullhead	3.1	--	2.9	--	0.1	11.4	2800% decrease	N/A
Yellow Perch	0	--	4.8	5.9	0.9	5.9	593% decrease	0%
Largemouth bass	0.2	7.2	0.6	11.6	0.5	11.5	20% decrease	1.0% decrease
Northern Pike	0.3	25.8	0.0	--	0.4	26.7	increase	--
Muskellunge	0.5	15.5	2.5	26.6	2.3	30.7	9% decrease	15% increase

Table 6. Number of Fish, Catch Rate and Length of Fish Captured using an Electrofishing Boat in Mission Lake during June 22, 2004 and June 22, 1983.

Species	Number of Fish		Catch per Mile/Hour		Mean Length (inches)	
	2004	1983	2004	1983	2004	1983
Largemouth bass	24	27	12.0/27.2	13.5/27	10.39	9.46
Northern Pike	1	1	0.5/1.1	0.5/1	22.10	12.0
Muskellunge	1	2	0.5/1.1	1.0/2	25.5	28.0

Table 7. Number of Fish and Catch Rate of Fish Captured using Mini-Fyke Nets in Mission Lake during July 7-8, 2003.

Species	Number	CPE (catch per net/night)
Black crappie	1	0.25
Bluegill	40	10
Pumpkinseed	16	4
Yellow perch	4	1

Table 8. Number of Fish Captured and Catch per Mile/Hour using a Mini-boom Electrofishing Boat in Mission Lake on September 23, 2003.

Species	All Species (index station)		All Species (GET Station)	
	Number of Fish	CPE (Mile/Hour)	Number of Fish	CPE (Mile/Hour)
Black crappie	1	2.0/6.0		
Bluegill	26	52/156		
Largemouth Bass	3	6/18	13	8.6/23.6
Muskellunge	2	4/12	6	4/10.9
Pumpkinseed	5	10/30		
White Sucker	1	2/6		
Yellow Perch	2	4/12		

Table 9. Number and Size of Fish Stocked Since 1972 in Mission Lake by Wisconsin DNR.

Year	Species	Size	Amount
1972	Muskellunge	FINGERLING	200
1975	Muskellunge	FINGERLING	200
1976	Muskellunge	FINGERLING	200
1977	Muskellunge	FINGERLING	700
1978	Muskellunge	FINGERLING	200
1979	Muskellunge	FINGERLING	200
1980	Muskellunge	FINGERLING	200
1982	Muskellunge	FINGERLING	200
1985	Muskellunge	FINGERLING	200
1987	Muskellunge	FINGERLING	400
1987	Muskellunge	FINGERLING	200
1991	Muskellunge	FINGERLING	200
1997	Muskellunge	LARGE FINGERLING	200
2003	Muskellunge	LARGE FINGERLING	100

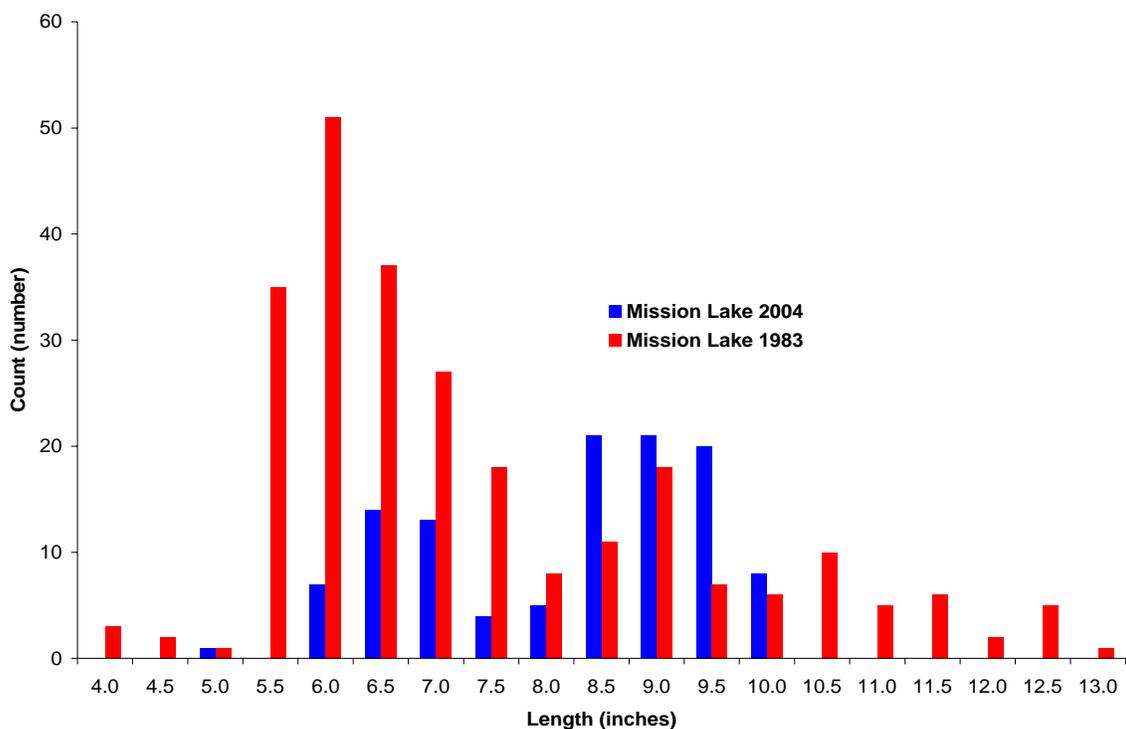


Figure 2. Length Frequency of Black Crappie Captured using Fyke Nets in Mission Lake during April 20-24, 2004 and April 28-May6, 1983.

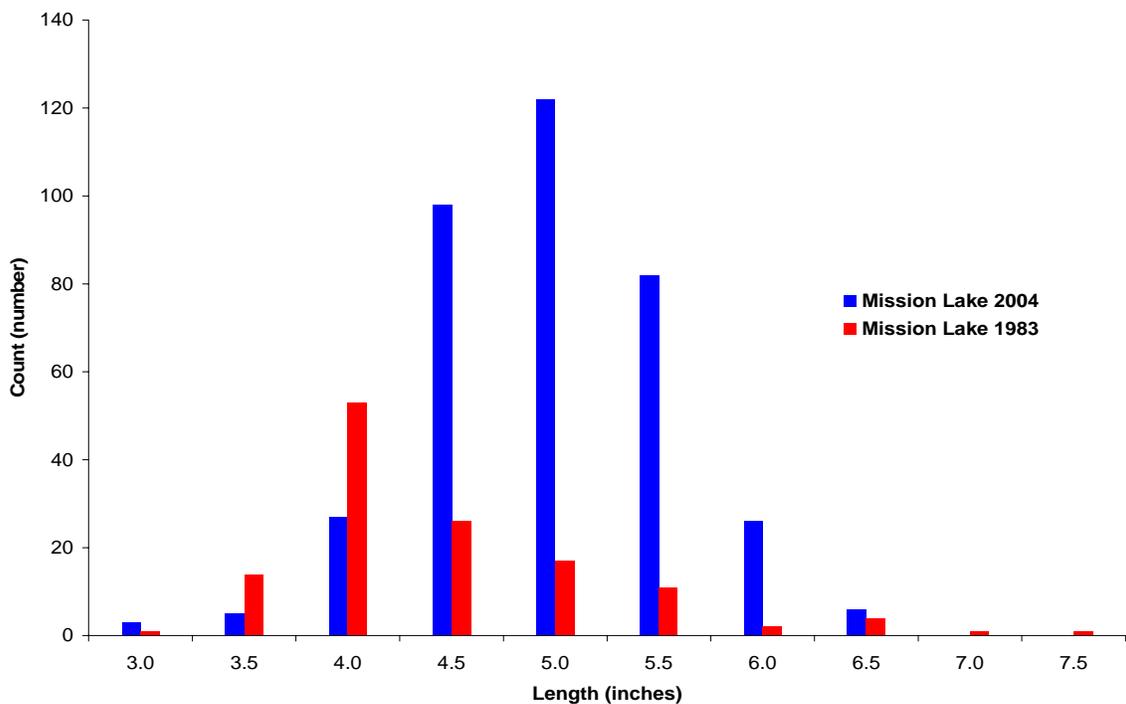


Figure 3. Length Frequency of Bluegill Captured using Fyke Nets in Mission Lake During April 20-24, 2004 and April 28-May6, 1983.

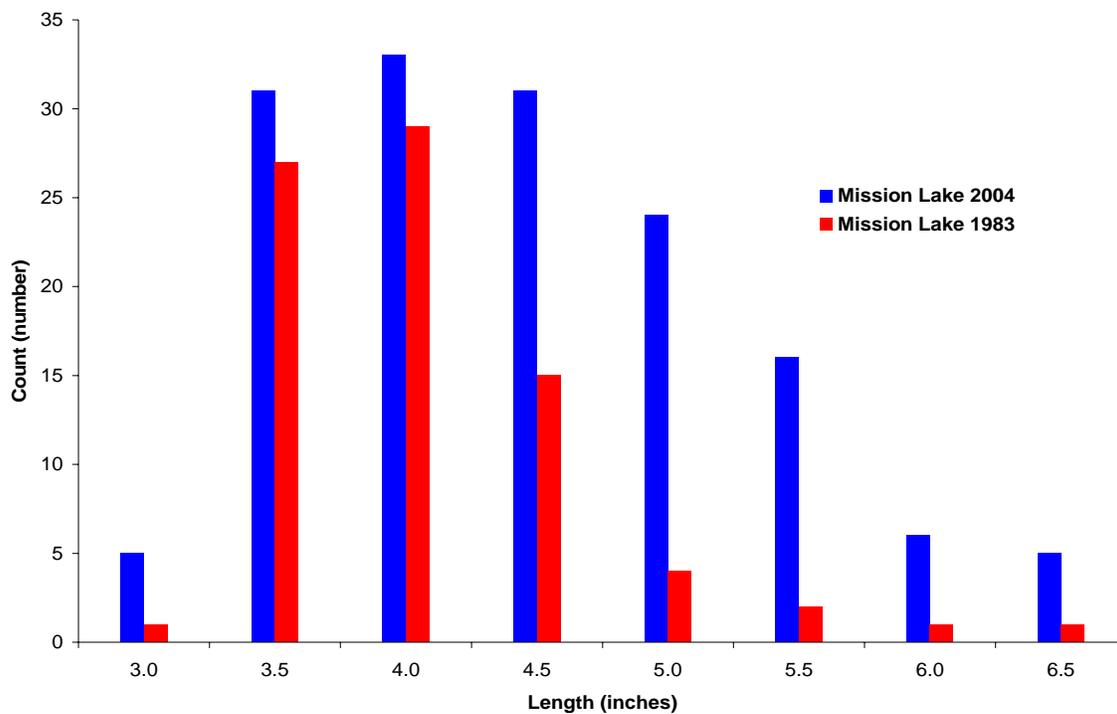


Figure 4. Length Frequency of Pumpkinseed Captured using Fyke Nets in Mission Lake During April 20-24, 2004 and April 28-May 6, 1983.

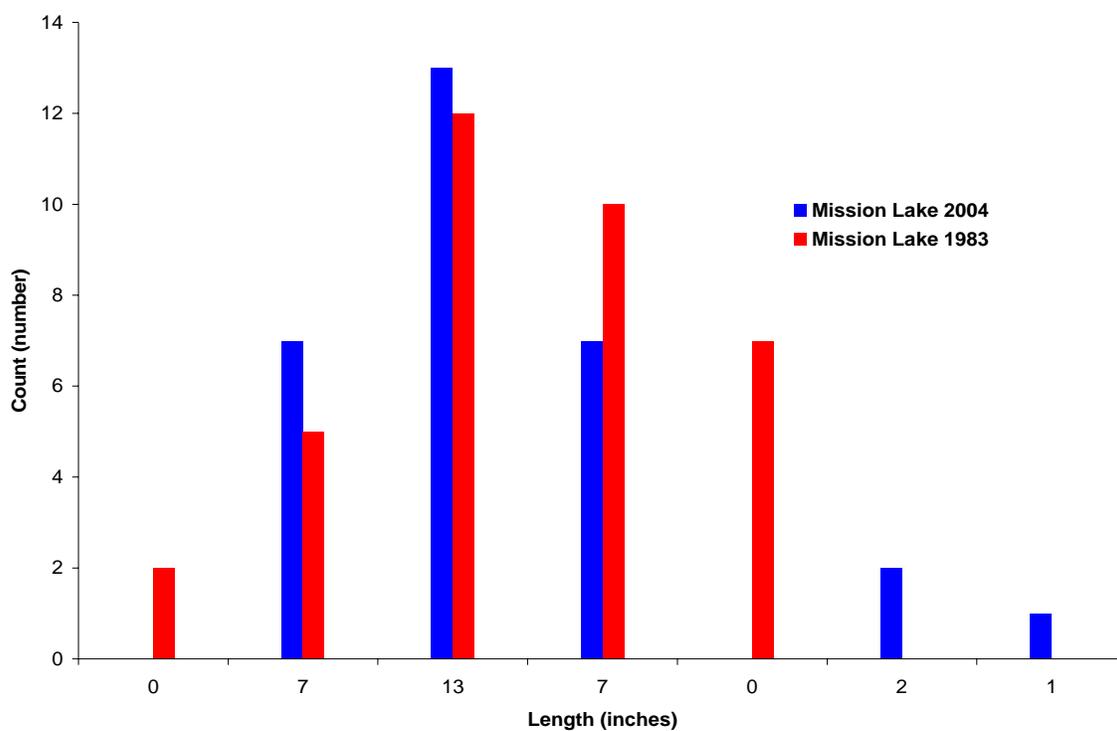


Figure 5. Length Frequency of Yellow Perch Captured using Fyke Nets in Mission Lake During April 20-24, 2004 and April 28-May 6, 1983.

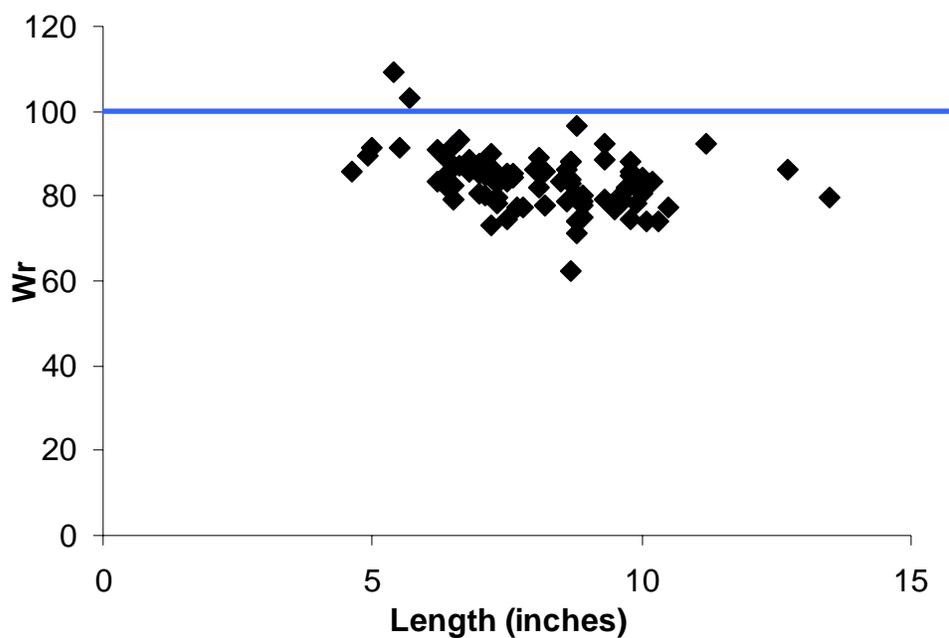


Figure 8. Relative Weight vs. Length of Black Crappies Captured using Fyke Nets in Mission Lake during April 20-24, 2004.

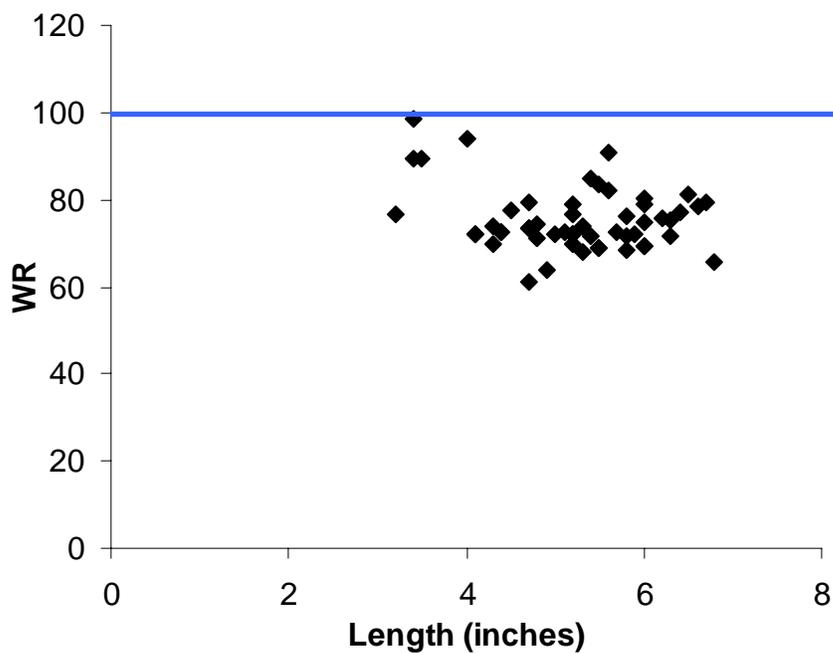


Figure 9. Relative Weight vs. Length of Bluegills Captured using Fyke Nets in Mission Lake during April 20-24, 2004.

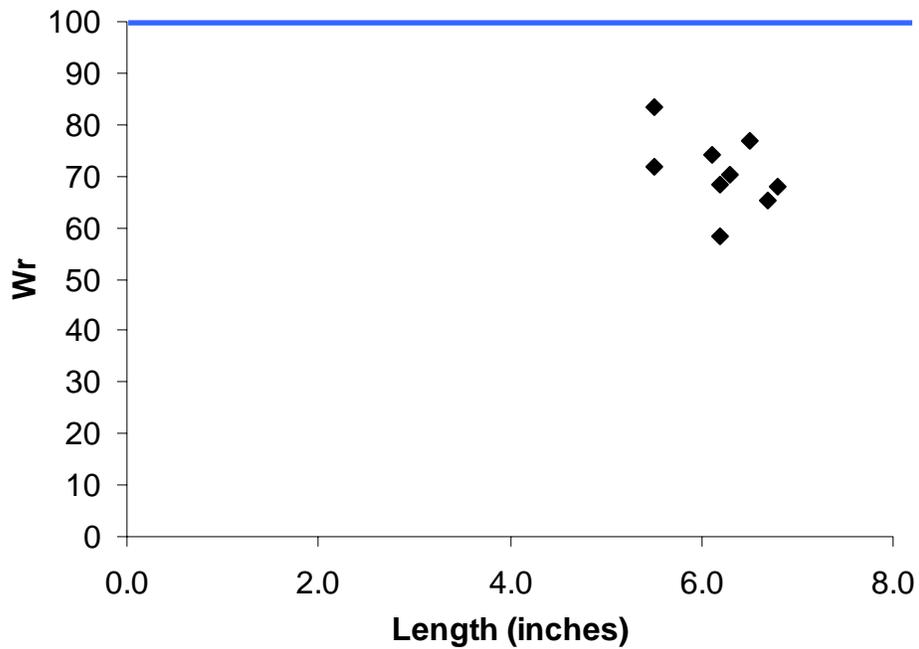


Figure 10. Relative Weight vs. Length of Yellow Perch Captured using Fyke Nets in Mission Lake during April 20-24, 2004.

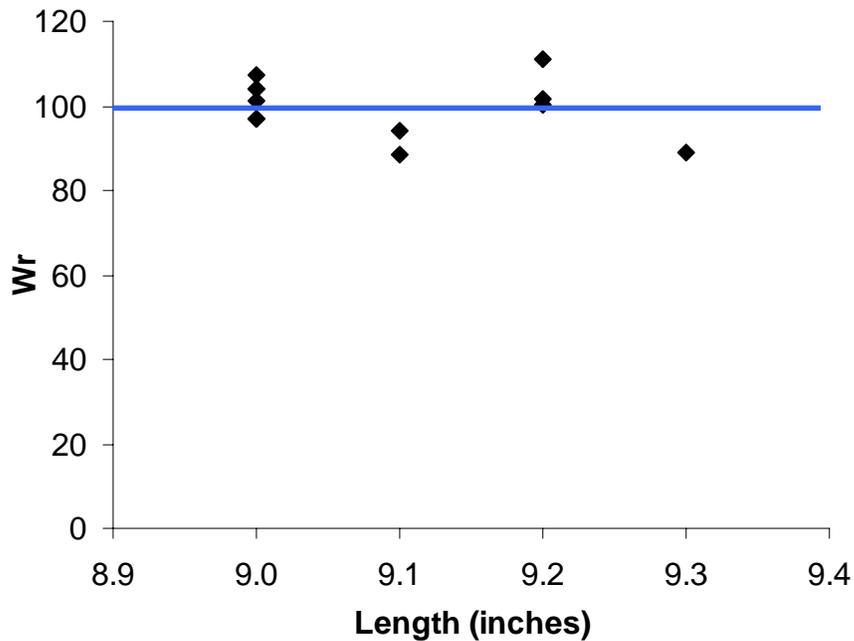


Figure 11. Relative Weight vs. Length of Largemouth Bass Captured using Fyke Nets in Mission Lake during April 20-24, 2004.

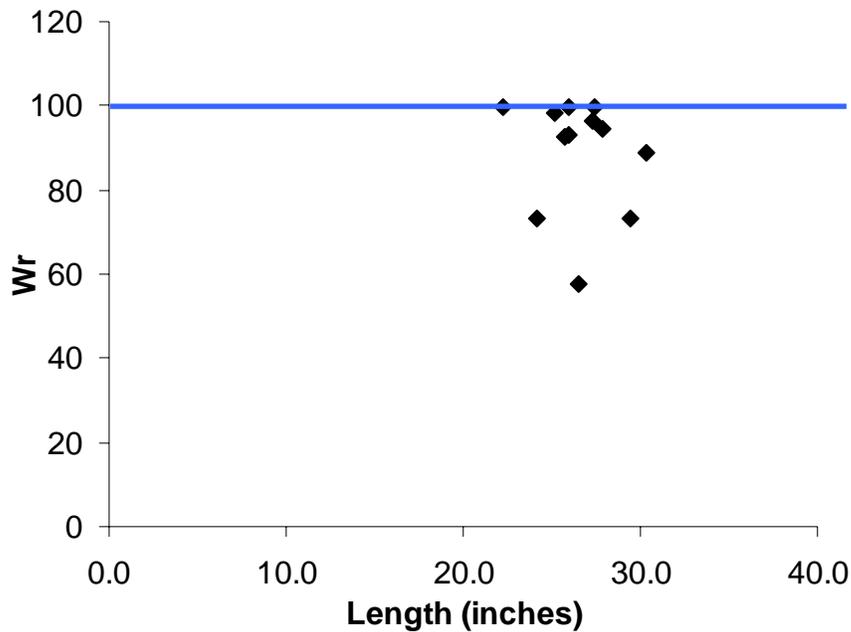


Figure 12. Relative Weight vs. Length of Northern Pike Captured using Fyke Nets in Mission Lake during April 20-24, 2004.

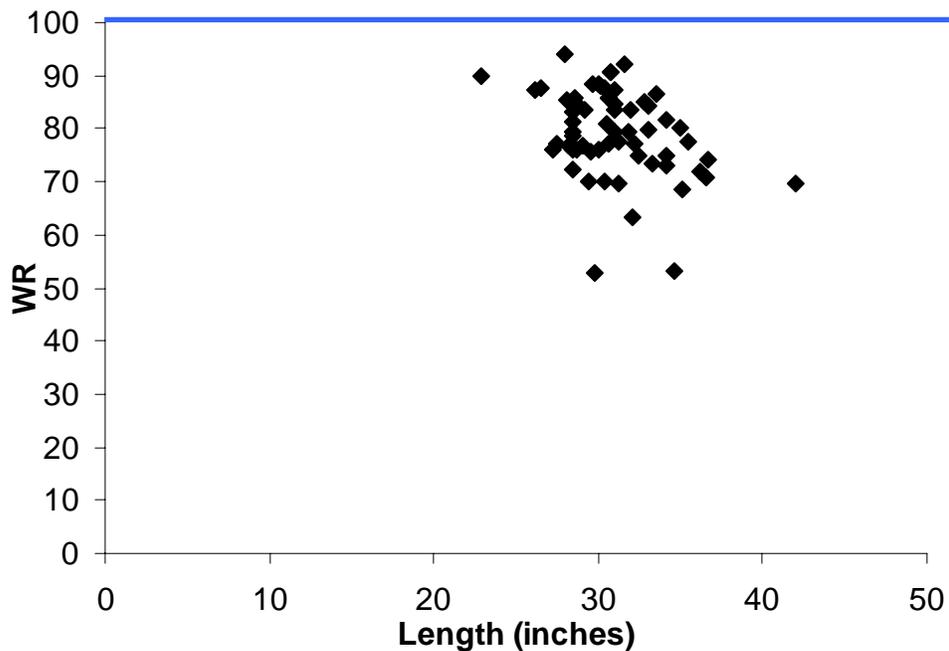


Figure 13. Relative Weight vs. Length of Muskellunge Captured using Fyke Nets in Mission Lake during April 20-24, 2004.

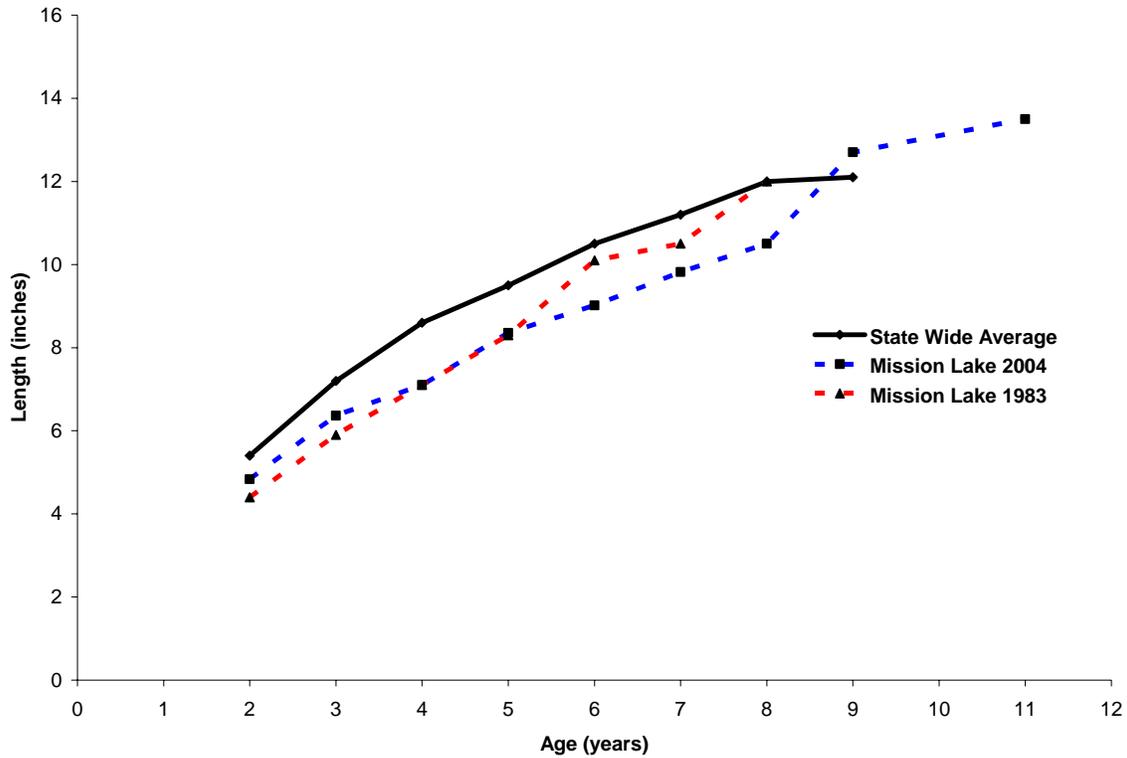


Figure 14. Length at Age of Black Crappie Captured using Fyke Nets in Mission Lake during April 20-24, 2004 and April 28-May6, 1983.

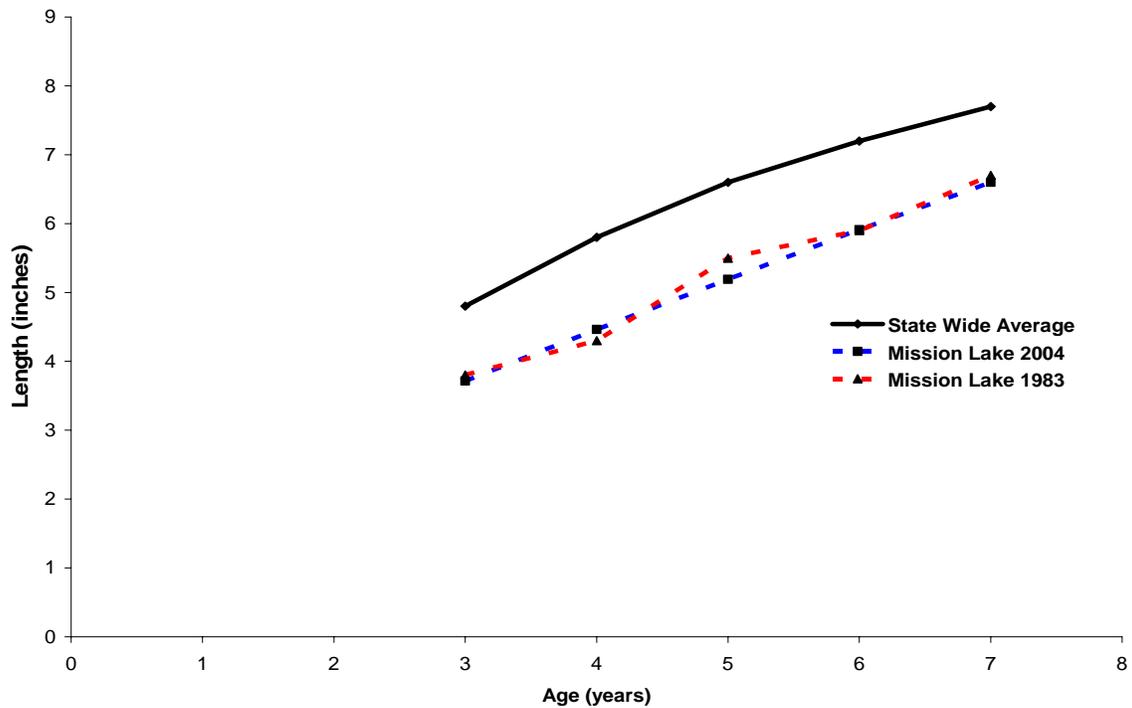


Figure 15 Length at Age of Bluegill Captured using Fyke Nets in Mission Lake during April 20-24, 2004 and April 28-May6, 1983.

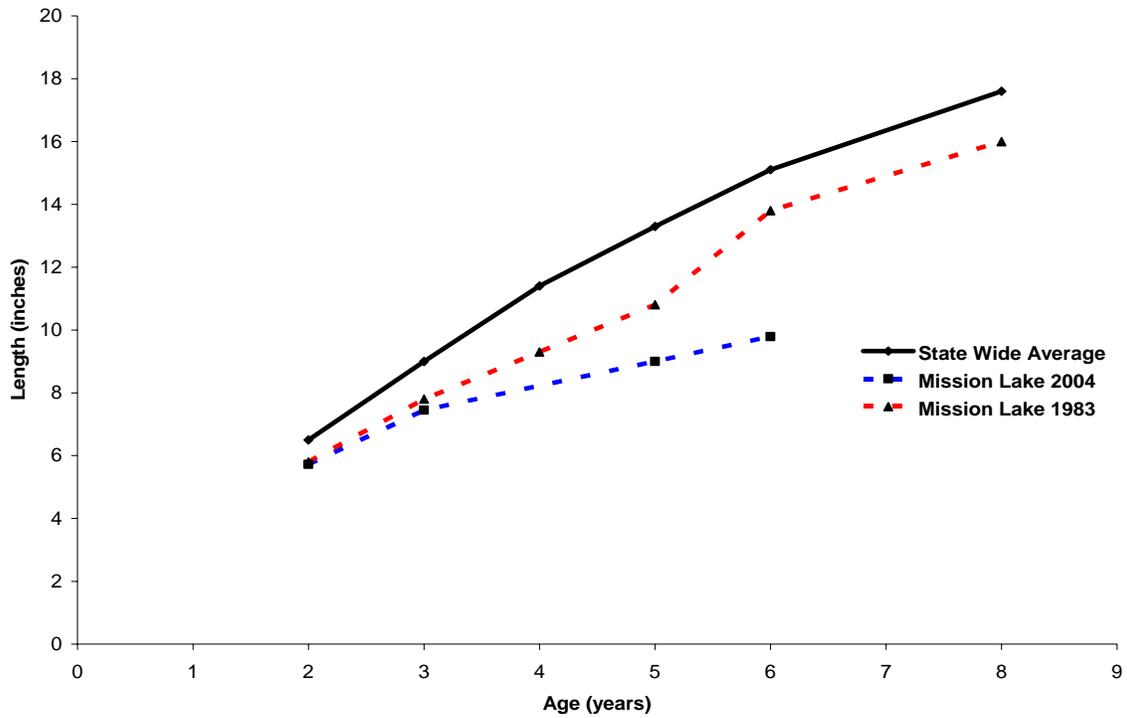


Figure 16. Length at Age of Largemouth Bass Captured using Fyke Nets in Mission Lake during April 20-24, 2004 and April 28-May6, 1983.

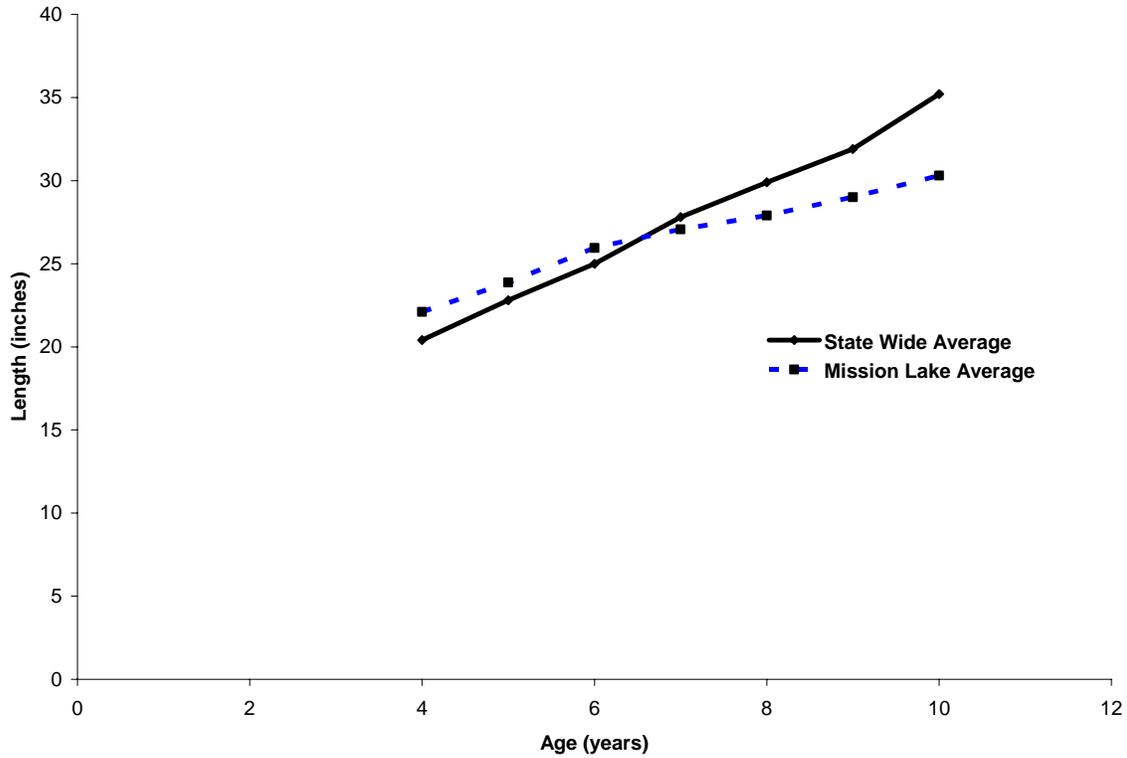


Figure 17. Length at Age of Northern Pike Captured using Fyke Nets in Mission Lake during April 20-24, 2004.

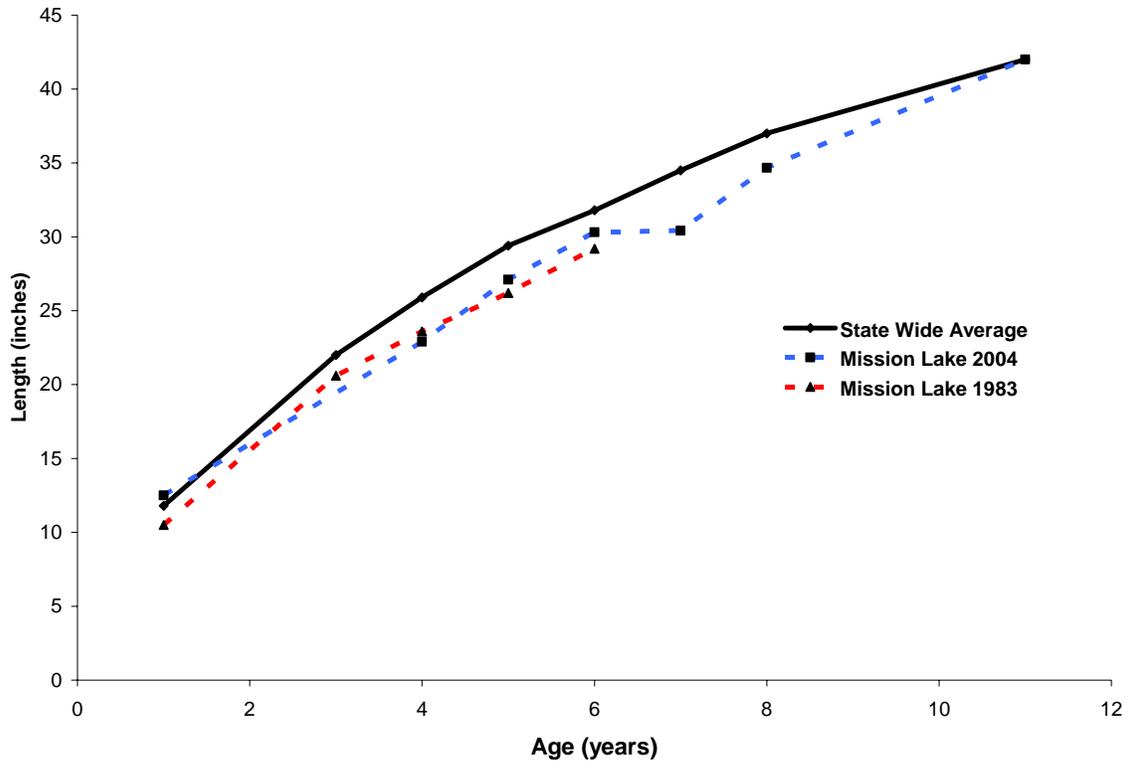


Figure 18. Length at Age of Muskellunge Captured using Fyke Nets in Mission Lake during April 28- May 6, 1983 and April 20-24, 2004.

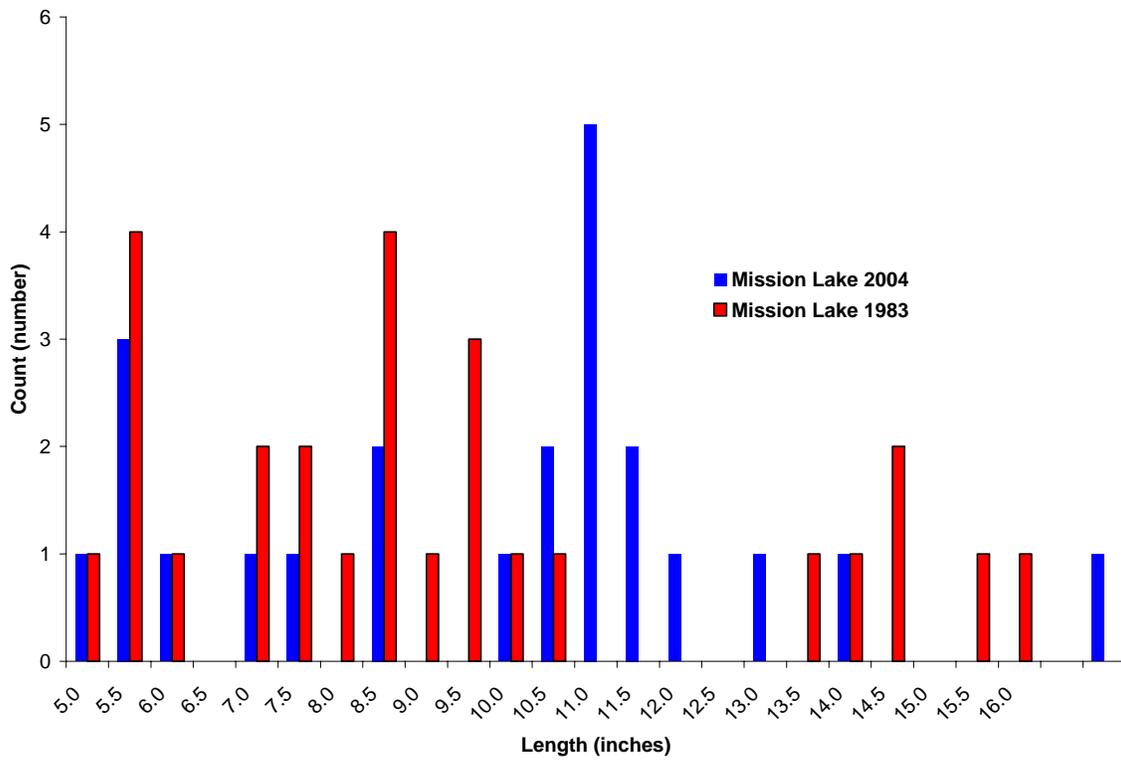


Figure 19. Length Frequency of Largemouth Bass Captured using an Electrofishing Boat in Mission Lake During June 22, 2004 and June 22, 1983.

Appendix A

Locations of fyke nets set during the Spring 2004 fyke net survey. Listed from East to West.

N 44.781 W-89.3479

N 44.7767 W-89.3481

N 44.7747 W-89.3486

N 44.7744 W-89.3506

N 44.7762 W-89.3537

N 44.7763 W-89.3563

N 44.7758 W-89.3590

N 44.7771 W-89.3595