

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND WILDLIFE

SECTION OF FISHERIES

MAJOR RIVER SURVEY REPORT

INITIAL RIVER SURVEY,

UPPER MISSISSIPPI RIVER, POOL 2, 2008

BY

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INTRODUCTION

A position in the East Metro Area Fisheries Office in St Paul was modified in January of 2008 to focus on the large river resources within the area (St Croix River and Pool 2 of the Mississippi River). The goal of this rededication to the rivers was to gather a better understanding of the fisheries in these rivers and sample them more consistently. In 2008, Pool 2 of the Mississippi River was re-surveyed for the first time since 2003. The upper limit of Pool 2 is Lock and Dam #1 in Saint Paul (also known as Ford Dam) at river mile 847.5 and the pool extends to Lock and Dam #2 in Hastings at river mile 815.2 (Figure 1). Over the years, effort, techniques, and sampling areas have varied greatly. It was determined that new standard electrofishing stations would be developed, and these stations would be repeated in future standardized surveys. In 1993, special catch-and-release regulations were imposed allowing year round angling on walleye, sauger, largemouth bass, and smallmouth bass. Little has been done to assess the impact of these regulations.

Past survey efforts have sampled the riverine portion independently of the backwaters (Baldwin, Mooers, Pigs Eye, River, and Spring lakes, and Grey Cloud Slough). Timing of the surveys was variable, as Pool 2 and its backwaters appear to have been assessed when time allowed and have been found to be sampled in June, July, or August. To formulate an accurate assessment of the fishery, Pool 2 surveys should be reported as a whole, not separating the backwaters into separate surveys. Although some individual fish may reside in some of the backwaters throughout their lifespan, it is more likely that the majority of fish found in these backwaters do not spend all of their lives in one backwater area. A survey of the entire stretch of Pool 2 is more useful to biologists, anglers, and environmental review staff than for example, a survey of Spring Lake one season in August compared to a survey of Baldwin Lake the next season in June. In addition, the timing of the surveys should remain consistent with previous surveys as the fish assemblage likely changes throughout the season.

METHODS

Due to habitat conditions throughout Pool 2, electrofishing was viewed as the best sampling method to assess the status of the fishery. Setting gill nets and trap nets in Pool 2 is difficult. Current, debris, commercial and recreational boat and barge traffic, and extended shallow areas prohibit setting gill nets and trap nets in much of the pool.

Twenty electrofishing stations were established to sample the entire 32.3 river miles and the backwaters within Pool 2. These stations were not chosen randomly. They were chosen to sample all of the available habitat types within the pool, while avoiding areas that could be unavailable due to commercial barge traffic. Each electrofishing station was approximately one-half mile in length with all species shocked being sampled. All fish shocked were collected, however extra effort was put forth to collect game fish species that surfaced behind the boat. Sixty pulses per second direct current was the standard frequency used. The voltage range setting was 240-340 volts with a target range of six to eight amperes. These settings produced the best electrofishing response across a broad array of species with minimal mortality. Crews consisted of two people, one boat operator and one dipper. Because of the

unpredictability of the work environment on the Mississippi River, electrofishing was performed in daylight hours and the boat traveled with the current during sampling.

The 20 standard electrofishing stations were sampled from July 21, 2008 through August 28, 2008. In addition to the new standard stations, additional data was obtained with 16 hoop net sets and fall electrofishing. The 16 hoop net sets were set in the fall in an attempt to sample channel catfish and supplement the data from the summer survey. The hoop net sets were also an initial attempt to evaluate the effectiveness of these nets to sample catfish in rivers in preparation for a metro catfish tagging project. The hoop nets did not have leads and were baited to attract catfish. Four of the nets had one-inch bar mesh, two of which had two eight-inch diameter throats while the other two had a first throat diameter of 12-inches, while the second throat was eight-inches. The other four hoop nets used had the same specifications on throat diameter, but the bar mesh was two-inches. The fall electrofishing was not conducted at standard sites and was not conducted to obtain catch rates. Rather, it was to sample as many walleye, sauger, largemouth bass, and smallmouth bass as possible to develop a length frequency histogram and collect scale samples for age analysis to evaluate the catch-and-release regulation on these species.

RESULTS & DISCUSSION

Twenty-eight different fish species, one hybrid (hybrid sunfish), and one variant (mirror carp) were sampled in Pool 2 during the standard electrofishing survey (Table 2). A few species sampled in the 2003 survey were not sampled in this survey. They were blue sucker, a Minnesota Species of Special Concern, bowfin, river redhorse, and silver chub. During the course of the supplemental fall electrofishing, blue suckers were observed and not collected. Emerald shiners were also observed, but no effort was made to enumerate them as they, and many other minnow species, are typically small enough to pass through the mesh of dip nets used for electrofishing. Greater redhorse, green sunfish, highfin carpsucker, pumpkinseed, and white crappie were sampled in this survey and not in 2003.

Many more gizzard shad were observed than were sampled for this survey. Due to the large abundance of gizzard shad and the limited information utilized from their collection, other species were collected before an attempt was made to collect shad. This occasionally happened with common carp and buffalo species as well, not because of the large numbers, but because of the size of the carp and buffalo. The time and effort it took to dip those larger fish with the net and transfer them to the holding tank sacrificed collecting other species (i.e. game fish) where more information could be obtained by collecting scale samples. Even with that sampling bias, common carp were the most abundant species sampled by number and weight, and smallmouth buffalo were the second most abundant species by weight. In general, the standard electrofishing survey yielded low numbers of game fish. A total of 784 fish were collected in the 20 stations, most of which were species not considered desirable by most anglers. This is not unexpected as major rivers have diverse fish communities and are extremely productive, capable of supporting a large amount of fish biomass.

Originally, this survey was to be reported as a re-survey effort. After analyzing the data, it was apparent much of the past and present data are not comparable and this survey will be stored in the database as an initial survey. Due to differences in sampling gear, locations, personnel, timing of sampling, and differences in crew sizes, data like catch rates and length frequency histograms can rarely be compared. Back-calculated length-at-age is the only data obtained that can be compared to past surveys when different methods are employed. However, aging error associated with aging fish species with scales is quite common. Much of the 2008 data collected is compared to similar sampling that occurs annually in Lake Pepin.

Only 15 walleye were sampled in the standard survey. However, targeted electrofishing in the fall sampled 88 more walleye. Combining these two survey samples yielded a PSD of 91, RSD₂₀ of 64, and RSD₂₅ of 32. The length frequency distribution was atypical of a normal population. Sixty-three (61.2%) of the 103 walleye sampled were 15-inches or longer. Additionally, 22 (21.4%) of the walleye sampled were 25-in or longer. Length frequency histograms of 2008 fall electrofishing for Pool 2 and Lake Pepin were compared to assess population size structure differences. The data were modified to allow a better comparison between the locations. First, the data were transformed to represent percent of fish caught per length frequency, rather than number caught per length frequency, as the Lake City crew sampled almost twice as many fish. The second modification omitted walleye less than 10-inches from the Pool 2 sample. Twenty-nine of the 88 (33%) walleye sampled in the fall were less than 10-inches long, whereas none were sampled below 10-inches in Lake Pepin (the Lake City Area Office reports this as a normal occurrence). Following these modifications to formulate more comparable data, a stark contrast is evident between the populations sampled over 10-inches (Figure 4). The large proportion of larger fish is likely due to the catch-and-release regulation on Pool 2 which has been in effect since 1993. Like Pool 2, Lake Pepin has a continuous walleye season. However, the regulation differs in that the Lake Pepin daily limit is six with a minimum length limit of 15-in. Scale samples were collected from all 103 Pool 2 walleye for age analysis. In addition, six otoliths were extracted to confirm ages. Walleye ages represented every age class from young of the year through 11 (Figure 5). The 11-year-old fish age was confirmed with an otolith and was the largest walleye in the sample, measuring 28.5-in long and weighing 8.6 pounds. Growth was fast as expected and was comparable to previous age and growth analyses (Figure 6). When Pool 2 average back-calculated lengths-at-age were compared to 2008 electrofishing data from Lake Pepin, the results were very similar (Figure 7). Of the walleye greater than 10-inches sampled by 2008 fall electrofishing, 61% (36 of 59) were at least 5-years-old in Pool 2 compared to 27.4% (29 of 344) for Lake Pepin. Four of the six walleye sacrificed for otolith extraction were also used in samples testing for Viral Hemorrhagic Septicemia (VHS).

Seven sauger were sampled in standard electrofishing stations and was supplemented with 15 more from fall electrofishing. Too few sauger were sampled to make an accurate assessment of stock density through descriptors such as PSD and RSD and similar 2008 data was not available to make comparisons to Lake Pepin. Twenty of the 22 sauger sampled had usable scales for age analysis. Back-calculated lengths-at-age were comparable to past surveys (Figure 8). Fish were aged 1 through 9, but

no 3- or 8-year-old fish were sampled (Figure 9). Most of the sauger sampled (12 of the 20 aged) were 1- year-old. The oldest and largest sauger sampled was 21.4-in long and weighed 3.1 lbs.

Fifty-seven smallmouth bass were sampled in the standard electrofishing stations. An additional 90 were collected in fall electrofishing, 26 of which were young of the year. Length frequency histograms comparing the summer electrofishing to fall electrofishing showed similar length frequencies with the exception of the larger number of small (less than 6-in) smallmouth bass sampled in the fall (Figure 10). Combining all smallmouth bass sampled, the PSD was 34, RSD_{14} was 13, and RSD_{17} was 3. The length frequency distribution was typical with smaller fish being more abundant than larger fish and growth was fast, which is expected. Twelve (8.2%) of the 147 smallmouth bass sampled were 14-in or larger. Age and growth analysis was performed on 137 of the 147 smallmouth bass sampled. All year classes were sampled back to 2001 (age-0 through age-7, Figure 11). Like the walleye data, editing occurred to make the fall smallmouth bass electrofishing data comparable between Pool 2 and Lake Pepin. Smallmouth bass below six-inches were omitted and the catch was converted to percent of catch six-inches and larger. Following these edits, the smallmouth bass populations displayed some minor differences between water bodies (Figure 12). This was unexpected given the catch-and-release regulation on Pool 2 compared to the 14-in minimum size limit on Lake Pepin. This could be due to strong year classes moving through the systems. However, a larger size structure was expected in Pool 2 given the no harvest regulation. Differences between the two water bodies are also likely to be obscured by the strong catch-and-release ethic of most anglers targeting smallmouth bass. Back-calculated mean length-at-age was similar in Pool 2 as compared to Lake Pepin until age 5, at which point smallmouth bass growth rates were slower in Pool 2 (Figure 13). This difference is likely due to the small sample size ($N=5$) of 5-year-old and older smallmouth bass sampled in Pool 2. Back-calculated length-at-age comparisons to previous sampling in Pool 2 had some differences (Figure 14). It is not known if these differences are due to small samples sizes, attributed to aging errors, or are correct and significant. Of the smallmouth bass aged, 3.6% were at least 5-years-old, while similar sampling on Lake Pepin had 8.4% ($N=29$) at least 5-years-old. The largest smallmouth bass sampled in Pool 2 was 18.4-in long, weighed 3 lbs, and was 4-years-old. The oldest smallmouth bass (7) was 17.5-in long.

This was possibly the largest largemouth bass sample in a single survey for Pool 2, likely because more diverse habitats were sampled throughout the pool, including stations in backwater areas. Fourteen largemouth bass were sampled in the standard survey stations and 98 more were sampled in fall electrofishing, eight of which were young of the year. All electrofishing combined, the PSD was 72 and RSD_{15} was 19. Like smallmouth bass, the largemouth bass length frequency distribution was what is typically expected, with a greater abundance of smaller fish sampled than larger fish. Seven (6.3%) of the 112 largemouth bass sampled were 15-in or larger. A length frequency histogram comparing percent of sample per length group for fall electrofishing data between Pool 2 and Lake Pepin were greatly different until all largemouth bass less than eight-inches were omitted (similar editing as done to compare Pool 2 walleye and smallmouth bass to catches in Lake Pepin). The large number of smaller bass sampled greatly skewed the percent catch at each length frequency for Pool 2. After the omission, the samples were comparable with a few differences, although the Pool 2 sample size was small after the omission ($N=25$, Figure 15). Age and growth analysis was performed on 104 of the 112 largemouth

bass sampled. All year classes were sampled back to 2001 (age-0 through age-7, Figure 16). Largemouth bass length-at-capture by age were more variable than the smallmouth bass. Mean back-calculated lengths-at-age showed a slightly slower growth rate than Lake Pepin (Figure 17). Comparing back-calculated ages within Pool 2 over time, a notable difference is observed from the 1994 sample (Figure 18). Growth rates appear to have slowed significantly since 1994. It is difficult to determine if this difference is significant and correct due to the difficulty and large variances observed when aging the 2008 sample with scales. The only way to be certain if these differences are in fact real would be confirmed ages with otoliths, which we do not have. Of the largemouth bass aged, 10 (9.6%) were at least 5-years-old. The smallest 4-year-old measured 8.4-in long and the largest was 16.2-in. The largest largemouth bass sampled was 17.2-in long, weighed 3.2 lbs, and was aged as 6-years-old. That age was confirmed with an otolith. Otoliths were extracted from two other largemouth bass and they were 13.4 and 14.2-in long and aged 2 and 3 respectively. The oldest largemouth bass (7) was 16.7-in long. The three largemouth bass sacrificed for otolith extraction were also used as samples submitted for VHS testing.

Greater attention was given to white bass in this survey as this species has been receiving increased demand for more intensive management in the metro area. Forty-four white bass were sampled in this survey ranging in size from 7.9-in to 16.8-in. The PSD was 95, RSD_{12} was 86, and RSD_{15} was 18. Forty of the 44 white bass collected were analyzed for age and growth information. White bass ages ranged from 2- to 6-years-old (Figure 19). Because of white bass' pelagic nature, electrofishing alone may be inadequate to accurately describe the population present in Pool 2. Most of the white bass sampled were larger than 12-inches (Figure 20). Gill nets would likely sample a broader range of sizes, although gill nets are difficult to set in Pool 2. Like other game fish species in Pool 2, white bass grow fast because of the abundant forage available to them. However, recent personal communication with Jonathan Meerbeek in the Lake City Area Office has revealed that white bass may be living much longer than what was previously estimated. Aging white bass with otoliths, Meerbeek has found white bass as old as 15 in Lake Pepin. White bass were previously thought to grow fast and die young, however these recent findings warrant more detailed aging investigations. This could be the reason white bass sometimes have higher contaminant levels than other piscivores as they could be bioaccumulating the contaminants over a longer time period than was previously estimated.

Like largemouth bass, bluegill were sampled in higher quantities than previous river surveys, again likely due to the diverse habitats (backwaters) sampled in this survey. Sixty-nine bluegill were collected in the electrofishing survey and two more were sampled in the supplemental hoop nets. Utilizing electrofishing data only yielded a PSD of 13. Only nine (12.7%) of the 71 bluegill sampled were 6-in or longer. Age and growth information was obtained for 54 of the 71 bluegill sampled. Growth was relatively slow and ages difficult to determine (Figure 21). Conditions in Pool 2 are not favorable to bluegill at this time. The water clarity is extremely poor even in backwater areas, which would make it difficult for a sight feeder like bluegill. It is recommended to obtain otoliths in future surveys to increase aging accuracy. The largest bluegill sampled was 7.9-in long, weighed 0.4 lb, and was aged as 7-years-old.

Nineteen channel catfish were sampled with summer electrofishing and another eight were sampled in fall electrofishing. Lengths ranged from 5.1- to 26.3-in with an average of 16.5-in. Supplemental hoop nets were used in the fall in an attempt to sample more channel catfish. Hoop nets were baited with soy cake one day and no channel catfish were sampled. The hoop nets were re-set in different locations with the remaining soy cake left in the bait bags and chicken livers were added. Again, no channel catfish were sampled in the hoop nets. Subsequently, channel catfish observed during fall electrofishing for walleye, sauger, largemouth bass, and smallmouth bass were then collected to supplement the data. Spines were removed on all channel catfish to obtain ages as no catfish aging has been performed on Pool 2. The spines were then taken to the Science Museum of Minnesota in St. Paul to have them cleaned by their dermestid beetle colony. Not enough spines were cleaned and aged at the time this report was written. This report will be amended when the spines are completed and all channel catfish aged. Although 61 channel catfish were sampled in the 2003 survey with electrofishing and trot lines, the data are not comparable to 2008.

Fourteen flathead catfish were sampled with summer electrofishing and ranged in size from 5.6- to 26.9-in with an average of 14.1-in. A separate flathead catfish survey was conducted June through July, 2008 specifically targeting flathead catfish with low frequency electrofishing and was summarized in a separate report. Like channel catfish, spines were removed from all flathead catfish for age analysis and not all spines were back from the Science Museum of Minnesota for processing at the time of this report. This report will be amended to include these data when aging is completed. 2008 data was not compared to 2003 survey data as they were not comparable.

Nine black crappie and six white crappie were sampled during summer electrofishing. Hoop nets captured 13 more black crappie and three more white crappie. Scale samples were obtained from all 31 crappie for age and growth analysis, although previous age and growth analysis from crappie on Pool 2 is not known to exist. This data will be used for comparison in future surveys. The hoop nets used to target channel catfish were worthwhile in that they sampled just over half of the crappie in this survey. Although the sample size is small, Figure 22 shows the mean back-calculated length-at-age for both black and white crappie for illustrative purposes. The largest black crappie sampled was 10.9-in long and weighed 0.7 lb. The largest white crappie was 12.2-in long and weighed 0.9 lb.

Only two northern pike and no muskellunge were sampled in this survey, which is not surprising. Two muskellunge were sighted during electrofishing (one estimated larger than 40-inches) but sampling crews were not able to capture them. Most of Pool 2 is not conducive to esocids because of poor water clarity and little submersed and emergent vegetation throughout the pool. In addition, electrofishing is not an efficient way to sample esocids, especially with low water clarity, as specialized sampling with gill nets and trap nets would be the preferred method.

RECOMMENDATIONS

It is highly recommended that the survey protocol established in this survey be the standard for future Pool 2 surveys. As future work continues in the pool, more questions will likely arise than be

answered. That being the case, we should be more certain of the data collected and conducting surveys in a repeatable fashion should help to show trends in the fishery over time. More specialized sampling may be required to target specific species to further our knowledge of that species in Pool 2. In addition, it is recommended that otoliths become a standard structure retrieved to age fish to reduce the amount of error when aging fish. It is evident that further investigation is needed to evaluate the effects of the catch-and-release regulation on walleye, sauger, smallmouth bass, and largemouth bass. Specialized tactics such as a mark-recapture study may be needed to accomplish this task.

ACKNOWLEDGEMENTS

I would like to thank everyone in the Central Region Office and the East Metro and Lake City Area Offices who participated in sampling efforts and data analysis for this survey effort. I would especially like to thank the Science Museum of Minnesota for their assistance in cleaning the catfish spines with their dermestid beetle colony.

Figure 1 – Mississippi River, Pool 2, Study Area.

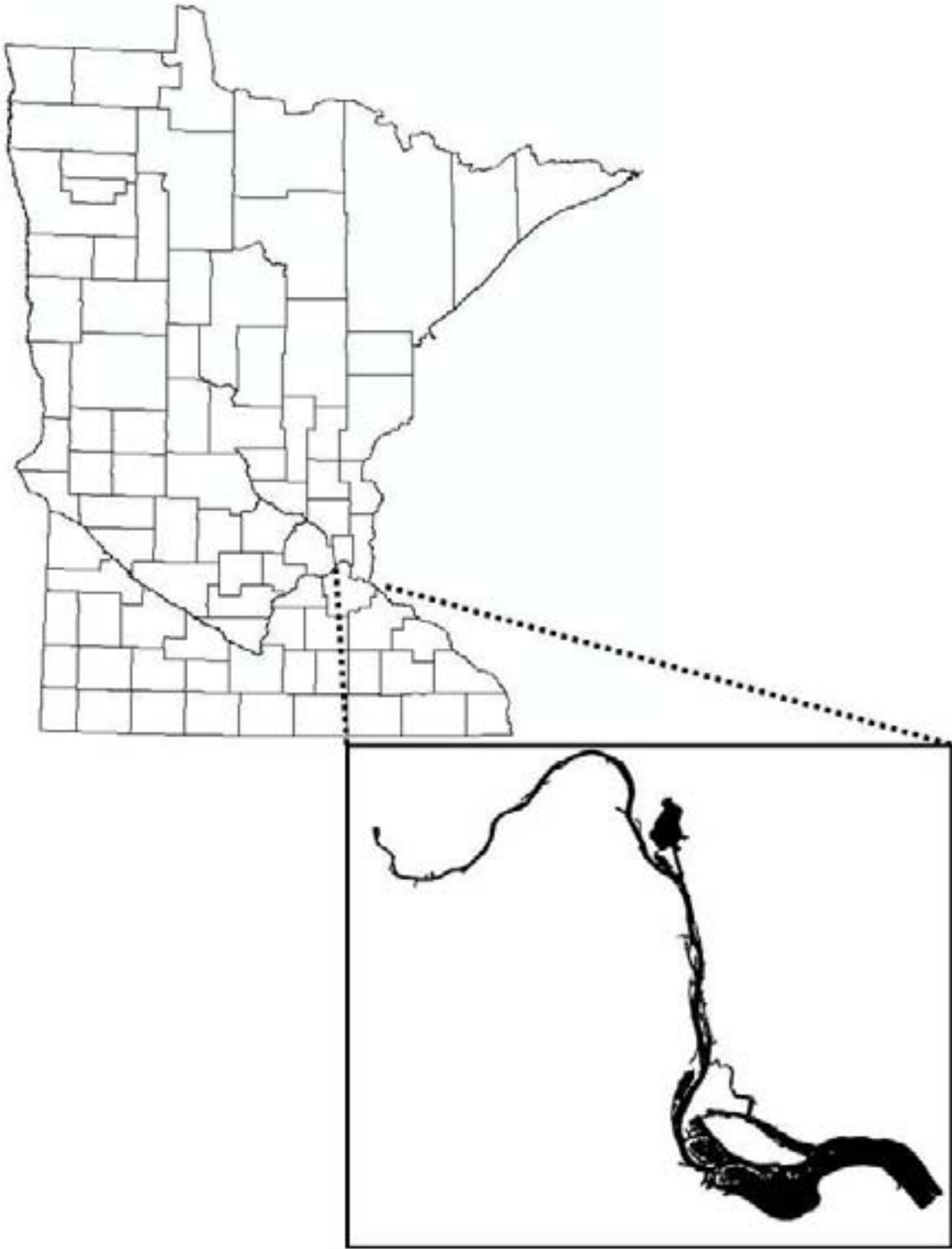


Figure 2 – Mississippi River Water Elevation at Saint Paul Gauge for 2008. This gage is cooperatively operated by the US Army Corps of Engineers St. Paul District and the US Geological Survey.

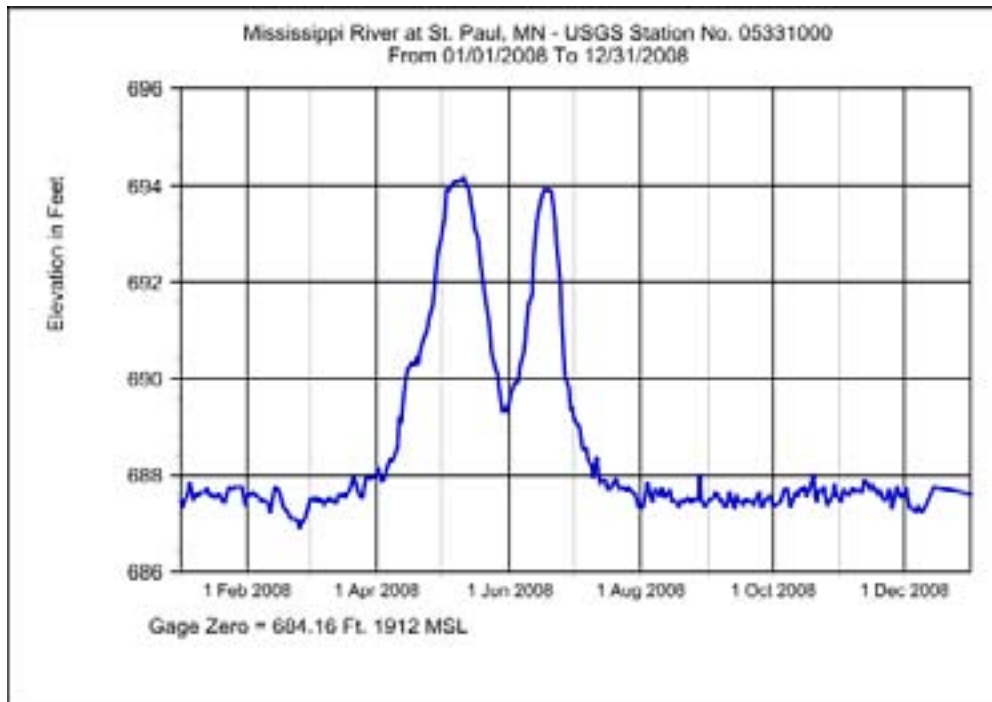


Figure 3 – Mississippi River Water Temperature (Degrees Fahrenheit) at Saint Paul Gauge for 2008. Incomplete line indicates missing data. This gage is cooperatively operated by the US Army Corps of Engineers St. Paul District and the US Geological Survey.

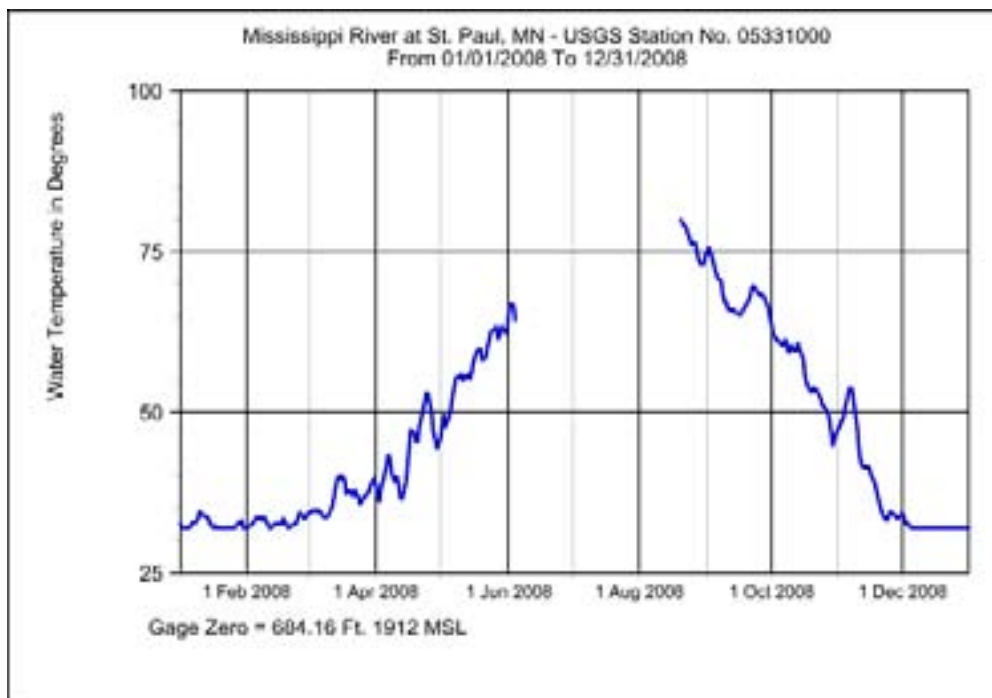


Figure 4 – Walleye Fall Electrofishing Percent of Catch by Length Class for Pool 2 and Lake Pepin, 2008. Pool 2 data modified to remove walleye sampled below 10-inches.

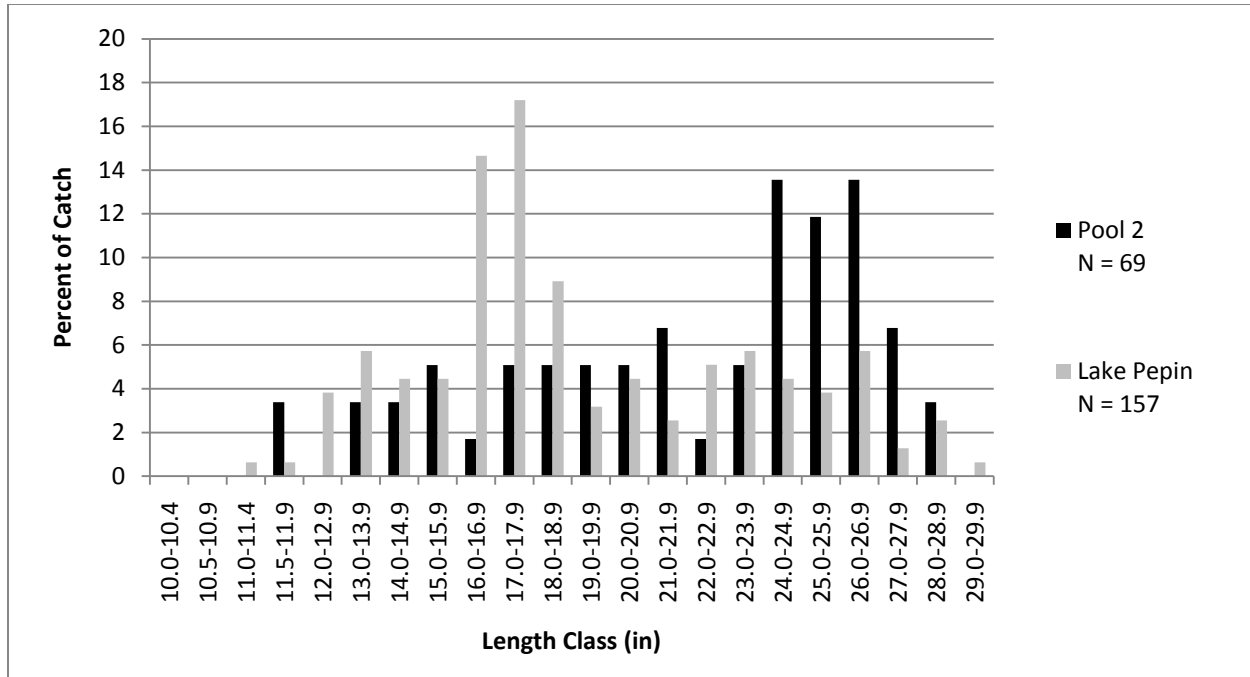


Figure 5 – 2008 Walleye Age and Length-at-Capture, all Electrofishing Data, Pool 2. Gray bars represent median length, boxes represent first and third quartiles, vertical lines represent maximum and minimum lengths.

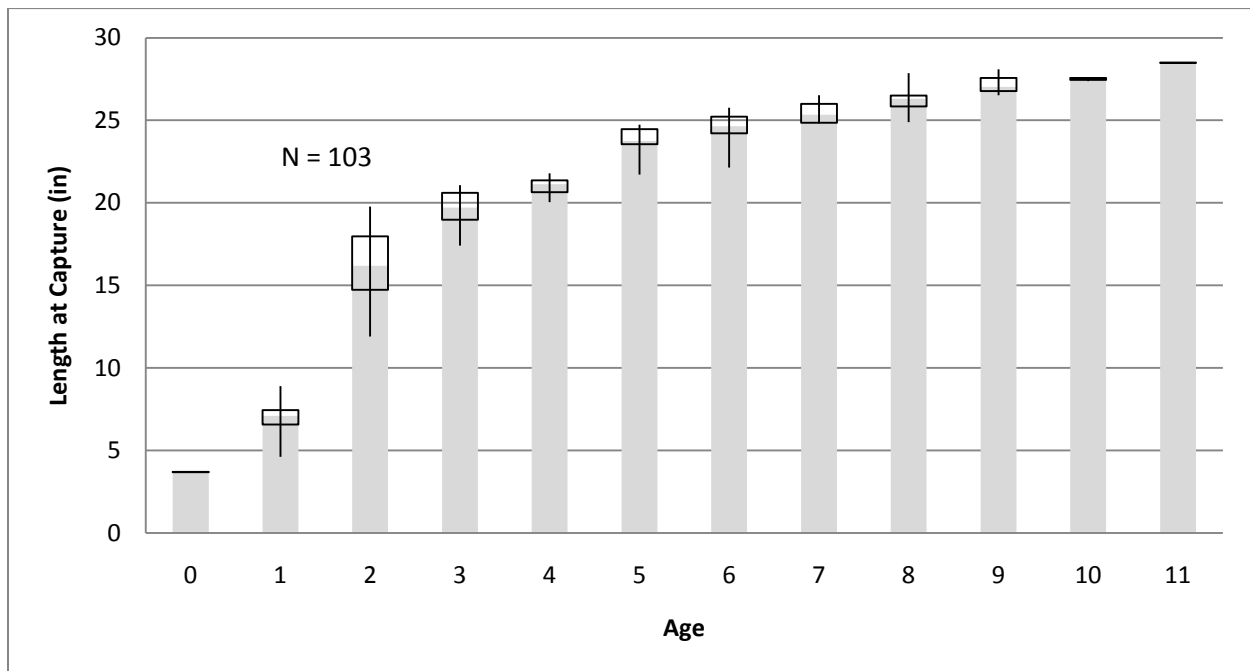


Figure 6 – Walleye Back-calculated Length-at-Age from Last Four Pool 2 Surveys.

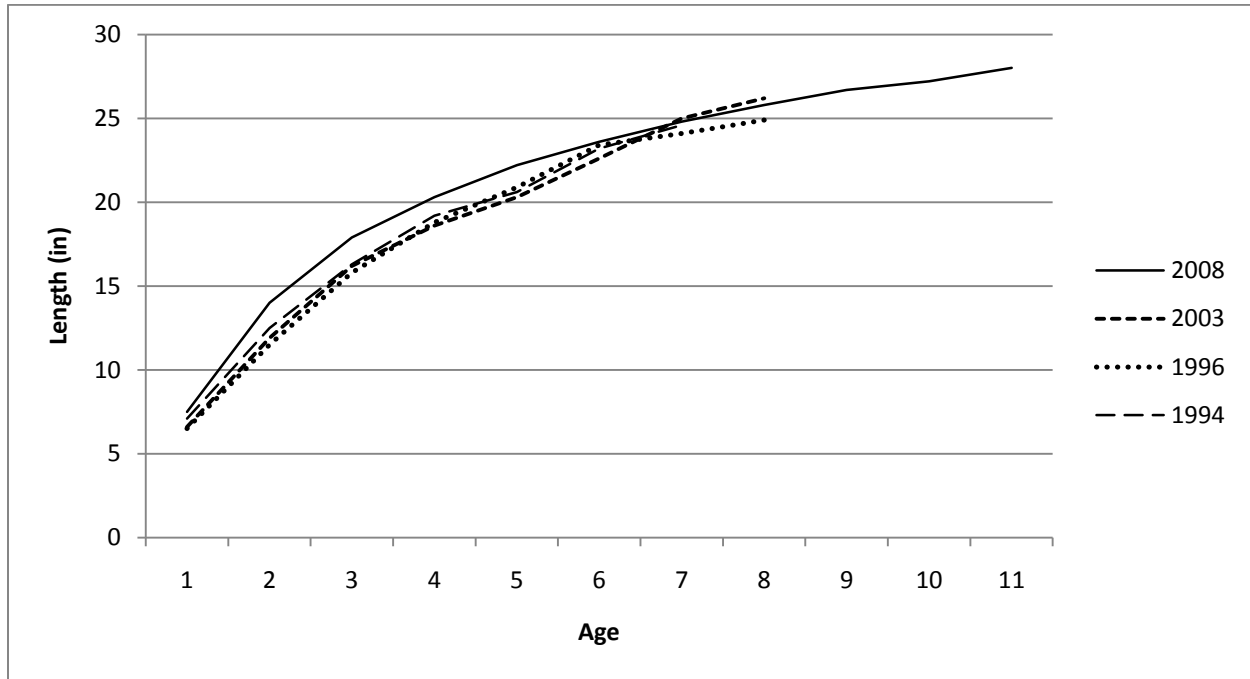


Figure 7 – Walleye Back-calculated Length-at-Age, Pool 2 Electrofishing 2008 versus Lake Pepin Fall Electrofishing 2008.

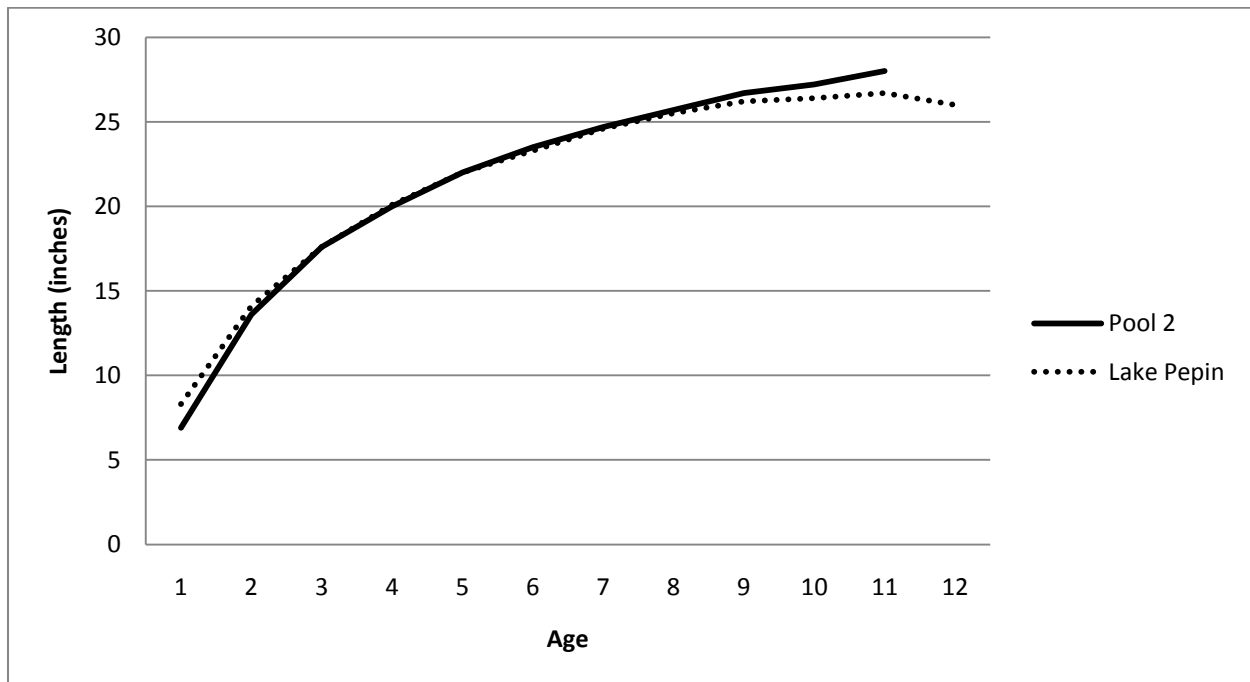


Figure 8 – Sauger Back-calculated Length-at-Age from Last Three Pool 2 Surveys.

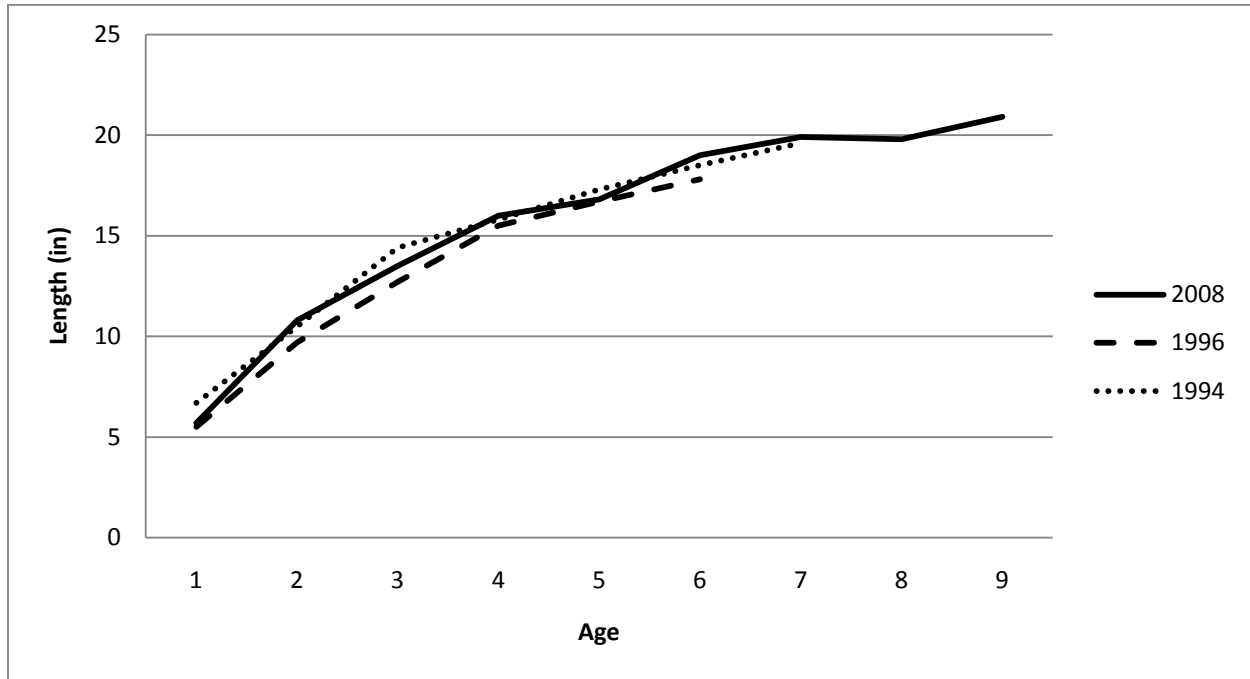


Figure 9 – 2008 Sauger Age and Length-at-Capture, all Electrofishing Data, Pool 2. Gray bars represent median length, boxes represent first and third quartiles, vertical lines represent maximum and minimum lengths.

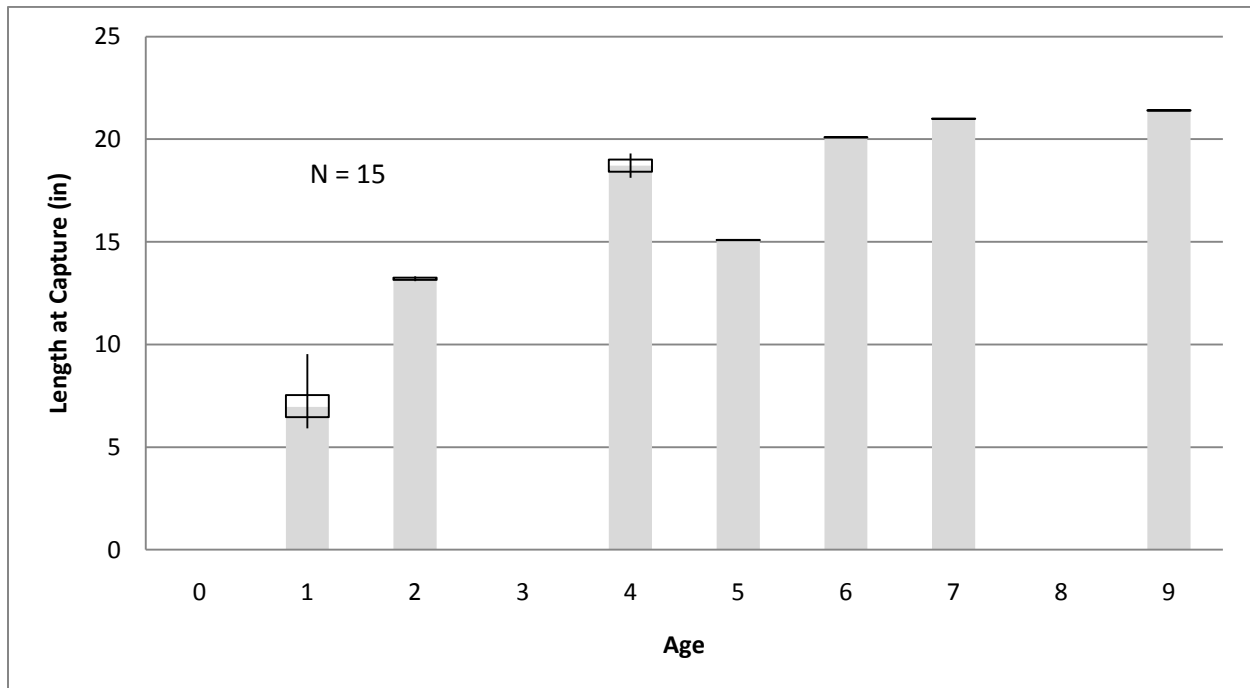


Figure 10 – Smallmouth Bass Summer Electrofishing Catch versus Fall Electrofishing Catch in Pool 2, 2008.

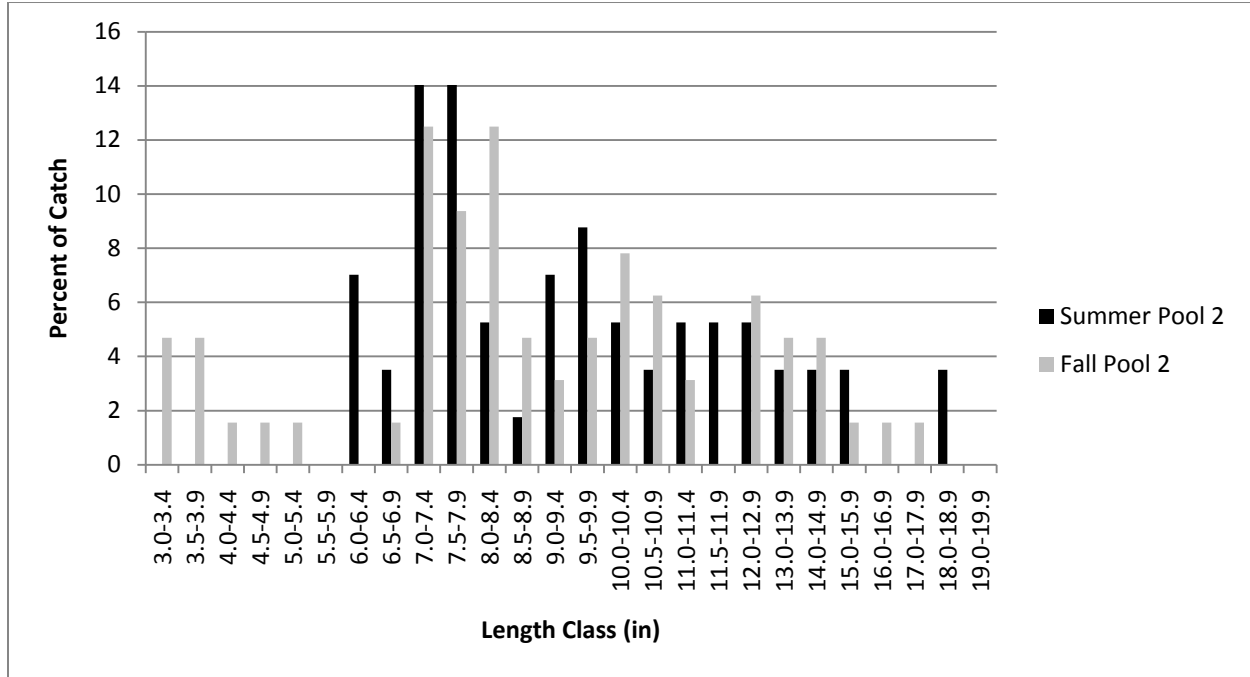


Figure 11 – 2008 Smallmouth Bass Age and Length-at-Capture, all Electrofishing Data, Pool 2. Gray bars represent median length, boxes represent first and third quartiles, vertical lines represent maximum and minimum lengths.

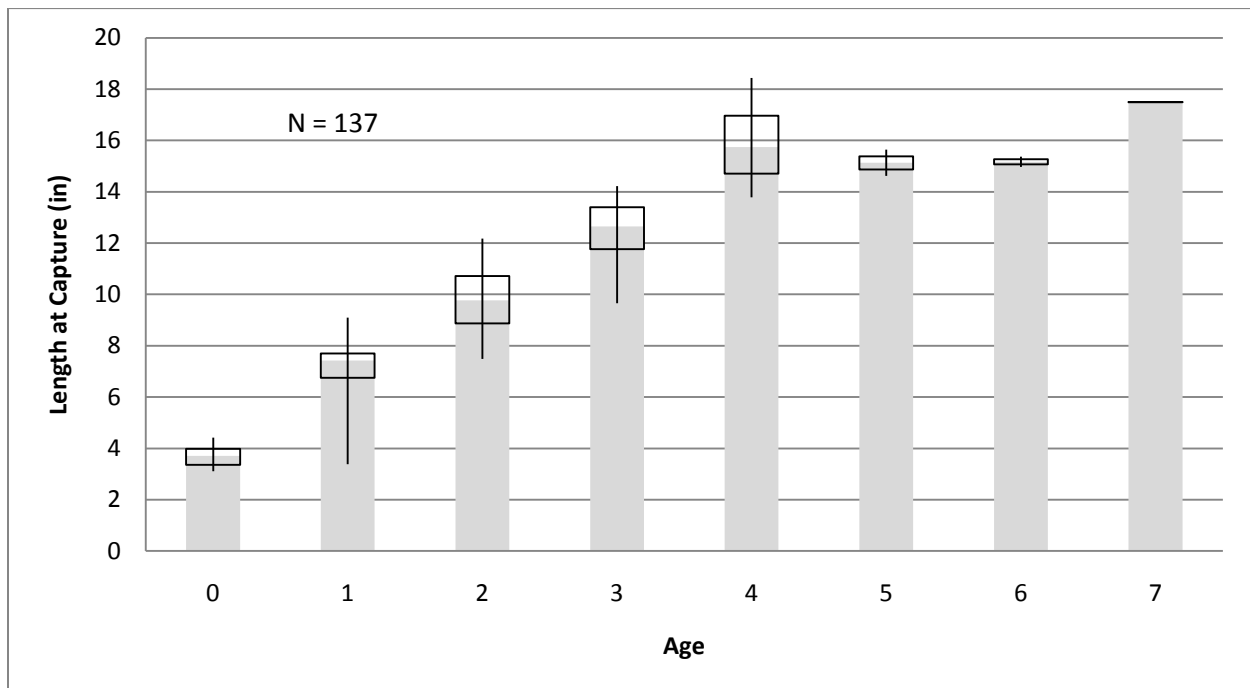


Figure 12 – Smallmouth Bass Fall Electrofishing Percent of Catch by Length Class for Pool 2 and Lake Pepin, 2008. Pool 2 data modified to remove smallmouth bass sampled below 6-inches.

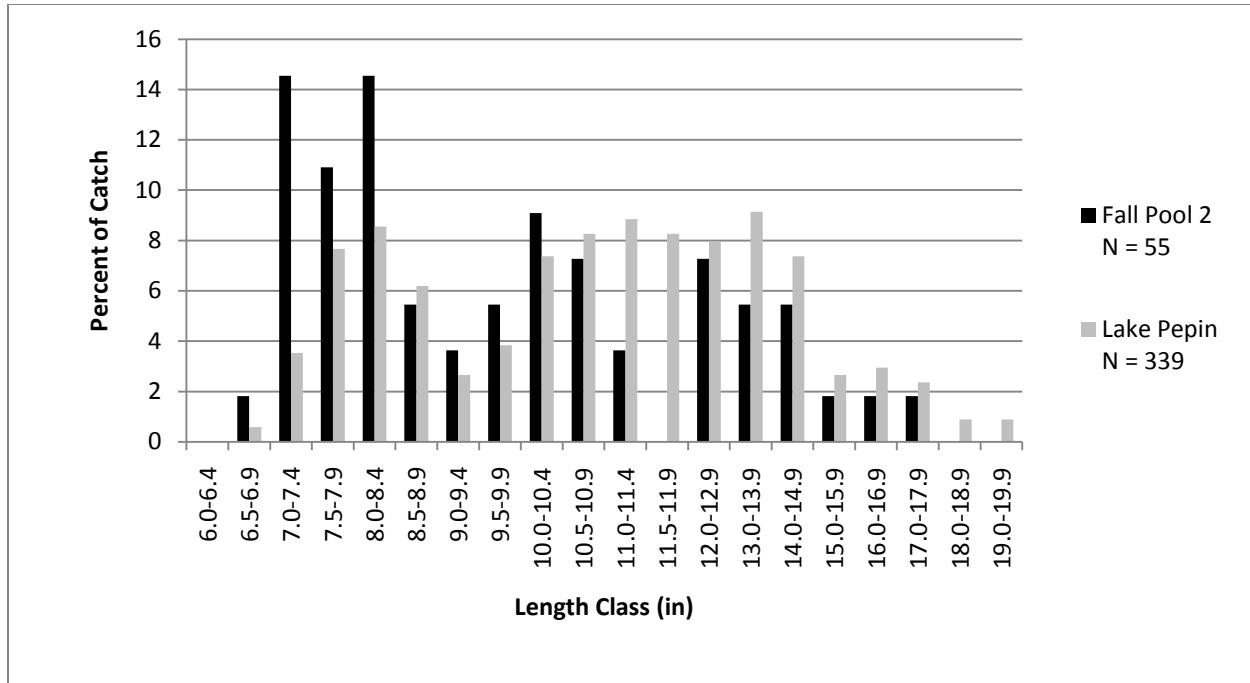


Figure 13 – Smallmouth Bass Back-calculated Length-at-Age, Pool 2 Electrofishing 2008 versus Lake Pepin Fall Electrofishing 2008.

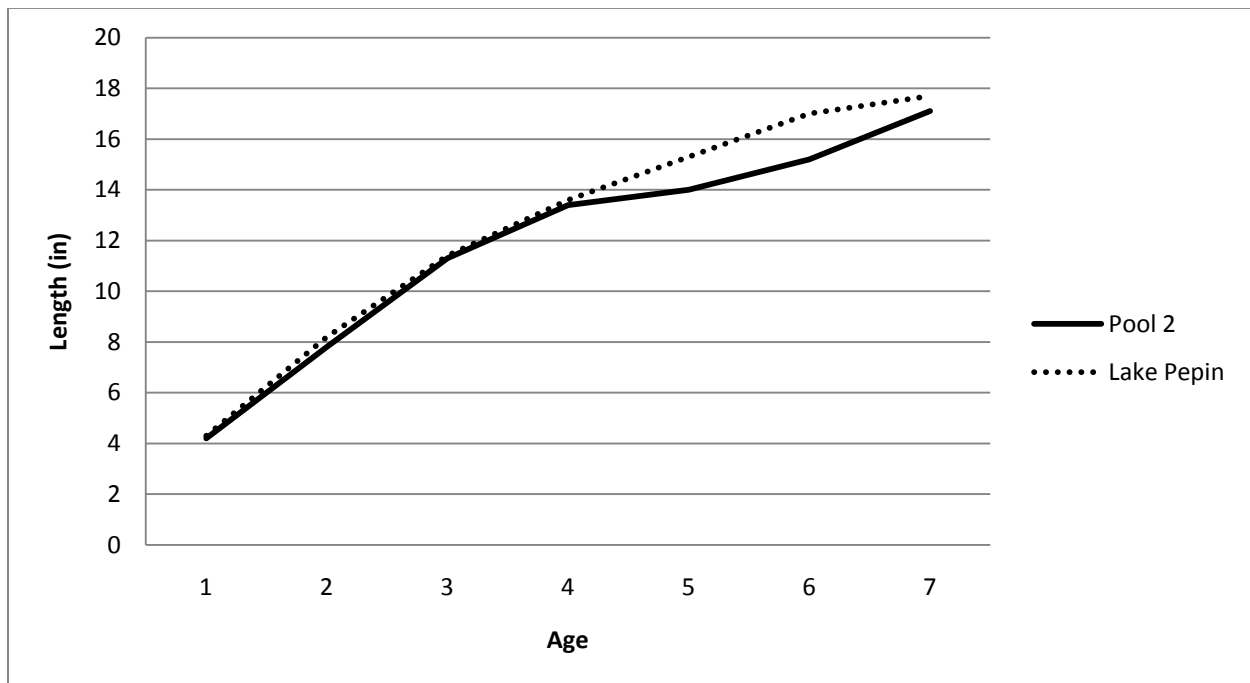


Figure 14 – Smallmouth Bass Back-calculated Length-at-Age from Last Three Pool 2 Surveys.

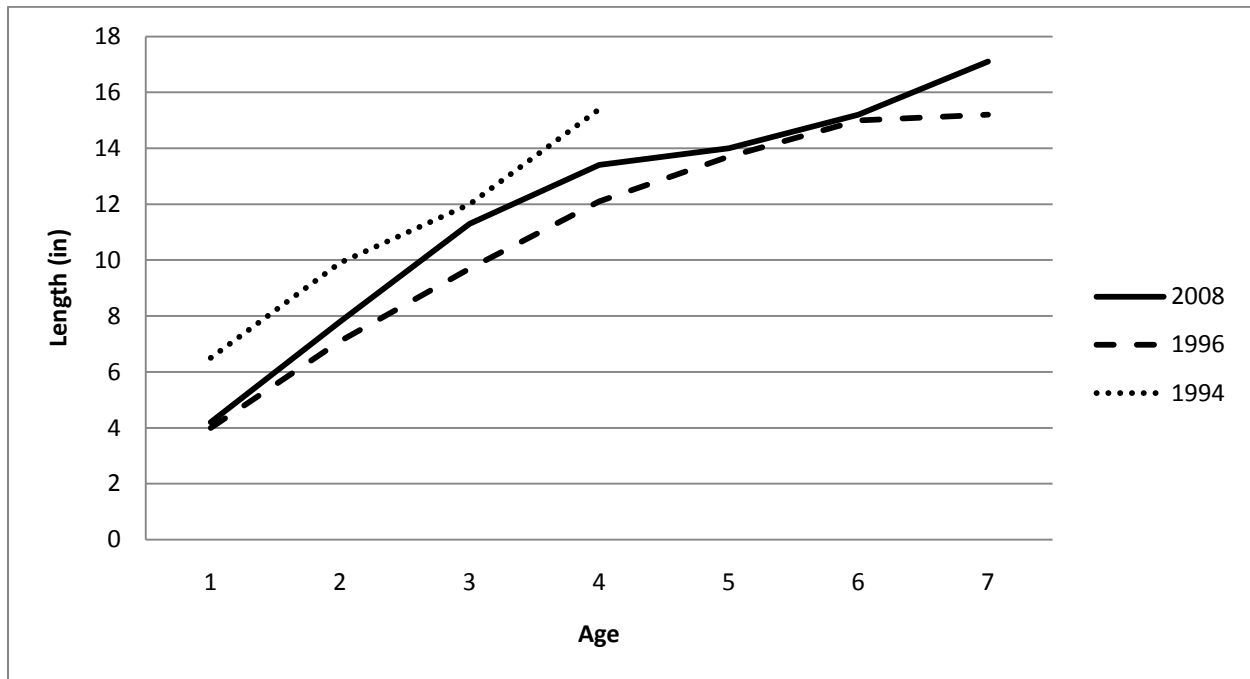


Figure 15 – Largemouth Bass Fall Electrofishing Percent of Catch by Length Class for Pool 2 and Lake Pepin, 2008. Pool 2 data modified to remove largemouth bass sampled below 8-inches.

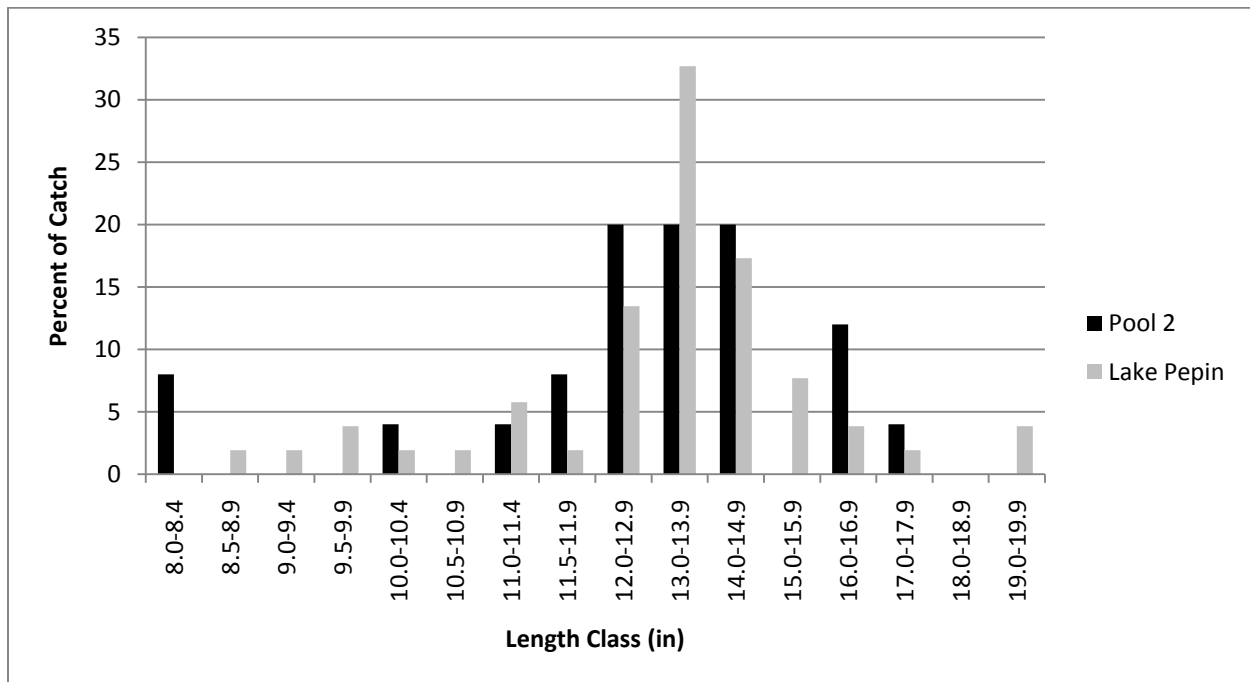


Figure 16 – 2008 Largemouth Bass Age and Length-at-Capture, all Electrofishing Data, Pool 2. Gray bars represent median length, boxes represent first and third quartiles, vertical lines represent maximum and minimum lengths.

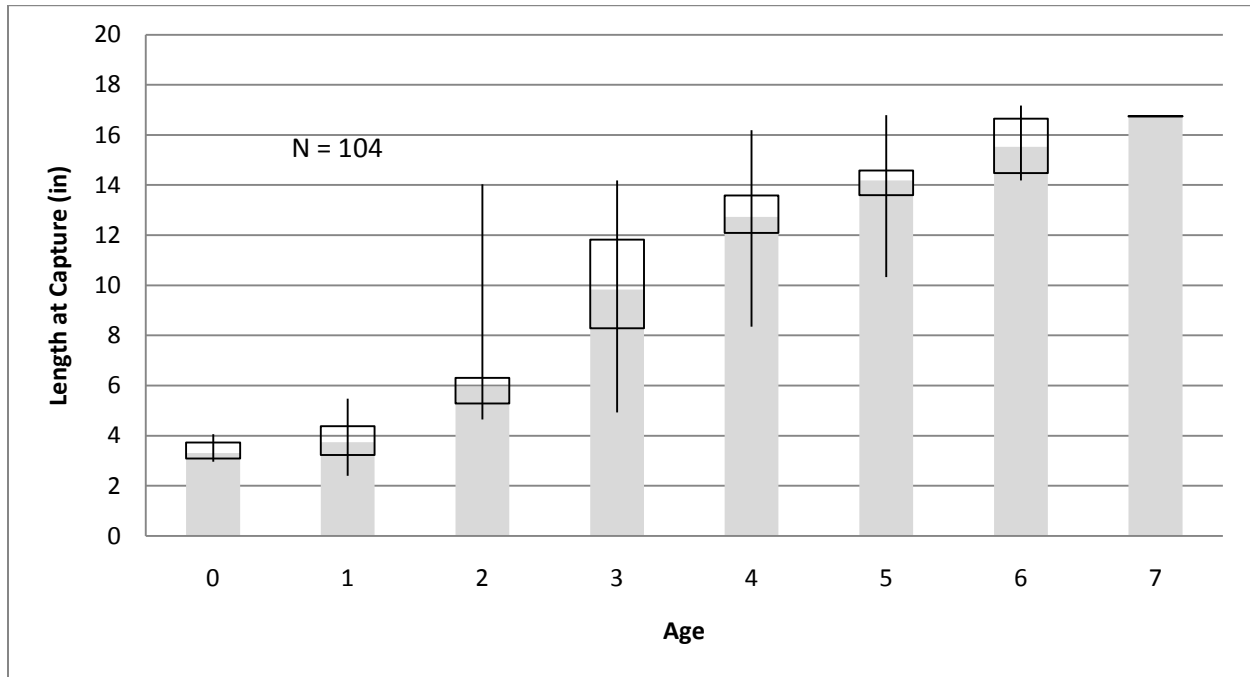


Figure 17 – Largemouth Bass Back-calculated Length-at-Age, Pool 2 Electrofishing 2008 versus Lake Pepin Fall Electrofishing 2008.

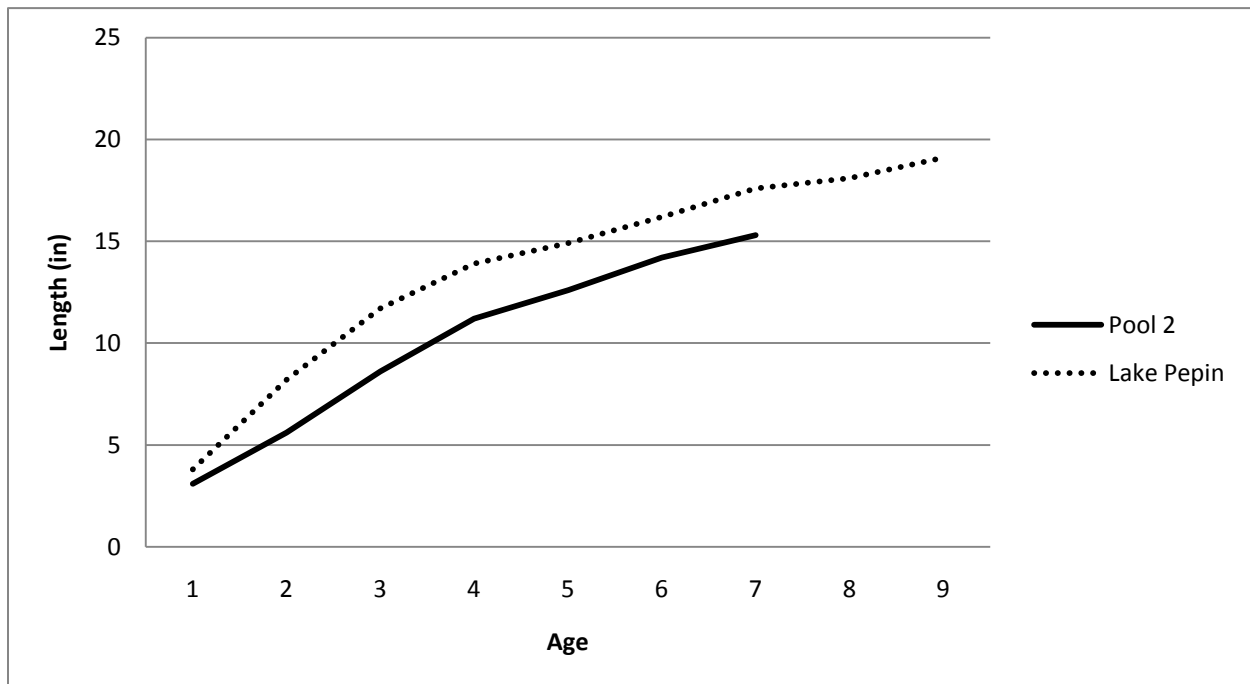


Figure 18 - Largemouth Bass Back-calculated Length-at-Age from Last Three Pool 2 Surveys.

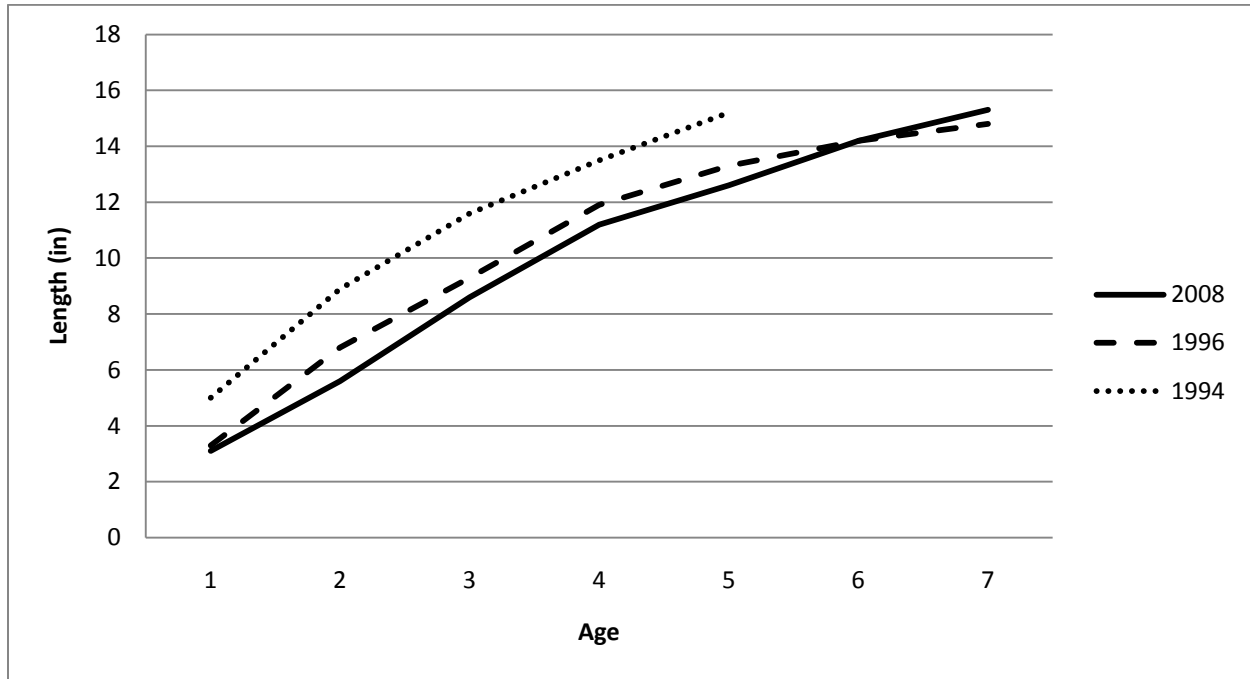


Figure 19 – 2008 White Bass Age and Length-at-Capture, all Electrofishing Data, Pool 2. Gray bars represent median length, boxes represent first and third quartiles, vertical lines represent maximum and minimum lengths.

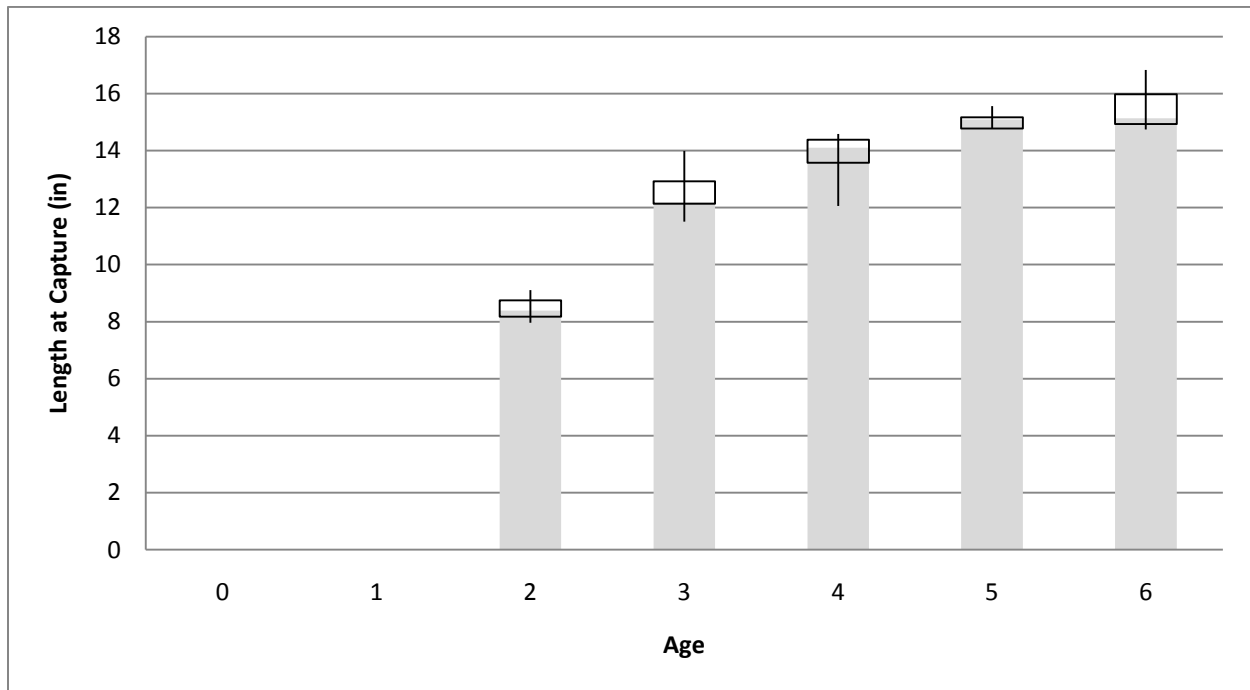


Figure 20 – White Bass Summer Electrofishing Percent of Catch by Length Class for Pool 2.

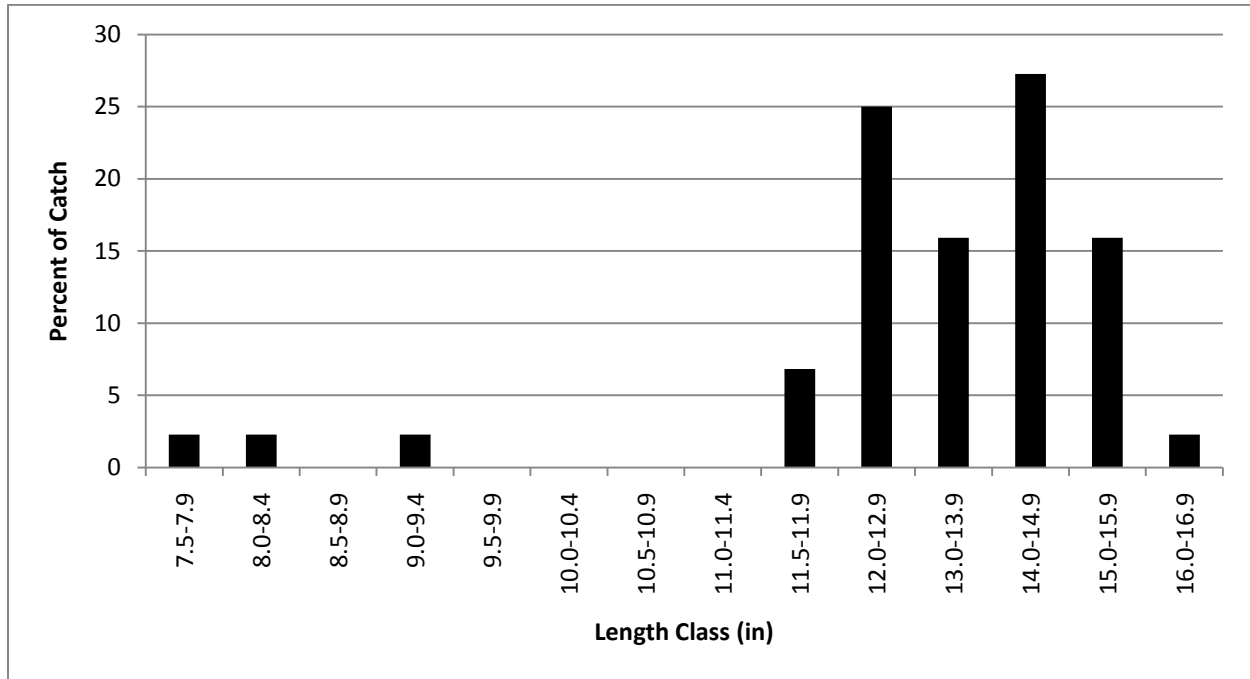


Figure 21 – 2008 Bluegill Age and Length-at-Capture, all Sampling Data, Pool 2. Gray bars represent median length, boxes represent first and third quartiles, vertical lines represent maximum and minimum lengths.

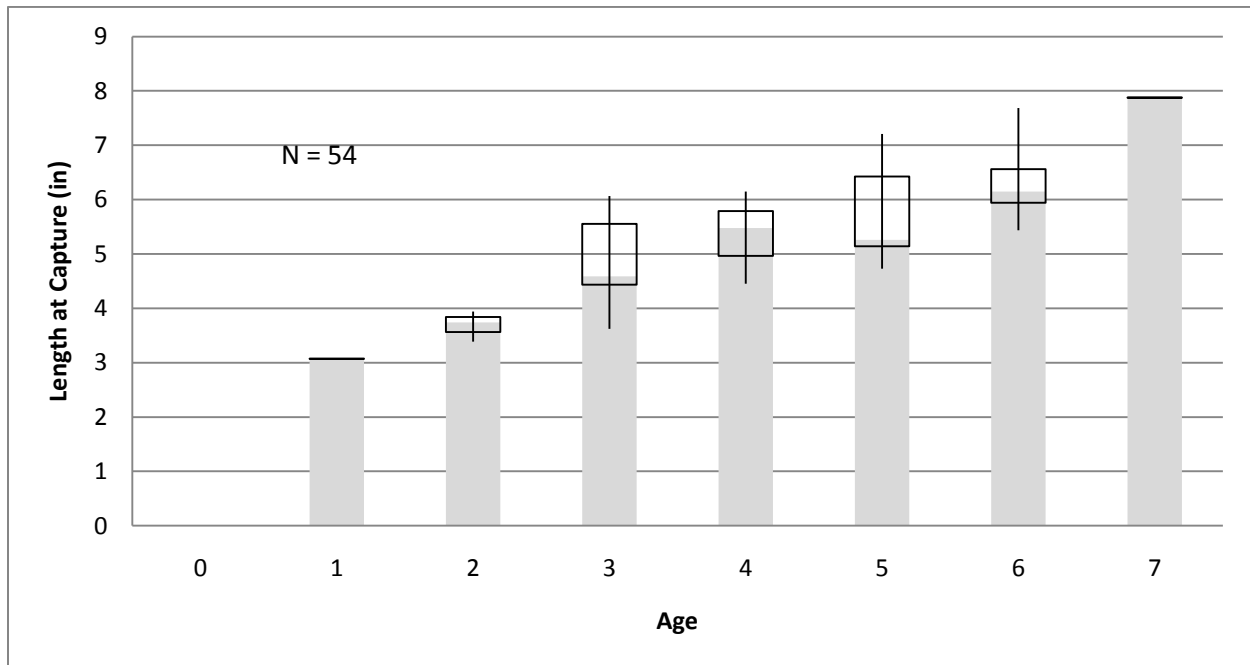


Figure 22 – Black Crappie and White Crappie Back-calculated Length-at-Age from 2008 Pool 2 Survey, all Sampling Gears.

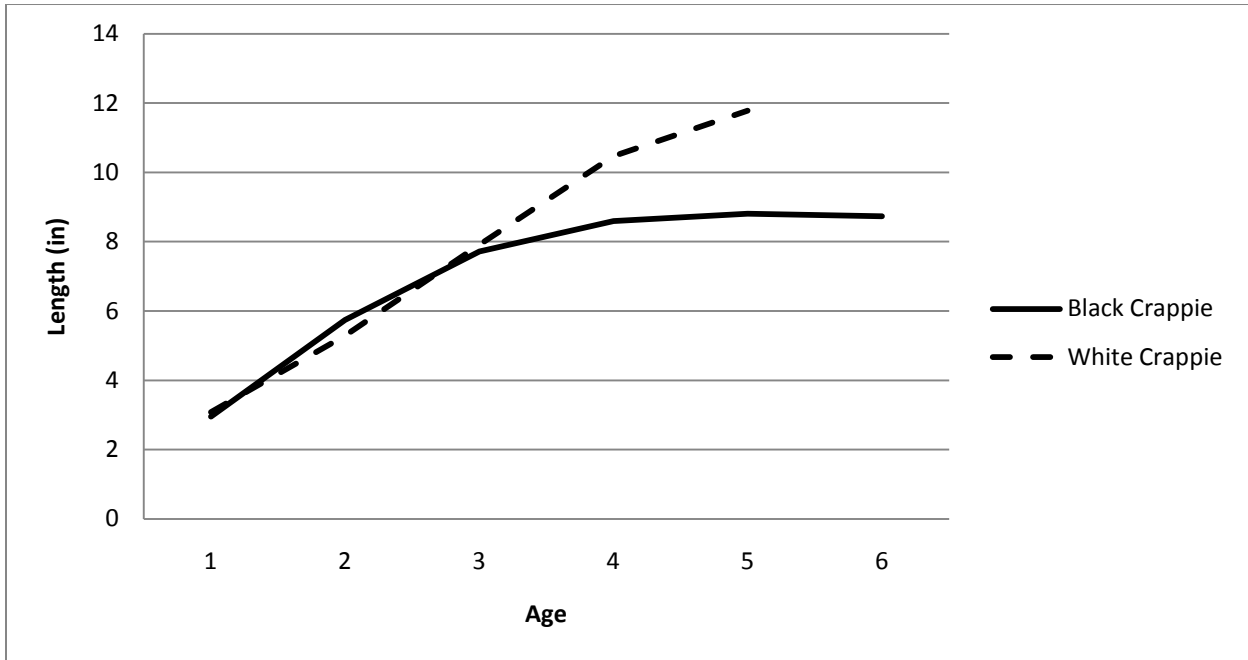


TABLE 1 - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Net Catch Summary by Numbers for STN

Special sampling with trap nets

Number of Sets: 16
First Set Date: 09/29/2008
Last Lift Date: 10/01/2008
Target Species: All adults channel catfish

Abbr	Species	Total Fish	Number Per Set	Quartiles for Lake Class 41*		
				25%	50%	75%
BLC	Black Crappie	13	0.81	N/A	N/A	N/A
BLG	Bluegill	2	0.13	N/A	N/A	N/A
CAP	Common Carp	7	0.44	N/A	N/A	N/A
FRD	Freshwater Drum	16	1.00	N/A	N/A	N/A
SLR	Silver Redhorse	1	0.06	N/A	N/A	N/A
SAB	Smallmouth Buffalo	13	0.81	N/A	N/A	N/A
WHC	White Crappie	3	0.19	N/A	N/A	N/A
Total Fish/Set:			3.44	* Quartiles for Number Per Set		

Net Catch Summary by Weight for STN

Special sampling with trap nets

Abbr	Species	Total Weight (Pounds)	Pounds Per Set	Mean Weight	Quartiles for Lake Class 41*		
					25%	50%	75%
BLC	Black Crappie	6.89	0.43	0.53	N/A	N/A	N/A
BLG	Bluegill	0.29	0.02	0.15	N/A	N/A	N/A
CAP	Common Carp	53.11	3.32	7.59	N/A	N/A	N/A
FRD	Freshwater Drum	9.86	0.62	0.62	N/A	N/A	N/A
SLR	Silver Redhorse	0.23	0.01	0.23	N/A	N/A	N/A
SAB	Smallmouth Buffalo	76.90	4.81	5.92	N/A	N/A	N/A
WHC	White Crappie	1.56	0.10	0.52	N/A	N/A	N/A
Total Pounds Fish/Set:			9.30	* Quartiles for Mean Weight			

TABLE 2 - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Standard Electrofishing Catch Summary for EF

Standard electrofishing

Total run-time for all stations: N/A
Total on-time for all stations: 07:13:00
First Sampling Date: 07/21/2008
Last Sampling Date: 08/28/2008
Daylight Sampling: Yes
Target Species: N/A

Abbr	Species	Summary By Numbers			Summary By Weight (pounds)			
		Total Number	Number per Hour Run-Time	On-Time	Total Weight	Lbs per Hour Run-Time	On-Time	Mean Weight
BIB	Bigmouth Buffalo	7	N/A	0.97	47.26	N/A	6.55	6.75
BLC	Black Crappie	9	N/A	1.25	3.76	N/A	0.52	0.42
BLG	Bluegill	69	N/A	9.56	8.28	N/A	1.15	0.12
CCF	Channel Catfish	19	N/A	2.63	33.46	N/A	4.64	1.76
CAP	Common Carp	132	N/A	18.29	650.00	N/A	90.07	4.92
FCF	Flathead Catfish	14	N/A	1.94	21.31	N/A	2.95	1.52
FRD	Freshwater Drum	115	N/A	15.94	132.84	N/A	18.41	1.16
GIS	Gizzard Shad	24	N/A	3.33	10.49	N/A	1.45	0.44
GLR	Golden Redhorse	2	N/A	0.28	1.10	N/A	0.15	0.55
GRR	Greater Redhorse	2	N/A	0.28	7.00	N/A	0.97	3.50
GSF	Green Sunfish	7	N/A	0.97	0.49	N/A	0.07	0.07
HFS	Highfin Carpsucker	12	N/A	1.66	9.02	N/A	1.25	0.75
HSF	Hybrid Sunfish	1	N/A	0.14	0.02	N/A	0.00	0.02
LMB	Largemouth Bass	14	N/A	1.94	15.37	N/A	2.13	1.10
MCP	Mirror Carp	1	N/A	0.14	5.07	N/A	0.70	5.07
MOE	Mooneye	1	N/A	0.14	0.02	N/A	0.00	0.02
NOP	Northern Pike	2	N/A	0.28	2.82	N/A	0.39	1.41
OSS	Orangespotted Sunfish	2	N/A	0.28	0.07	N/A	0.01	0.04
PMK	Pumpkinseed	1	N/A	0.14	0.14	N/A	0.02	0.14
QBS	Quillback	24	N/A	3.33	33.27	N/A	4.61	1.39
RCS	River Carpsucker	28	N/A	3.88	70.03	N/A	9.70	2.50
RKB	Rock Bass	1	N/A	0.14	0.26	N/A	0.04	0.26
SAR	Sauger	7	N/A	0.97	3.65	N/A	0.51	0.52
SHR	Shorthead Redhorse	87	N/A	12.06	45.53	N/A	6.31	0.52
SLR	Silver Redhorse	19	N/A	2.63	29.27	N/A	4.06	1.54
SMB	Smallmouth Bass	57	N/A	7.90	34.36	N/A	4.76	0.60
SAB	Smallmouth Buffalo	62	N/A	8.59	273.50	N/A	37.90	4.41
WAE	Walleye	15	N/A	2.08	29.63	N/A	4.11	1.98
WHB	White Bass	44	N/A	6.10	54.07	N/A	7.49	1.23
WHC	White Crappie	6	N/A	0.83	4.45	N/A	0.62	0.74

TABLE 3 - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Fall Electrofishing Catch Summary for SEF

Special sampling, electrofishing

Total run-time for all stations: N/A

Total on-time for all stations: 11:10:00

First Sampling Date: 09/05/2008

Last Sampling Date: 10/02/2008

Daylight Sampling: Yes

Target Species: All ages sauger, All ages largemouth bass, All ages smallmouth bass, All ages channel catfish, All ages walleye

Abbr	Species	Age	Total Number	Number Measured	Mean Length (inches)	Length Range (inches)		Catch Rates (number per hour)	
						Min	Max	Run-Time	On-Time
CCF	Channel Catfish	All	8	8	17.24	8.27	26.02	N/A	0.72
LMB	Largemouth Bass	YOY	8	8	3.41	2.95	4.06	N/A	0.72
LMB	Largemouth Bass	≥ 1	90	90	6.75	2.68	17.17	N/A	8.06
SAR	Sauger	All	15	15	11.04	5.91	21.38	N/A	1.34
SMB	Smallmouth Bass	YOY	26	26	3.68	3.11	4.41	N/A	2.33
SMB	Smallmouth Bass	≥ 1	64	64	9.14	3.35	17.44	N/A	5.73
WAE	Walleye	All	88	88	17.15	5.28	28.50	N/A	7.88

TABLE 4 - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Length Frequency Distribution For STN

Special sampling with trap nets

(Field work conducted between 09/29/2008 and 10/01/2008)

	<u>BLC</u>	<u>BLG</u>	<u>CAP</u>	<u>FRD</u>	<u>SAB</u>	<u>SLR</u>	<u>WHC</u>
< 3.00	-	-	-	-	-	-	-
3.00 - 3.49	-	-	-	-	-	-	-
3.50 - 3.99	-	-	-	-	-	-	-
4.00 - 4.49	-	-	-	-	-	-	-
4.50 - 4.99	-	-	-	-	-	-	-
5.00 - 5.49	-	-	-	-	-	-	-
5.50 - 5.99	-	2	-	2	-	-	-
6.00 - 6.49	1	-	-	1	-	-	-
6.50 - 6.99	-	-	-	-	-	-	-
7.00 - 7.49	-	-	-	-	-	-	-
7.50 - 7.99	-	-	-	-	-	-	-
8.00 - 8.49	1	-	-	-	-	1	-
8.50 - 8.99	1	-	-	-	-	-	1
9.00 - 9.49	-	-	-	-	-	-	1
9.50 - 9.99	4	-	-	2	-	-	-
10.00 - 10.49	5	-	-	3	-	-	-
10.50 - 10.99	1	-	-	-	-	-	1
11.00 - 11.49	-	-	-	-	-	-	-
11.50 - 11.99	-	-	-	1	-	-	-
12.00 - 12.99	-	-	-	3	-	-	-
13.00 - 13.99	-	-	-	2	-	-	-
14.00 - 14.99	-	-	-	2	-	-	-
15.00 - 15.99	-	-	-	-	-	-	-
16.00 - 16.99	-	-	-	-	-	-	-
17.00 - 17.99	-	-	-	-	1	-	-
18.00 - 18.99	-	-	1	-	1	-	-
19.00 - 19.99	-	-	-	-	1	-	-
20.00 - 20.99	-	-	-	-	3	-	-
21.00 - 21.99	-	-	-	-	3	-	-
22.00 - 22.99	-	-	-	-	2	-	-
23.00 - 23.99	-	-	-	-	1	-	-
24.00 - 24.99	-	-	-	-	-	-	-
25.00 - 25.99	-	-	4	-	1	-	-
26.00 - 26.99	-	-	1	-	-	-	-
27.00 - 27.99	-	-	-	-	-	-	-
28.00 - 28.99	-	-	-	-	-	-	-
29.00 - 29.99	-	-	1	-	-	-	-
30.00 - 30.99	-	-	-	-	-	-	-
31.00 - 31.99	-	-	-	-	-	-	-
32.00 - 32.99	-	-	-	-	-	-	-
33.00 - 33.99	-	-	-	-	-	-	-
34.00 - 34.99	-	-	-	-	-	-	-
35.00 - 35.99	-	-	-	-	-	-	-
= > 36.00	-	-	-	-	-	-	-

	<u>BLC</u>	<u>BLG</u>	<u>CAP</u>	<u>FRD</u>	<u>SAB</u>	<u>SLR</u>	<u>WHC</u>
Total	13	2	7	16	13	1	3
Min. Length	6.30	5.55	18.50	5.98	17.56	8.19	8.94
Max. Length	10.94	5.79	29.37	14.17	25.12	8.19	10.83
Mean Length	9.61	5.67	25.16	10.78	21.13	8.19	9.72
# Measured	13	2	7	16	13	1	3
No Lengths for	0	0	0	0	0	0	0

TABLE 5 - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Length Frequency Distribution For EF

Standard electrofishing

(Field work conducted between 07/21/2008 and 08/28/2008)

	<u>BIB</u>	<u>BLC</u>	<u>BLG</u>	<u>CAP</u>	<u>CCF</u>	<u>FCF</u>	<u>FRD</u>	<u>GIS</u>	<u>GLR</u>	<u>GRR</u>	<u>GSF</u>	<u>HFS</u>	<u>HSF</u>	<u>LMB</u>	<u>MCP</u>
< 3.00	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-
3.00 - 3.49	-	-	4	-	-	-	-	2	-	-	1	-	1	1	-
3.50 - 3.99	-	-	4	-	-	-	6	2	-	-	1	-	-	-	-
4.00 - 4.49	-	-	8	-	-	-	5	5	-	-	2	-	-	-	-
4.50 - 4.99	-	-	14	-	-	-	-	2	-	-	1	-	-	1	-
5.00 - 5.49	-	-	17	-	1	-	-	2	-	-	2	-	-	-	-
5.50 - 5.99	-	-	12	-	-	1	-	2	-	-	-	-	-	-	-
6.00 - 6.49	-	1	4	-	-	-	-	1	-	-	-	-	-	-	-
6.50 - 6.99	-	-	2	-	-	-	1	-	-	-	-	-	-	-	-
7.00 - 7.49	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
7.50 - 7.99	-	2	2	-	-	-	1	-	-	-	-	-	-	-	-
8.00 - 8.49	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
8.50 - 8.99	-	1	-	-	-	-	1	-	-	-	-	1	-	-	-
9.00 - 9.49	-	4	-	-	-	-	2	-	-	-	-	2	-	1	-
9.50 - 9.99	-	-	-	-	1	-	1	-	-	-	-	1	-	-	-
10.00 - 10.49	-	-	-	-	-	1	5	-	-	-	-	2	-	-	-
10.50 - 10.99	-	1	-	-	1	1	3	-	-	-	-	-	-	-	-
11.00 - 11.49	-	-	-	-	2	3	3	-	2	-	-	-	-	1	-
11.50 - 11.99	-	-	-	-	-	-	11	-	-	-	-	1	-	1	-
12.00 - 12.99	-	-	-	-	-	1	18	1	-	-	-	1	-	2	-
13.00 - 13.99	-	-	-	2	-	1	17	1	-	-	-	2	-	-	-
14.00 - 14.99	-	-	-	4	1	2	14	2	-	-	-	1	-	2	-
15.00 - 15.99	-	-	-	2	2	1	4	4	-	-	-	1	-	-	-
16.00 - 16.99	-	-	-	3	2	1	9	-	-	-	-	-	-	3	-
17.00 - 17.99	-	-	-	6	2	-	6	-	-	-	-	-	-	-	-
18.00 - 18.99	-	-	-	10	1	-	3	-	-	-	-	-	-	-	-
19.00 - 19.99	1	-	-	9	2	-	4	-	-	1	-	-	-	-	-
20.00 - 20.99	1	-	-	17	2	-	1	-	-	1	-	-	-	-	-
21.00 - 21.99	2	-	-	24	-	-	-	-	-	-	-	-	-	-	1
22.00 - 22.99	1	-	-	18	1	-	-	-	-	-	-	-	-	-	-
23.00 - 23.99	2	-	-	13	-	1	-	-	-	-	-	-	-	-	-
24.00 - 24.99	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-
25.00 - 25.99	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-
26.00 - 26.99	-	-	-	2	1	1	-	-	-	-	-	-	-	-	-
27.00 - 27.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.00 - 28.99	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
29.00 - 29.99	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
30.00 - 30.99	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
31.00 - 31.99	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
32.00 - 32.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33.00 - 33.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34.00 - 34.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35.00 - 35.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
= > 36.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	<u>BIB</u>	<u>BLC</u>	<u>BLG</u>	<u>CAP</u>	<u>CCF</u>	<u>FCF</u>	<u>FRD</u>	<u>GIS</u>	<u>GLR</u>	<u>GRR</u>	<u>GSF</u>	<u>HFS</u>	<u>HSF</u>	<u>LMB</u>	<u>MCP</u>
Total	7	9	69	132	19	14	115	24	2	2	7	12	1	14	1
Min. Length	19.09	6.30	2.83	13.62	5.12	5.59	3.74	3.35	11.02	19.76	3.23	8.78	3.43	2.40	21.61
Max. Length	23.07	10.63	7.87	31.02	26.26	26.93	20.55	15.79	11.18	20.00	5.31	15.16	3.43	16.61	21.61
Mean Length	21.80	8.73	5.07	21.50	16.20	14.06	12.77	7.95	11.10	19.88	4.40	11.47	3.43	10.92	21.61
# Measured	7	9	69	132	19	14	115	24	2	2	7	12	1	14	1
No Lengths for	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 5 (continued) - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Length Frequency Distribution For EF (Continued)

Standard electrofishing

(Field work conducted between 07/21/2008 and 08/28/2008)

	<u>MOE</u>	<u>NOP</u>	<u>OSS</u>	<u>PMK</u>	<u>QBS</u>	<u>RCS</u>	<u>RKB</u>	<u>SAB</u>	<u>SAR</u>	<u>SHR</u>	<u>SLR</u>	<u>SMB</u>	<u>WAE</u>	<u>YWAE</u>	<u>WHB</u>
< 3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.00 - 3.49	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
3.50 - 3.99	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-
4.00 - 4.49	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-
4.50 - 4.99	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
5.00 - 5.49	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
5.50 - 5.99	-	-	-	1	-	-	-	-	-	-	-	-	2	-	-
6.00 - 6.49	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-
6.50 - 6.99	-	-	-	-	-	-	1	-	1	3	1	2	-	-	-
7.00 - 7.49	-	-	-	-	-	-	-	-	-	6	4	8	-	-	-
7.50 - 7.99	-	-	-	-	2	-	-	-	-	5	-	8	-	-	1
8.00 - 8.49	-	-	-	-	-	-	-	-	-	6	1	3	-	-	1
8.50 - 8.99	-	-	-	-	-	-	-	-	-	7	-	1	-	-	-
9.00 - 9.49	-	1	-	-	-	-	-	-	-	3	1	4	-	-	1
9.50 - 9.99	-	-	-	-	2	-	-	-	1	2	-	5	-	-	-
10.00 - 10.49	-	-	-	-	-	-	-	-	-	10	-	3	-	-	-
10.50 - 10.99	-	-	-	-	1	1	-	-	-	12	1	2	-	-	-
11.00 - 11.49	-	-	-	-	2	1	-	-	-	4	-	3	-	-	-
11.50 - 11.99	-	-	-	-	-	-	-	-	-	6	-	3	-	-	3
12.00 - 12.99	-	-	-	-	5	4	-	2	-	9	1	3	-	-	11
13.00 - 13.99	-	-	-	-	2	-	-	2	2	5	-	2	-	-	7
14.00 - 14.99	-	-	-	-	3	2	-	3	-	3	1	2	-	-	12
15.00 - 15.99	-	-	-	-	-	5	-	3	-	2	1	2	1	-	7
16.00 - 16.99	-	-	-	-	2	3	-	2	-	1	-	-	-	-	1
17.00 - 17.99	-	-	-	-	1	2	-	2	-	1	-	-	4	-	-
18.00 - 18.99	-	-	-	-	2	3	-	8	1	1	1	2	1	-	-
19.00 - 19.99	-	-	-	-	1	3	-	7	-	-	1	-	-	-	-
20.00 - 20.99	-	-	-	-	1	2	-	14	-	-	2	-	-	-	-
21.00 - 21.99	-	-	-	-	-	1	-	9	-	-	2	-	2	-	-
22.00 - 22.99	-	-	-	-	-	1	-	4	-	-	1	-	-	-	-
23.00 - 23.99	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-
24.00 - 24.99	-	1	-	-	-	-	-	2	-	-	-	-	1	-	-
25.00 - 25.99	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
26.00 - 26.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27.00 - 27.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.00 - 28.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29.00 - 29.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30.00 - 30.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31.00 - 31.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32.00 - 32.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33.00 - 33.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34.00 - 34.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35.00 - 35.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
= > 36.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	<u>MOE</u>	<u>NOP</u>	<u>OSS</u>	<u>PMK</u>	<u>QBS</u>	<u>RCS</u>	<u>RKB</u>	<u>SAB</u>	<u>SAR</u>	<u>SHR</u>	<u>SLR</u>	<u>SMB</u>	<u>WAE</u>	<u>YWAE</u>	<u>WHB</u>
Total	1	2	2	1	24	28	1	62	7	87	19	57	14	1	44
Min. Length	4.33	9.06	3.11	5.51	7.52	10.87	6.85	12.01	3.90	5.16	5.08	6.18	4.61	3.74	7.95
Max. Length	4.33	24.45	3.39	5.51	20.31	22.09	6.85	24.92	18.11	18.31	22.87	18.43	25.12	3.74	16.81
Mean Length	4.33	16.75	3.25	5.51	13.64	16.43	6.85	19.43	9.82	10.57	13.57	9.81	15.62	3.74	13.40
# Measured	1	2	2	1	24	28	1	62	7	87	19	57	14	1	44
No Lengths for	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**TABLE 5 (continued) - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00**

Length Frequency Distribution For EF (Continued)

Standard electrofishing

(Field work conducted between 07/21/2008 and 08/28/2008)

	<u>WHC</u>
< 3.00	-
3.00 - 3.49	-
3.50 - 3.99	-
4.00 - 4.49	-
4.50 - 4.99	-
5.00 - 5.49	-
5.50 - 5.99	-
6.00 - 6.49	-
6.50 - 6.99	-
7.00 - 7.49	-
7.50 - 7.99	-
8.00 - 8.49	-
8.50 - 8.99	-
9.00 - 9.49	-
9.50 - 9.99	2
10.00 - 10.49	-
10.50 - 10.99	1
11.00 - 11.49	1
11.50 - 11.99	1
12.00 - 12.99	1
13.00 - 13.99	-
14.00 - 14.99	-
15.00 - 15.99	-
16.00 - 16.99	-
17.00 - 17.99	-
18.00 - 18.99	-
19.00 - 19.99	-
20.00 - 20.99	-
21.00 - 21.99	-
22.00 - 22.99	-
23.00 - 23.99	-
24.00 - 24.99	-
25.00 - 25.99	-
26.00 - 26.99	-
27.00 - 27.99	-
28.00 - 28.99	-
29.00 - 29.99	-
30.00 - 30.99	-
31.00 - 31.99	-
32.00 - 32.99	-
33.00 - 33.99	-
34.00 - 34.99	-
35.00 - 35.99	-
= > 36.00	-

	<u>WHC</u>
Total	6
Min. Length	9.69
Max. Length	12.17
Mean Length	10.93
# Measured	6
No Lengths for	0

TABLE 6 - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Length Frequency Distribution For SEF

Special sampling, electrofishing

(Field work conducted between 09/05/2008 and 10/02/2008)

	<u>CCF</u>	<u>LMB</u>	<u>YLMB</u>	<u>SAR</u>	<u>SMB</u>	<u>YSMB</u>	<u>WAE</u>
< 3.00	-	5	2	-	-	-	-
3.00 - 3.49	-	14	3	-	3	10	-
3.50 - 3.99	-	12	2	-	3	11	-
4.00 - 4.49	-	9	1	-	1	5	-
4.50 - 4.99	-	9	-	-	1	-	-
5.00 - 5.49	-	6	-	-	1	-	1
5.50 - 5.99	-	7	-	1	-	-	2
6.00 - 6.49	-	2	-	2	-	-	1
6.50 - 6.99	-	1	-	2	1	-	8
7.00 - 7.49	-	-	-	3	8	-	10
7.50 - 7.99	-	-	-	2	6	-	3
8.00 - 8.49	1	2	-	-	8	-	3
8.50 - 8.99	-	-	-	-	3	-	1
9.00 - 9.49	1	-	-	-	2	-	-
9.50 - 9.99	1	-	-	-	3	-	-
10.00 - 10.49	-	1	-	-	5	-	-
10.50 - 10.99	-	-	-	-	4	-	-
11.00 - 11.49	-	1	-	-	2	-	-
11.50 - 11.99	-	2	-	-	-	-	2
12.00 - 12.99	-	5	-	-	4	-	-
13.00 - 13.99	-	5	-	-	3	-	2
14.00 - 14.99	-	5	-	-	3	-	2
15.00 - 15.99	-	-	-	1	1	-	3
16.00 - 16.99	-	3	-	-	1	-	1
17.00 - 17.99	-	1	-	-	1	-	3
18.00 - 18.99	1	-	-	-	-	-	3
19.00 - 19.99	-	-	-	1	-	-	3
20.00 - 20.99	1	-	-	2	-	-	3
21.00 - 21.99	-	-	-	1	-	-	4
22.00 - 22.99	1	-	-	-	-	-	1
23.00 - 23.99	-	-	-	-	-	-	3
24.00 - 24.99	1	-	-	-	-	-	8
25.00 - 25.99	-	-	-	-	-	-	7
26.00 - 26.99	1	-	-	-	-	-	8
27.00 - 27.99	-	-	-	-	-	-	4
28.00 - 28.99	-	-	-	-	-	-	2
29.00 - 29.99	-	-	-	-	-	-	-
30.00 - 30.99	-	-	-	-	-	-	-
31.00 - 31.99	-	-	-	-	-	-	-
32.00 - 32.99	-	-	-	-	-	-	-
33.00 - 33.99	-	-	-	-	-	-	-
34.00 - 34.99	-	-	-	-	-	-	-
35.00 - 35.99	-	-	-	-	-	-	-
= > 36.00	-	-	-	-	-	-	-

	<u>CCF</u>	<u>LMB</u>	<u>YLMB</u>	<u>SAR</u>	<u>SMB</u>	<u>YSMB</u>	<u>WAE</u>
Total	8	90	8	15	64	26	88
Min. Length	8.27	2.68	2.95	5.91	3.35	3.11	5.28
Max. Length	26.02	17.17	4.06	21.38	17.44	4.41	28.50
Mean Length	17.24	6.75	3.41	11.04	9.14	3.68	17.15
# Measured	8	90	8	15	64	26	88
No Lengths for	0	0	0	0	0	0	0

TABLE 7 - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Length-at-capture With Last Incremental Length

(Body-Scale constant, all lengths, and all length increments in inches)

Species: Black Crappie
Body-Scale Constant: 0.79
Total Sample Size: 22

Length-at-capture in 2008 for Each Age Class, with Incremental Lengths for 2008

Year Class	Age	Sample Size	Length-at-capture			Standard Error	Length Increments	
			Average Length	Maximum Length	Minimum Length		Increment	Standard Error
2006	2	3	6.77	7.72	6.30	0.472	1.30	0.224
2005	3	7	9.74	10.35	8.35	0.256	1.34	0.119
2004	4	9	9.62	10.94	7.64	0.323	0.75	0.092
2003	5	2	9.69	10.63	8.74	0.945	0.54	0.263
2002	6	1	9.09	9.09	9.09	N/A	0.36	N/A

Species: Bluegill
Body-Scale Constant: 0.79
Total Sample Size: 54

Length-at-capture in 2008 for Each Age Class, with Incremental Lengths for 2008

Year Class	Age	Sample Size	Length-at-capture			Standard Error	Length Increments	
			Average Length	Maximum Length	Minimum Length		Increment	Standard Error
2007	1	1	3.07	3.07	3.07	N/A	1.40	N/A
2006	2	3	3.69	3.94	3.39	0.161	0.41	0.060
2005	3	18	4.91	6.06	3.62	0.175	0.52	0.092
2004	4	17	5.39	6.14	4.45	0.120	0.42	0.030
2003	5	10	5.69	7.20	4.72	0.268	0.36	0.039
2002	6	4	6.35	7.68	5.43	0.474	0.24	0.038
2001	7	1	7.87	7.87	7.87	N/A	0.31	N/A

Species: Largemouth Bass
Body-Scale Constant: 0.79
Total Sample Size: 104

Length-at-capture in 2008 for Each Age Class, with Incremental Lengths for 2008

Year Class	Age	Sample Size	Length-at-capture			Standard Error	Length Increments	
			Average Length	Maximum Length	Minimum Length		Increment	Standard Error
2008	0	8	3.41	4.06	2.95	0.148	3.41	0.148
2007	1	45	3.83	5.47	2.40	0.114	0.94	0.067
2006	2	21	6.77	14.02	4.65	0.616	1.16	0.149
2005	3	6	9.83	14.17	4.92	1.349	1.32	0.381
2004	4	14	12.90	16.18	8.35	0.525	1.27	0.113
2003	5	5	13.88	16.77	10.31	1.042	1.06	0.141
2002	6	4	15.59	17.17	14.17	0.724	1.17	0.372
2001	7	1	16.73	16.73	16.73	N/A	1.42	N/A

TABLE 8 - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Length-at-capture With Last Incremental Length (Continued)

Species: Northern Pike
Body-Scale Constant: 2.09
Total Sample Size: 2

Length-at-capture in 2008 for Each Age Class, with Incremental Lengths for 2008

Year Class	Age	Sample Size	Length-at-capture			Standard Error	Length Increments	
			Average Length	Maximum Length	Minimum Length		Increment	Standard Error
2006	2	1	9.06	9.06	9.06	N/A	1.34	N/A
2005	3	0	-	-	-	-	-	-
2004	4	1	24.45	24.45	24.45	N/A	2.03	N/A

Species: Sauger
Body-Scale Constant: 0.98
Total Sample Size: 20

Length-at-capture in 2008 for Each Age Class, with Incremental Lengths for 2008

Year Class	Age	Sample Size	Length-at-capture			Standard Error	Length Increments	
			Average Length	Maximum Length	Minimum Length		Increment	Standard Error
2007	1	12	7.09	9.53	5.91	0.288	1.68	0.097
2006	2	2	13.19	13.31	13.07	0.118	1.02	0.251
2005	3	0	-	-	-	-	-	-
2004	4	2	18.70	19.29	18.11	0.591	1.72	1.088
2003	5	1	15.04	15.04	15.04	N/A	0.63	N/A
2002	6	1	20.08	20.08	20.08	N/A	0.91	N/A
2001	7	1	20.98	20.98	20.98	N/A	0.37	N/A
2000	8	0	-	-	-	-	-	-
1999	9	1	21.38	21.38	21.38	N/A	0.50	N/A

Species: Smallmouth Bass
Body-Scale Constant: 1.42
Total Sample Size: 137

Length-at-capture in 2008 for Each Age Class, with Incremental Lengths for 2008

Year Class	Age	Sample Size	Length-at-capture			Standard Error	Length Increments	
			Average Length	Maximum Length	Minimum Length		Increment	Standard Error
2008	0	26	3.68	4.41	3.11	0.076	3.68	0.076
2007	1	46	7.03	9.09	3.39	0.209	2.76	0.142
2006	2	41	9.70	12.17	7.48	0.194	1.85	0.119
2005	3	15	12.55	14.21	9.65	0.314	1.41	0.162
2004	4	4	15.92	18.43	13.78	1.000	1.02	0.267
2003	5	2	15.12	15.63	14.61	0.512	0.87	0.208
2002	6	2	15.16	15.35	14.96	0.197	0.42	0.011
2001	7	1	17.44	17.44	17.44	N/A	0.36	N/A

TABLE 9 - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Length-at-capture With Last Incremental Length (Continued)

Species: Walleye
Body-Scale Constant: 1.10
Total Sample Size: 103

Length-at-capture in 2008 for Each Age Class, with Incremental Lengths for 2008

Year Class	Age	Sample Size	Length-at-capture			Standard Error	Length Increments	
			Average Length	Maximum Length	Minimum Length		Increment	Standard Error
2008	0	1	3.74	3.74	3.74	N/A	3.74	N/A
2007	1	33	6.86	8.90	4.61	0.168	2.11	0.102
2006	2	21	16.18	19.76	11.89	0.484	2.25	0.222
2005	3	6	19.58	21.06	17.40	0.558	0.94	0.118
2004	4	6	20.99	21.77	20.04	0.258	0.76	0.148
2003	5	5	23.63	24.72	21.69	0.531	0.84	0.089
2002	6	8	24.48	25.75	22.13	0.401	0.64	0.069
2001	7	9	25.47	26.50	24.80	0.222	0.68	0.086
2000	8	8	26.19	27.83	24.88	0.323	0.67	0.109
1999	9	3	27.19	28.07	26.50	0.464	0.51	0.087
1998	10	2	27.48	27.60	27.36	0.118	0.28	0.033
1997	11	1	28.50	28.50	28.50	N/A	0.49	N/A

Species: White Bass
Body-Scale Constant: 1.57
Total Sample Size: 40

Length-at-capture in 2008 for Each Age Class, with Incremental Lengths for 2008

Year Class	Age	Sample Size	Length-at-capture			Standard Error	Length Increments	
			Average Length	Maximum Length	Minimum Length		Increment	Standard Error
2006	2	3	8.48	9.09	7.95	0.333	2.01	0.064
2005	3	14	12.53	13.98	11.50	0.201	1.26	0.166
2004	4	11	13.87	14.57	12.05	0.226	1.17	0.178
2003	5	9	15.04	15.55	14.76	0.088	0.91	0.072
2002	6	3	15.55	16.81	14.72	0.640	0.46	0.085

Species: White Crappie
Body-Scale Constant: 0.79
Total Sample Size: 9

Length-at-capture in 2008 for Each Age Class, with Incremental Lengths for 2008

Year Class	Age	Sample Size	Length-at-capture			Standard Error	Length Increments	
			Average Length	Maximum Length	Minimum Length		Increment	Standard Error
2005	3	5	9.76	10.87	8.94	0.320	1.45	0.187
2004	4	3	11.27	11.54	10.83	0.224	0.99	0.546
2003	5	1	12.17	12.17	12.17	N/A	0.39	N/A

TABLE 10 - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Back-Calculated Lengths for Each Age Class and Average Annual Increments of Back-Calculated Lengths

Species: Black Crappie

Gear Type: Combined Gear Types (EF and STN)

Class	Age	N	1	2	3	4	5	6
2006	2	3	2.92	5.47	-	-	-	-
			2.92	2.56	-	-	-	-
2005	3	7	2.76	6.10	8.39	-	-	-
			2.76	3.34	2.29	-	-	-
2004	4	9	3.12	5.72	7.56	8.86	-	-
			3.12	2.60	1.84	1.31	-	-
2003	5	2	2.80	5.30	6.88	8.08	9.14	-
			2.80	2.50	1.59	1.20	1.07	-
2002	6	1	3.20	5.10	6.14	7.18	8.16	8.73
			3.20	1.90	1.04	1.04	0.98	0.57
Mean Length			2.95	5.74	7.72	8.59	8.81	8.73
			2.95	2.79	1.93	1.27	1.04	0.57
			22	22	19	12	3	1

Species: Bluegill

Gear Type: Combined Gear Types (EF and STN)

Class	Age	N	1	2	3	4	5	6	7
2007	1	1	1.67	-	-	-	-	-	-
			1.67	-	-	-	-	-	-
2006	2	3	2.20	3.28	-	-	-	-	-
			2.20	1.08	-	-	-	-	-
2005	3	18	1.63	3.16	4.39	-	-	-	-
			1.63	1.53	1.23	-	-	-	-
2004	4	17	1.66	2.81	4.02	4.97	-	-	-
			1.66	1.14	1.21	0.95	-	-	-
2003	5	10	1.65	2.91	3.97	4.72	5.32	-	-
			1.65	1.26	1.06	0.75	0.61	-	-
2002	6	4	1.49	2.57	3.80	4.70	5.56	6.11	-
			1.49	1.09	1.23	0.90	0.86	0.55	-
2001	7	1	1.83	2.64	4.47	5.45	6.28	7.12	7.57
			1.83	0.81	1.83	0.98	0.83	0.84	0.45
Mean Length			1.67	2.95	4.13	4.87	5.45	6.31	7.57
			1.67	1.28	1.20	0.88	0.69	0.61	0.45
			54	53	50	32	15	5	1

TABLE 11 - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Back-Calculated Lengths for Each Age Class and Average Annual Increments of Back-Calculated Lengths (Continued)

Species: Largemouth Bass

Gear Type: Combined Gear Types (EF and SEF)

Class	Age	N	1	2	3	4	5	6	7
2007	1	45	2.89	-	-	-	-	-	-
			2.89	-	-	-	-	-	-
2006	2	21	3.37	5.61	-	-	-	-	-
			3.37	2.24	-	-	-	-	-
2005	3	6	3.38	5.79	8.51	-	-	-	-
			3.38	2.42	2.72	-	-	-	-
2004	4	14	3.05	5.75	8.84	11.64	-	-	-
			3.05	2.70	3.09	2.80	-	-	-
2003	5	5	2.69	4.85	7.96	10.54	12.82	-	-
			2.69	2.17	3.11	2.58	2.28	-	-
2002	6	4	3.12	5.84	8.82	11.03	12.64	14.42	-
			3.12	2.72	2.98	2.21	1.62	1.78	-
2001	7	1	3.36	5.91	7.56	9.53	11.29	13.26	15.32
			3.36	2.55	1.65	1.97	1.76	1.97	2.06
Mean Length			3.05	5.62	8.58	11.22	12.60	14.19	15.32
			3.05	2.42	2.96	2.62	1.97	1.82	2.06
			96	51	30	24	10	5	1

Species: Northern Pike

Gear Type: Combined Gear Types (EF)

Class	Age	N	1	2	3	4
2006	2	1	5.01	7.72	-	-
			5.01	2.71	-	-
2004	4	1	9.44	15.89	19.62	22.42
			9.44	6.45	3.73	2.80
Mean Length			7.23	11.81	19.62	22.42
			7.23	4.58	3.73	2.80
			2	2	1	1

TABLE 12 - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Back-Calculated Lengths for Each Age Class and Average Annual Increments of Back-Calculated Lengths (Continued)

Species: Sauger

Gear Type: Combined Gear Types (EF and SEF)

Class	Age	N	1	2	3	4	5	6	7	8	9
2007	1	12	5.41	-	-	-	-	-	-	-	-
			5.41	-	-	-	-	-	-	-	-
2006	2	2	7.76	12.18	-	-	-	-	-	-	-
			7.76	4.42	-	-	-	-	-	-	-
2004	4	2	5.28	9.44	13.36	16.98	-	-	-	-	-
			5.28	4.17	3.92	3.63	-	-	-	-	-
2003	5	1	4.97	10.29	11.87	13.64	14.41	-	-	-	-
			4.97	5.32	1.58	1.77	0.77	-	-	-	-
2002	6	1	5.31	8.67	12.63	15.48	17.11	19.17	-	-	-
			5.31	3.36	3.96	2.85	1.63	2.06	-	-	-
2001	7	1	6.70	12.73	14.90	16.33	18.13	19.46	20.61	-	-
			6.70	6.03	2.17	1.43	1.80	1.33	1.15	-	-
1999	9	1	5.58	11.29	14.88	16.51	17.51	18.27	19.14	19.78	20.87
			5.58	5.71	3.59	1.63	1.00	0.76	0.87	0.64	1.09
Mean Length			5.68	10.78	13.50	15.99	16.79	18.97	19.88	19.78	20.87
			5.68	4.70	3.19	2.49	1.30	1.38	1.01	0.64	1.09
			20	8	6	6	4	3	2	1	1

Species: Smallmouth Bass

Gear Type: Combined Gear Types (EF and SEF)

Class	Age	N	1	2	3	4	5	6	7
2007	1	46	4.27	-	-	-	-	-	-
			4.27	-	-	-	-	-	-
2006	2	41	4.34	7.86	-	-	-	-	-
			4.34	3.52	-	-	-	-	-
2005	3	15	3.72	7.67	11.14	-	-	-	-
			3.72	3.95	3.47	-	-	-	-
2004	4	4	4.25	8.68	12.77	14.90	-	-	-
			4.25	4.43	4.09	2.13	-	-	-
2003	5	2	3.98	7.79	10.81	12.99	14.26	-	-
			3.98	3.81	3.03	2.18	1.27	-	-
2002	6	2	3.24	6.45	9.31	11.02	13.44	14.74	-
			3.24	3.21	2.86	1.72	2.42	1.30	-
2001	7	1	3.53	7.64	11.50	13.05	14.77	16.11	17.08
			3.53	4.11	3.86	1.55	1.72	1.34	0.97
Mean Length			4.19	7.82	11.25	13.40	14.03	15.19	17.08
			4.19	3.68	3.50	1.98	1.82	1.31	0.97
			111	65	24	9	5	3	1

TABLE 13 - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Back-Calculated Lengths for Each Age Class and Average Annual Increments of Back-Calculated Lengths (Continued)

Species: Walleye

Gear Type: Combined Gear Types (EF and SEF)

Class	Age	N	1	2	3	4	5	6	7	8	9	10	11
2007	1	33	4.75	-	-	-	-	-	-	-	-	-	-
			4.75	-	-	-	-	-	-	-	-	-	-
2006	2	21	8.58	13.93	-	-	-	-	-	-	-	-	-
			8.58	5.35	-	-	-	-	-	-	-	-	-
2005	3	6	8.18	14.37	18.64	-	-	-	-	-	-	-	-
			8.18	6.19	4.28	-	-	-	-	-	-	-	-
2004	4	6	7.90	14.26	18.06	20.23	-	-	-	-	-	-	-
			7.90	6.36	3.80	2.18	-	-	-	-	-	-	-
2003	5	5	7.48	14.21	18.23	20.68	22.78	-	-	-	-	-	-
			7.48	6.73	4.02	2.45	2.10	-	-	-	-	-	-
2002	6	8	8.26	14.56	18.37	20.69	22.53	23.84	-	-	-	-	-
			8.26	6.30	3.81	2.32	1.84	1.31	-	-	-	-	-
2001	7	9	7.72	13.44	17.26	19.98	21.92	23.52	24.79	-	-	-	-
			7.72	5.72	3.82	2.71	1.94	1.61	1.27	-	-	-	-
2000	8	8	7.40	12.82	17.09	19.61	21.52	23.11	24.50	25.51	-	-	-
			7.40	5.42	4.27	2.52	1.91	1.59	1.39	1.01	-	-	-
1999	9	3	6.62	11.45	16.21	19.38	21.77	23.51	25.08	25.99	26.68	-	-
			6.62	4.83	4.76	3.17	2.39	1.74	1.57	0.91	0.69	-	-
1998	10	2	5.91	10.86	15.52	19.08	21.61	23.66	25.23	26.38	26.88	27.20	-
			5.91	4.95	4.66	3.56	2.53	2.06	1.57	1.15	0.51	0.32	-
1997	11	1	6.70	10.03	13.82	17.44	20.60	22.84	24.29	25.31	26.16	27.15	28.01
			6.70	3.33	3.79	3.62	3.16	2.24	1.45	1.02	0.85	0.99	0.86
Mean Length			6.90	13.64	17.58	20.02	22.02	23.48	24.74	25.72	26.66	27.18	28.01
			6.90	5.71	4.06	2.59	2.04	1.59	1.39	1.01	0.66	0.54	0.86
			102	69	48	42	36	31	23	14	6	3	1

Species: White Bass

Gear Type: Combined Gear Types (EF)

Class	Age	N	1	2	3	4	5	6
2006	2	3	3.52	6.47	-	-	-	-
			3.52	2.94	-	-	-	-
2005	3	14	4.01	7.49	11.27	-	-	-
			4.01	3.47	3.79	-	-	-
2004	4	11	3.73	6.11	10.26	12.70	-	-
			3.73	2.38	4.14	2.44	-	-
2003	5	9	3.89	6.33	10.13	12.47	14.14	-
			3.89	2.44	3.79	2.35	1.66	-
2002	6	3	4.05	6.27	10.05	12.51	13.94	15.09
			4.05	2.22	3.78	2.46	1.43	1.14
Mean Length			3.88	6.68	10.59	12.59	14.09	15.09
			3.88	2.81	3.89	2.41	1.61	1.14
			40	40	37	23	12	3

TABLE 14 - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Back-Calculated Lengths for Each Age Class and Average Annual Increments of Back-Calculated Lengths (Continued)

Species: White Crappie

Gear Type: Combined Gear Types (EF and STN)

Class	Age	N	1	2	3	4	5
2005	3	5	3.55	5.91	8.31	-	-
			3.55	2.35	2.40	-	-
2004	4	3	2.34	4.26	7.22	10.29	-
			2.34	1.92	2.96	3.06	-
2003	5	1	2.89	5.28	7.94	11.00	11.78
			2.89	2.39	2.66	3.06	0.78
Mean Length			3.08	5.29	7.91	10.47	11.78
			3.08	2.21	2.62	3.06	0.78
			9	9	9	4	1

TABLE 15 - STANDARD LAKE SURVEY REPORT
INITIAL SURVEY DATED 07/21/2008 FOR DOW NUMBER 19-0005-00

Age Class Frequency Distribution

Species and Gear (1)	Number of Fish (2)			Number of Fish in Year Class ('yy) and Age Class															
	Aged	Keyed	Unaged	'08 0	'07 1	'06 2	'05 3	'04 4	'03 5	'02 6	'01 7	'00 8	'99 9	'98 10	'97 11	'96 12	'95 13	'94 14	<'94 15+
Black Crappie																			
EF	9	0	0	0	0	2	0	5	1	1	0	0	0	0	0	0	0	0	0
STN	13	0	0	0	0	1	7	4	1	0	0	0	0	0	0	0	0	0	0
Totals:	22	0	0	0	0	3	7	9	2	1	0	0	0	0	0	0	0	0	0
Bluegill																			
EF	52	17	0	0	2	5	21	21	14	5	1	0	0	0	0	0	0	0	0
STN	2	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
Totals:	54	17	0	0	2	5	22	22	14	5	1	0	0	0	0	0	0	0	0
Largemouth Bass																			
EF	12	2	0	0	2	2	2	5	0	3	0	0	0	0	0	0	0	0	0
SEF	92	6	0	9	46	19	5	11	5	2	1	0	0	0	0	0	0	0	0
Totals:	104	8	0	9	48	21	7	16	5	5	1	0	0	0	0	0	0	0	0
Northern Pike																			
EF	2	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
Sauger																			
EF	5	0	2	0	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0
SEF	15	0	0	0	10	0	0	1	1	1	1	0	1	0	0	0	0	0	0
Totals:	20	0	2	0	12	2	0	2	1	1	1	0	1	0	0	0	0	0	0
Smallmouth Bass																			
EF	51	6	0	0	18	24	10	4	0	1	0	0	0	0	0	0	0	0	0
SEF	86	4	0	28	31	19	7	1	2	1	1	0	0	0	0	0	0	0	0
Totals:	137	10	0	28	49	43	17	5	2	2	1	0	0	0	0	0	0	0	0
Walleye																			
EF	15	0	0	1	4	5	1	2	0	0	1	1	0	0	0	0	0	0	0
SEF	88	0	0	0	29	16	5	4	5	8	8	7	3	2	1	0	0	0	0
Totals:	103	0	0	1	33	21	6	6	5	8	9	8	3	2	1	0	0	0	0
White Bass																			
EF	40	4	0	0	0	3	16	12	10	3	0	0	0	0	0	0	0	0	0
White Crappie																			
EF	6	0	0	0	0	0	3	2	1	0	0	0	0	0	0	0	0	0	0
STN	3	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0
Totals:	9	0	0	0	0	0	5	3	1	0	0	0	0	0	0	0	0	0	0

(1) Key to sampling gear abbreviations:

EF = Standard electrofishing
 STN = Special sampling with trap nets
 SEF = Special sampling, electrofishing

(2) Notes:

Number of Fish Aged: Fish that were aged from bony parts.
 Number of Fish Keyed: Fish assigned an age with an age-length key or by expansion of mesh or station age distributions.
 Number of Fish Unaged: Fish that were not aged and were not assigned an age.

Mississippi River, Pool 2
Initial Survey Report
2008

Prepared by:

_____ Date

_____ Date
East Metro Area Fisheries Supervisor

_____ Date
Central Region Fisheries Supervisor