

Middlefork Reservoir

Fish and Wildlife Research and Management Notes

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INTRODUCTION

Middle Fork Reservoir is a 177-acre impoundment located in Richmond, Indiana. The lake was built in the early 1960s and its primary purpose is to provide water for the city. The reservoir and 350 acres surrounding the lake were leased to the Richmond Department of Parks and Recreation to provide additional recreational opportunities in the area. Since the lake is used for water supply, fish management tools such as chemical treatment, drainage, or drawdown cannot be utilized. This leaves fish stocking and fishing regulations as the primary options for maintaining a desirable fishery.

To utilize the abundant forage base, tiger muskellunge were stocked from 1980 through 1986, followed by northern pike introductions from 1987 to 1992. Stockings of both species were unsuccessful and angler interest was low, so the stockings were discontinued.

For most of the history of Middle Fork, the fish community has been composed of small bluegill and white crappie and a low density largemouth bass population that could not keep the panfish numbers cropped off. At the time of the last fisheries survey in 1997, bass were more abundant and the bluegill population was showing signs of improvement. Bluegill growth had improved and there was a good proportion of harvestable size fish. However, despite the increase in the bass population, crappie continued to be somewhat small and their growth was still slow.

The present survey was conducted to determine the balance of predators and prey. In addition, growth of the dominant sport species was a main focus.

RESULTS AND DISCUSSION

The present survey was conducted June 19 to 21, 2000. Survey effort consisted of one hour of D.C. electrofishing at night, eight experimental mesh gill net lifts, and four trap net lifts. Collected fish were measured to the nearest 0.1 inch and weights were estimated using central Indiana average weights. Scale samples were collected from the dominant game species and from carp for age and growth analysis. A total of 927 fish was sampled that weighed 777.92 pounds. Twelve species and one hybrid were represented in the sample.

Three hundred and seventy largemouth bass were collected that weighed an estimated 173.57 pounds. Bass abundance by number in the present survey (39.9 percent) was up considerably since the 1997 survey (18.9 percent) but was very similar in abundance by weight (22.3 percent compared to 23.1 percent respectively). Prior to the present survey, the highest relative abundance of largemouth by number was observed in 1997. Bass collected in 2000 ranged in length from 4.1 to 21.3 inches and averaged 9.1 inches. Only 4.3 percent of the bass were 14

inches or larger compared to 23 percent in 1997 and 36 percent in 1990. Proportional stock density (PSD) is often used as a measure of the balance of predators and prey. The PSD of largemouth bass is the proportion of bass 8.0 inches or longer that are also 12.0 inches or larger. The bass PSD was 24 in the present survey and 42 in 1997. Balanced bass populations have PSDs that range from 40 to 60. Growth of largemouth is normal compared to bass in other central Indiana lakes, and growth is nearly identical to that observed in 1997. Bass are reaching 14 inches long in just over 4 years. An extremely successful bass spawn occurred in 1999 as approximately 47 percent of the largemouth bass collected were one-year-old. Decent year classes of 2- and 3-year-old bass were also present.

Bluegill ranked second in abundance by number (18.7 percent) but were just sixth by estimated weight (3.8 percent). In 1997, bluegill comprised 37.1 percent of the sample by number. A total of 173 bluegill was collected in the present survey that weighed an estimated 29.42 pounds. Bluegill were collected up to 9.3 inches long and averaged 5.7 inches. Over 38 percent of the bluegill were considered harvestable (six inches or larger) which is very similar to that observed in 1997. The PSD for bluegill is the proportion of fish 3.0 inches or larger that are also at least 6.0 inches long. The bluegill PSD was 29 in the present survey compared to 41 in 1997. Balanced bluegill populations have PSDs which range from 20 to 40. Bluegill are growing near normal at 1- and 2-years-old and well above average at ages 3 through 5. Growth is very similar to that observed in 1997. The most represented bluegill year class was spawned in 1998.

The Bluegill Fishing Potential Index (BGFP) was developed to compare the quality of bluegill fishing among Indiana's lakes and ponds (Ball and Tousignant, 1996). The four criteria used to arrive at the BGFP score include bluegill density, growth, PSD, and RSD8 (relative stock density). Of a possible 40 points, the current Middle Fork Reservoir bluegill fishery scored 25 points. This ranks the bluegill fishery as good. In 1997, the bluegill fishery rated excellent with 28 points. The slightly lower ranking in the present survey was mainly due to a lower bluegill density.

One hundred and sixty-one white crappie were collected that weighed an estimated 34.58 pounds. White crappie was the third most abundant species sampled by number (17.4 percent) and fifth by weight (4.4 percent). Crappie were collected up to 11.8 inches long with the average fish measuring 7.5 inches. Nearly 43 percent of the crappie were considered harvestable (8.5 inches or larger). This compares favorably to 1997 when just 13 percent of the crappie were a harvestable size. White crappie growth has improved considerably since 1997, and now they are growing slightly above normal at 2- and 3-years-old.

Seventy-nine white suckers and 21 golden redhorse were collected. Together, these two sucker species comprised 10.8 percent of the sample by number and 26.5 percent by weight. These two species were probably very abundant in the stream prior to the impoundment of the reservoir, and they now have well established populations in the lake. The largest white sucker sampled measured 20.4 inches long while the largest golden redhorse was 16.8 inches.

Fifty common carp were sampled that collectively weighed an estimated 246 pounds. Carp was the most abundant species collected by weight (31.6 percent) and fifth in abundance by number (5.4 percent). Carp are more numerous than in 1997, however, their faster than normal growth

and their large sizes indicate that they are not overly abundant. Carp were collected up to 30.5 inches long, and they averaged 19.9 inches.

Black bullhead continues to be an abundant species in Middle Fork, and due to its average large size, could provide some angling opportunities. Forty-seven black bullhead were collected that weighed nearly 70 pounds. Black bullhead ranked sixth in abundance by number (5.1 percent) and fourth by weight (9.0 percent). All but one of the bullhead collected were 10 inches or larger and the average fish measured 13.6 inches.

Only nine golden shiners were sampled in the present survey compared to 73 in 1997. The increasing largemouth population is likely the main reason for the decline in the golden shiner population. Golden shiner is primarily a forage species.

Eight channel catfish were collected that ranged in length from 13.3 to 27.5 inches. Channel cats had been stocked regularly in the past, however, stockings were suspended following the 1997 stocking. Channel catfish stockings were discontinued because there was an under-utilized bullhead population that was composed of some quality size fish.

Other species collected included longear sunfish, green sunfish, pumpkinseed, and a single hybrid sunfish. These species likely contribute little to the overall angler harvest due to their low abundance and generally small size.

CONCLUSION AND RECOMMENDATIONS

Middle Fork Reservoir was once known for its large numbers of bluegill and crappie, however, their sizes were usually pretty small. The fish community has made a dramatic turn around recently and now contains a very respectable panfish fishery. In the 1997 survey, the bass population had risen considerably over previous levels. In the present survey, largemouth was the most abundant species represented. The extremely large 1999 year class of bass was the primary reason for their rise to the top. Despite the dramatic increase in the bass population, bass growth has not declined. The bluegill population showed some positive improvements in size structure in 1997, and that continued to the present survey as over 38 percent of the bluegill were six inches or larger. The continuing expansion of the largemouth population since 1997 has finally resulted in much larger crappie and much improved growth. The increase in the largemouth bass population is the primary reason for the improvement in the panfish populations. With the increase in the bass population, bass are able to keep the panfish populations in check which results in less competition among bluegill and crappie for food and growth improves.

There are two likely reasons for the increase in the largemouth bass population at Middle Fork. First, the 14 inch minimum size limit for bass forces anglers to release bass that are less than 14 inches in length. These small bass are the most effective predators in a lake and are also good spawners. Secondly, since more and more anglers are practicing voluntary catch and release for "legal-size" bass, there are more adult fish available to spawn.

Bullheads continue to maintain a large population in the lake and most of them are of quality size. Bullheads continue to be under-utilized in the lake. For this reason, channel catfish stockings are not recommended.

The next fisheries survey should be conducted in June of 2002. That survey should again focus on the balance of predators and prey and the growth rates of bass, bluegill, and crappie. Panfish recruitment will also be a major focus. If the bass population continues to increase, heavy predation on young panfish is possible.

At this time, the best fishing at Middle Fork Reservoir would be for bluegill and crappie. A good proportion of these species would be of a size to interest most anglers. Bass fishing should be good, however, most will likely be less than 14-inches long. Anglers wishing to harvest bass need to remember not only the 14-inch minimum size limit, but also that there is a five fish bag limit. Catfish fishing for bullheads and channels should be fair and most of them will be a desirable size.

LITERATURE CITED

Ball, R.L. and J.N. Tousignant. 1996. The development of an objective rating system to assess bluegill fishing in lakes and ponds, Research Report. Fisheries Section, Indiana Department of Natural Resources. Indianapolis. 18pp.

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