Rockville Lake, Parke County

Fish and Wildlife Research and Management Notes
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INTRODUCTION

Rockville Lake is a 100-acre impoundment located about a half mile north of Rockville, Indiana. The lake was created in 1972 as part of a Little Raccoon Conservancy District Public Law 566 project. The lake was stocked by the Division of Fish and Wildlife (DFW) with largemouth bass, bluegill, redear sunfish, and channel catfish following a pre-impoundment eradication.

Fish management practices at Rockville Lake have primarily focused on maintaining a desirable bass and bluegill fishery. The predator/prey balance at the lake has often shifted between the two, but from 1990 through 1997 largemouth bass was the dominant species in the lake. A history of poor reproduction and poor survival of young panfish has been noted at Rockville Lake. The problems have been caused by excessive predation by a dense bass population, poor water quality, and the continuation of a previous recommendation to perform winter drawdowns. Drawdowns concentrate the fish and allow bass to more easily prey upon bluegill and other panfish. It was discovered during the winter of 1997-98 that drawdowns were still being conducted even though there was a recommendation to end them in 1981. There was no drawdown in the winter of 1998-99.

The present survey was conducted to evaluate the predator/prey balance. It was also conducted to evaluate the effects grass carp are having on the level of submergent aquatic vegetation. In 1997 it was feared that the lack of vegetation, as a result of the grass carp foraging, may have adverse effects on the fishery.

RESULTS AND DISCUSSION

The present survey was conducted May 24 to 26, 1999. Survey effort consisted of one hour of D.C. electrofishing at night with two dippers, eight experimental mesh gill net lifts, and four trap net lifts. Ten species were collected during the survey that comprised a sample of 974 fish that weighed 295.51 pounds.

A total of 467 bluegill, that weighed 19 pounds, was collected. Bluegill abundance by number increased slightly from 43.7 percent in 1997 to 47.9 percent in the present survey, but abundance by weight (6.4 percent) was only about half of what it was previously (11.3 percent). This was the first time since 1988 that bluegill and not largemouth bass ranked first in abundance by number. The increase in bluegill abundance was due to a huge 1998 year class of bluegill. Nearly 69 percent of all the bluegill collected were age 1 and measured 3 inches long or less. Bluegill up to 8.7 inches were collected, but the 1998 year class brought the average size bluegill collected down from 4.6 inches in 1997 to 3.1 inches in the present survey. Only 6 percent of the bluegill were considered harvestable (6 inches or greater), down from 22 percent in 1997. Bluegill

growth rates were similar to those observed in 1997. Age 2 and 3 fish are growing slightly to well above normal compared to other central Indiana bluegill populations. Average weights of bluegill were mostly normal.

Proportional stock density (PSD) is often used as a measure of the predator/prey balance in a bass and bluegill dominated lake. Bluegill PSD is the proportion of 3.0 inch and larger bluegill that are also 6.0 inches or larger. The PSD for bluegill in the present survey was 11, compared to 26 in 1997, and 54 in 1992. Balanced bluegill populations have PSDs ranging from 20 to 40. The PSD was low in the present survey due to a fairly strong group of age 2 bluegill but few age 3 or older fish.

The Bluegill Fishing Potential Index (BGFP) is an objective rating system that was developed to assess bluegill fishing in lakes and ponds (Ball and Tousignant 1996). The four criteria used to determine the BGFP score are bluegill density, growth, PSD, and relative stock density (RSD8). Out of a possible 40 points, the Rockville Lake bluegill fishery scored 22 points which rates bluegill fishing as good. In 1997 (23 points) and 1992 (24 points), the Rockville bluegill fishery also received a good rating.

The second most abundant species collected by number (35.3 percent) and the most dominant by weight (47.9 percent) was largemouth bass. Bass abundance levels by number and weight were more desirable in the present survey than they were in 1997, as both were down from the levels observed in 1997, 45.3 percent and 54.3 percent, respectively. The 344 bass sampled in the present survey weighed 141.42 pounds. Largemouth ranged in length from 5.2 to 16.6 inches and averaged 8.9 inches, which is slightly less than the 9.3 inches they averaged in 1997. Like bluegill, 1998 was a good year for largemouth recruitment, as almost 50 percent of the bass collected in the present survey were 1-year-old. Almost identical to 1997, the percentage of bass that were 14 inches or longer was only 3.5 percent in the present survey. It is taking bass around five years to reach 14 inches at Rockville Lake. As they were in 1997, largemouth bass are growing slightly better than average to 2-year-old and then near average to 5-years-old. Largemouth weights were mostly normal.

Largemouth bass PSD is the proportion of 8.0 inch and larger bass that are also 12.0 inches and larger. Balanced bass populations have PSDs ranging from 40 to 60. The present Rockville bass population had a PSD of 35 compared to 46 in 1997 and 15 in 1992. Proportional stock density would have been higher if there had been more 4-year-old and older bass collected.

The Rockville Lake channel catfish population is maintained through biennial stockings by the DFW. Channel catfish usually have little spawning success in small impoundments because of a lack of spawning habitat and/or excessive predation on catfish fry and fingerlings by largemouth bass. Rockville Lake is no exception to this rule as there were definitive gaps in the length frequency of collected channels which indicates that the catfish in the lake are the same fish the DFW biennially stocks. There were two distinct groups of catfish that made up the bulk of the sample of 61 channels that weighed 84.63 pounds. The most abundant (38 fish) group ranged in length from 8.5 to 13.5 inches. These are probably all fish that were stocked in the fall of 1998. The other group (21 fish) ranged in length from 17 to 21 inches and were likely stocked in 1996. The remaining catfish measured 25.0 and 26.7 inches and the largest fish weighed over 8 pounds.

Since 1997, channel catfish abundance by number has increased slightly to 6.3 percent and abundance by weight has nearly doubled to 28.6 percent. Average weights of catfish were normal to well above normal.

The fourth most abundant species by number was green sunfish (3.3 percent). Green sunfish generally are not desirable because they lack the size to interest anglers, and they compete with more desirable panfish for food and space. However, a few of the green sunfish found were up to seven inches long. At their present density, they pose little threat to the other panfish.

Redear sunfish abundance by number and weight, 2.5 percent and 2.3 percent, respectively, was about the same as seen in 1997. Twenty-four redear were collected that weighed almost seven pounds. The biggest redear was 10.5 inches long, and the average size fish collected was 6.5 inches. Two-year-old redear was the most abundant year class collected, accounting for almost half of the total. Growth of 1-year-old and 2-year-old redear is well above average. Average weights of redear were normal to well above normal.

Black crappie had a successful spawn and good survival in 1998. Ranging from 4.2 to 7.6 inches long, all 22 black crappie collected were spawned in 1998 and exhibited good growth in their first year. Although no older crappie were collected, they are obviously present, as indicated by the large group of 1-year-old fish.

Fifteen white suckers that weighed a total of 34.55 pounds were collected. White sucker abundance by number (1.5 percent) and weight (11.7 percent) have both declined since 1997. The dense bass population keeps the suckers from becoming overly abundant.

Five yellow bullhead, two black bullhead, and two white crappie completed the sample of fish at Rockville Lake. Combined, these species accounted for 0.9 percent of the sample number and 1.5 percent of the sample weight.

Although no grass carp were collected during the survey, there were several large grass carp observed cruising the shallows, especially in the upper end of the lake. Like in 1997, grass carp, which were introduced in 1994, continue to inhibit the growth of submergent aquatic vegetation as there was none to be found during the present survey. There was a heavy planktonic algae bloom occurring at the time of the survey which was evident by the greenish color of the water and a relatively shallow turbidity reading of 3-feet 4-inches. With a lack of submergent vegetation to utilize nutrients, there are more nutrients available to fuel algae blooms. Prior to the grass carp introduction, levels of submergent vegetation coverage approached 30 percent.

CONCLUSION

The Rockville Lake fishery is more balanced than it was in 1997. For nearly a decade, the fishery had been unbalanced in favor of predators. With the addition of the tremendously successful 1998 year class of bluegill to a relatively strong year class from 1997, bluegill is finally again the most abundant species by number. Ideally, bluegill will remain the most abundant species in the lake and the relative abundance of largemouth bass will remain fairly stable. This can be accomplished if bluegill and other panfish continue to reproduce successfully.

Winter lake drawdowns have been performed annually at Rockville Lake for nearly 20 years with the exception of the winter of 1998-99, even though they were recommended to end in 1981. Drawdowns concentrate fish in a smaller area and allow largemouth bass to easily prey upon small panfish. Since many of the young panfish are consumed each winter during the drawdown, panfish recruitment suffers. Therefore, the panfish fishery cannot achieve its full potential. It was observed during the present survey that the ill advised drawdowns were probably the main reason why bluegill recruitment had been poor. Without a drawdown in 1998-99, survival of the 1998 year class of bluegill and all other species aged during the survey was very good.

The park manager indicated the lake was again taken down five feet in late 1999 to protect the park's boat docks from possible damage by ice. He also indicated that the Park Board would likely continue this practice annually. It is again strongly recommended that no further drawdowns be conducted at Rockville Lake unless one is needed for a specific construction purpose. Bluegill fishermen will benefit the most from this. With no drawdowns, bluegill and other panfish will be able to sustain larger populations rather than having to always try and build up a depleted population. Therefore, bluegill fishing will be better because there will be considerably more fish in the population. This should benefit the park economically. As word spreads about the improved fishery, more people are likely to come and fish at the lake because there are not many quality panfish lakes in the west-central part of the state. If the Park Board wishes to discuss this recommendation and its expected benefits, DFW personnel are willing to attend a board meeting and explain this further.

Only a very small percentage of the largemouth collected were 14 inches or longer. Recruitment of bass to the population has not been a problem as there has consistently been many age 3 and younger bass found during surveys of the lake. However, there are not very many keeper size bass ever collected. In order to provide a higher quality bass fishery where anglers have a chance to catch more bass over 14 inches, catch and release of largemouth bass is strongly encouraged.

Channel catfish provide anglers with a more diverse fishery and added angling opportunities. Without continued stockings of channels, anglers will not be able to enjoy fishing for them at Rockville Lake because of their lack of reproductive success. The gaps in the length frequency of channel catfish indicate that the majority of the catfish in the lake are those that have been stocked by the DFW. Therefore, the next stocking of catfish should be in the fall of 2000, when 1,667, 8-inch fish should be stocked.

There is no need to perform any weed control in the near future at Rockville Lake. Grass carp continue to keep submergent vegetation from reestablishing in the lake and cattails and bulrush are nowhere near nuisance levels. Hopefully as the grass carp grow older, their effectiveness at controlling vegetation will diminish. It would be beneficial to the fishery if there was some submergent vegetation present to provide a refuge for small panfish. If park management feels that treatment is needed, a weed control permit from the DFW is required.

The next standard fisheries survey should be conducted in 2001. At that time the predator/prey balance will be evaluated. Vegetation levels will also be evaluated at that time to determine what effects grass carp are having.

The best fishing opportunity at Rockville Lake should be for bluegill, as many of the fish from the 1997 year class will be of harvestable size in 2000, followed by the 1998 year class in 2001. Largemouth bass fishing should be good but most will be less than 14-inches long. While catch and release of largemouth bass is strongly encouraged, anglers are reminded that there is a five bass daily bag limit and a 14-inch minimum size limit. Catfish anglers should enjoy catching some good quality fish. There is a ten fish daily bag limit for channel catfish caught from lakes.

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. Indiana Department of Natural Resources. 18pp.