

Harden Reservoir

Fish and Wildlife Research and Management Notes

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Title: Evaluation of Striped Bass Stockings at Harden Reservoir

INTRODUCTION

Harden Reservoir is a 2,060 acre Army Corps of Engineers flood control impoundment. The reservoir, also known as Raccoon Lake or Mansfield Reservoir, is located in Parke County, approximately seven miles east of Rockville, Indiana.

Gizzard shad has predominantly been the most abundant species in Harden Reservoir since the early 1960's. The first management practices at the lake focused on trying to decrease the gizzard shad population. Emphasis later shifted towards utilizing the shad to provide more diverse and increased numbers of angling opportunities for predators. The latter has been accomplished through predator stockings and fishing regulations.

Striped bass is an open-water species that prefers to feed upon shad. Since 1994, except for 1995, striped bass have been stocked annually at Harden Reservoir ([Table 1](#)). Other than in 1996 when Harden received a double stocking, striped bass have been stocked at the rate of 10 fingerlings per acre.

Table 1. Striped bass stockings at Harden Reservoir, 1994 to 1999.

| Year | Number Stocked | Density (number/acre) | Average Size (inches) |
|-------------|-----------------------|------------------------------|------------------------------|
| 1994 | 20,600 | 10.0 | 1.40 |
| 1996 | 41,200 | 20.0 | 1.34 |
| 1997 | 20,600 | 10.0 | 1.28 |
| 1998 | 20,600 | 10.0 | 1.34 |
| 1999 | 20,700 | 10.0 | 1.96 |

Fall evaluations of striper stockings have been conducted every year since 1994, except for 1996. Other than 1995, when no 1-year-old stripers were collected, all year classes of striped bass were found during those surveys. The majority of young-of-the-year (YOY) striped bass were collected in the lower portion of the lake near the Raccoon State Recreation Area (RSRA) boat ramp, the ramp from which they were stocked. Therefore, in 1998, it was recommended that future stockings be divided between the RSRA ramp and Hollandsburg ramp to aid dispersal.

The present survey was conducted to evaluate the success of the 1999 striper stocking and survival of older stripers at Harden Reservoir. In addition, walleye were collected to assess natural reproduction in the lake since stockings of them were discontinued after 1996.

RESULTS AND DISCUSSION

The present survey was conducted October 4 to 7, 1999. Survey effort consisted of four hours of D.C. electrofishing at night with one dipper, nine standard experimental mesh gill net lifts, and nine larger experimental mesh gill net lifts. In an attempt to more effectively sample the older striped bass, the larger nets were suspended in at least 20 feet of water. Lengths, weights, and scale samples (for age and growth analysis) were taken from stripers and walleye.

A total of 173 striped bass that weighed almost 157 pounds was collected (Table 2). One hundred and forty-nine YOY stripers were collected, all while electrofishing. The electrofishing catch rate of YOY fish was 37.3 per hour and good numbers of them were found in the upper and lower sections of the reservoir. This was the second highest catch rate of YOY striped bass ever at Harden. The highest catch rate occurred in 1994 (69.4 per hour) and the lowest in 1997 (6.2 per hour). YOY stripers averaged almost two inches long when they were stocked in 1999, which was at least a $\frac{1}{4}$ inch longer than any of the previous stockings. Despite the larger size of stocked fish, YOY stripers only averaged 4.5 inches which is smaller than the previous low in 1994 of 4.9 inches. In low water years when there is little rain, like in 1999, fewer nutrients enter the lake. Without added nutrients, plankton production is decreased which can have an effect on the entire food chain. Therefore, more competition existed among the YOY stripers for food which resulted in decreased growth.

Out of the remaining stripers, four were collected while electrofishing and 20 were collected in the large gill nets. Five 1-year-old stripers were collected in gill nets. One-year-old stripers ranged in length from 12.9 to 15.8 inches and averaged 14.6 inches. This was larger than the average size 1-year-old striped bass collected in 1998 (13.4 inches), but smaller than the average from 1997 (15.3 inches). Seven 2-year-old stripers were found, one while electrofishing and the others in nets. Ranging from 19.6 to 20.8 inches long, the 2-year-old striped bass averaged 20.2 inches, nearly two inches shorter than those collected in 1998 (22.0 inches). Three 3-year-old stripers were found while electrofishing and six while running gill nets. The 3-year-old striped bass ranged from 26.1 to 27.9 inches long and averaged 27.0 inches. A total of three 5-year-old fish was collected in the nets. These stripers from the original stocking ranged from 32.1 to 33.2 inches in length and averaged 32.5 inches. The largest of these fish weighed 15.5 pounds.

Table 2. Striped bass stockings at Harden Reservoir, 1994 to 1999.

| | YOY | 1 | 2 | 3 | 5 | Total |
|------------------------------|---------|-----------|-----------|-----------|-----------|----------|
| Number collected | 149 | 5 | 7 | 9 | 3 | 173 |
| Length range (inches) | 3.6-6.5 | 12.9-15.8 | 19.6-20.8 | 26.1-27.9 | 32.1-33.2 | 3.6-33.2 |
| Ave. length (inches) | 4.5 | 14.6 | 20.2 | 27.0 | 32.5 | 7.1 |

Compared to past striper growth at Harden and Brookville Reservoirs, those collected during the present survey are growing well above normal at 3-years-old and beyond. Striped bass exhibited average growth to 2-years-old. One-year-old and 3-year-old striped bass are growing faster than the other year classes at Harden Reservoir. These two year classes exhibited extremely good growth in their first year (1996 and 1998) which may be attributed to high water levels in the spring of those years. With the spring rains came added nutrients that likely boosted plankton

production and other small prey species which provided an abundance of forage for the newly stocked striped bass.

Fifteen walleye were collected in the present survey that weighed 38.70 pounds. Walleye ranged in length from 15.8 to 22.8 inches and averaged 19.0 inches. Ten of the walleye collected were definitely results of natural reproduction. Eight of those ten walleye were 1-year-old and the others were 2-years-old. There were five 3-year-old walleye collected that may or may not have been stocked in 1996. Reaching the minimum size limit of 14 inches in well under two years, walleye in Harden Reservoir continue to grow well above normal compared to those in other central Indiana lakes.

CONCLUSION

Striped bass stockings were again successful at Harden Reservoir. In 1999, the second highest catch rate ever of YOY stripers occurred (37.3 per hour). Splitting the stockings of stripers between the RSRA ramp and Hollandsburg ramp seems to have helped to better distribute the fish throughout the lake as both the upper and lower sections of the reservoir held good numbers of YOY fish. Although the YOY stripers collected in the fall were not nearly as large as those from previous fall evaluations, survival and future good growth can be expected from this year class once they are large enough to utilize the abundant prey. Both the 1994 and 1997 year classes were relatively small at 1-year-old, but both survived and have normal to above average growth beyond 1-year-old.

The question of how large stripers can grow at Harden remains to be answered. Apparently at this point, stripers have not reached a size where they are being impacted by a need for cool, well oxygenated water. Literature suggests that striped bass over 11 pounds prefer water temperatures between 68 and 70, while fish under 20 pounds can tolerate 77 and higher temperatures for a short time. However, this stresses the larger stripers and could cause mortality (Ball and Kiley 1992). Future evaluations will hopefully provide more insight into the question of how large striped bass can get at Harden Reservoir.

Walleye did not appear to spawn successfully in 1999 as there were no YOY collected. Low water in the spring probably attributed to this. Given suitable conditions it has been seen that walleye can naturally reproduce in the lake and maintain a low level population. At least 66 percent of the walleye collected in the present survey were the result of natural reproduction. Walleye continue to grow fast at Harden.

A standard fisheries survey is scheduled at the lake in 2001, followed by a fall evaluation of striped bass stockings in 2002. Hopefully after these surveys, we will have a better idea as to whether there is suitable water to support striped bass up to and over 20 pounds. In an attempt to better sample the large striped bass, even larger mesh gill nets should be used in future fall evaluations. Larger mesh gill nets should also be set in place of the standard mesh gill nets when there is ample water depth since only the larger mesh nets caught striped bass in the present survey. Natural reproduction of walleye will continue to be evaluated during future surveys of the lake.

Both shore anglers and boat anglers have the opportunity to catch big striped bass at Harden Reservoir. From a boat, anglers may want to concentrate on fishing for stripers that are suspended over deeper water. During the summer, the stripers will likely spend most of their time down near the thermocline in cool water that contains sufficient oxygen for survival. Shore anglers should probably concentrate on shallow areas that drop off sharply into deeper water or in places where the former creek channel butts up against the bank. Striped bass will periodically move up into shallow areas adjacent to deeper water to feed. There is no minimum size limit for stripers, but there is a two fish daily bag limit. White bass are very abundant in the reservoir and may commonly be confused with striped bass. White bass have a deep body and a single tooth patch on the center of the tongue. However, stripers have a much more streamlined body and have two distinct tooth patches on the tongue. The horizontal lines found on both species are much more prominent on striped bass. Other species of interest to anglers at Harden Reservoir include crappie, largemouth bass, and catfish.

LITERATURE CITED

Ball, R.L. and Kiley, A.L. 1992. Predator Fishes Stocked Into Brookville Reservoir. Indiana Department of Natural Resources. 5pp.

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