

BISCHOFF RESERVOIR  
Ripley County  
2005 Fish Management Report

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## EXECUTIVE SUMMARY

- Bischoff Reservoir (also known locally as Batesville Reservoir or Morris Reservoir) is a 190-acre impoundment located approximately one mi southwest of the small town of Morris in southeastern Indiana. It is owned by the City of Batesville and managed by the Batesville Water and Gas Utility as a water supply reservoir. An Indiana Department of Natural Resources public access site with a parking lot and concrete boat ramp is present. Electric trolling motors and gasoline outboards (up to 6 horsepower) can be used on the lake.
- A survey of largemouth bass, bluegill, and gizzard shad was conducted on Bischoff Reservoir on June 13 and 21, 2005, as part of Division of Fish and Wildlife (DFW) Work Plan 204034, which is titled, "Gizzard shad experimental management strategies." Bischoff will be used as an experimental control to determine natural fluctuations in shad populations and is scheduled to be surveyed annually from early to mid-June through 2009.
- A total of 1,688 fish, representing three species, was collected during this survey. By number, gizzard shad ranked first, followed by bluegill and then largemouth bass. By weight, gizzard shad ranked first, followed by largemouth bass and then bluegill.
- The electrofishing catch rate for gizzard shad was 404.5/h, which is a 33% increase from 2004.
- Bluegill represented a balanced population with fish reaching 6.0 in TL in their 4<sup>th</sup> year of growth, which is average for southeastern Indiana.
- Largemouth bass represented a balanced population with fish most likely reaching 14.0 in TL in their 6<sup>th</sup> year of growth, which is average for southeastern Indiana.
- In Bischoff Reservoir, the DFW should maintain a 14.0-in minimum size limit on largemouth bass, continue to stock 3,040 (16/acre) channel catfish every two years, and continue to monitor the fishery.

## FIGURES

Figure	Page
1. Bischoff Reservoir gizzard shad growth from 2005 survey (solid line) compared to 2004 survey (dashed line) and to average gizzard shad growth observed in Fish Management District 8 impoundments (dotted line) .....	6
2. Bischoff Reservoir bluegill growth from 2005 survey (solid line) compared to 2004 survey (dashed line) and to average bluegill growth observed in Fish Management District 8 impoundments (dotted line) .....	6
3. Bischoff Reservoir largemouth bass from 2005 survey (solid line) compared to 2004 survey (dashed line) and to average largemouth bass growth observed in Fish Management District 8 impoundments (dotted line).....	6

## INTRODUCTION

Bischoff Reservoir (also known locally as Batesville Reservoir or Morris Reservoir) is a 190-acre impoundment located approximately one mi southwest of the small town of Morris in southeastern Indiana. It is owned by the City of Batesville and managed by the Batesville Water and Gas Utility as a water supply reservoir. Construction was completed in 1960. An Indiana Department of Natural Resources (IDNR) public access site with a parking lot and concrete boat ramp is present. Electric trolling motors and gasoline outboards (up to 6 horsepower) can be used on the lake.

Bischoff Reservoir is one of the few lakes in southern Indiana where the standing crop of fish has been measured. The lake was drained by the utility in the fall of 1966 to improve water quality by removal of rough fish. As the lake drained, IDNR personnel measured and weighed all the fish. Results revealed the standing crop of fish in Bischoff Reservoir was 300 lbs per acre (Barry 1967).

The lake was restocked early in 1967 with largemouth bass, redear sunfish, channel catfish, and white catfish (Ameiurus catus). Regular stockings of channel catfish were started in 1977 to maintain the channel catfish population, which was not expected to sustain itself through natural reproduction. Prior to this survey, 46,297 catfish had been supplementally stocked by the IDNR's Division of Fish and Wildlife (DFW) from 1977 through 2004.

Gizzard shad, a species that has the potential to ruin sport fisheries in impoundments, had not been collected during any surveys at Bischoff before 1993. In the 1993 survey, however, gizzard shad was found to be the dominant species by number and by weight (Lehman 1995).

Bischoff Reservoir is scheduled to be surveyed from 2005 through 2009 under DFW Work Plan 204034, which is titled, "Gizzard shad experimental management strategies." The work plan objectives are:

1. Report on how the illegal introductions of gizzard shad have negatively affected sport fish populations and reduced fishing opportunities.
2. Determine the most effective way(s) to control excessive gizzard shad populations.
3. Determine how sport fish populations respond to various gizzard shad management techniques.

According to the work plan, Bischoff will be surveyed from early to mid-June each year. Only largemouth bass, bluegill, and gizzard shad will be collected. Bischoff will be used as an experimental control to determine natural fluctuations in shad populations.

## METHODS

A survey of largemouth bass, bluegill, and gizzard shad was conducted June 13 and 21, 2005. A GPS unit, GARMIN GPSmap 76, was used to record the location of the fish collection sites.

Fish were collected by pulsed DC electrofishing the shoreline on two nights with two dippers for 2.0 h. Four 15-min electrofishing stations in the southeast arm of the lake were sampled the first night. Three 15-min electrofishing stations in the north arm of the lake and one 15-min station along the dam were sampled the second night.

All largemouth bass collected and subsamples of gizzard shad and bluegill were measured to the nearest 0.1 in TL. The remaining shad and bluegill were counted but not measured. The length-frequency distribution and total weight was created by applying the percentages by half-inch group of the sub-samples of 525 shad and 504 bluegill to the entire sample. Fish were not weighed; average weights for fish by half-inch groups for Fish Management District 8 were used to estimate the weight of the fish sample. Fish scale samples were taken from largemouth bass, bluegill, and gizzard shad for age and growth analysis. The proportional stock density (PSD) was calculated for largemouth bass and bluegill (Anderson and Neumann 1996). The bluegill PSD was calculated using only the bluegill subsample. The Bluegill Fishing Potential (BGFP) index was used to assess bluegill fishing quality (Ball and Tousignant 1996).

## RESULTS

A total of 1,688 fish, representing three species, was collected during this survey. Total weight of the fish sample was approximately 449 lbs. By number, gizzard shad ranked first, followed by bluegill and then largemouth bass. By weight, gizzard shad ranked first, followed by largemouth bass and then bluegill.

A total of 809 gizzard shad was sampled that weighed 245 lbs. They ranged in length from 6.6 to 12.7 in TL, averaging 9.6 in TL. Relative abundance was 48% by number and 55%

by weight. The electrofishing catch rate was 404.5/h, which is a 33% increase from 2004 (Kowalik and Lehman 2005). Growth is faster now than in 2004 and is above average at age 1 and age 2 for southeastern Indiana (Figure 1). Back-calculated lengths indicate that the average gizzard shad reaches 8.4 in by age 2.

A total of 753 bluegill was sampled that weighed 83 lbs. They ranged in length from 1.5 to 7.8 in TL, averaging 5.2 in TL. Relative abundance was 45% by number and 19% by weight. The electrofishing catch rate was 376.5/h, which is an 18% decrease from 2004 (Kowalik and Lehman 2005). Bluegill represented a balanced population; the bluegill PSD was 37, which is a 33% increase from 2004. Thirty-five percent of the bluegill in this sample were 6.0 in or longer (i.e. quality size), which is a 35% increase from 2004. As in 2004, the 2005 BGFP index was 15, which is in the fair category. Growth was similar to 2004 and back-calculated lengths indicate bluegill reached 6.0 in during their 4<sup>th</sup> year of growth, which is average for southeastern Indiana (Figure 2).

A total of 126 largemouth bass was sampled that weighed 120 lbs. They ranged in length from 1.3 to 21.4 in TL, averaging 10.8 in TL. Relative abundance was 8% by number and 27% by weight. The electrofishing catch rate is 63.0/h, which is a 44% decrease from 2004 (Kowalik and Lehman 2005). Largemouth represented a balanced population; the largemouth PSD was 52, which is a 10% increase from 2004. Twenty-five percent of the bass were 14.0 in or longer which is a 30% increase from 2004. Back-calculated lengths indicated largemouth bass most likely reached 14.0 in TL in their 6<sup>th</sup> year of growth, which is average for southeastern Indiana (Figure 3).

## DISCUSSION

In 2004, bluegill were the most abundant fish in the sample. In 2005, shad ranked first by number and weight in the sample as in 1993 when the species first appeared in a DFW survey at Bischoff (Lehman 1995). The electrofishing catch rate for shad increased by 33% from 2004, but is still less than the catch rate in 1993. The length range and average length of shad in 2005 are similar to 2004, but shad growth has increased at all ages through age 4.

Despite the growing population of shad, Bischoff Reservoir continues to provide fishing opportunities for bluegill; the BGFP index remained in the fair category. Thirty-five percent more quality size bluegill were collected than in 2004. The 2005 bluegill PSD increased by 33%

from 2004 and is in the middle of the desired range for a balanced fishery. PSD improvement appears to be due to a decrease in the number of 3.0 to 5.9-in bluegill as well as an increase in the number of bluegill 6.0 in and longer. Although bluegill growth is slightly above average, no bluegill over 8.0 in were collected (as in 2004). This lack of large bluegill may be the result of angler harvest and/or correlated with the presence of gizzard shad.

In 2005, a greater percentage of legal bass was collected and the PSD, which is in the desired range, improved slightly. The bass catch rate, however, has declined dramatically. As in the previous survey, it was not determined when Bischoff bass reached 14.0 in, but it appears that bass reached the legal-size of 14.0 in as fast as the average bass in southeastern Indiana. Bass at age 1, age 2, and age 3 are growing slightly slower than average, but age-4 and age-5 bass are growing faster than average. The 14.0-in minimum size limit should remain in effect to prevent over-harvest of largemouth bass, the primary source of predation on Bischoff's small panfish and growing gizzard shad population.

According to the work plan, Bischoff will be surveyed from early to mid-June each year. Only largemouth bass, bluegill, and gizzard shad will be collected. Bischoff will be used as an experimental control to determine natural fluctuations in shad populations.

#### RECOMMENDATIONS

- The DFW should maintain the 14.0-in minimum size limit on largemouth bass at Bischoff Reservoir.
- The DFW should continue to stock 3,040 (16/acre) channel catfish every two years as long as it is felt channel catfish should be managed in this manner. These channel catfish should average at least 8.0 in long to reduce mortality from bass predation.

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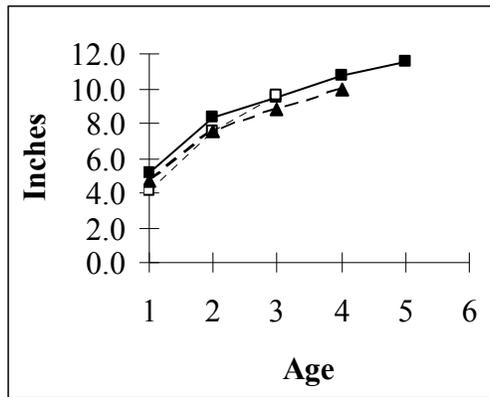


Figure 1. Bischoff gizzard shad growth from 2005 survey (solid line) compared to 2004 survey (dashed line) and to average gizzard shad growth observed in Fish Management District 8 impoundments (dotted line).

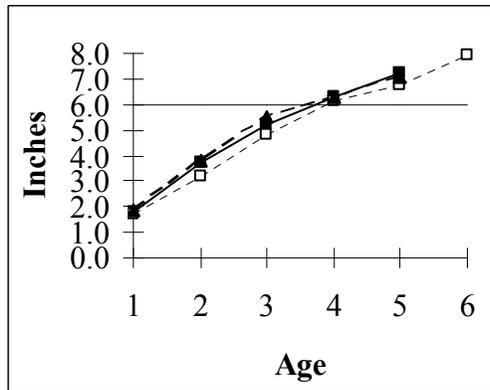


Figure 2. Bischoff bluegill growth from 2005 survey (solid line) compared to 2004 survey (dashed line) and to average bluegill growth observed in Fish Management District 8 impoundments (dotted line).

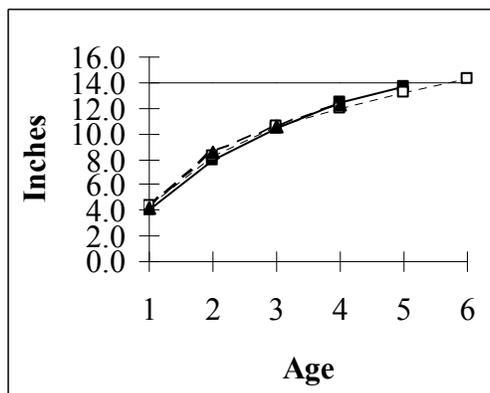


Figure 3. Bischoff largemouth bass growth from 2005 survey (solid line) compared to 2004 survey (dashed line) and to average largemouth bass growth observed in Fish Management District 8 impoundments (dotted line).