

# Deam Lake

## **Fish and Wildlife Research and Management Notes**

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## **INTRODUCTION**

Deam Lake is a 192-acre impoundment located in the Deam Lake State Recreation Area approximately seven miles northwest of Sellersburg on State Road 60 in Clark County. The Indiana Department of Natural Resources (IDNR) currently provides a boat ramp, a boat dock with boat rentals, a handicap fishing pier, Education Center, hiking trails, a beach and bathhouse, 265 class A campsites, picnic areas, shelter houses, and an ADA playground for recreational use. Only electric motors are allowed on the lake. Maps of the property are available from Deam Lake SRA, 1217 Deam Lake Road, Borden, Indiana, 47106.

Deam Lake was constructed in 1964 to provide flood control and recreation. In December of 1964, fishery biologists applied rotenone to 15 acres of water and two small tributaries in an effort to eliminate undesirable fish species. Their efforts were only partially successful as longear sunfish and green sunfish were not eliminated.

Largemouth bass, bluegill, redear sunfish, black crappie, and channel catfish were introduced in 1965. A regular catfish stocking program was started in 1972 by the Division of Fish and Wildlife (DFW) to maintain the channel catfish population, which was not expected to sustain itself through natural reproduction. Prior to this survey, 37,051 catfish had been supplementally stocked from 1972 through 1998.

## **METHODS**

This survey was conducted July 10-12, 2000 as part of work plan 98478 to evaluate the fish population since the last survey in July 1988. Some physical and chemical characteristics of the water were measured in the deepest area of the lake near the principal spillway. Vegetation was identified on site or later in the lab. The lake was at normal pool.

Fish were collected by DC electrofishing along the shoreline at night with two dippers for 0.75 hour. Two trap nets and four experimental-mesh gill nets were also fished overnight for two nights.

All fish collected were measured to the nearest 0.1 inch in total length. Fish were not weighed. Rather, average weights for fish by half-inch groups for Fish Management District 8 were used to estimate the weight of fish in the sample. Fish scale samples were taken from selected species for age and growth analysis. Electrofishing catch rates include all age groups of fish unless stated otherwise.

## RESULTS AND DISCUSSION

Deam Lake is approximately 35 feet deep. Clarity of the green-colored water, as measured with a secchi disk, was 8.6 feet. Total alkalinity values, which ranged from 17 to 51, indicate fertility levels are below average. Consequently, the pounds of fish produced will be low compared to impoundments with average or above average fertility levels.

As is typical for southern Indiana impoundments in the summer time, Deam Lake was thermally stratified into warm and cold layers. Dissolved oxygen concentrations were not adequate for fish survival below 14 feet. This stratified and anoxic condition is corrected each year during fall turnover when the water in the lake is mixed by the wind and falling temperatures.

Submersed aquatic vegetation was found in a band along the shoreline around most of the lake out to a depth of 12 feet. Using a map of Deam Lake compiled in 1965 with 2 foot contours, it was estimated that 77 acres were covered with submersed plants. This is 40 percent of the lake's area which is higher than the optimum level of 20 to 25 percent.

A total of 639 fish, representing 11 species and naturally occurring hybrid sunfish, was collected during this survey. Total estimated weight of the fish sample was approximately 127 pounds.

Bluegill ranked first by number (34 percent) and third by weight (10 percent) in the survey sample. They ranged in size from 1.1 to 9.1 inches and averaged 3.2 inches. Although growth has slowed slightly since 1988 for age 2 and 3 bluegill, back-calculated lengths indicate bluegill are still reaching 6 inches during their fourth year of growth.

The Proportional Stock Density (PSD) for bluegill is the proportion or percentage of stock-size bluegill (3.0 inches or longer) captured by electrofishing that are quality-size (6.0 inches or longer). PSD values for balanced bluegill populations range from 20 to 40 (Novinger and Dillard, 1978). The PSD of 31 for bluegill at this impoundment falls well within that range.

The Bluegill Fishing Potential (BGFP) Index is an objective rating system which was developed in Indiana to assess bluegill fishing in lakes and ponds (Ball and Tousignant, 1996). Criteria used to calculate this index include bluegill density based on electrofishing catch rates, back-calculated lengths for bluegill at 3- and 4-years-old, bluegill PSD value, and RSD<sub>8</sub> (Relative Stock Density for 8-inch or preferred-size bluegill). Out of a possible 40 points in the index, the current bluegill fishery scored 22 points which is in the middle of the good category ([Table 1](#)). Good growth and density, a good PSD, and the presence of some bluegill over 8 inches are the reasons for the good bluegill score in Deam Lake.

**Table. 1 Range of scores for each category in the bluegill fishing potential index.**

<b>POOR</b>	<b>MARGINAL</b>	<b>FAIR</b>	<b>GOOD</b>	<b>EXCELLENT</b>
0 - 7.0	7.1 - 12.9	13.0 - 18.9	19.0 - 25.9	26.0 - 40.0

Largemouth bass ranked second by number (24 percent) and first by weight (45 percent) in the sample. Six year classes were present that ranged in length from 1.7 to 13.5 inches. The average bass was 8.1 inches long. No legal bass were collected.

Growth rates for ages 0, 1, and 2 bass have improved slightly since 1988 while growth for 3-year-old bass has declined by 0.5 inch since 1988. Of 156 bass collected in this survey, none were 14 inches or longer. The absence of 14-inch and larger bass in the sample precludes determining the growth rates of bass beyond 5-years-old.

The Proportional Stock Density (PSD) for largemouth bass is the proportion or percentage of stock-size bass (8.0 inches or longer) captured by electrofishing that are quality-size (12.0 inches or longer). PSD values for balanced largemouth bass populations range from 40 to 60 (Novinger and Dillard, 1978). The PSD of 26 for bass at this impoundment falls below that range. The primary reason would appear to be that not enough bass are reaching 12 inches due to their slow growth.

Redear sunfish ranked fourth by number and by weight in this survey. They ranged in size from 2.5 to 9.5 inches. Of 62 redear in the sample, 11 (18 percent) were 7 inches (quality size) or longer. The average redear is reaching 7 inches during its fourth year of growth.

Two channel catfish were collected by electrofishing and 19 were collected in the gill nets. Based on their lengths, they should represent some of the catfish stocked in 1996 or 1998. All of them were longer than 12 inches which is considered a harvestable size.

A few longear sunfish, green sunfish, hybrid sunfish, and black crappie were collected. These panfish, along with bullheads, will add variety to angler harvest although longear and green sunfish seldom reach a size large enough to interest anglers. For this reason, longear and green sunfish represent undesirable competitors with bluegill for a limited food supply in an infertile impoundment. Black crappie, which were undersampled in this survey, can be caught in or near standing timber in the springtime.

## **SUMMARY AND RECOMMENDATIONS**

Deam Lake was created in 1964 to provide flood control and recreational activities such as swimming, boating, and fishing. However, the relatively low level of fertility at this impoundment precludes anglers from continuously harvesting large numbers of fish.

According to DFW fishery survey results and to the BGFP Index, bluegill fishing at Deam Lake presently is good although bluegill growth has declined slightly since last measured in 1988. Fourteen percent of the bluegill were quality-sized fish which is 6 inches or longer. Eighteen percent of the redear sunfish were quality-sized fish which is 7 inches or longer.

Bass growth rates are below average. Most of the bass in Deam Lake are sublegal fish and so most bass fishing will be catch-and-release.

It is estimated that submersed aquatic vegetation covers 40 percent of Deam Lake at this time. Largemouth bass and bluegill should benefit if the amount of vegetation was reduced to 20 percent or 25 percent so that bass could find and eat their prey, especially bluegill, more easily.

A regular catfish stocking program was started by the DFW in 1972 to maintain the channel catfish population, which was not expected to sustain itself through natural reproduction. Prior to this survey, 37,051 catfish had been supplementally stocked from 1972 through 1998. The Salem Catfish Club reports catching channel catfish up to nine pounds in the past five years (personal communication, Brent Miller, club member).

The primary fish management goals at Deam Lake are: 1) maintain quality fishing opportunities for panfish (chiefly bluegills) and channel catfish; and 2) maintain adequate bass growth to provide some fishing opportunities for bass exceeding the size limit. In order to meet those goals, the following recommendations are made:

- Maintain the 14-inch minimum size limit to prevent overharvest of largemouth bass, the primary source of predation on small panfish.
  1. The Division of Forestry should stock 1,155 triploid grass carp in 2001. Grass carp should be 8 inches or longer to reduce predation losses to bass. A stocking permit from the DFW is required before the fish can be stocked into Deam Lake.
  2. Regularly stock 3,072 channel catfish every two years as long as it is felt that channel catfish should be managed in this manner. Channel catfish should average at least 8 inches in length when stocked to reduce predation by bass. The next stocking is scheduled for the fall of 2002.

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