

Upper Wabash Reservoirs

Fish and Wildlife Research and Management Notes

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Title: Impact of Water Level Management on Fish Populations of Upper Wabash Reservoirs - Project Progress Report

Abstract: Mississinewa and Salamonie Reservoirs are U.S. Army Corps of Engineers (ACE) flood control projects in the upper Wabash River watershed. Both were constructed in the 1960's. The reservoirs were drawn down 25 feet in the winter to increase storage capacity. A three-year test of modified drawdown procedure at Salamonie and winter pool elevation at Mississinewa was begun in the fall of 1997. Under the agreement, the Division of Fish and Wildlife will monitor fish populations through general fish population surveys in August each year through 2001 and conduct angler creel surveys on both reservoirs and the tailwaters in 2001. Creel survey data was lacking for Mississinewa Reservoir so one was conducted during the summer of 1998 to collect reference data. Creel surveys were conducted on Salamonie Reservoir in 1992 and on the tailwaters of both reservoirs in the spring of 1997. General fish population surveys were conducted on Salamonie Reservoir 26-30 July 1999 and on Mississinewa Reservoir 9-13 August 1999. Sampling effort was reduced to 16 gill-net lifts and four hours dc electrofishing at each reservoir as recommended in the 1998 progress report to reduce mortality. Water levels at both reservoirs were stable during 1999.

The fish population of Mississinewa Reservoir continues to be dominated by gizzard shad and channel catfish. Bluegill and white crappie increased in relative abundance and size while white bass and largemouth bass relative abundance decreased. Thirty-five age 1+ and ten age 2+ walleye were collected, more than in any previous survey. Carp accounted for 6% of the sample by number but 25% by weight.

The fish population of Salamonie Reservoir is dominated by gizzard shad, white crappie and channel catfish which accounted for 44% of the biomass collected. Bluegill abundance and size increased. Largemouth bass abundance remains low. Carp accounted for 4% of the sample by number but 25% by weight.

In the fall of 1999 the ACE held a public meeting to inform people that there was a problem affecting the integrity of Mississinewa Dam. We were informed that the reservoir would be lowered to normal winter pool elevation of 712 ft. by the end of October 1999 to facilitate study of the problem and most likely not return to normal summer pool elevation until repairs were complete. ACE estimated that it would take at least three to five years to design, fund and complete repairs. Work plan 98825 therefore is put on hold until after repairs are complete and water level management can be renegotiated.

Introduction

Mississinewa and Salamonie Reservoirs are U.S. Army Corps of Engineers (ACE) flood control projects on the Mississinewa and Salamonie Rivers respectively in northeast Indiana (Figure 1).

Both were completed in the 1960's to control flood waters in the Wabash River. During summer months, surface acreage of Mississinewa Reservoir is maintained at about 3,180 acres and Salamonie Reservoir at 2,665 acres. After Labor Day each year, both have been lowered 25 feet by December to facilitate spring flood water storage. This drawdown seriously impacts recreational opportunities and the fish populations. After 30 years of operation, the ACE agreed to alter water level management practices to enhance recreation. Computer modeling indicated that a ten foot reduction in drawdown at Mississinewa and slower drawdown at both reservoirs would not have a major impact on the flood storage capacity. The ACE started a three year trial period in the fall of 1997 to verify the model. The Department of Natural Resources-Division of Fish and Wildlife will monitor the fish communities and fishing activity to see if any major changes can be correlated to the new water level strategy.

Methods

Fish population: The fish population of Mississinewa and Salamonie Reservoirs will be monitored yearly through standard fish population surveys conducted during August. Effort will consist of 24 gill-net lifts and 4 hours of night dc electrofishing per reservoir. Nets will be set in approximately the same locations and electrofishing stations will be the same shoreline areas each year. Data will be compared to previous years.

Angler use: Probability creel surveys will be used to estimate angler use. Methods will be the same as used at Salamonie Reservoir in 1992 (Braun 1996). Creel surveys will cover the period of April 1 through September 30. Creel survey data was lacking for Mississinewa Reservoir, therefore a creel survey was conducted in 1998 to establish a reference (Braun 1998). It was assumed that the fish population and fishing pressure had not changed appreciably in one year. Probability of ramp use was based on data collected by the ACE in 1989. In addition to the usual demographics, anglers were asked to answer several questions.

Angler creel surveys were conducted on the tailwaters of Mississinewa and Salamonie Reservoirs during April and May 1997 (Braun 1998). These creel surveys verified excellent fishing for walleye, crappie and catfish. These surveys are to be repeated in the spring of 2001 for comparison. GUTTER="46">

This report covers general fisheries surveys conducted on Mississinewa and Salamonie Reservoirs in 1999. Sampling effort was four hours of dc night electrofishing and 16 gill-nets lifts per reservoir. The Salamonie Reservoir survey was 26-30 July 1999 and the Mississinewa Reservoir survey was 9-13 August 1999. Creel surveys were not scheduled during 1999.

Results

Mississinewa Reservoir

The summer of 1999 was very dry so water level of the reservoir was relatively stable. Without rain, erosion in the watershed was minimal so the water remained relatively clear. Secchi disc reading was almost four feet on 9 August and dissolved oxygen was present to a depth of 35 feet. A planktonic algal bloom made the water appear green.

Total catch was 3,343 fish of 24 species and one hybrid (Appendix A). Species commonly sought by anglers accounted for 58% of the number and 49% of the weight collected. Six of the top ten species were in this group.

Gizzard shad was the dominant species accounting for 20.7% of the sample by number but only 4.4% by weight. Length range was 5.3-14.9 inches but over 90% were <9.5 inches

Channel catfish was the most abundant game species representing 17.6% of the sample by number and 24.4% by weight. Length range was 5.5-28.0 inches. Forty-eight percent were 12 inches, 24% were 16 inches and <6% were 20 inches. Channel catfish ranked second by weight.

The 377 bluegills collected represented 11.3% of the sample by number. Length range was 1.0-7.6 inches. Forty-nine percent were 6 inches and 6.1% were 7 inches. Growth was above average with age 1+ bluegills as large as six inches.

White bass accounted for 9.5% of the sample by number and 7.3% by weight. Length range of the 316 collected was 2.7-14.5 inches. Age groups 1+ through 3+ were represented. Growth was average. About 1/3 of the white bass collected were <7 inches and young-of-year (YOY). Nineteen percent were 12 inches.

White crappie accounted for 8.8% of the sample by number and 4.0% by weight. Length range of the 295 collected was 5.8-11.9 inches. Age groups 1+ through 6+ were represented. Growth was average. Sixty-two percent of the white crappies collected were 8 inches and 3.7% were 10 inches.

Black crappie are also present but not abundant. Length range of the 55 black crappie collected was 6.3-11.6 inches. The majority were age 2+ and 7.0-9.0 inches. Growth was average.

Two-hundred-eighty quillback were collected representing 8.4% of the sample by number but 18.7% by weight. Length range was 3.5-19.2 inches. Seventy percent were 12.5-15.5 inches.

Carp accounted for 6.2% of the sample by number but 24.5% by weight. Length range was 4.7-23.8 inches. Sixty-two percent of the carp collected were 15.0-19.0 inches.

The 165 largemouth bass collected represented 4.9% of the sample. Length range was 2.5-18.9 inches. Fourteen percent were 14 inches. Forty-two percent were young-of-year (YOY) and 2.5-5.5 inches. Two were 18.9 inches and age 9+. Growth was unchanged from previous years.

Smallmouth bass are also found in Mississinewa Reservoir. Length range of the 32 smallmouth collected was 2.9-15.6 inches. Two were >14 inches. Thirteen were YOY. Growth was similar to previous years.

Longear sunfish is primarily a river species that is common in the Mississinewa River and tributaries upstream of the reservoir. It is an indicator of good water quality. Seventy-five were collected, primarily from the upper reaches. Length range was 1.4-6.8 inches.

Sixty-nine walleye were collected representing 2.1% of the sample by both number and weight. Length range was 3.8-20.2 inches. Twenty-three were YOY, 35 age 1+ and the remaining 11 were age 2+. Twenty were 14 inches. Growth was excellent.

Twenty-two flathead catfish were collected. Length range was 5.7-23.8 inches. Seventeen were 9.0-16.0 inches.

Salamonie Reservoir

Water chemistry analysis was conducted on 26 July. The water was green from a planktonic algal bloom. Secchi disc was four feet and dissolved oxygen was present to a depth of 20 feet.

Twenty-four species were represented in the catch of 2,609 fish weighing 1,443.45 pounds (Appendix B). Fifty-four percent of the number and 54.6% of the weight were species commonly sought by anglers.

Gizzard shad was the most abundant species with 996 collected. YOY were very abundant but not collected as they were <2.0 inches in length. Length range of shad collected was 3.1-14.0 inches.

Length range of the 543 white crappies collected was 1.3-9.4 inches. White crappie accounted for 20.8% of the sample by number and 6.0% by weight. Only 19.5% were 8 inches. Growth was average.

Black crappies are also present but few in number. Length range of the 20 collected was 2.6-9.4 inches. Growth was similar to white crappie.

Channel catfish accounted for 19.8% of the sample by number but 43.2% by weight. Length range was 1.2-27.0 inches. Forty-three percent were 16 inches while 8.9% were 20 inches.

Bluegill accounted for 5.2% of the sample by number and 0.9% by weight. Length range of the 136 bluegills collected was 1.0-8.1 inches. Twenty-five percent were 6 inches. Growth was above average.

Carp accounted for 4.4% of the sample by number and 25.9% by weight. Length range was 9.4-27.8 inches. Forty-two percent were 20 inches while 4.3% were 24 inches.

Ninety-one white bass were collected. Length range was 2.1-16.0 inches. Eighty percent were YOY and 2.0-4.5 inches and only one was >12 inches. Growth was average.

Thirty-one percent of the 87 largemouth bass collected were YOY and 2.0-5.0 inches. Length range of older bass collected was 6.7-19.5 inches. The 19.5 inch bass was fin clipped from the 1992 population estimate and was ten years old. Nine were 14 inches and three were 18 inches. Growth was above average.

Two flathead catfish were collected, 8.2 and 12.6 inches.

Discussion

Mississinewa Reservoir

Some changes appear to have occurred in the fish population of Mississinewa Reservoir after two years of higher winter pool elevation and yet many things remain the same. Gizzard shad remains the most abundant species and the major forage. This has not changed in 30 years.

Channel catfish remain the most abundant game fish. Gill-net catch rate returned to over 35 per lift in 1999 after declining to 27 per lift in 1998. All sizes are present. Mississinewa remains one of the best catfish spots in Indiana.

Bluegills seem to have benefitted from the higher winter pool. The catch doubled from that of 1998 which was higher than any previous survey. Growth was excellent. Anglers have reported good bluegill fishing in some of the bays.

The higher winter pool appears to have helped largemouth bass too. Electrofishing catch rate for 1997 and previous years was less than 30 per hour. The 1998 catch rate was 52 per hour and in 1999 it was 40.5 per hour. There also appear to be more older bass in the population.

The walleye catch in 1997 consisted of four age 1+ and two age 3+. The catch increased to 55 age 1+ and three age 2+ in 1998. The 1999 catch was 38 age 1+ and 9 age 2+, the highest catch of older walleye. Although not as dramatic as hoped, it appears that walleye are responding to the higher winter pool favorably.

White bass have produced another strong year class, the third in a row. White bass have rebounded from the low population levels experienced in the early 1990's.

White crappie gill-net catch rate in 1999 was 16.5 per lift compared to 9.3 per lift in 1998 and 10.1 per lift in 1997. Size distribution was similar all three years with about 50% of the catch being 8-9 inches.

Unfortunately, the project will not be completed as outlined in the work plan. The Army Corps of Engineers has canceled the project because of problems with the dam. The water level was lowered to the old winter pool elevation of 712 ft. msl in September 1999. Summer pool elevation will be maintained at 717 ft. msl until dam repairs are completed which may take until 2003. At this elevation, summer pool is reduced to about 1,600 acres and only the lower three ramps will be usable. The marina at Red Bridge ramp is closed. After the dam is repaired, the project will have to be renegotiated with the Corps of Engineers.

Salamonie Reservoir

The later and slower drawdown from summer to winter pool at Salamonie Reservoir does not appear to have improved the fish population. When compared to the last general survey conducted in 1991, the species composition, size ranges and catch rates for most fish species are nearly the same.

Gizzard shad still dominate the fish population and are the main forage species. Electrofishing catch rate of shad larger than six inches was 125 per hour in 1999 compared to 105 per hour in 1991. Gill-net catch rate was only 17 per lift in 1999 compared to 84 per lift in 1991.

White crappie are the target of the majority of anglers on Salamonie Reservoir. The population remains dominated by age 2+ and 3+ fish averaging 7.5 inches in length. While gill-net catch rate decreased slightly from 36.5 to 31 per net lift, the electrofishing catch rate increased from 9.7 to 11.8 per hour. Many anglers complain about the small size of crappies and request a ten inch size limit. It takes three years for the crappies in Salamonie to reach eight inches. It would take five to six years for them to reach ten inches. Few survive past age 3+, so a ten inch size limit would allow virtually no harvest of crappies.

Channel catfish remain the third most abundant species. Gill-net catch rate decreased slightly from 34 per lift to 28.6 per lift but electrofishing catch rate remained at 15.3 per hour both years. Catfish are probably an underutilized resource.

Electrofishing catch rate of stock size (8 inches) largemouth bass declined from 17.7 per hour to 12.3 per hour. The bass population remains low in this inhospitable environment. Those that survive grow rapidly, reaching legal size of 14 inches at age 4+, a year earlier than the average for northern Indiana.

Catch rate of age 1+ and older white bass declined slightly from 2 per net lift to 1.1 per net lift and electrofishing catch rate also declined from 1 per hour to 0.75 per hour. Growth was the same during both surveys. White bass populations are very cyclic and it appears that both surveys occurred near the low point in that cycle. The large number of young-of-year collected may indicate an upward trend in the cycle.

Despite continued stocking, walleye have not fared well in Salamonie Reservoir. None were collected during the 1999 survey. Salamonie Reservoir personnel continue to raise walleye fingerlings in rearing ponds on the property which are released directly to the lake with no attempt to determine the number released. Observations during draining of the rearing pond indicate low numbers of walleye were released in recent years which may be a contributing factor. The tailwaters downstream of the dam however, continue to provide excellent walleye fishing, especially during spring. These fish most likely come from the reservoir during fall drawdown.

Recommendations

1. Work plan 98825 should be terminated with this report. A new work plan should be submitted upon completion of repairs to Mississinewa Dam and negotiation with the Army Corps of Engineers to again maintain modified water level management at the reservoirs for at least four years.
2. The catfish fishery at Salamonie Reservoir should be promoted through the news media.