

Shakamak Lakes

Fish and Wildlife Research and Management Notes

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Title: 1999 Voluntary Angler Survey of Kickapoo, Lenape and Shakamak lakes at Hakamak State Park

INTRODUCTION

Kickapoo, Lenape, and Shakamak Lakes are located within Shakamak State Park near Jasonville, Indiana. Fishing is a primary attraction in all three lakes and the lakes are managed to provide fishing opportunities for largemouth bass and panfish. There are boat ramps on all three of the lakes, and anglers may rent boats or fish from the shoreline. Electric motors are permitted while outboard motors are not. Camping and picnicking facilities are located nearby in the park.

Kickapoo Lake is a 290 - acre impoundment that is bordered on the west by Shakamak Lake (56 acres) and to the east by Lenape Lake (49 acres). Kickapoo is the newest of the three lakes in Shakamak State Park. The two older lakes, Shakamak and Lenape, are actually sub-impoundments of Kickapoo and drain directly into the lake. These two lakes help to protect the water quality of Kickapoo lake by trapping nutrients and sediment before they can enter the lake. Consequently, Kickapoo is the least productive of the three lakes.

Fishing is the primary activity in all three lakes and thus, to protect largemouth bass from overharvest, a 14 - inch minimum size limit was put into effect at Shakamak State Park and other state properties in 1973. By 1980, largemouth bass had begun to “stockpile” under the limit at all three Shakamak lakes. In 1986, the 14 - inch size limit was changed to a 12 to 15 inch slot limit. By allowing harvest of surplus small largemouth bass, it was hoped that growth and size distribution of bass could be improved while maintaining quality fishing opportunities for panfish.

A number of comments have been expressed regarding the quality of the fisheries at the Shakamak lakes. In an effort to determine fishing pressure and fish harvest, a voluntary angler survey was conducted in the summer of 1999. This report is a summary of that survey and provides information regarding angler usage, fish harvest, and catch and release of largemouth bass.

METHODS

The voluntary angler survey was conducted at Shakamak State Park from April 1 through September 6 of 1999. Anglers entering the front gate were given a unique numbered card. Anglers were to complete the cards and return them to a box located at the gate upon completion of their fishing trip. Interview data included; date of trip, length of trip, number in party, which lake was fished, number and size of fish harvested, and number and size of largemouth bass caught and released (less than 12 inches, 12 to 15 inches, and 15 inches). The total number of

cards handed out as well as the total number of cards returned were determined by the unique card numbers. The observed data were summarized and then expanded.

RESULTS AND DISCUSSION

Fishing Pressure and Harvest Rates

During the angler survey 1,008 forms were distributed to anglers. However, only 318 forms were returned. The overall return rate of the forms for the three lakes combined was 31.6 percent. The 318 valid returned forms represented a total angler effort of 1,587 hours. The average fishing trip lasted 4.06 hours. Reported fishing pressure during the survey period equaled 4.02 hours per acre. These figures represent a minimal value for fishing pressure at the three Shakamak Park lakes.

The combined Shakamak lakes data from the forms can be expanded. If the 985 anglers represented 31.6 percent of all anglers that reported fishing trip information, then an estimated 3,122 anglers fished at the Shakamak lakes during the survey period. An estimated 12,578 hours were spent fishing at the Shakamak lakes when using the average fishing trip length of 4.06 hours. The combined Shakamak lakes estimated total fishing pressure per acre during the survey period was 31.8 hours.

Kickapoo Lake, 290 acres, had 412 anglers report fishing information. The anglers fished a total of 1,790 hours which resulted in an estimated 5,673.5 hours of fishing pressure. Anglers fished 19.6 hours per acre at Kickapoo Lake.

Shakamak Lake, 56 acres, had 317 anglers fishing for 1,197 hours during the creel period. The expanded fishing pressure was 3,794.0 hours. Fishing pressure per acre was 67.8 hours.

Lenape Lake, 49 acres, was fished by 256 anglers. The anglers fished 980 hours, which can be expanded to 3,106.2 hours of fishing pressure. The fishing pressure per acre was 63.4 hours.

Based on the returned forms, anglers reported harvesting 2,604 fish from all three Shakamak lakes. Fish were harvested at the rate of 0.66 fish per hour. An additional 1,268 largemouth bass were caught and released. Estimated individual lake data for fishing pressure, harvest, and harvest rates can be found in [Table 2](#).

Table 1. Estimated monthly fishing pressure and harvest rates at Kickapoo, Lenape, and Shakamak Lakes, April 1 to September 6, 1999, based on returned survey cards.

Fishing Harvest	Harvest rate	Month Pressure (hrs.) (fish)	(fish per hour)
Kickapoo	5,673.5	3,452	0.61
Lenape	3,106.2	2,425	0.78
Shakamak	3,794.0	2,377	0.63
TOTAL	12,573.7	8,254	0.66

During April 1 to September 6, 1999 the gate attendant at Shakamak State Park handed 1,008 survey forms to anglers entering the park. Only 318 valid forms were returned by anglers, which is around a 31.6 percent return rate. The data from the valid forms were expanded to estimate fishing pressure and fish harvest during the survey. It was estimated that 3,122 anglers fished for a total of 12,574 hours. The estimated harvest was greatest at Kickapoo Lake, followed by Lenape Lake, and then Shakamak Lake. The estimated combined harvest for the three lakes was 8,252 fish. Due to the nature of the survey, the figures represent minimal values for fishing pressure and harvest at the three Shakamak State Park lakes.

Eighty percent of all harvested fish were bluegill. Redear sunfish were the second most abundant fish taken by anglers (7.9 percent). Largemouth bass comprised only 6.7 percent of the total harvest, followed by crappie (2.9 percent).

The largemouth bass harvest was below what would be anticipated for the slot limit regulation to be effective. Only an estimated 558 largemouth bass were harvested. Anglers need to be harvesting more largemouth bass 12 inches and under to enable the slot limit to be effective.

Channel catfish are stocked in Lenape and Shakamak lakes. These stockings should continue even though the contribution to angler harvest was small. Both Lenape and Shakamak will be stocked with 1,225 and 1,400 channel catfish respectfully, in 2001.

Table 2. Reported harvest, percent harvest, expanded harvest of bluegill, redear, largemouth bass, and crappie at Shakamak Lakes during the 1999 voluntary angler survey.

Reported fish	Percent of Estimated Species	Location harvested	Fish harvest
Bluegill			
Kickapoo	873	2,767	
Lenape	636	2,014	
Shakamak	574	1,821	
TOTAL	2,083	80.0	6,602
Redear sunfish			
Kickapoo	65	204	
Lenape	44	140	
Shakamak	98	312	
Largemouth bass			
TOTAL	207	8.0	656
Kickapoo	102	324	
Lenape	43	135	
Shakamak	31	99	
TOTAL	176	6.8	558
Crappie			
Kickapoo	32	100	
Lenape	30	95	
Shakamak	14	44	
TOTAL	76	2.9	239
Other			
Kickapoo	18	57	
Lenape	12	39	
Shakamak	32	2.3	101
TOTAL	62	197	
GRAND TOTAL	2,604	8,252	

The expanded harvest for the Shakamak lakes produced a total of 8,253 fish. Kickapoo Lake produced the highest estimated harvest of fish (3,452), followed by Lenape (2,423), and

Shakamak (2,378). The data indicated a total estimated harvest for the three lakes combined to be 20.89 fish per acre.

Bluegill were the primary fish harvested during the creel period. Bluegill composed 80.0 percent of the total harvest and ranged in size from four to 12 inches. Most of the harvested bluegill were 6 to 8 inches in length. The expanded catch of bluegill was 6,602 fish which is 16.71 fish per acre. Bluegill harvest was variable among the three Shakamak Lakes. Kickapoo had the greatest number of bluegill harvested (41.9 percent), followed by Lenape with 30.5 percent, and Shakamak with 27.6 percent of the total bluegill harvest.

Redear sunfish were the second most harvested fish. Redear composed 8.0 percent of the total harvest. The most common size of harvested fish was six to eight inches. The expanded catch of redear was 656 fish which yields 1.66 fish per acre. From the total redear harvested, Shakamak Lake accounted for 47.6 percent of the catch. Thirty-one percent of the harvested redear came from Kickapoo and 21.2 percent originated from Lenape.

Largemouth bass ranked third in total number of fish harvested. They composed 6.8 percent of the total harvest and ranged in size from four to over 15 inches. The most common size of harvested bass was 10 to 12 inches. The expanded harvest of largemouth bass was 558 fish for all three lakes combined. The estimated harvest per acre was 1.41 fish. Kickapoo had the greatest number of largemouth bass harvested (58.0 percent), followed by Lenape which harvested 24.2 percent largemouth bass, and Shakamak which produced 17.8 percent.

Crappie composed 3.0 percent of the harvested fish, most of which were six to eight inches in length. Other fish occasionally contributing to the harvest included channel catfish, bullheads, rock bass, and warmouth.

Supplemental stockings of channel catfish are made on a biennial basis at Lenape and Shakamak Lakes. Both Lenape and Shakamak will be stocked with 1,225 and 1,400 channel catfish respectively, in 2001.

Anglers reported catching and releasing a total of 400 largemouth bass from the three Shakamak lakes. Expanded data estimates 1,260 largemouth bass were caught and released. Fifty-seven percent of the largemouth bass released were 12 inches or smaller, while 41.5 percent of the released fish fell in the 12 to 15 inch range, and only 1.5 percent were 15 inches or larger. When the total catch and release data is broken down by lake, 52.0 percent of the catch was from Kickapoo, 28.7 percent was from Lenape, and 19.3 percent was from Shakamak.

The survey forms provided to anglers did not have a section for comments. Although, from the 318 returned forms, 14 forms had comments. The comments provided by anglers were mostly negative ([Table 3](#)), but only accounted for 4.4 percent of the returned forms. Based on angler responses they did not seem to be satisfied with their fishing trips.

Table 3. Comments from anglers participating in the voluntary angler survey conducted at Shakamak State Park from April 1 to September 6, 1999.

- Put trash barrels at boat ramps and picnic areas.
- There are no fish!
- These lakes need to be restocked. We catch fish everywhere we go but not here!
- Terrible fishing.
- Fishing is no good here!
- The fishing is poor in these lakes, probably won't be back.
- Need fish stocked.
- The fishing here used to be pretty good here. What happened??
- Fishing gets worse every year!
- Lake needs fish stocked.
- Put some fish in this lake!
- Fishing no good.
- This park needs a biologist brought in to help the fishing on this lake.
- Where are the bass in this lake?

CONCLUSION

During April 1 to September 6, 1999 the gate attendant at Shakamak State Park handed 1,008 survey forms to anglers entering the park. Only 318 valid forms were returned by anglers, which is around a 31.6 percent return rate. The data from the valid forms were expanded to estimate fishing pressure and fish harvest during the survey. It was estimated that 3,122 anglers fished for a total of 12,574 hours. The estimated harvest was greatest at Kickapoo Lake, followed by Lenape Lake, and then Shakamak Lake. The estimated combined harvest for the three lakes was 8,252 fish. Due to the nature of the survey, the figures represent minimal values for fishing pressure and harvest at the three Shakamak State Park lakes.

Eighty percent of all harvested fish were bluegill. Redear sunfish were the second most abundant fish taken by anglers (7.9 percent). Largemouth bass comprised only 6.7 percent of the total harvest, followed by crappie (2.9 percent)

The largemouth bass harvest was below what would be anticipated for the slot limit regulation to be effective. Only an estimated 558 largemouth bass were harvested. Anglers need to be harvesting more largemouth bass 12 inches and under to enable the slot limit to be effective. Channel catfish are stocked in Lenape and Shakamak lakes. These stockings should continue even though the contribution to angler harvest was small. Both Lenape and Shakamak will be stocked with 1,225 and 1,400 channel catfish respectfully, in 2001.

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