

STRATEGIES FOR QUALITY MANAGEMENT OF SMALLMOUTH BASS IN MISSOURI STREAMS

The goal of this study was to evaluate and recommend strategies for managing high-quality smallmouth bass fisheries in streams. The following objectives were established: 1) Determine the effect of an 18-inch minimum length limit on smallmouth bass on angling success and acceptance of this length limit by anglers, 2) Determine changes in abundance sizes, harvest rates, total mortality and catch-and-release mortality of smallmouth bass and rock bass following implementation of harvest regulations, and 3) Recommend strategies for developing trophy smallmouth bass fisheries in Ozark streams.

METHODS

A minimum length limit of 18 inches and a one-fish daily creel limit were implemented on smallmouth bass on sections of the Jacks Fork and Gasconade rivers in January of 1995. Response of smallmouth bass and rock bass populations and angler success and effort were monitored during the period 1990-2001. Angler fishing effort, catch rate by anglers, harvest and sociological information about angler acceptance of special smallmouth bass regulations were determined using angler surveys. Fish population sampling was conducted within the regulation reaches as well as in nearby reference reaches on both rivers using standardized DC electrofishing to collect all sizes of smallmouth bass and rock bass.

RESULTS AND DISCUSSION

In the Gasconade River, the numbers and sizes of smallmouth bass increased after the 18-inch limit was established. In the Jacks Fork River, numbers of smallmouth bass increased in the regulation area and one of the reference areas, but the sizes of smallmouth bass remained similar throughout the study in all areas. Numbers and sizes of rock bass in regulation areas of both rivers did not change during the study period. In both rivers, smallmouth bass growth rates did not change during the study. Anglers returned tags from 8 to 45 percent of the 11.5-inch and larger bass tagged each year, but voluntarily released 51 to 100 percent of them. Angler fishing effort declined in the regulation area of the Jacks Fork

River, but was variable in the Gasconade River. Catch and harvest of smallmouth bass declined in the regulation area of the Jacks Fork River, but increased in the last three years of the study in the Gasconade River regulation area. Larger bass (≥ 12 in) were a higher percentage of the angler catch in both the Gasconade and Jacks Fork rivers after the 18-inch length limit was established. Anglers were generally supportive of high length limits on both rivers, before and after implementation of the 18-inch length limit. Most anglers identified sizes of 18 inches or larger as the minimum length of a trophy smallmouth bass. On the Gasconade River, more than half the anglers interviewed in the regulation area said they would release all the smallmouth bass they caught, regardless of size.

MANAGEMENT IMPLICATIONS FOR MISSOURI ANGLERS

This study suggests that harvest restrictions can improve the sizes and numbers of smallmouth bass in streams under the following conditions:

- 1.) Harvest Rate- Anglers caught greater numbers of smallmouth bass larger than 12 inches in both rivers in the restricted zones. However, harvest restrictions may not create greater overall numbers or improve the numbers of large (>18 inch) smallmouth bass if harvest rates of smallmouth bass are already low before new restrictions are implemented. Natural mortality may reduce some of the gains in numbers of larger smallmouth bass if growth rates are less than satisfactory to produce trophy size fish before they reach the higher size limit.
- 2.) Growth – Even with greater numbers of smallmouth bass present after an 18” length limit was implemented there was no significant change in growth rates. This information suggests that the Jacks Fork and Gasconade rivers held sufficient food to support more and larger smallmouth bass.
- 3.) Habitat – Adequate habitat for large smallmouth bass must be present and harvest restrictions will not compensate for poor quality habitat no matter what the harvest rate of smallmouth bass might be. Deep pools with boulders and large woody debris and permanent summer flows should be

common if management by regulations is going to produce the desired results of improving the smallmouth bass population.

- 4.) Angler Acceptance – Anglers should desire better fishing for large smallmouth bass and be willing to give up all, or most, harvest of smallmouth bass for an improved opportunity to catch and release larger fish with an occasional opportunity to harvest a trophy size smallmouth bass exceeding 18 inches in length.
- 5.) Since growth rates in some streams are quite variable and habitat may not be satisfactory to support more and larger fish, and angler acceptance of high size limits are variable streams in Missouri will continue to be managed within reason with different size and creel limit regulations.
- 6.) No significant changes in rock bass were observed in either river even with some increases in smallmouth bass numbers and improvements in the sizes of larger smallmouth bass.