

EFFECTS OF WOODY DEBRIS EROSION CONTROL STRUCTURES ON FISH COMMUNITIES OF LITTLE TOPASHAW CREEK, MS

S. S. Knight, F. D. Shields, Jr. and T. W. Welch*

ABSTRACT: Fish were sampled by backpack electroshocker from Little Topashaw Creek, MS to evaluate the effectiveness of bank stabilization structures constructed of large woody debris in reducing erosion and improving aquatic habitat. Specific details of project design and of physical habitat and morphology of Little Topashaw Creek may be found in other papers before this congress. Sampling was conducted in the spring and fall of 1999 through 2001 along a 2 km portion of the creek both before and after restoration and stabilization using large woody debris structures. A total of 3,852 specimens representing 25 species were collected from five 100 m sampling reaches. The assemblage of fishes collected was typical of north Mississippi streams of similar size (fourth-order stream) and drainage. Species collected that would be considered sensitive in a regionally based Index of Biotic Integrity include: goldstriped darter, *Etheostoma parvipinne*, bluntnose darter, *Etheostoma chlorosomum*, brindled madtom catfish, *Noturus miurus* and pirate perch, *Aphredoderus sayanus*; while tolerant species included green sunfish, *Lepomis cyanellus*, bluntnose minnow, *Pimephales notatus*, and yazoo shiner, *Notropis rafensquei*.

Cyprinids dominated the catch in both pre and post construction sampling, representing 85% and 81% of the catch respectively. The next most abundant species were Centrarchids which represented about 6% of the catch in both sampling periods. Percent differences in catch observed between pre and post sampling are primarily due to the presence of Catostomids in post construction catches. Creek Chubsuckers, *Erimyzon oblongus* were the only Catostomids captured and were only collected in the post construction period. Catch per unit of effort and number per unit of effort was 11.1 kg hr⁻¹ and 2985 numbers hr⁻¹ respectively for the pre construction sampling and 11.4 kg hr⁻¹ and 1699 numbers hr⁻¹ respectively for the post construction sampling. These data indicate a slight increase in average size of fish following construction.

Modest changes in fish community structure suggest that extreme seasonal floods are preventing or slowing a shift from a cyprinid dominated system to one dominated by centrarchids. Cyprinids seem more tolerant of extreme events because their relatively small adult sizes allow them to more easily exploit shallow water habitats common in Little Topashaw Creek and to seek shelter from high water velocity during storm events. Based on the apparent availability of a remnant community of fishes in Little Topashaw Creek, and assuming no physical barriers downstream from the project area to prevent immigration of additional fish species, a shift from a cyprinid dominated to a centrarchid dominated system may be realized as pool habitat becomes deeper and more stable.

* Respectively, Research Ecologist, Research Hydraulic Engineer, and Biologist, all of USDA-ARS National Sedimentation Laboratory, PO Box 1157, Oxford, MS 38655-1157 (662-232-2934, Fax: 662 232 2915; E-Mail: sknight@ars.usda.gov)