

# Off-stream dugout livestock watering ponds offer habitat for Topeka shiner

The Topeka shiner is an endangered fish found in smaller streams of the Missouri River Basin. Topeka shiners have also been found in off-channel flood plain wetlands, side-channels, and oxbows that are seasonally connected to stream channels during times of high runoff.

Researchers at South Dakota State University have found that Topeka shiners can also benefit from dugout ponds that have been built in flood plains near small streams to provide water for livestock.

“We wanted to find out if dugout ponds constructed near streams could function as off-channel habitat similar to natural oxbows and flood plain wetlands,” says Charles Berry, Jr., leader of the South Dakota Cooperative Fish and Wildlife Research Unit, U.S. Geological Survey (USGS). “Could Topeka shiners and other fish enter created dugouts that were hydrologically connected to the stream during a flood and avoid being trapped when flooding recedes?”

Under Berry’s supervision, graduate student Sheila Thomson sampled 20 existing and 2 newly constructed dugouts along Six Mile Creek in Brookings County, South Dakota, from 2003 to 2005. She sampled dugouts that varied in age and location in the stream corridor to determine if fish were present. She found fish, including Topeka shiners, indicating that dugouts can provide a refuge for stream fishes as well as habitat for reproduction and rearing of young.

Specific findings were:

- Fish numbers and species were similar in dugouts (22 species) and the stream (20 species).
- Fish inhabited 14 of 20 dugouts; 7 of 20 dugouts contained Topeka shiners. Three dugouts contained Topeka shiners each year

of the study, and two dugouts contained Topeka shiners during each of seven sampling seasons.

- Highest Topeka shiner abundance was in two dugouts that were frequently flooded, but remained disconnected throughout the study and were within a 50-foot riparian zone of the stream.
- Fish were more likely found in dugouts that were seasonally disconnected from the stream, but close and frequently flooded.
- Fish presence was positively correlated to dissolved oxygen concentration.
- Fish predators, such as black bullhead and sunfishes, coexisted with Topeka shiners.

“This study showed that stream fishes reproduce and survive in dugouts,” Berry says, “and that landowners can improve fish habitat in general if the dugouts have adequate habitat.”

“This information helps planners consider fish conservation, as well as livestock production needs, when determining where to install dugouts,” says Kathryn Boyer, a fisheries biologist with the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) in Portland, Oregon, who facilitated the study.

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The AWCC, located in Madison, Mississippi, is a fish and wildlife technology development center.



*Photos by Sheila Thomson*

**Topeka shiner (top); Dugout for watering livestock and providing fish habitat (bottom)**

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