



# 'WAKE-UP CALL' from the Topeka shiner

Sheila Thomson,  
Steve Wall, and  
Tracey Mastel look  
for Topekas after  
seining Six Mile  
Creek.

**He's just a little minnow**, an average 2 inches long, a Topeka shiner.

His species had vanished from 90% of its historic range by the time it made the federal endangered species list in 1999. Now, however, things are looking up. In addition to federal recovery programs in other states, he also has his own specific South Dakota management plan.

If he lives in Six Mile Creek, a tributary of the Big Sioux River, he might have a little adventure; he could be swept up in the seine of a fisheries team from South Dakota State University. Not to worry; he'll be released back into the stream again.

Why all this attention to a little fish?

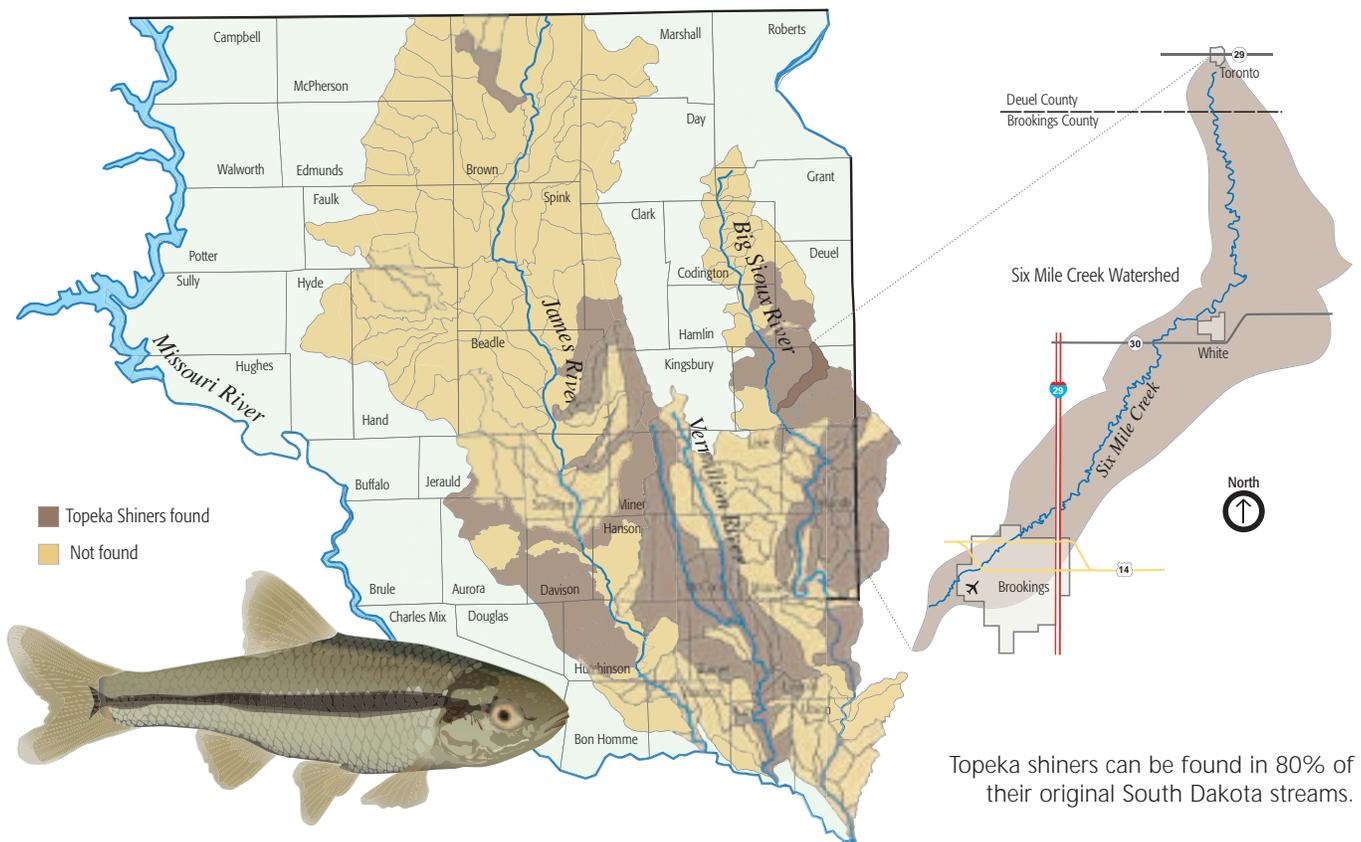
The 1999 endangered species listing "was a wake-up call," says Chuck Berry, unit leader of the South Dakota Cooperative Fish and Wildlife Research Unit at SDSU. "Five years ago we didn't know much about the Topeka shiner.

"Now we know more about how it fits into stream and floodplain habitats. We have new information on its populations, new plans for its recovery, and new programs at agencies

like the NRCS [Natural Resources Conservation Service], and SDDOT [South Dakota Department of Transportation] that can have big impacts on the species.

"And not just on him. There are all the benefits that extend to all the other fish, wildlife, livestock, and landowners who depend on a healthy stream ecosystem."

**IT MAY COME AS A SURPRISE** that the small tributaries of the Big Sioux, Vermillion, and James rivers have 20 to 30 species of fish in them. This high species richness, or biodiversity, is an indicator of a healthy stream ecosystem. So is the Topeka shiner, Berry says.



Topeka shiners can be found in 80% of their original South Dakota streams.

Its presence tells biologists that the stream will have little sediment, abundant invertebrate prey species, normally a gravelly stream bed, groundwater flow, and stable, and grassy banks. Besides being beneficial for other fish, that's also "a good deal for livestock," says Berry.

"In fact, we can usually count on good shiner populations in streams running through pastures where grazing is managed for sustainable grass production."

Topeka shiners can be found in 80% of their historically occupied South Dakota streams, and they're in places they've never been seen before. That tells fisheries scientists that "farmers have been doing things right on the land, with their conservation of soil and water," Berry says.

"On a good day in the James River drainage, we can get up to a hundred Topeka shiners in one seine haul."

It's more like what farmers don't do on their land that makes life easier for the Topeka shiner in South Dakota. National Wetlands Inventory data show that only 3% of South Dakota streams have been altered or channelized in East River.

In former Topeka shiner range, changes in land use probably lead the list of reasons the Topeka shiner is endangered, according to Jeff Shearer, SDSU graduate and senior author of the South Dakota management plan for the Game, Fish and Parks Department. Urbanization and residential development on farm land and intensive agriculture in more populous states to the south have most likely increased sediment load and degraded streams below the point the minnow can survive.

**WHILE FARMERS ARE THE PRIMARY CARETAKERS** of the Topeka shiner, scientists and state officials also have contributions to make.

From stream size, amount and timing of flow, groundwater potential, stream position within a watershed, and other geographical data, Steve Wall, research assistant in the SDSU Wildlife and Fisheries Sciences Department, has designed a GIS (Geographic Information System, a way to visualize and analyze spatial data) model that correctly predicts, 89% of the time, whether Topeka shiners will be present or absent in a stream.

And the Department of Transportation now has its first field biologist, a move prompted by the shiner.

"BMPs, best management practices, for road and bridge construction are already known. The problem is putting a good plan on paper into the dirt. Contractors have other things on their minds than protecting a little fish, but there are some things they can do to protect stream life," says Berry.

"The big thing is usually just putting some inflatable floating barriers in the water to keep the stream flowing and the work going. It's stuff we already know how to do."

**THERE'S MORE BEING DONE.** Sheila Thomson, graduate student; Wall; and Tracey Mastel, a senior biology student from the University of Minnesota-Moorhead regularly wade Six Mile Creek, a tributary of the Big Sioux River in eastern South Dakota. Their research will help farmers dig dugouts that meet NRCS [Natural Resources Conservation Service] criteria for technical assistance and partial funding in situations where an endangered species is found. The team hopes for rain and a flooding stream sometime this summer.

"We tend to think of a stream ecosystem as the water between the banks, but every other year or so, the stream jumps its banks onto the flood plain. This is a natural process,

## FWS: South Dakota needs no critical habitat designation

The U.S. Fish and Wildlife Service (FWS) has announced that it is exempting South Dakota from critical habitat designation for the Topeka shiner, federally designated as endangered.

The state has “management plans that provide comprehensive conservation measures and programs to achieve recovery of the Topeka shiner,” the FWS says.

The state management plan for the species, prepared by the South Dakota Department of Game, Fish and Parks (GFP), was based largely on a 5-year investigation of the distribution, abundance, and habitat needs of the fish by the South Dakota Cooperative Fish and Wildlife Research Unit based at South Dakota State University.

“This is one of the best examples of how research pays off with good information leading to decisions that help both the

species and the landowners,” says Chuck Berry, Unit leader and head of the Topeka shiner research team.

The federal decision says three things, Berry adds.

“First, it acknowledges the proactive conservation activities that the state has undertaken. Second, there is an economic benefit because the costs of designating critical habitat might have exceeded the costs of existing conservation activities. Third, fewer regulations are in effect for South Dakota agencies, landowners, and researchers.

“South Dakotans can be proud that their landowners, state agencies, and SDSU have been proactive about this little fish. We’ve been ahead of the game and need no federal oversight on management of the Topeka shiner.”

the “flood pulse,” and we are becoming more and more aware of the importance of the flood pulse to stream health and the health of the plants, fish, and wildlife that depend on the stream,” says Berry.

When the stream rises out of its banks, it connects with secondary channels, backwaters, and wetlands, ponds, and dugouts. These places can be nursery areas for some animals, watering holes for others, and sources of nutrients for the stream.

“Just think of all the studies that one little minnow has started for all the other life in this creek,” says Berry as he watches two of his team work a seine down the creek.

Nearby are two dugouts, marvels for the cooperation that went into their creation, says Berry.

“They were designed by NRCS, constructed on SDSU property, paid for by FWS [Fish & Wildlife Service], and monitored by USGS [U.S. Geological Survey].” In addition, NRCS is funding the entire 3-year study.

Even though one dugout is 2 feet lower than the other and in a swale that could receive creek overflow, neither has Topeka shiners.

“Give them time,” says Sheila Thomson, graduate student in fisheries sciences and leading this study. “They’re new last fall. Theoretically, based on GIS, that lower dugout should flood in one out of every 2 years.”



Six Mile Creek in eastern South Dakota is site of Topeka shiner study.

### THE TEAM IS HAVING BETTER LUCK upstream.

With the cooperation of private landowners, the crew is monitoring 20 dugouts that represent different degrees of flooding along Six Mile Creek. Eleven of the 20 have fish, and five have Topeka shiners.

They may be sources or sinks.

“Do flooded dugouts become places Topeka shiners like? Do they breed there and flush out again at the next high water and repopulate the stream again?” asks Berry. “Those are sources.

“Or do these dugouts become death traps for the Topeka shiners? Are the fish trapped in there with a big predator pike, or is the water quality bad, or is it too hot in the summer, and they die? Those dugouts will be sinks.”

This year the water level has been low, but the finds are encouraging. Some unflooded dugouts have fish in them, including Topeka shiners.

“This means that the minnows survived the winter and predation in a confined environment,” Thomson says. “We’re seeing successful spawning, no winter kill, and in fact, actually higher numbers of Topeka shiners than last summer.”

Decisions on funding new dugouts and dugout cleanouts in the floodplain are being held up until information is gathered from this study.

“Then we hope to tell people which types of dugouts are sources or sinks; where and how they can build dugouts to be good sources, be easy to flush; or how to build dugouts far enough away to never get any fish in them to start with,” Berry says.

When the study is concluded, in somewhat less than 2 years from now, the NRCS will have new criteria for dugout construction that will meld the use of this type of livestock watering system with better fish and wildlife conservation.

Berry also has other hopeful plans for the dugouts on SDSU property.

“This pasture could become a great SDSU outdoor classroom or demonstration site for the public, where people can walk out and see how farming, ranching, and fish and wildlife conservation can coexist in the floodplain of a prairie stream.” ♦

—Mary Brashier