Forty-One Tons

by Tyler Sykes

The boulder darter, a member of the perch family, reaches a maximum length of about 3 inches (7.5 centimeters).
Photo by Richard Biggins/USFWS
Inset: After this truck dumped boulders at the river's edge, volunteers lugged them into place to enhance habitat for the endangered boulder darter.
Photo by Tyler Sykes/USFWS

Why would 30 people volunteer to move large boulders, by hand, into the Elk River on a hot day in August? "In the hopes of providing new habitat for one of the rarest fishes in the Southeast," replies Lee Barclay, Supervisor of the Cookeville, Tennessee, Field Office of the U.S. Fish and Wildlife Service. He is talking about the boulder darter *(Etheostoma wapiti)* and the massive undertaking organized by the Lower Tennessee/Cumberland Ecosystem Team in August 2001 for this little fish.

The boulder darter was first seen in the Elk River drainage in 1891 and has never been found in any other river. As a result, it was originally called the Elk River darter, but this changed when it was discovered that the species spends its entire life in close proximity to boulders on the river bottom. This habitat specificity is one of the reasons the fish is now so rare.

"Areas in the Elk River with these boulders are hard to find," notes Pat Rakes, co-director of Conservation Fisheries, Inc. (CFI), a Knoxville-based nonprofit organization working to protect and restore rare fishes to southeastern rivers and streams. For years, this limited habitat has been polluted by cities, industries, and farms along the river. Water temperatures and levels also have changed due to construction of dams on the Elk and Tennessee rivers. As a result, the numbers of boulder darters decreased over the years, leading the Service to list the boulder darter in 1988 as an endangered species.

Rakes and CFI co-director J.R. Shute have spent many hours surveying the Elk River and its tributaries for the boulder darter and suitable habitat. Based on this work, the boulder darter is currently believed to be limited to a 63-mile (101-kilometer) stretch of the Elk River and a few of its larger tributaries in southern Tennessee and northern Alabama. Within this region, the species is found only in areas that have adequate boulder habitat. Boulder darters use these rocks for spawning substrate and cover. Rakes explains that "the female boulder darter attaches her eggs to the bottom of these rocks and the male has the job of fertilizing them and then guarding them until they hatch." Subsequently, lack of this habitat could result in the eventual demise of the species. Members of the Lower Tennessee/Cumberland Ecosystem Team and other partners came up with the idea of augmenting the existing habitat with the limestone slabrocks preferred by the boulder darter.

Volunteers from the Service, Tennessee Wildlife Resources Agency, Tennessee Valley Authority, CFI, International Paper, and private citizens placed 41 tons of rock into the Elk River at two locations: one near Fayetteville and the other at an old mill dam near Dellrose. Limestone boulders from a rock quarry in Woodbury, Tennessee, were taken to the two sites by personnel with Noland Stone Company in Nashville.

The two locations selected were chosen because the surveys conducted by Rakes and Shute indicated that boulder darters were known, either historically or currently, from these sites and that the limited habitat could be augmented with additional rock. As a result, approximately 18 of the 41 tons were placed into the river at Fayetteville and the remaining 23 tons went to Hamilton Mill. "This work was not for the faint of heart or back," says Barclay. Moving these boulders took several hours over a two-day period. After the rocks were set in place, captive-reared boulder darters were released at both stream locations.

The fish released were the young of boulder darters collected from the Elk River by CFI during 1997-2000. Rakes and Shute have worked for years learning how to breed rare fish in captivity, and they have had great success doing so with a number of rare fish, including the boulder darter. Their work is aimed at producing fish that can be returned to the wild to help bolster rare species. They produced 500 boulder darters that were released at the sites.

Each fish was marked with a colored tag that allows biologists to determine when and where particular boulder darters were released. "We will be able to tell how far the boulder darters are traveling up and down the river, how long they live in the wild, and whether or not they are using the boulders we put in the river," explains Shute.

Are these efforts effective? Past attempts are encouraging. In the summer of 1999, some of the same volunteers that came together this time were present for the placement of slabrock at the I-65 bridge crossing of the Elk River near the Town of Pulaski in Giles County, Tennessee. Approximately 3.5 tons of rock were placed at this location in the riffle areas above and below the bridge crossing. Captive-reared boulder darters were released at the site at that time and the following year. Biologists with CFI revisited the site soon after the second release to look for boulder darters in the area of the slabrocks. Within a few hours of snorkeling, they discovered 16 boulder darters, most of them using the rocks that had been placed the year before. This was and still is the largest concentration of boulder darters ever found on the Elk River. The rocks are being used not only by the boulder darters, but also by an assortment of other fish.

Because water quality in the Elk River is improving, and because we have discovered ways to provide additional habitat in the form of natural slabrocks, more areas in the Elk River are ready for boulder darters. To give them a hand, several other people are getting involved in raising boulder darters for release to the wild. The Dale Hollow and Chattahoochee Forest National Fish Hatcheries are helping CFI to raise more boulder darters for future releases. More releases mean more rocks… calling all volunteers!

All of these efforts for a little fish? Why? "Because the boulder darter plays some role in the environment that we may not yet understand, but we certainly don't want to lose," states Richard Kirk, Endangered Species Coordinator with the Tennessee Wildlife Resources Agency. Barclay adds that, "…if efforts like these continue to prove successful, we may one day be able to remove the boulder darter from the endangered species list."