

ESC America's Top 10

General Information		Please Use this Column to Provide the Requested Information
Organization & web address		Conservation Fisheries, Inc. http://conservationfisheries.org
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Report Questions		
Do you have photos that can be used in the report?	yes	
Will you want printed reports?	no	
If your species is selected, will you use the opportunity to organize around the species and/or publicize its plight?	yes	
The Species & Its Status Questions		
Common name, genus & species		Smoky Madtom; <i>Noturus baileyi</i>
Conservation Status		Federally Endangered
Current population size		undetermined
Has the species been delisted? If yes, when? Was the recovery on time? (Skip questions 17+18.)	no	
If no, does the species have a recovery plan?		The species does have a Recovery Plan
If it does have a recovery plan, what is the projected downlisting and/or delisting date?		Establishing two additional viable populations apart from Citico Creek could be grounds for downlisting the species. We are well on our way to making this claim. The species has such a restricted range that delisting will never be very likely.
Background Questions (for the report profile)		
Geographic range		Three small tributaries to the Little Tennessee River, Blount & Monroe Co., Tennessee
Habitat		Clear, silt-free medium-sized streams with available cobble/slab rock cover
Primary diet (if applicable)		aquatic insects
Public Engagement Questions (Please explain why the species is interesting, why it matters, why decision-makers + the public should care.)		
Interesting facts about the species		<p>Madtoms are small, mostly stream-dwelling members of the catfish family. Smoky madtoms are small even for madtoms, rarely reaching three inches in length! All known madtoms exhibit strong parental care of their small nests. The male selects a cover object, a flat rock in the case of Smoky madtoms. Eggs are laid in a cavity beneath the rock and the male guards his eggs, and later, his larvae until they are able to venture out on their own. All during his care of the little ones, he does not feed! This can be as long as three or more weeks! Once believed extinct, the rediscovery of the Smoky madtom in Citico Creek in the Cherokee National Forest in Tennessee prompted the U. S. Fish and Wildlife Service to initiate recovery efforts to try to reintroduce the species to streams within its native range. This is one of the first species of non-game freshwater fishes captively propagated and reintroduced resulting in a successfully reproducing population. This was the first such project involving a small nongame fish in the nation and led to the formation of Conservation Fisheries, Inc., which has since cooperated with the U. S. Fish and Wildlife Service (USFWS), various state agencies and other organizations in recovery efforts for many other imperiled southeastern U.S. fish species.</p>

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Additional background information to complete the species profile in the report.	This species, along with several other now federally listed fishes, was eliminated from Abrams Creek in the Great Smoky Mountains National Park in the 1950s in an effort to establish a trophy (non-native) trout fishery. The entire lower portion of the stream was treated with an ichthyocide to eliminate all potential competition with the trout. The smoky madtom was unknown at the time and all were eliminated from Abrams Creek. Preserved specimens from Abrams Creek were used for a scientific description in 1969 and the species was presumed extinct. Smoky madtoms were rediscovered in 1980 in nearby Citico Creek. Since the treatment of Abrams Creek was a one-time event, wildlife officials were hopeful that a population of this rare catfish could be re-established in Abrams Creek using brood-stock from Citico Creek. This is when the individuals that ultimately became Conservation Fisheries, Inc. began a captive propagation program to supply madtoms to be used for this reintroduction effort.
What are the most important messages that should be communicated about this success story?	There are a number of points to be taken away from this effort. Were it not for the presence of this species in Citico Creek, this reintroduction could never have been accomplished. Citico Creek is almost entirely protected on the public lands of the Cherokee National Forest. The likelihood of a stream the size of Citico Creek with water quality sufficient to sustain this sensitive species occurring on private lands is very remote. We can think of no examples where this is the case! Most streams of this size have been severely impacted by siltation. Without high quality waters, recovery efforts of aquatic species are impossible. Another take-away message to consider: recovery projects, especially of aquatic species, are long-term projects. It took many years before we began to see reproduction and recruitment of these rare fishes. Finding funding sources committed to such long-term projects is difficult.
Outline and describe the existing threats that might impede its recovery, e.g., new threats to its habitat, etc. Include any potential political threats, e.g., a Congressional delisting before its time. Cite any substantiating scientific studies.	Currently, the greatest threat to the continued success of this project is recreational overuse of these streams. Campers, hikers, horseback riders and (illegal) ORV users can "love this area to death". Overuse of trails by hikers and horse riders can result in siltation entering the streams. Streamside campers often build small rock dams that result in the removal of the rocks these madtoms spawn under. Disturbance of these rocks can also result in destruction of madtom nests. Currently, most of these activities are adequately regulated and do not pose an immediate threat. A failure to continue long-term monitoring and genetic augmentation of the reintroduced populations could result in their decline. There is no natural corridor to allow genetic exchange between populations. They are currently separated by reservoirs and dams. A significant decrease or cessation of funding could be detrimental to the long-term viability of the species.

Criteria-Specific Questions

Detail the ecological and scientific importance of the species. Note if it is a keystone species. Describe its role in the biodiversity of its environment. Cite any substantiating scientific studies.	The Smoky Madtom is not a Keystone species, however it serves as an excellent indicator of stream and water quality. All madtoms are sensitive to chemical changes in the stream and are highly affected by "olfactory noise" in the water. The smoky madtom is particularly sensitive to siltation because it lives and nests under flat rocks. It is also an exceptional indicator of habitat stability because it is essentially an "annual" species that generally reproduces only once before dying.
Provide information on any additional benefits the species provides, such as economic, medicinal, or ecosystem services.	While we do not have conclusive evidence to support this, we have seen an increase in mussel numbers and diversity in Abrams Creek where these reintroductions are occurring. Mussels use specific species of fish as hosts for their larvae. Perhaps these madtoms serve as hosts to some of the apparently recovering mussels. In any case, restoring several species to Abrams Creek serves to strengthen and diversify the overall aquatic community which once occurred in this stream.

Judge's score for importance of species.

What recovery actions have been taken for the species?	Beginning in 1986, per Recovery Plan recommendations, a captive propagation effort was initiated at the University of Tennessee, Knoxville, in the hopes of restoring the Abrams Creek (type) population. Captively propagated smoky madtoms, collected as eggs or larvae from Citico Creek, were stocked into Abrams from 1986 to 2001. The effort successfully restored a reproducing and dispersing population, whose status and expansion continues to be monitored by Great Smoky Mountains National Park and CFI. Beginning in 2002 smoky madtoms were also captively propagated and reintroduced to the Tellico River, where a reproducing and growing population has also become established.
Why were those recovery actions successful?	These actions were successful because the ESA calls for the development of a Recovery Plan for listed species, and the Plan for the smoky madtom called for efforts to captively propagate and reintroduce/restore the species to additional appropriate streams to reduce the risk of extinction. Without this mandate, no recovery efforts or funding for such efforts would have been likely. Implementation of these aspects of the Recovery Plan was only made possible with the dedicated support and patience of FWS personnel in the Asheville, NC and Cookeville, TN field offices, the Region 4 office in Atlanta, leaders of the Tennessee Wildlife Resources Section 6 Endangered Species Recovery program, a Cherokee National Forest fisheries biologist, and others. This support permitted a prominent ichthyologist's proposal and his graduate students' naive optimism to succeed.

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If there are or have been multi-agency and/or public/private collaboration to protect the species, please describe.

The U.S. Fish and Wildlife Service (see above), the Tennessee Wildlife Resources Agency, the Cherokee National Forest, the University of Tennessee (Knoxville), Great Smoky Mountains National Park, and Conservation Fisheries, Inc. have all been critical collaborators.

Please detail the species' recovery. What increases have there been in the size of the population and in the number of populations?

As described above, the species was considered extinct from its 1969 description until rediscovery in 1980 in Citico Creek. This population was known to occur in only 8 miles of the creek, likely numbering in only the hundreds; hence, the ESA Endangered listing. Actions taken for protection of the Citico Creek population have clearly resulted in increased numbers there today. Reintroductions to Abrams Creek and Tellico River have established populations in both streams that are reproducing and growing, with local abundances in both actually exceeding those in Citico. Both populations already appear viable and will probably support numbers at least equivalent to the Citico population. Downlisting to Threatened status is due consideration, but there are no other streams for potential restoration, so the species is likely to always remain listed.

If there is political support for the conservation of the species, please explain.

In Tennessee?! Honestly, in east Tennessee, the most common comments about a fish like this from the average Joe and most elected (conservative) politicians are "What good is it?", "Why should anyone care if it disappeared?"

Are there actions that need to be taken by government officials and/or NGOs to continue the recovery?

Reintroduction efforts by Conservation Fisheries are not complete in Tellico River, but are about to transition into a long term monitoring, protection and management phase in which genetic variability is evaluated and gene exchange programs are developed and implemented to mimic natural immigration rates that occurred prior to the current fragmentation and isolation of the three populations by dams and reservoirs. Long term monitoring plans and protocols are currently in development. All these require support and funding by state and federal governing agencies for each stream, a significant portion of which has recently been lost due to the federal budget sequester.

Are there additional actions that individuals can take to continue the species' recovery?

Individuals can help continue the species' recovery by communicating with elected representatives demanding protection for our public lands and waters, particularly from resource extraction industries (primarily logging for this species), by participating in snorkel outings in Citico Creek led by the Cherokee National Forest to learn more about fish and habitat, by *responsibly* camping and recreating near or in waters with smoky madtoms (keeping trash and human waste away from the water and not building rock dams), and by supporting work by organizations like Conservation Fisheries and the Endangered Species Coalition.

Judge's score for recovery.

Final Judge's Score

0

Please submit to Nancy Welch at nwelch@endangered.org by July 3, 2013. Thank you for participating in the 2013 Top Ten Report.