

U. S. Fish and Wildlife Service

Draft Recovery Plan for the Chucky Madtom
(Noturus crypticus)



Chucky madtom illustration courtesy of Joseph Tomelleri©

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DISCLAIMER

Recovery plans delineate reasonable actions that are believed necessary to recover and/or protect the species. Plans are prepared by the U.S. Fish and Wildlife Service, sometimes with the assistance of recovery teams, contractors, State agencies, and others. Plans are reviewed by the public and subject to additional peer review before they are adopted by the U.S. Fish and Wildlife Service. Objectives will only be attained and funds expended contingent upon appropriations, priorities, and other budgetary constraints. Recovery plans do not obligate other parties to undertake specific tasks. Recovery plans do not necessarily represent the views nor the official positions or approval of any individuals or agencies involved in the plan formulation, other than the U.S. Fish and Wildlife Service. They represent the official position of the U.S. Fish and Wildlife Service only after they have been signed by the Regional Office as approved. Approved recovery plans are subject to modification as dictated by new findings, changes in species status, and the completion of recovery tasks. By approving this document, the Regional Director certifies that the information used in its development represents the best scientific and commercial data available at the time it was written. Copies of all documents reviewed in development of the plan are available in the administrative record, located at the U.S. Fish and Wildlife Service's Southeast Regional Office, Atlanta, Georgia.

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Draft Recovery Plan for Chucky madtom (*Noturus crypticus*)

This recovery plan describes criteria for determining when the Chucky madtom should be considered for reclassification from endangered to threatened status, lists site-specific actions that will be necessary to meet those criteria, and estimates of the time required and cost to carry out those measures needed for recovery. Additionally, cursory information on the species' biology and status are included, along with a brief discussion of factors limiting its populations. A Species Biological Report, which provides a more detailed accounting of the species status, biology, and threats, and a Recovery Implementation Strategy, which describes the activities to implement the recovery actions, is available at <http://www.fws.gov/cookeville>. The Recovery Implementation Strategy and a Species Biological Report will be updated on a routine basis.

CURRENT SPECIES' STATUS:

The Chucky madtom (*Noturus crypticus*; a small catfish) was federally listed as an endangered species under the Endangered Species Act of 1973 as amended (Act) on August 9, 2011 (76 FR 48722) and critical habitat was designated for the species on October 16, 2012 (77 FR 63604). The Chucky madtom grows to 2.9 inches (7.4 centimeters) total length and is endemic to the upper Tennessee River system in Tennessee. This fish is historically known from two creek systems and 15 individuals. One individual was collected in Dunn Creek in 1940. Currently, the species is thought to persist only in Little Chucky Creek, where a total of 14 individuals have been collected. All 14 have been collected in Little Chucky Creek since 1991; however, none have been captured since 2004 despite considerable survey effort.

HABITAT REQUIREMENTS AND LIMITING FACTORS:

Chucky madtoms are currently known from a single tributary, Little Chucky Creek, to the NoliChucky River in stream sections 5 to 7 meters (16 to 23 feet) wide in riffle and run areas bordered by water willow (*Justicia* spp.) beds with slow to moderate current over pea-sized gravel, cobble, or slab-rock substrates. In addition to habitat degradation, threats to the species include extreme curtailment of habitat and range, small population size and low numbers, inability to offset mortality with natural reproduction and recruitment, and their resulting vulnerability to natural or human induced catastrophic events (e.g., droughts, pollution spills, etc.). The single surviving population is threatened by inadequate water quality, habitat deterioration, and introduced species. Virilis crayfish (*Orconectes virilis*) and Kentucky River crayfish (*Orconectes juvenilis*), both introduced species, are abundant in Little Chucky Creek and compete with Chucky madtoms for access to the little habitat that is available for cover and spawning.

RECOVERY STRATEGY:

The initial strategy for recovery for Chucky madtom is to prevent the extinction of this fish by locating individuals and working with partners and the community of Greeneville, Tennessee to protect and enhance the existing habitat along Little Chucky Creek.

Conservation and recovery of this fish will require human intervention and participation. When we are successful at finding individuals, our recovery strategy will develop to work towards increasing madtom numbers through hatchery propagation and augmentation/reintroduction; enhanced restoration and protection of habitat in Little Chucky Creek and in those streams targeted for reintroduction as we learn more about this fish; addressing possible threats such as fish and crayfish species that feed on or compete with Chucky madtoms; and monitoring success of recovery of the Chucky madtom population and its habitat in Little Chucky Creek. To fully recover this species, we intend to strengthen our partnerships in this drainage with the community of Greeneville, Tennessee; Middle Nolichucky Watershed Alliance; Natural Resources Conservation Service; Greene County Soil Conservation District; Tennessee Valley Authority; non-governmental organizations; universities; and Tennessee Wildlife Resources Agency to help improve habitat condition by implementing best management practices related to agriculture (e.g., control runoff of pollutants, reduce erosion). We also will need to find or establish new populations outside of the main stem of Little Chucky Creek. We will learn more on developing our recovery strategy as we implement recovery, especially research on life history as individuals are found and studied.

RECOVERY OBJECTIVES:

The recovery objectives over the 30 years are to determine if the species is extant and, if so, work to reduce threats in order to downlist the Chucky madtom to threatened status. Defining reasonable delisting criteria is not practicable at this time given the current low number of individuals that comprise one population, extreme curtailment of the species' range, extensive modification and fragmentation of habitat within the species historical range, lack of information about the species' biology, and magnitude of other existing threats. Therefore, this recovery plan establishes downlisting criteria for this catfish. Criteria will be reevaluated as new information becomes available.

RECOVERY CRITERIA:

Criteria for Reclassification from Endangered to Threatened

1. Suitable instream and riparian habitat, flows, and water quality for Chucky madtom as defined by the best available science (to be refined by recovery actions), exist in occupied streams (addresses Factor A).
2. Population studies show that a viable¹ Chucky madtom population in Little Chucky Creek and at least 1 other stream (Dunn Creek, Jackson Branch; e.g., the only known stream representing the historical range of the species) are naturally recruiting (consisting of two year classes in the fall months) and sustainable over a period of 20-30 years (10 generations) (addresses Factors A, C, and E).

¹ We define "viable" to be a population that is stable or increasing, of no less than 500 individuals that is showing natural reproduction, no longer requires augmentation, and is able to maintain itself and offset mortality. It has been estimated that effective population sizes may range from 500 individuals (Franklin and Frankham 1998) to avoid deleterious effects of genetic drift over several generations, up to 5,000 individuals (Lande 1995) for long-term survival. Populations will be considered to have sufficient genetic variation to be viable if measurements of observed number of alleles and estimates of heterozygosity and effective population size have remained stable or increased during the ten generations used to establish demographic viability.

ACTIONS NEEDED:

The recovery actions identified below are those that, based on the best available science, we believe are necessary bring about the recovery of the Chucky madtom. We have included an estimated cost to complete the action and priority number².

Table 1. Recovery actions with estimated cost and priority number.

Recovery Action	Estimated Cost	Priority
1. Capture and maintain Chucky madtom broodstock.	\$1,135,000	1
2. Protect and enhance existing habitat in Little Chucky Creek.	\$2,190,000	1
3. Conduct life history studies on Chucky madtoms and/or surrogates.	\$250,000	2
4. Promote voluntary stewardship as a practical means of reducing nonpoint pollution from private land use and improving habitat.	\$90,000	2
5. Develop models to identify potential Chucky madtom habitat and potentially find new populations.	\$305,000	2
6. Develop and implement programs and materials to help inform the public about the Chucky madtom	\$90,000	3
7. Coordinate all recovery activities, evaluate success, and revise recovery plan as appropriate	Costs will be absorbed under existing State and Federal programs	3
Total Estimated Cost: \$4,060,000		

ESTIMATED COSTS OF DOWNLISTING:

Recovery criteria for downlisting is expected to take 30 years (approximately 10 generations; 2047) for a total estimated cost is \$4,060,000 (Table 1). These costs are based on similar actions conducted for similar species and are offered as a reasonable estimate as we learn more about this fish. At this time, we are unable to estimate the cost to delisting due to the unknown needs of the species.

DATE OF DOWNLISTING AND DELISTING: If all actions are fully funded and implemented as outlined, including full cooperation of all partners needed to achieve recovery, downlisting is expected to take 30 years (approximately 10 generations; 2047). We anticipate

² Recovery actions are assigned numerical priorities to highlight the relative contribution they may make toward species recovery (48 FR 43098):

Priority 1 - An action that must be taken to prevent extinction or to prevent the species from declining irreversibly.

Priority 2 – An action that must be taken to prevent a significant decline in species population/habitat quality or some other significant negative impact short of extinction.

Priority 3 – All other actions necessary to provide for full recovery of the species.

that recovery criteria for delisting could then be developed and met by 2077 (based on an estimated additional 30 years, or 10 generations, following downlisting).

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