

CANDIDATE ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: Noturus sp.cf. Noturus elegans

COMMON NAME: chunky madtom

LEAD REGION: 4

INFORMATION CURRENT AS OF: January 2003

STATUS/ACTION (Check all that apply):

New candidate

Continuing candidate

Non-petitioned

Petitioned - Date petition received: \_\_\_\_

No finding yet

90-day positive - FR date: \_\_\_\_

12-month warranted but precluded - FR date: \_\_\_\_

Is the petition requesting a reclassification of a listed species?

Listing priority change

Former LP: \_\_\_\_

New LP: \_\_\_\_

Latest date species first became a Candidate: \_\_\_\_\_

Candidate removal: Former LP: \_\_\_\_ (Check only one reason)

A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

F - Range is no longer a U.S. territory.

M - Taxon mistakenly included in past notice of review.

N - Taxon may not meet the Act=s definition of A species.@

X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Fishes - Ictaluridae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Tennessee

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE:  
Tennessee

LEAD REGION CONTACT (Name, phone number): Richard Gooch, 404/679-7124

LEAD FIELD OFFICE CONTACT (Office, name, phone number): Cookeville, Tennessee  
Field Office, Rob Tawes, 931/528-6481, extension 213

BIOLOGICAL INFORMATION (Describe habitat, historic vs. current range, historic vs. current population estimates (# populations, #individuals/population), etc.):

The chunky madtom is a rare, undescribed catfish known from only 12 specimens collected from two Tennessee streams. A lone individual was collected in 1940 from Dunn Creek (a Little Pigeon River tributary) in Sevier County and 11 specimens have been encountered since 1991 in Little Chucky Creek (a Nolichucky River tributary) in Greene County. Only 1 specimen has been encountered since 1994 despite numerous surveys of both historic localities and several streams, similar in size and character to Little Chucky Creek, in the Nolichucky, Holston, and French Broad River watersheds (upper Tennessee River basin). The species is apparently very rare and geographically restricted.

The chunky madtom is a member of the *Rabida* subgenus (i.e., the *Anotled* or *Asaddled* madtoms) and part of the *Noturus elegans* species complex (Burr and Eisenhour 1994). Chunky madtoms differ from typical *N. elegans* by having more robust bodies, different pigmentation patterns, a more posterior dorsal fin, and larger, prominent cheek melanophores (Burr and Eisenhour 1994). Preliminary meristic, allozyme, and morphometric analyses have indicated that the chunky madtom is a unique species (Burr and Eisenhour 1994). Brooks M. Burr (Southern Illinois University), James Grady (University of New Orleans), and David Eisenhour (Morehead State University) are currently completing a formal description of the chunky madtom that will result in the taxon becoming a distinct species.

Originally, museum specimens collected from the Roaring River (a Cumberland River drainage) and from the Paint Rock River system in Alabama (a Tennessee River tributary well downstream of the Nolichucky and Little Pigeon River sites) were tentatively identified and catalogued as *Noturus elegans* and thought to be chunky madtoms. However, closer analysis of morphology and meristic characters in these specimens has indicated that they are likely distinct from the Dunn Creek and Little Chucky Creek forms (B. Burr, J. Grady, separate personal communications, 2001). Therefore, the Little Chucky and Dunn Creek forms are the only forms that are recognized as chunky madtoms.

This species is currently believed to be restricted to two riffle areas in Little Chucky Creek, a third order tributary of the Nolichucky River that drains a portion of the Ridge and Valley physiographic province. All of the specimens collected in the creek have been found in stream runs with slow to moderate current over pea gravel, cobble, or slab-rock substrates (Burr and Eisenhour 1994). Habitat of these types is sparse in Little Chucky Creek, and the stream affords little loose, rocky cover suitable for madtoms (Shute *et al.*, 1997). It is notable that an intact riparian buffer occurs in the two riffles where chunky madtoms have been found (Shute *et al.*, 1997). Intact riparian buffers may be required by the species. Studies to determine the life history and behavior of this species have not been conducted. Nothing is known about chunky madtom reproductive or foraging behavior, recruitment, life expectancy, food items, or mobility, although it is likely that this species exhibits similar behavior and has similar habitat requirements to other members of the *N. elegans* species complex.

**THREATS** (Describe threats in terms of the five factors in section 4 of the ESA providing specific, substantive information. If this is a removal of a species from candidate status or a change in listing priority, explain reasons for change):

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

The current range of the chunky madtom is believed to be restricted to Little Chucky Creek in Greene County, Tennessee. Because this species was also collected from Dunn Creek, a stream

that is in a different watershed and physiographic province than Little Chucky Creek, it is likely that the historic range of the chucky madtom encompassed a wider area in the Ridge and Valley and Blue Ridge physiographic provinces in Tennessee than is demonstrated by its current distribution. A survey for the chucky madtom in Dunn Creek in 1996 was not successful at locating the species (Shute *et al.*, 1997), and approximately ten additional collections from the Dunn Creek site, during both daylight hours and at night, from the 1970s through 2001, also failed to produce chucky madtoms (D. Etnier, University of Tennessee, personal communication, 2001). The Dunn Creek population may be extirpated. The very small current range of the species leaves it vulnerable to stochastic events that may extirpate it from the only creek that it occupies (also see Factor E).

The chucky madtom is a bottom dwelling species. Bottom dwelling fish species are susceptible to sedimentation and other pollutants that degrade or eliminate habitat and food sources (Berkman and Rabeni 1987; Folkerts 1997; Richter *et al.*, 1996; Waters 1995). Etnier and Jenkins (1980) suggested that madtoms, which are heavily dependent on chemoreception for survival, could be susceptible to anthropogenic disturbances, such as chemical and sediment inputs, because these alterations interfere with a madtom's ability to obtain food and otherwise monitor its environment.

The majority of the Little Chucky Creek watershed is privately owned and managed for beef cattle production, tobacco cultivation, and row crops, especially corn and soybeans (USDA 1958, USFWS, personal observation, 2001). Therefore, nonpoint source sediment and agrochemical inputs into Little Chucky Creek from local agricultural and other sources may adversely affect the chucky madtom by altering the physical characteristics of its habitat, thus potentially impeding its ability to feed, seek shelter from predators, and successfully reproduce. The Dunn Creek watershed shares some of these same agricultural pressures, and these will continue to threaten the species if it still occurs there. Additional threats within the Dunn Creek watershed also include residential development and associated new infrastructure (e.g., roads, utilities, etc.) that contribute sediment and other pollutants to the stream or alter riparian areas. The effects of these types of threats will likely increase as human populations in these watersheds increase in response to human demands for housing, transportation, and places of employment. In particular, the areas surrounding Dunn Creek are becoming developed for new residential and vacation homes due to its proximity to the Great Smoky Mountains National Park and other area attractions. Overutilization for commercial, recreational, scientific, or educational purposes. This species is known from only 12 collected specimens. Because of the chucky madtom's extreme rarity and restricted range, scientific or commercial collection of even a few individuals could be detrimental to the species. The release of locality information for the species could also increase the risk of over-collection.

#### B. Disease or predation.

Various predators, including birds, snakes, and other fish, undoubtedly consume chucky madtoms. No predation studies have been performed on this species, but, because the chucky madtom is presumed to be extremely rare, even natural predation could adversely effect any extant population. No diseases are known to affect the species.

C. The inadequacy of existing regulatory mechanisms.

The federally endangered Cumberland bean (Villosa trabalis) is still believed to exist in the western section of Little Chucky Creek, Greene County, Tennessee (S. Ahlstedt, USGS, personal communication, 2002). Therefore, the chucky madtom would potentially receive incidental protection under the federal Endangered Species Act within sections of Little Chucky Creek that may contain the Cumberland bean. However, one of the known chucky madtom locations is located upstream of the sites thought to contain the Cumberland bean. Chucky madtoms that occur in the upper section of Little Chucky Creek are not federally listed and would not receive protection under the Endangered Species Act. Federal listing would provide additional protection for this species by (1) requiring federal endangered species permits to take or collect this species and (2) requiring federal agencies to consult with the Service when projects they fund, authorize, or carry out may adversely affect the species. The chucky madtom was listed as Endangered by the State of Tennessee in September of 2000. Potential collectors of this species would be required to have a state collection permit.

D. Other natural or manmade factors affecting its continued existence.

The chucky madtom is apparently restricted to two riffle areas in Little Chucky Creek, Greene County, Tennessee, and is, therefore, extremely vulnerable to extirpation from vandalism or random catastrophic events such as toxic chemical spills. Species that are restricted in range and population size are also susceptible to inbreeding depression and genetic bottlenecks (Avisé and Hambrick, 1996). It is likely that the only extant population of chucky madtoms is below the effective population size (Soulé 1980) required to maintain long-term genetic and population viability without substantial human intervention. Overall, the Service believes that the potential demographic effects of inbreeding, limited species distribution, and low number of individuals pose the most significant threats to the chucky madtom.

FOR RECYCLED PETITIONS:

- a. Is listing still warranted?
- b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? \_\_\_
- c. Is a proposal to list the species as threatened or endangered in preparation? \_\_\_
- d. If the answer to c. above is no, provide an explanation of why the action is still precluded.

LAND OWNERSHIP (Percentage Federal/state/private, identify non-private owners):

The Little Chucky Creek watershed is primarily owned by private entities with the exception of small government land holdings such as public school properties and county and state road right-of-ways. Approximately 5 percent of the Dunn Creek watershed is owned by the National Park Service (i.e., portions of the Great Smoky Mountains National Park and Foothills Parkway), but the Dunn Creek watershed is also primarily in private ownership.

PRELISTING (Describe status of conservation agreements or other conservation activities):

The Service has four Partners for Fish and Wildlife projects underway along Little Chucky Creek. These projects involve riparian fencing, creation of alternate water sources and development of hardened stream access points for cattle, and bank stabilization. Additional Partners for Fish and Wildlife funding has been secured for new habitat restoration projects in the watershed during 2003. The Service's Candidate Conservation Program has also provided funding for Conservation Fisheries, Inc.(CFI), to perform an intensive survey for the chucky madtom in Little Chucky Creek. Three separate surveys conducted under this contract in the summer and fall of 2002 failed to locate additional madtoms. CFI will continue surveying Little Chucky Creek in the Spring of 2003. Any live individuals encountered during the survey will be retained by CFI in order to initiate a captive propagation program.

REFERENCES (Identify primary sources of information (e.g., status reports, petitions, journal publications, unpublished data from species experts) using formal citation format):

- Awise, J.C. and J.L. Hambrick, eds. 1996. Conservation Genetics: Case Histories from Nature. Chapman & Hall, N.Y.
- Berkman, H.E. and C.F. Rabeni. 1987. Effect of siltation on stream fish communities. Environmental Biology of Fishes. 18:285-294.
- Burr, B.M. and D.J. Eisenhour. 1994. Final report: status survey of the chucky madtom (Ictaluridae: Noturus sp.) in east Tennessee. Report submitted to Tennessee Wildlife Resources Agency, Nashville. 24 pp.
- Etnier, D. A. and R. E. Jenkins. 1980. Noturus stanauli, a new madtom catfish from the Clinch and Duck rivers, Tennessee. Bulletin of the Alabama Museum of Natural History 5:17-22.
- Folkerts, G.W. 1997. State and fate of the worlds aquatic fauna. pp. 1-16 In: Aquatic Fauna in Peril: The Southeastern Perspective, G.W. Benz and D.E. Collins (editors). Species Publication 1, Southeast Aquatic Research Institute, Lenz Design & Communications, Decatur, Georgia.
- Lang, N.J. and R.L. Mayden. 2001. Status and distribution of the chucky madtom, Noturus sp.cf. N. elegans, (Ictaluridae) in Alabama and Tennessee: preliminary report. Report submitted to the U.S. Fish and Wildlife Service, Cookeville Field Office, Tennessee. 3 pp.
- Richter, B.D., D.P. Braun, M.A. Mendelson, and L.L. Master. 1996. Threats to imperiled freshwater fauna. Conservation Biology. 11(5): 1081-1093.
- Shute, P.W., P.L. Rakes, and J.R. Shute. 1997. Status survey of the chucky madtom (Noturus sp., cf. elegans). Final Report for Tennessee Wildlife Resources Agency, Contract No. GR-5-106052-6-01. 14 pp.

Soulé, M.E. 1980. Threshold for survival: maintaining fitness and evolutionary potential. Pages 151-169 in: M.E. Soulé and B.A. Wilcox, eds. *Conservation Biology*. Sinauer Associates Inc., Sunderland, Massachusetts.

U.S. Department of Agriculture, Soil Conservation Service. 1958. Soil survey of Greene County, Tennessee. Series 1947, Number 7. U.S. Government Printing Office, Washington D.C., 89 pp.

Waters, T.F. 1995. Sediment in streams: sources, biological effects, and control. Monograph #7. American Fisheries Society, Bethesda, Maryland, 251 pp.

LISTING PRIORITY (place \* after number)

THREAT
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Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2*
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

**Rationale for listing priority number:**

*Magnitude:*

This taxon is known from only 12 specimens in two streams in eastern Tennessee. Only 11 of these specimens were taken relatively recently (since 1985) and they were all taken from Little Chucky Creek in Greene County, Tennessee. Chucky madtoms have not been encountered in Little Chucky Creek since 2000 despite intensive survey efforts. This indicates that the chucky madtom may actually be extirpated from the one stream where it has been documented in recent years.

*Imminence:*

We believe that this species should receive a Listing Priority Number of 2 to reflect the imminent, extremely high level of threat (due to small population size and land use practices) that this species faces if it is still extant in Little Chucky Creek.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, annual retentions of candidates, removal of candidates, and listing priority changes.

Approve: Linda Kelsey March 14, 2003  
Acting Regional Director, Fish and Wildlife Service Date

Concur: \_\_\_\_\_  
Director, Fish and Wildlife Service Date

Do not concur: \_\_\_\_\_  
Director, Fish and Wildlife Service Date

Director's Remarks:

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Date of annual review: March 2003

Conducted by: Rob Tawes - Cookeville, Tennessee FO

Comments:

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