U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW for
NEOSHO MADTOM
(*Noturus placidus*)

Species Reviewed: Neosho madtom *(Noturus placidus)*

Federal Register Notice of Listing Determination: 55 FR 21148, May 12, 1990. Endangered and Threatened Wildlife and Plants; Neosho Madtom determined to be Threatened.

Federal Register Notice Announcing Initiation of this Review: 88 FR 15448, March 13, 2023. Initiation of 5-Year Status Reviews of 27 Listed Species in the Mountain-Prairie Region.

Lead Region: Region 6, Kansas Ecological Services Field Office, Manhattan, Kansas, Michael Disney, Field Supervisor, 785–306-4277

Classification: Threatened

Current Recovery Priority Number: 8C. This recovery priority number is indicative of a species facing a moderate degree of threat and a high recovery potential.

Methodology used to complete this review: In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (Act), the purpose of a 5-year review is to assess each threatened and endangered species to determine whether its status has changed and whether it should be classified differently or removed from the List of Threatened and Endangered Wildlife and Plants. We previously completed a 5-year review for the Neosho madtom on August 22, 2019. The Kansas Ecological Services Office completed this current 5-year review in August, 2025. We contacted individuals and agencies, including the Kansas Department of Wildlife and Parks (KDWP), Ecological Service Division, Kansas State University Division of Biology, Peoria Tribe of Indians, the USFWS Missouri and Oklahoma Ecological Services Field Offices, Neosho National Fish Hatchery regarding Neosho madtom information. Additionally, we solicited data for this review from interested parties through a March 13, 2023, Federal Register notice announcing this review (83 FR 39771). We received new information in the form of survey data, including occurrence data that indicates that the Neosho madtom persists in relatively small numbers at previously documented locations. However, this new information did not alter our understanding of the species status or threats for this status review.

Review Summary: The Neosho madtom is a small catfish found within the Neosho River basin in the Cottonwood, Neosho, and Spring rivers in Kansas, Oklahoma, and Missouri. It depends on relatively clean gravel substrates to feed, reproduce, and secure shelter. The Service originally listed the Neosho madtom as a threatened species in 1990 (55 FR 21148–21153) due

to existing and potential habitat modifications, such as impoundments, gravel dredging, channelization, water diversions, water allocations, and impairments to water quality. Other threats to the species are the potential impacts of predators, regulatory mechanisms that may not be adequate to protect the species, and extended droughts. Since the listing, no new dams have been constructed in Neosho madtom habitat. However, there have been discussions about removing and retrofitting existing dams to improve conditions for the Neosho madtom, but these conservation efforts have not yet occurred.

New information received since our last 5-year review included occupancy surveys completed in Kansas. Researchers with Pittsburg State University in Kansas performed Neosho madtom surveys in 2019-2021 comparing densities in the Cottonwood-Neosho and Spring River systems (Buroughs et al. 2024). Those surveys indicated that the Neosho madtom was found in varying densities at the survey locations. In total, 641 Neosho madtoms were found in both systems in Kansas. The counties sampled include Allen, Coffey, Lyon, Chase, Labette and Cherokee counties, Kansas. The maximum number of Neosho madtoms found at any survey site was 227 individuals in the Cottonwood River in Lyon county. The surveys documented the presence of Neosho madtoms in the Spring River which was previously considered too contaminated by heavy metals to support them in sufficient numbers. The study found that Neosho madtom densities in the Spring River were now comparable to densities in the Neosho-Cottonwood River system. This new survey data indicates that the Neosho madtom has maintained a continued presence in the Cottonwood and Neosho River main stems and has increased in numbers in the Spring River despite past concerns with metals pollution, indicating water quality may have improved (Buroughs et al. 2024).

Collection permit data received from the Kansas Department of Wildlife and Parks indicate within the years 2000-2024 a total of 742 Neosho madtoms were collected in Kansas during 47 sampling efforts. The above-mentioned study contributed to most of those collections.

Neosho madtom sampling occurred in Missouri by the Missouri Department of Conservation in 2020 and 2024. All samples occurred on the Spring River from the confluence of the North-fork to the Kansas/Missouri state line. In 2020, 76 sites were sampled and Neosho madtoms were found at 50 of those locations resulting in a total of 171 individual Neosho madtoms recorded. In 2024, 76 sites were sampled and Neosho madtoms were found at 50 of those locations and a total of 94 individual Neosho madtoms were recorded. The species appears to maintain a stable population in the Spring River within Missouri.

During the onset and duration of the COVID-19 pandemic in 2020, many government agencies experienced interruptions to their field survey season, thus this review may not contain as much field data as was included in previous reviews.

In 2022 a paper looking at the genetic variation and population structure of the Neosho madtom with whole genome sequence data was published (Whitacre et al. 2022). The study successfully generated whole-genome sequence data from 10 Neosho madtoms from 3 geographically separated populations. The analysis showed a weak population structure indicating that although the fish were geographically isolated, they represented a single population.

Several fish hatcheries also have discussed working on captive prorogation of the Neosho madtom. The Peoria Tribe of Oklahoma has done past work on captive propagation. Past efforts with captive propagation were minimally successful and no supplemental stocking of Neosho madtoms has occurred. The Neosho National Fish Hatchery currently has no plans to work with this species.

In 2021 the USFWS and the Kansas Department of Wildlife and Parks finalized a Candidate Conservation Agreement with Assurances/Safe Harbor Agreement (Agreement) for 14 aquatic species as part of the Kansas Aquatic Species Reintroduction Program which seeks to introduce, reintroduce, translocate, and augment rare aquatic species' populations throughout Kansas. The purpose of the program is to recover threatened and endangered aquatic species throughout Kansas; delist state and federally protected species; and avoid future listings. The Agreement is 50 years in duration and extends protections and assurances under the Endangered Species Act to non-federal landowners participating in the Reintroduction Program. The Neosho madtom is included in this agreement. To date, no Neosho madtoms have been released under the Agreement. The agreement has since been amended to cover a total of 21 aquatic species.

Recommendations on species status: Surveys indicate that the Neosho madtom persists within the Cottonwood-Neosho River basin and numbers and densities in the Spring River in Kansas have significantly improved from studies conducted in the 1990's, yet stressors are still acting upon the species. The numbers of individual Neosho madtoms in the wild remain low to moderate. Our review of new information does not change our evaluation of the species' status nor our understanding of the magnitude of threats acting on the species from our most recent published review of the species. Specifically, existing and potential habitat modifications, such as impoundments, gravel dredging, channelization, water diversions, water allocation, and impairments to water quality remain as threats to the species. These existing and potential threats, along with the low to moderate numbers of Neosho madtoms counted during surveys, support our previous evaluation which concluded the Neosho madtom is likely to become endangered throughout all of its range in the foreseeable future.
Therefore, after reviewing the best available scientific information, we recommend no change in status to the species and conclude that the Neosho madtom remains a threatened species.

Recommendations for Future Actions:

1. Communicate and coordinate with the U.S. Army Corps of Engineers (Corps) concerning potential impacts to the Neosho madtom due to the operation of the John Redmond Dam. Consider consulting with the Corps on changes to the dam operations that could benefit the species.

2. Work with partners to draft a new recovery plan for the Neosho madtom, which would include objective and measurable recovery criteria.

3. Continue to monitor the species and its habitat annually using standardized methods to help inform evaluations of abundance, distribution, and trends.

4. Continue to coordinate with other agencies, municipalities, and landowners to encourage the removal of low head dams in watersheds containing the Neosho madtom.

5. Continue efforts to reduce non-point source pollution by working through the Farm Bill, the Watershed Restoration and Protection Strategy program, and other incentive programs to implement best management practices on private lands.

6. Work with partners in Oklahoma, Missouri and Kansas at aquatic biodiversity centers for future propagation and reintroduction plans for Neosho Madtoms.

7. The USFWS Field Offices in Oklahoma, Missouri and Kansas coordinate with EPA to minimize impacts to Neosho madtoms regarding their remediation efforts occurring on the Spring River basin to remove historic mining waste from the Tri-State Mining District.

8. Enroll non-federal lands owners in Kansas under the 21 species Candidate Conservation Agreement with Assurances/Safe Harbor Agreement in order to promote conservation efforts for the Neosho madtom, particularly in areas in the Spring river basin that have been recently undergone remediation of metal contaminated water and substrates.

References:

Boroughs, K.L., Whitney, J.E., King, A.D. *et al.* Comparison of threatened Neosho madtom (*Noturus placidus*) densities between riverscapes differing in anthropogenic stressors, with a particular focus on recovery from mining-derived metal pollution. *Environ Biol Fish* 107, 59–73 (2024). https://doi.org/10.1007/s10641-024-01510-9.

Lynsey K Whitacre, Mark L Wildhaber, Gary S Johnson, Harly J Durbin, Troy N Rowan, Peoria Tribe, Robert D Schnabel, Tendai Mhlanga-Mutangadura, Vernon M Tabor, Daniel Fenner, Jared E Decker, Exploring genetic variation and population structure in a threatened species, *Noturus placidus*, with whole-genome sequence data, *G3 Genes|Genomes|Genetics*, Volume 12, Issue 4, April 2022, jkac046, https://doi.org/10.1093/g3journal/jkac046

U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW
NEOSHO MADTOM (*Noturus placidus*)

CURRENT CLASSIFICATION: Threatened

RECOMMENDATION RESULTING FROM THE 5-YEAR REVIEW:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist:
____ Extinction
____ Recovery
____ Original data for classification in error
_X_ No change is needed

APPROPRIATE LISTING/RECLASSIFICATION PRIORITY NUMBER, IF APPLICABLE: No change from 8C.

FIELD OFFICE APPROVAL:

Approve: _____ Date: August 8, 2025

Michael Disney
U.S. Fish and Wildlife Service
Acting Kansas Ecological Services Field Supervisor

OTHER REGIONAL OFFICE APPROVAL:

The Kansas ES Field Office e-mailed the review to the Missouri and Oklahoma Field Offices for their concurrence prior to the finalization of this document. The Kansas office will retain comments and verification of concurrence in the administrative record for this 5-year review.