Bluemask Darter
(Etheostoma akatulo Layman and Mayden, 2009)

5-Year Status Review:
Summary and Evaluation

Photo courtesy of Conservation Fisheries, Inc.

U.S. Fish and Wildlife Service
Southeast Region
Tennessee Ecological Services Field Office
Cookeville, Tennessee

August 2025

5-YEAR STATUS REVIEW
Bluemask Darter (*Etheostoma akatulo*)

GENERAL INFORMATION

Current Classification: Endangered

Lead Field Office: Tennessee Ecological Services, Santiago Martín, (931) 431-2688.

Reviewers:
Lead Regional Office: Southeast Region, Atlanta, Georgia; Carrie Straight.

Date of original listing: January 26, 1994 (58 FR 68480; December 27, 1993).

Methodology used to complete the review: In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (ESA), the purpose of a status review is to assess each threatened or endangered species to determine whether its status has changed and if it should be classified differently or removed from the Lists of Threatened and Endangered Wildlife and Plants (50 CFR 424.11). The U.S. Fish and Wildlife Service (Service) evaluated the best available information about the bluemask darter's biology, habitat, and threats to inform this status review.

We announced initiation of this review in the Federal Register on June 6, 2024 (89 FR 48437) with a 60-day comment period. We received one comment letter from the National Council for Air and Stream Improvement, Inc. describing application rates of best management practices for silviculture and their benefit, when employed, to water quality. We reviewed these comments and incorporated them into the discussion of threats below. The primary sources of information used in this analysis were the 1993 final listing rule (58 FR 68480), the 1997 recovery plan, peer-reviewed reports, agency reports, unpublished survey data and reports, and personal communication with recognized experts. The Service, Tennessee Ecological Services Field Office, Cookeville, Tennessee, completed this review. All literature and documents used for this review are on file at the Field Office. All recommendations resulting from this review are the result of thoroughly reviewing the best available information on the bluemask darter.

FR Notice citation announcing the species is under active review:
June 6, 2024 (89 FR 48437)

Species' Recovery Priority Number at start of 5-year review (48 FR 43098):
The bluemask darter has a recovery priority number of 5, indicating a high degree of threat, low recovery potential, and an entity considered a species.

Review History:
We have published two 5-year status reviews since the listing of the bluemask darter, one on December 27, 2013, and the other on August 5, 2020. Both reviews recommended "no change" in status (Service 2013, 2020).

REVIEW ANALYSIS

Listed Entity

Taxonomy and nomenclature:
We are not aware of any changes to the taxonomy of this entity and still considers it valid. The species' nomenclature is consistent with that used by the American Fisheries Society (Page et al. 2023) and found in the Integrated Taxonomic Information System (2025).

Recovery Criteria

Recovery Plan or Outline:
Recovery Plan for the Bluemask (=Jewel) Darter (*Etheostoma* [*Doration*] *sp*.), July 25, 1997.

Recovery plans serve as a road map for species recovery. They are non-regulatory documents that provide guidance to the Service, states, and other partners on actions that minimize threats to listed species as well as recovery criteria. If the criteria defined in the plan are still valid, then meeting all the criteria suggests that the species no longer requires protection under the Act. However, when recommending whether a listed species should be delisted, the Service must apply the factors in section 4(a) of the ESA (84 FR 45020).

The Service should remove the bluemask darter from the Lists of Threatened and Endangered Wildlife and Plants when the species is no longer likely to become extinct in the foreseeable future. The following criteria would support a decision to remove the species' protection under the Act:

Criterion 1. *Through the protection and enhancement of existing populations and successful establishment of reintroduced populations or discovery of additional populations, five distinct viable populations exist.*

Criterion 2. *Studies of the fish's biological and ecological requirements have been completed and the implementation of management strategies developed from these studies have been successful in substantially increasing the number and/or range of the bluemask darter in four rivers (other than the Collins River) or additional collections or reintroduction efforts extend the species' present known range to a total of at least six rivers.*

Criterion 3. *No foreseeable threats exist that would likely impact the survival of the species over a significant portion of its range.*

We continue to assess the recovery criteria above as appropriate and relevant. At the time of this review, none of the recovery criteria have been met. And it is unlikely that we will achieve all delisting criteria by 2030, the next scheduled status review, even if the Service and partners can

fully fund the Recovery Plan. The main limitation to achieving all criteria is the effort and time needed to reintroduce and establish five viable bluemask darter populations.

Notwithstanding the goal of having five viable populations, we are making considerable progress on Criterion 2. The Service and partners have already funded projects to understand habitat preferences and develop propagations techniques. We have tentatively been awarded funding for a project to study groundwater flows and landscape influences on water quality in the Calfkiller River to inform future reintroduction efforts.

Biology and Habitat Summary

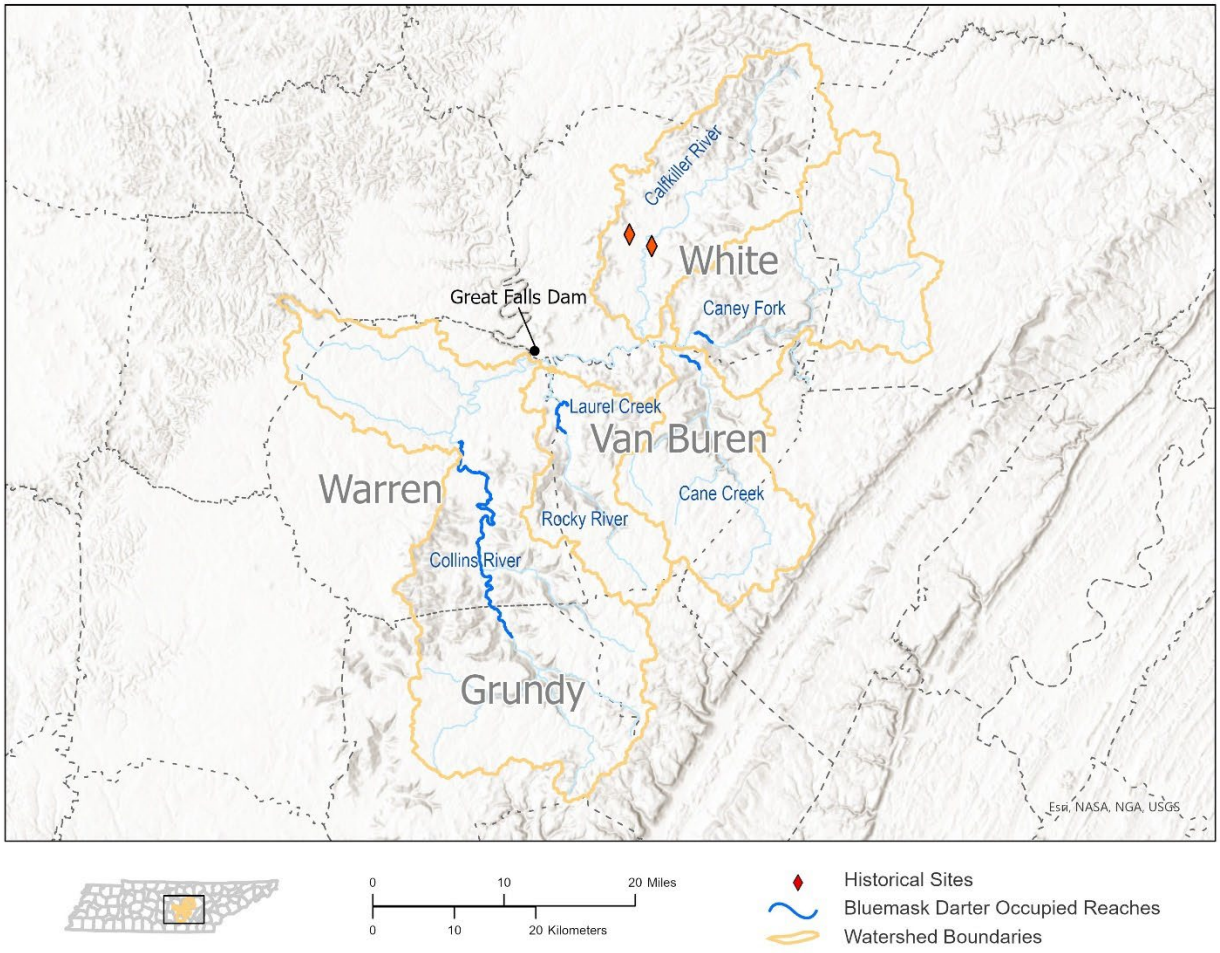

Figure 1: Map showing the bluemask darter distribution and historical sites.

Populations and Distribution

Our understanding of bluemask darter distribution and population viability has not changed since the last 5-year status review (Service 2020). The bluemask darter is endemic to the Caney Fork River watershed in central Tennessee (Figure 1) where it inhabits the lower free-flowing reaches of some streams on the eastern Highland Rim (Layman and Mayden 2009). These streams are characterized by moderate gradient; waters of low to moderate productivity; and substrates of

limestone or chert bedrock, coarse chert gravel, and sand (Etnier and Starnes 1993). The species is known to occur in the following five rivers above Great Falls Reservoir: Caney Fork River in White County; Rocky River, Laurel Creek, and Cane Creek in Van Buren County; and Collins River in Warren and Grundy counties (Figure 1). The species inhabited the Calfkiller River in White County as recently as 1968 but has since been extirpated from that stream (Layman and Mayden 2009). The best available information shows that bluemask darter has a western (Collins River) and an eastern population (Rocky River, Cane Creek, Caney Fork River) (Taylor et al. 2021).

The Tennessee Valley Authority has been the primary entity coordinating and performing range wide monitoring efforts since 2008. Based on recent survey data, we estimate that bluemask darters occupy approximately 1.7 river miles of Caney Fork River, 2.9 river miles of Cane Creek, 3 river miles of Rocky River, and 30 miles of Collins River (Mattingly et al. 2022; TVA 2011, 2019, 2020, 2024). The eastern bluemask darter population (Caney Fork River, Cane Creek, and Rocky River) occupies less than one-fourth of the stream miles occupied by the western population (Collins River) (6.1 vs 30 river miles) and experiences significant habitat disturbance due to seasonal fluctuations of the Great Falls Reservoir pool elevation. The Caney Fork River has limited areas with sandy substrates and little flow during the summer, which contributes to the small number of fish observed during monitoring efforts (Table 1). Abundances are greatest in the Collins River, which is likely a function of greater habitat availability (Table 1) (Simmons et al. 2008; Layman and Mayden 2009).

Table 1: Average number of bluemask darters observed per site sampled during range wide monitoring efforts (TVA 2011, 2019, 2020, 2024).

Stream	Year	Sites Sampled	Fish Count	Fish/Site
Caney Fork River	2011	5	18	3.6
Caney Fork River	2017	3	19	6.3
Caney Fork River	2020	8	6	0.75
Caney Fork River	2024	6	4	0.67
Cane Creek	2011	7	23	3.29
Cane Creek	2017	4	40	10
Cane Creek	2020	7	73	10.4
Cane Creek	2024	5	17	3.4
Rocky River	2011	1	34	34
Rocky River	2017	3	60	20
Rocky River	2020	4	106	26.5
Rocky River	2024	5	48	9.6
Collins River	2011	2	199	99.5
Collins River	2017	5	147	29.4
Collins River	2020	5	241	48.2
Collins River	2024	3	170	56.67

Genetics

Bluemask darter population structure and genetic diversity has been studied using microsatellites and double digest Restriction-site Associated DNA (ddRAD) (Robinson et al. 2013, Taylor et al. 2021). The microsatellite analyses of Robinson et al. (2013) supported the delineation of three genetically distinct populations: the Collins River, Rocky River, and the Cane Creek/Caney Fork

River populations. However, Taylor et al. (2021) supported a deeper divergence of the species into a western (Collins River) and an eastern population (Rocky River, Cane Creek, Caney Fork River) based on a robust analysis using ddRAD and phenotypic variation (differences of observable characteristics or traits of individuals). Neither Robinson et al. (2013) nor Taylor et al. (2021) found significant evidence of genetic structure within individual occupied streams. Also, both suggested that the divergence among bluemask darter populations predate the completion of Great Falls Dam in 1916.

Overall, bluemask darter genetic diversity is lower than the average population-level diversity values across freshwater fishes (Robinson et al. 2013). The western population has the highest genetic diversity and effective population size (Robinson et al. 2013, Taylor et al. 2021). And demographic models developed by Taylor et al. (2021) suggest that the eastern population is small and approximately half the size, or less, of the western population. Within the eastern population, Rocky River individuals had the highest genetic diversity (Taylor et al. 2021).

Life History

The bluemask darter inhabits stream systems with slow to moderate current over clean sand and fine gravel. The species requires diverse microhabitats within a river system to support different life stages and behaviors. Bluemask darters are typically found just downstream of riffles or along the margins of pools and runs with sand-dominant substrates and lower water velocities (Layman et. al. 1993; Simmons and Layzer 2004). Layman et. al. (1993) collected bluemask darters in slow to moderate current over clean sand and fine gravel at depths of 4 to 20 inches, typically just downstream of riffles or along the margins of pools and runs. Simmons and Layzer (2004) reported that bluemask darters preferred areas with water column velocities less than 0.16 feet(ft) per second(sec) and depths between 14.1 and 28.3 inches.

Since the last 5-year review, Mattingly et. al. (2022) completed and extensive study of bluemask darter habitat use at different spatial scales (microhabitat [285 centimeters squared] and plot [160 meters squared]). Mattingly et. al. (2022) reported that bluemask darters preferred microhabitats with lower water column velocities mean (0.13 ft/sec) compared to available habitats (mean 0.26 ft/s) and individuals preferred smaller substrate mean particle sizes (mean 3.6 millimeters[mm]) and lower levels of silt (mean silt index 1.48) compared to available habitats (mean particle size 34.1 mm and silt index 1.88). Bluemask darters were observed at depths ranging from 4.72 to 42.91 inches, with an average depth of 18.5 inches. At the plot scale, bluemask darters also preferred smaller substrate mean particle sizes (mean 23.4 mm) compared to unoccupied plots (mean 52.8 mm). In addition, bluemask darter presence was positively correlated with groundwater influence, indicating a preference for areas with noticeable groundwater upwelling. The findings of Mattingly et al. (2022) were consistent with past work and highlighted the importance of sandy substrates, low silt levels, groundwater influence, and specific water velocities for the bluemask darter.

Bluemask darter spawning habitat is different from that used most of the year, and it is characterized by areas with swifter water column velocities and gravel-dominant substrate. Simmons and Layzer (2004) observed spawning pairs in runs with mean water depths of 8.42 inches, bottom velocities of 0.62 ft/sec, and water column velocities of 0.95 ft/sec. Also, lone males occupied areas with gravel-pebble substrates and swifter velocities than lone females, which preferred sand-dominant substrates and slow water column velocities.

Bluemask darters spawn between spring and early summer. Simmons and Layzer (2004) observed spawning activity in the wild at water temperatures ranging from 61.7°F to 74.3°F between May 29 and July 1. Conservation Fisheries, Inc. (2015) observed and filmed bluemask darters spawning in the Collins River on April 24, 2014, when the water temperature measured 55.9°F; the observations indicated that bluemask darters might begin spawning at slightly cooler temperatures than previously realized, suggesting a longer and more flexible spawning period. Bluemask males show aggressive behavior towards other males and follow females closely when females entered the spawning area, where females select small sand patches among gravel for burying their eggs (Simmons and Layzer 2004). Peak spawning activity occurs in June and decreases significantly by early July when water temperatures reach 74.48°F (Simmons and Layzer 2004). Bluemask darter eggs are small, oblong, clear, and adhesive, with an estimated hatching time of 11-12 days (CFI 2015). Larvae are pelagic (living or occurring in the water column) after hatching and become demersal (living or occurring near the stream bottom) approximately 28 days later (CFI 2015).

Captive Propagation and Reintroduction

Captive propagation and reintroduction efforts in the Calfkiller River have not been reinitiated since the last 5-year status review (Service 2020). Between 2016 and 2018, Conservation Fisheries, Inc. stocked 329 bluemask darters from Collins River broodstock at river mile 29.6 – near the mouth of Doe Creek. However, Conservation Fisheries, Inc. chose another reintroduction site in 2019 at river mile 40.1 –near the mouth of Mill Creek – because various fish species were found dead over a river mile in the summer of 2018 downstream of the groundwater emergence at Twenty Springs (river mile 38.6) (Figure 2) (Petty et al. 2022). Conservation Fisheries, Inc. stocked 298 bluemask darters from Collins River broodstock at the new reintroduction site in 2019 to avoid water quality issues. These water quality issues might have been associated with the Town of Monterey's Wastewater Treatment Plant discharge (Service 2020). A similar mortality event was observed in the same area below Twenty Springs in 2019. Therefore, reintroduction efforts stopped soon after to reassess the situation (Petty et al. 2022, Service 2020).

Figure 2: Picture of the Twenty Springs emergence showing discolored water on August 24, 2021.

Conservation Fisheries, Inc. developed a monitoring protocol to assess the success of bluemask darter reintroduction efforts. Visual searches occurred annually beginning in summer and fall 2017. No bluemask darters were seen at the first release site near the mouth of Doe Creek. But bluemask darters released on January 16, 2019, were seen on September 10, 2019, downstream of the mouth of Mill Creek (Petty et al. 2022). This observation showed that the species can survive in the Calfkiller River several months. Unfortunately, no bluemask darters have been observed in the Calfkiller River since.

Threats (Five-Factor Analysis) Summary

The Service determines the status of a species from an assessment of the factors specified in section 4 (a)(1) of the Act. We provide a summary of this assessment below.

Factor A - Present or threatened destruction, modification or curtailment of its habitat or range:

In its final listing decision, the Service found that the bluemask darter's range had been reduced by impoundments, water withdrawal, and the general deterioration of water quality resulting from siltation and pollutants contributed by coal mining (coal mining-related impacts do not

occur in the Collins River); gravel mining; poor land use practices related to agriculture, road construction, etc.; water withdrawal; and waste discharges (58 FR 68480). These factors continue to affect the species and its habitat (Figure 3). However, the proper implementation of best management practices can be effective in protecting water quality and instream habitats, which can moderate the threat in many instances as is the case with forestry (Cristan et al. 2016; Warrington et al. 2017; Schilling et al. 2021).

Figure 3: Evidence of water quality issues in the Caney Fork River during reduced flow conditions in Summer.

The upper reaches of all four streams that support the bluemask darter flow underground during summer, with little to no surface flow (Figure 4). This limits perennial habitat for the species to the lower stream reaches and areas influenced by springs (Layman and Mayden 2009). In the case of the streams occupied by the eastern bluemask darter population, a sizable part of the lower reaches are also inundated by the Great Falls Reservoir at summer pool elevations, limiting available habitat.

Figure 4: Example sandy habitat that is perched and unavailable in the upper reaches of the Caney Fork River during reduced flow conditions in summer.

Factor B - Overutilization for commercial, recreational, scientific, or educational purposes:
The Service did not find that overutilization was a threat to the species when the agency listed it under the ESA (58 FR 68480). We did not obtain information that changes our understanding of this factor during this status review and continue to assess that overutilization is not a threat to the species.

Factor C - Disease or predation:
The Service did not find that disease or predation were threats to the species when the agency listed the species under the ESA (58 FR 68480). We did not obtain information that changes our understanding of this factor during this status review and continue to assess that neither disease nor predation are threats to the species.

Factor D - Inadequacy of existing regulatory mechanisms:
The species continues to benefit from the State of Tennessee's scientific collection permits that the help minimize take through a permitting process (Tennessee Code Annotated §§ 70- 8-101-112). In addition, existing regulatory mechanisms (e.g., Clean Water Act of [33 U.S.C. 1251 et seq.] and the Tennessee Water Quality Control Act of 1977) have improved water quality and habitat conditions but are inadequate in fully protecting the species and its habitat. For example, portions of the Caney Fork, Collins, and Rocky rivers continue to be assessed as impaired (i.e., streams in Tennessee that do not meet one or more water quality standards) by the State of Tennessee (TDEC 2024). Pollutants named on the list as occurring in these waterbodies include

Escherichia coli, pH, iron, and manganese. Sources of these pollutants are varied and include abandoned mining areas and grazing in riparian or shoreline zones.

Factor E - Other natural or manmade factors affecting its continued existence:
In its final listing decision, the Service found that bluemask darter was vulnerable to extinction from accidental toxic chemical spills. The Service also questioned the long-term genetic viability of extant populations due to their isolation from one another caused by the Great Falls Reservoir (58 FR 68480). Based on species surveys and genetic studies, we know that the eastern population (Rocky River, Cane Creek, and Caney Fork River) has a smaller population, occupies less stream miles, and has lower genetic diversity than the western population (Collins River). Therefore, the eastern population is less resilient than the western population to random events, such as toxic spills from commercial nurseries or agricultural activities or genetic drift.

We consider climate change as an emerging threat that may significantly affect the long-term viability of bluemask darter populations. Tennessee, where the species' range occurs, has experienced some changes in weather. Runkle et al. (2022) reported that Tennessee had an overall temperature rise of 0.5°F since 1900 and total annual precipitation above average since 1990. Prediction models show that the number and intensity of extreme heat and precipitation events may significantly increase in the future (Runkle et al. 2022). In Tennessee, changes in water temperature, dissolved oxygen, recharge rates, altered hydrological regime, groundwater levels, and groundwater quality are expected effects of climate change (Glick et al. 2015). Although bluemask darter was not specifically assessed, a climate change vulnerability assessment of the different taxonomic groups in Tennessee revealed that fishes were the most vulnerable (Glick et al. 2015).

Increased rainfall, especially extreme events, would increase runoff of sediment and pollutants into waterways. These inputs could potentially degrade spawning and foraging habitat for the bluemask darter. Increased flows during the spawning season could also increase the distance that bluemask darter larvae drift before becoming benthic (found on the bottom, or in the bottom sediments, of a sea, lake, or other body of water). If the larvae find suitable habitat, increased flow could expand the range of the species and contribute to genetic mixing. Drought could reduce the amount of sandy patch habitat available during periods of low flow, which could be reduced further by water extraction for irrigation of commercial nurseries or other agricultural activities. Another likely negative effect of persistent low flows is the loss of clean-swept sand habitats due to siltation, reducing the amount of suitable habitat for bluemask darters.

Synthesis

The bluemask darter is endemic to the Caney Fork River watershed in central Tennessee. The species had been extirpated from one stream, the Calfkiller River, where it historically occurred. The species has two populations. The eastern population inhabits the Caney Fork River, Cane Creek, and Rocky River and the western population inhabits the Collins River. Impoundment of the Caney Fork River by Great Falls Dam limits the connectivity among occupied streams.

The operation of Great Falls Dam and presence of the reservoir affects the bluemask darter by limiting available habitat, in the eastern population in particular; bluemask darters are unable to migrate and establish other populations in tributary streams, such as the Calfkiller River. Water

quality deterioration from land use practices also persists within the range of the species, and climate change is an emerging threat that may affect the species' future viability.

Due to its fragmented and isolated populations, its continued exposure to multiple threats, our poor understanding of these threats, and the uncertainty about the viability of extant populations, the bluemask darter continues to meet the definition of endangered (i.e., in danger of extinction throughout all or a significant portion of its range). The recovery priority number for the bluemask darter should remain at 5, as the species has a high degree of threat and the potential for recovery at this time is low.

RECOMMENDED FUTURE ACTIVITIES

The Service provides a detailed discussion of recovery actions and criteria in the Recovery Plan (Service 1997). During this status review we recognized potential recovery activities and included them below.

Recovery Activities

- Update the Translocation, Propagation, and Reintroduction Plan for the bluemask darter as well as the Calfkiller River Site Plan.
- Initiate bluemask propagation activities at the Dale Hollow National Fish Hatchery.

Monitoring and Research Activities

- Determining the source(s) contributing to water quality impairment, if any, in the Calfkiller River and develop a plan for remediation.
- Continuing periodic range wide population monitoring.
- Assessing population dynamics of the Rocky River to determine if the sites can support broodstock collection or to serve as a source for direct transplant of individuals for Calfkiller River reintroductions.

REFERENCES

Conservation Fisheries, Inc. (CFI). 2015. Development of Propagation Protocols for Bluemask Darter, *Etheostoma akatulo*, from the Collins River, White County, Tennessee, Progress Report for 2014. 8 pp.

Cristan, R., W. M. Aust, M. C. Bolding, S. M. Barrett, J. F. Munsell, and E. Schilling. 2016. Effectiveness of forestry best management practices in the United States: Literature review. Forest Ecology and Management 360:133-151.

Petty, M.A., J.W. Simmons, C. Ruble, J.R. Shute, and P.L. Rakes. 2022. Propagation and reintroduction of bluemask darter, *Etheostoma akatulo*, in the Calfkiller River, White and Putnam counties, Tennessee. Final Report, Grant No. F18AP00121. Report prepared for U.S. Fish and Wildlife Service, Tennessee Ecological Services Field Office, Cookeville, Tennessee. 16 pp.

Etnier, D.A., and W.C. Starnes. 1993. The Fishes of Tennessee. Knoxville: University of Tennessee Press. 708 pp.

Glick, P., S. Palmer, and J. Wisby. 2015. Climate change vulnerability assessment for Tennessee wildlife and habitats. Report prepared by the National Wildlife Federation and The Nature Conservancy – Tennessee for the Tennessee Wildlife Resources Agency, Nashville, TN. 108 pp.

Layman, S. R., and R. L. Mayden. 2009. A new species of the darter subgenus Doration (Percidae: *Etheostoma*) from the Caney Fork River System, Tennessee. Copeia No. 1:157-170.

Layman, S.R., A.M. Simons, and R.M. Wood. 1993. Status of the dirty darter (*Etheostoma olivaceum*) and bluemask darter (*Etheostoma* (Doration) sp.) With notes on the fishes of the Caney Fork River system, Tennessee. J. Tenn. Acad. of Sci. 68(2):65-70.

Mattingly, H., V. Jones, and S. Allen. 2022. Determining bluemask darter ecological requirements at multiple spatial scales to support reintroductions in the Calfkiller River system. Final Report, Grant No. F17AC00592. Report prepared for U.S. Fish and Wildlife Service, Tennessee Services Field Office, Cookeville, Tennessee. 66 pp.

Page, L.M., K.E. Bemis, T.E. Dowling, H. Espinosa-Pérez, L.T. Findley, C.R. Gilbert, K.E. Hartel, R.N. Lea, N.E. Mandrak, M.A. Neighbors, J.J. Schmitter-Soto, and H.J. Walker, Jr., editors. 2023. Common and scientific names of fishes from the United States, Canada, and Mexico, 8th edition. American Fisheries Society, Special Publication 37, Bethesda, Maryland.

Integrated Taxonomic Information System (ITIS). 2025. ITIS Report for *Etheostoma akatulo* (Layman and Mayden, 2009). [retrieved May 21, 2025] http://www.itis.gov.

Robinson, J.D., J.W. Simmons, A.S. Williams, and G.R. Moyer. 2013. Population structure and genetic diversity in the endangered bluemask darter (*Etheostoma akatulo*). Conservation Genetics 14(1):79-92.

Runkle, J., K.E. Kunkel, D.R. Easterlng, L.E. Stevens, B.C. Stewart, R. Frankson, L. Romolo, J. Neilsen-Gammon, T.A. Joyner, and W. Tollefson. 2022. Tennessee State Climate Summary 2022. NOAA Technical Report NESDIS 150-TN. NOAA/NESDIS, Silver Spring, MD, 5 pp. Tennessee - State Climate Summaries 2022

Schilling, E. B., A. L. Larsen-Gray, and D. A. Miller. 2021. Forestry best management practices and conservation of aquatic systems in the southeastern United States. Water 13(19): 2611.

Simmons, J.W. and J.B. Layzer. 2004. Spawning behavior and habitat of the endangered bluemask darter, Etheostoma (Doration) sp. Copeia 2004(2): 412-417.

Simmons, J.W., J.B. Layzer, and D.D. Smith. 2008. Age-class structure and variability of two populations of the bluemask darter *Etheostoma* (Doration) sp. American Midland Naturalist 160:300-309.

Taylor, L.U., E. Benavides, J.W. Simmons, and T.J. Near. 2021. Genomic and phenotypic divergence informs translocation strategies for an endangered freshwater fish. Molecular Ecology 30(14): 3394-3407.

Tennessee Department of Environment and Conservation (TDEC). 2024. EPA Approved Lists of Impaired and Threatened Waters. https://www.tn.gov/content/dam/tn/environment/water/watershed-planning/wr_wq_impaired-waters-list-2024-final.xlsx

Tennessee Valley Authority (TVA). 2011. U.S. Fish &Wildlife Service Operations Consultation Compliance Fiscal Year 2010 Report. Knoxville, Tennessee. November 2011. 98pp.

----. 2019. Synopsis of the current status of the Bluemask Darter from 2017 surveys with comparisons to historical data. Prepared by J.W. Simmons. 17pp.

----. 2020. Unpublished data. Email correspondence from Jeffrey Simmons, Tennessee Valley Authority, to Santiago Martin and Daniel Elbert, U.S. Fish and Wildlife Service, transmitting 2020 bluemask darter range wide survey data in Excel spreadsheet. Email dated June 13, 2023.

----. 2024. Unpublished data. Email correspondence from Todd Amacker, Tennessee Valley Authority, to Santiago Martin, U.S. Fish and Wildlife Service, transmitting 2024 bluemask darter range wide survey data in Excel spreadsheet. Email dated July 21, 2025.

U.S. Fish and Wildlife Service (Service). 1997. Recovery Plan for the Bluemask (=Jewel) Darter (*Etheostoma* [*Doration*] sp.). July 25, 1997. 25pp.

----. 2013. Bluemask darter (*Etheostoma akatulo*) 5-year review: summary and evaluation. Southeast Region, Tennessee Ecological Services Field Office, Cookeville, Tennessee. 29 pp.

----. 2020. Bluemask darter (*Etheostoma akatulo*) 5-year review: summary and evaluation. South Atlantic - Gulf Region, Tennessee Ecological Services Field Office, Cookeville, Tennessee. 34 pp.

Warrington, B. M., W. M. Aust, S. M. Barrett, W. M. Ford, C. A. Dolloff, E. B. Schilling, T. B. Wigley, and M. C. Bolding. 2017. Forestry best management practices relationships with aquatic and riparian fauna: A review. Forests 8(9):331.

RESULTS / SIGNATURES

U.S. Fish and Wildlife Service Status Review of
Bluemask Darter (*Etheostoma akatulo*)

Status Recommendation:

On the basis of this review, we recommend the following status for this species (50 CFR § 424.11). A 5-year review presents a recommendation of the species status. Any change to the status requires a separate rulemaking process that includes public review and comment, as defined in the Act.

____ Downlist to Threatened.
____ Uplist to Endangered.
____ Delist:
____ *The species is extinct.*
____ *The species is recovered.*
____ *New information suggests the species does not meet the definition of an endangered or threatened species.*
____ *The listed entity does not meet the statutory definition of a species.*
_X_ No change needed.

FIELD OFFICE APPROVAL:

Field Supervisor, Tennessee Ecological Services Field Office, U.S. Fish and Wildlife Service

Approve DANIEL ELBERT Digitally signed by DANIEL ELBERT Date: 2025.08.18 13:00:22 -05'00'