

U. S. Fish and Wildlife Service

Recovery Plan for the Trispot Darter (*Etheostoma trisella*)



Photo courtesy of Pat O'Neil, Geological Survey of Alabama

For:
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Approved: **MICHAEL
OETKER**

Digitally signed by MICHAEL
OETKER
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Regional Director, Southeast Region, U.S. Fish and Wildlife Service

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 (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 Director or Director 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.

Suggested citation:

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Recovery Plan for Trispot Darter (*Etheostoma trisella*)

This recovery plan describes criteria for determining when the trispot darter has been recovered and should be considered for delisting from the Federal List of Endangered and Threatened Wildlife. It also lists site-specific actions that will be necessary to meet those criteria and estimates of the time and cost required 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 detailed discussion of these and other topics pertinent to the recovery of trispot darter can be found in the Species Status Assessment (SSA) (<https://ecos.fws.gov/ServCat/Reference/Profile/101341>). A Recovery Implementation Strategy (RIS) will be developed; it is the operational document that details on-the-ground activities for implementing the recovery plan actions. The RIS and SSA are finalized separately from the Recovery Plan and will be updated on a routine basis.

Current Species' Status

The trispot darter was federally listed as a threatened species under the Endangered Species Act of 1973 as amended (Act) on January 28, 2019 (83 FR 67131). Critical habitat was designated and a section 4(d) rule was adopted for the species on October 30, 2020 (85 FR 61619 and 85 FR 61614, respectively). The section 4(d) rule provides measures that are necessary and advisable to conserve the species. This freshwater species is a small-bodied, benthic fish native to the Coosa River system in Alabama, Georgia, and Tennessee. Adult males and females range in size from 1.3 to 1.6 inches (in) (33 - 40 millimeters (mm)) standard length (Mettee *et al.* 1996), and the body is slender to moderately stout (see photo above). The darter has three prominent dusky dorsal saddles, pale undersurface, and a dark bar below the eye (Bailey and Richards 1963). Scattered dark blotches exist on the fin rays. This fish is thought to live a maximum of three years, but many individuals likely die after the end of their second year (Ryon 1981). During the breeding season, males are a reddish-orange color and have green marks along their sides and a red band through their spiny dorsal fin.

All known records of the trispot darter occur above the fall line in the Ridge and Valley ecoregion of Alabama, Georgia, and Tennessee. Historically, this species occurred throughout the middle to upper Coosa River Basin with records from the mainstem Coosa, Conasauga, and Coosawattee rivers, their tributaries, and tributaries to the Oostanaula River. Genetic studies on the species indicate that this species historically maintained gene flow throughout the upper Coosa River Basin and ranged from at least the Little Canoe Creek system near Springville, Alabama to the Upper Conasauga River, near Conasauga, Tennessee (Fluker and Kuhajda 2011). However, due to several large impoundments, management units (MUs) are now fragmented and only occur in Little Canoe Creek and tributaries (including Gin Branch), Ballplay Creek tributaries, Conasauga River and tributaries (including Holly, Coahulla, and Mill (GA) creeks, and a Mill Creek (TN) tributary,) and Coosawattee River and tributary (including Salacoa Creek) (Service 2017).

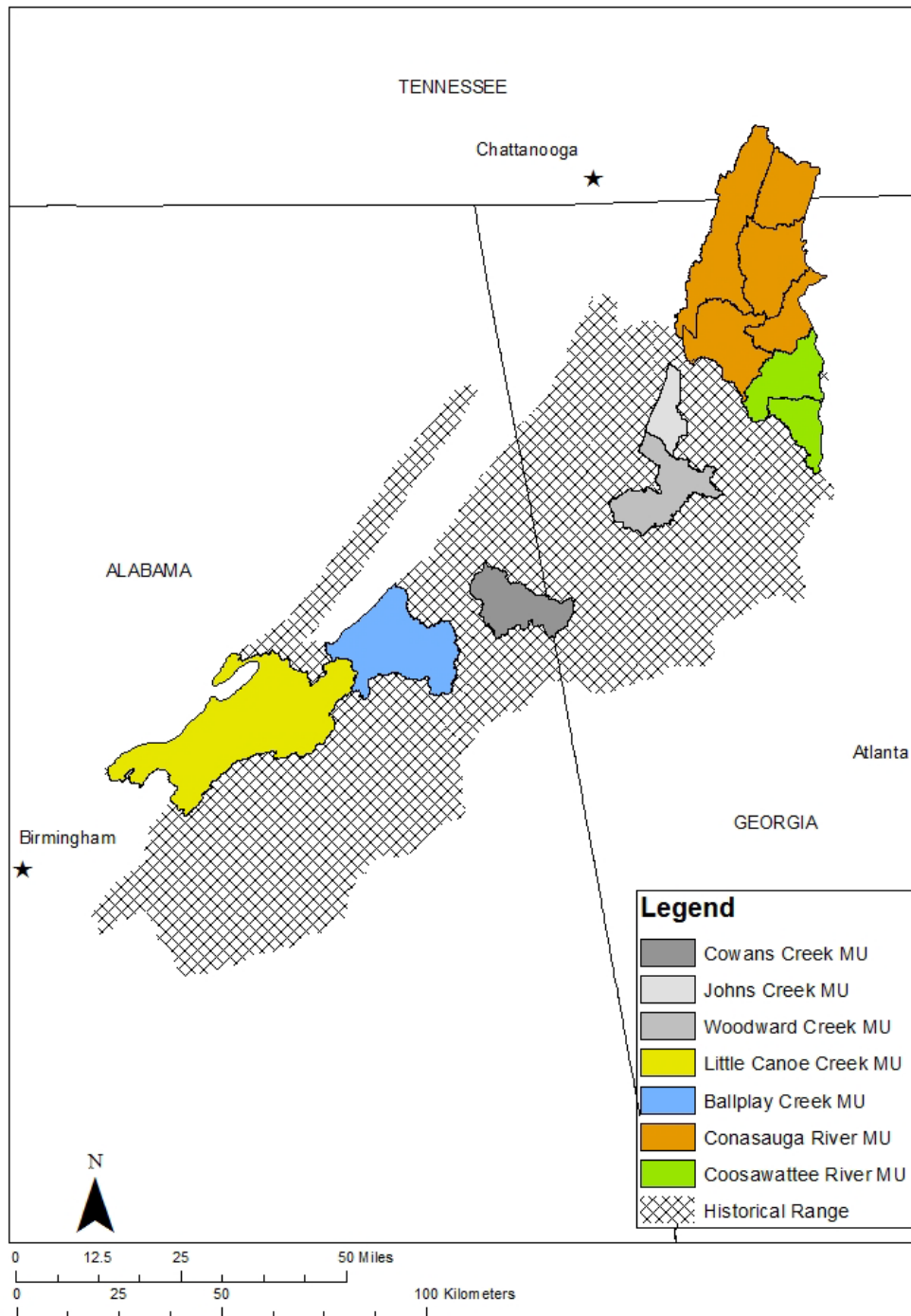


Figure 2-3. Trispot darter assumed historical range and the watersheds where this species has been collected in the Coosa River basin within the Ridge and Valley region. The grayscale MUs are Historical and the colored Management Units are Current.

Habitat Requirements and Limiting Factors

The trispot darter is migratory, meaning that the fish utilizes distinct breeding and nonbreeding habitats. Predominant food items have been found to be non-biting midge larvae and pupae and mayfly nymphs (Ryon 1986). Between April and October, the trispot darter inhabits its non-breeding habitat located on the margins of small to medium sized rivers in areas of slower velocities. The species has also been documented in larger rivers such as the Coosa River. Within these areas, additional needs and requirements include detritus, woody debris, and stands of American water willow (*Justicia americana*) over stream substrate consisting of small cobble, pebbles, gravel, and fine layers of silt. In late fall, the trispot darter begins to move toward spawning areas, identified as ephemeral streams that hold water from November through April. Migration into spawning areas begins in late November/early December and is likely stimulated by precipitation, temperature, and changes in daylight hours. Individuals remain in the spawning areas until late April.

Based on the Species Status Assessment (SSA), agricultural and developmental land-use practices can negatively impact the availability of suitable habitat as described above. Additionally, barriers to fish movement that limit connectivity and result linear distributional patterns reduce the trispot darter's long-term viability (Service 2018). To maintain stable and increasing populations of trispot darter, connectivity of breeding and non-breeding habitat, channel integrity, and adequate water quantity and water quality are required.

Recovery Strategy

The ultimate goal of the recovery effort is to ensure the long-term survival of the trispot darter by minimizing or eliminating threats to the extent that populations are self-sustaining and protections afforded by the Act are no longer required. The primary strategies for recovery of the trispot darter are to (1) increase population numbers and distribution across the species' historical range, (2) maintain and restore connectivity between breeding and non-breeding habitat, (3) conserve genetic and morphological diversity of the species, (4) emphasize voluntary stewardship practices in the Coosa River basin. Conservation and recovery of this fish will require human intervention and participation. The plan is to work with partners, landowners, and stakeholders to reduce and alleviate threats to the trispot darter. We plan to work cooperatively with County and State municipalities and agencies (Alabama, Georgia, and Tennessee), other Federal agencies, and private landowners to protect the integrity and quality of existing habitats that currently support, or could support, the trispot darter.

Recovery Criteria

- (1) Six (6) or more Management Units exhibit a stable or increasing trend, evidenced by natural recruitment, recruitment rates exceeding mortality rates, and multiple age classes. (addresses Factors A and E)
- (2) Spatial distribution of the six (6) Management Units (as defined in Criterion 1) includes at least one (1) population in four of the five (4 of 5) historical river basins (HUC 8 level) (Middle

Coosa – HUC8 CODE 03150106; Upper Coosa – HUC8 CODE 03150105; Oostanaula- HUC8 CODE 03150103; Conasauga – HUC8 CODE 03150101; Coosawattee – HUC8 CODE 03150102). These populations should extend over 70% of the known historic range within each of the four river basins. (addresses Factors A and E)

(3) Threats have been addressed and/or managed to the extent that the species will remain viable based on scientifically defensible evaluation methods, for the foreseeable future. (addresses Factors A, D, and E)

Justification

For this species MUs are defined at the HUC10 drainage scale and include trispot darters that are assumed or known to use the same connected breeding and non-breeding waterways and are demographically, spatially, or genetically separated from other groups. A resilient MU for the trispot darter is defined as maintaining a stable (constant age distribution and abundance over time) or increasing population trend, as evidenced by natural recruitment and multiple age classes. Six or more MUs exhibiting these traits are necessary to provide sufficient redundancy, as defined in the SSA, to ensure the species will no longer require protection under the Act.

To ensure that the species will not become endangered in the foreseeable future a sufficient number of MUs should be distributed throughout its historical range, therefore we believe it is necessary for the species to occur in multiple sub-basins provided in Criterion 2. Maintaining or expanding the species range across most of the historically occupied river reaches will increase its resiliency, representation, and redundancy, as defined in the SSA (Service 2018), and reduce threats due to curtailment of range (Factor A) and stochastic events (Factor E).

Abatement of the threats will allow populations to become stable and contribute to viability of the species. Eliminating significant sources of sedimentation, avoiding channelization and further construction of organism passage barriers, and adhering to good land management practices that minimize non-point source pollution in the species' range, will contribute to the conservation of the species into the foreseeable future. Agreements and management plans targeting threats relating to the trispot darter are necessary to ensure the species will no longer require protection under the Act (Factors A, D, and E).

Actions Needed

The recovery actions identified below are those that, based on the best available science, we believe are necessary to recover the trispot darter. We have included an estimated cost to complete the action and priority number¹.

Recovery Action	Additional Information	Estimated Cost	Priority
1. Conduct field surveys using conventional, standardized methods throughout historical range to identify and understand breeding and non-breeding habitat.	Develop and apply occupancy and habitat suitability models to inform population and watershed management. Gain a better understanding of life history and habitat characteristics for both breeding and non-breeding requirements.	\$1.32 million	1
2. Conduct range-wide status surveys and genetic research to determine needs specific to populations and apply the results toward genetic diversity enhancement, management, and recovery actions for the species.	Continue refining and standardizing eDNA techniques to help evaluate trispot darter presence.	\$350 thousand	1
3. Conduct road crossing and dam surveys to identify potential barriers to passage issues.	Where practical, restore stream connectivity and instream integrity by removal of existing stream barriers that restrict migration and alter the natural hydrology. Alternatively, replace barriers with structures that enhance migration and restore natural flows.	\$3.14 million	1

¹ 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.

Recovery Action	Additional Information	Estimated Cost	Priority
4. Protect and restore, if needed, key parcels via land acquisition, conservation agreements, and conservation easements in the range.	Promote voluntary stewardship as a practical means of reducing nonpoint pollution from private land use and improving habitat.	\$15 million	2
5. Develop educational and outreach programs for foresters and County, State, and Federal transportation groups on the use of stream crossings that encourage fish passage and maintain natural hydrology to reduce impacts to crucial spawning areas.		\$25 thousand	2
6. Assess, develop, and implement a captive propagation or translocation program for trispot darters to augment known populations, as necessary, and re-populate other historically occupied areas. Monitor augmentation efforts for success and alter approach as necessary.	Prior to implementation, the feasibility, need, and likelihood of success of captive propagation and reintroduction efforts will be thoroughly evaluated.	\$1.15 million	2
Total Estimated Cost:		\$20,985,000	

Estimated Costs of Recovery

The estimated costs of implementing recovery actions will total approximately \$20,985,000. These costs are based on similar actions conducted for similar species, studies, and restoration programs and are offered as a reasonable estimate as we learn more about this fish. Due to not knowing exact costs, the total cost of recovery may be higher or lower than this estimate.

Date of Delisting

If all actions are fully funded and implemented as outlined, including full cooperation of all partners needed to achieve recovery, delisting is expected to take 30 years (approximately 10 generations; 2050).

Literature Cited

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