

U.S. Fish and Wildlife Service

Draft Revised Recovery Plan for the

Amber Darter (*Percina antesella*)



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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 (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 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 Service. They represent the official position of the Service only after they have been signed by the Regional 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 Service's Georgia Field Office, Athens, Georgia.

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Draft Revised Recovery Plan for Amber Darter (*Percina antesella*)

This recovery plan describes criteria for determining when the amber darter should be considered for removal from the *List of Endangered and Threatened Wildlife* (50 CFR 17.11). It also lists specific actions necessary to meet those criteria and estimates the time and cost for implementing recovery actions. Brief descriptions of the species' status, habitat requirements, and limiting factors are included. This recovery plan was informed by a Species Status Assessment (SSA) (available at <https://www.fws.gov/southeast/endangered-species-act/species-status-assessments/>). A recovery implementation schedule (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 US Fish and Wildlife Service (Service) listed the amber darter as endangered and identified critical habitat in the Conasauga River on August 5, 1985 (50 FR 31597). The fish occurs in a 33.5-mile (53.9 km) reach of the Conasauga River, Georgia and Tennessee, and a 28-mile (45.1 km) reach of the Etowah River, Georgia; these two populations are isolated from each other by Lake Allatoona on the Etowah River. Count data from fish surveys conducted regularly over almost two decades indicate both populations have declined significantly over the past 10-15 years. Occupancy of shoals has been reduced in the Conasauga, and fish in both systems have been extirpated or greatly reduced in abundance in the lower third of their historic ranges. Viability models suggest that, at current rates of decline, amber darters would be effectively undetectable between 2021-2032 in the Conasauga and 2030-2047 in the Etowah, with extirpation likely shortly thereafter (Edward Sage Stowe, UGA, and Mary Freeman, USGS, pers. comm., November 2018).

HABITAT REQUIREMENTS AND LIMITING FACTORS

Amber darters generally are found in the rivers' mainstems, preferring shoals with a moveable gravel/small cobble substrate and moderate to swift currents (Freeman and Freeman 1994). The presence of clean moveable gravel and high water quality in shoal habitat appears to be highly important in determining distribution. Amber darters forage primarily on snails, limpets, and aquatic insects (Etnier and Starnes 1993, Freeman and Freeman 1994). Probable current stressors include natural stochastic events that affect small populations with limited geographic range, climate change, and habitat/water quality degradation associated with urban sprawl (primarily in the Etowah) and changes in agricultural practices that degrade water quality (primarily in the Conasauga) (Purvis et al. 2000, Wenger and Freeman 2007, Baker et al. 2013, Freeman et al. 2015, Lasier et al. 2016).

RECOVERY STRATEGY

The primary strategies for recovery of the amber darter are to (1) increase population numbers and distribution across the species' historic range in the Etowah and Conasauga River systems, (2) reduce priority anthropogenic stressors on the two populations, (3) conserve genetic and morphological diversity of the species, and (4) emphasize voluntary stewardship practices by citizens in the Conasauga and Etowah watersheds. To achieve this, the Service and conservation

partners [e.g., Georgia Department of Natural Resources (GDNR), The Nature Conservancy (TNC), Natural Resource Conservation Service (NRCS), University of Georgia, US Geological Survey (USGS), Limestone Valley RC&D, Georgia-Alabama Land Trust, Upper Etowah River Alliance, Conasauga River Alliance, U.S. Army Corps of Engineers (Corp), and U.S. Forest Service] will continue to work with private landowners and state/local governments to implement measures to conserve the species. Available conservation programs include NRCS' Working Lands for Wildlife-Conasauga, the Corps' CWA 404 mitigation program, National Fish and Wildlife Foundation and Environmental Protection Agency Section 319 grants, the Service's Partners for Fish and Wildlife Program, and NRCS' Farm Bill programs. Partners need to better coordinate with the Georgia Environmental Protection Division (GEPD) to ensure protective measures and best management practices for sediment, erosion, and stormwater management are implemented to protect water quality within the amber darter's range. The Service must also work with conservation partners to inform local governments and the public about the amber darter, the value of its habitat to the community (e.g., recreation, drinking water, tourism), and conservation measures they can take to conserve the species.

Conservation partners will continue work to address information gaps related to amber darter demographics and threat sensitivity. The ongoing standardized monitoring programs in both basins should be continued to track the species' status, and further research is needed to evaluate parcels and land use practices where management actions first should be targeted. Management actions that reduce transport of agricultural nutrients/chemicals from farmland to stream systems and other best management practices may need to be developed/adapted to improve water quality, and environmental outreach/education is needed to promote public awareness of rare Conasauga and Etowah aquatic species and their threats. Captive propagation may be necessary if populations continue to decline before management actions are implemented at a scale that sufficiently restores habitat and water quality within the species range.

THREATS AND CONSERVATION ACTIONS UNDER THE 1986 RECOVERY PLAN

The original amber darter recovery plan was published in June 1986 (USFWS 1986), when the Etowah River population was thought to be extremely small or extirpated. Primary threats identified in the plan included proposed Corps' reservoir construction in the Conasauga mainstem, catastrophic events, increased silviculture, road and bridge construction, stream channel modification, and land use changes. Recovery efforts to date have not been sufficient to prevent amber darter declines in the face of changing/ intensifying watershed-wide threats over the past few decades. Urbanization rapidly increased in the Etowah basin upstream of Lake Allatoona after 1980, introducing new stressors associated with increased impervious surface, large-scale land clearing/grading, and other factors. In the Conasauga, changes in agricultural practices coincided with increased measured levels of nutrients, estrogens, and glyphosate break-down products in surface waters.

CRITERIA FOR DELISTING

All criteria address listing factors A, D, and E. As new information becomes available, criteria will be reevaluated.

1. Biennial fish surveys at the 13 Conasauga and 16 Etowah fixed-sample locations document a stable or increasing trend for each population as evidenced by natural recruitment, and multiple age classes.
2. Biennial fish surveys (as in Criterion 1) document adults occupying at least 80% of the shoals in the species' historic range in each river systems.
3. Water quality standards are met such that the species will remain viable into the foreseeable future.
4. Conasauga and Etowah populations are protected from habitat threats and/or managed such that the species will remain viable into the foreseeable future.

JUSTIFICATION FOR RECOVERY CRITERIA

1. Criterion 1: An increasing population trend, observed over a sufficient time period, would indicate that recruitment of young is occurring at a rate higher than adult mortality.
2. Criterion 2: Recolonization of historically-occupied habitat downstream of currently-occupied reaches in both the Conasauga and Etowah Rivers could increase the species' resilience to stochastic and/or catastrophic events.
3. Criterion 3: Poor water quality is one of the main threats to this fish.
4. Criterion 4: Meeting Criteria 1 and 2 would indicate the population is currently resilient but not that it is no longer threatened or endangered with extinction in the future.

ACTIONS NEEDED

The recovery actions identified in the table below are those we believe are necessary to recover the amber darter, based on the best available science.

Table 2. Recovery Actions with Estimated Cost and Priority Number¹

Recovery Action	Estimated Cost	Priority
1. Implement management actions and encourage best management practices to improve water quality in both the Conasauga and Etowah River mainstems. This action may include retrofitting existing stormwater networks, working with farmers to reshape agricultural ditches to serve as constructed wetlands or stormwater treatment swales, and/or other measures to improve water quality in runoff before it is discharged into receiving waters.	\$25,000,000	1
2. Work with local/county/state governments to develop and implement ordinances regulating stormwater management and earth-moving activities, establishing stormwater utility fee programs, and other actions to address urban stressors on aquatic systems.	\$300,000	1
3. Protect key parcels via land acquisition, conservation agreements, and conservation easements in both basins. Promote voluntary stewardship to reduce non-point pollution and habitat improvement.	\$100,000,000	1

4. Implement a biennial fish monitoring program at the 13 Conasauga shoals and 16 Etowah shoals where long-term monitoring has been conducted to determine population and habitat trends as management actions are implemented. Monitoring should continue until recovery criteria are met. Additional monitoring post-recovery will also be needed.	\$500,000	1
5. Install sensors at USGS gages 02384500 and 02391860 in the Conasauga and Etowah Rivers and monitor real time water quality in each river, focusing on nitrite, phosphorus, turbidity, and water temperature.	\$200,000	1
6. Develop eDNA markers to help evaluate amber darter presence in Conasauga and Etowah tributaries and in the Coosawattee River. Conduct focused surveys at eDNA positive sites to assess abundance and habitat use.	\$150,000	2
7. Conduct research to determine the species' demographics and threat sensitivity to aid recovery efforts for the amber darter.	\$250,000	2
8. Develop, and implement as needed, a propagation plan for the species that provides for an ark population if numbers continue to decline. Reintroduce to former habitat when stressors are identified and eliminated/reduced.	\$100,000	2
9. Increase public awareness through outreach materials, festivals, planned snorkel and canoe/kayak trips, and other methods.	\$25,000	2
10. Modify State and local government policies and regulations to improve protection of the fish and its habitat and enhance enforcement of such policies and regulations.	Costs covered under existing State and Federal programs	2
11. Work with GEPD to develop water quality standards for nitrate and phosphorus in north Georgia free-flowing streams.		3
12. Coordinate all activities and conduct periodic review of recovery progress and strategy		3
Total Estimated Cost: \$126,525,000		

¹Recovery 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.

ESTIMATED COST TO DELIST:

The cost to recover and ultimately delist the amber darter is estimated to be \$126,525,000. Costs will be considerably less if landowners are amenable to easements and conservation agreements to conserve the fish, rather than land purchase and if NRCS Farm Bill and other funds can be applied to improve water quality of runoff from agricultural lands in the basins. Some costs are not determinable at this time. Twelve other fish and mussel species listed as endangered or threatened occur in these two basins, including five species that are either endemic to the basins or have been extirpated from all historic range except the basins. Recovery actions above will benefit these species.

DATE OF DELISTING

If all actions are fully funded and implemented, in a timely manner, as outlined, including full cooperation of all partners needed to achieve recovery, we anticipate that recovery criteria for delisting could be met by 2040. As we learn more about this species and its threats and recovery actions are implemented and funded with close cooperation of all partners, we will carefully monitor and assess progress toward recovery to ensure we are on track.

LITERATURE CITED

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