Amber Darter
(*Percina antesella*)

5-Year Status Review:
Summary and Evaluation



Photo credit: Robert Lamb

U.S. Fish and Wildlife Service
Southeast Region
Georgia Ecological Services Field Office
Athens, Georgia

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5-YEAR STATUS REVIEW
Amber Darter (*Percina antesella*)

GENERAL INFORMATION

Current Classification: Endangered

Lead Field Office: Georgia Ecological Services Field Office

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Reviewers:

Lead Regional Office: Southeast Region, Carrie Straight.

Cooperating Field Office(s): Tennessee Ecological Services Field Office, Abigail Brown

Date of original listing: September 4, 1985 (50 FR 31597; August 5, 1985)

Critical Habitat final rule: September 4, 1985 (50 FR 31597; August 5, 1985)

Methodology used to complete the review:
In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (Act), the purpose of a status review is to assess each threatened species 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 amber darter's biology, habitat, and threats of to inform this status review.

We announced initiation of this review in the Federal Register on November 25, 2025 (90 FR 53383) with a 60-day comment period and received one public comment from the National Council for Air and Stream Improvement, Inc. The public comment discussed silviculture best practices and impacts on water quality, which was evaluated and incorporated into this final document as appropriate. The primary sources of information used in this analysis were the 2014 and 2021 5-year reviews (Service 2014 and 2021), the 2020 recovery plan (Service 2020), the 2019 Species Status Assessment (SSA; Service 2019) and expert/agency reports, unpublished survey data and reports, and personal communication with recognized experts. This review was completed by the U.S. Fish and Wildlife Service, Georgia Ecological Services Field Office, Athens, GA, with assistance from students at Fort Valley State University, Fort Valley, GA. All literature and documents used for this review are archived by the Field Office. All recommendations resulting from this review are the result of the Service's thorough review of the best available information on the amber darter.

FR Notice citation announcing the species is under active review:
November 25, 2025 (90 FR 53383)

Species' Recovery Priority Number at start of 5-year review (48 FR 43098): 5; amber darter is a species with a high degree of threat and a low recovery potential.

Review History:
Two 5-year status reviews recommending no change in status have been published (Service 2014 and 2021).

REVIEW ANALYSIS

Listed Entity

Taxonomy and nomenclature
We are not aware of any changes to the taxonomy of this entity, and it is still considered valid by the Service. The nomenclature is consistent with and follows that listed by the American Fisheries Society (Page *et al.* 2023) and with the Integrated Taxonomic Information System (2025).

Distinct Population Segment (DPS) (61 FR 4722)
The Act defines species as including any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate wildlife. This species was not listed as a DPS, and we have no new information that would indicate the species should be listed as a DPS under the Service's 1996 DPS Policy.

Recovery Criteria

Recovery Plan or Outline

Revised Recovery Plan for the Amber Darter (*Percina antesella*), January 9, 2020

Recovery plans are not regulatory documents but are intended to provide guidance to the Service, States, and other partners on methods of minimizing threats to listed species and on criteria that may be used to determine when recovery is achieved. If the recovery criteria defined in the plan are still valid, meeting recovery criteria can indicate 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 Act (84 FR 45020).

The 2020 revised recovery plan defines delisting (recovery) criteria as:

1. Two stable, self-sustaining populations exist in both the Conasauga and Etowah Rivers, as evidenced by population trends over multiple spawning cycles.

2. Eighty percent of shoals within the species' historic range in each river system are consistently occupied by the species.

3. Key water quality standards are met such that the species will remain viable, based on Population Viability Analysis (PVA) or other scientifically-defensible evaluation methods, for the foreseeable future.

4. Amber darters are protected from habitat threats and/or managed such that the species will remain viable, based on PVA or other scientifically-defensible evaluation methods, for the foreseeable future.

The Service believes these criteria are appropriate and relevant; however, no criteria have currently been met.

Abundance, Populations, Biology, and Habitat Summary

Basic biology and habitat information about the amber darter can be found in the Species Status Assessment Report (Service 2019). We provide a summary of the species status (abundance and distribution information) below.



Figure 1. Amber darter (*Percina antesella*). Etowah River, Georgia. Photo Credit: Asha Miller-Murthy, 2026.

The amber darter is a small-bodied freshwater fish endemic to the Conasauga and Etowah Rivers of Georgia and Tennessee (Figure 1). One individual has been documented in the Coosawattee River of Georgia, downstream of Carters Lake Reservoir (Freeman *et al.* 2010; Figure 2). The amber darter is found in shoal or riffle habitats with cobble and gravel substrates often vegetated by riverweed (*Podostemum ceratophyllum*) and within moderate to swift currents (Freeman and Freeman 1994). Little is known of their spawning behavior or habitat use during larval and juvenile stages aside from lab-based observations (Freeman and Freeman 1994). Experts speculate that, much like the closely related snail darter (*Percina tanasi*), larval amber darters may occupy slower-moving pool or edge-pool habitats and then transition into faster-moving

riffle habitats as juveniles in mid-late summer, after they obtain lengths of around one inch (Freeman and Freeman 1994; Freeman *et al.* 2010).

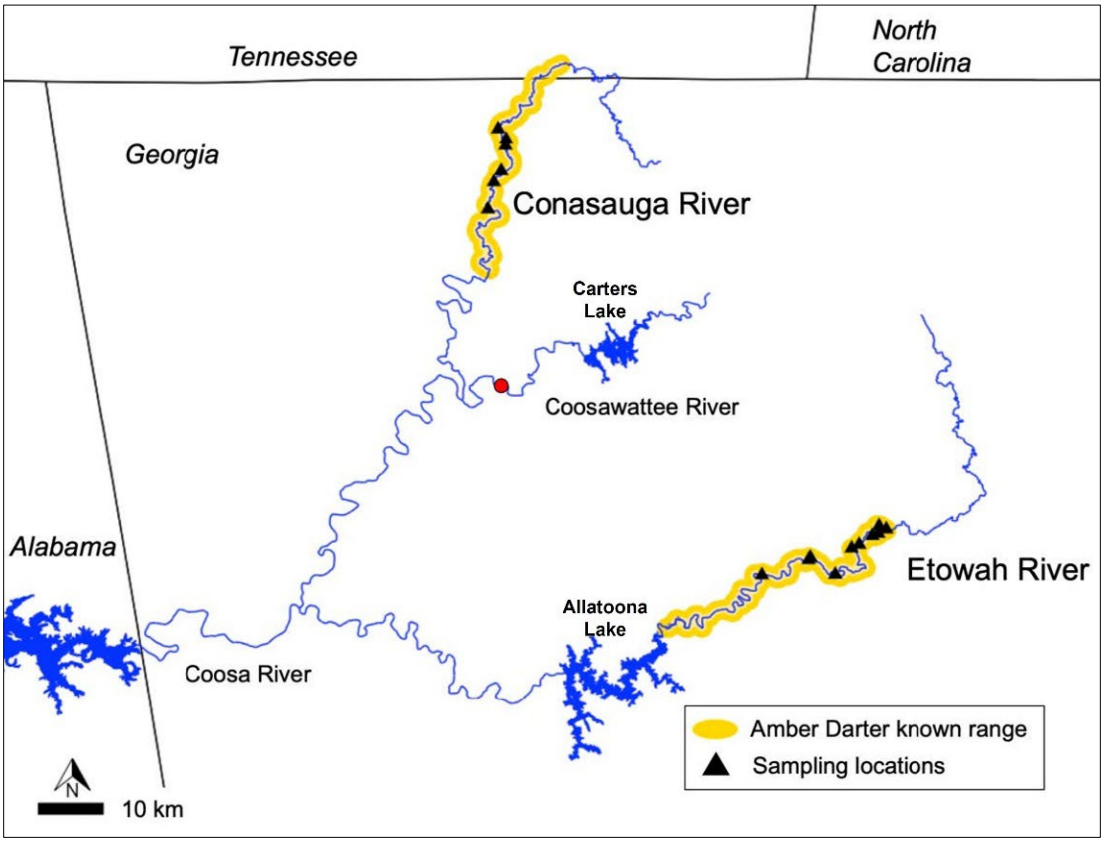

Figure 2. Approximate known historic range of amber darter (*Percina antesella*) in the Conasauga and Etowah River mainstems, northwest Georgia, U.S.A. State boundaries are shown for reference. Capture of a single amber darter in 2010 in the Coosawattee River is indicated by the red point. Black triangles indicate long-term sampling locations from which the data used in Stowe *et al.* 2020 and 2023 originated (modified from Stowe *et al.* 2023).

Since the 1990's, researchers with the University of Georgia, Georgia Museum of Natural History, and U.S. Geological Survey have led monitoring surveys at shoals in the Conasauga and Etowah Rivers, targeting suitable shoal habitat sites that were occupied by the amber darter. This long-term dataset has enabled us to track the species' population abundance trends over time. An analysis by Stowe *et al.* (2020) based on long-term shoal monitoring data found that amber darters have declined approximately 9% annually between 1996-2018 in both the Etowah and Conasauga Rivers (previously reported as a decline between 9-12% in the Conasauga; Service 2021). Their analysis projected that if this rate of decline continued, amber darters would become undetectable (with very low catch per unit of effort, or CPUE) using traditional survey methods by 2050 at all monitoring sites across both rivers. Conasauga sites were forecasted to reach low catch per unit of effort (*i.e.*, one individual in 200 seine-sets) sooner than Etowah sites, with most Conasauga sites projected to reach this level by 2031 (Stowe *et al.* 2020). The lack of any

recorded collections or observations in the Conasauga River in the past 8 years of record is consistent with this prediction.

Conasauga River. No observations or collections have been recorded by long-term shoal monitoring surveys in the Conasauga between 2020-2025 despite fairly consistent sampling effort of 5 mainstem sites sampled in 2020 and 12 mainstem sites in 2022 through 2025 (University of Georgia, unpublished data). Additional efforts using kick-seine, sweep, and snorkel methods conducted at sites known to be previously occupied and additional sites with seemingly high-quality habitat have not yielded any recent (since 2017) observations of the amber darter (Freeman *et al.* 2026; Lamb, pers. comm. 2026; Kuhajda, pers. comm. 2026).

Etowah River. Surveys conducted between 2020 and 2025 detected individuals at most long-term monitoring sites in the basin (Table 1). In 2020, 16 amber darters (range = 1-5) were observed across 7 of 9 Etowah sites surveyed. In 2025, 69 amber darters (range = 2-15) were observed across 8 of 9 Etowah sites (Freeman *et al.* 2026). These are unadjusted counts that have not been standardized by survey effort per site across years. Therefore, these counts do not represent an estimated abundance trend. Of note, monitoring surveys in 2025 found the first juvenile amber darter recorded in at least 15 years, signaling recruitment is occurring.

Table 1. Number of amber darters recorded through long-term monitoring surveys at 9 shoals in the Etowah River between 2020 and 2025 (Freeman *et al.* 2020, 2023a, 2024, 2025, 2026, unpublished data). Surveys were not completed in 2021.

Year	Number of individuals observed	Range of number of individuals observed across sites	Number of sites detected/surveyed
2020	16	1-5	7 / 9
2022	21	1-8	6 / 9
2023	22	1-4	8 / 9
2024	47	1-25	7 / 9
2025	69	2-15	8 / 9

Coosawattee River. In 2010, researchers collected one amber darter in the Coosawattee River, downstream of Carters Lake Reservoir (Freeman *et al.* 2010, 2023b). We do not have data suggesting a self-sustaining population currently or historically occurred in this river. Previous collections upstream of their historic range in both the Conasauga and Etowah River suggest that some individuals may travel large distances (Service 2019 and references therein).

Threats (Five-Factor Analysis) Summary

The status of a species is determined from an assessment of factors specified in section 4(a)(1) of the Act. A summary of the current threats to the species is detailed below.

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range

The SSA and previous 5-Year Review for the amber darter outlined current and emerging stressors to the species and their habitat (Service 2019, 2021). Here, we summarize any recent research or policy changes related to these stressors.

Excess sediment, nutrients, and pesticides

Sediment, nutrient, and contaminant inputs to the Conasauga and Etowah rivers are associated with agricultural, commercial, industrial, and municipal land use practices. Excess nutrients are known to stimulate algal growth and result in reduced water clarity and quality and fish habitat quality. Across the amber darter's range, the magnitude and frequency of sediment, nutrient, and contaminant loading into streams and rivers are exacerbated by increasing impervious surfaces and decreasing riparian buffer area. This shift often leads to quicker transport of stormwater runoff to streams and rivers with less retention and filtration of nutrients and contaminants on the landscape before it enters waterways. The effects of imperviousness in the Upper Coosa Basin are reviewed in the SSA (Service 2019) and 2021 Five-Year Review (Service 2021).

Agricultural contaminants like nitrogen, phosphorus, steroid hormones, and glyphosates degradation product (aminomethyl phosphonic acid (AMPA)) have been detected in surface waters and sediments in the Conasauga mainstem and its tributaries at levels that are harmful to aquatic taxa (Lasier *et al.*, 2016). Martin *et al.* (in prep) recently evaluated sediment and water chemistry conditions in the Conasauga basin and detected widespread but low-level sediment-associated pesticide exposure (including herbicides, insecticides, fungicides, degradates, and other compounds) across 13 randomly selected sites across the basin. Acute toxicity thresholds for amber darter are unknown so we cannot conclude if or how the detected levels would impact individuals.

Exposure to glyphosate can cause changes in fish (reviewed in Tresnakova *et al.* 2021), such as hematologic and biochemical processes in tissues, genotoxicity, histopathological damage, immunotoxicity, or cardiotoxicity. Ames *et al.* (2022) found that glyphosate affects developmental stages and demonstrates toxicity and damage in zebrafish. Embryos exhibited increased mortality, morphological abnormalities, and decreased body size when exposed to glyphosate. In the Conasauga River, Lasier *et al.* (2016) detected the highest concentrations of sediment glyphosate and AMPA in May, which is likely related to spring precipitation and runoff. Because the amber darter spawns during the spring, embryos and larvae may be exposed to and affected by heightened levels of glyphosate in the Conasauga River. Further research could help identify current levels of glyphosate in surface water and sediment and how it may impact amber darters and other aquatic taxa in the basin.

Legacy contaminants

Per- and polyfluoralkyl substances (PFAS) are a group of synthetic chemicals that include perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) and occur widely in aquatic systems today (Jarvis *et al.* 2021; Pepper 2026), entering streams and rivers via many sources including firefighting foams, atmospheric disposition, landfill leakage discharge, and sewage treatment plants (Evich *et al.*, 2022; Banyoi *et al.* 2022; Pepper 2026). PFAS do not degrade in the environment and tend to bioaccumulate in living organisms. Exposure to specific

PFAS has been linked to adverse health effects in humans, including altered immune and thyroid function, liver disease, lipid and insulin dysregulation, kidney disease, adverse reproductive and developmental outcomes, and cancer (reviewed in Fenton *et al.* 2021).

In the Conasauga basin, PFAS chemicals used in carpet manufacturing entered industrial wastewater, passed through wastewater treatment systems lacking the technology to remove them, and ultimately entered the Conasauga River. Konwick *et al.* (2008) provided early evidence of the carpet-to-river PFAS pathway in the Conasauga basin, reporting extremely elevated PFOA concentrations of 253–1150 ng/L and PFOS concentrations of 192–318 ng/L in the Conasauga River downstream of the wastewater land application sites. Recent reviews have addressed PFAS in aquatic organisms (Banyoi *et al.*, 2022; Hong *et al.* 2025) and the mechanisms of PFAS toxicity in these environments (Lee *et al.* 2020; Ma *et al.* 2023). PFAS chemicals have been shown to disrupt endocrine functioning, growth, and development in fishes (Ma *et al.* 2023). We are learning more about the long-term health and ecological impacts that historical and current PFAS inputs have on life in and around the Conasauga River.

Dams and Reservoirs

Dams and large-scale channel modifications (shoal blasting/removal) have fundamentally modified habitat availability for amber darter and other imperiled species in the Upper Coosa River Basin. The amber darter has been documented in the Conasauga River mainstem (no mainstem dams), the upper Etowah River above Allatoona Dam, and the lower Coosawattee River below Carters Dam (only 1 documented individual). The documented Etowah and Conasauga populations are effectively isolated from each other by the Allatoona Dam (Figure 2).

The Coosawattee River is impounded by the Carters Dam and re-regulation Dam, which were built between 1962-1977. However, large-scale channel modifications to make the Coosawattee River navigable for steamboats began as early as the 1870s and resulted in the destruction of shoal habitats throughout the section below where the dam was constructed (U.S. Department of War Office of Engineers 1875, pp. 792-794). The section above Carters Dam was historically avoided due to the presence of more dangerous, rocky shoals. The first and only record of amber darter in the Coosawattee River was made in 2010 (Figure 2), when it was collected during 1 of 11 surveys conducted below Carters dam (Freeman *et al.* 2023b). If amber darters persist in this section of the Coosawattee River, they are subject to reservoir impacts on flow, dissolved oxygen, and temperature.

The Etowah River is impounded by the Allatoona Dam, which was completed in 1950 by the U.S. Army Corps of Engineers to provide flood control and hydroelectric power. The 12,000-acre reservoir fragments many aquatic populations within the Etowah basin, including amber darters, which may have previously existed as a more continuous or interconnected population (Freeman *et al.* 2012). Like the upper Coosawattee River, the Etowah River upstream of Lake Allatoona is relatively unaltered by dredging or channel modification work.

Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Although there may be some unpermitted activities occurring in the range of the amber darter, there is currently no indication that overutilization for commercial, recreational, scientific, or educational purposes presents a significant threat to the species.

Factor C. Disease or Predation

Currently, there is no evidence that disease or predation presents a significant threat to the species. Diseases affecting the amber darter remain poorly studied. Amber darter egg and larval stages are vulnerable to predation by larger benthic-feeding fishes (Freeman 1995), but there's no evidence of these predators posing a significant threat.

Factor D. The Inadequacy of Existing Regulatory Mechanisms

The following regulatory frameworks protect the amber darter's habitat to varying degrees:

- The 1985 designation of critical habitat for the amber darter (50 FR 31597) comprises approximately 33.5 river miles of the Conasauga River, from the U.S. Route 411 bridge (Polk County, Tennessee) downstream to the Tibbs Bridge Road bridge (Murray/Whitfield County line, Georgia). The designated critical habitat only includes the Conasauga River portion of the species' range and excludes the Etowah River, however, the Etowah River currently represents the only habitat where the species is detectable. No critical habitat was designated in the Etowah in 1985 because the Etowah population was then known from a single 1980 specimen and was considered very small or possibly extirpated (Service 1985).
- The State of Georgia's Endangered Wildlife Act of 1973 (O.C.G.A. 27-3-130 *et seq.*) limits protection of listed species to individuals found on State public lands (excluding Georgia Department of Transportation lands). Individuals on private lands are unprotected by State law.
- Tennessee Nongame and Endangered or Threatened Wildlife Species Conservation Act of 1974 (Tenn. Code Ann. § 70-8-101) makes it unlawful for any person to take, attempt to take, possess, transport, export, process, sell or offer for sale or ship nongame wildlife.
- Under the Clean Water Act, as amended (33 U.S.C. 1251 *et seq.*), point source dischargers must obtain permits based on water quality standards. derived from laboratory toxicity testing. However, limited data on aquatic contaminants present in the Conasauga River and specific toxicity effects studies for amber darter raises uncertainty about the species' response to aquatic contaminants and the protectiveness of water quality standards.
- Georgia Erosion and Sedimentation Act (O.C.G.A. 12-7-1 *et seq.*) requires an erosion, sedimentation, and pollution control plan for land-disturbing activities on sites greater than 1 acre. It requires minimal stream buffer protection (25-foot buffer between a permitted land-disturbing activity and non-trout streams), and a buffer variance may be obtained.
- Tennessee Water Quality Control Act of 1977 (Tenn. Code Ann. § 69-3-101) requires a 60-foot natural riparian buffer between a land-disturbing activity and a receiving stream designated as impaired or an Exceptional Tennessee water. A 30-foot natural riparian buffer zone is required to be adjacent to all other streams.

Buffer Protections

The State of Georgia's Erosion and Sedimentation Control Act of 1975 (GESCA; O.C.G.A. 12-7-1 *et seq*.) was passed to protect waters from soil erosion and sediment deposition. The GESCA

requires erosion, sedimentation, and pollution control plans for land-disturbing activities on sites greater than 1 acre. The GESCA also mandates minimal stream buffer protection (25-foot riparian buffer between a permitted land-disturbing activity and non-trout streams or 50-foot from designated trout streams) and a buffer variance may be obtained. The Conasauga River is not considered a trout stream in the State of the Georgia but does have some protections upstream of the Georgia-Tennessee state line. The Tennessee Water Quality Control Act of 1971 (TWQA; T.C.A. §69-3-101 *et seq*.) requires a 60-foot natural riparian buffer between a land-disturbing activity and a receiving stream designated as impaired or an Exceptional Tennessee water, including the Conasauga River and its tributaries (TDEC 2026). A 30-foot natural riparian buffer zone is required to be adjacent to all other streams. Agriculture and forestry are fully or partially exempted from regulation under the GESCA and the TWQA. The States address threats to water quality that are associated with agriculture and silviculture primarily through voluntary Best Management Practices (BMPs). We recognize that silvicultural operations are generally widely implemented in accordance with State-approved BMPs (as reviewed by Cristan *et al.* 2016), and the adherence to these BMPs broadly protects water quality, particularly related to sedimentation (Cristan *et al.* 2016, Warrington *et al.* 2017, and Schilling *et al.* 2021). However, the degree of compliance with BMPs for agricultural activities has not been systematically measured in either Tennessee or Georgia.

A review of local riparian buffer ordinances and scientific literature concluded that to maintain aquatic habitat, 35-100 foot forested riparian buffers should be preserved or restored along all streams (Wenger 1999). A minimum buffer of 35-foot can be effective at trapping sediment short-term; 50-foot or wider would be needed to trap metals, pesticides, and biological pathogens; and 100-foot can be sufficient to trap sediment long-term under most circumstances, although buffers should be extended for steeper slopes (Wenger and Fowler 2000). To be most effective, buffers should extend along all streams, including intermittent and ephemeral channels. Buffers should also be augmented by limits on impervious surfaces and strictly enforced on-site sediment controls (Wenger and Fowler 2000).

PFAS contamination in the Conasauga River basin

Beginning in the 1980s, the local wastewater treatment facility in Dalton, GA, and within the Conasauga River Basin was releasing treated wastewater containing high levels of PFOA/PFOS (historically used in carpet manufacturing) into a 9,600-acre land application system (LAS) known as Loopers Bend that would have met and exceeded all State buffer recommendations. Because the treated wastewater was distributed over land instead of discharging directly into the river, the operation did not require a federal Clean Water Act permit. The two largest carpet producers in the U.S. (Shaw Industries and Mohawk Industries Inc.) operate mills in the Conasauga watershed. After learning about the human health risks, the carpet industry began to phase out their use of PFOA, PFOS, and PFOS-related products in the early 2000s, and Shaw and Mohawk stopped using PFAS in 2019. Levels of PFAS are high in the Conasauga River downstream of the LAS (PFOA, 253–1,150 ng/L; PFOS, 192–318 ng/L; PFNA, 202–369 ng/L; PFDA, 30.1–113 ng/L; PFUA, 58.0–99.2 ng/L; PFOSA, 162–283 ng/L; Konwick et al. 2008) and the land application system (Loopers Bend) may be significant source of PFAS in the Conasauga for many years to come.

Recently introduced regulatory standards are expected to promote new efforts to monitor and minimize its introduction into aquatic systems like the Conasauga River. In 2024, the Environmental Protection Agency designated PFOS and PFOA as hazardous substances under

the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendment and Reauthorization Act of 1986 (also known as Superfund; 42 U.S.C §9601 *et seq*.). This rule requires reporting releases of 1 pound or more within 24 hours, requires cleanup and recovery of the associated costs from responsible parties, and aims to reduce toxic exposure. The Environmental Protection Agency also set Maximum Contaminant Levels for PFAS in drinking water (89 FR 32532) and water quality criteria and benchmarks for aquatic life (89 FR 81077) under the Safe Water Drinking Act and Clean Water Act, respectively. However, the EPA has proposed an extension until 2031 for the compliance deadline for the enforceable Maximum Contaminant Levels for PFOS and PFOA (EPA 2026a). The agency has also proposed rescinding the regulatory determinations and maximum contaminant levels previously established for specific long-lasting industrial chemicals (*e.g*., PFHxS, PFNA, HFPO-DA GenX chemicals), and the Hazard Index mixture of these three plus PFBS (perfluorobutane sulfonic acid), and to re-evaluate these for potential future regulation (EPA 2026b). Therefore, exposure to this contaminant and its impact on the communities within and surrounding the Conasauga River are likely to continue.

Factor E. Other Natural or Manmade Factors

Extreme Precipitation Events

Increases in temperature, drought, and extreme precipitation events (Frankson *et al.* 2022, Runkle *et al.* 2022) are expected to affect amber darter reproduction, physiological stress, and habitat conditions. Hagler and Freeman (2014) found evidence that the amber darter benefits from windows of low spring flow for spawning and recruitment success. High flows have the potential to damage eggs, wash larvae from nursery habitat, hinder upstream movement by juveniles towards suitable shoal habitat, and increase turbidity and sedimentation that degrades habitat (Service 2019). Amber darters are also likely to be affected by high-flow events and drought conditions in which changes to water depth and velocity would alter the availability of high- and low-flow microhabitats in shoal areas (Baynes *et al.* 2022). As adults, they are classified as fast-water specialists (Baynes *et al.* 2022); however, less is known about the habitat preferences (*e.g.*, flow tolerance) of amber darters in their larval and juvenile life stages.

Reproductive Success

Amber darters may be limited primarily by low spawning success or juvenile recruitment, rather than factors affecting adult survivorship. Highly variable reproductive success and/or recruitment at individual shoals, with two to three successive years of poor juvenile recruitment of this short-lived fish, could negatively affect local amber darter numbers, although year-class failure may be compensated by immigration from nearby shoals (Freeman 1989, 1990).

Population Limitations

The amber darter is known to have two small and declining populations, including one that is currently below detection thresholds. The two populations are effectively isolated by Lake Allatoona, a 12,000-acre U.S. Army Corps of Engineers reservoir in the Etowah River and therefore lack the connectivity that would facilitate gene flow and bolster its resilience to demographic stochasticity and catastrophic events. Despite their geographic isolation, a study by Stowe *et al.* (2020) found covarying fluctuations in the Etowah and Conasauga populations, suggesting some events and/or stressors are impacting the whole species. Fitness and genetic diversity decrease when populations become small, and this deterioration precipitates positive feedback loops called extinction vortices (Service 2019 and references therein). The Etowah

population exhibits lower genetic diversity than the Conasauga population, consistent with a past bottleneck (the lower Shoal Creek population was inundated by Allatoona Reservoir around 1950 and presumed extirpated before rediscovery in the early 1990s) (Freeman et al. 2012; Service 2019 and references therein). Because genetic diversity is considerably higher in the Conasauga, continued decline or loss of that population would remove the more genetically diverse population of the species.

Synthesis

The amber darter is a small fish endemic to the Etowah and Conasauga rivers in Georgia and Tennessee. They are generally found in the rivers' mainstems, preferring shoals with a moveable gravel/small cobble substrate and moderate to swift currents. Amber darter numbers and occupancy have declined since the early 2000s. Amber darter has not been detected in the Conasauga River since 2017, suggesting extremely low numbers or extirpation in the basin. This potential outcome would leave only the Etowah River population sustaining the amber darter from extinction, leading to additional challenges to the species' recovery. The incorporation of spatial synchrony into risk assessments has highlighted the compounded risks of extinction when populations fluctuate in unison due to shared stressors. The amber darter faces a combination of habitat degradation; contaminant exposure (including nutrients, pesticides, per- and polyfluoroalkyl substances); altered flow regimes from dams; and climate-driven extremes that collectively impair reproduction, recruitment, and long-term population viability. Current protections offer only partial safeguards, leaving the species vulnerable to persistent nonpoint-source pollution, legacy contaminants, and the consequences of its small, isolated, and declining populations. Therefore, the amber darter continues to meet the definition of an endangered species under the Act.

RECOMMENDED FUTURE ACTIVITIES

Detailed discussion of recovery actions and criteria are presented in the Recovery Plan (Service 2020). During this status review, new and/or targeted potential recovery activities were identified and described below.

Recovery Activities

- Assess captive propagation as a tool for establishing an ark population and for future recovery implementation efforts; including developing propagation methods, identifying habitat requirements, investigating population genetics, identifying potential broodstock, and identifying locations for reintroduction.
- Protect and restore land and waters in the Conasauga and Etowah River basins by working with communities to implement restoration of aquatic connectivity, stream banks, riparian buffers, shoal habitat, and aquatic vegetation (*e.g.*, *Podostemum*).
- Support water quality protection through conservation easements, agreements, and other mechanisms along the Conasauga and Etowah Rivers and their tributaries.
- Encouraging partnerships among governmental agencies, private landowners, and conservation organizations to implement large-scale management practices.

- Formalize and support the Partnership for the Upper Coosa, a multi-partner working group that will focus on recovery of imperiled species, habitat restoration, and stakeholder engagement in the Upper Coosa River basin.

Monitoring and Research Activities

- Assess species population demographics and genetic characteristics.
- Continue annual monitoring in Georgia portion of the amber darter range and expand monitoring efforts in the Tennessee portion of the range.
- Develop eDNA assay and calibrate with quantitative field surveys for future application in monitoring occupancy.
- Expand surveys of potential habitat for larval and juvenile individuals that may include larval drift traps, snorkel surveys, and/or other sampling methods in deeper slower-flow areas, secondary channels, and pools.
- Conduct lab-based life history and threats assessment studies for larval, juvenile, and adult amber darters.
- Conduct field-based life history (*e.g.*, seasonal variability in habitat use) studies for larval, juvenile, and adult amber darters.

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RESULTS / SIGNATURES

U.S. Fish and Wildlife Service
Status Review of Amber Darter

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 indicates 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, Georgia Ecological Services Field Office, U.S. Fish and Wildlife Service

Approve PETER MAHOLLAND Digitally signed by PETER MAHOLLAND Date: 2026.08.24 09:18:41 -04'00'