

Five-Year Review: Summary and Evaluation

Cherokee Darter (*Etheostoma scotti*)



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U.S. Fish and Wildlife Service
South Atlantic–Gulf Region
Georgia Ecological Services Field Office
Athens, Georgia

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FIVE-YEAR REVIEW
Cherokee Darter (*Etheostoma scotti*)

I. GENERAL INFORMATION

A. 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. The U.S. Fish and Wildlife Service (Service) evaluated the biology, habitat, and threats of the Cherokee darter to inform this status review. In conducting this 5-year review, we relied on the best available information pertaining to historical and contemporary distributions, life histories, genetics, habitats, and threats of this species. We announced initiation of this review on March 25, 2020 and requested information in a published Federal Register notice with a 60-day comment period (85 FR 16951). The primary reference point document for our review was the previous 5-year review completed in 2014 (USFWS 2014). Additional documents referenced in this review included the publication that formally described the species (Bauer et al. 1995); the final rule listing the fishes under the Endangered Species Act of 1973, as amended (ESA); and the Service's *Mobile River Basin Aquatic Ecosystem Recovery Plan* (USFWS 2000). We also conducted a search of peer-reviewed scientific literature, reviewed unpublished reports and field observation notes in our files, and reviewed all Formal Consultations that occurred since the previous 5-year review. No new species surveys or data analyses were conducted expressly as part of this review. We received zero public comments during the public-comment period. A record of all public comments and responses are maintained in the administrative record for this review. We have not received significant new information since the last status review and the level of public interest is low and non-controversial; therefore, no official peer review was conducted. We worked with species experts to ensure section II.C. of this document included all current information for the species.

B. Reviewers:

Lead Field Office: Georgia Ecological Services Field Office, Eric Prowell; 706-613-9493.

Lead Region: South Atlantic–Gulf Region, Carrie Straight, 404-679-7226

C. Background

1. Federal Register (FR) Notice citation announcing initiation of this review:

85 FR 16951 16953; March 25, 2020.

2. Listing History:

Original Listing

FR notice: 59 FR 65505

Date listed: Dec. 20, 1994

Entity listed: species

Classification: Threatened

3. Associated rulemakings: None

4. Review History:

Each year, the Service reviews and updates listed species information for inclusion in the required Recovery Report to Congress. Through 2013, we did a recovery data call that included status recommendations such as “Stable, Decreasing or Increasing” for this species. The most recent evaluation for Cherokee darter was completed in 2014.

Final Recovery Plan: 2000

Previous 5 Year Review: 2014 recommending no change in status.

5. Species’ Recovery Priority Number at start of review (48 FR 43098):

2C

Degree of Threat: High

Recovery Potential: High

Taxonomy: species

Conflict Reasoning: Suitable habitat for this species includes small streams and creeks that are often impacted by new roads, utilities, and occasionally reservoirs.

6. Recovery Plans:

Name of plan: Mobile Basin Aquatic Ecosystem Recovery Plan

Date issued: November 17, 2000.

II. REVIEW ANALYSIS

A. Application of the 1996 Distinct Population Segment (DPS) policy

1. Is this species under review listed as DPSs?

No

2. Is there relevant new information that would lead you to consider listing this species as a DPS in accordance with the 1996 policy?

Not at this time.

B. Recovery Criteria:

1. Does this species have a final approved recovery plan with objective, measurable criteria?

Yes

2. Adequacy of recovery criteria.

- a. **Do the recovery criteria reflect the best available and most up-to date information on the biology of the species and its habitat?** Yes.
- b. **Are all of the 5 listing factors relevant to the species addressed in the recovery criteria?**

All relevant listing factors are addressed in each species' recovery criteria. New data suggest that stressors not considered, or considered marginally, when each species was listed actually are highly important to species recovery. However, the recovery criteria, which are based on population stability and implementation of management plans or strategies to benefit the species, are appropriate means to assess recovery.

3. List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information:

Delisting will be considered when the following two criteria are met:

1. their known populations are shown to be stable or increasing for a period of at least five years, and
2. community developed watershed plans are implemented to protect and monitor water and habitat quality in all occupied watersheds.

Hundreds of Cherokee darter surveys have been conducted across the species' range since the fish was listed. The Cherokee darter still occurs in most of the 26 Etowah tributary systems where it was known to occur when the species was listed and has been found, since being listed, in 20 additional Etowah River tributaries. Seventeen of the 20 new tributary systems are small, and several drain directly into Lake Allatoona, which isolates those populations and reduces the potential for genetic exchange between populations. The largest of the 20 tributaries located since the species was listed, Pettit Creek, drains the Cartersville area, which is rapidly developing. Two of the other newly-identified Cherokee darter streams, Richland and Russell Creeks, have or will be impounded for drinking water reservoirs, in addition to the two reservoirs that were constructed since 1997 on Cherokee darter streams.

Long term monitoring of specific populations has not been conducted to determine if criteria one has been met. Studies have been conducted to look at the distribution of Cherokee darters relative to land use. Wenger et al. (2010) determined that size of the population decreased in response to increasing impervious area. Based on this, it is likely that Cherokee darter numbers are declining throughout the portion of the species' range where urban development has resulted in large increases in impervious surface and associated stormwater runoff and sedimentation. Considering the models reflecting sensitivity to development and the loss or anticipated loss of four populations due to reservoir construction, criteria one has not been achieved.

The second recovery criterion for Cherokee darter has been partially met. Local governments in the Etowah basin submitted a draft Etowah River Habitat Conservation Plan (HCP) to the Service in 2007 that detailed measures to address threats associated with urbanization. The HCP was not finalized; however, a number of the counties in the basin,

have adopted some HCP-recommended conservation measures, including riparian buffer and stormwater management requirements. Additionally, the Corps of Engineers now requires most projects authorized under Nationwide Permit to meet draft HCP-developed measures for new culverts and utilities to reduce potential for fish movement barriers. However, key components of the draft HCP that would have required more stringent post-construction stormwater runoff limits and sediment/erosion control have not been implemented. Stormwater management criteria has improved since the previous 5-year review. The Georgia Stormwater Management Manual was revised in 2016 to include a runoff reduction criterion similar to the runoff limits in the draft HCP. Implementation of many of these criteria happens at the local level and varies considerably throughout the Cherokee darter range. No watershed-wide plans or strategies have been developed to protect and monitor water/habitat quality in occupied watersheds outside of the draft Etowah River HCP.

Ongoing Conservation Actions: The Service and partners are implementing the following conservation actions to reduce fragmentation and restore and protect Etowah, Cherokee, and amber darter habitat:

- Protecting Paulding Forest and Sheffield Wildlife Management Area (WMA) on Raccoon Creek. GDNR and Paulding County purchased extensive land in the basin with a Service section 6 Recovery Land Acquisition Grant and other funds. The Nature Conservancy, Service, GDNR, and Paulding County currently are working acquire additional lands and to restore fish passage, riparian buffers, and stream stability on and off public lands in the basin.
- Removal and replacement of culverts that are barriers to movement of Cherokee darters. Two were replaced in the Raccoon Creek Watershed since the previous 5 year review.
- Conserving lands in the Smithwick Creek basin, adjoining GDNR's McGraw Ford WMA and a 5-mile reach of Smithwick restored/protected as partial mitigation for construction of the Hickory Log Creek Reservoir.
- Conserving lands in the Shoal Creek basin (Dawson County), upstream of the City of Atlanta's Dawson Forest.
- Working with The Nature Conservancy, private landowners, and others via the Service's Partners for Fish and Wildlife program to improve habitat and reduce stressors for rare aquatic species lands in the basin.
- Working with the Corps of Engineers to select mitigation properties that restore and conserve priority stream reaches in the Etowah Watershed.

C. Updated Information and Current Species Status

1. Biology and Habitat

a. Summary of new information of species biology and life history:

Since the previous 5-year review in 2014, no new information on the species biology or life history is available.

b. Abundance, population trends, demography:

Since the previous 5-year review in 2014, no new populations of Cherokee darter have been discovered and the number of populations have continued to decline due to reservoir construction. Construction began on the Richland Creek Reservoir in Paulding County in 2016 and was completed in 2020. This reservoir resulted in inundation of approximately two miles of Cherokee darter habitat. The Russell Creek Reservoir in Dawson County was also permitted in 2017 and was scheduled to begin construction in 2020. This reservoir will result in an additional mile of Cherokee darter habitat loss. Both tributaries, Richland and Russell, are relatively small and neither had known populations of Cherokee darter at the time of listing. Both of these tributaries also had existing dams so no new barriers were created. The loss of occupied habitat associated with these two reservoirs would amount to less than one percent of existing occupied habitat.

A chemical spill in the headwaters of Flat Creek (tributary to Shoal Creek, Dawson County) on March 20, 2018 led to an extensive fish kill in a 3.7-mile reach of Flat Creek. The fish kill included at least 2000 Cherokee darters. Recolonization of the reach is being monitored, but accessibility to the upper 1.5 miles of habitat is blocked by a perched culvert.

c. Genetics:

Since the previous 5-year review in 2014, no new information on the species genetics is available.

d. Taxonomic classification or changes in nomenclature:

No changes have occurred.

e. Distribution and trends in spatial distribution:

Populations of Cherokee darter appear stable throughout most of its range, even in watersheds with considerable stressors (Freeman and Hagler 2012), with the exception of those tributaries lost to reservoirs. The amount of impervious surface has increased in the basin since the Freeman and Hagler publication in 2012 and populations of Cherokee darters in the areas of those increases have likely declined to some extent since the last review, but confirmation of and the extent of those declines are unknown at this time.

f. Habitat or ecosystem conditions:

No changes have occurred in general habitat suitability or condition since the previous 5-year review

2. Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms):

The purpose of a 5-Year Review is to recommend whether a listed taxon continues to warrant protection under the ESA and, if so, whether it should be reclassified (from threatened to endangered or from endangered to threatened). This task requires that the analysis of the threats to the species be performed while assuming that the species is not receiving the regulatory protections, funding, recognition, and other benefits of ESA listing. Summaries of

ongoing applications of ESA protections may shed light on some future activities that constitute threats to the species. However, the analysis under Factor D (Inadequacy of Existing Regulatory Mechanisms) focuses on the adequacy of existing alternative (i.e., non-ESA) mechanisms to address the continuing and foreseeable threats.

All of the threats described in the last 5-year review are still considered current threats to the species. A detailed discussion of those threats can be found in the last review (USFWS 2014). Updates about some of those threats are described below.

a. Present or threatened destruction, modification of its habitat or range:

The Cherokee darter listing document identifies the primary causes of habitat destruction, modification, or curtailment as:

- Impoundments that result in habitat loss, population extirpation, fragmentation, and changes in the thermal regime below dams that favors predatory fishes.
- Siltation associated with timber clearcutting, clearing of riparian vegetation, and construction, mining, and agricultural practices that allow dirt to enter streams.
- Increased development and land clearing that increases siltation from erosion, accelerates runoff, allows transport of pollutants into the Etowah River system, and requires additional road and landfill infrastructure.
- Bridges, railroad crossings, and other stream crossings that are potential sites for spills of toxic material due to vehicle accidents, deliberate dumping, and other means.
- Pollution from other point and nonpoint sources such as municipal and industrial waste discharges, agricultural runoff, poultry processing plants, and silvicultural activities.

In the 27 years since the Cherokee darter was listed, some of these threats have been mitigated while key stressors associated with stream channel modifications and land use change persist and are expected to persist or increase as population and development increases into the future. Surface waters in the Etowah River basin continue to be affected by sedimentation, fish passage barriers, impoundments, increased stormwater runoff (due to increased effective impervious area), and other human activities that are sources of both acute and chronic stress on the Cherokee darter.

Construction of the Richland Creek Reservoir is completed and construction is beginning on the Russell Creek Reservoir. Combined, these two reservoirs impound more than 3 miles of Cherokee darter habitat and degradation of additional habitat is likely upstream and downstream of the reservoirs.

Changes in land use have continued to increase impervious surfaces with implications on Cherokee darter habitat. As the amount of impervious surface grows, stormwater runoff volumes and rates increase, transporting more nutrients and contaminants into streams and rivers that support Cherokee darters and other aquatic life. Walsh et al. (2005) summarized the “urban stream syndrome” where urban streams consistently demonstrated impaired water quality, more flashy and erosive flows, a shift from sensitive to tolerant invertebrates and fishes. Wenger et al. (2010) used modeling approaches to show the how Cherokee darter population size decreased with increasing impervious surface. With increasing population growth in the region, impervious area has been increasing since the last review and is expected to increase into the future.

b. Overutilization for commercial, recreational, scientific, or educational purposes:

At the time of listing, there was concern that general public knowledge of the species distribution may lead to more collection. However, published maps only show the species distribution in general terms without coordinates of survey sites. Despite the issuance of multiple Endangered Species Act Section 10 permits that authorize presence-absence surveys, ecosystem studies, genetic studies, and other projects, we have seen no evidence that this is a significant threat. Although not known to be a large-scale threat, micro fishing (fishing that targets small minnows/shiners (family Cyprinidae) and darters (family Percidae)) has been increasing since 2012. There are several active groups, which have captured listed minnows and have targeted darters in the Etowah basin.

c. Disease or predation:

There is no information suggesting disease or predation are a threat to Cherokee darters.

d. Inadequacy of existing regulatory mechanisms:

Habitat for Cherokee darters is protected, to varying degrees, under the State of Georgia's Endangered Wildlife Act of 1973 (O.C.G.A. 27-3-130 *et seq.*), Clean Water Act (33 U.S.C. §1251 *et seq.*), Georgia Erosion and Sedimentation Act (O.C.G.A. 12-7-1 *et seq.*), and other local ordinances that implement BMPs such as stormwater management or wider riparian buffers.

- 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.
- Clean Water Act (33 U.S.C. §1251 *et seq.*). Total maximum daily loads have been developed for the Etowah basin that work to address issues of water pollution (e.g., fecal coliform). Although some protection is contingent on ESA listing, 404 permits provide opportunities to consult under Section 7, provide opportunities to coordinate under the Fish and Wildlife Coordination Act, and include requirements for aquatic organism passage and minimization.
- 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 one acre. It requires minimal stream buffer protection (25-ft buffer between a permitted land-disturbing activity and a non-trout streams) and a buffer variance may be obtained. Water quality violations do happen and can result in impacts to Cherokee darters and their habitat.
- Local Ordinances throughout the Etowah Watershed regulate some other threats such as stormwater runoff and often impose more protective limits on things like buffer width. These ordinances vary throughout the entirety of the Cherokee darter range, and overall, have become more protective since the previous 5-year review.

e. **Other natural or manmade factors affecting its continued existence:**

Climate change is expected to bring more extreme weather events, such as flooding and drought. Drought flows impact the availability and connectivity of shallow water habitat and high flows may damage eggs, wash larvae from nursery areas, prevent juveniles from migrating upstream to suitable habitat, and increase turbidity and sedimentation that degrades habitat.

As mentioned in the 2014 status review, toxic chemical spills continue to be a threat to this species as seen with the Flat Creek fish kill mentioned earlier in this document. This species' patchy distribution that limits recolonization of extirpated suitable habitat, particularly as urban development increases the number of culverts, dams, and other structures that block upstream fish passage.

D. Synthesis:

Since the previous review in 2014, construction of the Richland Creek Reservoir has been started and is almost completed. In 2017, the Russell Creek Reservoir was permitted and construction is supposed to begin in 2021. The combination of these two projects result in the loss of more than 3 miles of Cherokee darter habitat. Additionally, 3.7 miles of Cherokee darter habitat was impacted by contaminants, resulting in the loss of more than 2000 Cherokee darters and an extirpation of part of the Flat Creek population that will likely require human intervention to reestablish.

Research indicates that Cherokee darter population size declines when impervious surface increases in close proximity. Most of the Cherokee darter streams in the basin are vulnerable to increasing impervious surface. Cherokee darters tend to persist in many tributaries impacted by upstream development, but abundance of these populations declines with increasing upstream impervious surface. The Service and partners have implemented a number of conservation and habitat restoration measures in the Etowah basin that benefit aquatic resources, but these currently are insufficient to protect the Cherokee darter across its range.

Based on information regarding distribution, population status, and future threats we conclude that the Cherokee darter still meets the definition of threatened under the Endangered Species Act.

III. RESULTS

A. Recommended Classification: No Change is needed

IV. RECOMMENDATIONS FOR FUTURE ACTIONS

The following are future actions for Cherokee darter recovery:

- Work with local governments in the Etowah River basin to continue improving local ordinances that minimize impact of development on water quality and suitable habitat.
- Continue to establish mitigation options that benefit Cherokee darter including conservation banking.
- Fund annual long-term monitoring of Cherokee darter status surveys to determine if Criteria 1 is being met.

- Develop a baseline database on stream geomorphic characteristics in high quality Cherokee darter streams. Use these data to revise stream restoration methods commonly used in the basin to ensure development of habitat for benthic shoal-dwelling fishes is a primary restoration project component (where applicable).
- Develop and implement programs and materials to educate government officials and the public on the need and benefits of ecosystem management and to involve them in watershed stewardship for Cherokee darter and other aquatic species
- Continue to work with GA DNR, TNC and other partners to protect high quality lands throughout the Etowah Watershed, but especially in the Raccoon Creek, Smithwick Creek and Shoal Creek (Dawson County) watersheds.
- Work with GEPD and EPA to incorporate listed species' review into NPDES point-source and construction permit review
- Continue to hold periodic Coosa Summits to bring together researchers, land managers, environmental groups, local government officials, and others to discuss recent Coosa research results, new threats, and needed management actions. Continue to meet in smaller committees, as needed, to discuss management actions to address stressors.

V. LITERATURE CITED

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U.S. FISH AND WILDLIFE SERVICE
Five-Year Review
Cherokee Darter (*Etheostoma scotti*)

Current Classification: Threatened

Recommendation resulting from the five-year review:

- Downlist to Threatened
- Uplist to Endangered
- Delist
- No changes are needed for Cherokee darter

Review Conducted By: Eric Prowell, Georgia Ecological Services Field Office

FIELD OFFICE APPROVAL:

Field Supervisor, Georgia Ecological Services Field Office, Fish and Wildlife Service

Approve _____

Date _____

Peter Maholland, Georgia Ecological Services

* Since 2014, Southeast Region Field Supervisors have been delegated authority to approve 5-year reviews that do not recommend a status change.