

**Cahaba Shiner**  
**(*Notropis cahabae*)**

**Status Review:**  
**Summary and Evaluation**



**U.S. Fish and Wildlife Service**  
**South Atlantic-Gulf Region**  
**Alabama Ecological Services Field Office**  
**Daphne, Alabama**

**September 2022**

# STATUS REVIEW

## Cahaba Shiner (*Notropis cahabae*)

### GENERAL INFORMATION

**Current Classification:** Endangered

**Lead Field Office:** Alabama, Ecological Services Field Office: Scott Lamont, 251-441-5857.

**Reviewers:**

**Lead Regional Office:** Atlanta Regional Office, Carrie Straight, (404) 679-7226.

**Date of original listing:** October 25, 1990 (55 FR 42961)

**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 (USFWS) evaluated the biology, habitat, and threats of the Cahaba shiner (*Notropis cahabae*) 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 in the Federal Register on June 23, 2021 (86 FR 32965) with a 60-day comment period. We received no public comments during the open period. We used a variety of information resources, including monitoring reports, surveys, and other scientific and management information. Specific sources included the final rule listing this species under the Act, peer reviewed scientific publications, unpublished field observations, and personal communication with recognized experts. This review was completed by the U.S. Fish and Wildlife Service, Alabama Ecological Services Field Office (AFO), Daphne, Alabama. All literature and documents used for this review are on file at the AFO. All recommendations resulting from this review are the result of thoroughly reviewing the best available information on the Cahaba shiner.

**Peer Review:** We have not received significant new information, nor have we interpreted previously reviewed information in a new, significant light since the last review and the level of public interest is low and non-controversial; therefore, no peer review was conducted.

**FR Notice citation announcing the species is under active review:**  
June 23, 2021 (86 FR 32965)

**Species' Recovery Priority Number at start of 5-year review ([48 FR 43098](#)):** 8 *Notropis cahabae* is a species with a moderate degree of threat and a high recovery potential.

## **Review History:**

Recovery Plan Amendment: September 27, 2019

Five-year Review: June 29, 2016 – No change in status was recommended

Recovery Plan: April 23, 1992

## **REVIEW ANALYSIS**

### **Listed Entity**

#### **Taxonomy and nomenclature**

We are not aware of any changes to the taxonomy of this entity, and the Cahaba shiner is still considered valid by the USFWS.

#### **Distinct Population Segment (DPS):**

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 USFWS's 1996 DPS Policy.

### **Recovery Criteria**

#### **Recovery Plan**

Cahaba shiner (*Notropis cahabae*) Recovery Plan, April 23, 1992.

Amended Recovery Plan for the Cahaba shiner (*Notropis cahabae*), September 27, 2019.

Recovery plans are not regulatory documents and are intended to provide guidance to the USFWS, 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 protections under the Act. However, when recommending whether a listed species should be delisted, the USFWS must apply the factors in section 4(a) of the Act ([84 FR 45020](#)). The Amended Recovery Plan establishes that the Cahaba shiner could be considered for downlisting when the following criteria are met:

Criterion 1. Cahaba shiner populations in the Cahaba River and Locust Fork River systems exhibit stable or increasing trends over 10-year period, evidenced by natural recruitment, and multiple age classes (Factors A, D, E).

Criterion 2. The Cahaba River and Locust Fork drainages are protected from water quality degradation and other foreseeable threats. Protected is defined as having enough control over the geographic area in question that adverse impacts to the water quality,

water quantity, geomorphic design of the water course, and substrate are unlikely to occur (Factors A, D).

In addition to meeting downlisting criteria 1-2, Cahaba shiner will be considered for delisting when:

Criterion 3. Three additional populations in separate drainages, are discovered or established, and are shown to have a stable or increasing trend over a 10-year period, evidenced by natural recruitment, and multiple age classes (Factors A, D, E).

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

### **Biology and Habitat Summary**

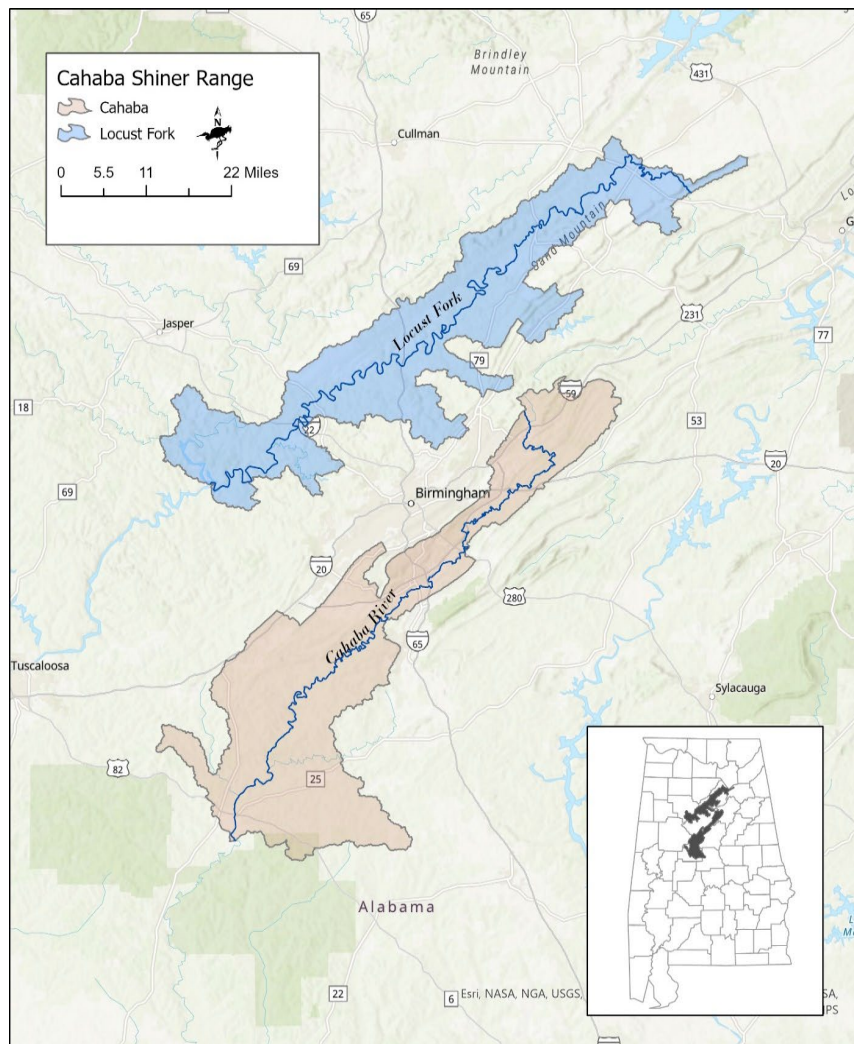


Figure 1. Current range of the Cahaba shiner. Found in the Cahaba River and Locust Fork watersheds.

A detailed review of the species' biology and habitat information can be found in the previous 5-year status review of this species (USFWS 2016).

The Cahaba shiner can be found in the Cahaba River and Locust Fork watersheds near the City of Birmingham, Alabama. The species' range at the time of listing in 1990 included 96 km (60 mi) of the Cahaba River watershed. In 1999, the species' range was more than doubled with the discovery of the Locust Fork population which added 118 km (73 mi) of the Locust Fork of the Black Warrior River and 8 km (5 mi) in Blackburn Fork, a tributary to the Locust Fork (Kuhajda and Shepard 2004). Since the latest 5-year status review in 2016, collection efforts have resulted in the capture of the Cahaba shiner in several known and one new location(s) within both the Cahaba River (Alabama River drainage) and Locust Fork (Black Warrior/Tombigbee River drainage). In 2019 a new record for the Cahaba shiner was discovered in lower Turkey Creek, approximately 0.25 miles upstream of its confluence with the Locust Fork (USFWS, Kuhajda 2019). In 2022, additional surveying by the USFWS discovered numerous specimens in both the Locust Fork and Cahaba River, with larger numbers found in the Locust Fork. The number of Cahaba shiner observed during collection efforts from 2016-2022 are below in Table 1. Based on survey results, the Cahaba shiner population appears to be stable in the Locust Fork, however low collection numbers within the Cahaba River suggests the species continues to be very rare in this watershed (Fix, Kuhajda 2019).

Table 1. River and locations and number of observed Cahaba shiner (with source information) in surveys conducted in 2016, from 2016 and 2019, and in 2022.

<b><u>River/Location</u></b>	<b><u>2016 (# observed/collector)</u></b>	<b><u>2016-2019 (# observed/collector)</u></b>	<b><u>2022 (# observed/collector)</u></b>
Cahaba River downstream of Marvel Slab	<u>19</u> <sup>1</sup>	<u>0</u>	<u>0</u>
Cahaba River downstream of Riverbend Rd	<u>0</u>	<u>3, 3, 7</u> <sup>2</sup>	<u>0</u>
Cahaba River at Cahaba NWR	<u>0</u>	<u>0</u>	<u>1</u> <sup>3</sup>
Locust Fork upstream Crooked Creek	<u>0</u>	<u>26</u> <sup>2</sup>	<u>0</u>
Locust Fork below Crooked Creek	<u>0</u>	<u>14</u> <sup>2</sup>	<u>0</u>
Locust Fork at Warrior Kimberly Rd	<u>0</u>	<u>3</u> <sup>2</sup>	<u>0</u>

Locust Fork downstream of Warrior Kimberly Rd	<u>0</u>	<u>4</u> <sup>2</sup>	<u>0</u>
*Turkey Creek above Locust Fork confluence	<u>0</u>	<u>1</u> <sup>2</sup>	<u>0</u>
Locust Fork Fork below Turkey Creek	<u>0</u>	<u>1</u> <sup>2</sup>	<u>0</u>
Locust Fork at Warrior Trafford Rd	<u>0</u>	<u>8</u> <sup>2</sup>	<u>0</u>
Locust Fork at Center Springs/Armstrong	<u>0</u>	<u>2</u> <sup>2</sup>	<u>0</u>
Locust Fork at covered bridge	<u>0</u>	<u>6</u> <sup>2</sup>	<u>0</u>
Locust Fork at Warrior-Kimberly Rd	<u>0</u>	<u>0</u>	<u>8</u> <sup>3</sup>
Turkey Creek at Sardis Rd	<u>0</u>	<u>0</u>	<u>1</u> <sup>3</sup>

1 Geological Survey of Alabama; 2 USFWS/Kuhajda; 3 USFWS

\* new location

### **Threats (Five-Factor Analysis) Summary**

A detailed review of the species' threats can be found in the 2016 Cahaba shiner 5-year status review (USFWS 2016). The status of a species is determined from an assessment of factors specified in section 4 (a)(1) of the Act, including:

*Factor A: the present or threatened destruction, modification, or curtailment of its habitat or range.*

*Factor B: overutilization for commercial, recreational, scientific, or educational purposes.*

*Factor C: disease or predation.*

*Factor D: the inadequacy of existing regulatory mechanisms.*

*Factor E: other natural or manmade factors affecting its continued existence.*

The present or threatened destruction, modification, or curtailment of the habitat (Factor A) continues to be the primary threat to the Cahaba shiner as described in the 2016 5-year status review (USFWS 2016). Both the Cahaba River and Locust Fork watersheds experience occasional impairments by siltation from urbanization and eutrophication from municipal wastewater sources and nonpoint sources (O'Neil 2002, USEPA 2003). Episodes of poor water

quality and low water quantity with a high potential of non-point source pollution due to urbanization also occur sporadically and likely impact the species (ADEM 2006, 2013).

**Factor A:**

Water quality within the Locust Fork and Cahaba River are threatened by urban and industrial growth. Due to continued and increasing urban development around the Birmingham metropolitan area, water quality threats from sedimentation, urban runoff, effluents related to stormwater runoff, historical and present mining operations, and toxic spills continue to pose threats to this species. During periods of low water levels, phytoplankton growth increases as-a-result-of municipal and industrial wastewater discharges (Putt 2003). During periods of high stream flow, agricultural runoff and channel erosion impact water quality (Putt 2003). The species is vulnerable to yearly precipitation amounts as well as from extirpation from catastrophic events which have been noted throughout the watersheds over the last 100 years (Hudgins et al. 1984; Shepard et al. 2018). Additionally, climate change poses a threat to this species.

**Factor B:**

The species is not commercially utilized. At the time of listing, overutilization was not deemed to be a threat to this fish. Individuals have been taken for scientific and private collections in the past but collecting is not considered a factor in the decline of this species and is not expected to be so in the future.

**Factor C:**

Disease is not considered to be a factor in the decline of the Cahaba shiner. Although the species is undoubtedly consumed by predators, the available information suggests that this predation is naturally occurring, or a normal aspect of the population dynamics of this fish. As a result, we do not believe that predation is considered to pose a threat to the Cahaba shiner.

**Factor D:**

In the State of Alabama, the species is protected by the Code of Alabama §§ 220-2-.92, which makes it unlawful to take, capture, kill, possess, or sell this animal without a permit. The species is afforded some protection from water quality and habitat degradation under the Clean Water Act of 1972 (33 U.S.C. 1251 et seq.), the Alabama Water Pollution Control Act, as amended, 1975 (Code of Alabama, §§ 22-22-1 to 22-22-14, and the Surface Mining Control and Reclamation Act of 1977 (Public Law 95- 87). The Alabama Department of Environmental Management (ADEM) and the Alabama Office of Water Resources (AOWR) are the two state agencies responsible for protecting water resources in the state, however, even with regulatory authority, protecting water resources in Alabama has been difficult over time (Putt 2003).

**Factor E:**

The Cahaba shiner occurs in two distinct and non-connecting watersheds. The existing

populations are localized to certain reaches of watersheds where there is appropriate habitat. This population isolation leaves them vulnerable to localized extinctions from intentional or accidental toxic chemical spills, habitat modification, progressive degradation from runoff (non-point source pollutants), natural catastrophic changes to their habitat (e.g., flood scour, drought), other stochastic disturbances, and to decreased fitness from reduced genetic diversity (Harris 1984; Noss and Cooperrider 1994). Potential sources of spills include accidents involving vehicles transporting chemicals over road crossings of inhabited by the Cahaba shiner, or the accidental or intentional release into river or tributaries of chemicals used in agricultural or residential applications. The long-term viability of the Cahaba shiner is based on conservation of numerous local populations throughout its geographic range (Harris 1984). These features are essential for the species to recover and adapt to environmental change (Harris 1984; Noss and Cooperrider 1994).

### **Synthesis**

Many of the threats present at the time of listing remain present but to a lesser degree in some river reaches. We have made progress on recovery implementation with improvements to the species' status and range including the discovery of an additional population within the Locust Fork watershed; site specific relative abundance increase; some improvements of connectivity and fish passage and momentary improvement in general water quality by Total Maximum Daily Loads (TMDL) designations in the Cahaba River system.

Even though we have gained a better understanding of the distribution of the species and have found that its range is larger than previously believed, the species' range is still presumably influenced by a large urban zone of intensive development within the greater Birmingham metropolitan area and is not secure from threats.

Enforcement of water quality regulations is inadequate. Particularly poignant is data suggesting that the overall health of the aquatic community structure, including the reaches occupied by the Cahaba shiner is fair to poor based on basic biological parameters (USFWS 2016). Sedimentation in stormwater runoff from urbanized areas, eutrophication from nutrient loading by municipal wastewater and non-point sources, as well as increased coal strip mining continue to contribute to general degradation of water quality.

In summary, though there have been some improvements in the species' numbers and habitat at selected sites, due to the lack of long-term monitoring, we are unable to determine the viability of the Cahaba shiner. In addition, we are unable to document that water quality degradation no longer poses a threat to this species. Therefore, the Cahaba shiner continues to meet the definition of endangered species under the Act.

### **RECOMMENDED FUTURE ACTIVITIES**

A detailed discussion of recovery actions and criteria are presented in the Recovery Plan (USFWS 1992) and Cahaba shiner Recovery Plan Amendment (USFWS 2019).

## Recovery Activities

1. Initiate long-term monitoring and population viability analysis of the species at sites within the Cahaba River and Locust Fork River basins.
2. Continue to survey suitable habitat within the Cahaba River and Locust Fork River basins for Cahaba shiners.
3. Define the minimum viable population size for this shiner to include population metrics, age classes, collection numbers, and mortality and natality.
4. Statistical confidence intervals need to be established to propose viable benchmarks of the species populations to indicate species health along with the inclusion of factors identified for persistence in populations to include stochastic and deterministic factors.
5. Explore the use of new technology in surveying, specifically environmental DNA (eDNA) survey methods.
6. Work to obtain protection for riverine and tributary buffering on privately owned lands specifically, by forming relationships with landowners and working with conservation groups, state, county, and municipal governments.
7. Establish best management and conservation practices to improve water quality and water quantity issues by reducing stormwater runoff, sediment, and eutrophication.
8. Formalize protection through cooperative agreements, conservation easement, fee title purchase or other means to guarantee safeguards to water quality, especially to address turbidity, water quantity, geomorphology, hydrology, and other aspects of the habitat.
9. Devise a husbandry and augmentation plan for existing Cahaba shiner populations in both systems and begin propagation, husbandry and maintaining captive colonies of the species.
10. Conduct research to compare water quality in the Locust Fork and Cahaba River to better understand differences and determine species abundance in the Cahaba River basin compared with the Locust Fork basin.
11. Revise and update recovery plan based on improved conditions in the Locust Fork.

## RESULTS / SIGNATURES

**U.S. Fish and Wildlife Service  
Status Review of Cahaba Shiner (*Notropis cahabae*)**

**Status Recommendation:**

On the basis of this review, we recommend the following status for this species. 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

Delist:

*The species is extinct*

*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*

No change needed

**FIELD OFFICE APPROVAL:**

**Field Supervisor, Alabama Ecological Services Field Office, Fish and Wildlife Service**

Approve \_\_\_\_\_

## REFERENCES

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- U.S. Environmental Protection Agency (EPA). 2003. *Cahaba River: Biological and water quality studies, Birmingham, AL, March/April, July and September*. Athens, Ga. 155 pp.
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Recovery Plan.

U.S. Fish and Wildlife Service (USFWS). 1992. Cahaba Shiner (*Notropis cahabae*) Recovery Plan. Atlanta, GA., 11 pp.

**Personal Communication**

Dr. Bernie Kuhajda, Tennessee Aquarium Conservation Institute. 2022. Email to Dr. Kuhajda regarding Cahaba shiner research since 2016.

Dr. Pat O'Neil. September, 2022. Email to Dr. O'Neil regarding Cahaba shiner research since 2016.