this rulemaking. All comments received will be posted without change to *https://www.regulations.gov,* including any personal information provided.

Docket: To access the docket and read background documents or comments received, go to: *https://www.regulations.gov.* Background documents and comments received may also be viewed at the U.S. Department of Transportation, 1200 New Jersey Ave. SE, Docket Operations, M–30, West Building Ground Floor, Room W12–140, Washington, DC 20590–0001, between 9 a.m. and 5 p.m. EST, Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: For program matters, contact Valerie Beck, Office of Transit Safety and Oversight, FTA, telephone (202) 366–9178 or email *FTAFitnessforDuty@dot.gov.* For legal matters, contact Emily Jessup, Office of the Chief Counsel, telephone (202) 366–8907 or email *emily.jessup@dot.gov.* Office hours are from 7:30 a.m. to 4 p.m., Monday through Friday, except Federal holidays.

SUPPLEMENTARY INFORMATION: In a letter submitted to the docket dated November 29, 2023, the American Public Transportation Association (APTA) requested a 30-day extension of the comment period for the advance notice of proposed rulemaking (ANPRM) published in the **Federal Register** on October 30, 2023 (88 FR 74107).

As justification for this extension, APTA believed that it could synthesize consensus comments from the industry by the December 29, 2023, deadline, but it will be nearly impossible due to two Federal holidays between the time the NPRM was published and comments are due, and the fact that that many offices, including APTA's, will be closed between Christmas and New Year's Day. APTA also notes that it held a webinar for safety coordinators to collect comments and plans to hold another one in later December to synthesize comments. APTA also stated that intends to hold a meeting for transit CEOs to collect their thoughts on an initial draft response in late December or early January. APTA believes an extension of time would ensure that APTA and its members have the necessary time to survey, draft, and vet consensus comments and to produce a more complete response to the NPRM.

Given the importance of public transportation safety and the desire for a robust dialogue on the issues surrounding transit worker fatigue, and the likelihood that other commenters may have similar concerns, FTA believes an extension of time is justified and is extending the comment period until January 29, 2024.

FTA is not republishing the questions in this document. Instead, please refer to the ANPRM (88 FR 74107). To ensure that comments are filed correctly, please follow the instructions in the **ADDRESSES** section above and include the docket number provided [FTA–2023–0018] in your comments.

Veronica Vanterpool,

Deputy Administrator.

[FR Doc. 2023–28154 Filed 12–20–23; 8:45 am]

BILLING CODE 4910–57–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R4–ES–2023–0220; FF09E21000 FXES1111090FEDR 245]

RIN 1018–BG92

Endangered and Threatened Wildlife and Plants; Threatened Species Status for Coal Darter With Section 4(d) Rule

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to list the coal darter (*Percina brevicauda*), a small, benthic freshwater fish native to the Mobile River Basin in Alabama, as a threatened species under the Endangered Species Act of 1973, as amended (Act). This determination also serves as our 12-month finding on a petition to list the coal darter. After a review of the best available scientific and commercial information, we find that listing the species is warranted. Accordingly, we propose to list the coal darter as a threatened species with a rule issued under section 4(d) of the Act (''4(d) rule'') to provide for the conservation of the species. If we finalize this rule as proposed, it would add this species to the List of Endangered and Threatened Wildlife and extend the Act's protections to the species.

DATES: We will accept comments received or postmarked on or before February 20, 2024. Comments submitted electronically using the Federal eRulemaking Portal (see **ADDRESSES**, below) must be received by 11:59 p.m. eastern time on the closing date. We must receive requests for a public hearing, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by February 5, 2024.

ADDRESSES:

Written comments: You may submit comments by one of the following methods:

(1) *Electronically:* Go to the Federal eRulemaking Portal: *https://www.regulations.gov.* In the Search box, enter FWS–R4–ES–2023–0220, which is the docket number for this rulemaking. Then, click on the Search button. On the resulting page, in the panel on the left side of the screen, under the Document Type heading, check the Proposed Rule box to locate this document. You may submit a comment by clicking on ''Comment.''

(2) *By hard copy:* Submit by U.S. mail to: Public Comments Processing, Attn: FWS–R4–ES–2023–0220, U.S. Fish and Wildlife Service, MS: PRB/3W, 5275 Leesburg Pike, Falls Church, VA 22041–3803.

We request that you send comments only by the methods described above. We will post all comments on *https://www.regulations.gov.* This generally means that we will post any personal information you provide us (see Information Requested, below, for more information).

Availability of supporting materials: Supporting materials, such as the species status assessment report, are available on the Service's website at *https://www.fws.gov/office/alabama-ecological-services,* at *https://ecos.fws.gov/ecp/species/9959,* and at *https://www.regulations.gov* under Docket No. FWS–R4–ES–2023–0220.

FOR FURTHER INFORMATION CONTACT: William Pearson, Field Supervisor, U.S. Fish and Wildlife Service, Alabama Ecological Services Field Office, 1208 Main Street, Daphne, AL 36526; telephone 251–441–5181. Individuals in the United States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States. Please see Docket No. FWS–R4–ES–2023–0220 on *https://www.regulations.gov* for a document that summarizes this proposed rule.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Act (16 U.S.C. 1531 *et seq.*), a species warrants listing if it meets the definition of an endangered species (in danger of extinction throughout all or a significant portion of its range) or a

threatened species (likely to become endangered within the foreseeable future throughout all or a significant portion of its range). If we determine that a species warrants listing, we must list the species promptly and designate the species' critical habitat to the maximum extent prudent and determinable. We have determined that the coal darter meets the Act's definition of a threatened species; therefore, we are proposing to list it as such. Listing a species as a threatened species can be completed only by issuing a rule through the Administrative Procedure Act rulemaking process (5 U.S.C. 551 *et seq.*).

What this document does. We propose to list the coal darter as a threatened species with a rule issued under section 4(d) of the Act.

The basis for our action. Under the Act, we may determine that a species is an endangered or threatened species because of any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We have determined that the coal darter meets the definition of a threatened species due to habitat loss or degradation from the following activities or conditions: hydrologic alteration by impoundments, including dams and other barriers; agriculture (poultry farming); urban development or change in land cover, including increased density of residential and commercial infrastructure; resource extraction, including mining and silviculture operations that do not follow State-approved best management practices (BMPs); diminished water quality from point and nonpoint source chemical contamination and sedimentation (Factor A); and climate change (Factor E).

Information Requested

We intend that any final action resulting from this proposed rule will be based on the best scientific and commercial data available and be as accurate and as effective as possible. Therefore, we request comments or information from other governmental agencies, Native American Tribes, the scientific community, industry, or any other interested parties concerning this proposed rule. We particularly seek comments concerning:

(1) The species' biology, range, and population trends, including:

(a) Biological or ecological requirements of the species, including habitat requirements for feeding, breeding, and sheltering;

(b) Genetics and taxonomy;

(c) Historical and current range, including distribution patterns and the locations of any additional populations of this species;

(d) Historical and current population levels, and current and projected trends; and

(e) Past and ongoing conservation measures for the species, its habitat, or both.

(2) Threats and conservation actions affecting the species, including:

(a) Factors that may be affecting the continued existence of the species, which may include habitat modification or destruction, overutilization, disease, predation, the inadequacy of existing regulatory mechanisms, or other natural or manmade factors;

(b) Biological, commercial trade, or other relevant data concerning any threats (or lack thereof) to this species; and

(c) Existing regulations or conservation actions that may be addressing threats to this species.

(3) Additional information concerning the historical and current status of this species.

(4) Information on regulations that may be necessary and advisable to provide for the conservation of the coal darter and that we can consider in developing a 4(d) rule for the species. In particular, we seek information concerning the extent to which we should include any of the Act's section 9 prohibitions in the 4(d) rule or whether we should consider any additional exceptions from the prohibitions in the 4(d) rule.

Please include sufficient information with your submission (such as scientific journal articles or other publications) to allow us to verify any scientific or commercial information you include.

Please note that submissions merely stating support for, or opposition to, the action under consideration without providing supporting information, although noted, do not provide substantial information necessary to support a determination. Section 4(b)(1)(A) of the Act directs that determinations as to whether any species is an endangered or a threatened species must be made solely on the basis of the best scientific and commercial data available.

You may submit your comments and materials concerning this proposed rule by one of the methods listed in **ADDRESSES**. We request that you send comments only by the methods described in **ADDRESSES**.

If you submit information via *https://www.regulations.gov,* your entire submission—including any personal identifying information—will be posted on the website. If your submission is made via a hardcopy that includes personal identifying information, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy submissions on *https://www.regulations.gov*.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on *https://www.regulations.gov*.

Our final determination may differ from this proposal because we will consider all comments we receive during the comment period as well as any information that may become available after this proposal. Based on the new information we receive (and, if relevant, any comments on that new information), we may conclude that the species is endangered instead of threatened, or we may conclude that the species does not warrant listing as either an endangered species or a threatened species. In addition, we may change the parameters of the prohibitions or the exceptions to those prohibitions in the 4(d) rule if we conclude it is appropriate in light of comments and new information received. For example, we may expand the prohibitions to include prohibiting additional activities if we conclude that those additional activities are not compatible with conservation of the species. Conversely, we may establish additional exceptions to the prohibitions in the final rule if we conclude that the activities would facilitate or are compatible with the conservation and recovery of the species. In our final rule, we will clearly explain our rationale and the basis for our final decision, including why we made changes, if any, that differ from this proposal.

Public Hearing

Section 4(b)(5) of the Act provides for a public hearing on this proposal, if requested. Requests must be received by the date specified in **DATES**. Such requests must be sent to the address shown in **FOR FURTHER INFORMATION CONTACT**. We will schedule a public hearing on this proposal, if requested, and announce the date, time, and place of the hearing, as well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers

at least 15 days before the hearing. We may hold the public hearing in person or virtually via webinar. We will announce any public hearing on our website, in addition to the **Federal Register**. The use of virtual public hearings is consistent with our regulations at 50 CFR 424.16(c)(3).

Previous Federal Actions

On April 20, 2010, we received a petition from the Center for Biological Diversity (CBD), Alabama Rivers Alliance, Clinch Coalition, Dogwood Alliance, Gulf Restoration Network, Tennessee Forests Council, and West Virginia Highlands Conservancy to list 404 aquatic, riparian, and wetland species, including the coal darter, as endangered or threatened species under the Act. In response to the petition, we published a partial 90-day finding on September 27, 2011 (76 FR 59836), in which we announced our finding that the petition contained substantial information indicating that listing may be warranted for numerous species, including the coal darter.

Peer Review

A species status assessment (SSA) team prepared an SSA report for the coal darter. The SSA team was composed of Service biologists, in consultation with other species experts. The SSA report represents a compilation of the best scientific and commercial data available concerning the status of the species, including the impacts of past, present, and future factors (both negative and beneficial) affecting the species.

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review in listing actions under the Act, we solicited independent scientific review of the information contained in the coal darter SSA report. We sent the SSA report to five independent peer reviewers and received one response. Results of this structured peer review process can be found at *https://www.regulations.gov*. In preparing this proposed rule, we incorporated the results of these reviews, as appropriate, into the SSA report, which is the foundation for this proposed rule.

Summary of Peer Reviewer Comments

As discussed in Peer Review, above, we received comments from one peer reviewer on the draft SSA report. We reviewed the comment for substantive issues and new information regarding the information contained in the SSA report. The peer reviewer generally provided constructive suggestions and was broadly supportive. No substantive changes to our analysis and conclusions within the SSA report were deemed necessary, and peer reviewer comments are addressed in version 1.1 of the SSA report.

I. Proposed Listing Determination

Background

A thorough review of the taxonomy, life history, and ecology of the coal darter is presented in the SSA report (version 1.1; Service 2023, pp. 11–15).

The coal darter (*Percina brevicauda*) is a small, benthic freshwater fish native to the Mobile River Basin in Alabama. The species occurs in small to medium-sized rivers and the larger tributaries of those rivers with moderate to swift flowing water. It has been observed in riffle and run habitat, as well as in glide and pool habitat with stable sand, gravel, cobble, and bedrock substrates with low levels of siltation. The coal darter is a member of the genus *Percina* in the family *Percidae* (perches), and was originally described as the channel darter, first as *Etheostoma copelandi* (Gilbert 1891) and subsequently, as *Percina copelandi* (Moore 1957) when the channel darter was reclassified into the genus *Percina*. In 1994, the coal darter was described as a unique species, named *Percina brevicauda,* and placed with two other species recognized within the subgenus *Cottogaster* (the channel darter (*Percina copelandi*) and the pearl darter (*Percina aurora*)) (Suttkus and Bart 1994). Genetic analyses provided strong support of *Cottogaster* being a monophyletic clade, with these three species being sister clades.

The coal darter is a small, elongated, slightly compressed freshwater fish reaching up to 50 millimeters (mm) (1.96 inches (in)) in total length with smaller fins compared to other *Cottogaster* members. It has dark lateral blotches and a continuous lateral stripe pattern on the body. Nuptial males are heavily pigmented, including on the ventral surface of the head and body, giving them a dusky appearance, which is the reason for the common name, coal darter. They are diurnal feeders and consume aquatic invertebrates (insects, crustaceans, worms). Little is known about the specific life-history characteristics of the coal darter. Most of the life-history knowledge for the species is inferred from information known for the channel darter and pearl darter.

The coal darter is endemic to the eastern and central part of the Mobile River Basin in the State of Alabama. The species primarily occupies habitat above the Fall Line within the Piedmont, Ridge and Valley, and Southwestern Appalachians level III ecoregions. Additionally, there are several historical records below the Fall Line in the Cahaba River and Black Warrior River that are in the Southeastern Plains ecoregion.

Presently, the species has a disjunct distribution, with populations in the Cahaba River, the Locust Fork of the Black Warrior River, and two tributaries in the lower Coosa River (Weogufka Creek and Hatchet Creek). Within the Locust Fork watershed, occurrences are mostly in the Locust Fork mainstem, but there are also occurrences in Turkey Creek, the Little Warrior River, and Blackburn Fork. In the Cahaba River system, the coal darter is predominantly found in the mainstem of the Cahaba River with occurrences in Shades Creek and the Little Cahaba River.

Regulatory and Analytical Framework

Regulatory Framework

Section 4 of the Act (16 U.S.C. 1533) and the implementing regulations in title 50 of the Code of Federal Regulations set forth the procedures for determining whether a species is an endangered species or a threatened species, issuing protective regulations for threatened species, and designating critical habitat for endangered and threatened species. In 2019, jointly with the National Marine Fisheries Service, the Service issued a final rule that revised the regulations in 50 CFR part 424 regarding how we add, remove, and reclassify endangered and threatened species and the criteria for designating listed species' critical habitat (84 FR 45020; August 27, 2019). On the same day, the Service also issued final regulations that, for species listed as threatened species after September 26, 2019, eliminated the Service's general protective regulations automatically applying to threatened species the prohibitions that section 9 of the Act applies to endangered species (84 FR 44753; August 27, 2019). Our analysis for this decision applied the regulations that are currently in effect, which include the 2019 revisions. However, we proposed further revisions to these regulations on June 22, 2023 (88 FR 40764). In case those revisions are finalized before we make a final status determination for this species, we have also undertaken an analysis of whether the decision would be different if we were to apply those proposed revisions. We concluded that the decision would have been the same if we had applied the proposed 2023 regulations. The

analyses under both the regulations currently in effect and the regulations after incorporating the June 22, 2023, proposed revisions are included in our decision file.

The Act defines an ''endangered species'' as a species that is in danger of extinction throughout all or a significant portion of its range, and a ''threatened species'' as a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether any species is an endangered species or a threatened species because of any of the following factors:

(A) The present or threatened destruction, modification, or curtailment of its habitat or range;

(B) Overutilization for commercial, recreational, scientific, or educational purposes;

(C) Disease or predation;

(D) The inadequacy of existing regulatory mechanisms; or

(E) Other natural or manmade factors affecting its continued existence.

These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species' continued existence. In evaluating these actions and conditions, we look for those that may have a negative effect on individuals of the species, as well as other actions or conditions that may ameliorate any negative effects or may have positive effects.

We use the term ''threat'' to refer in general to actions or conditions that are known to or are reasonably likely to negatively affect individuals of a species. The term ''threat'' includes actions or conditions that have a direct impact on individuals (direct impacts), as well as those that affect individuals through alteration of their habitat or required resources (stressors). The term ''threat'' may encompass—either together or separately—the source of the action or condition or the action or condition itself.

However, the mere identification of any threat(s) does not necessarily mean that the species meets the statutory definition of an ''endangered species'' or a ''threatened species.'' In determining whether a species meets either definition, we must evaluate all identified threats by considering the species' expected response and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level. We evaluate each threat and its expected effects on the species, then analyze the cumulative effect of all of the threats on the species as a whole. We also consider the cumulative effect of the threats in light of those actions and conditions that will have positive effects on the species, such as any existing regulatory mechanisms or conservation efforts. The Secretary determines whether the species meets the Act's definition of an ''endangered species'' or a ''threatened species'' only after conducting this cumulative analysis and describing the expected effect on the species now and in the foreseeable future.

The Act does not define the term ''foreseeable future,'' which appears in the statutory definition of ''threatened species.'' Our implementing regulations at 50 CFR 424.11(d) set forth a framework for evaluating the foreseeable future on a case-by-case basis. The term ''foreseeable future'' extends only so far into the future as we can reasonably determine that both the future threats and the species' responses to those threats are likely. In other words, the foreseeable future is the period of time in which we can make reliable predictions. ''Reliable'' does not mean ''certain''; it means sufficient to provide a reasonable degree of confidence in the prediction. Thus, a prediction is reliable if it is reasonable to depend on it when making decisions.

It is not always possible or necessary to define the foreseeable future as a particular number of years. Analysis of the foreseeable future uses the best scientific and commercial data available and should consider the timeframes applicable to the relevant threats and to the species' likely responses to those threats in view of its life-history characteristics. Data that are typically relevant to assessing the species' biological response include species-specific factors such as lifespan, reproductive rates or productivity, certain behaviors, and other demographic factors.

Analytical Framework

The SSA report documents the results of our comprehensive biological review of the best scientific and commercial data regarding the status of the species, including an assessment of the potential threats to the species. The SSA report does not represent our decision on whether the species should be proposed for listing as an endangered or threatened species under the Act. However, it does provide the scientific basis that informs our regulatory decisions, which involve the further application of standards within the Act and its implementing regulations and policies.

To assess the coal darter's viability, we used the three conservation biology principles of resiliency, redundancy, and representation (Shaffer and Stein 2000, pp. 306–310). Briefly, resiliency is the ability of the species to withstand environmental and demographic stochasticity (for example, wet or dry, warm or cold years); redundancy is the ability of the species to withstand catastrophic events (for example, droughts, large pollution events); and representation is the ability of the species to adapt to both near-term and long-term changes in its physical and biological environment (for example, climate conditions, pathogens). In general, species viability will increase with increases in resiliency, redundancy, and representation (Smith et al. 2018, p. 306). Using these principles, we identified the species' ecological requirements for survival and reproduction at the individual, population, and species levels, and described the beneficial and risk factors influencing the species' viability.

The SSA process can be categorized into three sequential stages. During the first stage, we evaluated the individual species' life-history needs. The next stage involved an assessment of the historical and current condition of the species' demographics and habitat characteristics, including an explanation of how the species arrived at its current condition. The final stage of the SSA involved making predictions about the species' responses to positive and negative environmental and anthropogenic influences. Throughout all of these stages, we used the best available information to characterize viability as the ability of a species to sustain populations in the wild over time. We use this information to inform our regulatory decision.

The following is a summary of the key results and conclusions from the SSA report; the full SSA report can be found at Docket No. FWS–R4–ES–2023–0220 on *https://www.regulations.gov* and at *https://ecos.fws.gov/ecp/species/9959*.

Summary of Biological Status and Threats

In this discussion, we review the biological condition of the species and its resources, and the threats that influence the species' current and future condition, in order to assess the species' overall viability and the risks to that viability.

Individual, Population, and Species Needs

A thorough review of the coal darter's resource needs is presented in chapter

3 of the SSA report (version 1.1; Service 2023, pp. 17–18).

For the coal darter to survive and reproduce, individuals need suitable habitat that supports essential life functions at all life stages (see table 1, below). Four elements appear to be essential to the survival and reproduction of individuals: sufficient water quality, flowing water, stable substrates, and habitat heterogeneity.

For coal darter populations to be resilient, the needs of individuals require sufficient water quality, flowing water, stable substrates, and habitat heterogeneity to be met on a larger scale (see table 1, below). Stream reaches with suitable habitat must be large enough to support a sufficient reservoir of potential mates for coal darters to breed with and maintain sufficient genetic health while avoiding issues associated with small population sizes, such as genetic drift and inbreeding depression.

Connectivity is also an important factor for populations because it facilitates genetic health for populations and enables movement of individuals to suitable habitats that can accommodate the life-history needs for the species (*i.e.,* spawning, refuge, feeding). Natural flow regimes are an important resource need for coal darter populations, as flows may help trigger spawning and are a habitat requirement for all life stages.

At the species level, the coal darter needs a sufficient number and distribution of healthy populations to withstand environmental stochasticity (resiliency) and catastrophes (redundancy), and to adapt to biological and physical changes in its environment (representation). For the species to be viable, there must be adequate redundancy (suitable number, distribution, and connectivity of populations to allow the species to withstand catastrophic events) and representation (genetic and environmental diversity to allow the species to adapt to changing environmental conditions). Redundancy improves with increasing numbers of resilient populations distributed across the species' range, and connectivity (either natural or human-facilitated) allows connected populations to ''rescue'' each other after catastrophes. Representation improves with the persistence of populations having greater genetic and ecological diversity across the species' range, resulting in an increased ability to adapt to changing environmental conditions. Long-term viability will require resilient populations; for the coal darter, this will mean maintaining quality stream habitat (for example, sufficient water quality, natural flow regime, stable substrate, and adequate habitat heterogeneity) to support multiple populations across the species' range (see table 1, below).

TABLE 1—SUMMARY OF COAL DARTER INDIVIDUAL RESOURCE NEEDS BY LIFE STAGE

Life stage	Resources needed
Eggs	• Suitable gravel/cobble substrate for egg deposition. • Low amounts of silt and fine sediment. • Suitable water quality and quantity.
Larvae	• Connectivity to suitable habitat for dispersal. • Sufficient water flow for dispersal.
Juveniles	• Sufficient gravel/cobble/boulder substrate. • Aquatic invertebrate food source. • Sufficient water flow. • Presence of habitat heterogeneity (riffles, runs, pools). • Suitable water quality and quantity.
Adults	• Sufficient gravel/cobble substrate. • Sufficient structural habitat (rock, aquatic vegetation). • Aquatic invertebrate food source. • Sufficient water flow. • Presence of habitat heterogeneity (riffles, runs, pools). • Sufficient water quality and quantity.

At the species level, the coal darter requires sufficient connectivity between populations to facilitate gene flow and ensure adaptive potential. Genetic diversity should be high enough that the species will be able to adapt to changing environmental factors through the process of natural selection. Additionally, the species needs to have sufficient connectivity between enough individuals to promote an effective population size that is high enough to maintain evolutionary potential and genetic adaptive capacity. To evaluate the current and future viability of the coal darter, we assessed a range of conditions to allow us to consider the species' resiliency, representation, and redundancy.

Threats

A thorough review of the threats affecting the coal darter is presented in chapter 4 of the SSA report (version 1.1, Service 2023, pp. 23–31).

The coal darter is influenced by stressors affecting water quality, water flow, stream connectivity, and genetic diversity. The main threat is habitat loss or degradation from the following activities or conditions: hydrologic alteration by impoundments, including dams and other barriers; agriculture (poultry farming); diminished water quality from point and nonpoint source chemical contamination and sedimentation; urban development or change in land cover, including increased density of residential and commercial infrastructure; resource extraction, including mining and silviculture operations that do not follow State-approved BMPs; and climate change (Service 2023, p. 23).

Impoundments

Impoundment of rivers is a primary threat to aquatic species in the Southeast (Service 2023, pp. 23–24). Dams modify habitat conditions and aquatic communities both upstream and downstream of an impoundment. Upstream of dams, habitat is flooded and in-channel conditions change from flowing to still water, with increased depth, decreased levels of dissolved oxygen, and increased sedimentation. Downstream of dams, flow regimes of the released tailwater vary with resulting fluctuations in water temperature and dissolved oxygen levels, the substrate is scoured, and downstream reaches are eroded. These negative tailwater effects on habitat can extend many kilometers downstream. Dams fragment habitat for the coal darter by blocking corridors for

migration and dispersal, resulting in population isolation and increased risk of extirpation and extinction. All known populations of the coal darter are separated from each other by large dams. The virtually complete loss of the Coosa population and approximately 50 percent loss of the Black Warrior population are attributed to the construction of dams, reservoir creation, and channelization that occurred in these systems in the late 1800s to mid-1900s (see table 2, below). Impoundments in the Black Warrior River system were created to transport goods between Mobile and Tuscaloosa, and ultimately Birmingham. Construction of these impoundments included removal and clearing of overhanging trees and vegetation, blasting of rock and shoal complexes, removal of submerged woody debris and logs, and modification or removal of sand and gravel bars (Mettee 2019, pp. 10–22). Impoundments in the Coosa River Systems for hydroelectric power production were constructed by Alabama Power between the 1920s and 1960s. These impoundments are still in place today and significantly reduced the amount of available habitat for coal darters in the Coosa and Black Warrior River systems (Table 2).

TABLE 2—COMPARISON OF HISTORICALLY OCCUPIED RIVER LENGTHS AND CURRENTLY OCCUPIED RIVER LENGTHS OF COAL DARTERS IN THREE MAJOR RIVER SYSTEMS

[Service 2023, p. 14]

River systems	Historically occupied	Currently occupy
Black Warrior	At least 130 river miles (rmi)/209.2 river kilometers (rkm).	65 rmi/104.7 rkm.
Cahaba	133 rmi/214 rkm	114.9 rmi/184.9 rkm.
Coosa	At least 92.2 rmi/148.4 rkm	9 rmi/14.5 rkm in Hatchet Creek, one site in Weogufka Creek.

The Cahaba River, at 190 rmi/305.8 rkm long, is often referred to as Alabama's longest free-flowing stream. However, two barriers have impacted the flow of the river. The first is a low-head dam, located at Highway 280 near Acton, Alabama, and built in 1891. It is 15 feet tall and backs up water for withdrawal by Birmingham. This low-head dam is significantly smaller than the dams on the Black Warrior River and Coosa River, and as such, the Highway 280 dam has not converted vast areas of habitat, meaning habitat for the coal darter is still present and the species is still able to occupy habitat both upstream and downstream of the dam. Although coal darters occur upstream and downstream of the Highway 280 dam, this dam represents a significant barrier to upstream movement of coal darters. Downstream dispersal could be possible when larvae enter the water column and are carried downstream during a process known as pelagic larval drift (PLD). Because individuals upstream of the dam are isolated from those downstream, the upstream subpopulation is at a higher risk of genetic drift and inbreeding depression. The second barrier, the Marvel Slab, was removed in 2004; it is discussed in more detail under *Conservation Efforts and Regulatory Mechanisms,* below.

Water Quality

In general, darters tend to be sensitive to poor water quality (Service 2023, pp. 24–26). According to the Fishery Index Biotic Integrity (IBI) reports and related fish community survey work, coal darters are consistently labeled as a ''disturbance-sensitive'' or an ''intolerant'' (of habitat impairments) species. Based on its narrow distribution and habitat conditions (including water quality parameters) where coal darters are found, the coal darter needs clean, relatively clear, flowing water to survive and carry out its basic life-history functions; thus, water quality degradation is considered a threat to the species. Below, we discuss the causes of water quality degradation in more detail.

Point and Nonpoint Source Pollution—Inputs of point source pollution (discharge from an identifiable source) and nonpoint source pollution (diffuse land surface runoff) across the coal darter's range are numerous and widespread. Point source pollution originates from inadequately treated effluent from industrial plants, sanitary landfills, sewage treatment plants, active surface mining, drain fields from individual private homes, and others.

Nonpoint source pollution may originate from agricultural activities, poultry and cattle feedlots, abandoned mine runoff, construction, silviculture operations that do not follow State-approved BMPs, failing septic tanks, and contaminated runoff from urban areas. These sources have the potential to contribute pollution, including sediments, heavy metals, fertilizers, pesticides (*e.g.,* herbicides, insecticides, fungicides, and rodenticides), animal wastes, septic tank and gray water leakage, and oils and greases, to streams. Water quality declines resulting from this pollution cause nitrification, decreases in dissolved oxygen (DO) concentration, increases in acidity and conductivity, and introduction of toxicants. These alterations likely have direct (decreased survival and/or reproduction) and indirect (loss, degradation, and fragmentation of habitat) effects on coal darters. For the coal darter, submerged vegetation provides spawning habitat for adults, refugia from predators, and habitat for prey of all life stages. Aquatic vegetation also provides substrate stability for the species. Degraded water quality and high algal biomass that result from pollutant inputs cause loss of these critical submerged plant species (*e.g.,* water willow (*Justicia americana*), river weed (*Podostemum ceratophyllum*)), which are vital habitat for the coal darter and its prey.

Sedimentation—Sedimentation has been linked to changes in fish assemblages and community structure (Shepard et al. 1994; Onorato et al. 2000, pp. 56–58). A wide range of current activities and land uses can lead to excessive sedimentation within streams, which has occurred throughout the coal darter's range, especially in Hatchet Creek. Sources potentially include agricultural practices, construction activities, stormwater runoff, unpaved roads, silvicultural activities, utility crossings, and mining. Fine sediments are not only introduced into streams during present day activities, but historical land-use practices may have substantially altered hydrological and geomorphological processes such that sediments continued to be input into streams for several decades after those activities ceased.

Increases in sedimentation from sources such as agriculture, silviculture operations that do not follow State-approved BMPs, mining, and

urbanization are of concern for the coal darter and can negatively affect the species by reducing growth rates, disease tolerance, and gill function; reducing spawning habitat, reproductive success, and egg (embryo), larva, and juvenile development; reducing food availability through reductions in prey; reducing foraging efficiency; and reducing shelter (Service 2023, pp. 25–26).

Agriculture

Agricultural practices such as traditional farming, feedlot operations, and associated land-use practices can contribute pollutants to rivers. These practices can also degrade habitat by encouraging the erosion of stream banks, which results in alterations to stream hydrology and geomorphology. Nutrients, bacteria, pesticides, and other organic compounds are generally found in higher concentrations in areas around agriculture than in forested areas. Contaminants associated with agriculture (fertilizers, pesticides, herbicides, and animal waste) can cause degradation of water quality and habitats through instream oxygen deficiencies, excess nutrification, and excessive algal growths, with a related alteration in fish community composition. In the Alabama Department of Environmental Management's (ADEM's) 2022 list of impaired waters, which was prepared in accordance with section 303(d) of the Clean Water Act (CWA; 33 U.S.C. 1251 *et seq.*) and submitted to the Environmental Protection Agency (EPA), Hatchet Creek was designated as impaired due the presence of pathogens from animal feeding operations and pasture grazing, and Weogufka Creek was designated as impaired due to the presence of pathogens from pasture grazing (ADEM 2022, p. 300).

Poultry farming, undertaken primarily in poultry houses, occurs within the range of the coal darter, especially in and around the Locust Fork watershed. Poultry houses have an estimated ability to produce approximately 100 tons of litter a year (assuming a 20,000-square-foot poultry house stocked at one bird per square foot and six flocks produced per year, which is a probable underestimate of litter production per broiler house). Poultry litter is a mixture of chicken manure, feathers, spilled food, and bedding material that is used to fertilize pastureland or row crops that frequently occur adjacent to rivers and streams.

Runoff from heavy rains carries excess nutrients from chicken manure into nearby streams as a result of surface-spreading of litter. Litter can also contain arsenic, which is formed from a chemical routinely used as a feed additive to prevent disease and stimulate growth, and it enters streams through runoff (Stolze et al. 2007, p. 821). Other substances often found in poultry litter include fecal coliform, S*almonella,* and other pathogens; pesticide residue; and other heavy metals (Bolan et al. 2010, pp. 676–683). In general, the inputs from poultry litter into rivers and streams reduce water quality for the coal darter, causing physiological stress. This is especially evident in Locust Fork in the species' range (ADEM 1999, pp. 57–78, 147, 218; Deutsch et al. 1990, entire).

Resource Extraction: Mining and Oil/Gas

Coal mining in Alabama began in the early 1800s. Currently, there are active and reclaimed mines operating throughout the Black Warrior and Cahaba watersheds, and one proposed graphite mine permitted for future operations in the Coosa watershed. Surface and subsurface coal mines have the potential to degrade water quality from erosion and sedimentation, and the presence of mines near rivers and streams elevates the risk of water contamination. These mining processes expose metallic minerals, which can then enter the surrounding waterways, increasing conductivity, increasing acidity, and contaminating the waterways with heavy metals, creating toxic conditions for aquatic fauna (Stiefel and Busch 1983, pp. 187–212; Neves et al. 1997, pp. 69–70).

In addition to surface and subsurface mining, oil and gasoline extraction and transportation is also present within the range of the coal darter. In 2016, there was a near disaster in the range of the coal darter when 252,000 gallons of gasoline spilled from the Colonial Pipeline into an old mining pond that feeds into a tributary of the Cahaba (EPA 2016, unpaginated). The spill was contained before reaching the Cahaba River; however, this incident illustrates that the risk of threat to the species from resource extraction does exist.

Resource Extraction: Silviculture

The forestry industry, in the form of monoculture pine plantations, is prevalent throughout the range of the coal darter. Forestry can have negative implications for water quality in the form of nonpoint source pollution, especially when BMPs are not implemented. Excessive sedimentation in Hatchet Creek has been documented since the mid-1990s. The excessive sedimentation and subsequent loss of clean gravel and pool habitat has been attributed to forestry activities, including removal of riparian vegetation (Alabama Department of Conservation and Natural Resources (ADCNR) 2006, p. 3). Sedimentation of streams and waterways has the potential to increase due to accelerated erosion from logging roads and timber harvest. We recognize that modern silvicultural operations are widely implemented in accordance with State-approved BMPs, and the adherence to these BMPs broadly protects water quality, particularly related to sedimentation. However, in many cases, sedimentation in streams is a continuing legacy effect from past eras of poor logging practices (Service 2023, p. 27).

Urbanization

Urbanization is a significant source of water quality degradation that can reduce the survival of aquatic organisms, including the coal darter. Urbanization refers to a change in land cover and land use from forests or agriculture to increased density of residential and commercial infrastructure. Urban development can stress aquatic systems in a variety of ways, including increasing the frequency and magnitude of high flows in streams, increasing sedimentation (construction activities) and nutrient loads (lawn fertilization), increasing contamination and toxicity (from household pesticides and herbicides), altering flows because of an increase in impervious surfaces (*i.e.,* flashier flows), and altering stream morphology, stability, and chemistry, which can result in a decreased diversity of fishes, aquatic insects, plants, and amphibians. Sources and risks of an acute or catastrophic contamination event, such as a leak from an underground storage tank, pipeline, or wastewater system, or a hazardous materials spill on a highway, also increase as urbanization increases.

Changes to both frequency and magnitude of stream flows have direct effects on important structural habitat for coal darters. Stream channelization and higher flows reduce overall stream cover and other natural substrates like boulders, cobble, and gravel, and they remove large woody structures and other terrestrial plant materials. As a result, urban streams have lower habitat heterogeneity, stable substrates, and amounts of plant material, which negatively impacts the coal darter's sheltering, breeding, and feeding.

Birmingham is the third largest city in the State of Alabama and was ranked as the largest city until the 2020 census. It continues to be one of the fastest growing metropolitan areas in the State.

Despite the population of Birmingham decreasing between 1992 and 2011, urban cover over that time period increased from 9.4 percent to 35.7 percent due to expansion of the metropolitan area (Dosdogru et al. 2020, p. 2). The upper part of the Cahaba River watershed and the southeastern part of the Locust Fork watershed drain a significant portion of the Birmingham metropolitan area. The overall degradation of water and habitat quality because of increased urbanization has negative implications for coal darter populations currently, and into the future, as discussed below under *Current Condition* and *Future Condition.*

Climate Change

Changing climate conditions can influence coal darter viability through changes in water temperature and precipitation patterns that result in increased flooding, prolonged droughts, or reduced stream flows. Since the 1970s, moderate to severe droughts in the Southeast have increased by 12 percent during spring months and by 14 percent during summer months (Jones et al. 2015, p. 126). Reduced baseflows due to droughts can cause population declines, habitat loss, and degraded water quality (decreased dissolved oxygen and temperature alteration) leading to death, crowding of individuals leading to stress, and decreased reproduction in stream fish populations. Increased groundwater withdrawal for agriculture or other human needs during droughts may potentially exacerbate the impacts of reduced quantity or frequency of precipitation.

Climate models for the southeastern United States project that average annual temperatures will increase, cold days will become less frequent, the freeze-free season will lengthen by up to a month, days with temperatures exceeding 95 degrees Fahrenheit will increase, heat waves will become longer, and the number of category 5 hurricanes will increase (Ingram et al. 2013, p. 32; IPCC 2021, entire). While these climate models predict variability into the future, they suggest that the region will be subjected to more frequent large storms (hurricanes) with severe flooding and extremely low flows during droughts. Average and extreme precipitation is expected to increase, and subsequently, river flooding is also expected to increase. Extreme weather events, such as flash flooding associated with heavy precipitation events, are projected to increase in the future within the range of the coal darter, and these events can impact the coal darter through habitat degradation and displacement, injury, or even mortality (Service 2023, pp. 29–30).

Future changes in climate within the coal darter's range include increases in temperatures, especially for summer and fall, and increases in overall precipitation. Therefore, the watersheds occupied by coal darters could experience moderate to significant changes in climate by the 2050s, especially under scenarios run for representative concentration pathway (RCP) 8.5 (corresponding to high levels of carbon emissions). Increases in summer temperatures coupled with decreased instream flow can increase water temperatures and reduce dissolved oxygen levels, while flashier flows can increase soil erosion and stream sedimentation.

Low Genetic Diversity

Low genetic diversity makes the coal darter vulnerable to threats. Greater genetic diversity results in greater potential to adapt to a changing environment through natural selection. Reduced genetic diversity in a population can limit its adaptive potential. Small populations often have lower genetic diversity because there are fewer individuals. Small populations are also susceptible to genetic phenomena of inbreeding depression, population bottlenecks, and genetic drift, which can lead to a greater reduction in genetic diversity over time and reduced fitness of the population, leaving it more vulnerable to changing environmental conditions. The combination and interaction of these negative demographic and genetic effects on a small population can lead the population into an extinction vortex.

Effective population size (N_e) goes hand in hand with genetic diversity. There are two heuristics relating effective population size to conservation biology principles. The first is the 50/500 ''rule of thumb,'' which states that if a population's estimated effective population size is greater than 500, then it will maintain evolutionary potential and adaptive capacity over time. However, an effective population size of fewer than 50 would place the population in the extinction vortex, and as the N_e falls below 500 and moves towards 50, the population becomes increasingly at risk of loss in genetic variation. The more conservative theory is the 100/1,000 ''rule of thumb,'' which states that an estimated effective population size of more than 1,000 is needed to maintain evolutionary potential, and an effective population size of fewer than 100 would place the population in the extinction vortex.

In 2018 to 2020, range-wide genetic analyses were carried out for the coal darter, which included samples from the Cahaba River, Locust Fork, and Hatchet Creek. No samples were included in the analysis from Weogufka Creek, because individuals at that site were discovered in 2021, after this genetic work was completed. As such, the Coosa River system is represented only by Hatchet Creek in the genetics analysis.

Results show that populations were historically connected and shared gene flow, however they are currently functionally isolated, showing no gene flow between the three watersheds (Jones and Sandel 2019, entire; Jones 2021, entire). Genetic diversity was relatively low across all three watersheds as indicated by the observed and expected heterozygosity (H_o and H_e) and percent polymorphic loci. The Hatchet Creek population's genetic diversity is considered very low (Jones and Sandel 2019, entire; Jones 2021, entire). Effective population size (N_e), the number of breeding individuals in an idealized population that would maintain genetic diversity, was also reported for each of the watersheds. The effective population size for the Black Warrior population is 2,759 (range of 2,158–3,823); Cahaba River population is 3,145 (range of 2,423–4,480); and Coosa River population is 268 (range of 252–290) (Jones and Sandel 2019, pg. 5; Jones 2021, pg. 22). In the Coosa River, Hatchet Creek's effective population size is an order of magnitude lower than the other two populations (Jones 2021, entire).

Summary

A summary of the threats acting on coal darter populations in each river system is presented below in table 3. The magnitude of each of these threats varies from river system to river system. Details on the impacts of the different threats on coal darter populations are provided below under *Current Condition.*

TABLE 3—SUMMARY OF THREATS IN EACH RIVER SYSTEM

Black Warrior	Cahaba	Coosa
• Water quality degradation from: • Urbanization; • Active and reclaimed mines; and • Agriculture (including poultry operations); and • Silviculture—legacy effects • ~50% reduction in range. • Low genetic diversity. • Climate change.	• Water quality degradation from: • Urbanization; • Silviculture—legacy effects; • Active and reclaimed mines; and • Agriculture. • Low genetic diversity. • Climate change.	• Water quality degradation from: • Agriculture. • Silviculture—legacy effects; and • Future mining. • ~90% reduction in range. • Very low genetic diversity. • Low effective population size. • Climate change.

Conservation Efforts and Regulatory Mechanisms

The coal darter is not State-protected in Alabama but is included in the Alabama State Wildlife Action Plan (SWAP), where it is assigned a ''priority 2'' (''high conservation concern'') status (ADCNR 2015, pg. 19). There have been no captive propagation efforts for the species. The Geological Survey of Alabama (GSA) completed targeted surveys for the species in the Locust Fork in 2001, and rangewide in 2022 in partnership with the Service. Additionally, GSA, ADEM, ADCNR, and other partners have conducted fish Index of Biotic Integrity (IBI) assessments, a fish community-based assessment of stream health, in waterways throughout the State, including areas within the coal darter's range (Service 2023, pp. 31–32).

Priority watersheds within the range of the coal darter have been designated as ''strategic habitat units'' (SHUs) by the Alabama Rivers and Streams Network (ARSN). The SHU concept was created to prioritize efforts and leverage capacity among partners (government, nongovernmental organizations, private industry) to implement restoration and recovery of listed and rare aquatic species. Locust Fork, the Cahaba River, and Hatchet Creek have all been designated as SHUs. However, Weogufka Creek does not have an SHU designation.

Habitat restoration has been one of the most influential conservation efforts positively affecting coal darters. Projects, such as stream bank stabilization and dam removal, have been completed or planned by State and Federal partners, nonprofit organizations, and private landowners. These types of restoration projects are not specifically targeting coal darter conservation, but they aim to improve the habitat quality in general for the benefit of imperiled aquatic species.

Cahaba

The Cahaba River has a long history of water quality declines and subsequent remediation activities (Thom et al. 2013, pp. 60–62). In recognition of these water quality challenges, EPA and the State of Alabama began working on measures to improve the water quality of the river under the auspices of the CWA. The CWA regulates water quality standards for surface waters and discharges of pollutants into the waters of the United States. The CWA made point source discharge into navigable waters without a permit unlawful in 1972. The EPA has authority to enforce the CWA, and with that authority, has developed national water quality criteria recommendations for pollutants found in surface waters and has implemented various pollution control programs (*i.e.,* wastewater standards for industry) (EPA 2021, entire).

Stormwater runoff containing pollutants is often transported through municipal separate stormwater sewer systems (MS4s), which discharge without treatment into local waterways (Service 2023, p. 33). An MS4 is owned by a public entity and is designed to collect and convey stormwater that discharges to waters of the United States. It is not part of a combined sewer or a publicly owned treatment facility or works (EPA 2023, entire). Administered under the National Pollution Discharge Elimination System (NPDES) permit program, MS4 permits require development and implementation of a comprehensive storm water management program (SWMP) that addresses prevention, treatment, removal, monitoring, and other measures to control the quality of stormwater that travels through storm drains to waters of the United States (EPA 2021, introduction). At present, several urban areas in the Upper Cahaba are designated as part of the MS4 program. These permits are regulated under the NPDES system, are treated as point sources by the EPA, and receive waste load allocations (WLAs) under the total maximum daily load (TMDL) program, which is a calculation of the maximum amount of a particular pollutant that can enter a water body and allow that water body to meet water quality standards (Service 2023, p. 34). Thereby, under the CWA, point source discharges of pollutants (including stormwater) are currently being regulated.

In addition, there are processes in place to manage new discharges into the river from industrial sources (*e.g.,* industrial plants, mining, and wastewater). Water quality has substantially improved in recent decades due in part to the NPDES and the NPDES MS4 permits in the upper watershed, the TMDL program, and a general trend towards better stormwater management and soil retention measures in the watershed. TMDLs establish pollution reduction targets, allocate load reductions for pollutant sources, and include a margin of safety while also accounting for seasonal variability of water quality. Currently, the TMDL for Buck Creek, Cahaba Valley Creek, and the Cahaba River adhere to ADEM's water quality standards for the designated use classification of that stream. Overall, this has improved turbidity and improved nutrient loading near the coal darter population (Service 2023, pp. 34–35).

Significant habitat restoration efforts have also taken place in the Cahaba River. For example, in 2004, The Nature Conservancy, the U.S. Army Corps of Engineers, and other partners removed a vented ford dam named the Marvel Slab. Built in the 1960s and 1970s, the dam was originally used for transporting coal and timber across the river. It was 67 meters (219 feet) long, 1.8 meters (5.9 feet) tall, and 7.6 meters (24.9 feet) wide with 40 culverts through which water could flow. Ecologically, the barrier functioned as a dam, blocking upstream movement of aquatic fauna. Removal of the structure restored connectivity between the river reaches. When compared with historical records, fish monitoring conducted after the dam was removed indicated that several fish species, including two that are Federally listed under the Act, have extended their ranges as a result of the removal (Bennett et al. 2015, pp. 51–61).

Black Warrior

Currently, within the Black Warrior River system, the coal darter is restricted to the Locust Fork. The Locust Fork has its own history of water quality issues and remediation. In 1998, it was added to the EPA's list of impaired and threatened waters in Alabama (*i.e.,* Alabama's 303(d) list) due to siltation and nutrient loading concerns along with the presence of federally endangered and threatened species. The ADEM performed monitoring of four 303(d) segments between 2012 and 2016 by assessing the macroinvertebrate community and habitat quality, and evaluating water quality data (Service 2023, pp. 35–36).

From these assessments, the macroinvertebrate community was characterized as ''fair'' for each of the four segments; habitat quality was ''optimal'' at the most upstream segment, ''sub-optimal'' at the middle two segments, and ''marginal'' at the most downstream segment; and the numerical water quality parameters (total suspended solids and turbidity) were below the eco-reference guidelines for all four segments (ADEM 2018, pp. 14–16). Based on these monitoring results, in 2018, the Locust Fork was removed from the 303(d) list for siltation, and it was also removed from the 303(d) list for nutrients because a TMDL was established (Service 2023, p. 36).

Synergistic and Cumulative Effects

We note that, by using the SSA framework to guide our analysis of the scientific information documented in the SSA report, we have not only analyzed individual effects on the species, but we have also analyzed their potential cumulative effects. We incorporate the cumulative effects into our SSA analysis when we characterize the current and future conditions of the species. Our assessment of the current and future conditions encompasses and incorporates the threats individually and primary threats cumulatively. Our current and future conditions assessment is iterative because it accumulates and evaluates the effects of all the factors that may be influencing the species, including threats and conservation efforts. Because the SSA framework considers not just the presence of the factors, but to what degree they collectively influence risk to the entire species, our assessment integrates the cumulative effects of the factors and replaces a standalone cumulative effects analysis.

Current Condition

A thorough review of the coal darter's current condition is presented in chapter 5 of the SSA report (version 1.1, Service 2023, pp. 39–53).

Currently, the coal darter is known from three tributary systems of the Mobile River Basin: Locust Fork of the Black Warrior River, Cahaba River, and Hatchet and Weogufka Creeks of the Coosa River. Coal darter movements and dispersal patterns within these systems are not well understood. Recent population genetics work by University of West Alabama supports gene flow within each river system. However, migration rate estimates indicate no individuals migrating between river systems; thus, no contemporary gene flow exists between systems. These results indicate that each river system is demographically independent of each other. Using these data, populations were delineated based on river system, resulting in three populations that will serve as the resiliency units for assessing population resiliency: the Black Warrior, the Cahaba, and the Coosa. Currently, each population is found in a different Level III ecoregion. Since no other biologically meaningful boundaries are known to exist for the coal darter, we determined the representative units to be the same as the resiliency units (populations).

Based on the coal darter's individual and population needs, such as adequate water quality and quantity, the availability of clean gravel/cobble substrates, sufficient food sources, and appropriate population size and connectivity to support reproduction and recruitment within a population, we developed an approach using key habitat and demographic factors to assess population resiliency. We assessed two demographic condition parameters (genetic health and persistence through time) and two habitat condition parameters (Human Disturbance Gradient Index and habitat quantity) (see table 4, below). Based on the coal darter's lifespan, we used the time period from 2007 to 2022 to inform the current condition of the species.

For a population to be resilient in the context of genetic health, a population should have sufficient standing genetic variation and effective population size (N_e). The 50/500 and 100/1,000 ''rules of thumb'' threshold were used to describe the minimum effective population size needed for both short-term and long-term viability. Greater genetic diversity in a population will improve the fitness of a population, equating to higher survival and rebound potential in the face of demographic and environmental stochasticity. An N_e greater than 50 or 100 is necessary to prevent the deleterious effects of inbreeding depression and genetic drift (*i.e.,* short-term viability) (Service 2023, p. 41). The upper thresholds of the N_e ''rule of thumb'' (500 or 1,000) will be important for our current condition representation because above this upper threshold, a population is expected to be able to maintain its adaptive capacity (*i.e.,* long-term viability). However, the upper threshold of 500 or 1,000 is important to consider for resiliency as well, because when the N_e declines from 500 to 50, or from 1,000 to 100, the risks of genetic diversity loss progressively increase. Thus, an N_e below the upper thresholds of 500 or 1,000 are of concern for both population resiliency and species representation.

We consider a population with high resiliency to have high or moderate genetic diversity and an N_e that exceeds the 500/1,000 threshold. Thresholds for genetic diversity could not be quantified in table 4, below, because the genetic data we have available represent a snapshot of the current condition, and we do not have historical genetic data to which we can compare them. What is considered high, moderate, and low genetic diversity can vary from taxa to taxa. However, after consulting with conservation genetics experts on the coal darter's genetics and the scientific literature on genetic diversity results of other similar species, we determined that the Cahaba and Black Warrior populations exhibit ''low'' genetic diversity and the Hatchet Creek population exhibits ''very low'' genetic diversity. We used these expert opinions along with the N_e 500/1,000 ''rules of thumb'' to differentiate our ranking of moderate resiliency and low resiliency (Service 2023, pp. 41–42). We used research by University of West Alabama, which provided range-wide genetic diversity metrics and effective population size estimates for coal darter, in our assessment of current genetic health.

When determining the current condition of the coal darter, the extent of the current range in the context of the historical range was important to consider (see table 4, below). Impoundments constructed in the Black Warrior and Coosa Rivers in the late 1800s to the mid-1900s, converted mainstem areas once occupied by coal darters to unsuitable conditions, resulting in large-scale extirpation throughout the species' historical range. This was an important consideration for the species because coal darters are now restricted to smaller areas than they were previously, which has

implications for maximum attainable population size, access to suitable habitat, and the overall ability to move and disperse when conditions are unfavorable at certain locations, all of which are important needs of the species in order to successfully reproduce and maintain populations (Service 2023, p. 42).

To better assess coal darter resiliency, thresholds were standardized for each population by using a percentage of historical range in each river system to represent potential habitat for the species (see table 4, below). We determined that a population with high resiliency would have lost no more than one third of its historical range; a population with moderate resiliency would have lost between one third and two thirds of its historical range; and a population with low resiliency would have lost more than two thirds of its historical range.

The coal darter's sensitivity to habitat alterations from human activities were also used to assess resiliency. In order to describe the level of impairment and risk to natural aquatic habitats that arise from human activities, the Human Disturbance Gradient Index (HDGI) was used (see table 4, below). The HDGI considers a variety of landscape variables associated with disturbance to aquatic environments. Specifically, these variables include: human density (population count/kilometer of watershed), phosphorus load (kilograms/hectare/year), percent developed (percentage of the watershed that is developed), percent barren (percentage of the watershed that is barren due to human activities), percent pasture (percentage of the watershed that is pasture), percent crop (percentage of watershed that is used for row crops), road density (kilometers of roads/square kilometer of watershed), and road-stream crossings (number of road-stream crossings per kilometer of road). Each landscape variable is weighted by a factor known as the landscape development intensity (LDI) index, which ranges between 0 and 10, and relates land-use classifications with the intensity of nonrenewable energy consumption. An LDI of 0 corresponds to natural environments, and an LDI of 10 corresponds to highly developed urban environments. The sum of the weighted landscape variables calculated for each hydrologic unit code (HUC) 12 watershed in the range equates to the HDGI (Service 2023, pp. 42–43).

The final HDGI for each population of the coal darter was found by averaging the HDGI of its constituent HUC 12 watersheds. Stream reaches with HDGI values that exceed 200 were found to correspond to poor biological condition with low diversity of fish species, mostly inhabited by generalist species tolerant of habitat uneasiness (Service 2023, p. 43). Therefore, we expect the abundance and probability of coal darter presence to decline when HDGI scores approach and exceed 200. However, we acknowledge that landscape heterogeneity within the scale of a HUC 12 watershed may allow suitable environmental conditions to persist within an otherwise largely disturbed landscape. Further, based on our analysis, we are most confident that HDGI scores below 175 reflect good conditions and those above 300 reflect poor conditions. For these reasons, HDGI scores below 175 were classified as high condition or most suitable for the coal darter, with high probability of occurrence and high abundance; scores between 176 and 300 as moderate condition, with moderate probability of occurrence and moderate abundance; and scores greater than 300 as low condition, with the lowest probability of occurrence or very low abundance and posing the highest levels of risk to the species (Service 2023, pp. 42–43; see table 4, below).

Habitat quantity is another important metric to assess the current condition of the coal darter using HUC 12 watersheds as our units. The greater quantity of connected, suitable habitat available within a population, the greater the population resiliency. Resiliency was classified into one of three classes: High, Moderate, and Low. Thresholds for habitat quantity were established by enumerating extent of coal darter presence in the context of the historical range limits (see table 4, below).

TABLE 4—CONDITION CATEGORIES FOR DEMOGRAPHIC AND HABITAT PARAMETERS USED TO ASSESS COAL DARTER RESILIENCY

[Service 2023, p. 45]

Parameter	Condition category		
	High (3)	Moderate (2)	Low (1)
Genetic health	Genetic diversity considered ''moderate'' or ''high''; N_e exceeds the 500/1,000 ''rule of thumb'' threshold.	Genetic diversity considered ''low''; N_e exceeds the 500/1,000 ''rule of thumb'' threshold.	Genetic diversity considered ''very low''; N_e does not exceed the 500/1,000 ''rule of thumb'' threshold.
Percentage of historical range with current records.	Greater than 66 percent of historical range is currently occupied.	33–66 percent of historical range is currently occupied.	Less than 33 percent of historical range is currently occupied.
Human Disturbance Gradient Index (HDGI).	0–175	176–300	Greater than 300.
Habitat quantity	Greater than or equal to 8 currently occupied HUC 12 units.	4–7 currently occupied HUC 12 units	Fewer than 4 currently occupied HUC 12 units.

For each parameter, we assigned a score from 1 to 3 (1 = low, 2 = moderate, 3 = high) based on condition categories that we developed in coordination with species experts. For the overall resiliency of a population, scores were summed for all parameters. The minimum possible sum is 4 (a score of low for each of the four parameters), and the maximum possible sum is 12 (a score of high for each of the four parameters). We set thresholds for overall resiliency scores based on the minimum and maximum possible sums and the number of categories (3: high, moderate, low) (see table 5, below). The following discussion describes our reasoning for each parameter, the condition categories, and the methodology we used to derive an overall score for each factor.

TABLE 5—THRESHOLDS FOR OVERALL POPULATION RESILIENCY

[Service 2023, p. 45]

	Overall population resiliency		
	High	Moderate	Low
Parameter Score Sum	10–12	7–9	4–6

Resiliency

Black Warrior—The overall resiliency for the Black Warrior population is moderate (see table 6, below). Genetic diversity, as expressed by observed and expected heterozygosity and percent polymorphic loci, is considered low for this population by experts. Additionally, the effective population size is higher than the 500 or 1,000 ''rules of thumb'' threshold at 2,759 (range of 2,158–3,823) (Jones and Sandel 2019, pg. 5; Jones 2021, pg. 22). Due to the low genetic diversity but high effective population size (exceeding the 500/1,000 threshold), a score of moderate is assigned for genetic health of the Black Warrior population. The Black Warrior population has experienced a 50 percent reduction, at minimum, in occupied range due to the installation of impoundments in the late 1800s and early 1900s, resulting in a moderate score for the percentage of historical range with current records metric. The HDGI for the Black Warrior population is most heavily influenced by a combination of moderate amounts of development and urbanization in northern Jefferson County and more intensive livestock agriculture in the area. The averaged HDGI for currently occupied HUC 12 watersheds is 207, which results in a classification of moderate. With nine HUC 12 watersheds currently occupied, this population scores high for habitat quantity. However, despite the effects of these impacts, the Black Warrior population currently has an adequate effective population size and connectivity to support reproduction and recruitment.

Cahaba—The Cahaba River is considered the stronghold for the species, reflected by consistent catch records from the 1960s to present day. Trends in population numbers can be difficult to discern due to differences in sampling methods and purpose over the years, but there continues to be evidence of reproduction and recruitment. However, there is evidence that population numbers of the coal darter may be declining in the Cahaba River, especially in the upper portion of the watershed around the Birmingham metropolitan area. A comparison by experts of historical fish community records spanning from 1964–1983 to records obtained in 1994–1997 at 12 sites in the upper Cahaba River watershed in the Birmingham area indicated an overall decrease in fish species diversity, pointing to habitat degradation related to urbanization as the primary reason. Coal darters were found to have the greatest decline of all darter species, with 330 total specimens collected from historical samples (out of 46 samples) and only 6 collected from the same sites in the 1995–1997 samples (out of 48 samples). Along with coal darters, the study found disturbance-sensitive species, in general, to have decreased in percent relative abundance (Service 2023, p. 47).

The overall resiliency for the Cahaba population is moderate (see table 6, below). Genetic diversity of the Cahaba population is low, and the effective population size is higher than 500 or 1,000 ''rules of thumb'' threshold at 3,145 (range of 2,423–4,480) (Jones and Sandel 2019, pg. 5; Jones 2021, pg. 22). Due to the low genetic diversity but high effective population size (exceeding the 500/1,000 threshold), the Cahaba population scores moderate for genetic health (see table 6, below). The population genetic results indicate that the Cahaba population currently has a lower expected heterozygosity and percent polymorphic loci when compared to the Black Warrior population, yet a higher effective population size than the Black Warrior population (Service 2023, p. 46). One explanation for this could be a decrease in population size because of degraded water quality in the Cahaba River beginning in the early 1900s up to the enactment of the CWA (1972). A significant decrease in the number of individuals in this population would have resulted in a loss of genetic diversity. Because of their short generation time, coal darter numbers may have been able to rebound faster than it would take to increase genetic diversity since the latter would be dependent on the accumulation of novel mutations which would be expected to occur over thousands of years.

The Cahaba population has experienced the least reduction in range of the three populations. No major impoundments were constructed within the mainstem of the Cahaba River. However, a single low head dam located at Highway 280 currently prevents movement of coal darters upstream. While the species still occupies sites approximately 20 miles upstream of this dam, those individuals are isolated from downstream individuals and gene flow is likely unidirectional, creating a greater risk of further loss in genetic diversity in this portion of the river (Zarri et al. 2022, entire). To date, no range reduction of the species due to this dam has been observed. The Cahaba population scores high for the percentage of historical range with current records metric (see table 6, below).

The Cahaba River HDGI score is largely influenced by intense urbanization associated with the City of Birmingham and its suburbs. The averaged HDGI for currently occupied HUC 12 watersheds is 356 (Service 2023, p. 46), which results in a score of low for the Cahaba population (see table 6, below). Eight HUC 12 watersheds are currently occupied, which results in a score of high for habitat quantity (see table 6, below).

Coosa—The overall resiliency for the Coosa population is low (see table 6, below). Genetic diversity is considered very low for this population. Since Weogufka Creek discovered individuals in 2021 following the completion of the genetic analysis, only the Hatchet Creek population was used in the Coosa River system genetics results, The effective population size is above the ''rule of thumb'' threshold of 50 or 100 that is necessary to prevent deleterious effects of inbreeding depression and genetic drift. However, the effective population size is still considered low at 268 (range of 252–290) (Jones and Sandel 2019, pg. 5; Jones 2021, pg. 22) and is an order of magnitude lower than the other two populations. Furthermore, the effective population for Hatchet Creek falls in between the upper and lower bounds of the 50/500 and 100/1,000 rule thresholds, indicating that the population is at high risk of continual loss of genetic diversity. This low effective population size may also reflect the ongoing deleterious genetic effects of a population bottleneck or the

ongoing habitat limitations that prevent population sizes reaching those found in the other two populations or both (Franklin 1980, pp. 135–149; Frankham et al. 2014, pp. 56–63; Franklin et al. 2014, pp. 284–285). Based on the lower effective population size in Hatchet Creek coupled with the very low genetic diversity, the Coosa population results in a score of low for genetic health (see table 6, below).

The Coosa population has experienced the greatest range reduction of the three coal darter populations. With a 90 percent reduction in range compared to pre-impoundment historical condition, this population is assessed a score of low for the percentage of historical range with current records metric (see table 6, below).

The HDGI for the Lower Weogufka Creek HUC 12 had a value of 51.5, and the HDGI for the Lower Hatchet Creek HUC 12 had a value of 40.7 (Service 2023, p. 49). The averaged HDGI score for currently occupied HUC 12 watersheds is 46, which results in a score of high for the HDGI metric for this population (see table 6, below).

Regarding the habitat quantity metric for the Coosa population, only two HUC 12 watersheds are currently occupied: Lower Hatchet Creek and Lower Weogufka Creek. Within these two HUC 12 boundaries, the coal darter is only known from one site in Weogufka Creek and 14.5 rkm (9 rmi) of Hatchet Creek. Because of the low quantity of occupied habitat, this population scores low for the habitat quantity factor.

TABLE 6—CURRENT CONDITION RESILIENCY RESULTS BY POPULATION FOR THE COAL DARTER

[Service 2023, p. 50]

Factor	Population		
	Black Warrior	Cahaba	Coosa
Genetic health	Moderate (2)	Moderate (2)	Low (1).
Percentage of historical range with current records	50 percent: Moderate (2)	90 percent: High (3)	10 percent: Low (1).
Human Disturbance Gradient Index (HDGI)	207: Moderate (2)	356: Low (1)	46: High (3).
Habitat quantity	9: High (3)	8: High (3)	2: Low (1).
Overall resiliency	Moderate (9)	Moderate (9)	Low (6).

Representation

Representation is the ability of a species to adapt to both near-term and long-term changes in its physical and biological environment. The best available scientific information suggests using population genetic analyses to characterize the coal darter's current adaptive capacity. Due to the current isolation of coal darter populations, it is unlikely that gene flow exists among rivers (to increase genetic diversity), or that darter populations are able to shift to track suitable habitat conditions. Isolated coal darter populations must adapt to changing conditions in place, requiring sufficient genetic variation in order to respond to shifting selection pressures and any unexpected selection events, such as introduction of a novel disease or invasive species (Service 2023, p. 52).

The Cahaba River and Black Warrior populations meet the effective population size threshold ''rule of thumb'' of 500 or 1,000 to maintain evolutionary potential and adaptive capacity over time. By contrast, the Coosa population does not meet these effective population size thresholds for retaining adaptive potential. Coupled with its low genetic diversity, this population is at high risk of ongoing losses of standing genetic variation, lowering its capacity to respond to changing selection pressures.

We estimate that the coal darter has low adaptive capacity based on the poor genetic condition of the Coosa population; the low genetic diversity, yet sufficient effective population sizes, of the Black Warrior and Cahaba populations; and the lack of connectivity between populations. Overall representation for the coal darter is currently low.

Redundancy

Redundancy refers to the ability of a species to withstand catastrophic events and is measured by the amount and distribution of resilient populations across the species' range. Catastrophic events that could severely affect or extirpate entire coal darter populations include gas pipeline bursts and associated spills, changes in upstream land use that alter stream characteristics and water quality, and potential effects of climate change such as drought and increases in occurrence of flash-flooding events.

Redundancy is characterized by having multiple, resilient and representative populations of the coal darter distributed throughout the species' range. While there remain three populations distributed throughout the range and at a scale for which it would be unlikely for a single event to catastrophically affect all, one population (Coosa) has low resiliency to stochastic events and a higher risk of extirpation. The remaining two populations (Black Warrior and Cahaba) were found to be moderately resilient to stochastic events. Each population's reduced resiliency prevents them from fully contributing to a high level of redundancy; therefore, the coal darter currently exhibits a moderate level of redundancy.

Future Condition

A thorough review of the coal darter's future condition is presented in chapter 6 of the SSA report (version 1.1, Service 2023, pp. 54–58).

In our SSA report (version 1.1, Service 2023, entire), we define viability as the ability of the coal darter to sustain natural populations in river and stream systems over time. In our assessments of factors influencing viability and current condition, we found that disturbance on the landscape negatively affects the coal darter's ability to sustain natural populations and these disturbances can be attributed and measured by quantifying land use and cover types. To help address uncertainty associated with the degree and extent of potential future stressors and their impacts on the species' needs, the concepts of resiliency, redundancy, and representation were assessed using two scenarios and time stepped them at years 2040 and 2050. We devised these scenarios by identifying information on primary threat factors arising from increasing human populations and resulting alterations to the habitat. The four scenarios use the EPA's Integrated Climate and Land Use (ICLUS; version 2.1.1, EPA 2017) model, which uses human demography as a primary means to project local land-use changes in the future with consideration of climate change. It is consistent with updated global socioeconomic scenarios (shared

socioeconomic pathways (SSPs)) and global climate change model targets (representative concentration pathways (RCPs)). Using the ICLUS models, we projected the future resiliency of coal darter populations using two future scenarios that consider a range of impacts from future urbanization and land-use change along with climate change effects. Data from the ICLUS model was used to predict future HDGI scores, which can be compared with the HDGI scores of each population from our current condition analysis. While other stressors were identified as factors influencing viability, such as impoundments and genetic health, we were unable to model these factors into the future. However, these stressors are expected to continue to limit the species' viability into the future. Dams and impoundments are expected to constrain population extent, and genetic health is not expected to improve due to the long period of time required for mutations to occur that would improve genetic diversity (Service 2023, pp. 23–31).

We used the best available data and models to project changes in human disturbance under a high impact scenario and a moderate impact scenario at year 2040 and 2050 (20 and 30 years). This timeframe was reasonably certain to predict patterns of urbanization and agriculture, and how these land uses forecast patterns in the species' range relevant to the coal darter and its habitat given the species' short lifespan. In addition, catastrophic events (for example, invasive species, disease, and chemical spills) could have an immediate impact on the species, especially on the Coosa population due to its limited abundance and distribution.

Results of HDGI under the two future scenarios did not vary greatly between the two scenarios within each population (Black Warrior: 610 and 635; Cahaba: 636 and 661; Coosa: 77 and 141) (Service 2023, pp. 56–59). As stated above under *Current Condition,* HDGI scores below 175 are classified as high condition or most suitable for the coal darter, with high probability of occurrence and high abundance; scores of between 176 and 300 correspond to moderate condition, with moderate probability of occurrence and moderate abundance; and scores greater than 300 are classified as low condition, with the lowest probability of occurrence or very low abundance and posing the highest levels of risk to the species.

When compared to the current condition's HDGI, the Black Warrior and Cahaba populations' future HDGI scores nearly tripled and doubled, respectively. Therefore, aquatic habitats currently occupied by the coal darter will experience substantial levels of disturbance due to human urbanization activities, and the species' likelihood of presence and abundance will continue to decline. Furthermore, the habitat quantity will also decrease. Due to the significant projected increase in human disturbance within the Black Warrior and Cahaba populations, resiliency of each of these populations is projected to decrease from moderate to low under all future scenarios (Service 2023, p. 56).

While the future HDGI did not indicate poor habitat condition in the Coosa population, no habitat improvements are projected. The Coosa population of the coal darter is confined to small reaches of Hatchet and Weogufka creeks. These two tributaries of the Coosa River likely represent peripheral habitat that was sustained by now extirpated source populations in the Coosa River. As flow appears to be a predictor of species presence, population expansion in these streams is constrained by the lack of suitable flows and habitat in the upstream reaches. Further, given the natural state of these streams, it is unlikely density could increase. That is, the populations are likely at carrying capacity within these refugia. The Coosa population's poor genetic health is projected to decline without the influx of any new genetic material. Therefore, projected resiliency of the Coosa population remains low (Service 2023, p. 56).

The overall projected decline in resiliency decreases the Black Warrior and Cahaba populations' contribution to future redundancy. Therefore, catastrophic events that occur across the regional or State scale could cause extirpation in both populations. Furthermore, the current low resiliency in the Coosa population leaves it susceptible to extirpation, and with heavy land-use changes projected to occur on the landscape surrounding this population, this population is likely to be extirpated by the 2040 and 2050 time steps. For these reasons, the overall redundancy under all future scenarios is low.

We do not anticipate any improvement to the connectivity or adaptive capacity of the species. While our current condition assessment finds sufficient effective population size in the Black Warrior and Cahaba populations, the amount of habitat disturbance projected to occur, and probable range contraction, will reduce the effective population size and genetic diversity of these two populations. The overall representation for the coal darter under all future scenarios is assessed as low.

Determination of Coal Darter's Status

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of an endangered species or a threatened species. The Act defines an ''endangered species'' as a species in danger of extinction throughout all or a significant portion of its range, and a ''threatened species'' as a species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether a species meets the definition of an endangered species or a threatened species because of any of the following factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

Status Throughout All of Its Range

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the coal darter. We considered whether the coal darter is presently in danger of extinction. Our review of the best available information indicates there are three populations across the known historical range in the Locust Fork of the Black Warrior River system, the Cahaba River system, and the Hatchet and Weogufka Creeks of the Coosa River system in Alabama. Genetic analysis indicates that the three populations were previously connected but are currently isolated and uniquely identifiable populations. Based on the coal darter's individual and population needs, an approach including two key habitat (Human Disturbance Gradient Index (HDGI) and habitat quantity) factors and two demographic (genetic health and persistence through time) factors was used to assess population resiliency with an assigned score of high, moderate, or low.

The current resiliency for both the Black Warrior and Cahaba populations is moderate. Impacts from habitat destruction and modification; the reduction of range as a result of impoundments (Black Warrior); and water quality degradation resulting from urbanization, mining, and agriculture (Factors A and E) appear to be affecting the coal darter at the population level

for these two resiliency units. Both also have low genetic diversity. The Black Warrior population has experienced at least a 50 percent reduction in occupied range due to the installation of impoundments in the late 1800s and early 1900s. However, despite the effects of these impacts, the Black Warrior and Cahaba populations currently have adequate effective population sizes and connectivity to support reproduction and recruitment. The Cahaba population has experienced the smallest range reduction (14 percent) of the three populations and has had no major impoundments constructed within the mainstem of the Cahaba River. It is considered the stronghold for the species.

The Coosa population has low resiliency due to habitat destruction and degradation resulting from dams and impoundments (Factors A and E). Only two HUC 12 watersheds are currently occupied in the Coosa population: Lower Hatchet Creek and Lower Weogufka Creek. Within these two HUC 12 boundaries, the coal darter is only known from one site in lower Weogufka Creek and 9 rmi (14.5 rkm) of lower Hatchet Creek. The genetic diversity is currently very low for this population (an order of magnitude lower than the other two populations), and its inadequate effective population size is vulnerable to the deleterious effects of inbreeding depression and genetic drift. This low effective population size may also reflect the ongoing harmful genetic effects of a population bottleneck or the ongoing habitat limitations that prevent population sizes reaching those found in the other two populations or both.

The species is currently extant in all three representation units, with two resiliency units (Black Warrior and Cahaba) having moderate resiliency. Both units with moderate resiliency contain effective populations sizes necessary for retaining adaptive potential. In contrast, the one unit (Coosa) with low resiliency does not meet the effective population size threshold for retaining adaptive potential. Coupled with low genetic diversity, the Coosa unit is currently at high risk of ongoing losses of standing genetic variation, lowering its capacity to respond to changing selection pressures.

The three populations are distributed across northern Alabama, and two of the three units across the range currently have moderate resiliency, which bolsters the species' ability to withstand catastrophic events. However, a catastrophic event (such as a chemical spill, change in upstream land use that alters stream characteristics and water quality, new impoundment, drought, or flash flood) could severely affect or extirpate coal darter populations such that the species is affected as a whole. This is exacerbated by one population (Coosa) having low resiliency to stochastic events and being at a higher risk of extirpation, while the remaining two populations (Black Warrior and Cahaba) have moderate resiliency to respond to stochastic events. Connectivity does not exist between any of the extant units. However, the species is not presently facing threats that place it at risk of extinction throughout all its range. Further, while multiple populations exist, each population's low or moderate resiliency contributes to a moderate level of redundancy for the species. Therefore, we find that the species does not meet the definition of an endangered species.

We forecasted the viability of the coal darter under four plausible scenarios into the future (summarized above under *Future Condition*). We assessed relevant risk factors that may be acting on the coal darter in the future and whether we could make reliable predictions about these factors and how they may impact the viability of the species. Since the main threats arise from increasing human populations and resultant alterations to the habitat, we used human demography as a means to project land-use changes in the future with consideration of climate change. We projected changes in human disturbance under two scenarios at year 2040 and 2050 (*i.e.,* 20 and 30 years). In considering the foreseeable future as it relates to the status of the coal darter, we considered the relevant risk factors (threats/stressors) acting on the species and whether we could draw reliable predictions about the species' response to these factors. Our analysis in the SSA report of future scenarios over an approximately 30-year timeframe encompasses the best available information for future projections of land-use change. We determined that this approximately 30-year timeframe enables us to consider the threats/stressors acting on the species and draw reliable predictions about the species' response to these factors. This 30-year timeframe allows multiple generations of the short-lived coal darter to respond to potential land-use changes.

Taking into account the primary factors influencing the species in the future (habitat destruction and degradation caused by land uses, and loss of connectivity between populations) and the potential impacts to the species' needs, we project a decline in resiliency for the coal darter throughout its range. The current low resiliency in the Coosa population leaves it vulnerable to extirpation, especially considering the major land-use changes expected to occur to this landscape, and this population is projected to remain in low condition. Furthermore, the Black Warrior and Cahaba populations are projected to decline in resiliency, as will their projected contribution to redundancy over the next 30 years. Therefore, potential catastrophic events occurring across the Southeast or in the State of Alabama could result in extirpation of any of the populations. Given the scenarios assessed, it is projected that aquatic habitats currently occupied by the coal darter will experience substantial levels of disturbance due to human activities, reducing the amount of habitat available to the species and corresponding to declines in the species' likelihood of presence and abundance. For these reasons, the overall projected redundancy for the coal darter under all future scenarios is low.

Future projections also indicate that the coal darter will continue to have low adaptive capacity (low representation) based on (1) the poor genetic condition of the Coosa population, if it remains extant in the future; (2) the low genetic diversity of the Black Warrior and Cahaba populations; and (3) the lack of connectivity between populations. Further, while the current condition assessment found sufficient effective population sizes in the Black Warrior and the Cahaba populations, the amount of habitat disturbance and range contractions that are projected to occur would likely reduce the effective population sizes and genetic diversity of these two populations. For these reasons, the overall projected representation for the coal darter under all future scenarios is low. From our future scenario assessment, we find that the coal darter will be at risk of extinction, and therefore is likely to become endangered, within the foreseeable future (*i.e.,* within the next 30 years) throughout all of its range.

Based on projected future threats, the coal darter will not have sufficient resiliency, redundancy, and representation to support species' viability. Overall, the future threats are projected to increase in magnitude and severity such that the coal darter is at risk of extinction throughout all of its range. Thus, after assessing the best available information, we conclude that the coal darter is likely to become in danger of extinction within the foreseeable future throughout all of its range.

Status Throughout a Significant Portion of Its Range

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so within the foreseeable future throughout all or a significant portion of its range. The court in *Center for Biological Diversity* v. *Everson,* 435 F. Supp. 3d 69 (D.D.C. 2020) (*Everson*), vacated the provision of the Final Policy on Interpretation of the Phrase ''Significant Portion of Its Range'' in the Endangered Species Act's Definitions of ''Endangered Species'' and ''Threatened Species'' (hereafter ''Final Policy''; 79 FR 37578, July 1, 2014) that provided if the Service determines that a species is threatened throughout all of its range, the Service will not analyze whether the species is endangered in a significant portion of its range.

Therefore, we proceed to evaluating whether the species is endangered in a significant portion of its range—that is, whether there is any portion of the species' range for which both (1) the portion is significant; and (2) the species is in danger of extinction in that portion. Depending on the case, it might be more efficient for us to address the ''significance'' question or the ''status'' question first. We can choose to address either question first. Regardless of which question we address first, if we reach a negative answer with respect to the first question that we address, we do not need to evaluate the other question for that portion of the species' range.

Following the court's holding in *Everson,* we now consider whether there are any significant portions of the species' range where the species is in danger of extinction now (*i.e.,* endangered). In undertaking this analysis for coal darter, we choose to address the status question first—we consider information pertaining to the geographic distribution of both the species and the threats that the species faces to identify portions of the range where the species may be endangered.

We evaluated the range of the coal darter to determine if the species is in danger of extinction now in any portion of its range. The range of a species can theoretically be divided into portions in an infinite number of ways. We focused our analysis on portions of the species' range that may meet the definition of an endangered species. For the coal darter, we considered whether the threats or their effects on the species are greater in any biologically meaningful portion of the species' range than in other portions such that the species is in danger of extinction now in that portion.

The statutory difference between an endangered species and a threatened species is the timeframe in which the species becomes in danger of extinction; an endangered species is in danger of extinction now while a threatened species is not in danger of extinction now but is likely to become so within the foreseeable future. Thus, we considered the time horizon for the threats that are driving the coal darter to warrant listing as a threatened species throughout all of its range. We then considered whether these threats or their effects are occurring in any portion of the species' range such that the species is in danger of extinction now in that portion of its range. We examined the following threats: habitat degradation or loss stemming from hydrologic alteration by impoundments, including dams and other barriers; habitat degradation or loss stemming from urban development or change in land cover, including increased density of residential and commercial infrastructure; resource extraction, including mining and timber operations; agriculture, including poultry farming; and diminished water quality from point and nonpoint source chemical contamination and siltation, including cumulative effects.

We identified that the Coosa portion of the species' range is experiencing a concentration of the following threat at a biologically meaningful scale: habitat destruction and degradation from land uses and impoundments resulting in poor water quality (Factor A). Currently, the Coosa population unit has low resiliency, with only two HUC 12 watersheds currently occupied: Lower Hatchet Creek and Lower Weogufka Creek. This population unit has experienced the greatest range reduction (a loss of 90 percent of its historical range) of the three coal darter populations, and its low effective population size is an order of magnitude lower than the other two populations. Overall, the Coosa population lacks any adaptive potential, and it is likely that a single catastrophic event would result in the extirpation of the species from this portion. Based on this information, we conclude that the impacts are having a biologically meaningful effect on the Coosa population. Therefore, the best scientific and commercial information indicates that the Coosa population may have a different status than the other two populations in the species' range.

We then proceeded to consider whether this portion of the range (*i.e.,* the Coosa population) is significant. The Service's most recent definition of ''significant'' within agency policy guidance has been invalidated by court order (see *Desert Survivors* v. *U.S. Department of the Interior,* 321 F. Supp. 3d 1011, 1070–74 (N.D. Cal. 2018)). In undertaking this analysis for the coal darter, we considered whether the Coosa population portion of the species' range may be significant. Therefore, for the purposes of this analysis, when considering whether this portion is significant, we considered whether the portion may (1) occur in a unique habitat or ecoregion for the species; (2) contain high-quality or high-value habitat relative to the remaining portions of the range, for the species' continued viability in light of the existing threats; (3) contain habitat that is essential to a specific life-history function for the species and that is not found in the other portions (for example, the principal breeding ground for the species); or (4) contain a large geographic portion of the suitable habitat relative to the remaining portions of the range for the species.

Currently, the Coosa population represents a small portion (less than 5 percent based on current occurrences and occupied stream reaches) of the coal darter's range. In addition, this portion does not have any areas of habitat that are unique or that contain high-quality or high-value habitat relative to the remaining portions of the range. The Coosa population also does not contain habitat that is essential to a specific life-history function. Overall, we found no information that would indicate that the Coosa population constitutes a portion of the range that may be significant in terms of its geographic portion of suitable habitat, or that it is significant in terms of high-quality habitat or otherwise important for the species' life history.

The best scientific and commercial data available indicate that no portion of the species' range provides a basis for determining that the species is in danger of extinction in a significant portion of its range, and we determine that the species is likely to become in danger of extinction within the foreseeable future throughout all of its range. This does not conflict with the courts' holdings in *Desert Survivors* v. *U.S. Department of the Interior,* 321 F. Supp. 3d 1011, 1070–74 (N.D. Cal. 2018) and *Center for Biological Diversity* v. *Jewell,* 248 F. Supp. 3d 946, 959 (D. Ariz. 2017) because, in reaching this conclusion, we did not apply the aspects of the Final Policy, including the definition of ''significant,'' that those court decisions held to be invalid.

Determination of Status

Our review of the best available scientific and commercial information

indicates that the coal darter meets the Act's definition of a threatened species. Therefore, we propose to list the coal darter as a threatened species in accordance with sections 3(20) and 4(a)(1) of the Act.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened species under the Act include recognition as a listed species, planning and implementation of recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and conservation by Federal, State, Tribal, and local agencies, private organizations, and individuals. The Act encourages cooperation with the States and other countries and calls for recovery actions to be carried out for listed species. The protection required by Federal agencies, including the Service, and the prohibitions against certain activities are discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Section 4(f) of the Act calls for the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

The recovery planning process begins with development of a recovery outline made available to the public soon after a final listing determination. The recovery outline guides the immediate implementation of urgent recovery actions while a recovery plan is being developed. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) may be established to develop and implement recovery plans. The recovery planning process involves the identification of actions that are necessary to halt and reverse the species' decline by addressing the threats to its survival and recovery. The recovery plan identifies recovery criteria for review of when a species may be ready for reclassification from endangered to threatened (''downlisting'') or removal from protected status (''delisting''), and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Revisions of the plan may be done to address continuing or new threats to the species, as new substantive information becomes available. The recovery outline, draft recovery plan, final recovery plan, and any revisions will be available on our website as they are completed (*https://www.fws.gov/program/endangered-species*), or from our Alabama Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, Tribes, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (*e.g.,* restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their ranges may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands.

If this species is listed, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost-share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the State of Alabama would be eligible for Federal funds to implement management actions that promote the protection or recovery of the coal darter. Information on our grant programs that are available to aid species recovery can be found at: *https://www.fws.gov/service/financial-assistance.*

Although the coal darter is only proposed for listing under the Act at this time, please let us know if you are interested in participating in recovery efforts for this species. Additionally, we invite you to submit any new information on this species whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7 of the Act is titled, ''Interagency Cooperation,'' and it mandates all Federal action agencies to use their existing authorities to further the conservation purposes of the Act and to ensure that their actions are not likely to jeopardize the continued existence of listed species or adversely modify critical habitat. Regulations implementing section 7 are codified at 50 CFR part 402.

Section 7(a)(2) states that each Federal action agency shall, in consultation with the Secretary, ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Each Federal agency shall review its action at the earliest possible time to determine whether it may affect listed species or critical habitat. If a determination is made that the action may affect listed species or critical habitat, formal consultation is required (see 50 CFR 402.14(a)), unless the Service concurs in writing that the action is not likely to adversely affect listed species or critical habitat. At the end of a formal consultation, the Service issues a biological opinion, containing its determination of whether the Federal action is likely to result in jeopardy or adverse modification.

In contrast, section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action which is likely to jeopardize the continued existence of any species proposed to be listed under the Act or result in the destruction or adverse modification of critical habitat proposed to be designated for such species. Although the conference procedures are required only when an action is likely to result in jeopardy or adverse modification, action agencies may voluntarily confer with the Service on actions that may affect species proposed for listing or critical habitat proposed to be designated. In the event that the subject species is listed or the relevant critical habitat is designated, a conference opinion may be adopted as a biological opinion and serve as compliance with section 7(a)(2) of the Act.

Examples of discretionary actions for the coal darter that may be subject to conference and consultation procedures under section 7 of the Act are land management or other landscape-altering activities on Federal lands administered by the U.S. Department of Agriculture's U.S. Forest Service or Natural Resources Conservation Service, the U.S. Geological Survey, and the U.S. Army Corps of Engineers, as well as actions on State, Tribal, local, or private lands that require a Federal permit (such as a permit from the U.S. Army Corps of Engineers under section 404 of the CWA or a permit from the Service under section 10 of the Act) or that involve some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation

Administration, or Federal Emergency Management Agency). Federal actions not affecting listed species or critical habitat—and actions on State, Tribal, local, or private lands that are not funded, authorized, or carried out by a Federal agency—do not require section 7 consultation. Federal agencies should coordinate with the local Service Field Office (see **FOR FURTHER INFORMATION CONTACT**) with any specific questions on section 7 consultation and conference requirements.

It is the policy of the Service, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify to the extent known at the time a species is listed, specific activities that will not be considered likely to result in violation of section 9 of the Act. To the extent possible, activities that will be considered likely to result in violation will also be identified in as specific a manner as possible. The intent of this policy is to increase public awareness of the effect of a proposed listing on proposed and ongoing activities within the range of the species proposed for listing. Although most of the prohibitions in section 9 of the Act apply to endangered species, sections 9(a)(1)(G) and 9(a)(2)(E) of the Act prohibit the violation of any regulation, including a rule issued under section 4(d) of the Act pertaining to any threatened species of fish or wildlife, or threatened species of plant, respectively. Section 4(d) of the Act directs the Secretary to promulgate protective regulations that are necessary and advisable for the conservation of threatened species. As a result, we interpret our policy to mean that, when we list a species as a threatened species, to the extent possible, we identify activities that will or will not be considered likely to result in violation of the protective regulations under section 4(d) for that species.

At this time, we are unable to identify specific activities that will or will not be considered likely to result in violation of section 9 of the Act beyond what is already clear from the descriptions of prohibitions and exceptions we would establish by protective regulation under section 4(d) of the Act (see Provisions of the Proposed 4(d) Rule, below).

Questions regarding whether specific activities would constitute violation of section 9 of the Act should be directed to the Alabama Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

II. Proposed Rule Issued Under Section 4(d) of the Act

Background

Section 4(d) of the Act contains two sentences. The first sentence states that the Secretary shall issue such regulations as she deems necessary and advisable to provide for the conservation of species listed as threatened species. The U.S. Supreme Court has noted that statutory language similar to the language in section 4(d) of the Act authorizing the Secretary to take action that she ''deems necessary and advisable'' affords a large degree of deference to the agency (see *Webster* v. *Doe,* 486 U.S. 592, 600 (1988)). Conservation is defined in the Act to mean the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Additionally, the second sentence of section 4(d) of the Act states that the Secretary may by regulation prohibit with respect to any threatened species any act prohibited under section 9(a)(1), in the case of fish or wildlife, or section 9(a)(2), in the case of plants. Thus, the combination of the two sentences of section 4(d) provides the Secretary with wide latitude of discretion to select and promulgate appropriate regulations tailored to the specific conservation needs of the threatened species. The second sentence grants particularly broad discretion to the Service when adopting one or more of the prohibitions under section 9.

The courts have recognized the extent of the Secretary's discretion under this standard to develop rules that are appropriate for the conservation of a species. For example, courts have upheld, as a valid exercise of agency authority, rules developed under section 4(d) that included limited prohibitions against takings (see *Alsea Valley Alliance* v. *Lautenbacher,* 2007 WL 2344927 (D. Or. 2007); *Washington Environmental Council* v. *National Marine Fisheries Service,* 2002 WL 511479 (W.D. Wash. 2002)). Courts have also upheld 4(d) rules that do not address all of the threats a species faces (see *State of Louisiana* v. *Verity,* 853 F.2d 322 (5th Cir. 1988)). As noted in the legislative history when the Act was initially enacted, ''once an animal is on the threatened list, the Secretary has an almost infinite number of options available to [her] with regard to the permitted activities for those species. [She] may, for example, permit taking, but not importation of such species, or [she] may choose to forbid both taking and importation but allow the transportation of such species'' (H.R. Rep. No. 412, 93rd Cong., 1st Sess. 1973).

The provisions of this proposed 4(d) rule would promote conservation of the coal darter by encouraging management of the landscape in ways that meet both watershed and riparian management purposes and facilitate the conservation of the species. The provisions of this proposed 4(d) rule are one of many tools that we would use to promote the conservation of the coal darter. This proposed 4(d) rule would apply only if and when we make final the listing of the coal darter as a threatened species.

As mentioned previously in Available Conservation Measures, section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. In addition, even before the listing of any species or the designation of its critical habitat is finalized, section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed under the Act or result in the destruction or adverse modification of critical habitat proposed to be designated for such species.

These requirements are the same for a threatened species with a species-specific 4(d) rule. For example, as with an endangered species, if a Federal agency determines that an action is ''not likely to adversely affect'' a threatened species, it will require the Service's written concurrence (see 50 CFR 402.13(c)). Similarly, if a Federal agency determinates that an action is ''likely to adversely affect'' a threatened species, the action will require formal consultation with the Service and the formulation of a biological opinion (see 50 CFR 402.14(a)).

Provisions of the Proposed 4(d) Rule

Exercising the Secretary's authority under section 4(d) of the Act, we have developed a proposed rule that is designed to address the coal darter's conservation needs. As discussed previously under Summary of Biological Status and Threats, we have concluded that the darter is likely to become in danger of extinction within the foreseeable future primarily due to habitat loss or degradation from the following activities or conditions: hydrologic alteration by impoundments, including dams and other barriers;

agriculture (poultry farming); urban development or change in land cover, including increased density of residential and commercial infrastructure; resource extraction, including mining and silviculture operations that do not follow State-approved BMPs; diminished water quality from point and nonpoint source chemical contamination and sedimentation; and climate change. Section 4(d) requires the Secretary to issue such regulations as she deems necessary and advisable to provide for the conservation of each threatened species and authorizes the Secretary to include among those protective regulations any of the prohibitions that section 9(a)(1) of the Act prescribes for endangered species. We find that, if finalized, the protections, prohibitions, and exceptions in this proposed 4(d) rule as a whole satisfy the requirement in section 4(d) of the Act to issue regulations deemed necessary and advisable to provide for the conservation of the coal darter.

The protective regulations we are proposing for the coal darter incorporate prohibitions from section 9(a)(1) of the Act to address the threats to the species. Section 9(a)(1) prohibits the following activities for endangered wildlife: importing or exporting; take; possession and other acts with unlawfully taken specimens; delivering, receiving, carrying, transporting, or shipping in interstate or foreign commerce in the course of commercial activity; or selling or offering for sale in interstate or foreign commerce. This protective regulation includes all of these prohibitions because the coal darter is at risk of extinction within the foreseeable future and putting these prohibitions in place would help to preserve the species' remaining populations and decrease synergistic, negative effects from other ongoing or future threats.

In particular, this proposed 4(d) rule would provide for the conservation of the coal darter by prohibiting the following activities, unless they fall within specific exceptions or are otherwise authorized or permitted: import or export; take; possession and other acts with unlawfully taken specimens; delivery, receipt, carriage, transport, or shipment in interstate or foreign commerce in the course of commercial activity; and sale or offer for sale in interstate or foreign commerce. We also include several exceptions to these prohibitions, which, along with the prohibitions, are set forth below.

Under the Act, ''take'' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Some of these provisions have been further defined in regulations at 50 CFR 17.3. Take can result knowingly or otherwise, by direct and indirect impacts, intentionally or incidentally. Regulating take would help preserve the species' remaining populations and slow their rate of decline. Therefore, we propose to prohibit take of the coal darter, except for take resulting from those actions and activities specifically excepted by the 4(d) rule. Exceptions to the prohibition on take would include all of the general exceptions to the prohibition on take of endangered wildlife, as set forth in 50 CFR 17.21, and additional exceptions, as described below.

The proposed 4(d) rule would also provide for the conservation of the species by allowing exceptions that incentivize conservation actions or that, while they may have some minimal level of take of the coal darter, are not expected to rise to the level that would have a negative impact (*i.e.,* would have only de minimis impacts) on the species' conservation. The proposed exceptions to the prohibitions include: take incidental to any otherwise lawful activity caused by channel restoration; streambank restoration; habitat improvement activities; and silviculture and forestry activities that follow best management practices (described below). These are expected to have negligible impacts to the coal darter and its habitat.

Channel Restoration—Channel restoration is used as a technique to restore degraded, physically unstable streams back to natural, physically stable, ecologically functioning streams. When done correctly, these projects reduce, ameliorate, or fix unnatural erosion, head cutting, and/or sedimentation. Thus, channel restoration projects result in geomorphically stable stream channels that maintain the appropriate lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation and include stable riffle-run-pool complexes that consist of silt-free gravel, coarse sand, cobble, boulders, woody structure, and river weed (*Podostemum ceratophyllum*). This provision of the proposed 4(d) rule for channel restoration would promote conservation of the coal darter by excepting incidental take resulting from activities that would improve channel conditions and restore degraded, physically unstable streams or stream segments. We anticipate these activities will advance ecological conditions within a watershed to a more natural state that would benefit the coal darter.

Streambank Stabilization—Streambank stabilization is used as a habitat restoration technique to restore degraded and eroded streambanks back to natively vegetated, stable streambanks. When done correctly, these projects reduce bank erosion and instream sedimentation, resulting in improved habitat conditions for aquatic species. Therefore, we would allow streambanks to be stabilized using the following bioengineering methods: native live stakes (live, vegetative cuttings inserted or tamped into the ground in a manner that allows the stake to take root and grow), native live fascines (live branch cuttings, usually willows, bound together into long, cigar-shaped bundles), planting of bare-root seedlings or native brush layering (cuttings or branches of easily rooted tree species layered between successive lifts of soil fill). All methods should use plant species native to the region where the project is being conducted. These methods would not include the sole use of quarried rock (riprap) or the use of rock baskets or gabion structures, but quarried rock (riprap), rock baskets, or gabion structures could be used in conjunction with the allowed bioengineering methods described above. This provision of the proposed 4(d) rule would promote conservation of the coal darter by excepting from the prohibition on incidental take those streambank stabilization activities that would improve habitat conditions by reducing bank erosion and instream sedimentation.

Habitat Improvement Activities—Activities that improve watershed, riparian, or habitat conditions within the range of the coal darter would provide for the conservation of the species. Activities carried out under the Working Lands for Wildlife program of the Natural Resources Conservation Service, U.S. Department of Agriculture, or similar projects, which may include projects funded by the Service's Partners for Fish and Wildlife Program or the EPA's 319 grant program, would benefit the species if they do not alter habitats known to be used by the species beyond its tolerances and are implemented with a primary objective of improving environmental conditions to support the aquatic biodiversity of flowing water habitats. This provision of the proposed 4(d) rule would promote conservation of the coal darter by excepting from the prohibition on incidental take those activities described above that improve conditions for the species and that would likely increase resiliency in the

Black Warrior, Cahaba, and Coosa Rivers resiliency units.

Silviculture and Forestry Management Activities—Silviculture and forest management activities that use State-approved BMPs to protect water and sediment quality and stream and riparian habitat would provide for the conservation of the coal darter. Best management practices would have to be designed to reduce sedimentation, erosion, and bank destruction, thereby protecting instream habitat for the species. We recognize that silvicultural operations are widely implemented in accordance with State-approved BMPs (as reviewed by Cristan et al. 2018, entire), and the adherence to these BMPs broadly protects water quality, particularly related to sedimentation (as reviewed by Cristan et al. 2016, entire; Warrington et al. 2017, entire; Schilling et al. 2021, entire). This provision of the 4(d) rule would promote conservation of the coal darter by excepting from the prohibition on incidental take those silviculture and forest management activities that use State-approved BMPs because this exception would allow these activities to continue while protecting the coal darter's habitat.

Despite these prohibitions regarding threatened species, we may under certain circumstances issue permits to carry out one or more otherwise-prohibited activities, including those described above. The regulations that govern permits for threatened wildlife state that the Director may issue a permit authorizing any activity otherwise prohibited with regard to threatened species. These include permits issued for the following purposes: for scientific purposes, to enhance propagation or survival, for economic hardship, for zoological exhibition, for educational purposes, for incidental taking, or for special purposes consistent with the purposes of the Act (50 CFR 17.32). The statute also contains certain exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

We recognize the special and unique relationship with our State natural resource agency partners in contributing to conservation of listed species. State agencies often possess scientific data and valuable expertise on the status and distribution of endangered, threatened, and candidate species of wildlife and plants. State agencies, because of their authorities and their close working relationships with local governments and landowners, are in a unique position to assist us in implementing all aspects of the Act. In this regard, section 6 of the Act provides that we must cooperate to the maximum extent practicable with the states in carrying out programs authorized by the Act. Therefore, any qualified employee or agent of a State conservation agency that is a party to a cooperative agreement with us in accordance with section 6(c) of the Act, who is designated by his or her agency for such purposes, would be able to conduct activities designed to conserve coal darter that may result in otherwise prohibited take without additional authorization.

Nothing in this proposed 4(d) rule would change in any way the recovery planning provisions of section 4(f) of the Act, the consultation requirements under section 7 of the Act, or the ability of the Service to enter into conservation partnerships for the management and protection of the coal darter. However, interagency cooperation may be further streamlined through planned programmatic consultations for the species between Federal agencies and the Service, where appropriate. We ask the public, particularly State agencies and other interested stakeholders that may be affected by the proposed 4(d) rule, to provide comments and suggestions regarding additional guidance and methods that the Service could provide or use, respectively, to streamline the implementation of this proposed 4(d) rule (see Information Requested, above).

III. Critical Habitat

Background

Critical habitat is defined in section 3 of the Act as:

(1) The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the Act, on which are found those physical or biological features

(a) Essential to the conservation of the species, and

(b) Which may require special management considerations or protection; and

(2) Specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

We have found critical habitat to be prudent and determinable for the coal darter and have developed a proposed critical habitat rule for this species. On October 25, 2023, we were informed that the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget (OMB) determined that our proposed critical habitat rule is significant under Executive Order 12866. Therefore, we will publish a proposed critical habitat rule for the coal darter following interagency review of the proposed critical habitat rule.

Required Determinations

Clarity of the Rule

We are required by E.O.s 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

(1) Be logically organized;

(2) Use the active voice to address readers directly;

(3) Use clear language rather than jargon;

(4) Be divided into short sections and sentences; and

(5) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in **ADDRESSES**. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

National Environmental Policy Act (42 U.S.C. 4321 et seq.)

Regulations adopted pursuant to section 4(a) of the Act are exempt from the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*) and do not require an environmental analysis under NEPA. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This includes listing, delisting, and reclassification rules, as well as critical habitat designations and species-specific protective regulations promulgated concurrently with a decision to list or reclassify a species as threatened. The courts have upheld this position (*e.g., Douglas County* v. *Babbitt,* 48 F.3d 1495 (9th Cir. 1995) (critical habitat); *Center for Biological Diversity* v. *U.S. Fish and Wildlife Service,* 2005 WL 2000928 (N.D. Cal. Aug. 19, 2005) (concurrent 4(d) rule)).

Government-to-Government Relationship With Tribes

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), E.O. 13175 (Consultation and Coordination with Indian Tribal Governments), and the Department of the Interior's manual at

512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with federally recognized Tribes on a government-to-government basis. In accordance with Secretary's Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with Tribes in developing programs for healthy ecosystems, to acknowledge that Tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes. We have determined that no Tribal lands fall within the occupied range of the coal darter, so no Tribes would be affected by the listing of the species.

References Cited

A complete list of references cited in this rulemaking is available on the internet at *https://www.regulations.gov* and upon request from the Alabama Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this proposed rule are the staff members of the Fish and Wildlife Service's Species Assessment Team and the Alabama Ecological Services Field Office.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Plants, Reporting and recordkeeping requirements, Transportation, Wildlife.

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

■ 1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

■ 2. In § 17.11, amend paragraph (h) by adding an entry for ''Darter, coal'' to the List of Endangered and Threatened Wildlife in alphabetical order under FISHES to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
*	*	*	*	* * *
Fishes				
*	*	*	*	* * *
Darter, coal	*Percina brevicauda*.	Wherever found ..	T	[**Federal Register** citation when published as a final rule]; 50 CFR 17.44(ii).[4d]
*	*	*	*	* * *

■ 3. Amend § 17.44 by adding paragraph (ii) to read as follows:

§ 17.44 Special rules—fishes.

* * * * *

(ii) Coal darter (*Percina brevicauda*).

(1) *Prohibitions.* The following prohibitions that apply to endangered wildlife also apply to the coal darter. Except as provided under paragraph (ii)(2) of this section and §§ 17.4 and 17.5, it is unlawful for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit, or cause to be committed, any of the following acts in regard to this species:

(i) Import or export, as set forth at § 17.21(b) for endangered wildlife.

(ii) Take, as set forth at § 17.21(c)(1) for endangered wildlife.

(iii) Possession and other acts with unlawfully taken wildlife, as set forth at § 17.21(d)(1) for endangered wildlife.

(iv) Interstate or foreign commerce in the course of commercial activity, as set forth at § 17.21(e) for endangered wildlife.

(v) Sale or offer for sale, as set forth at § 17.21(f) for endangered wildlife.

(2) *Exceptions from prohibitions.* In regard to this species, you may:

(i) Conduct activities as authorized by a permit under § 17.32.

(ii) Take, as set forth at § 17.21(c)(2) through (c)(4) for endangered wildlife.

(iii) Take, as set forth at § 17.31(b).

(iv) Possess and engage in other acts with unlawfully taken wildlife, as set forth at § 17.21(d)(2) for endangered wildlife.

(v) Take incidental to an otherwise lawful activity caused by:

(A) Channel restoration projects that create natural, physically stable, ecologically functioning streams. These projects can be accomplished using a variety of methods, but the desired outcome is a natural channel with geomorphically stable stream channels that maintain the appropriate lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation and include stable riffle-run-pool complexes that consist of silt-free gravel, coarse sand, cobble, boulders, woody structure, and river weed (*Podostemum ceratophyllum*).

(B) Streambank stabilization projects that use bioengineering methods to replace pre-existing, bare, eroding stream banks with natively vegetated, stable stream banks, thereby reducing bank erosion and instream sedimentation, and improving habitat conditions for the coal darter. Stream banks may be stabilized using native live stakes (live, vegetative cuttings inserted or tamped into the ground in a manner that allows the stake to take root and grow), native live fascines (live branch cuttings, usually willows, bound together into long, cigar-shaped bundles), planting of bare-root seedlings or native brush layering (cuttings or branches of easily rooted tree species layered between successive lifts of soil fill). Stream banks must not be stabilized solely through the use of quarried rock (riprap) or the use of rock baskets or gabion structures.

(C) Activities that improve the watershed, riparian, or habitat conditions for the coal darter within the range of the species. Activities carried out under the Working Lands for Wildlife program of the Natural Resources Conservation Service, U.S.

Department of Agriculture, or similar projects, which may include projects funded by the Service's Partners for Fish and Wildlife Program or the Environmental Protection Agency's 319 grant program, benefit the species if they do not alter habitats known to be used by the species beyond its tolerances and are implemented with a primary objective of improving environmental conditions to support the aquatic biodiversity of flowing water habitats.

(D) Silviculture and forest management activities that use State-approved best management practices to protect water and sediment quality and stream and riparian habitat. Best management practices must be designed to reduce sedimentation, erosion, and bank destruction, thereby protecting instream habitat for the coal darter.

Martha Williams,

Director, U.S. Fish and Wildlife Service.

[FR Doc. 2023–27873 Filed 12–20–23; 8:45 am]

BILLING CODE 4333–15–P