DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R4–ES–2025–0033; FXES1111090FEDR–256–FF09E21000]

RIN 1018–BI18

Endangered and Threatened Wildlife and Plants; Endangered Species Status for Barrens Darter

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to list the Barrens darter (*Etheostoma forbesi*), a fish species from Cannon, Coffee, Grundy, and Warren Counties, Tennessee, as an endangered 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 Barrens darter. After a review of the best scientific and commercial data available, we find that listing the species is warranted. Accordingly, we propose to list the Barrens darter as an endangered species under the Act. 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. We find that designating critical habitat for this species is not determinable at this time.

DATES: We will accept comments received or postmarked on or before [**INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER***]. 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 [**INSERT DATE 45 DAYS**

AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*].

ADDRESSES: *Comment submission*: 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–2025–0033, 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–2025–0033, 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/tennessee-ecological-services, at https://www.regulations.gov at Docket No. FWS–R4–ES–2025–0033, or both.

FOR FURTHER INFORMATION CONTACT: Daniel Elbert, Field Supervisor, U.S. Fish and Wildlife Service, Tennessee Ecological Services Field Office; telephone 931–431–2480; daniel_elbert@fws.gov. 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–2025–0033 on https://www.regulations.gov for a document that summarizes this proposed rule.

SUPPLEMENTARY INFORMATION:

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.

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, as 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, and section 4(b)(2) of the Act directs that the Secretary shall designate critical habitat on the basis of the best scientific 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 threatened instead of endangered, or we may conclude that the species does not warrant listing as either an endangered species or a threatened 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

For a detailed description of Federal actions concerning the Barrens darter that occurred prior to April 2019, please refer to the 12-month not-warranted finding we published in the *Federal Register* on April 4, 2019 (84 FR 13237).

On September 27, 2022, the Center for Biological Diversity (CBD) filed a complaint challenging the merits of our 2019 12-month not-warranted finding (*Center for Biological Diversity* v. *Service, et al.*, No. 1:22-cv-02922 (D.D.C.)). Subsequently, the CBD and Service entered into a stipulated settlement agreement whereby both parties

agreed the Service would submit to the Office of the Federal Register for publication a new 12-month finding for the Barrens darter by June 30, 2025. By publishing this proposed rule, which constitutes our 12-month finding and proposes to list the Barrens darter as an endangered species under the Act, the Service is complying with the settlement agreement.

Peer Review

To inform the new 12-month finding stipulated by the settlement agreement, a species status assessment (SSA) team prepared, updated, and revised the Barrens darter SSA report (Service 2025, entire). The SSA team was composed of Service biologists, in consultation with other species experts. The SSA report (version 3.0: Service 2025, entire) represents a compilation of the best scientific and commercial data available concerning the status of the species, including new scientific information that has become available since our initial SSA report (version 1.0: Service 2018, entire); the SSA report also includes 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 and recovery actions under the Act (https://www.fws.gov/sites/default/files/documents/peer-review-policy-directors-memo-2016-08-22.pdf), we will solicit the independent scientific review of the Barrens darter SSA report (Service 2025, entire) from at least three appropriate specialists. The SSA report will be made available for peer and partner review concurrently with this proposed listing rule. We will address and incorporate the results of the peer reviews, as appropriate, into the updated SSA report and the final decision document.

I. Proposed Listing Determination

Background

A thorough review of the taxonomy, life history, and ecology of the Barrens darter is presented in the SSA report (version 3.0; Service 2025, pp. 5–9).

The Barrens darter is a small fish endemic to streams in the Barrens Plateau region of middle Tennessee. It is found in the Collins River watershed, which is a tributary to the Caney Fork of the Cumberland River drainage (see figure 1, below). The Barrens darter belongs to the *Stigmacerca* clade (lineage of species that includes a common ancestor and its descendants), with all 11 member species sharing the distinguishing characteristic of a vertical row of three black dots at the base of the tail fin. Per the formal species description that is part of a larger review of closely related species (Page et al. 1992, entire), females and non-breeding males in the clade have a pattern of brown mottling on a light tan background, 9 to 13 small blotches along the sides, and 6 to 8 dark brown saddles on the back. In breeding male Barrens darters, the second dorsal fin is black with a yellow-gold margin that is lightly speckled with black.

Barrens darters occur almost exclusively in small headwater streams with slab rock substrates and strong groundwater influence. They likely prey on larval aquatic insects and microcrustaceans, as has been observed for other species in *Stigmacerca*. Spawning occurs between mid-March and early June. During spawning, the male establishes a territory around a cavity under a slab rock and, based on its body size and quality of its nest cavity, attracts females. Males also produce sounds to court females and defend the nest cavity from other males. Once a female has chosen to spawn with a male, the pair invert under the rock and the female adheres eggs to the underside of the rock in a single layer. Multiple females will lay eggs in a single nest, with average count per nest of 457 eggs and a maximum count of 1,992 eggs observed in one study (Bergen et al. 2012, p. 235). The male cleans the eggs and guards them from predators until they

hatch, in about 15.5 days on average. After hatching larvae quickly drop toward the stream bottom, remaining among the substrates near the nest rock. In the closely related spottail darter (*Etheostoma squamiceps*), the transition from the relatively non-mobile larval stage to the more mobile juvenile stage was complete at approximately 2 months (Page 1974, pp. 11-12). Time from larva to juvenile is likely similar in the Barrens darter. Barrens darters reach adulthood (sexual maturity) between one to two years post-hatching, have an approximate lifespan of 3 years, and may rarely live to 4 years of age.

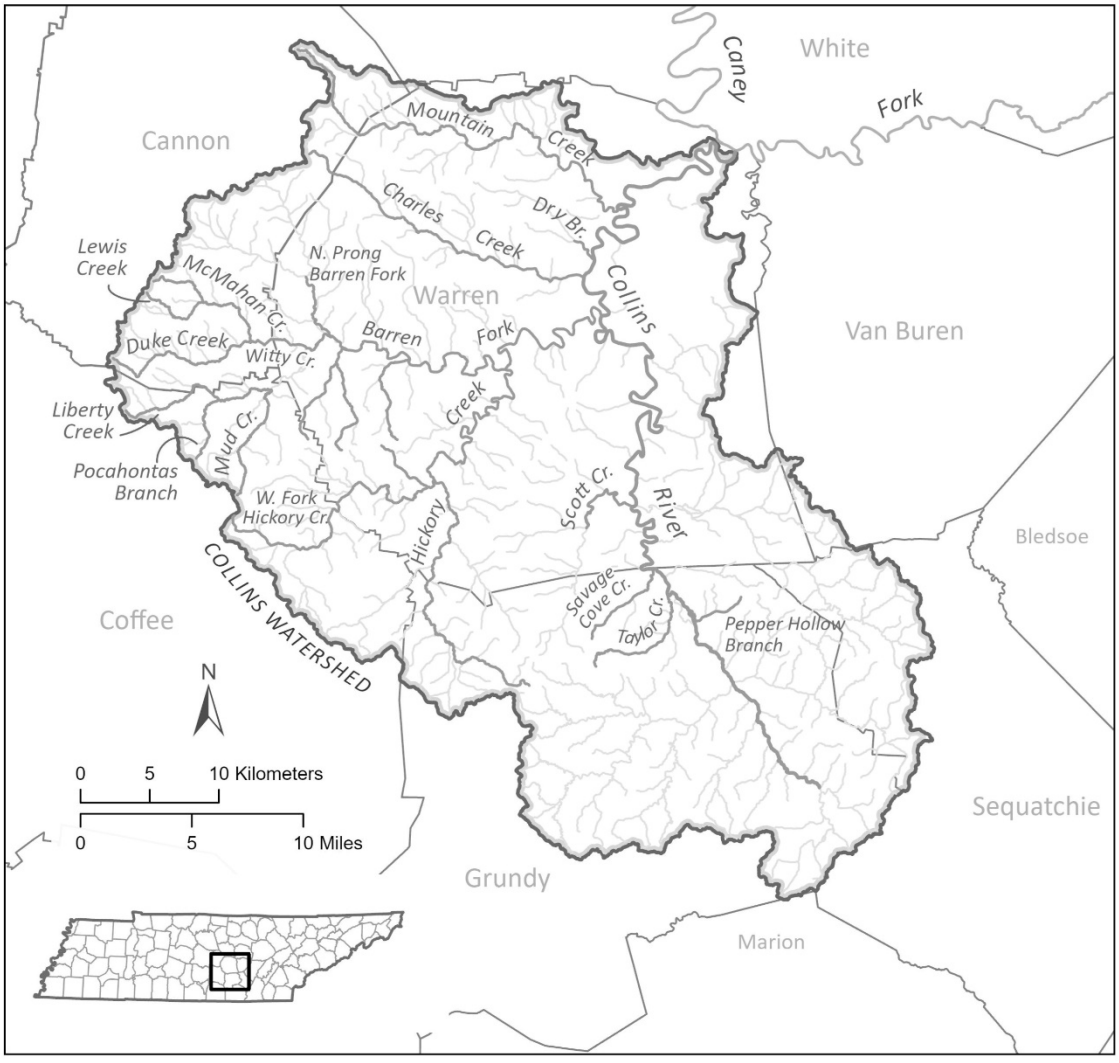

Figure 1. Map of the Collins River system in Tennessee.

We assessed the viability of the Barrens darter in our initial SSA report (Service 2018, entire), which informed our 2019 not-warranted 12-month finding (84 FR 13237;

April 4, 2019). Concurrent with development of the initial SSA report, ichthyologists had initiated a Barrens darter distribution and population genetics survey. The analysis of the survey was published in a peer-reviewed journal and mapped the expansion of native fringed darters (*Etheostoma crossopterum*) upstream, in some cases into headwater streams occupied by Barrens darters where fringed darters completely replaced Barrens darters, through competition and hybridization (see **Summary of Biological Status and Threats**, below), over time (Harrington et al. 2020, entire). The information provided in Harrington et al. (2020) highlighted the immediacy of the threat posed by the fringed darter, which was not well understood when we produced our 2018 SSA report. It also documented the current rangewide distribution of the Barrens darter, detecting extirpations and adding occurrence records in previously undocumented sites. As discussed in this proposed rule, we compiled and used the best scientific information currently available, including the data provided in Harrington et al. (2020) to update our SSA (Service 2025, entire) and subsequent 12-month finding and status determination.

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.

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 definition of an "endangered species" or a "threatened species" only after conducting this cumulative analysis and describing the expected effect on the species.

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 which is further described in the 2009 Memorandum Opinion on the foreseeable future from the Department of the Interior, Office of the Solicitor (M–37021, January 16, 2009; "M-Opinion," available online at https://www.doi.gov/sites/doi.opengov.ibmcloud.com/files/uploads/M-37021.pdf). We need not identify the foreseeable future in terms of a specific period of time. We will describe the foreseeable future on a case-by-case basis, using the best available data and taking into account considerations such as the species' life-history characteristics, threat projection timeframes, and environmental variability.

Analytical Framework

The SSA report documents the results of our comprehensive biological review of the best scientific and commercial data available 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 viability of the Barrens darter, 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 scientific and commercial data available to characterize viability as the ability of a species to sustain populations in the wild over time, which we then used 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–2025–0033 on https://www.regulations.gov.

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.

Species Needs

To maintain viability at the individual level and species level, Barrens darters need third-order (method in Strahler 1957, p. 914) or smaller headwater streams (Zuber 2014, p. 46), as they are not generally found in larger streams. Areas with intact, rather than eroded, stream banks are another important habitat feature that support Barrens darters (Zuber 2014, p. 47). Intact stream banks harbor vegetation that provides shade that moderates water temperatures, and these banks ensure rocks used for shelter and spawning are not covered by excessive sediments. Barrens darters have been observed mostly in streams with moderate pH (average 7.3, but in one case, as high 9.0), and relatively low total dissolved solids (less than 135 parts per million) (Zuber 2014, p. 45), indicating these values are reasonable parameters for viability. Observations during the March to June spawning season indicated important habitat features for individuals, including flat rocks for nesting, relatively low water depth (40 centimeters (15.7 inches) or less), and water temperatures ranging from 6 to 23 degrees Celsius (43 to 73 degrees Fahrenheit) (Bergen et al. 2012, pp. 436–437). As discussed below (see *Threats*), fringed darters are a threat to Barrens darter persistence. Therefore, Barrens darters need sites that are free of fringed darters.

At the species level, the Barrens darter needs connected populations distributed across multiple streams and watersheds. The Barrens darter also needs sufficient resources (food, space, refugia, etc.) to sustain enough individuals so that populations can withstand normal demographic and environmental stochasticity (resiliency). In addition, dispersion of populations within multiple streams and watersheds (redundancy) reduces

the likelihood of rangewide impacts from catastrophic events, such as an extreme drought or flood that kills individuals or causes them to move to unsuitable habitats, or invasion of a species that competes for spawning and feeding resources. Long-term viability will require multiple resilient populations to persist into the future; for the Barrens darter, this means good habitat (resiliency) to support multiple populations in close enough proximity and with sufficient connectivity to allow for emigration/immigration (redundancy). Sufficient connectivity will also support maintenance of genetic diversity and adaptive capacity (representation).

Threats

The greatest threat to the Barrens darter is competition and hybridization with the fringed darter, which has expanded its range in the Collins River drainage over the past several decades (Harrington et al. 2020, entire). The spatial pattern of fringed darter incursion into and near streams occupied by Barrens darters was not fully assessed and mapped until 2020 (Harrington et al. 2020, entire). Due to temporal and spatial gaps in fish surveys in the Collins River system, the intensity of the fringed darter invasion remained unclear prior to the new Barrens darter and fringed darter distribution records reported in 2020. Additionally, the taxonomic identity of several collected specimens held in museum collections was uncertain prior to 2020. This uncertainty was resolved as the museum specimens that were not confidently identified as Barrens darter, fringed darter, or hybrids were verified genetically or morphologically in the study reported in 2020. In summary and as reported in Harrington et al. (2020, entire), compiling all historical distribution data, resurveying historical sites and surveying new sites, and verifying the taxonomic identity of female specimens and hybrids using genetics and morphology provided the most comprehensive information to date on the changes in the distribution of the two species in the Collins River system. This information clearly showed the broad expansion of the fringed darter into or close to streams occupied by

Barrens darters. Because fringed darters hybridize and compete with Barrens darters for nesting space (see "Fringed Darter Threat of Native Invasion", below), the ongoing expansion of fringed darters into Barrens darter habitat is the greatest threat to the Barrens darter. This threat was not fully understood or incorporated in the 2019 status determination (84 FR 13237), which was informed by a Species Status Assessment completed in 2018 (Service 2018, entire); however, the imminence and magnitude of this threat is now fully recognized and used to inform this determination.

Other major threats influencing the viability of the Barrens darter are habitat loss from degradation of stream banks, loss of instream cover, degradation of water quality, and habitat fragmentation and isolation. When these threats are combined with effects from the invasion of the fringed darter, they act synergistically to negatively impact Barrens darter populations. The habitat-related threats stem from agricultural activities and associated riparian clearing that alters instream habitat and hydrology needed by the Barrens darter. In addition to row crops and grazing, agriculture on the Barrens Plateau includes several plant nurseries, which require water withdrawals that may reduce flows in headwater streams and exacerbate the effects of drought.

Fringed Darter Threat of Native Invasion

The fringed darter has a large native range, occurring in the middle and lower Cumberland River system, middle and lower Tennessee River system, and two Mississippi River tributaries. Fringed darters occupy a broader range of stream sizes than Barrens darters, and based on historical records, fringed darters likely occurred in tributaries to the lower Collins River system (see figure 2, below). One fringed darter specimen voucher (University of Tennessee Etnier Ichthyological Collection, UT 91.646) was collected in the mainstem of Barren Fork, in McMinnville, in 1972. Records from 1994 show several sites with fringed darter occurrences in Mountain Creek (where Barrens darters are not known to have occurred), which is the lower-most tributary to the

Collins River, and in tributaries of the Caney Fork, downstream from the mouth of the Collins River (Madison 1995, p. 78). Further, fringed darters likely are native to the lower Collins River system as indicated by the presence of a mitochondrial DNA haplotype found in the Upper Caney River and Collins River systems that is not found elsewhere in the Cumberland River system (Harrington et al. 2020, p. 6).

Over the past 40 to 50 years, fringed darters have expanded their range into the upper reaches of the Collins River system, which may be due to a phenomenon called native invasion (Scott and Helfman 2001, pp. 9–11). This occurs when changes to the landscape make habitats in headwater streams resemble those in medium and larger streams, creating favorable conditions for invasion by species that naturally occur and once were limited to downstream habitats. Fringed darters have replaced Barrens darters in the West Fork Hickory Creek system, where Barrens darters were extirpated sometime between 1983 and 2001, and in Mud Creek (Barren Fork system), where Barrens darters were extirpated sometime between 2009 and 2018 (Harrington et al. 2020, p. 4; see figure 2, below). Both creek systems are impaired by alteration of streamside vegetation, and West Fork Hickory Creek is also impaired by *E. coli* and nutrients (Tennessee 2024 List of Impaired and Threatened Waters), suggesting native invasion as a factor in the extirpations.

Data collected to date suggest gene flow from Barrens darters into fringed darter populations, and possible bias of female Barrens darters hybridizing with male fringed darters, which is the larger of the two species (Service 2018, p. 15; Harrington et al. 2020, pp. 17–19). Of 364 Collins River system fringed darters examined, 4 specimens from the West Fork Hickory Creek system and 8 specimens from the Mud Creek and McAfee Creeks in the South Fork Barren system were found to have Barrens darter mitochondrial DNA and fringed darter nuclear DNA (Harrington et al. 2020, pp. 14–15). Mitochondrial DNA is inherited only from the mother in most species, including fishes.

Therefore, the occurrence of Barrens darter DNA in fringed darters (based on morphology) may point to female Barrens darters preferentially selecting the larger male fringed darters to breed with when the species co-occur or that fringed darters are more successful in competing for spawning cavities. Because female Barrens darters must mate in spawning cavities, male fringed darters successfully competing for the spawning cavities results in female Barrens darters mating with male fringed darters rather than with male Barrens darters.

Fringed darters are a substantial threat to Barrens darters by competing for spawning space and mates, and likely for other resources including prey and cover. After fringed darters colonize a Barrens darter site, the Barrens darter population is at high risk of becoming replaced over time, as some of the Barrens darters lose their genetic identity through hybridization. The male Barrens darters, due to competition for mates and spawning cavities or female preference for fringed darters, may fail to produce offspring at sufficient rates to sustain future generations. Because Barrens darters have a short 3-year lifespan, most males survive long enough to attempt spawning in two seasons per lifetime. Thus, if only a few male Barrens darters successfully produce annually due to competition with fringed darters, the pace of replacing generations will be insufficient, quickly driving the Barrens darter population to extirpation.

Except for the upper Collins River, fringed darters have advanced relatively rapidly into the headwater habitats that Barrens darters need for survival. Habitat degradation present in many stream reaches of the Collins River system is a major threat to Barrens darters because, in addition to its direct effect of lost cover, it promotes invasion of fringed darters into the headwaters. Where Barrens darters and fringed darters have been observed to co-occur, Barrens darters became extirpated within 15 years. Therefore, due to competition, hybridization, and their ongoing expansion in the Collins

River system, which comprises the entirety of the range of the Barrens darter, fringed darters pose the greatest threat to the viability of the Barrens darter.

Although fish survey records prior to the 1980s are sparse, it appears that the Barrens darter's decline did not start (or the decline was not noticed) until fringed darters began moving into the Barrens darter's headwater habitat. Because Barrens darters withstood habitat and water quality disturbances for a long period prior to the fringed darter invasions, including times prior to the CWA or when the CWA regulations were first being implemented, it is more likely that the invasions together with habitat and water quality impacts, rather than habitat and water quality impacts alone, are a crucial driver of Barrens darter declines. In summary, competition and hybridization with the fringed darter is occurring in two of the three systems that comprise the Barren darter's range and is highly likely to continue.

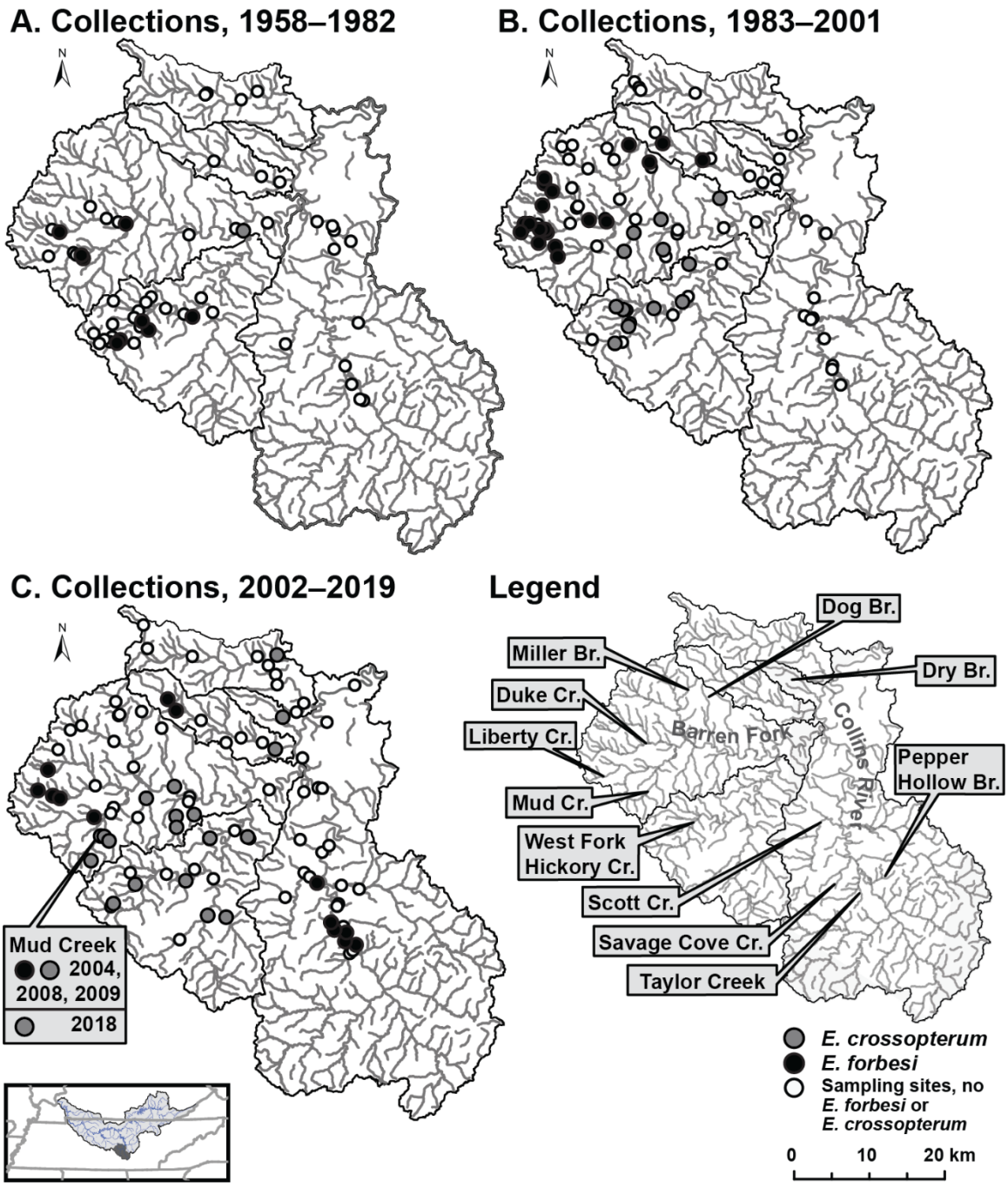

Figure 2. Records of Barrens darter and fringed darter in the Collins River system over time. Charles Creek, adjacent to the north boundary of the Barren Fork watershed, not labeled. From Harrington et al. (2020, p. 4), with permission.

Habitat Threats from Agricultural Activities and Riparian Clearing

Land cover and land use have a strong influence on the quality and quantity of water in streams (Allan 2004, entire; Freeman and Marcinek 2006, entire). Vegetation coverage and type can affect the timing, amount, temperature, and quality of water in

streams, and livestock with free access to stream channels and streambanks can have direct and indirect effects on water quality through waste and sedimentation. The Barrens Plateau area of Tennessee is very susceptible to impacts from agriculture according to the Tennessee State Wildlife Action Plan (Tennessee Wildlife Resources Agency (TWRA) 2015, p. 23).

Many of the streams within the Barrens darter's range are used as water sources for cattle and other livestock. Reduced riparian vegetation on lands where livestock have access to streams and where vegetation is destroyed by livestock or fencing is absent or insufficiently maintained can lead to increased water temperatures due to loss of shade. Elevated temperatures may reduce Barrens darter nest success by reducing the number of eggs produced, hatching rates, or larval survival, as was observed in a laboratory study of temperature effects on the fountain darter (*Etheostoma fonticola*) (Bonner et al 1998 p. 974). Unfettered cattle access increases bank erosion, which is negatively associated with Barrens darter occurrence (Zuber 2014, p. 95), and unfettered cattle access increases turbidity and sedimentation in streams. Sedimentation from livestock and other sources has the potential to cover cobble and other instream substrates, resulting in lower habitat quality, fewer food items, and fewer spawning cavities. In addition, influxes of large amounts of animal waste increase the amount of nutrients in streams and further reduce visibility, which can impact the spawning displays of Barrens darters. Increased bacterial levels, associated with nutrification, may increase the risk of infection to eggs, reducing egg viability (Pat Rakes, Conservation Fisheries, Inc. 2018, pers. comm.). Fungus-covered eggs in Barrens darter nests have been observed in Lewis Creek and Duke Creek in the Barren Fork system (Hansen et al. 2006, p. 66; Bergen et al. 2012, p. 438).

Several streams currently occupied by the Barrens darter have impaired water, impaired habitat quality, or both (Tennessee 2024 List of Impaired and Threatened Waters, not paginated). Charles Creek, a direct tributary to the lower Collins River, is

impaired by *Escherichia coli* (*E. coli*) along its entire length, but the State reports the source of the *E. coli* is unknown. Liberty Creek, in the Barren Fork system, is impaired by alteration of stream-side vegetation and cover due to crop production and grazing in the riparian area. Two tributaries to the Upper Collins River, Savage Cove Creek and Taylor Creek, are listed by the State as impaired. Savage Cove Creek is impaired by alteration of streamside vegetative cover due to specialty crop production (nurseries) and grazing in the riparian area. Taylor Creek is impaired by alteration of streamside vegetative cover, low dissolved oxygen, and sedimentation due to nurseries and silviculture activities. In summary, all three MUs currently occupied by the Barrens darter contain streams listed by the State as impaired and 4 of the 8 streams occupied by the species are experiencing impaired water or habitat quality, or both, and that impairment is expected to continue.

Effects of Drought

Barrens darter habitat can be diminished during droughts, and some streams in the Collins River system have occasionally dried out completely during periods of moderate drought (Harrington et al. 2020, p. 19). Flow in Duke Creek and Lewis Creek in the Barren Fork system ceased during parts of May and June 2009, coinciding with the species' spawning period, when the streams were reduced to stretches of isolated pools (Bergen et al. 2012, p. 237). As a headwater species, Barrens darters are likely adapted and resilient to occasional intermittent reduced flows or streambed drying. During moderate droughts, unless there is strong groundwater influence, the pattern of drying typically starts near the head of the stream channel and progresses downstream, and Barrens darters have adapted to this headwater flow dynamic. However, periods of drought require movement, usually downstream, to access wetted stream channels. Currently, the suitability of these downstream areas as drought refugia is diminished

because they have impaired habitat quality, are occupied by fringed darters, or both (see "Fringed Darter Threat of Native Invasion," above).

Conservation Efforts and Regulatory Mechanisms

Application of best management practices (BMPs), such as fencing livestock away from streambanks and riparian areas, providing alternative watering sources, and maintaining or planting riparian buffers with native vegetation, can positively affect the viability of the Barrens darter. However, outside of the few surveys and life-history studies that informed our SSA report, there have not been any targeted conservation efforts for the Barrens darter. This species occurs in streams located entirely on private land and does not receive the benefits of public conservation land. Efforts have been made to fence livestock out of streams and provide them alternate water sources in some places where Barrens darters occur. These are very limited in scale and amount of overlap with the Barrens darter's range. Most of these efforts have been funded and organized through Partners for Fish and Wildlife agreements with landowners, but most of the agreements have expired, so it is unclear whether riparian buffer maintenance is continuing at sites where the agreements were applied.

The Barrens darter is afforded some protection via State and Federal regulatory mechanisms. It is listed as endangered by the State of Tennessee (TWRA 2024, p. 2), making it unlawful to take the Barrens darter without a State permit. Additionally, the bluemask darter (*Etheostoma akatulo*) is federally listed as an endangered species under the Act, and the Barrens darter currently benefits from the Act's protections where these species' ranges overlap along approximately 2.3 mi (3.7 km) of the upper Collins River. The Clean Water Act of 1977 (CWA; 33 U.S.C. 1251 et seq.), as amended, which is implemented by Tennessee Department of Environmental Conservation through Tennessee's Water Quality Control Act of 1977 and its implementing State regulations, provides a level of protection to Barrens darter habitat and water quality. While the

protections afforded by these regulatory mechanisms have not fully prevented the degradation of some habitats used by the Barrens darter, as some streams occupied by the Barrens darter are recognized as having impaired water and habitat quality, the species has benefited from improvements in water quality and habitat conditions stemming from these mechanisms. For example, CWA section 319 grants for States to address nonpoint source runoff or CWA section 402 permits to reduce pollutants in point source discharges to levels that are protective of aquatic life have served to reduce impacts to Tennessee streams from effluents, runoff, and landscape disturbance.

Cumulative Effects

We note that, by using the SSA framework to guide our analysis of the scientific information documented in the SSA report (Service 2025, entire), we have analyzed the cumulative effects of identified threats and conservation actions on the species. To assess the current and future condition of the species, we evaluate the effects of all the relevant 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

Historically, the Barrens darter occurred in four watersheds in the Collins River system: Charles Creek, Barren Fork, West Fork Hickory Creek, and the upper Collins River. West Fork Hickory Creek feeds Hickory Creek, which feeds the lower Barren Fork upstream from the Barren Fork confluence with the Collins River (see figure 2, above). Charles Creek and Barren Fork feed the lower Collins River directly. The Barrens darter is extirpated from the West Fork Hickory Creek system, where it was last collected in 1982.

Each of the three watersheds where the Barrens darter is extant and the watershed where it is extirpated is treated as a management unit (MU) in our SSA report (version 3.0: Service 2025, entire). To assess the current resiliency of the MUs, we selected seven metrics that included two habitat factors and five population factors (see table 1, below). For habitat factors, the physical habitat metric was determined using the Tennessee Department of Environment and Conservation (TDEC) stream habitat assessment protocol for moderate to high gradient streams (TDEC 2017, p. I.I-D-1-24). This protocol scores habitat quality based on factors such as sediment deposition, substrate availability, channel alteration, riparian vegetation, etc. Water quality was rated based on designations from the U.S. Environmental Protection Agency (USEPA) and TDEC, such as the List of Impaired and Threatened Waters (covered by CWA section 303(d)) (see Habitat Threats from Agricultural Activities and Riparian Clearing section, above) as well as observations from field surveys.

We obtained population factor data from surveys and other records for the Barrens darter from 2009 through 2019 (Harrington et al. 2020, entire; Mattingly and Johansen 2017, entire; and Zuber 2014, entire). These survey efforts were standardized and used methods to specifically target darters across all size classes. Age structure criteria (high, moderate, or low categories) were based on the number of age classes present and whether juveniles were collected in the most recent survey. Due to population variability through time and across sites, as well as differential collection techniques between surveys, we characterized approximate abundance as the average number of Barrens darters collected at all the sites in a management unit. Occurrence extent was measured as the distance between the upstream-most and downstream-most occurrence record in a MU stream network, which approximated the size of the Barrens darter's range within each MU. Occurrence complexity describes the dispersion of the Barrens darter in each MU as the number of occupied tributaries feeding the mainstem. Presence

of fringed darters characterizes the degree of threat they pose to Barrens darters via competition, hybridization, and likely replacement of Barrens darters once the two species come into contact. Within each MU, the fringed darter presence metric was measured as the ratio of streams occupied by the fringed darter to streams occupied by the Barrens darter. If fringed darters are present in a MU, the overall current resiliency is rated as low, given the scope and magnitude of this threat to the species, which outweigh all other threats combined.

Table 1. Factors and criteria for assessing population (MU) resiliency.

Factor	Type	High	Moderate	Low	Unsuitable
Physical Habitat Score	Habitat	151–200	101–150	0–100	Does not support survival
Water Quality	Habitat	Minimal issues	Issues recognized, e.g., CWA 303(d) streams	Issues known to impact populations	Does not support survival
Age Structure	Population	Two to three age classes, including juveniles	One adult age class and juveniles	One age class	Extirpated
Approximate Abundance	Population	Greater than 15 fish per 100 meters (m) (328 feet (ft))	5 to 15 fish per 100 m (328 ft)	Fewer than 5 fish per 100 m (328 ft)	Extirpated
Occurrence Extent	Population	Range greater than 10 stream mi (16.1 km)	Range 5 to 10 stream mi (8.0 to 16.1 km)	Range less than 5 stream mi (8.0 km)	Extirpated
Occurrence Complexity	Population	Occupies main channel and multiple tributaries	Occupies main channel and one tributary	Occupies main channel only	Extirpated
Fringed Darter Occurrence	Population	None in MU	Ratio of tributaries occupied by fringed darter to those	Ratio of tributaries occupied by fringed darter to those	Extirpated

			occupied by Barrens darter less than 50 percent	occupied by Barrens darter greater than 50 percent	

Currently, the Barren Fork and Charles Creek MUs have low resiliency, the Upper Collins River MU has moderate to high resiliency, and the Barrens darter is extirpated from the Hickory Creek MU (table 2). Although occurrence extent is classified as “high” in the Upper Collins River and Barren Fork MUs, the stream lengths that approximate the range in these units are small, measuring 10.4 mi (16.7 km) and 14.7 mi (23.7 km), respectively. The Barren Fork system’s overall moderate habitat and water quality (table 2) derives from averaging the classifications for those two metrics in all streams currently and historically occupied by Barrens darters, although both metrics are low in some occupied streams (discussed below). Occurrence extent is only 1 mi (1.6 km) in the Charles Creek unit, in a single reach of the mainstem (low occurrence complexity).

Table 2. Classification of resiliency factors and current resiliency of Barrens darter management units (MUs).

MU	Physical Habitat	Water Quality	Age Structure	Approximate Abundance	Occurrence Extent	Occurrence Complexity	Fringed Darter Presence*	Resiliency
Charles Creek	Moderate	Moderate	Low	Low	Low	Low	Low	Low
Barren Fork	Moderate	Moderate	High	High	High	Moderate	Low	Low
Hickory Creek	Moderate	Low	Extirpated	Extirpated	Extirpated	Extirpated	Extirpated	None (Extirpated)
Upper Collins River	Moderate-Low	Low	High	Mod	High	High	High	Moderate-High

*Low resiliency rating is assigned for MUs with high levels of fringed darter presence.

Considering the strong negative influence that fringed darters have on Barrens darters, coupled with the impacts of habitat and water quality impairment in some of its tributaries, the Barren Fork MU has low resiliency. Within the Barren Fork system since 2002, records of Barrens darters are from only Duke (includes McMahan Creek and its tributary, Lewis Creek), Mud, and Liberty Creeks. In Mud Creek, fringed darters replaced Barrens darters between 2009 and 2018 (Harrington et al 2020, p. 17). Mud and Liberty Creeks have poor habitat quality and are listed as impaired by the State. By stream miles, Liberty Creek comprises just over one-third of the stream systems within the Barren Fork where the Barrens darter remains extant. The Barrens darter is extirpated from the North Prong Barren Fork system and Dog Branch, a direct tributary to mainstem Barren Fork. North Prong Barren Fork is listed as impaired by the State, and fringed darters currently occur in the lower end of Dog Branch. The mouth of Mud Creek is just below the current record of Barrens darter in Liberty Creek. Therefore, the Liberty Creek Barrens darters are at very high risk of fringed darter invasion, owing both to poor habitat and fringed darter proximity. The Duke Creek system is farther upstream (about 6 mi (9.7 km)) from fringed darter records, but fringed darters have been encroaching closer over the past 40 years. Water quality and habitat in Duke Creek is moderate, and one of its tributary systems, McMahan Creek (including Lewis Creek), has high habitat quality (Service 2018, p. 24). As noted above (see *Threats*), Duke Creek and Lewis Creek, as well as other headwater streams in the Collins River system, have gone dry during moderate drought, which has the potential to put Barrens darters in contact with fringed darters as they move downstream to find watered stream channels.

The ability of Barrens darters to disperse and recolonize tributaries where they once occurred is likely precluded by the occurrence of fringed darters along several pathways in the stream network comprising the Barren Fork MU. This MU has moderate complexity because there are three tributaries occupied by the Barrens darter but Barrens

darters are absent from the mainstem. Because fringed darters are in the mainstem and have colonized several tributary systems in the Barren Fork MU, including the North Prong Barren Fork, Dog Branch, and Mud Creek systems (Harrington et al. 2020, pp. 17–19) where Barrens darters are extirpated, opportunities for Barrens darters to recolonize historically occupied tributaries are extremely reduced. Together, the occurrence of fringed darters in multiple tributaries, several stream reaches with poor habitat quality, and the threat of occasional moderate droughts contribute to the low resiliency of the Barrens darter in the Barren Fork MU.

In addition to population (MU) resiliency, we assessed species redundancy, which is low. The Barrens darter is confined to three of its four historically occupied MUs, and two of those MUs, Charles Creek and Barren Fork, have low resiliency. Only the Upper Collins River MU has moderate to high resiliency. There is likely no connectivity allowing for dispersal from the Upper Collins River MU to colonize and "rescue" the two low resiliency MUs because fringed darters are in the intervening stream reaches. With only one moderate to high resiliency MU, no connectivity between the three occupied MUs, and the close spatial arrangement of the three occupied MUs, which makes all of the occupied MUs vulnerable to incurring the same harmful effect of a catastrophic event, such as an extreme flood that passively pushes the species downstream or a drought that prompts dispersal downstream to sites occupied by fringed darters or that are unsuitable habitat, Barrens darter redundancy is low.

Species representation is also low. The range of the Barrens darter is naturally narrow, consisting of headwater streams in the Collins River subbasin of the Caney Fork that drains four counties situated on the Barrens Plateau within a single physiographic province, the Eastern Highland Rim. There are no areas within the species' natural range that contain unique habitat features that might promote development of different adaptive traits. Genetic data show very little variation between the Charles Creek and Barren Fork

populations. However, the Collins River population harbors a unique mitochondrial DNA (mtDNA) haplotype, and the frequency of (mtDNA) haplotypes in the Collins population is measurably different from Barren Fork and Charles Creek populations (Harrington et al. 2020, pp. 16–17). Although this spatial structuring of genetic variation is based on haplotypes from a single region of mtDNA (locus) and should be interpreted with caution until more loci can be assessed, it suggests there has been little recent gene flow between the Upper Collins River MU and the other MUs (Harrington et al. 2020, p. 16) and indicates there is potentially greater adaptive capacity within the upper Collins system. Nevertheless, Barrens darter representation is likely to erode over time because the unique alleles (gene variants) in the Upper Collins River MU that may bolster adaptive capacity cannot be shared with the rest of the basin where there is little allelic diversity due to a lack of connectivity among MUs. Overall, the Barrens darter's habitat diversity and genetic diversity are low, indicating the species' capacity to adapt to environmental changes, such as channel widening that can result from streambank alteration or novel exposure to a species such as the fringed darter, are limited. Therefore, the Barrens darter's representation is low.

Future Condition

Considering the accumulation of the best scientific information to date on the severity of threats currently affecting the viability of the Barrens darter, which includes new data that clearly shows the imminence and high magnitude of the threat posed by the ongoing fringed darter expansion into or near streams occupied by the Barrens darter, we determined that the current condition of the Barrens darter is consistent with an endangered species (see **Determination of Barrens Darter Status**, below) and did not conduct a new future condition analysis for the SSA report (version 3.0: Service 2025, entire). As part of our initial SSA report (version 1.0: Service 2018, entire), we developed three future-condition scenarios to capture the range of uncertainties regarding future

threats and the projected responses by the Barrens darter. Our scenarios considered three main elements of change: land development, conservation levels, and changes in precipitation and drought. The scenarios differ by considering variations that were forecast in each of the three elements of change and capture the range of outcomes the Barrens darter was expected to exhibit in the MUs by 2050. Effects of storms and drought were expected to worsen regardless of scenario, whereas projected development and conservation effects vary depending on scenario but were generally expected to remain similar to current levels or worsen. Please refer to the initial SSA report (Service 2018, pp. 25–39) for the full analysis of future scenarios.

Determination of Barrens Darter 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

The Barrens darter has a small range, which has been reduced from its historical size. Barrens darters currently occur in three of four stream systems that we defined as management units (MUs) in our SSA report (Service 2025, entire): Charles Creek, Barren

Fork, and the upper Collins River. The species is extirpated from the Hickory Creek system. In Charles Creek, the Barrens darter's known range consists of a single, linear, 1-mi (1.6 km) reach in the creek's mainstem. In Barren Fork and the upper Collins River, the extent of the Barrens darter's range (upstream to downstream-most occurrence) is 14.7 and 10.4 mi (23.7 and 16.7 km), respectively.

Some streams within each MU are listed by the State of Tennessee as having impaired water and habitat quality along their entire length. Degraded habitat likely provides conditions favorable for invasion by fringed darters, and Barrens darters have been completely replaced in all streams colonized by fringed darters, including in the entire Hickory Creek MU. Species replacement has been rapid, with Barrens darters disappearing within 15 years after contact between the two species.

Overall, the resiliency, redundancy, and representation of the Barrens darter are low. Population resiliency in Charles Creek is low, given the 1-mi (1.6-km), single occupied stream segment, and fringed darter occupation of the downstream reach. Resiliency in the Barren Fork also is low due the ongoing colonization of upstream reaches by the fringed darter, and poor habitat conditions in some stream reaches that favor the fringed darter and directly impact Barrens darter populations via sedimentation and reduced cover. Resiliency in the Upper Collins River MU is moderate to high, but there is no connectivity between the Upper Collins River MU and the other MUs. Barrens darter redundancy is low. Among the three extant MUs, Charles Creek and the Barren Fork contribute little to redundancy, due to their low resiliency. In addition, the close spatial arrangement of the MUs leaves the species vulnerable to the effects of a single catastrophic event. For example, an extreme or prolonged drought would likely affect the entire range of the species, with individuals that survive desiccation by moving downstream encountering fringed darters. An extreme flooding event would likely affect the entire range of the species by scouring or smothering nesting habitat and washing

individuals downstream and into contact with fringed darters. Representation is low because the breadth of occupied habitat types and number of physiographic regions occupied by Barrens darters is naturally low, and genetic diversity is low rangewide, except for a unique genetic marker in the Upper Collins River MU that cannot be shared with the other MU populations because of the lost connectivity.

After evaluating threats to the species and assessing the cumulative effect of the threats under the Act's section 4(a)(1) factors, we find that the primary threats influencing the viability of the Barrens darter are habitat loss; degradation of stream banks, instream cover, and water quality; and habitat fragmentation and isolation (Factor A); and the invasion of Barrens darter-occupied streams by the fringed darter (Factor E). The scope, magnitude, and imminency of these threats have reduced the resiliency, redundancy, and representation of the Barrens darter such that the species is in danger of extinction throughout its range. We did not identify threats to the continued existence of the Barrens darter due to overutilization for commercial, recreational, scientific, or educational purposes (Factor B); or disease or predation (Factor C). After evaluating the threats to the species, we found that past and ongoing changes in habitat, together with the current number of Barrens darter sites colonized by fringed darters, result in conditions that present a high risk of extinction for the Barrens darter. Thus, after assessing the best scientific and commercial data available, we determine that the Barrens darter is in danger of extinction 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. We have determined that the Barrens darter is in danger of extinction throughout all of its range and accordingly did not undertake an analysis of any significant portion of its range. Because the Barrens darter

warrants listing as endangered throughout all of its range, our determination does not conflict with the decision in *Center for Biological Diversity* v. *Everson*, 435 F. Supp. 3d 69 (D.D.C. 2020), because that decision related to significant portion of the range analyses for species that warrant listing as threatened, not endangered, throughout all of their ranges.

Determination of Status

Based on the best scientific and commercial data available, we determine that the Barrens darter meets the Act's definition of an endangered species. Therefore, we propose to list the Barrens darter as an endangered species in accordance with sections 3(6) 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, foreign governments, 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 Tennessee 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 range 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 may 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 Tennessee would be eligible for Federal funds to implement management actions that promote the protection or recovery of the Barrens 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 Barrens 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 (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 Barrens darter that may be subject to conference and consultation procedures under section 7 are actions that require a Federal permit (such as a permit from the U.S. Army Corps of Engineers under section 404 of the CWA (33 U.S.C. 1251 et seq.)) or actions funded by Federal agencies such as the Federal Highway Administration, the U.S. Department of Agriculture's Natural Resources Conservation Service, or the 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 federally funded, authorized, or carried out by a Federal agency—do not require section 7 consultation. Federal agencies should coordinate with the Tennessee Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**) with any specific questions on section 7 consultation and conference requirements.

The Act and its implementing regulations set forth a series of prohibitions and exceptions that apply to endangered wildlife. The prohibitions of section 9(a)(1) of the Act, and the Service's implementing regulations codified at 50 CFR 17.21, make it illegal for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit, or to cause to be committed any of the following acts with regard to any endangered wildlife: (1) import into, or export from, the United States; (2) take (which includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) within the United States, within the territorial sea of the United States, or on the high seas; (3) possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any such wildlife that has been taken illegally; (4) deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever and in the course of commercial activity; or (5) sell or offer for sale in interstate or foreign commerce. Certain exceptions to these prohibitions apply to employees or agents of the Service, the National Marine Fisheries Service, other Federal land management agencies, and State conservation agencies.

We may issue permits to carry out otherwise prohibited activities involving endangered wildlife under certain circumstances. Regulations governing permits for endangered wildlife are codified at 50 CFR 17.22, and general Service permitting regulations are codified at 50 CFR part 13. With regard to endangered wildlife, a permit may be issued: for scientific purposes, for enhancing the propagation or survival of the species, or for take incidental to otherwise lawful activities. The statute also contains certain exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

II. Critical Habitat

Background

Section 4(a)(3) of the Act requires that, to the maximum extent prudent and determinable, we designate a species' critical habitat concurrently with listing the species. Critical habitat is defined in section 3(5)(A) 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.

Our regulations at 50 CFR 424.02 define the geographical area occupied by the species as an area that may generally be delineated around species' occurrences, as determined by the Secretary (i.e., range). Such areas may include those areas used throughout all or part of the species' life cycle, even if not used on a regular basis (e.g., migratory corridors, seasonal habitats, and habitats used periodically, but not solely by vagrant individuals).

Conservation, as defined under section 3(3) of the Act, means to use and the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and

transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Critical habitat receives protection under section 7 of the Act through the requirement that each Federal action agency ensure, in consultation with the Service, that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of designated critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation also does not allow the government or public to access private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Rather, designation requires that, where a landowner requests Federal agency funding or authorization for an action that may affect an area designated as critical habitat, the Federal agency consult with the Service under section 7(a)(2) of the Act. If the action may affect the listed species itself (such as for occupied critical habitat), the Federal agency would have already been required to consult with the Service even absent the designation because of the requirement to ensure that the action is not likely to jeopardize the continued existence of the listed species. Even if the Service were to conclude after consultation that the proposed activity is likely to result in destruction or adverse modification of the critical habitat, the Federal action agency and the landowner are not required to abandon the proposed activity, or to restore or recover the species; instead, they must implement "reasonable and prudent alternatives" to avoid destruction or adverse modification of critical habitat.

Under the first prong of the Act's definition of critical habitat, areas within the geographical area occupied by the species at the time it was listed are included in a critical habitat designation if they contain physical or biological features (1) which are essential to the conservation of the species and (2) which may require special

management considerations or protection. For these areas, critical habitat designations identify, to the extent known using the best scientific data available, those physical or biological features that are essential to the conservation of the species (such as space, food, cover, and protected habitat).

Under the second prong of the Act's definition of critical habitat, we can designate critical habitat in 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.

Section 4(b)(2) of the Act requires that we designate critical habitat on the basis of the best scientific data available. Further, our Policy on Information Standards Under the Endangered Species Act (published in the *Federal Register* on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106–554; H.R. 5658)), and our associated Information Quality Guidelines provide criteria, establish procedures, and provide guidance to ensure that our decisions are based on the best scientific data available. They require our biologists, to the extent consistent with the Act and with the use of the best scientific data available, to use primary and original sources of information as the basis for recommendations to designate critical habitat.

When we are determining which areas should be designated as critical habitat, our primary source of information is generally the information compiled in the SSA report and information developed during the listing process for the species. Additional information sources may include any generalized conservation strategy, criteria, or outline that may have been developed for the species; the recovery plan for the species; articles in peer-reviewed journals; conservation plans developed by States and counties; scientific status surveys and studies; biological assessments; other unpublished materials; or experts' opinions or personal knowledge.

Habitat is dynamic, and species may move from one area to another over time. We recognize that critical habitat designated at a particular point in time may not include all of the habitat areas that we may later determine are necessary for the recovery of the species. For these reasons, a critical habitat designation does not signal that habitat outside the designated area is unimportant or may not be needed for recovery of the species. Areas that are important to the conservation of the species, both inside and outside the critical habitat designation, will continue to be subject to: (1) Conservation actions implemented under section 7(a)(1) of the Act; (2) regulatory protections afforded by the requirement in section 7(a)(2) of the Act for Federal agencies to ensure their actions are not likely to jeopardize the continued existence of any endangered or threatened species; and (3) the prohibitions found in section 9 of the Act. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. These protections and conservation tools will continue to contribute to recovery of the species. Similarly, critical habitat designations made on the basis of the best scientific data available at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans (HCPs), or other species conservation planning efforts if new information available at the time of those planning efforts calls for a different outcome.

Critical Habitat Determinability

Our regulations at 50 CFR 424.12(a)(2) state that critical habitat is not determinable when one or both of the following situations exist:

(i) Data sufficient to perform required analyses are lacking, or

(ii) The biological needs of the species are not sufficiently well known to identify any area that meets the definition of "critical habitat."

We reviewed the available information pertaining to the biological needs of the Barrens darter and habitat characteristics where the species is located. A careful

assessment of the economic impacts is pending, and we will begin working to acquire the complex information needed to perform that assessment. Therefore, due to the current lack of data sufficient to perform required analyses, we conclude that the designation of critical habitat for the Barrens darter is not determinable at this time. The Act allows the Service an additional year to publish a critical habitat designation that is not determinable at the time of listing (16 U.S.C. 1533(b)(6)(C)(ii)).

Required Determinations

Clarity of the Proposed Rule

We are required by Executive Orders (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.

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, May 4, 1994), E.O. 13175 (Consultation and Coordination with Indian Tribal Governments), the President's memorandum of November 30, 2022 (Uniform Standards for Tribal

Consultation; 87 FR 74479, December 5, 2022), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with federally recognized Tribes and Alaska Native Corporations 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 boundaries of the proposed critical habitat for the Barrens darter, so no Tribal lands would be affected by the proposed designation.

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 Tennessee Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

List of Subjects in 50 CFR Part 17

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

Signing Authority

Paul Souza, Regional Director, Region 8, Exercising the Delegated Authority of the Director of the U.S. Fish and Wildlife Service, approved this action on June 6, 2025, for publication. On June 25, 2025, Paul Souza authorized the undersigned to sign the document electronically and submit it to the Office of the Federal Register for publication

as an official document of the U.S. Fish and Wildlife Service.

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, in paragraph (h), amend the List of Endangered and Threatened Wildlife by adding an entry for "Darter, Barrens" 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, Barrens	*Etheostoma forbesi*	Wherever found	E	[*Federal Register* citation when published as a final rule]
* * * * * * *				

Madonna Baucum,
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U.S. Fish and Wildlife Service.

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